

RE-DWELL Conference

“Housing co-creation for tomorrow’s cities”

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Conference Proceedings

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Introduction

Adriana Diaconu, Conference chair

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The first RE-DWELL conference addressed contemporary housing issues such as climate change and the social challenges of housing by focusing on the multiple actors involved in housing policy, planning, design and construction. Around the theme of co-creation, it brought to the fore the interactions of these players and the ways researchers and housing practitioners can engage both with established stakeholders and with new arrivals. This way, the discussions gave rise to a reflection on the multi-dimensional aspects of housing and on the concepts and methods comprehended in a holistic approach, as well as on the roles, particularities and settings of the different actors involved. The conference brought together a diversity of researchers from different academic backgrounds whose work focused on transforming and adapting the existing systems and professional practices while establishing new conceptions of housing in order to meet the present and future challenges that cities face.

The extended abstracts of the presentations, gathered in these proceedings, reflect this diversity of approaches. The twenty-two abstracts selected by the scientific committee examine co-creation from a variety of perspectives offering insight into current research projects through theoretical or methodological reflections, or partial research results. Ten of these abstracts, were submitted by early-stage researchers of the RE-DWELL programme and showed the progress of their doctoral research projects. The presentations in the conference provided opportunities for exchanges and collaboration between these researchers and more experienced scholars, in the RE-DWELL network and outside, with similar research interests.

The conference consisted of six thematic panels that explored various aspects of co-creation and how the interactions between actors shape the processes of conceptualizing, designing, building, and managing housing.

The first panel, on “**Methodologies and methods for knowledge co-creation**”, brought together attempts to engage both conceptually and methodologically with different actors of a housing system and, furthermore, with the complexity of housing issues. The contributors provided insights into viewing housing as a comprehensive system and how to implement this perspective in housing projects. They also discussed the role of the researcher and the significance of considering their own position and context, as well as the research design and adaptations to the specificities of various stakeholders involved in the process, such as housing associations, policy makers, tenants, and home owners.

The second panel, entitled “**Environments and processes for co-design**”, brought forward several multi-disciplinary approaches to understanding co-design processes, and more particularly to apprehending the behaviour of stakeholders, through a combination of ethnographic, architectural and geographical approaches. The panellists were particularly interested in the methods and techniques used to facilitate the participation of inhabitants in co-design, particularly those which involved those commonly left out of mainstream design processes. By doing that, the contributions discuss the tools and effects of participatory processes, such as action research. They do so both in terms of outcomes of design processes, through the “social value” assessment of housing estates, (Ricaurte) and in terms of the transformative effects on their participants, as for example by turning architecture students

into “spatial agents” (Roussou and Charalambous) and thus transforming their perception of their role in society.

The third panel extended the discussion further to policy and spatial planning. Under the title **“Transforming governance: between coordinative action and self-organization”**, it gathered four contributions that discussed collective actions in response to crisis situations such as the COVID pandemic, increase in homelessness and mortgage arrears, housing exclusion and deprived neighbourhoods. Situated in different contexts in Europe and the United States, these studies put the spotlight on how informal, ad hoc or bottom-up solutions can be related to institutional practices. Some authors analysed institutionally-driven responses such as temporary housing in the Netherlands, while others discussed the effects and potential of the institutionalization of informal or experimental endeavours such as “homeless villages” in Portland, or the Community Land Trust model in Cyprus. The effects of these actions are evaluated in terms of their impact on governance, as well as their social and spatial impacts, such as favouring empowerment or, on the contrary, reinforcing exclusion.

The presentations of the fourth panel entitled **“Housing assessment for social and environmental sustainability”** addressed on housing sustainability from several perspectives. Even if the papers gathered in this panel developed more technical approaches to building characteristics, they considered the social theme as a backbone to understanding sustainability. Some contributions aimed to broaden the traditional technical approach to sustainability by enhancing theoretical and evaluation frameworks and incorporating social aspects and decision-making processes. Others focused on tools for evaluating greenhouse gas emissions and mitigation strategies in building and design practices, taking into account energy and resource consumption and the challenges faced by urban communities in poverty.

The fifth panel, titled **“From housing issues to policy and back”**, brought together a more diverse set of perspectives on housing that we can identify as mainly economic (Fernandez et al.), social (Hoekstra and Gentili) and territorial (Caramaschi and Peverini). This research work covered different themes: the strategies of social housing providers in the EU for obtaining “sustainability” earmarked European funds, the difficulties young adults face in the Amsterdam housing market and the territorial dynamics in the Italian region of Milan observed through its housing issues by using a territorial ecology framework. The conclusions show that these different disciplinary approaches are interrelated. Their analysis requires an integration of diverse rationales of housing that encompass individual and collective strategies and territorial dynamics.

The last panel, on **“New sustainable housing solutions in the existing city”**, explored the possibility of developing innovative and sustainable housing solutions by exploiting regulations, standards and norms and by allowing new uses and adaptations of existing spaces, buildings and housing estates. The different interventions argued for the adaptation of the existing urban heritage, regardless of whether it is appreciated or criticised, through soft architectural and management interventions, such as light densification and appropriation of “urban voids” (Iannizzotto and Paio). They put forward both conceptual and concrete approaches to fully exploit the potential of the urban fabric as a tactic for urban sustainability.

In addition to the specific topics covered in each panel, the proceedings are an invitation to extend further the interdisciplinary discussions and reflections between the papers. Such analytic perspectives tackle, for example, the implications of national and European policies both on conceptualising sustainability (Tzika and Furman) and on the practices and strategies of housing associations and of their different departments (Fernández et al., Croon et al.). Some

of these cross-cutting research perspectives will be developed in the individual research projects of the participants and in the future activities of the RE-DWELL network.

Panel 1: Methodologies and methods for knowledge co-creation

Mahmoud Alsaeed, Karim Hadjri, Krzysztof Nawratek, *Mode 2 science: Exploring a common ground of knowledge production in the fields of housing and sustainability*

Tijn Croon, Joris Hoekstra, Ute Dubois, *Energy poverty alleviation in social housing: Prototyping policies with practitioners*

Margaux Lespagnard, Waldo Galle, Niels De Temmerman, *Visualising equitable housing: A prototype for an equitable housing framework*

Christophe Verrier, *Making sense of a new national context in comparative housing: Personal and systemic reflections of a researcher's journey in France*

Mode 2 science: Exploring a common ground of knowledge production in the fields of housing and sustainability

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Keywords: knowledge production, housing research, sustainability research, mode 2 science

1. Introduction

The field of housing research is very diverse, theoretically reliant and intertwined with politics, economics, social and, more recently, environmental studies (Matthews, 2016). Sustainability research, on the other hand, is often perceived as a complicated, practice-oriented field that examines the interactions between the economic, social and environmental pillars of society (Purvis et al., 2019). The links between housing and sustainability research are often described as ambiguous and thorny topics, and many scholars refer to them as bifurcated areas of study. As a result, researchers have developed and adapted different approaches to the way knowledge on these two critical areas is perceived and generated. The Mode 2 science is a relatively new concept that calls for the production of context-oriented, scientifically reliable and robust social knowledge, and is most notable for its tendency towards a transdisciplinary approach (Frost & Osterloh, 2003; Gibbons et al., 1994).

This paper is concerned with the methodological issues on how housing and sustainability research and knowledge is presented and produced by those who engage with it. A literature focused exploratory investigation was used to identify the most common methodological issues of both fields. In the end, a reasoned claim was made that the Mode 2 of knowledge production is one of the appropriate approaches to address the methodological challenges of dealing with sustainability and housing. Yet, the claim requires further in-depth investigation leading to a better understanding of the true extent of the problem and the possibility to design an innovative framework for sustainable housing knowledge production.

2. Housing and sustainability methodological challenges

The argument presented in this paper rests on three pillars. The first pillar introduces the methodological principles of Mode 2 science. The second explores methodological issues in housing research, and the third one highlights the prominent debate on sustainability research issues.

2.1 Mode 2 principles

Gibbons et al. (1994), writing about the dynamics of science production, make a clear distinction between Mode 1 and 2 knowledge production. The former is discipline-based and clearly separates 'theoretical' from 'applied', while the latter forms a continuous flow between theory and application to create contextualised outcomes that are influenced by all disciplines concerned (Gibbons et al., 1994). While Mode 1 focuses on the codified component of knowledge, Mode 2 focuses on the tacit components that represent a shift towards a broader social distribution of knowledge (Frost & Osterloh, 2003; Gibbons et al., 1994). Mode 2 dynamics

look at the structure of knowledge from both a homogeneous and a heterogeneous perspective and is therefore not only able to understand and explain the communication between science, society and scientific practitioners, but also to provide a clear framework for the structure of knowledge components (Frost & Osterloh, 2003; Gibbons et al, 1994).

Mode 2 is defined primarily by its inter¹- and transdisciplinary² approach, which shares the same principle with critical research and the postnormal³ sciences (Gibbons et al., 1994). Both academic and social aspects are taken into account to construct the knowledge and methods of the research; validity comes not only from academic peers but also from the extended peer community; furthermore, uncertainty and ignorance are used as a method to verify rather than question the data generated; and a discursive process of opening and closing the focus is followed rather than a strict top-down approach (Carayannis & Campbell, 2009; Frost & Osterloh, 2003; Gibbons et al. , 1994; Wiek & Lang, 2016).

One of the examples of Mode 2 application is the development of an effective healthcare delivery system for the Scottish Health Advisory Service (SHAS) that meets the need for rapid decision-making and a clear but flexible organisational structure (MacLean et al., 2002). Another example is the development of hypersonic projectiles that overcome the challenges of knowledge, material and technology limitations (Gibbons et al., 1994). Both examples raised several issues, including the lack of guidance from existing science, discontinuous prior experience, and the uncertainty of data and results. Applying the Mode 2 approach - as explained by MacLean et al. (2002) for the first example and by Gibbons et al. (1994) for the second - led to the formulation of a structure for collaboration between academics, professionals, scientists and engineers in a trans- and interdisciplinary manner to overcome such challenges and create an effective knowledge base to inform solutions (Gibbons et al., 1994; MacLean et al., 2002).

2.2 Housing research-ers

Writing in 2009, Chris Allen (2009, p. 54) explains that tracking the problems in housing research indicates that the problem is not the lack of a theorising methodology or a justifiable rationale, but that a significant part of the problem lies in the way housing researchers investigate and

¹ Interdisciplinary means that two or more academic disciplines collaborate in an activity that explores a particular topic from different perspectives. See Szostak, R. (2013). The State of the Field: Interdisciplinary Research. *Interdisciplinary Studies*, 1(31), 44-65.

² Transdisciplinary approach enables collaboration between scientific and non-scientific actors and facilitates a systemic approach to address complex challenges. See Pohl, C., & Hadorn, G. H. (2008). Core terms in transdisciplinary research. *Handbook of transdisciplinary research* (pp. 427-432). Springer.

³ Postnormal science is a recently emerged paradigm that investigates-to-evaluate decision-making processes, when facts are uncertain, the stakes are high, solutions are ambiguous and the decision is urgent. See Nogueira, L. A., Bjørkan, M., & Dale, B. (2021). Conducting Research in a Post-normal Paradigm: Practical Guidance for Applying Co-production of Knowledge. *Frontiers in Environmental Science*, 337.

define the ground of their knowledge in the context of social science knowledge production (Allen, 2009). Allen's (2009) debate draws on Gadamer's (1975) philosophical views on the perception of knowledge and Bourdieu's (2000) discussion of the practices of scholars to conclude that housing research has succeeded in producing adequate theoretical knowledge, but as soon as it believed that this knowledge was superior to other forms of knowledge, particularly '*lived experience*', it declared itself a failure (Allen, 2009; Bourdieu, 2000; Gadamer, 1975). Moreover, it seems that housing researchers have double standards when it comes to questioning research methodology. They doubt the reliability of other scientific methods – especially practice-based research – and overlook the issues of methodology and knowledge organisation in housing, such as the origins and background of applied methodology (Allen, 2008, 2009).

The examination of the most influential works⁴ in the field of housing comes to the same conclusion as Jacques Du Toit et al. (2022), namely that housing scholars focus on the direct applications of approaches but present little to nothing about the context and ground on which these approaches are built (Du Toit et al., 2022). It is also noteworthy that prototypical methodological criteria useful for housing studies are still underdeveloped and lack a clear schematically organised framework (Tobi & Kampen, 2018). Du Toit et al. (2022) add that housing researchers often adopt their methodologies and designs from other social sciences without assessing their applicability to housing research or considering existing proven methodologies (Du Toit et al., 2022; Tobi & Kampen, 2018).

2.3 Sustainability research-ers

Meanwhile, at the level of sustainability research. The work of Wiek and Lang (2016) and Spangenberg (2011) divides sustainability studies into one type that focuses on the descriptive analysis of sustainability problems (descriptive-analytical), while the second type works on developing solutions to these problems and testing their applicability (transformational) (Spangenberg, 2011; Wiek & Lang, 2016). Even though the main methodologies of the two types differ drastically, they share the same risks. Meppem and Bourke's (1999) study was one of the first to point out that sustainability researchers must have a comprehensive understanding of the subject; otherwise, the knowledge produced might not make sense in the context of sustainability (Meppem & Bourke, 1999; Wiek & Lang, 2016). Murphy (2012) clarifies that when researching sustainability, the researcher must explain the context and scale; otherwise, the knowledge produced could be general and serve a limited purpose (Murphy, 2012).

Although the transition from disciplinary to interdisciplinary and later to transdisciplinary approaches is regarded as progress for sustainability science, it poses a greater challenge for

⁴ The examination included: Vestbro et al. (2005) Methodologies in Housing Research; Maginn et al. (2008) Qualitative Housing Analysis; An International Perspective, Studies in Qualitative Methodology; Smith (2012) The International Encyclopaedia of Housing and Home.

knowledge construction (Wiek & Lang, 2016). Jerneck et al. (2011) explain that this requires not only a common ground of terminologies and perceptions, but also a clarification of 'uncertainty' as an indicator of scientific disagreement rather than a data problem (Jerneck et al., 2011). The work of Scerri & James (2010) explains that the coupling of qualitative and quantitative methodologies is crucial to overcome the 'abstract view' of generated knowledge and avoid the exclusive consideration of technical aspects (Scerri & James, 2010). Spangenberg (2011) adds that the tendency towards 'fragmentation' in sustainability research puts the primary goals of 'solving' or 'analysing' at greater risk of generating fragmented knowledge (Spangenberg, 2011).

3. Conclusion

The identified features of Mode 2 directly deal with the presented risks of housing and sustainability research; therefore, the claim that a shift from Mode 1 to Mode 2 is reasonable. However, the question of whether it is necessary to move from the first to the second mode of knowledge production remains unanswered and requires further investigation. But the methodological problems and questions of housing and sustainability research that relate to knowledge production have a threefold connotation:

- The methodological problems of housing and sustainability research can be traced back to the researcher's understanding of knowledge production and the context in which knowledge is produced, and therefore the risk of taking knowledge out of context is high (Allen, 2008). The second problem relates to the principles of methodology construction. As Du Toit et al. (2022) explained, any methodology needs to be comprehensively structured before it can be applied. Therefore, a transdisciplinary methodology needs a review phase, which is often neglected, resulting in some of the methodological specificities being disregarded (Du Toit et al., 2022).
- Leech & Onwuegbuzie (2009) pointed out that for years the choice of methodology seemed to be dichotomous –qualitative and quantitative– and only recently a third choice –mixed– has been introduced, which poses a major challenge for addressing transdisciplinary problems (Leech & Onwuegbuzie, 2009). Spangenberg (2011) adds that despite profound changes in nature and society, the disciplinary organisation of scientific knowledge production remains unchanged, especially in housing and sustainability research (Spangenberg, 2011). Therefore, it is necessary to consider Mode 2 to overcome problems in the methodological structure and researchers' approach to knowledge production. However, this change requires its own vocabulary with clearly defined terms to avoid misunderstandings and fragmented knowledge.
- The search for common ground between sustainability and housing research does not only mean finding a common methodology or goal but also extends to the methodological issues that researchers in both fields face. The existence of methodological differences is a natural outcome of the specificity of the fields. However, developing an innovative framework that recognises these differences and responds to rapid societal and technological change is crucial and needs further exploration.

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Energy poverty alleviation in social housing: Prototyping policies with practitioners

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Keywords: energy poverty, social housing, co-creation, policy prototyping

1. Introduction

The European energy crisis of 2022 stresses the importance of protecting the most vulnerable households. Price peaks disproportionately affect households with low incomes, limited savings, and inefficient homes, and increased energy poverty: the inability to secure sufficient domestic energy services that allow for participation in society (Bouzarovski & Petrova, 2015).

Since European social housing countries have become increasingly residualised, a significant share of households in or at risk of energy poverty are being accommodated by social housing providers (Poggio & Whitehead, 2017; Walker, 2008). However, while most practitioners acknowledge that social housing providers (SHPs) have a responsibility in energy poverty alleviation, targeted intervention approaches have hardly been explored (Desvallées, 2022). The body of scholarship on energy poverty measurement has grown rapidly, but its use in practice has hardly been addressed (Bouzarovski et al., 2021). Sherriff et al. (2019) note that a possible explanation might be that insights from research are inadequately communicated to policymakers and practitioners. Charlier and Legendre (2021) add that the sense of urgency has substantially differed across countries.

This paper aims to combat these gaps, by proactively engaging with practitioners across Europe to find out which targeted intervention approaches are considered most effective, what their benefits and potential (regulatory) obstacles are, and whether these perspectives differ in different policy contexts. We indirectly examine the responsibilities SHPs are willing to accept within a 'just transition', and explore whether, and if so how, their apparent techno-economic approach to retrofit provision could be altered (De Feijter et al., 2019).

2. Policy prototyping

Generally, research strategies are based on either a deductive or an inductive approach to science (Bryman, 2016). While the former offers 'reliability' and the latter indicates 'probability', it could be argued that both miss the notion of 'possibility' (Barry & Hansen, 2008, p. 457). Peirce (1965) therefore developed his abductive approach to develop 'tentative explanatory hypotheses' or 'proto-theories' and initiate novel research trajectories. In policymaking, deductive approaches (testing policy interventions through randomised controlled trials) or inductive approaches (exploring why these did or did not work) could be complemented with abductive approaches (Bason, 2014). Exploring new policy interventions ('musement' in Peirce's words) and making provisional guesses on their effects are key (Kimbrell, 2015).

Abductive approaches are often based on participatory research design. First, a carefully selected mix of participants is asked to become part of the ‘innovation journey’, de facto acting as ‘co-researchers’ and ‘codesigners’. As abductive policy experimentation requires a holistic perspective, it is preferable to select a diverse array of participants. Then, researcher and participants collectively delve into the subject matter, starting with a definition of the desirable outcome and gradually moving towards a hypothesis of an underlying structure comprising concrete rules, arrangements, and operations.

3. Research design

At the time of submitting this conference paper, the research process is ongoing. Nevertheless, the following section presents an overview of the research design.

3.1 Focus groups

This qualitative research design incorporates six focus group sessions, referred to as ‘workshops’, as the primary data collection method. The focus groups take approximately three hours each, and their semi-structured design is set out below. They are planned in the fourth quarter of 2022.

Introduction and benchmark

In order for all participants to start the session with approximately the same understanding of the problem, we define energy poverty and describe its prevalence in social housing estates. Subsequently, we ask what data the SHP already collects and/or uses about experienced energy poverty in its stock, and what obstacles there are in collecting or using this data. We also ask participants to elaborate on current efforts of the SHP to mitigate the negative impact of the current energy crisis.

Brainstorm and prioritisation

To facilitate creative thinking, we divide the participants into three or four groups. Participants then engage in an open and candid discussion on which additional approaches their SHP could adopt. The approaches are recorded on sticky notes and displayed on a wall, and participants are asked to rank them according to their perceived potential. While part of the following semi-structured discussion is set beforehand to allow for comparison between SHPs and countries, there is room for discussion on other highly-regarded innovative approaches as well.

Semi-structured discussion

Preliminary interviews taught us several crucial approaches that have been adopted by SHPs in recent years, and we start off by discussing these approaches in detail:

- Prioritised retrofit: considering social factors (characteristics of households or neighbourhoods) besides technical or financial data in prioritising renovations.
- Strategic rent setting: considering the risk of energy poverty when setting rents, for instance based on a combination of energy efficiency and household income. Other ways of financial compensation (subsidising energy, direct allowances) can also be discussed in this round.
- Targeted allocation of dwellings: considering household income and other factors that increase risk of energy poverty (age, ability, composition) when allocating dwellings at the start of a tenancy.

However, we reserve sufficient time for the input from the previous session. After the discussion, the participants are asked to rank the various approaches again in terms of potential.

After these six focus groups are finished, the recordings are thoroughly analysed to provide insight in all possible policies and related deliberations, and to shed light on what incidental or structural obstacles must be further studied by researchers and/or addressed by policymakers before effectively targeted interventions are feasible.

3.2 Participant selection

The empirical research consists of six focus groups or ‘workshops’ in three different countries: France, the UK, and the Netherlands (Table 1). Conducting the research in different countries provides the opportunity to compare between regulatory contexts, and therefore to suggest which legislation facilitates targeted intervention in one country and obstructs it in another. We selected these three countries because of their traditionally substantial social housing sectors, and these six major SHPs because they might be able to exercise thought leadership due to their size and professionalism.

Table 1. Participating housing associations

Country	Region	Social housing provider	Rented dwellings
France	Countrywide	Polylogis	145,000
	Paris Metropolitan Area	Paris Habitat	125,000
United Kingdom	England	Clarion	125,000
	Greater London	Peabody	104,000
The Netherlands	Amsterdam Metropolitan Area	Ymere	75,000
	Rotterdam	Havensteder	45,000

However, their size also implies a compartmentalised organisation, which makes it even more important to select a diverse group of participants with a variety of backgrounds and perspectives. The six to eight professionals we select per workshop work in different departments and have supposedly different interests. Simply put, financial practitioners want breakeven results, legal experts want compliance with the law, and social workers want sufficient resources to protect vulnerable tenants.

Further analysis and discussion of these preliminary results will continue as part of the ongoing research undertaken in the RE-DWELL project.

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Visualising equitable housing: A prototype for an equitable housing framework

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Keywords: equitable housing, qualitative housing, systemic model

1. Introduction

The growing housing crisis in Western Europe increases the pressure on conventional support measures and further reduces the accessibility to equitable housing. In housing projects, stakeholders in practice are often only confronted with a fraction of the project within their expertise. Yet, an overarching, interdisciplinary housing concept could lead to stronger and more equitable living situations and buildings.

This paper adopts the term *equitable housing* instead of affordable housing, as the term equitable contains qualitative, social, environmental, and financial aspects. While affordable housing is usually only perceived as the cost ratio of household income and housing costs (Winters, 2021) This interdisciplinary nature of equitable housing projects is also stressed in literature, where researchers often define extensive lists of criteria to explain equitable housing. From user participation to hygiene to water efficiency, criteria are often very widespread over different focuses and disciplines. (Gan et al., 2017; Karji et al., 2019; Mulliner et al., 2013; Olakitan Atanda, 2019; Zarrabi et al., 2022), leaving the concept scattered and complex.

Visualizing the complex and systemic nature of an equitable housing project in a comprehensible way could help stakeholders in defining an inclusive and equitable housing project. This research proposes a prototype for an equitable housing framework that could serve as a base for an open discussion between stakeholders in a housing project. The framework encourages them to think systemically and visualize their intentions. It can be used when designing, drawing up and analysing housing projects.

2. Methodology

An explorative international literature study was set up to establish an in-depth understanding of the different criteria for equitable housing. A series of twenty-one semi structured interviews allowed to further define equitable housing in the Flemish and Brussels housing practice. Among the interviewees were Architects, sustainability engineers, co-housing residents, social housing companies, cooperatives, and community land trusts. Together, the literature studies and the interviews resulted in an in-depth list of criteria for equitable housing projects. These criteria were then grouped into 15 dimensions. These dimensions are distributed over four categories: living, financing, dwelling, and using. The dimensions were then visualised in a framework that aligned with the goals of the research; simplifying the complex concept of equitable housing and encouraging systemic thinking.

3. Results and discussion

Fifteen dimensions were defined to structure and simplify the long complex list of criteria for equitable housing, derived from the literature study and the interviews (Table 1). Each paper of the literature review discussed dimensions such as comfort, neighbourhood, social contact, safety, responsibility, adequate living space, energy and water use. The other dimensions such as solidarity, the total cost of ownership, capital accumulation, initial price, scale and total cost of usership were not as important in literature but were mentioned and stressed by the interviewees. Table 1 shows the meaning of each dimension.

Table 1. Fifteen dimensions of equitable housing (Gan et al., 2017; Karji et al., 2019; Mulliner et al., 2013; Olakitan Atanda, 2019; Paduart, 2012; Zarrabi et al., 2022)

Dimension	Meaning
Comfort	Creating a healthy and comforting living environment, regarding temperature, daylight, hygiene, acoustics, accessibility
Neighbourhood	Providing enough services in the area, like schools, greenspace, work, public transport, healthcare, childcare
Social contact	Allowing social interaction without the invasion of privacy.
Safety	Creating a safe environment without the feeling of being controlled. Safety also includes protection from natural disasters and tenure security.
Solidarity	Financial inclusion of all stakeholders in the project. Reducing social inequity between inhabitants.
Responsibility	Involvement of all stakeholders in the project with the least amount of conflict. Allowing stakeholders to make informed choices.
The total cost of ownership	The cost that will be spent over time for (co-)owning the dwelling, including interest rates and life cycle costs.
Capital accumulation	Gaining financial security in the long run while living in a dwelling. This can be for example through cost recovery, shares, or (co-)ownership.
Initial cost	The cost spent at the beginning of a project, including building costs, and organisational costs.
Adequate living space	The space inside the dwelling in relation to the resident's needs, including individually used and shared spaces.
Scale	The number of housing units and other functions in the project.
Service life	Lifespan envisioned for (part of) the project, including also long-term project phasing and temporary use.
Energy and water use	Strategies for efficient energy and water use, including reducing the use of environmental resources.
Maintenance costs	Costs spent on repair and maintenance of the building.
The total cost of usership	The costs spent on using the project over time

Mulliner et al. (2013) describe how a group of criteria should be considered to develop equitable housing. This research approaches equitable housing as an equilibrium between interconnected dimensions. All dimensions are equally important or gain importance, depending on the project and its inhabitants. This is symbolised by placing the dimensions on a circle (Figure 1). The larger the radius of the circle becomes, the more of a certain dimension is present in the project. However, each dimension must have an upper and lower limit. For example, A minimum sum of maintenance costs is required to prevent a building from decay, i.e., lower limit. On the other hand, there is also a maximum sum of maintenance costs when stakeholders cannot afford the costs, or it is simply not worth it.



Figure 1. To create an equitable housing project, stakeholders should strive to stay in between the defined upper and under limits, i.e., in the black zone. Source: Authors

Finding solutions that balance both the lower and upper limits for the fifteen dimensions in the framework is thus key when developing an equitable housing project. The exact solutions are very context-specific and will vary depending on the project and the stakeholders involved in the decision-making. Defining one dimension will inevitably influence other dimensions, it is thus key for users to think systemically when using the framework.

The goal of this research was not to find a new definition of equitable housing but to bring together already existing knowledge and prototype a model that simply communicates this knowledge. The goal was also to allow stakeholders to think more systematically when addressing different disciplines, for example during a meeting where a group develops and discusses their housing concept with the architect. In further research, the prototype of the framework was adapted to a workshop format and tested based on actual projects.

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Making sense of a new national context in comparative housing: personal and systemic reflections of a researcher's journey in France

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Keywords: comparative housing policies, housing studies

1. Introduction

Considering the complex meshing behind housing systems, the fact that housing policies are highly contextual is not particularly ground-breaking. Variegated political and institutional pathways, economic conditions, the state of the housing stock, or simply socio-culturally constructed housing aspirations each singularly shape the ways housing systems function so as to—in an ideal world—provide decent homes for all. This complexity leads to a particular set of challenges for comparative housing researchers.

For example, anyone discussing 'social housing' across national boundaries needs to account for the wide variation in the meaning of the term, which may refer to very different objects in different countries (Scanlon et al., 2014). It could refer solely to publicly owned units offered as a last resort option for the most vulnerable (like in the United States), while it may also refer to a broad tenure type geared at a range of household types by a wide variety of actors, whether public, not for profit or collective (such as in Sweden or Singapore). In fact, even the previous sentences are oversimplifications, as only a—relatively—lengthy discussion of national specificities of different cases studied allows to create a space for comparison and differentiation (Haffner et al., 2009). In fact, defining and building understandings are central pieces of most comparative housing literature publications.

Yet, this relatively well acknowledged difficulty hides a wider conceptual issue; the words underpinning these definitions and differentiations, somewhat obscure the actual process leading researchers to make sense of the various logics, institutions and actor behaviours operating within a specific housing system. In fact, where the literature is quite explicit on the multiple variations across contexts and what they mean for comparative work, there is little interest given to the actual learning process, how individual researchers acquire the knowledge necessary to carry research on housing, whether at home or abroad. Ultimately, this poses a challenge for comparative work specifically: how can one effectively understand the national specificities of an 'external' housing system to an extent that would allow them to carry meaningful comparative work?

Stemming as a reflection on Van Heur's (2020) call to better integrate personal histories and the role of researchers' positionality in affecting the knowledge they produce; this contribution will reflect on both the personal and systemic aspects involved in the process of "learning" a new housing system. This, with a more specific aim to encourage comparative researchers working on policies, institutions, and actors to better engage openly and reflectively with their topics.

2. Research work

This contribution will be articulated around the personal experience of the author in “learning” the French and Dutch housing systems along with a broader reflection on the systemic implications behind the housing as an object of knowledge acquisition. Firstly, the presentation will trace the trajectory of the author as a Canadian slowly specializing on housing policy research while moving between different countries. It will serve as an example of the different conceptual and practical challenges that one can encounter in the process. This experience will be framed as a form of knowledge acquisition bearing important similarities with that of learning a second language: from the acquisition of a new vocabulary, to using a different grammar, to interpret a new reality.

Following up on the parallels with didactics, the second part of the presentation will delve more systematically into the “learning” of housing research through an analysis of the syllabi and reading lists used in different housing studies classes in North America and Europe. This analysis will study the different themes, topics and objectives of these courses in order to compare the similarities and dissimilarities in the ways the topic of housing is introduced to bachelor's and master's students in the fields of public policy and urban planning. The analysis will show that while crosscutting themes are plentiful, they are most often underpinned by a specific syntax anchored in local realities. It will also posit that vocabulary and topics that may seem connected can easily turn into false friends, where a foreign concept appears deceptively similar to another in one's own frame of reference. On the surface, this situation raises questions on the transferability of knowledge acquired in such classes: are these local specificities only used as examples to present more general processes, or are they so particular to a given context that they need to be specified? More deeply, this situation should also lead us to reflect more openly on the impact of our own positionality in our work. Indeed, if these courses introduce housing to students using a specific local syntax, one can reasonably wonder in what ways this originally localized exposure (also in informal settings) later shapes the way we approach our object of research. Pursuing the analogy with language, this question has important similarities to those surrounding linguistic relativity as to “whether people who speak different languages think differently” (Wolff & Holmes, 2011, p. 253).

3. Conclusion

This contribution argues that there is a clear need to explicitly reflect on the impact of our own individual experiences in the way we carry out our research on housing, especially in comparative work. Doing so could not only improve our capacity to deal with shortcomings in dealing with unfamiliar contexts, but also represents an exciting opportunity to introspectively explore the relationship we have with our research object. Ultimately, this presentation aims to present possible avenues offered by a reflexive exploration of the interface between the initial housing experiences of researchers, system-specific idiosyncrasies and the resulting production of knowledge.

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Panel 2: Environments and processes for co-design

Georges-Henry Laffont, Clément Guilloteau, Axelle Pavero, *Learning from "Îlot Neyron" in Saint-Etienne: Thinking, designing and living the city in an alternative way*

Leonardo Ricaurte, *New approaches to Post-Occupancy Evaluation: Unveiling the social value of housing design*

Effrosyni Roussou, Nadia Charalambous, *On becoming a spatial agent: A comparative analysis of transdisciplinary design and build studio pedagogy in Cyprus and Sweden*

Paola Briata, Gennaro Postiglione, Constanze Wolfgring, *From unconventional households to unconventional affordable housing*

Learning from "Îlot Neyron" in Saint-Etienne: Thinking, designing and living the city in an alternative way

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Keywords: Saint-Etienne, co-creation, urban fabric, housing vacancy, popular centrality

In Saint-Etienne, the project "Neyron: *rebuilding the neighbourhood around a popular centrality*"¹ questions the links between innovation and the urban fabric by interlacing the scales of living, from housing to the neighbourhood (Lussault, 2007). First, it queries the concept of urban innovation (Arab et Vivant, 2018) as an "end in itself" in favour of an obligation of means to ensure the habitability of urban spaces. Secondly, it allows us to characterize the specificity and analyse the efficiency of the "layers of the city" method (Roncayolo, 2002). Finally, the Neyron project gives rise to a discussion on the limits between situated response and intention of replicability on a larger scale.

For this purpose, a multidisciplinary team² conducted analytical, methodological, and reflexive work aimed at providing an outside view of Neyron project as it is conceived and led by an analysis of the urban action and, thus, providing input in reflection order to support the changes at and of Neyron. This contribution will first examine the relationship between innovation and urban manufacturing in the context of Saint-Etienne, before explaining the spatial characteristics and operational approach of the project in the light of the hypotheses and initial results of the action research.

Since the beginning of the 21st century, innovation has been a major theme in debates on urban design, focusing on the materiality of the city (Bourdin, 2001), its organizational methods, regulations and processes (Offner, 2000), and, more generally, on the public policies

¹ Neyron is a hill district in downtown Saint-Etienne close to the new Châteaureux business EcoQuartier, whose eponymous street is the subject of a "reactivation" project proposed by the EPA Saint-Etienne. This project, conceived in a shared governance approach, aims to include many local partners to achieve a high level of complementarity between the different innovations tested on the Neyron demonstrator.

² This action-research project is conducted, in addition to the authors of this contribution, by Frédéric Bonnet (architect, professor at the ENSA of Saint-Etienne) and the students of the third year of bachelor's degree, fourth and fifth years of master's degree at the ENSA of Saint-Etienne.

implemented there (Kunzmann, 2005). Urban planning and urban design are a field of professional practices (Barles, 2018) where processual innovations are explored and experimented with. It aims to produce a habitable urban space by working with and on its materiality (Arab, 2017), while paying attention to individual well-being, community life and environmental preservation³.

However, between singular processes claiming the "right to design the city off the beaten track" and copied and standardized "ready-made thinking" and its "ready-to-use solutions", innovation in urban planning seems to participate in the strengthening of the generic city. Saint-Etienne, a shrinking city (Béal et al., 2020) has used these "good practices" to transform its image and its urban fabric (Laffont, 2022). Nevertheless, from the 1990s onwards, this devalued city (Guilloteau, 2020) reported a situation that complicated the spatial translation of an urban renewal: an economic context that didn't support symbolic and material transformations, a political and administrative system with low culture of the urban project, and a lack of urban engineering to lead these transformations.

To stop the spiral of urban devaluation, the Établissement Public d'Aménagement de Saint-Etienne (EPASE) was created in 2007. After a period particularly marked by the "mainstream" orientation of its urban intervention (Morel-Journel & Pinson, 2012), today EPASE claims a doctrine of bifurcation with respect to the "urbanistic ready-to-think" and a dual role of developer able to regenerate places and uses, and of "housekeeper" in charge of repairing the old and taking care of the existing⁴. Among these alternative urban planning actions, the project "Neyron: rebuilding the neighbourhood around a popular centrality" stands out. This project plans to transform a brownfield site located on a hilly area between the TGV station business centre of Châteauneuf and the city centre (Figure 1).

³ Temporary reinvestment of abandoned spaces; sensitive experience, co-construction with other disciplines or actors; artistic approach; etc.

⁴ "4 convictions pour innover : ces mots qui nous gouvernent" 2020, EPASE publication



Figure 1. Site of the Neyron project - personal achievement. Source: EPASE

This neighbourhood, defined by poor geotechnical quality, various types of pollution, degraded housing, and a devalued image, however, has many resources to be regenerated and to respond to the expectations of its inhabitants. EPASE's approach to urban innovation is based on simple, frugal and affordable solutions. The aim is to meet various challenges: regenerating the urban fabric of Neyron as well as its image; maintaining the social diversity of the neighbourhood while upgrading the housing supply; adapting this neighbourhood to climate transitions by a public space with a strong presence of vegetation and biodiversity; opening up the neighbourhood by creating local facilities, services and uses while improving its connectivity; involving residents beyond the various institutionalized mechanisms and associative dynamism to free the creative thought of all, and thus updating the notion of "practices" in urban planning (Figure 2).

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New approaches to post-occupancy evaluation: Unveiling the social value of housing design

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Keywords: post-occupancy evaluation, social value, quality of life, architectural geography, housing design

1. Introduction

This research focuses on identifying the spaces that are crucial in yielding the well-being and quality of life of residents in housing schemes. Post-Occupancy Evaluation (POE) is a promising method for assessing a building's adequacy to meet social impact goals, comply with building regulations, and deliver improved sustainability and affordability, but it tends to focus on environmental outcomes rather than the less tangible social outcomes (Hay et al., 2017; RIBA & MacDonald P., 2020; Samuel, 2020). When it comes to housing, a decision about the height of a bench in a common space, the position of windows and porches in relation to a playground, or the size of a stairwell can affect the social value of a space, and only dialogue with inhabitants can bring these nuances to light. Although architects such as Herman Hertzberger (1963, 1991) have speculated about these effects, they have not yet been subject to systematic study or reconciled with contemporary debates about the social value of housing. In the field of urban design, for instance, Jan Gehl (Gehl, 1986, 2010, 2011; Gehl et al., 2006; Gehl & Svarre, 2013) has developed scholarship and methodological approaches that rely on systematic participant observation and surveys to determine what constitutes appropriate spaces that support vibrant residential life and liveable neighbourhoods. This paper advocates that these enquiries can be further complemented by incorporating input from disciplines such as the geographies of architecture, particularly the research on 'building events' conducted by Lees and Baxter (Lees, 2001; Lees & Baxter, 2011), Jacobs et al., (2010) and Rose et al., (2010). Altogether, this can deepen the development of a more structured and evidence-based POE that is able to create and sustain learning loops that include the inhabitants' experience of spaces and shed light on the design process of housing schemes. The research question guiding the development of this paper is therefore: To what extent can the social value created by the design of housing blocks be better informed and conceptualised involving participant observation and geographies of architecture as part of post-occupancy evaluation?

2. Social value and its implications for housing design

The backdrop of the discussion is the recent interest in the English built environment sector for integrating social value as a pivotal aspect of its activity. Social value is understood as an umbrella term that encompasses the wider economic, social and environmental effects of any given activity; it is a concept that has become very prominent, especially in the UK after the advent of the Social Value Act in 2012 (UK Green Building Council, 2020, 2021). Since then, progress was made in incorporating the idea of measuring quantitatively the impact of projects in communities and society. As it can be applied to a wide array of sectors, the concept can have multiple interpretations and definitions. Efforts have been made to unify and agree on a common approach to the built environment (Raiden et al., 2018; Raiden & King, 2021).

Frameworks and tools have led to a better understanding of the protocols to assess the real social impact of projects. This is the case in the UK Green Building Council's reports *Delivering Social Value: Measurement* (2020) and *Framework for Defining Social Value* (2021); offering an overview of the necessary steps to identify it. However, there is still a lack of standardised methods to measure social value, mainly because every development has specific circumstances, and it is not as simple as prescribing metrics hastily. In 2020 the Royal Institute of British Architects RIBA in collaboration with the University of Reading, published the *Social Value Toolkit for Architecture* (Samuel, 2020), a document that encapsulates some of the key aspects that architects should consider to create and measure social value in their projects, a notable first step toward the involvement of architects in social value debates. *The Quality of Life Framework* (URBED, 2021) discussed below builds directly on the Social Value Toolkit. The current investigation aims to hone and theorise the process further, suggesting a more comprehensive approach to POE as a method to ascertain the real social impact of design.

3. Human behaviour, space and design: Methodologies to produce places that work

The Quality of Life Framework by The Quality of Life Foundation (QoLF) and URBED (2020) is a research-based methodology that identifies a range of themes, i.e., control, health, nature, wonder, movement and belonging, as responsible for creating liveable communities and quality of life. This document is the result of a literature review on the effects of the built environment on people's quality of life. It underscores the critical role of housing in this issue. The term 'housing' in this case alludes not only to the domestic and private spatial configuration of dwellings, but rather accentuates the importance of considering the neighbourhoods in which homes are located, the communities that live therein, and the transport links, community facilities and open spaces that serve them, as key aspects when considering health and wellbeing (URBED, 2021). This framework opened the way for the development of a POE service offered by the QoLF (QoLF, 2022) that is the vehicle to analyse and reflect on the potential of different spatial disciplines to complement the methodology. The aim is to provide a more comprehensive understanding of the ways in which space users give meaning and value to the built environment, so that architects and developers can use this information to better conceive and improve new and existing housing schemes.

On the other hand, POE, however beneficial it may be to the built environment, is not commonplace in the sector and there is a glaring lack of literature addressing this issue (Durosaiye et al., 2019; Hadjri & Crozier, 2009). POE is often regarded as an activity that demands long-term commitment and can be time-consuming. An issue that can be explained by the short-term logic of the construction sector, and the fleeting commitment of developers, especially private and profit-driven, to the communities and clients they engage with.

4. Where to look to?

The literature points at certain places within the confines of the housing block and the site as possible targets of the empirical study. Gehl (1986, 2011) and Hertzberger (1991) agree on the relevance of thresholds and transitions between levels of privacy as a key locus of successful places. Gehl refers to this as the 'edge effect' (2011, p.149), and Hertzberger as the 'in-between space' (1991, p.32). Both have to do with the design of entrances and the flow of activities throughout, and the soft transition that they can provide. Lynch (1964) also identifies the edge as an important constituent of the city image. And in *A Pattern Language* (1977), Alexander

alludes to it as the pattern of *Building the edge* which is further complemented by the one of *Activity pockets*.

Here insights from geography, particularly architectural geographies can be very valuable in informing the array of methods that can be put in place as part of a comprehensive POE. As Jacobs (Jacobs, 2006) argues, there have been calls in the field of geography for a new 'critical geography of architecture' that asks geographers to analyse the built forms up close and recognise them as "occupied performative events" (Jacobs, 2006, p.10). They suggest that spaces and places are conceptualised through the socially mediated practices they contain as part of being inhabited. Accordingly, buildings are not just static and closed masses stacked in urban blocks, but permeable entities in which users play a significant role through movement, interaction and relationships (Jenkins, 2002). Therefore, the building is conceptualised as a 'building event', "conceived of in this way, a building is always being 'made' or 'unmade', always doing the work of holding together or pulling apart" (Jacobs, 2006, p.11). In this vein, buildings are seen as assemblages of human and non-human actors who impact each other following an Actor-network theory approach. Stewart Brand (Brand, 1995) conveys a similar idea with the 'Shearing layers of change'. He asserts that this ensemble involves a hierarchical relationship, which in turn alludes to the temporal property and associated behaviour. As Brand puts it, "Site dominates the Structure, which dominates the Skin, which dominates the Services, which dominates the Space plan, which dominates the Stuff" (p.17). Thus, architecture is not static but very much alive and the 'building event' can be that vehicle to unpack residents' lived experiences of their housing estates, by looking at the feel of buildings, feelings *in* buildings and feelings *about* buildings (Rose et al., 2010). In this way, a new approach to POE can be generated that places the social interactions within the spaces under study at the centre of the enquiry. As Lees and Baxter (Baxter & Lees, 2008; Lees, 2001; Lees & Baxter, 2011) have shown, using an ethnographic approach to disentangle the different layers of 'building events' can provide rich data about community cohesion, sense of belonging and social value.

5. Conclusion

Evidence-based design is a neglected area in architectural research (Groat & Wang, 2013). Architectural practises can benefit from investigating what makes a good design from the users' perspective. Methods such as POE and participant observation can not only help to balance the scale between the social, economic and environmental facets of projects, but also reinvigorate the role of research in design. In this sense, POE can bring together different strands of research from various disciplines that seek to analyse the built environment and create new pathways to explain the phenomena. This research aims to expand the knowledge of how buildings work by focusing on the human dimension and the interaction and behaviour of inhabitants in built spaces. The empirical study, which incorporates all these considerations, is still being conducted on a specific case study and will be completed in the coming months.

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On becoming a spatial agent: A comparative analysis of transdisciplinary design and build studio pedagogy in Cyprus and Sweden

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Keywords: transdisciplinarity, design and build pedagogy, live studio, spatial agency, commons

1. Introduction

As the traditional design studio becomes increasingly obsolete in the face of complex and multi-faceted realities, architectural education is in urgent need of profound restructuring (Awan et al., 2011; Doucet, 2017; Salazar Ferro et al., 2020). For several decades, the live studio framework, *i.e.* a framework that exposes students to the contingencies of a “real-world” experience, intertwined with a web of spatial, social, environmental and political aspects, has been challenging the archetype of the architect, allowing for a proliferation of the ways of being-in-context for students, educators, institutions and communities alike (Abrahams et al., 2021). There is, however, room for further exploration in the ways in which the live studio is interpreted and implemented, within a rising post-capitalist wave of thought, both in the different geographical and cultural contexts, but also in its ideological standpoint and underpinnings.

The aim of this paper is to contribute to the ongoing discussion on reshaping live studio architectural education as a transformative and transdisciplinary pedagogy geared towards design activism, direct action and reclaiming learning as a commons that transcends the boundaries of academia (Bollier, 2021). More specifically, this paper will reflect on the opportunities, implications, as well as the limitations of a situated, transdisciplinary, design & build studio as a hub for training future architects in becoming socially conscious spatial agents, able to assess and respond effectively to complex challenges and work collectively towards a common future.

2. From architecture to spatial agency

Spatial agency is a term that illustrates the gradual moving away from architecture and the way it has been established as a practice through the modern era. It seeks to highlight a transdisciplinary practice of synergy-forming that puts “spatial judgement, mutual knowledge and critical awareness” at the forefront (Lorne, 2017). The value of synergies has been illustrated by the steadily rising adoption of co-creation methods over the past decades, both in practice, and education.

Through co-creation processes in architecture pedagogy, *i.e.* the live studio, students are exposed to unique contributions where everyone’s competences, knowledge and lived experiences can be recognised, highlighted and utilised. The entanglement of all the different knowledge and meanings can create connections and reconfigurations can challenge the primacy of established pre-conceptions of what is each participant’s role, be it student,

educator, or stakeholder and allows for multiple ways of an individual's situatedness (Abrahams et al., 2021). Therefore knowledge & knowledge production become a “commons” that can be co-produced in a reflexive and exploratory way, which allows for fresh ideas to emerge. Design & build as a method of learning can add the element of praxis in the form of a tangible and immediate impact in space. Knowledge co-production, in this sense, moves away from theorisation and exercise-on-paper to the neighbourhood and the city, thus breaking the barrier between academia and society in a most direct way.

2.1 Case studies

In exploring how can a transdisciplinary design & build studio impact student perception, two case studies are selected: The first one is a design & build workshop in the University of Cyprus (department of Architecture), which is directly linked to the 2nd year “co-creating urban commons” studio. The second is the summer design & build course called “DARE to Build” offered by Chalmers University of Technology to master students of the Department of Architecture and Civil Engineering. In Table 1, the two courses are presented through relevant basic descriptors.

Table 1. The two courses illustrated through basic descriptors

	Co-creating Urban Commons (CY)	DARE to Build (SE)
Initiating Entity	University of Cyprus	Chalmers University of Technology
Objective/Vision/Agenda	Expose future graduates to real-world contingencies through a collaborative, co-creation framework illustrated through the interaction with different agents and disciplines as well as with practice while at the same time promoting engagement and a sense of responsibility towards the commons.	Reconcile the disparity between monodisciplinary education and multi-disciplinary practice, while at the same time creating impact and outreach in local communities.
Students	2nd, 3rd and 4th year architecture students	Master students, engineers and architects
Educational methods	Urban Living Lab, design & build	Problem-and-project-based learning (PPBL), design & build, CDIO (conceive, design, implement, operate)
Urban Context	Latsia Municipality (suburban Nicosia)	Million home programme (Miljonprogrammet) suburban areas in Gothenburg
Scale/Location	Neighbourhood-level interventions, Nicosia, Cyprus	Neighbourhood-level interventions, Gothenburg, Sweden
Status/Runtime	2022-	2018-
Duration & Pace	3 weeks, full time (5 ECTS)	5 weeks, fulltime (7,5 ECTS)
Stakeholders & Partnerships	Latsia Municipality, Nicosia Development Agency, local community	Municipality of Gothenburg, local housing companies, local community

By perceiving live projects as case studies that fall under the broader scope of urban studies, this comparative analysis adopts the viewpoint of scholars within the field, such as Jennifer Robinson and Manuel Aalbers; they argue for a proliferation of comparative analyses that move beyond clusters of similarity and pre-established theorisations of places (e.g. comparing housing policies of northern European countries between themselves because the “global south” is just too different) towards a more relational approach, fortified by a reflexive process, and a postcolonial lens (Aalbers, 2022; Robinson, 2016). Sweden and Cyprus, two national contexts with diverse cultural, socio-political environmental and economic characteristics provide an interesting testbed for a comparative analysis that aims to move away from contrasting through either a western superiority perspective or a romanticised reading of local practices, to a search for common trajectories. Furthermore, prior familiarity with both contexts presents an opportunity of ethnographic strategies and elements that can be incorporated and enhance the analysis (Ronald, 2011).

2.2 Methods

This comparative analysis aims to provide insight on the impact of a transdisciplinary design & build pedagogical model on student perceptions regarding their positioning as future professionals, their attitude towards processes of cooperation and co-creation with various stakeholders, as well as their confidence levels regarding transdisciplinary, hands-on teamwork. To achieve this, the study draws on social sciences methodologies within a participatory action research (PAR) framework; a set of two questionnaires was handed out to the participating students of both courses (Figures 1 and 2), one in the beginning of each course and one at their completion, in order to trace and document both the collective and the individual shifts in mindsets and perceptions. Within the PAR framework, a reflexive insider researcher perspective methodology is used, solidified both by the aforementioned prior familiarity with these contexts in both a macro (cultural, historical) and a micro (educational, interpersonal) level, and by an active and immersed role as a teacher throughout the process. This position enabled the enrichment of the research process by building bonds of trust between those involved, through which observation and in-depth analysis of formal (focus group session) and informal, everyday interactions was facilitated, while working collaboratively towards a common goal.



*Figure 1. UCY students posing while sitting on a cement block bench that they designed & built.
Source: Effrosyni Roussou*



Figure 2. Chalmers students enjoying celebratory cake after the completion of the outdoor classroom. Source: Effrosyni Roussou

3. Conclusion

To sum up, the expected outcome of this exploration is a set of observations on the limitations and opportunities of a transformative design & build pedagogy as well as the ways in which it impacts the (self) perception of future architects. By tracing the common trajectories of the two study cases, embedded in their own cultural, economic, environmental and socio-political contexts, the scope of impact identification is broadened to shed light on aspects of this matter that may exist beyond educational methods and curriculum structure. Preliminary analysis reveals interesting questions regarding the correlation of long-term sustaining co-creation processes and shifts in students' perception. Overall, steps in this direction of education can directly contribute to a better-informed architectural education, able to guide students through the necessary shift in perception in the present that may secure better practitioners in the future.

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From unconventional* households to unconventional affordable housing

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Keywords: housing typologies, unconventionality, affordability, research by design, reuse

Over the past years, a multi-disciplinary group of colleagues at Politecnico di Milano has been exploring how contemporary social and demographic dynamics challenge housing policies and projects. These issues have been at the core of teaching activities in design-based studios involving architecture students as well as in field research with the aims to investigate the state of the art of dwelling practices and to develop alternative housing solutions able to overcome an emerging distance between demand and supply. Profound socio-demographic transformations have taken place in Europe and Italy over the past decades, leading to major changes in household composition (an increase in the number of households of single people, divorced couples with children, single parents and the elderly, as well as in the spread of the phenomenon of cohabitation, not only among young people) and in what is typically referred to as the family (Meyer & Carlson, 2014). As a consequence, the ideal equivalence between the nuclear family and a corresponding housing typology, as promoted by the Modern Movement, collapsed (Star strategies + architecture, 2016). At the same time, changes in the labour market have forced people to organize their lives in more than one place (Rolshoven, 2007) which has led to the emergence of new lifestyles. In addition, worsening employment and economic conditions have reduced housing affordability, increased precarious and informal housing conditions, and set constraints on access to housing, even for middle-income groups (Costa et al., 2014; Ronald & Elsinga, 2012).

Taking these societal transformations as a starting point, the research and teaching experience aims at investigating 'unconventional' housing practices and projects, hence, at analysing how people (individuals, households) and professionals (e.g., architects, planners) respond to these developments in the organization and design of housing solutions,

* By "unconventional", we mean above all the non-equivalence between the idea/ideal(s) of family households and the apartment typology.

and at exploring the potential of such solutions to promote housing affordability. While ‘unconventional’ housing can take many shapes and emerge from a diversity of household and living arrangements, their emergence often reflects the inadequacies, unaffordability, dissatisfaction with, or inaccessibility of conventional housing offers.

The research adopts a mixed methodology, combining case studies of unconventional housing practices and projects (Boudet, 2018; Guidarini, 2018; Coricelli et al., 2018) with architectural ethnography (Cranz, 2016; Kaijima et al., 2018; Stender et al., 2021; Briata & Postiglione, 2020) and a research-by-design approach within architectural design studios. Over a period of six years, BA and MSc architecture students have, in fact, conducted design explorations on the Milanese existing (residential and non-residential) building stock – a decision taken to empower adaptive reuse as a sustainable approach also in housing –, with the task to develop “unconventional” affordable housing solutions.

Prior to the design task, the students were asked to explore examples of unconventional household situations and housing solutions by adopting ethnographic methods and tools (direct participant observation, interviews, photography, drawing, writing, etc.) in order to gain insights into the strategies of households in the organisation and use of their dwellings which, in a further step, should underpin the design. The application of an interdisciplinary approach within an international setting – students usually come from many different countries – has been perceived as great potential and resulted in a broad discussion.

The present research by design strives to contribute to the advancement of knowledge on the (so far underexplored) link between unconventional housing solutions and affordability in different ways:

- a) in conceptual terms, by attempting a systematic analysis and classification of the case studies collected in the past years - distinguishing between *unconventional housing practices*, housing solutions that are often bottom-up or third-sector driven targeting particular (often precarious) population groups, and *unconventional housing projects*, experimenting new ways of dwelling, often with an articulated architectonic design programme;
- b) in architectural terms, by discussing how architecture and design choices can promote the affordability of housing (Brysch & Czischke, 2022) - through its layout (e.g. the minimization of private spaces in favour of shared spaces), the choice of materiality, the implementation of design elements allowing for flexibility and adaptability to changing household and life situations, self-build/renovation.

The case study investigations enriched critical observations on co-housing behaviours and the spatial and distributional particularities to be considered when designing for co-housing (Kries et al., 2017). The data collected were translated by the research team into guidelines and recommendations for the design of a housing typology intended for shared living encapsulated in a five-point Tentative Manifesto:

- 1. The Nucleus: it stands for one or more persons bonded together by either blood or intimate relationships;
- 2. The Unit: it is the private space of the Nucleus, and it consists of a room with a bed-alcove and an independent bathroom. It is the core of the new housing typology configuration;

3. The Cluster: it is the private space of a multi-person Nucleus, and it consists of a Unit and an extra room;
4. The Aggregation: it is the combination of Units and Clusters, and it replaces the concept of the Apartment;
5. The Con-le-ctive space: it is the combination of Connective and Collective, and it consists of the shared areas among Units and Clusters.

To carry out the design exercise (Figures 1-3), residential and non-residential buildings in Milan were chosen from a wide range of twentieth-century examples. The projects reveal with immediacy the differences in organization and layout of interior space, testifying to the complexity of housing needs and the vitality of new configurations, as well as the attempt to articulate public, private and collective spaces in a way to ensure a balance between moments of conviviality and sharing, and those that are more intimate.

The project is based on a redefinition of the terms of living, aiming at the identification of a new idea of a private room (equipped with a niche for a bed and an independent bathroom) (Dogma 2017, 2019) and its relationship to collective (shared) spaces. The room-space dialectic constitutes the main topological matrix for the design of the new apartments that echoes the relationship between buildings and public/open space within the established city.



Figure 1. Diagrams of typical 1UR. Source: Authors

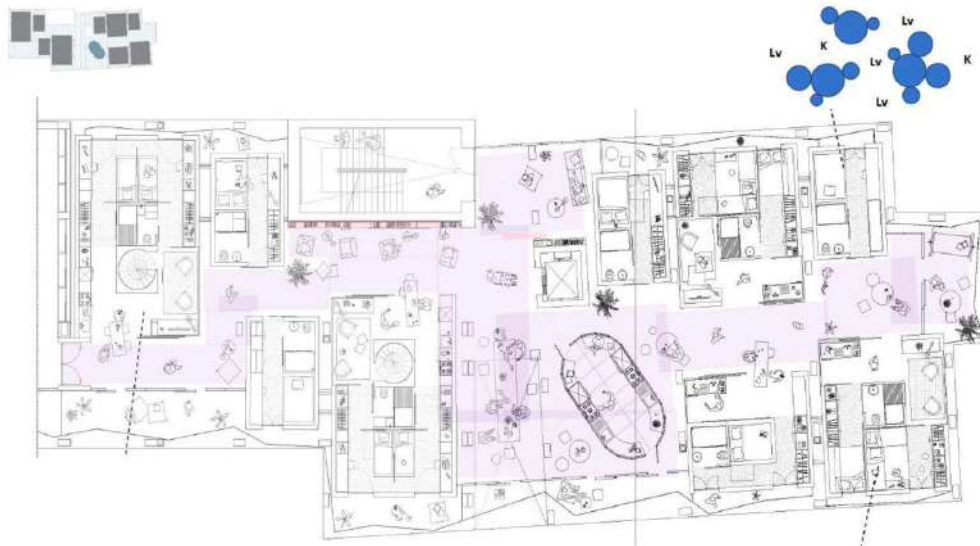


Figure 2. Aggregation: Connective=collective. Source: Authors

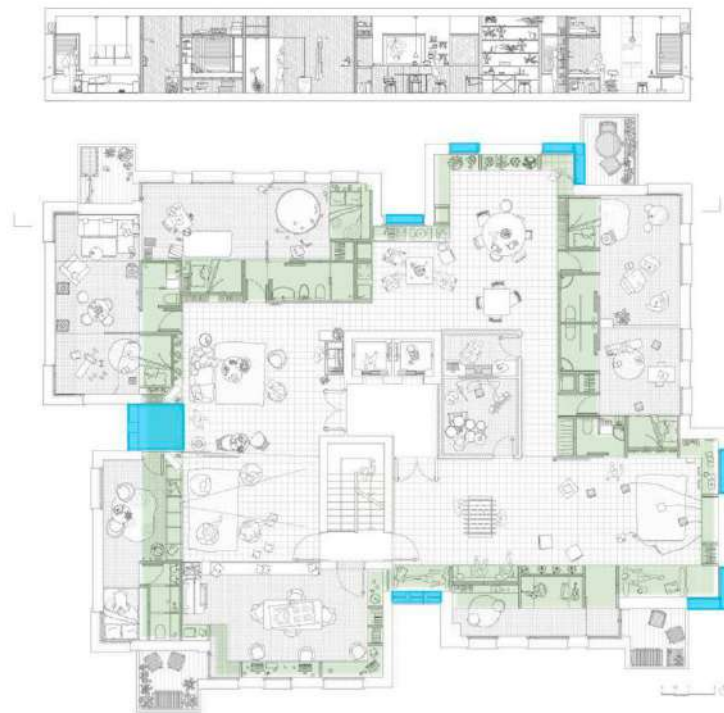


Figure 3. Design proposal. Source: Authors

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Panel 3: Transforming governance: Between coordinative action and self-organization

Antonin Margier, *The rise of homeless villages in Portland: Institutionalization of tiny home villages or informalization of public policies?*

Jolien Groot, Frans Schilder, *Housing-to-go: to what extent do the perceived benefits of replaceable housing units materialise? Synthesis of a series of studies into the possibilities and limitations of replaceable housing units in the Netherlands*

Andreas Panagidis, Nadia Charalambous, *Co-creation from the South: The case of Cyprus*

Androniki Pappa, Alexandra Paio, *Local partnerships and urban governance: The case of Lisbon*

The rise of homeless villages in Portland: Institutionalization of tiny home villages or informalization of public policies?

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Keywords: homelessness, tiny home villages, informality

1. Introduction

In a global context of economic crisis (Peck, 2012), public authorities and local governments are compelled to cope with austerity, resulting in transformations of public policies ranging from local policy tinkering (Tonkiss, 2013) to the institutionalization of existing informal practices. In Portland, Oregon, on May 21st of 2021, elected officials, policy makers and public stakeholders gathered to celebrate the opening of St. Johns Village, a village of 19 tiny homes funded and developed by the local government as a means to provide beds for homeless individuals. This structure is officially inspired by the homeless villages that have informally sprung up in west coast cities in the last years.

In the light of this evolution, the main research questions that drive the article are: how and to what extent informal housing practices influence public authorities and reconfigure the local policies for ending homelessness? How the informality circulates from homeless advocates and grass roots organizations to the local government?

2. The tiny home villages in Portland: From grassroots organizations to public authorities

In the United States, the emergence of tiny home villages for the homeless provides evidence of the ways in which informality have spread in the development of the American city. These self-managed homeless villages have been increasing for more than a decade in many cities, in particular in the west coast cities, in parallel to the rise of the housing crisis and within a context of austerity urbanism (Peck, 2012). Whether they are perceived as a symbol of the economic crisis (Herring & Lutz, 2015) or as a creative solution to cope with it (Evans, 2020), these villages are nowadays part of the urban landscape in many American cities (Evans, 2020; Fowler, 2017). These homeless villages appear as a more permanent and effective solution than temporary assistance (food banks, night shelters, etc.) and as a cheaper alternative than the development of housing units. For these reasons, public authorities tend to draw on those villages: “tent cities have not only been sanctioned, but also publicly supported as tools of social welfare in light of the costs and shortage of existing shelters” (Herring & Lutz, 2015: 696). In regard to this evolution, tiny homes villages have become well studied within the academic research about homelessness, giving rise to different interpretations. On the one hand, some scholars argue that the development of these homeless villages is part of the punitive management of poverty in public spaces (Herring & Lutz, 2015) as a space of containment and seclusion (Herring, 2014; Speer, 2018). On the other hand, other scholars point out the role of this housing model as it would provide safe spaces, hence giving the opportunity for homeless people to exercise a level of agency they are often denied in congregate shelters where the many strict rules reduce their own autonomy (Gowan, 2010). In that perspective, these villages are also perceived as spaces of

resistance and empowerment. The rise of homeless villages in American cities hence sheds light on the ambivalence of the management of homelessness which is both punitive and compassionate (Speer, 2018; Stuart, 2016).

This debate on American *tent cities* leaves in the shadows the role of informality in their own development and the ways in which this informality transforms (and diffuses in) the governance of homelessness. Through the analysis of the evolution of homeless villages (and their management) in the city of Portland, this paper aims at understanding the ways in which informality cannot be reduced to the target of public interventions but also results in the transformation of urban governance (Davis, 2017) and in a co-construction of alternative shelters for the unhoused.

The example of the homeless villages in Portland points out the ways in which informal housing practices are not limited to the megacities of the Global South but are also impregnating the production and the governance of the western cities. In order to address the emergence of homeless informal villages in the city, public authorities adopt a variable strategy, ranging from the suspension of laws (to give them the space to operate) to their formalization or their destruction. Within the context of housing crisis, the effectiveness of these villages to provide a safe shelter to people living on the streets brought the city to institutionalize this model, by drawing on these existing villages and by shaping it in a way that respond to the goals of public policies. Although these informal practices have been progressively transforming city regulations and homelessness policies for years, the pandemic accelerated the momentum of this institutionalization of the village model and grassroots organizations worked together with public authorities for developing and operating these villages. But the willingness of public authorities to develop tiny home villages might be ambivalent. Relying on multiple criteria and rules for developing a village, this institutionalization could run counter the effectiveness and the qualities originally associated with the informal homeless villages. Due to the willingness of public authorities to control the villages and to contract their operation to professional services providers, this mode of management reduces the principles of autonomy and self-management, considered as a key element in the capacity of the villages to empower the homeless.

3. Conclusion

Then, this example highlights how public authorities cope with the rise of austerity urbanism (Peck, 2012) and informal housing practices in the cities of the Global North; between permissiveness and control, between *laissez-faire* and regulation. In this gap, the post-crisis urbanism is drawing, between a politicization from below and an instrumentalization of the grass roots movements.

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Housing-to-go: to what extent do the perceived benefits of replaceable housing units materialise? Synthesis of a series of studies into the possibilities and limitations of replaceable housing units in the Netherlands

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Keywords: replaceable housing, flexible housing, innovation, target group housing

1. Introduction

To combat the adverse effects of an affordable housing shortage, the Dutch central government has made ‘flexible housing’ a key point of housing policy. Flexible housing is a term used by the government to describe different housing solutions with a temporary component: from temporary housing in transformed office buildings to mobile tiny houses. All these solutions share the characteristic that they do not intend to offer a permanent home to the tenant. Flexible housing is not a typical Dutch phenomenon. Non-traditional, flexible and shared forms of housing seem to have become more common across various national contexts, incorporated as a housing strategy by public housing providers, co-operations, or transformed into commercially successful housing concepts (Fitzpatrick & Pawson, 2014; Doling & Ronald, 2019; Debrunner & Gerber, 2021). The Netherlands’ particular take on temporary and flexible housing provision has been shaped in a wider policy environment featuring sector restructuring, shifting demand and diminishing housing affordability (Hochstenbach & Ronald, 2020). Anticipated benefits of promoting the realisation of flexible housing include the addition of a more accessible stock of housing units, spurring innovation in housing construction to improve sustainability in the sector, and a speedy increase in total housing construction (Ministry of the Interior and Kingdom Relations, 2019). However, flexible housing did not bring about the acceleration of affordable housing provisions Dutch policymakers hoped to see. What factors hamper the realisation of flexible housing in the Netherlands?

2. Findings

Our research has evolved in steps and is laid out in two reports (Groot et al., 2020, 2022). The first study identified potential areas to allocate flexible housing. Physical-spatial and legal considerations were central to this research phase. The potential space for flexible accommodation was analysed using a geographic information system (GIS) that PBL previously used to map inner-city transformation possibilities (Van Duinen et al., 2016). The analysis was applied to the province of North Holland, the region for which the most spatial plans and zoning data were available. We found many locations, such as empty fields and fallow ground or vacant offices and shops, that the government could consider using for flexible housing (the dark blue areas in Figure 1a). However, the majority of these underused locations are in rural areas and, using dummy target group requirements such as proximity to public transport are rejected as

potential locations. Less than 20 percent of locations identified in step 1 were left (Figure 1b). Still, according to our estimation, these locations enable the construction of 1.6 to 4.45 million temporary dwellings. Note that ambitions for all new construction until 2030 ‘only’ comprise 900,000 dwellings (Ministry of the Interior and Kingdom Relations, 2022).

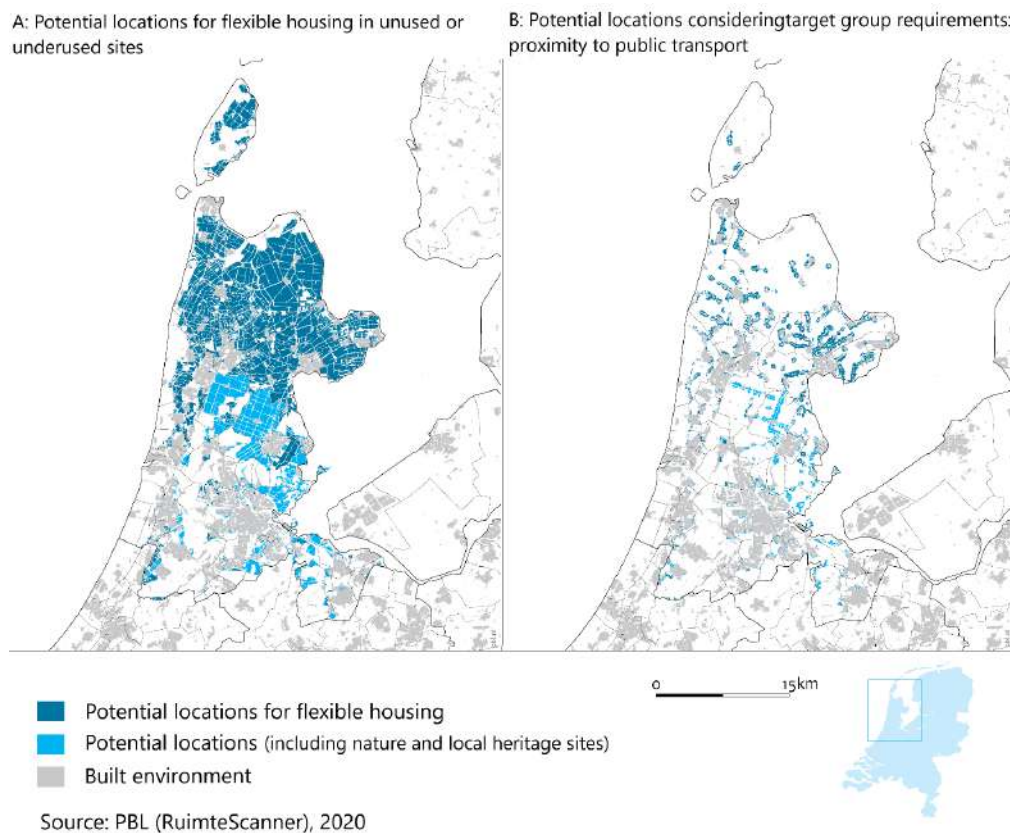


Figure 1. Potential sites for flexible housing in North-Holland, 2019

Although the analysis has important limitations, the results raise the question of why, despite an ambition to realise up to 15.000 units per year, the production of flexible housing has peaked at just under 5.000 units. The second study uncovered several challenges related to planning and creating flexible housing. For this, we interviewed people who were involved in the realisation of these projects. In the selection, we have strived for variation in location, type of home or building (transformation or new/modular) and type of operator (corporation or other).

We found three central challenges to increasing the supply of flexible housing. First, space is often contested by planning professionals and other policymakers. Local governments need to consider whether flexible housing is the best use of a location. Given other policy objectives in the realm of, e.g., nature conservation or the energy transition, other uses (green space, solar panels, wind turbines) are regularly considered of equal or greater importance. This consideration can be easily understood given the lack of binding covenants for housing, as opposed to binding European and national legislation in other fields. The first set of covenants for housing production is planned for October 2022. This could potentially result in different priorities in the planning process; however, the status of these covenants compared to (inter)national legislation will need to prove itself.

Second, space is often also socially contested. Flexible housing suffers greatly from NIMBYism, primarily because of unsuccessful projects in the past and the severe overallocation of this type of dwelling to socially vulnerable people such as asylum seekers and former and ambulant psychiatric patients. Therefore, public support for building flexible housing is generally lacking, and people protest the development of flexible housing in their neighbourhoods. Thorough and timely government communication may help in practice but hardly leads to any guarantees for the outcome of the process. As a result, many projects are realised at less attractive locations.

Third, the business case for a movable temporary housing project is often negative. Flexible housing is legally allowed for no more than 15 years. Developers, therefore, often seek the guarantee that they can use the buildings again at a different location after the exploitation term ends, as that results in a positive business case. Apart from location, other financial aspects make investments in moveable flexible housing difficult, such as unknown residual values of the constructions. The business cases can be very different for temporary housing in retrofitted buildings. We even see developers engage in temporary housing to be later able to redevelop on the same site.

3. Conclusion

One of the most important findings of our studies for the (potential) future of flexible housing is that there should be a more fundamental discussion on the potential benefits and costs of flexible housing. The discussion is currently focused on land and money. It has little consideration for issues like the impact of temporary housing on households and the use of temporary solutions for mostly permanent problems. Continuing the current road, realising flexible housing with a high concentration of people with special needs or creating high-density real estate in amenities-poor environments, flexible housing will likely not set sail.

Acknowledgment

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Co-creation from the South: The case of Cyprus

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Keywords: co-creation, global South, urban living labs, planning

1. Introduction

In Greek-Cypriot, postcolonial society, the modernist ideals of the 20th century have largely influenced planning institutions that give shape to the urban landscape. Moreover, the dominance of private real-estate development industries in Nicosia and the coastal cities of the island is physically manifested by the incessant parcellation of land, opportunistic development and various forms of peri-urban growth with interconnected socio-environmental implications (Constantinides, 2018; Ioannou, 2016). More democratic and equitable processes of urban development are urgently needed with a focus on the increased participation of citizens as co-creators of urban knowledge. However, contemporary literature argues that urban theory from the global North can no longer be simply copied and applied to the global South. Instead, new urban theory engages with the heterogeneous realities of different contexts. This is particularly relevant to the burgeoning theory and practices of citizen participation and co-creation in urban planning in Europe. This paper investigates the weaknesses and opportunities of active civic engagement in housing and neighbourhood development matters in the Greek-Cypriot context of Southern Europe. Finally, it concludes with recommendations in applying the methodology of Urban Living Labs in order to facilitate inclusiveness and co-creation in planning in 'Southern' regions.

2. Research work

In the period of rapid urbanisation in Cyprus during the 1950s and '60s and more recently, in post-crisis construction busts and booms, private property ownership has been the dominant driver in decisions about urban land. These trajectories of urban development involve the promotion of individual home ownership and the construction of infrastructure mainly in the interest of further capital accumulation by the development industry. More recent efforts to attract foreign investment, by large scale property developments and luxury housing, are arguably widening the state-citizen gap in decisions about housing. Furthermore, urban governance has been in these ways very much *infrastructure-led* (Ekers et al., 2012) and *property-led*, and therefore, in accordance with global trends of urban growth.

However, in contrast to many industrialised Western European countries, suburban expansion in postcolonial Cyprus did not take place in the form of large-scale housing developments backed by state policies. Instead, "spontaneous urban development" and urban informality, as in other South European cities (Leontidou, 1990), characterise the organisation of housing and land uses. In addition, dominated by a technocratic state and a form of "Greek-Cypriot corporatism" (Mavratsas, 1998), civil society has been found to be underdeveloped (CIVICUS, 2011). Accordingly, a lack of citizen participation and the lack of power to negotiate decisions about urban development is reflected by the many people dwelling and working in the margins between powerful state and market actors. Informal and co-produced urban spaces (here understood as spontaneously co-produced) by actors who "do not typically fit into state-

led and ‘professional’ planning schemes” (Galuszka, 2019, p. 144) are common, yet not recognised or institutionalised. These characteristics place Cyprus in the discussions around citizenship and participation in the global South.

In the meantime, new urban governance arrangements are on the agenda of many European governments promoting “active citizenship” and social innovation concerning the decision-making processes that involve citizens in the planning and provision of housing and public services (Bisschops & Beunen, 2019; Boonstra, 2015; Garcia & Haddock, 2016; Morgan, 2018). Also, opportunities for new infrastructure networks and governance arrangements that reshape power imbalances particularly exist in the suburbs (Filion & Keil, 2017; Hamel & Keil, 2016). In these views the suburbs are cast as fertile “laboratories” for fostering alternatives to dominant governance coalitions that have determined housing and infrastructure. The case of Oosterwold in the Netherlands is one prominent example (Cozzolino et al., 2017).

Furthermore, recent research is increasingly emphasising *co-creation* (Davis & Andrew, 2017; Koster, 2015) – the sharing of decision-making powers between municipalities, citizens and other actors – and this term is being applied in housing development and urban regeneration experiments at the neighbourhood scale. Innovative governance processes encouraging self-organisation to engage citizens beyond participation in planning are being investigated in settings labelled by the terms Urban Living Labs (ULLs), city labs or citizen innovation labs. In ULLs the joint knowledge and abilities of citizens, urban professionals, and local authorities is mobilised in collaborative environments where innovation can take place in real-life settings. Temporary settings of experimentation provide opportunities for exploring different paths to institutional norms by prioritising collaboration among stakeholders.

However, as these novel approaches are being transferred mainly from Northern cities to Southern Europe, there is a need to investigate co-creation by “seeing from the South” (Watson, 2009) and to avoid the mistake of applying a universal concept to contexts which to date have been perceived at the fringes of urbanity. In support of the “peripheral turn” in urban studies, it is important to challenge general guidelines that are replicated, including ULLs, and to adapt these novel governance approaches to their respective contexts (Galuszka, 2019). The ways in which civic engagement is fostered in Cyprus, especially regarding matters of urban development and informality, will form the main research question. How are processes and methods of citizen participation in planning influenced by socio-cultural traits?

Interviews will be conducted with a civil society group who deal with community engagement and urban regeneration in Nicosia, with municipality employees and with staff of NGOs involved in the Active Citizens Fund Cyprus Programme (Outcome 1, “Increased Citizen Participation in Civic Activities”). An online questionnaire will also be used to collect data from citizens in order to investigate how the different path-dependent, political, economic and cultural histories that are entangled with home ownership and neighbourhood development patterns, may affect the opportunities and needs for co-creation in urban planning. Available secondary data regarding citizen participation in planning will be examined.

3. Conclusion

This paper aims to add to the theoretical discussion of co-creation, social innovation and active citizenship from a “southern” perspective, including the overlapping interpretations of the global South and Southern Europe. It will challenge existing parameters and guidelines of civic engagement and innovation in urban planning and housing by exploring the need to develop a southern perspective of co-creation. The goal is to enhance the diversity of southern

perspectives of urban theory, to challenge assumptions around best practices of sustainable urban development, but also to improve the methodology of applying co-creation to tackle housing and planning issues in postcolonial contexts.

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Local partnerships and urban governance: The case of Lisbon

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Keywords: urban governance, local partnerships, quintuple helix, data analysis

1. Introduction

Collaborative forms of governance in urban regeneration are increasingly gaining ground in cities around the world, contributing to the active engagement of citizens in decision-making processes that affect their neighbourhoods and lives. In some cases, municipalities embrace local grassroots initiatives, as for example with the implementation of participatory budgets, enabling active citizens to creatively invent ways to regain and co-manage the urban commons.

In a similar vision, the Department of Housing and Local Development of the Municipality of Lisbon launched in 2011 a participatory budget program, namely BIP/ZIP, to annually fund bottom-up initiatives led by local partnerships in priority neighbourhoods that enable responses to social and territorial emergencies.

The aim of this research is to investigate the matrix of local partnerships that have been formulated throughout the eleven years of BIP/ZIP and understand their dynamic role in the transformation of the urban governance in the city of Lisbon.

2. Participatory budgets and urban commons

Participatory budgeting is a tool to democratise urban governance, in the sense that it facilitates collective decision-making on the allocation of municipal or state resources. As one of the most successful innovations of democratic governance of the last 25 years (Allegretti & Hartz-Karp, 2017), it not only enables the dialogue between public administrations and the general public, but also promotes inclusive democracy, in the sense that it most often aims at engaging into public policy those parts of the society that are frequently excluded from political processes.

The promotion of the collaborative management of urban resources and facilitation of multi-stakeholder cooperation has been also theorised in the notion of urban commons⁹. Several commons theorists, also referred to as “institutionalists” (Huron, 2018), explore the role

⁹ The concept is based on the idea that city resources such as public spaces and infrastructure ought to be accessible by urban communities, not only for use but also for co-responsibility and management in a way that supports the sustainability of those communities and especially the most vulnerable.

of urban commons in reshaping the urban governance through the integration of their collaborative management in local strategies. Christian Iaione (2015, 2017) also in collaboration with Sheila Foster (2020; 2015) argue that in order to establish the city as commons, it is necessary to facilitate “quintuple helix” governance structures, that stimulate partnerships among five types of actors: civic (social innovators and active citizens), social (third sector organizations), cognitive (cultural institutions, schools and universities), public (public institutions) and private (local enterprises and industries) (Quintuple Helix | LabGov, n.d.).

2.1 BIP/ZIP local partnerships program

The BIP/ZIP participatory budget aims to foster the socio-territorial cohesion in Lisbon by integrating 67 ‘priority’ neighbourhoods (Figure 1). To do so, the programme promotes active citizenship through the establishment of partnerships between parish councils, societies, local associations and non-governmental organisations that propose initiatives towards specific local issues. To present, the programme has funded 426 projects with an implementation grant of up to 50,000 euros per project, involving thousands of different partner entities.

Structurally the facilitation of partnerships targets the democratisation of local governance based on ‘quality delivery’ that is territorial intervention through concrete local action (Crespo & Caetano, 2021). The partner types per project is open, given that the public sector, represented by the parish councils is always involved, as well as ensuring that the third sector and local community are an essential part too. Therefore, the collaborative culture is on the one hand formally regulated by the municipality and on the other hand informally produced by experimentation between new associations and local communities.

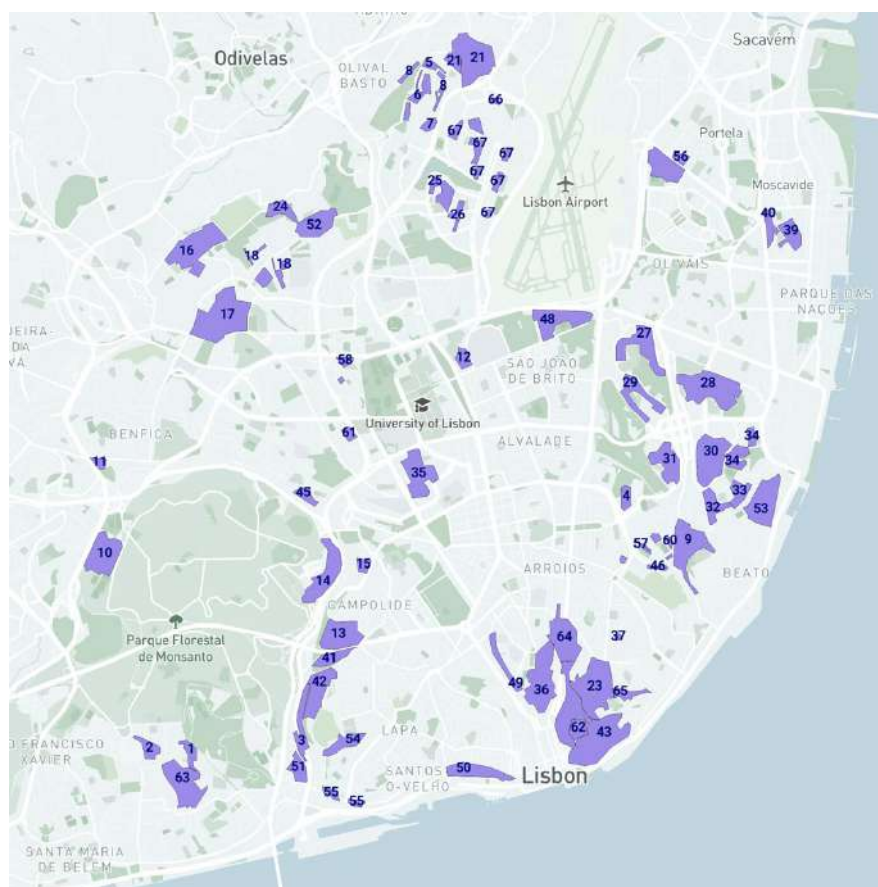


Figure 1. The 67 Priority areas of BIP/ZIP. Source: Author

3. Methodology

The first step of the methodology employs data analysis to explore the transformation of the urban governance through the emerging roles of different types of partners – organisations, based on two key aspects: i. the types of partners/institutions and their involvement in projects, which entails the indicators of partner type, number of entities in each type and number of different projects in which they are involved; and ii. the evolution of the types of partners through time based on the parameter of year of participation. This second aspect of the evolution of the partners through time is also extrapolated to the quintuple helix governance model to offer an overview at the level of urban actors. To do so, the partner types are correlated to the quintuple helix's urban actor types.

The dataset for the analysis is composed by coding qualitative information from three sources: the successful application files available at the website of BIP/ZIP <https://bipzip.cm-lisboa.pt/>; the website ForumUrbano <https://forumurbano.pt/>; as well as documents shared by the Municipality of Lisbon with the first author during a four-month research secondment.

In overview, we analysed 416 projects and recorded 1276 individual partner entities which through their repeating involvement reach almost 4000 participations. Each project involves between 2 and 22 entities with the most frequent being 3 partners.

3.1 Results

In overview, we analysed 416 projects and recorded 1,276 individual partner entities which through their repeated involvement reach almost 4,000 participations. A preliminary statistical analysis revealed insights into the overall participation in the programme, such as the observation that 45% of the partner entities participated only once, and the fact that each project involved between 2 and 22 partner entities, with the majority of projects involving three partners. When examining the different types of partners/institutions, our analysis found that among the 18 types we identified, informal groups, cultural associations and private institutions for social solidarity each include more than 200 entities. They have a high involvement in projects, as well, being involved in 400 to 997 projects. Additionally, the analysis of the evolution of partner types, and consequently the quintuple helix actors over time, showed fluctuations in the number of entities and their participation in projects for most types. However, the types of partners associated with the social sector have a significantly leading involvement, compared to other types, while the cognitive sector consistently has the lowest level of involvement.

4. Conclusion and discussion

This study presents a first step in understanding the transformation of the urban governance in Lisbon through a study of the emerging roles of the local partners of BIP/ZIP. The statistical analysis and visualisations provide insightful information on who is engaged in this transformation, showcasing two paces of involvement: one of institutions with a short participation in one or two projects and one of institutions that are repeatedly involved.

Looking at the types of partners/institutions, a further step would be to reconsider the categorisation beyond their governance model and use the scope of the project, for example the categories defined as “other” and “informal group”.

The analysis of the partner types through the number of entities and the number of projects involved provides information on the temporality of the institutions in terms of governance. However, due to data limitation, this research has not taken into consideration the lifespan of

each institution to understand if and for how long have entities that were explicitly formed for the participation in a BIP/ZIP project remained as operational entities after the completion of the project.

Lastly, the analysis of the types of partners over time and their correlation to the quintuple helix illustrates the evolution of the governance change and points out leading and less involved sectors. The analysis based on the dimension of time can further integrate social or urban phenomena, such as the pandemic.

Methodologically, the next stage of this research includes the spatial depiction of the matrix of partnerships in the urban fabric, to illustrate the complex relationships of partners in the formation of the city.

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Panel 4: Housing assessment for social and environmental sustainability

Alberto Quintana Gallardo, Ignacio Guillén Guillamón, *Energy poverty and climate change in impoverished households: Social life cycle assessment and solutions*

Julia Nerantzia Tzortzi, Rola A. Hasbini, *Simulating heat transfer performance for double-walls concrete residential building envelope in Mediterranean climate*

Zoe Tzika, Saskia Furman, *Towards integrating social and environmental sustainability in housing: Conceptualisation, measurement frameworks, and indicators*

Annette Davis, Alberto Quintana Gallardo, *Rethinking housing as a kit-of-parts and shearing layers: An LCA approach*

Energy poverty and climate change in impoverished households: Social life cycle assessment and solutions

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Keywords: social life cycle assessment, climate change, energy poverty

1. Introduction

The effects of climate change are already noticeable in many parts of the world. As the years go by, these effects will become more and more extreme worldwide. Besides the impact on nature, the dramatic temperature increase will significantly affect the human population. However, not everybody will suffer the effects in the same way. Lower-income and impoverished households are more exposed to those changes. This vulnerability is due to the lower quality of the building envelope on their homes. Insufficient insulation increases the energy needed to maintain a comfortable temperature in the home and the price of the electricity bill. Exposure to high temperatures may lead to cardiovascular diseases, mental disorders, heat strokes, and even increase the incidence of domestic violence (Heat and Health, n.d.), (Extreme Heat Contributes to Worsening Mental Health, Especially Among Vulnerable Populations, n.d.).

Some governments and local administrations are making considerable efforts to mitigate these damaging impacts. However, determining what actions to take, what areas should be prioritized, and the long-term effect of those measures is highly complicated. The Social Life Cycle Assessment methodology (S-LCA) can be a valuable tool to support those decisions. Using S-LCA, it is possible to evaluate communities' current social state and foresee the effectiveness of such policies before their application. This methodology enables the parametrization of social impacts through a set of indicators. These indicators represent aspects such as human rights, governance and health, and safety. Each can be rated either qualitatively or quantitatively (Norris, 2012).

Nevertheless, unlike LCA and LCC, S-LCA is not yet correctly standardized. While the ISO/AWI 14075 is under development, S-LCA practitioners continue using the environmental LCA standards (ISO 14040), (Pollok et al., 2021). The methodology is in a maturation process, and case studies can be instrumental in fostering its improvement (Larsen et al., 2022). Under the current energy crisis, finding ways to mitigate social issues such as energy poverty is more urgent than ever. In 2020, the United Nations Environmental Programme (UNEP) updated its S-LCA Guidelines (Life Cycle Initiative et al., 2020).

To our knowledge, no studies have discussed the use of Social LCA to analyse the combined effect of energy poverty and climate change in the context of impoverished households. This work seeks to analyse the UNEP Guidelines and assess their suitability for being used in these situations. The outcome will be a framework to obtain an adapted methodology for S-LCA studies in the context of energy poverty and climate change in the building sector. Policymakers, researchers, and building industry professionals can apply these ideas to their work.

2. Methods

The study critically analyses the UNEP guidelines following the method proposed by Bowen (2009). The research goes through the four iterative phases of an S-LCA (Goal and Scope, S-LCI, S-LC impact assessment, and interpretation) to find the key indicators that require special attention in energy poverty studies. The study is conducted using the Social Hotspots Database and Simapro.

3. Results and discussion

After the literature analysis, it is clear that S-LCA is a methodology that, with minor adaptations, can be a suitable tool to study the combined effect of energy poverty and climate change on impoverished households. When it comes to the iterative phases of S-LCA (Figure 1), it is essential to establish the goal and stakeholders of these kinds of studies.

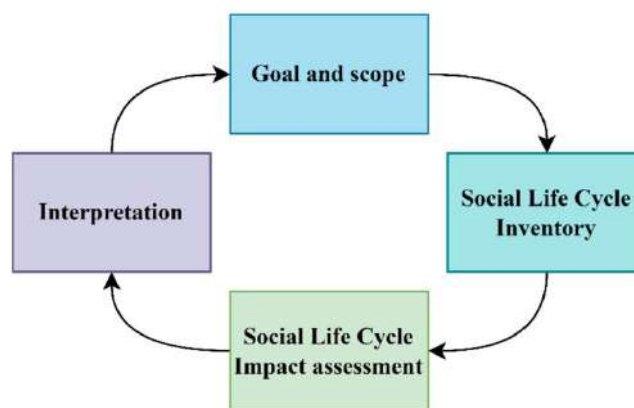


Figure 1. Iterative phases of S-LCA. Source: Adapted from (Norris, 2012)

The main goal will be to provide policymakers with information to assess which households might need at risk of vulnerability. By obtaining that information, public measures can be taken to help those in need. Also, the main stakeholders are the local community, the ones affected by energy poverty and climate change, the society as a whole, the policymakers, and the energy providers. The S-LCA inventory is one of the most critical steps in Life Cycle related studies. The inventory consists in gathering and organizing all the available data relevant to the subject of study. The inventory defines the links and relations between the processes. Those relations will define the impact results in the latter phases. Using accurate and independently reviewed databases is instrumental in developing a truthful inventory. However, those databases are not explicitly designed for studies on energy poverty and climate change. The information provided by the databases needs to be complemented with local data.

The Social Impact Assessment and Interpretation phases are the areas that need to undergo the most changes. Figure 2 depicts the most commonly followed impact categories and subcategories in S-LCA studies. While all the impact categories are relevant for these kinds of studies, subcategories such as forced labour and freedom of association can be avoided. Defining a set of indicators would be the most critical part of obtaining significant results. The proposed indicators are Salary to energy expenditure rate (Taylor, 1993), thermal comfort (Hills, 2012), building envelope quality (Llera-Sastresa et al., 2017), local risk of heatwaves (Llera-Sastresa et al., 2017), and exposure to natural disasters (Knutsson & Ostwald, 2006).

Impact categories	Subcategories	Indicators
LABOR RIGHTS	<ul style="list-style-type: none"> Forced labor, Excessive Working Time, Poverty Freedom of Association, wage assessment Migrant labor, unemployement, child labor Labor laws, discrimination, social benefits 	
HUMAN RIGHTS	<ul style="list-style-type: none"> Human health issues Gender Equity High Conflicts Indigenous rights 	
HEALTH AND SAFETY	<ul style="list-style-type: none"> Injuries and fatalities Toxics and hazards 	
GOVERNANCE	<ul style="list-style-type: none"> Legal system Corruption 	
COMMUNITY	<ul style="list-style-type: none"> Hospital beds, drinking water, children out of school Sanitation, smallholder vs commercial farms 	
SOCIOECONOMIC CONTRIBUTORS	<ul style="list-style-type: none"> Contributions to Value Added Other Socioeconomic Impacts 	

Figure 2. Assessment system from categories to inventory data. Source: Adapted from SHD and (Life Cycle Initiative et al., 2020)

4. Conclusion

After the completion of the study, several conclusions can be drawn:

- Social Life Cycle Assessment is a suitable methodology for studies on the combined effect of energy poverty and climate change on impoverished households.
- The methodology needs minor modifications, especially regarding the inventory and the impact indicators.
- Databases such as the Social Hotspots Database need to be complemented with location-specific data to depict the local context accurately.
- The proposed indicators are Salary to energy expenditure rate, thermal comfort, building envelope quality, local risk of heatwaves, and exposure to natural disasters

Acknowledgment

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Simulating heat transfer performance for double-walls concrete residential building envelope in Mediterranean climate

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Keywords: Mediterranean dwellings, double walls, concrete building envelope, simulation, heat transfer, greenhouse gases emissions reduction

1. Introduction

It is well-known the fact that carbon dioxide (CO₂) is the main global warming agent. In Europe, 36% of CO₂ emanates from the building sector which consumes 40% of the energy usage (European Commission, 2020). To meet the Paris agreement, researchers are investigating construction techniques, which can be applied to new and/or renovated buildings, to achieve NZEB (Net Zero Energy Buildings) or nearly NZEB (MOOC, 2021).

The efficient energy performance of a building envelope is largely tied to its thermal performance; therefore, a related improvement should be one of the primary goals (COMSOL Multiphysics® webinar, 2022). In this perspective, this research focuses on a simple construction technique: the double-wall concrete for buildings envelopes. In Mediterranean climatic zone, this type of construction reduces heating/cooling loads; greenhouse gases emissions related to the energy consumption are, therefore, reduced.

1.1 Methodology

To prove the argument of decreased heating loads requirement by reverting to a double-concrete wall construction in residential buildings, we adopted the following methodology: first, a virtual laboratory is set in COMSOL Multiphysics® version 6.0 simulation software where parameters related to the internal and external temperature are initially configured as well as those related to proposed materials properties; second, a prototype residential apartment plan is drawn first with a single-concrete-wall construction and then with a double-wall concrete; third, the heat transfer performance through both layouts is simulated.

Similarly, two simulations for peak summer temperature are also performed for both the single and the double-concrete wall building envelope respectively.

2. Simulations

For this research, a computer simulation is defined as virtual modelling representation of a physical reality for analytical study. Furthermore, a parametric computer simulation is defined as a variables-based representative computer model which can be manipulated for various studies while based on the originally modelled one.

2.1 Methods

Framing the analysis within the Mediterranean climatic zone, the peak external temperature is set to 0 °C (winter) while internal temperature is set to 23 °C (comfort level). A prototype one-bedroom studio is proposed consisting of only two-rooms: a living room with a kitchen counter and a bedroom with a toilet. For the same layout, the simulation is conducted first for the single-concrete-wall construction building envelope and then for the double-wall concrete one.

The simulations are performed as an application of COMSOL Multiphysics® Heat Transfer module for Buildings and Constructions (COMSOL Multiphysics® software, 2022) – Stationary Study. Some of the considered parameters are indicated in the Table 1 below.

Table 1. Heat transfer simulation parameters

Parameters	Type	Figure
Parameter 1	External temperature	0 °C
Parameter 2	Internal temperature	23 °C
Parameter 3	Atmospheric pressure	1 atm
Parameter 4	Convective heat transfer coefficient	4 W/m ² .K

Other parameters related to the geometry of the proposed dwellings layouts are indicated in the layouts below drawn on AutoCAD 2023 (AutoDesk) (Figures 1 and 2).

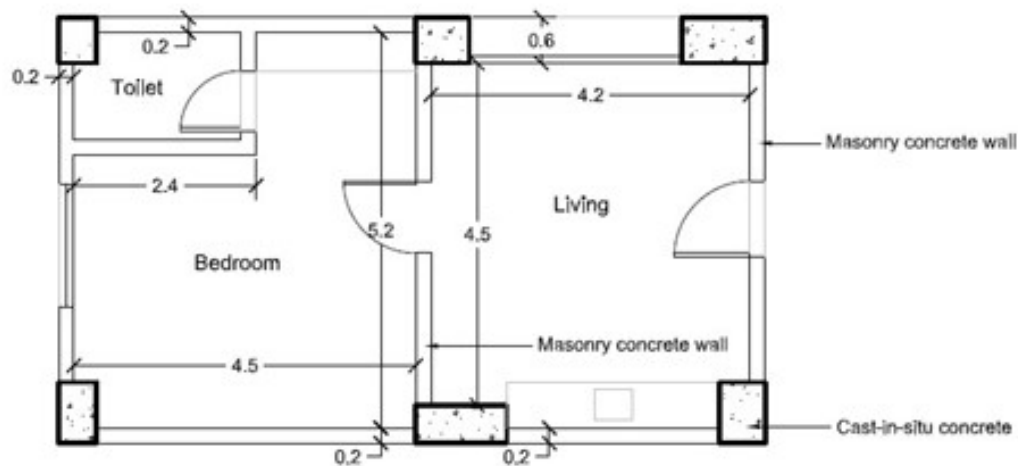


Figure 1. Prototype dwelling with a single concrete wall as a building envelope (drawing is not at scale)

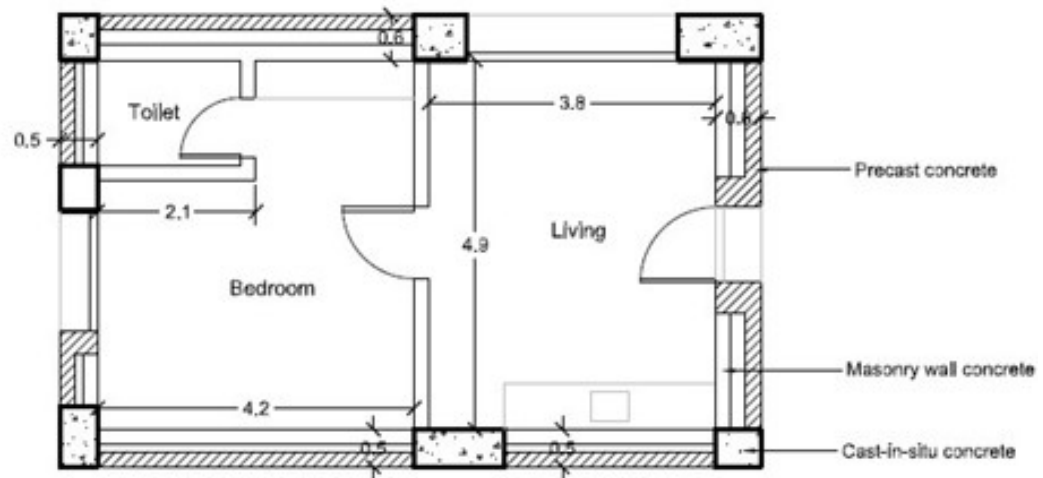


Figure 2. Prototype dwelling with a double-wall concrete as a building envelope (drawing is not at scale)

2.2 Results

Within the wall space, the first simulation shows interference of the internal temperature with the external one while the second simulation shows non-interference, except at structural jointing continuous elements (Figures 3 and 4). Hence, a double-wall concrete envelope would insulate the inner heated space from the external cold environment due to the effective presence of the interstitial air space.

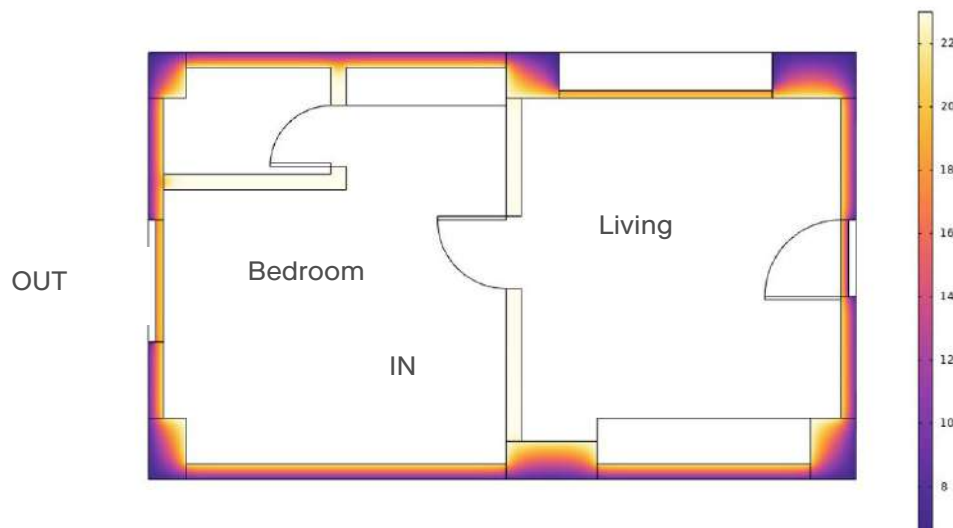


Figure 3. Heat transfer through single-wall concrete building envelope for peak winter temperature in Mediterranean climatic zone. Simulation by Authors using COMSOL Multiphysics® version 6.0 (drawing is not at scale)

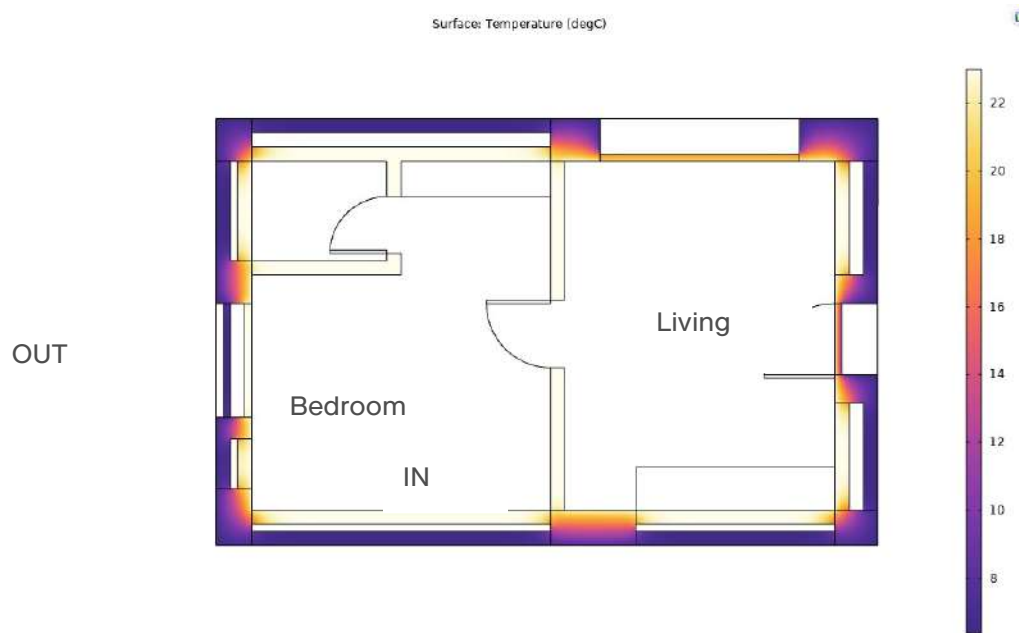


Figure 4. Heat transfer through double-wall concrete building envelope for peak winter temperature in Mediterranean climatic zone. Simulation by Authors using COMSOL Multiphysics® version 6.0 (drawing is not at scale)

The simulations are based on the European norm EN 15026 (COMSOL Multiphysics® documentation, 2022). COMSOL Multiphysics Heat Transfer Module capabilities are based on the three modes of heat transfer: conduction, convection, and radiation (COMSOL Multiphysics®, 2022).

2.3 Discussion

Adequately separating the internal heated wall from the external cold one reduces the amount of heat needed to maintain a comfortable temperature inside.

Reduction of heating/cooling loads results in a reduction of the related greenhouse gases (GHG) emissions. Whether for new or for renovated building envelopes, the double wall construction effectively contributes to reducing the GHG from the building sector. Further enhanced insulations techniques would, efficiently, minimize those GHG emissions.

Limitations of the study are related to the virtual set-up where the impact of orientation, sun, prevailing wind direction and, overall yearly heating/cooling loads amount are not calculated. Furthermore, for model simplification, the impact of construction details, such as precast panels specific shapes and fixations, is not taken into consideration; steel reinforcement in structural elements, mortar and material finishes have been neglected through the study. Finally, given the fact that the study is stationary, time related changes were not analysed.

2.5 Further work

Similar simulations were conducted for the peak Mediterranean summer conditions i.e., an external temperature of 35 °C and an internal air-conditioned temperature of 22 °C. For the case of the double-concrete wall, the simulations showed separate cooling behaviour of the internal concrete wall from the warmer external one (Figures 5 and 6).

Based on SimaPro version 9.4.0 calculations and in reference to EcoInvent database version 3.8 database, an initial life cycle assessment showed an increase of 68.9% of the CO₂ emissions, at production phase; this result is inferred when comparing the production of the double-wall concrete i.e., with an internal masonry concrete blocks construction, to a single external concrete layer for the Mediterranean residential building envelope. Primary calculations and simulations showed that this amount could be offset after two years of building usage.

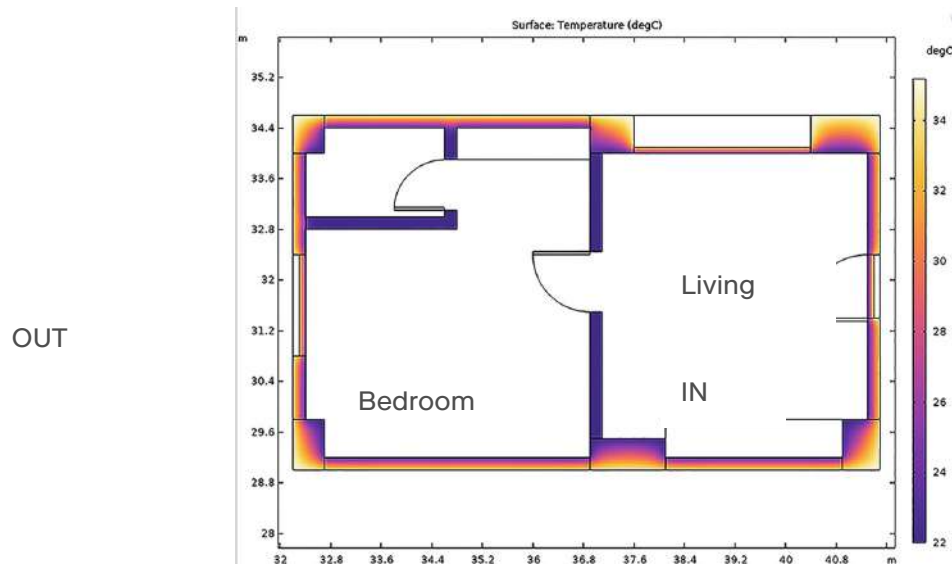


Figure 5. Heat transfer through single-wall concrete building envelope for peak summer temperature in Mediterranean climatic zone. Simulation by Authors using COMSOL Multiphysics® version 6.0 (drawing is not at scale)



Figure 6. Heat transfer through double-wall concrete building envelope for peak summer temperature in Mediterranean climatic zone. Simulation by Authors using COMSOL Multiphysics® version 6.0 (drawing is not at scale)

The impact of suggested further measures such as the initial orientation of the building structure and the provision of natural ventilation for the enhancement of the building envelope thermal performance requires further more serious parametric investigations. Further construction technical considerations such as adequate finishing and thermal insulation characteristics are, also, factors to be optimized within the context of the building envelope best heat transfer performance.

3. Conclusion

In conclusion, a proper construction assessment of the building envelope together with the adoption of advanced simulation tools may effectively minimize CO₂ and other GHG emissions from Mediterranean dwellings and from the building sector, in general.

With regard to the impact of double-concrete walls construction in optimizing heat transfer between outer and inner spaces of Mediterranean residential buildings, this study has proven the efficient reduction of heating load requirement; thus, the effective reduction of related greenhouse gases emissions.

Future research would simulate various other possible climatic conditions adopting different building envelope techniques and materials. Collected in a dedicated database, classified results would help professionals chose optimum construction techniques and materials for the building envelope.

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Towards integrating social and environmental sustainability in housing: conceptualisation, measurement frameworks, and indicators

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Keywords: sustainable housing, social sustainability, environmental sustainability, sustainable measurement frameworks, total quality assessment

1. Introduction

The global housing crisis is an important social, environmental, and economic issue that is increasingly affecting more households, leading to housing deprivation. Housing is a “human right” (United Nations, 1948) and a primary physiological human need, underpinning progress towards improved quality of life, health, wellbeing, and life satisfaction. At the same time the climate emergency demands more ecological ways of living that vastly reduce energy consumption in order to achieve the European Commission’s goal of carbon neutrality by 2050 (European Commission, 2020). The current lack of adequate sustainable housing can be addressed by employing good practices throughout the design and construction of new housing, alongside drastic maintenance of existing buildings and neighbourhoods via regeneration, reuse and retrofit. The importance of involving communities in the decision-making process, by communicating lived experiences and realities, has been highlighted as a key factor to obtaining more equitable and socially just results (Dempsey et al., 2011). There is a demand for further empirical housing research to better understand the housing conditions of individuals and communities, subsequently improving the failings of housing.

2. Methodology

This research explores the meaning of sustainability in housing, to better understand the potential to address current inequalities. Social and environmental sustainability were explored under a broadly constructivist and critical paradigm, not only to challenge their separation, but also to recast the entire relationship between them. Sustainability was first analysed as a theoretical concept, followed by its practical application. In the first part, a literature review was conducted concerning social and environmental sustainability in housing as stand-alone, and integrated concepts. In the second part, Sustainable Assessment Tools (SATs) and their associated indicators were analysed. Framework indicators and conceptual definitions identified within the literature were then compared. This analysis indicates that future investigation into the successes and failures of housing case studies should be conducted through an integrated approach to sustainability, to identify areas for improvement.

3. Conceptualisation

Sustainability in the housing context is used as an umbrella term to incorporate the demands for affordable, inclusive, and environmentally responsible living environments. The most

common conceptualisation of sustainability follows the triple bottom line paradigm (Elkington, 1997), formed by social, environmental, and economic pillars. Other scholars have also added political, cultural, or institutional aspects (Littig & Griebler, 2005). However, sustainability is often used ambiguously or in a techno-managerial way (Mehmood & Parra, 2013) following a functionalist approach which silences existing conflicts and depoliticises the concept (Paidakaki & Lang, 2021). This reduces its meaning to ticking boxes on pre-defined frameworks that often prioritise environmental aspects (Berardi, 2012) because they are easier to measure (Manoochehri, 2016). Should sustainability be understood as part of a broader process following democratic values of decision-making, the co-production of housing can lead towards societal transformation.

Social sustainability proposes social relations within a city that improve the existing by opposing social inequalities, such as segregation and exclusion (Brindley, 2003). There are three main aspects of social impact within communities: social materiality (physical living conditions, physical health, and economic fairness), social equity (justice, human rights, and economic opportunities), and community life (community wellbeing and social networks). Further literature considers the relationship between social sustainability and the other two pillars through five main approaches (Edwards, 2019): a limiting constraint on the other dimensions (Boyer et al., 2016); a human developmental approach (Dempsey et al., 2011); a bridging approach between the others; a maintenance approach that preserves culture (Vallance et al., 2011); or an integrated, process-oriented approach (Edwards, 2019). Several critical points were identified to be examined during case study analysis: assessment of objective or subjective conditions, ontology of the 'community' and 'neighbourhood' groups, top-down or bottom-up indicators, and assessment of current or future oriented impact (Magee et al., 2012).

Environmental sustainability in housing revolves around reducing greenhouse gas emissions and energy consumption (European Commission, 2021). Energy efficiency can be achieved through two approaches: active and passive maintenance strategies affecting ventilation, heating, water, and electricity (Kubba, 2012b); and embodied energy savings. Passive maintenance design strategies include building shape and orientation, passive solar gain, daylighting, natural ventilation, thermal mass, and insulation to preserve warmth (Hannula, 2012; Kubba, 2012a), while active strategies use smart energy management systems to monitor and control mechanical systems, alongside energy production through renewable energy sources (RES). Energy savings through embodied energy can be achieved during production, transportation, material assemblage, and building technique (Hannula, 2012). Existing buildings have high embodied energy and therefore high environmental sustainability potential when integrated with passive and active maintenance techniques. Further, if residents' needs are integrated with care to avoid top-down decision-making that exacerbates disempowerment, social sustainability can be reached.

Separating environmental sustainability from the other pillars can lead to housing with especially low energy consumption. Such is the case with net zero energy buildings (NZEB) and energy positive buildings, which use on-site RES to produce as much, or more, energy than needed for building operation (D'Agostino et al., 2022; Kubba, 2012b). However, NZEBs rely on technical solutions that could create further social sustainability issues: increased upfront and maintenance costs, exacerbated inequalities, inaccessibility, and emotional distress (Lowe et al., 2018). Improving energy efficiency and housing quality while paying close attention to residents' needs can directly improve social sustainability through financial cost, health and wellbeing, and quality of life (URBED, 2022). To unify environmental and social sustainability, it is necessary to situate pragmatic environmental solutions within the critical paradigm.

4. Measurement

The shift towards sustainable development in recent decades has prompted the evolution of SATs to objectively measure sustainability. SATs are perceived as useful guides for decision-making during different phases of a project: planning, design, construction, maintenance, and end-of-life (Karji et al., 2019). Measurements can help assess housing and resident satisfaction, identify successes and failures in housing, and suggest further improvements. Comparative studies of SATs have been performed to better define key indicators and remove subjectivity from measurements (Thuvander et al., 2012; Al Waer & Sibley, 2005). Total quality assessment (TQA) systems aim to consider ecological, economic and social aspects, often including both qualitative and quantitative approaches for the varying criteria (Berardi, 2012). To test this aim, the four most widely used and researched TQA systems were chosen from the literature (Berardi, 2012; Karji et al., 2019; Orova & Reith, 2019; Thuvander et al., 2012) and analysed — BREEAM, LEED, CASBEE and DGNB — as well as the EU Level(s) Framework, launched in 2020 to homogenise housing sustainability measures (European Commission, 2021). The building scale and neighbourhood scale variation of each framework were analysed to broaden the scope of sustainability indicators.

5. Conclusion and discussion

The analysis found that the social dimensions of sustainability are only partially considered in existing measurement frameworks, which tend to favour building energy performance. As social sustainability is less profitable, it does not fit succinctly into existing market-orientated structures, and therefore sustainable technical housing infrastructure is favoured. However, housing sustainability must be approached holistically. To achieve this, the following recommendations are suggested: apply sustainability as a transformative process, rather than functioning as a checklist; take an embedded approach to incorporate community well-being, economic affordability, and energy efficiency; approach sustainability as a dynamic concept, in the same way that contexts, practices, and technologies evolve over time; be place-specific as homogenised frameworks are incompatible with the realities of diverse contexts. Finally, sustainability should be the result of a broader collaborative process between communities and institutions, so that residents have the opportunity to influence governing institutions towards policies for housing provision and adaptation aligned with their needs.

Acknowledgment

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Rethinking housing as a kit-of-parts and shearing layers: An LCA approach

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Keywords: life cycle assessment, shearing layers, design for disassembly, industrialised construction, kit-of-parts

1. Introduction

Our built environment generates many climate challenges and at the forefront to address these are decarbonisation, implementing regenerative principles, and the transition to a Circular Economy (ARUP, 2016; EMF, 2015). As 75% of building stock in the EU is residential (EC, 2022), focusing on housing is key to responding to these issues.

Carbon emissions in housing can be reduced over the building lifespan using strategies such as Design for Disassembly (DfD) and Industrialised Construction (IC), with the planned reuse of building components, known as a kit-of-parts. Shearing Layers is similar concept that treats buildings as layers and components, which can be utilised to improve the circularity of housing.

Life Cycle Assessment (LCA) is used to quantify the environmental impacts of buildings (EC, 2010). However, the conventional LCA methodology does not support the use of these innovative construction approaches, in addition to a current lack of guidance over the replacement of different building elements.

The aim of this study is to propose an LCA methodology that supports a circular approach to housing and the replacement of building components. The kit-of-parts and Shearing Layers concepts were applied a case study house, to investigate the impact these theoretical assumptions have on carbon emissions during a 100-year lifespan.

1.1 Housing as a kit-of-parts

A kit-of-parts approach to housebuilding breaks down the home into a library of separate standardised and pre-engineered components, much like a LEGO set (Howe et al., 1999). Large building elements such as wall panels, roofs, and bathroom pods are considered products that can be mass customised to provide different housing configurations. Production is made economically viable using economies of scale through IC, also known as Modern Methods of Construction (MMC), which commonly takes place off-site under controlled factory conditions (Andersson & Lessing, 2017).

Circular housing requires repairing, reusing, remanufacturing, and recycling building components over the course of the lifecycle, both during the use phase (whilst the home is inhabited) and at the end of its useful life. These processes rely on DfD to safely remove building elements whilst avoiding damage to other building parts, which would otherwise result in greater carbon emissions (Crowther, 2005; Cruz Rios & Grau, 2019).

1.2 Housing as shearing layers

Another approach to housebuilding is Shearing Layers, a concept created by Duffy (1992) and further developed by Brand (1994), which conceptualises buildings through six layers, these are the Site, Skin (façade), Structure, Services, Space plan (partitions and fittings), and Stuff (furnishings). Each of these have differing expected lifespans and hence require different frequencies of replacement. The recent European-wide framework Level(s) incorporates this concept within indicator 1.2 for Global Warming Potential, to provide users with metrics for component lifespans to perform an LCA (Dodd & Donatello, 2020).

1.3 Life cycle assessment

LCA is a methodology and decision-supporting tool used by industry professionals and scholars to measure and compare the environmental impacts of buildings. LCAs are based on the international standard EN 15978 that consists of phases A-D, covering the product and construction phase (A), use (B), demolition (C), and beyond end-of-life benefits (D). There is ongoing research into utilising LCA to combine the Shearing Layers concept to measure the impacts of building components (Densley Tingley & Davison, 2012; Joensuu et al., 2022; Pushkar & Verbitsky, 2014). Nevertheless, there lacks a robust LCA methodology outlining the replacement of kit-of-parts components.

2. Methods

2.1 Research framework

This study applied the kit-of-parts and Shearing Layers concepts to housing, to break down the building into manageable elements and measure their environmental impacts using LCA. The LCA methodology used was based on the international standard illustrated in Figure 1, measuring carbon emissions of kit-of-parts components over the product and construction phases (A1-A5) and parts of the use phase over a 100-year period including: replacement (B4), operational energy (B6) and water (B7) usage.

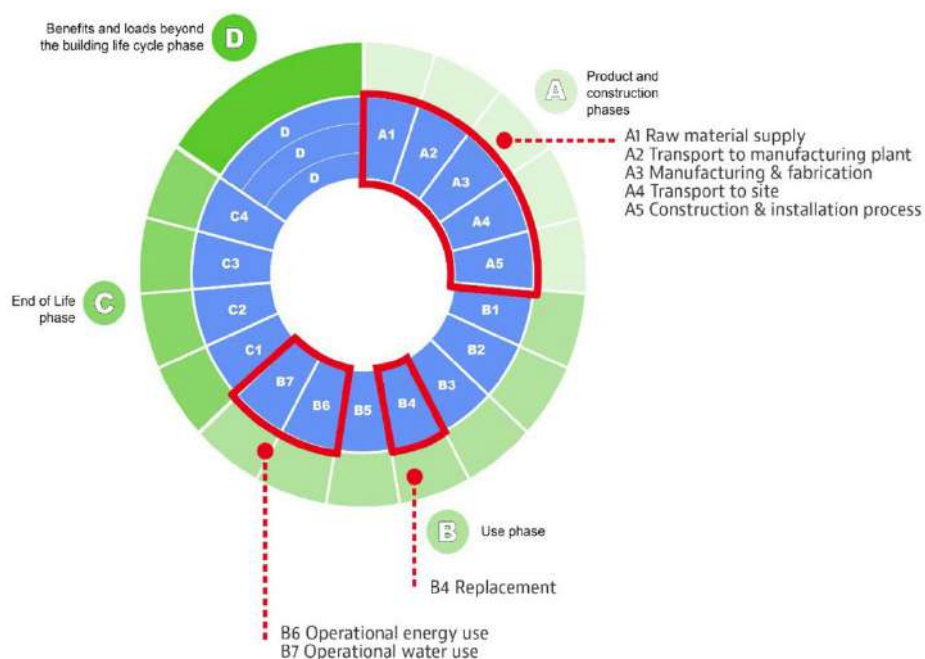


Figure 1. Building life cycle phases and modules. Source: Author's own image based on EN 15978

A kit-of-parts was organised into four of Brand's (1994) Shearing Layers: the structure, skin, services, and space plan; the stuff and site were considered out of the scope of this study. The lifespan of each layer was based on values provided by the Level(s) framework (Dodd & Donatello, 2020), with the exception of the structure. As illustrated in Figure 2, over a 100-year period, the structure would be built once, the skin replaced every 30 years, the services every 25 years, and the space plan every 20 years.

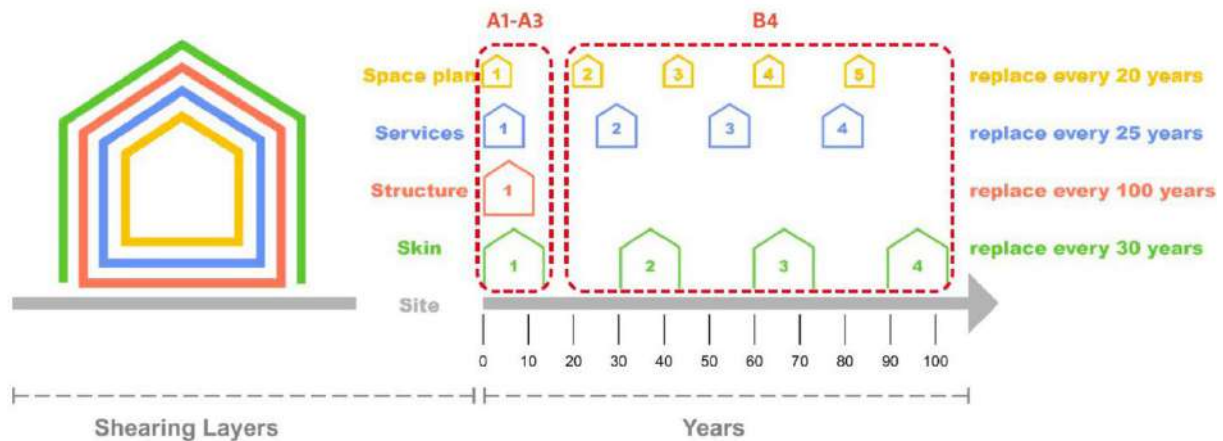


Figure 2. Shearing Layers and assumed life spans. Source: Author's own image based on Brand (1994) and Dodd & Donatello (2020)

2.2 A Case study: Single family house

Edificación Eco-Eficiente (E3) served as a case study to apply the LCA, a prototype house built in 2011 at the UPV campus in Valencia, Spain. Prominent characteristics are the steel structure, ventilated ceramic façade, and photovoltaics on the roof to produce on-site renewable energy. Built using industrialised methods, the house was prefabricated and assembled on-site within 19 days. Although E3 was not designed using a kit-of-parts or the Shearing Layers concept, the Bill of Quantities could be organised into assumed kit-of-parts components and subsequently into the four separate layers.

2.3 Analysis tools and methods

SimaPro was used to perform the analysis of materials and processes in conjunction with the ecoinvent Life Cycle Inventory database. Materials were adapted to the availability of European suppliers, to support the comparison of future case studies from different European countries. The annual energy consumption was provided from a previous study by the Centre for Physics Technologies at UPV, and water consumption was assumed as the Spanish national average.

3. Results and discussion

The LCA revealed which building layers emit the most carbon, whilst the kit-of-parts enabled identification of which components should be re-designed to reduce environmental impacts. The carbon emissions due to replacement (B4) of the skin, services, and space plan over the 100-year period were greater than the total embodied energy to produce and construct the original building (A1-A5). The results also show E3 is a positive energy building, however, it is not net-positive energy within the 100 years. This means more embodied energy was spent to

produce the building and replace parts, than the amount of energy produced by the photovoltaics.

4. Conclusion

The assumed lifespan of building elements has a significant impact on carbon emissions over the building lifespan. Assumptions based on the kit-of-parts and Shearing Layers concepts were applied, highlighting the importance to strike the right balance between prolonged periods of the useful life of building parts, and their planned replacement. This work is being further developed as part of the on-going doctoral research with RE-DWELL.

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Panel 5: From housing issues to policy and back

Alex Fernández, Marja Elsinga, Marietta Haffner, *Investigating the role of ESG bonds and loans in financing housing renovation among social housing providers: a comparative approach to six European countries*

Joris Hoekstra, Martina Gentili, *The position of young adults on the Amsterdam housing market: How to better connect system world and life world?*

Sara Caramaschi, Marco Peverini, *Towards a socio-ecological and territorial understanding of housing issues: A new interpretation of housing dynamics in the case of Milan, Italy*

Investigating the role of ESG bonds and loans in financing housing renovation among social housing providers: a comparative approach to six European countries

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Keywords: ESG, social housing, energy transition, green finance, sustainability

The energy transition across Europe's built environment will probably be one of the main financial challenges of the coming decades. Renovating the social housing stock to attain the built fabric standards introduced in the European Directive on Energy Performance of Building (EPBD) will require the mobilisation of both public and private funding as envisioned by the European Commission in the Renovation Wave. In this landscape of increased investment needs, Environmental, Social and Governance (ESG) standards have risen to a prominent position as the main indicators of sustainable investment. While ESG-earmarked funds have grown significantly in the last years, there is widespread concern about the real impact of ESG-funded projects and whether these are in fact bringing additional investment into key transitional activities such as the renovation of the social housing stock. This project poses two questions, first, *How does ESG funding interlock with the renovation strategies of social housing providers?* And second, *How do institutional factors affect the uptake of ESG funding?* To answer these questions, this project draws from semi-structured interviews with finance officers from housing providers across six European countries with large social housing stocks: Austria, Germany, The Netherlands, France, Sweden, and the UK. The main objective of this paper is to critically assess the contributions of ESG funding to the energy transition and contextualise it within traditional forms of private and public financing of social housing.

Sustainability transition and its financial implications have become an area of legislative focus for European institutions. For instance, the Strategy for financing the transition to a sustainable economy has proposed a set of voluntary standards for European Green Bonds (EUGBS). This standard requires bond issuers to align with the EU Taxonomy, a classification of environmentally sustainable economic activities. When it comes to building renovation, the Taxonomy requires a 30% reduction in primary energy consumption to characterize an investment as "green" and thus be financed through a green bond. For new constructions, the green requirements are even more stringent with primary energy demands set at least 10% lower than national nearly-zero-energy requirements. The introduction of ESG standards does not only target borrowers at the project level but also the information investment funds release to end-investors. The Sustainable Finance Disclosure Regulation ("SFDR") imposes a set of information disclosure requirements on funds so these are comparable and clearly labelled. For asset managers, these regulations result in increased transparency requirements, updated prospectus and the release of more granular information. The SFDR also details indicators to identify green assets. In the case of real estate, a formula has been proposed for the identification of those energy inefficient assets by taking into account the value of buildings under EPC C and nearly zero-energy (NZEB) in proportion to overall stock value. These indicators serve to assess how Taxonomy-aligned are different investment funds. The EU's legislation on ESG has so far focused on environmental indicators and the social Taxonomy is

yet to be finalised, as a result, while green financing is becoming more tightly regulated, social indicators remain less stringent.

Real estate is one of the areas where Taxonomy-alignment is supposed to be higher and willingness for investment is stronger. However, transitional risks in real estate are deeper since banking and the wider financial sector are reliant on property valuations, albeit with major divergences by country. The Joint Research Centre (JRC) (Alessi & Battiston, 2022), has estimated that while a 100% of real estate activities are taxonomy-eligible only 15% of them are taxonomy-aligned, despite the existence of widespread transitional risks for 70% of the sector. The goals of the EU legislation and guidance are to serve as labels directing investment towards sustainable activities and signalling which areas are under higher environmental risks. Ultimately, the objective of ESG finance is to increase the pool of investors into aligned activities resulting in more favourable lending conditions such as lower interest rates and broader investor bases. Traditionally, the academic literature on Green finance has focused on the question of additionally, that is whether ESG brings additional funding into aligned sectors. Some researchers highlight Green Bonds as not generating additional capital for environmental protection, as these usually refinance conventional ones at more advantageous rates (Bongaerts & Schoenmaker, 2019). Research on Green Bonds (Fatica & Panzica, 2021) has found that ESG-linked securities do seem to be financing new investments into aligned projects.

When it comes to social housing, our preliminary findings point to unequal access to ESG finance. Countries such as the UK where social housing providers have been accessing private funding for decades seem to be more accommodating to ESG reporting requirements. For example, Peabody, a large London-based provider, has issued a 12-year £350m green bond under its new sustainability financing framework specifically targeting the energy transition and housing stock renovation. In other countries such as the Netherlands where most social housing associations are funded via loans from the Local Authorities and the Water Banks the implementation of ESG criteria seems to be taking place at the financial intermediary level. Similarly, in France, the Caisse de Dépôts(CDC), a bank providing low-interest loans to housing associations, has issued a green bond that has been used for housing renovation by a Parisian housing association. Preliminarily, the capacity of ESG finance to bring additional funding to social housing renovation seems to be path-dependent hinging on national institutional arrangements and prior direct access to capital markets.

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The position of young adults on the Amsterdam housing market: How to better connect system world and life world?

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Keywords: housing affordability, young adults, capability approach

In recent years, the housing market of Amsterdam, traditionally known for its large share of social rental dwellings, experienced a trend of commodification and financialization. Due to its central position and good facilities, the Dutch capital has become very popular among both home seekers and investors.

As previous research testifies (Hochstenbach & Boterman, 2015; Lennartz et al., 2016; Jonkman, 2019), in Amsterdam starters on the housing market, particularly young people, have been experiencing housing difficulties for years, due to soaring house prices and rents, the precarization of the labour market, the decline of the social housing sector and processes of gentrification. For more vulnerable young people – those with a lower socio-economic background, those without family support, migrants and refugees – it is especially challenging to find a suitable dwelling. They cannot access homeownership and are struggling due to unaffordable rents on the private rental market, and to strict income requirements and long waiting lists in the social rental sector. Housing insecurity for this segment is on the rise, even though the city government has developed several measures to try and protect the more vulnerable groups.

Based on life course interviews and inspired by the Capability Approach, this paper investigates how young people navigate through this complex housing market. What are their strategies? How do their housing strategies intertwine with other aspects of their life? To what extent are these strategies supported by existing policies?

Here, we present the results of extensive qualitative work carried out in the framework of a Horizon 2020 project called UpLift - Urban PoLicy Innovation to address inequality with and for Future generaTions, which started in 2020 and will run until June 2023. The overall aim of the project is to explore how young people's voices can be put at the centre of youth policy, with local case studies addressing the domains of housing, education and employment. In Amsterdam, 40 in-depth life course interviews with people aged 18 to 45, that are currently or have been facing housing difficulties, have been complemented with several group discussions with young people about housing issues, thus providing an account of a wide range of experiences of young people over the course of the last two decades. The theoretical lens of the Capability Approach allowed us to explore the interaction of personal life stories and policy context, highlighting how the “system world” of policies, market and institutions can expand or restrict the capabilities of (young) entrants in the housing market, particularly those with a weak socio-economic position.

In its initial section, this work introduces the housing problem in the context of Amsterdam, and it provides a brief analysis of the literature in this regard, together with an exploration of the

empirical application of the Capabilities Approach. Then it proceeds to outline the methodology and to present the results of the qualitative analysis.

We conclude that the housing problem in Amsterdam is so severe, that it also affects the choices that young people make in the field of labour market and education.

A particularly concerning pattern emerged, where young people delay the end of their studies in order to be able to remain longer in their student accommodation, thus postponing their full entrance in the labour market for fear of not finding an affordable home. Indeed, compared to other young people, students are a relatively protected category in the housing market. For example, if they manage to find student housing, so much so that a few of the interviewees broke the rules or enrolled in programmes they did not intend to follow simply in order to keep their student accommodation.

Finding a new dwelling is so challenging that the perspective of moving seems to be scary and stressful even for the highly educated and well employed youngsters in our sample. In this regard, there seems to be an increasing gap between the system world of the policy makers, and the life world of the young adults themselves. Indeed, while the problem of affordability has been acknowledged by both local and national governments and is currently being tackled, albeit not very successfully, the issue of precarity remains unaddressed. Despite the cries for stability from young people, temporary contracts are now the norm in the private rental market, and are increasingly used also in the social rental sector, while homeownership is an unattainable objective for most (Huisman, 2016a, 2016b, 2019). Among our participants, not even those with a high level of education and well-paying jobs had yet managed to achieve homeownership, unless some very substantial help came from previous generations.

Finally, to further elaborate on the detachment between the system world of policy and the life world of young people, our results show that there is a fundamental erosion of young people's trust towards institutions that are perceived as slow, burdensome and not attuned to young people's needs. This is especially true for people with a migration background. In turn, this mistrust leads to a low level of knowledge of local policies that could be helpful, especially with regard to employment. Except for the most obvious and well-known national subsidies for rent and unemployment, interviewees tend to be unaware and uninterested in the initiatives and programmes offered by public administrations, while they are more inclined to rely on NGOs and other local associations. Nonetheless, the most common strategy to face life difficulties – in housing, in employment and in most other life domains – is to seek the material and immaterial support of their personal networks of friends and family.

However, it is important to note that several actors in Amsterdam – chiefly the Municipality and some housing associations – have shown an interest in improving housing affordability and security and have started to recognize the value of seeking input from vulnerable young people who have first-hand experience in housing problems in the creation of more effective policies.

In order to close the gap between the system world and the life world of young people, we propose to take advantage of this recent trend and give young people a greater voice in the development of housing policies. An example of how this could be done is an advisory board formed by young people that could contribute to the discussion on existing housing needs and problems, and on potential solutions and policy approaches. In addition to the interview work, the UpLift project aimed to initiate such a process of cooperation by working with a local NGO, a housing association and the Municipality to set up a youth board and start a

co-creation process of youth housing policy, with a particular focus on temporary contracts and mixed housing concepts.

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Towards a socio-ecological and territorial understanding of housing issues: A new interpretation of housing dynamics in the case of Milan, Italy

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Keywords: housing issues, territorial inequalities, regional polarization, territorial ecology

1. Introduction: A fragmented debate on shrinkage and attraction

Demographic trends in the European context are characterised by two contrasting tensions. On the one hand, demographic shrinkage and aging affect struggling rural areas and deindustrialized cities. These territories experience a persisting decline in socio-spatial development, as well as a long-lasting solidification of structural deficits in terms of services, occupation, and quality of life (Kühn, 2015). Overall, peripherality and shrinkage negatively influence the sustainability of the local housing market, the prospects of new economic projects, as well as the overall habitability of the building stock (Couch & Cocks, 2013; Keenan et al., 1999). Ultimately, this encourages future waves of out-migration and leads to a vicious circle that reproduces peripherality (Massey, 1990).

On the other hand, the attraction exerted by some economically more prosperous urban centres creates interregional inequality and polarization. Such centripetal and centrifugal forces lead the younger and more dynamic segments of the population from peripheral areas to more attractive agglomerations (Rodriguez-Pose & Storper, 2020). To illustrate the latter tensions, present-day talent, youth, wealth and innovation are flowing to a limited set of mostly large metropolitan areas (Florida, 2017), contributing to rising housing prices and making housing increasingly unaffordable or unavailable for local residents (Figure 1).



Figure 1. Milano, Italy. Source: Sara Caramaschi, 2022

These spatial and economic divergences are not new, as they also occurred throughout the twentieth century in different forms (e.g., migration to major industrial cities). However, today the situation is more complex, as a number of geopolitical factors such as income, housing costs, and services create internal and external inequalities. While attractive cities remain prosperous, the pains are felt strongly by both low-/middle-income communities living and working in these territories and by those areas that are left behind. Regarding the latter, the loss of population and human capital together with the amount of unused or abandoned stock affect struggling rural and deindustrialized shrinking cities. In more attractive and jobs- and skill-abundant areas, housing affordability is considered to be among the most important issues of our time – especially due to exclusionary housing markets (Peverini, 2021). As a reaction, the growing focus on competitiveness and growth – deeply rooted in prevailing neoliberal logics of development – is not the best option for both scenarios.

Development strategies against peripheralization target specific interventions allocated through national or European programmes on infrastructures and services. However, these are not sufficient to bridge the increasing core-periphery gap and do not consider the issue of building emptiness and the overall inability to maintain the built environment (Caramaschi & Chiodelli, 2022). In core areas, on the contrary, the shortage and/or unaffordability of housing is usually addressed by incentivizing the enlargement of the stock, without considering more sustainable policies that prevent housing emptiness and speculation. In brief, the tendency to consider strategies that either advance competitiveness or solve its pitfalls does not address the most pressing issues and deficits of current geographically uneven development and regional futures.

2. A new framing of territorial dynamics through housing: research questions, theoretical framework and method

We aim to link the two perspectives described above by looking at housing issues (i.e., abandonment and oversupply; unaffordability, pressure, and land rent distribution) as a privileged vantage point for understanding territorial inequalities and polarization. We argue that a revised framework on housing issues is needed, considering the multiple scales and dynamics at which housing may originate socially and environmentally unsustainable patterns. A more choice-centred and place-centred understanding of what is fair and what may create well-being, therefore, needs to come into play (Sen, 1993). This means exploring the actors' identity, aspirations, possibilities and attachments, thus revealing which structural (dis)advantages affect them the most. Which housing dynamics are occurring in shrinking and attractive territories? What are the social and environmental consequences of these dynamics on shrinking and attractive territories?

Simultaneously, we believe that new models of transcalar governance capable of mitigating centripetal and centrifugal forces are crucial for a more socially and environmentally sustainable housing system. Which are the territorial scales and relations at stake? Who are the actors involved? Which elements could drive a new framing of the problem?

To do this, the paper applies the analytical lenses of socio-ecological transition and of territorial ecology to housing issue. Territorial ecology is a systemic view of the consequences of individual and collective actions on the sustainability of local socio-ecosystems (Buclet, 2021). The main idea is to simultaneously look at the social *and* environmental sustainability of housing dynamics that is happening *among* territories that are subject to regional polarization.

In terms of housing, we are interested in the coevolution between individuals' and communities' choices and the (built and natural) environment at multiple territorial scales. It must be stressed that territories here are intended as socio-ecosystems and treated as relational elements of a National system. This perspective is explored theoretically by analysing the scholarly debate on geographical patterns of convergence and divergence, and empirically by looking at housing dynamics occurring among the city of Milan – Italy's economic capital and one of Europe's most competitive locations (Clark et al., 2018) – and a set of less attractive Italian territories that suffer the magnetism of this core area.

Acknowledgment

This paper draws from broader research projects about housing issues and territorial fragilities undertaken by both authors. Currently, Dr. Sara Caramaschi is working on a research project on processes of uneven geographical development that produce and reproduce peripherality in Italy. Dr. Marco Peverini develops his research in the framework of the Observatory on Housing Affordability in Milan Metro-area (OCA). They both work as postdoctoral researchers at DASTU – Politecnico di Milano.

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Panel 6: New sustainable housing solutions in the existing city

Marco Peverini, Federica Rotondo and Paola Savoldi, *Yes, we can! Systems of standards, practices and conditions toward a socially sustainable densification*

Agnieszka Włoch-Szymła, *Contemporary socio-spatial change in the built environment of the socialist estates in Krakow*

Lorenzo Stefano Iannizzotto, Alexandra Paio, *Rethink terrain vague potential for sustainable habitat*

Yes, we can! Systems of standards, practices and conditions toward a socially sustainable densification

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Keywords: housing needs, norms, urban policies, densification, social sustainability

1. Housing needs, built environment and sustainable housing solutions

In the last century, urban growth took place through expansion processes that profoundly transformed the shape and organization of cities. A significant portion of the new buildings represented the answer to an urgent and massive demand for housing. However, the current conditions are far from peaceful. Despite the large number of houses built over the "short century," a new and different housing demand emerged (Allen et al., 2004; Eleb & Simon, 2013; Bricocoli et al., 2021). Furthermore, the size and obsolescence of the inherited patrimony require interventions that cannot be exclusively punctual. It is, in fact, a question that not only affects individual artefacts but concerns a perspective that considers cities and citizens together (Callon et al., 2014).

This contribution discusses how to face emerging housing needs by practicing "light and socially sustainable densification" approaches to the built heritage (Peverini et al. 2020), offering responses that are attentive to the specific context and the expressed needs (Bramley 2012; Fijalkow, 2022). The hypothesis is that it is worth considering forms of light densification involving (i) a minimal or almost zero volumetric increase in the existing heritage and (ii) an approach to transformation of the built environment that modifies its vocations and, only partially, its spatial organization. Overall, we highlight how it is possible, starting from the needs and opportunities offered by the heritage conditions, to favour these forms of densification, identifying operational spaces for action and hypothesizing an adaptation of existing norms. In this perspective, the rules are assumed not only as construction requirements but as the outcome of technical, social, and cultural mediations, therefore, a tool with a political value (Borraz, 2004; Fijalkow 2015).

As part of a research conducted at the Department of Architecture and Urban Studies of the Politecnico di Milano, the present contribution aims at enriching the debate starting from a limited number of recent European experiences (in the cities of Vienna, Bologna, and Milan), as "tactics" of innovation (Donolo et al., 1988) in the system of standards that are tested to produce new and sustainable housing solutions.

2. Tactics of innovation: Systems of standards, practices and conditions for a light and socially sustainable densification

Without any rigidly comparative pretension, the considered experiences are synthetically reconstructed concerning the original characteristics, the regulatory dimensions involved, the process of interaction and mediation between the different actors who guided

their construction, and the building and urban repercussions. In all three cases, it is possible to assess the processes and outcomes that have characterized the different contexts, underlining the traits of interest in a transversal manner, in the belief that they can contribute to feeding the terms of the debate and of the experiments to come (Passeron & Revel, 2005).

- The *Vinzirast Mittendrin* project involves the reuse of a vacant building in the city centre of Vienna, made possible by the coalition of a variety of civil society and institutional actors, with the shared goal of creating housing solutions for students, refugees and the homeless in a collective setting.
- The *Cinisello Balsamo* case regards new public housing realized by increasing the height of existing residential buildings owned by the municipality. This latter has thus activated a "latent" resource of the existing public built stock, making housing available at social rents in response to the municipality's housing emergency
- The *Bologna* case regards the temporary adaptation of a public building to residential use, to host displaced households coming from formerly squatted buildings around the city. It advocates to an incremental and agile intervention of housing inclusion that makes use of the exceptional and temporary rental for residential use of an empty building.

The paper analyses how practices of light densification result from the ability to grasp the conditions and opportunities of the moment, prefiguring solutions that are sometimes temporary or marked by an incremental logic of transformations (Lindblom, 1959). The investigated practices begin to nourish a catalogue of practical cases. They are not numerous, but they are worth recognizing and discussing them, capitalizing on a sort of empirical heritage. In fact, it is not only a question of theoretically delineating the problem, but also of maturing practical knowledge, assuming real situations as a reflexive field of exercise to identify spaces for action and to prefigure some adaptation of existing standard systems (Figures 1-3). The process of the reuse of the built environment, albeit temporary or long-lasting, often have non-linear development times. Sometimes, spontaneous coalitions of interests on the part of social actors active in the city trigger accelerations and project triggers, where the availability of the entire building makes the realization of an aspiration matured in previous times feasible. In other cases, it is instead the sudden push of the emergency, the urgency to resort to alternative solutions to the ordinary ones.

The challenge consists in practicing a light densification, attentive to the possibility of socially sustainable responses, in a medium-term perspective, without the pretence of prefiguring a definitive solution. This is an incremental perspective which, however, requires a systematic approach: in terms of governance and regulation, through programs, measures and resources defined at the urban (and metropolitan) or even national scale and in terms of skills and design dimensions, from the constructive one (the envelopes, the windows, the remodelling of spaces), to the urban one (the mutual relations between the building and its surroundings, the complementarity of vocations, the availability of space and services).



Figure 1. Vinzirast Mittendrin, Vienna. Source: Authors



Figure 2. Public housing, Cinsello Balsamo. Source: Authors



Figure 3. Student housing, Bologna. Source: Authors

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Contemporary socio-spatial change in the built environment of the socialist estates in Krakow

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Keywords: large-scale housing estates, post-socialist transformation, socio-spatial change, housing policy, sustainable development

1. Introduction

The post-communist urban and housing heritage has experienced a process of permanent adaptation to the requirements of current social needs, to environmental requirements and new spatial planning conditions. After the fall of communism, housing development has undergone many unwanted and uncontrolled transformations. At present, it is in the process of adapting to the contemporary political, social and economic conditions and to the challenges of the future.

In the past, in a city of socialist modernism (1956-1989), living in a housing estate offered almost the only opportunity to improve one's conditions and quality of life. After 1989, the system of public investments in housing ceased, and housing construction passed into the hands of private investors, which significantly influenced the quality of urban spaces. The privatization of housing construction, combined with the lack of local spatial plans, led to urban sprawl, to the construction of housing estates in peripheral areas, deprived of infrastructure and often to gated estates for selected social groups. However, currently there is a tendency to return to the estates dating from the times of the communist era. Buildings from that period are very often located near old city centres and are well-connected with other districts of the city. They are well-equipped with social and service infrastructure and have a lot of freely accessible green recreational spaces.

2. Research work

The paper considers the relationship between the size of the area of "socialist" housing estates and the present legal regulations on social and spatial changes in Krakow. To underline this relationship, this study draws on empirical evidence from housing from that period and of different size categories: from the administrative district to a selected fragment of a housing estate managed by one administrator. The current socio-spatial transformation of large housing estates shapes the regulated urban environment through stabilization of legal regulations and an entrepreneurial approach of local authorities to improving the quality of life. Therefore, the study also refers the legal possibilities of transforming housing estates to the current sustainable development objectives. It turns out that the spaces of multi-family housing estates built according to the regulations in force at that time meet the contemporary needs of residents. These spaces also have a great potential to implement the principles of sustainable development of housing estates. The positively changing legal possibilities and social attitudes, and often the fact that a housing estate is managed by one administrator, create opportunities for easier resident turnover and greater accessibility depending on the family situation and current needs.

The main objective of this work is to offer answers to the following questions:

- What current legal regulations affect the management of housing estates built in the period of the People's Republic of Poland?
- What is the impact of the size of housing estates on the legal possibilities of managing them in the context of improving living conditions?
- What are current qualitative requirements with regard to the spatial and social conditions of “socialist” housing estates?
- Finally, to what extent do “socialist” housing estates meet qualitative requirements resulting from sustainable development?

The research focuses on Polish cooperative housing estates built in the period of Socialist Modernism. The work presents a historical background, contemporary qualitative requirements as well as research indicators related to the quality of life and to meeting sustainable development requirements in housing estates. The research method proposed by the author is presented in the context of the actual housing estates with a view to identifying further development measures and strategies for housing estates built in the discussed period. The territorial focus is on the city of Krakow, in which three housing estates of different size have been selected for a detailed analysis.

The issue of “socialist” housing estates, in both its theoretical and empirical aspects, deserves attention because it is an underexplored research area that is often viewed through many stereotypes which should be verified at different spatial scales and by using different research methods. The changes in the housing estates of post socialist cities, the image of such estates, their social perception and their position in the spatial structures of cities are of key significance to their future, taking into account the large part they represent in cities' housing resources.

The complexity of the social and spatial aspects of housing estates requires an integrated approach that draws on the experience of various theoretical and methodological approaches adopted by scientists who explore and interpret specific phenomena: geographers, sociologists, urban planners, architects as well as the representatives of other sciences who explore cities as areas inhabited by people, such as, environmental psychologists and social anthropologists.

To date, social and spatial diagnoses as well as transformation trends in the housing estates of Polish cities are widely discussed in a number of works including Komar (2014), Szafrńska (2016), Węclawowicza et al. (2004), and Zaniewska (2013). The case of Krakow has been presented by Zborowski (2005), among others. The literature on the subject also presents other cases of post-socialist cities in Europe (Aernouts et al., 2020; Sendi & Kerbler; Temelová et al., 2011). However, as a dynamic phenomenon large socialist housing estates require further theoretical and empirical research in response to social and spatial changes in cities. In this context, it is necessary to combine the case of cooperative housing with spatial urban quality and to present relationships between managing a housing estate and its spatial quality.

The adoption of specific assumptions and the specificity and complexity of research – with regard to similarities and diversities – as well as the common occurrence of processes in “socialist” housing estates require the use of three spatial research scales: macro, meso, and micro.

- A macro scale – urban and architectural transformations and legal regulations concerning entire housing estates within a given district.

- A meso scale – functional and spatial transformations and legal possibilities in smaller neighbourhoods within a given estate.
- A micro scale – internal transformations and the legal status which includes spatial changes with regard to buildings.

The summary of the two first research questions:

The research indicates that cooperative policies focused on inhabitants' well-being and cooperation between housing estate boards and residents have a positive impact on the urban and social aspects of residential areas. Some cooperatives have their representatives in district and city councils, allowing for a constructive dialogue with decision-makers on important issues with a view to undertaking common action. Unfortunately, the fragmentation of housing estate land ownership has a negative impact on joint undertakings.

On a meso scale, residents frequently report the need for spatial and functional changes, which reflects an increasing interest in social participation. Unfortunately, a frequent problem is the lack of unanimous decisions on behalf of residents in controversial matters related to, e.g., green areas or car parks. Another issue is a negative impact of decisions made by different administrators within the same residential areas, indicating the lack of cooperation and focus on the self-interest of the estate under management.

The most difficult problem is posed by transformations inside buildings. They require specific interventions, and, unfortunately, because of the ownership status and the need for owners' consent and willingness, as well as the lack of confidence, it is difficult to implement projects on a micro scale aimed to improve the quality of housing, e.g., through flat swaps. However, some socially positive changes in "socialist" housing estates are increasingly frequent.

3. Conclusion

Recognizing the strength of specific local imperatives, the research indicates a correlation between a certain size of housing development and the legal possibility and variety of transformations. It also turns out that the functioning of an estate is often related to a legal situation in which different actors have a different impact on the entire estate.

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Rethink terrain vague potential for sustainable habitat

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Keywords: terrain vague, sustainability, collaborative methodology, nature-based solutions, sustainable habitat design

1. Introduction

As cities continue to be the primary habitat for humanity, their study has become increasingly vital in addressing the pressing global challenges of sustainability and inclusiveness in the future. The contemporary city is subjected to processes of transformation that are generating new types of spaces within itself and at its borders. Among these spaces there are *terrain vague*, undeveloped spaces within urban areas, at different scales, where emptiness prevails over fullness and naturalness prevails over built, with unclear boundaries or thresholds. Emptiness can be thought as both negatively and positively, in fact, as referred by Solà Morales (1995), the “emptiness, therefore, as an absence but also as a promise, as a contrast, as a place of possible and hopeful waiting.”

These spaces can play an important role in promoting an inclusive, affordable, sustainable, resilient urban regeneration, by integrating the environmental approach, through the nature-based solutions (Rok, 2019), and the social approach, through the co-creation process (Cardoso & Paio, 2021). In fact, there is a correlation between green spaces accessibility and social equality (Figure 1).



Figure 1. Urban Garden in Lisbon. Source: Câmara Municipal de Lisboa

1.1 Emptiness as a promise

Contemporary cities are changing their physical structure and their immaterial and symbolic relationships (Sieverts, 2003). Many authors have attempted to define a new urban form that they named *zwischenstadt* (Sieverts, 2003), *città diffusa* (Secchi, 2005), or *generic city* (Koolhaas & Mau, 1995), *planetary urbanization* (Brenner & Schmid, 2010), *regional urbanization* (Soja, 2010). Common characteristics are: the end of traditional divisions between city and countryside; urban and rural dimensions interpenetration, overlaps and hybridization, creating blurred and indeterminate boundaries (Secchi, 2005; Sieverts, 2003); the place where local actions and regional, national, global decisions compete.

Contemporary cities generate within themselves and create urban voids at their borders (Pineiro, 2020). These voids have been defined in many ways, such as *terrain vague* (Solà Morales, 1995), *territori attuali* (Careri, 2004), *spazi interclusi* (Rossi & Zetti, 2018), *nuove terre* (Marini, 2010), *spaces in-between* (Spirito, 2015), *third landscape* (Clément, 2005), or *urban interstices* (Brighenti, 2013). These are unbuilt spaces within urban areas, at different scales, where emptiness prevails over fullness and naturalness prevails over built (Careri, 2004); waiting, abandoned, marginal, underused, ambiguous spaces (Solà-Morales, 1995). There may be a tendency to think that urban voids have been randomly generated and that nobody use them. However, they show clearly the relation with the *territorial palimpsest* (Corboz, 1985) and they are often used for informal activities. In fact, emptiness can be thought as both negatively and positively (Kamvasinou & Roberts, 2014). These spaces allow any possibility and are bearers of hope and freedom (Solà Morales, 1995). They have a great environmental, social and economic value (Clément, 2005); they can be integrated with traditional public spaces, or being linked each other, creating a network of in-between spaces of transition, cooperation, threshold (Kamvasinou & Roberts, 2014; Cavaco, Santos & Brito-Henriques, 2018; Lokman, 2017; Stavrides, 2014; Young, Keil, 2010).

2. Methods

Methodologically, the research follows a literature review comparison in order to define the theoretical background of this field of research. Furthermore, in order to evaluate the potential of urban voids for the contemporary city, two examples will be chosen, and a comparative analysis is proposed on the basis of three criteria based on both nature-based solutions (Rok, 2019) and sustainable development objectives (UN, 2018).

3. Results and discussion

This paper presents a new approach to *terrain vague* spaces: no longer an approach based on land consumption, mono functionalism of spaces and zoning, but a more flexible, dynamic, and reversible approach based on human-centric design and identity embedded *in situ*. This new approach is based on time, system, participation, and diversity. In fact, *terrain vague* can be linked, creating a network of in-between spaces of transition, offering equal access to green spaces (Stavrides, 2014; Sendra & Sennett, 2020); they offer possibility of temporary alternative uses, engaging citizens and strengthen sense of community through bottom-up and co-creation process (Kamvasinou & Roberts, 2014); they can generate the increase the economic value of neighbourhood, stimulating urban regeneration (Cavaco, Santos, & Brito-Henriques, 2018). A new way of designing habitat based on diversity, which represents their greatest resource (Clément, 2005).

These spaces can offer at least two different solutions to achieve a more sustainable habitat. On the one hand, these empty and free spaces represent an important resource for future housing development, because they are rare empty spaces within the dense built urban environment. These spaces can be occupied temporarily with temporary and reversible constructions, to meet the demand for housing at a specific time of city expansion; or they offer cheap free space for the construction of low-cost social housing: this is the case of the *SRU Lisboa Ocidental* programme in Lisbon, for instance.

On the other hand, they have great potential for improving the built environment of the neighbourhood and quality of citizens life concerning to ecological, social and economic issue. In fact, these spaces perform or could perform important ecological functions, they can guarantee equal access to green spaces for an inclusive city and it is proven that the presence of green spaces increases the value of surrounding buildings.

The preliminary results will discuss the potential of *terrain vague* related to habitat development, some holistic approaches involving different actors and how they strengthen communities including co-creation processes in sustainable habitat design (Figures 2 and 3).



Figure 2. *Becoming Garden*. Source: *Diventare Giardino*, Archilovers



Figure 3. Festival a Rua é Nossa. Source: LABIC Barreiro Velho

3. Conclusion

Because of its potential, *terrain vague* inspires solutions for the unsolved problems of the contemporary city. But it is necessary to develop a new approach to these spaces: we can no longer follow an approach based on land consumption, mono functionalism, zoning, and top-down design; these spaces require a more flexible, dynamic, temporary and reversible approach focused on urban relations systems (Rossi & Zetti, 2018; Solà-Morales, 1995) and based on union between top-down and bottom-up policies, with new experiments in participatory urban design.

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