

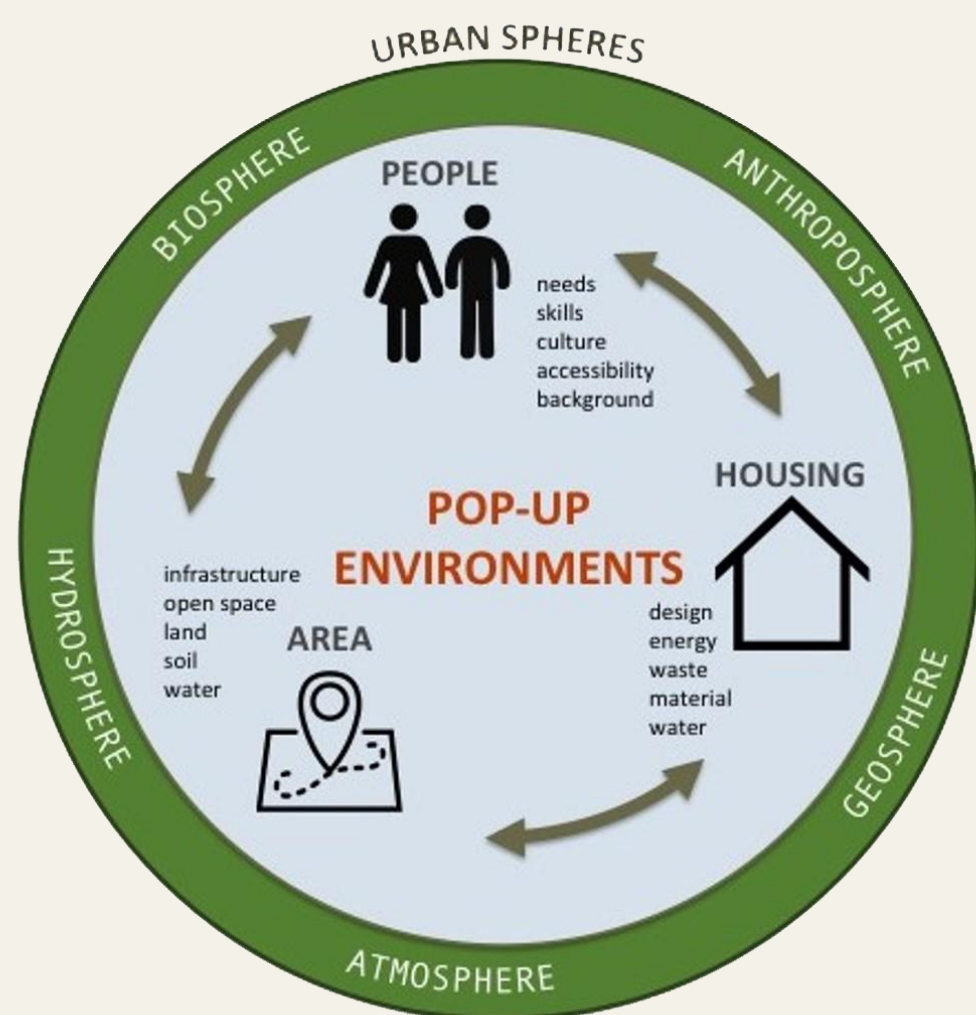
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Project description

The need for temporary housing in urban environments is expected to increase dramatically. To address these urgent demands, it is important to find affordable and flexible but sustainable and reusable concepts that are easy to construct and rapid to implement. In this respect, this project focuses on an inter- and trans-disciplinary approach to systematically investigate and evaluate existing temporary housing options, and to create holistic, innovative and sustainable models for pop-up living systems in urban environments. Methods from urban and landscape planning, architecture and building systems technologies are interlinked to resource related disciplines such as energy optimization, green technologies, sustainable waste management, water supply and wastewater treatment as well as social and political sciences. Diverse modelling approaches are integrated into a cross-disciplinary model and subsequent scenarios of pop-up housing environments are developed for different target groups and types of urban spaces. Risk assessment approaches as well as energy and life-cycle-assessments are applied to evaluate the housing models. This research clearly goes beyond state-of-the-art, since for the first time a systemic modelling approach is applied to develop high-quality and sustainable temporary housing environments as innovation niches within urban systems.



Project objectives

- Systematic investigation and evaluation of existing temporary housing concepts.
- Conceptualizing and exploring pop-up housing environments as local innovation systems.
- Development of holistic, innovative and sustainable models for pop-up living systems in urban environments (for case study of Vienna).
- Portrayal of integrated urban pop-up concepts based on environmental, technical and social evaluation of temporary housing models and scenarios.

Outcomes

- Integrated urban pop-up concepts based on environmental, technical and social evaluation of temporary models and scenarios
- Collection of temporary housing concepts and case studies
- Development of a typology of temporary housing concepts
- Identification of adequate area types and vacancies for temporary housing in Vienna
- Mapping of niche experiments (in Vienna) with focus on sustainable innovation
- Stakeholder interaction (workshop)

Funding

This research was funded within the project "Urban Pop-Up Housing Environments and Their Potential as Local Innovation Systems" under the Vienna Science and Technology Fund (WWTF) with the project number ESR17-010.

Acknowledgements

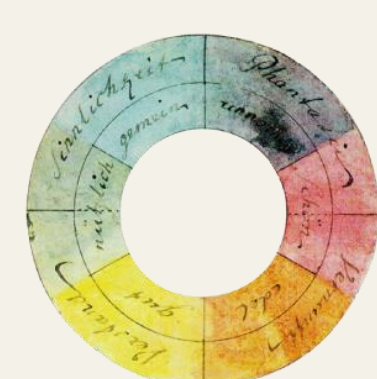
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Definitions

- **pop-up environments (P.U.E.):** structures that, due to characteristics such as light-weight technologies and fast and easy assembly-disassembly operations, occupies the ground only temporarily, and thanks to its flexible structure is adaptable to different uses and target groups
- **pop-up housing:** non-permanent reusable physical shelter
- **temporary:** ranging from several weeks to 5 years (in exceptional cases max. 10 years)
- **target group:** in general, people with an urgent housing demand, in a phase of transition or disaffiliation (disruption in biography due to diverse reasons)
- **local innovation system:** space where innovative forms of living, collaboration and learning, as well as technical, infrastructural and resource orientated innovation can occur



(adapted after designs by Freepik, Smashicon, Pause08, Lyolya, monkik from Flatication)

Criteria and requirements

Requirements of both temporary and permanent environments

Requirement	Definition	Relevance
<i>utilitas</i>	Degree of utility, functionality and distribution organization	Good space arrangement Adequate acoustic and thermal insulation Adaptability to people's need
<i>firmitas</i>	Degree of strength, durability, solidity, and resistance to stress and external agents	Structural stability Protection from atmospheric agents Protection of privacy
<i>venustas</i>	Degree of beauty or aesthetic pleasantness	Aesthetic beauty related to the single environment Aesthetic beauty related to the local context

Requirements of temporary pop-up environments and their relevance for urban planning

Requirement	Definition	Relevance
Modularity	Degree to which system's components may be separated and recombined	Minimizing costs Minimizing production time Minimizing consumption of space
Flexibility	Ability to produce environments that can evolve and change	Rapid implementation Respect for users' uses and customs Easy change of intended use Adaptability to everyone's needs
Speed	Ability to transport and install environments quickly	Easy transportation on site Reducing construction time Adaptability to different contexts
Simplicity	Ability to install environments easily in different conditions	Low structural complexity Easy assemble of elements
Affordability	Economic possibility of exploiting a specific resource	Guarantee of adequate housing Minimizing cost of use Minimizing manutention
Reversibility	Ability to return to the starting point without leaving traces	Reducing environmental impact Reducing complexity in disassembly operations
Second-life management	Ability to have sustainable solutions for the end-of-life	High quality control for products Reuse/recyclability for new life cycles Reducing energy consumption and related CO ₂ emissions

Framework parameters to be considered

Parameter	Definition
Location	Place where the PUE is located
Plot Original Function	Area in which the PUE is located
Temporary Use	Intended use of the PUE
Project Time Duration	Intended time of the PUE
Background Purpose	Planification of the PUE
Criteria for Realization	Objectives and aims of the PUE in its context
Design and Materials	Physical description of the PUE and its elements
User Groups	Type of user for which the PUE is intended
Neighborhood Characteristics	Spatial context in which the PUE is located
Neighborhood Density	Number of users expected to use the PUE
Lifecycle of the PUE	Considerations on reuse or recycling
Economic Aspects	Costs and economic benefits

Conclusion

The analysis shows how the use of pop-up environments has had a positive impact in the most diverse contexts that often represented a limit or a problem for urban planning due to their intrinsic nature. The temporary nature of pop-up environments is characterized by the changeability of the functions and destinations of use while maintaining recognition and local identity. They are a solution to specific temporary needs of function and use, susceptible to continuous modification and adaptability, integrating the permanent environment and completing it. The use of pop-up environments is supposed to increase sustainability, thanks to numerous advantages such as low cost, environmentally friendly construction processes, the use of raw materials with low embodied energy (including recycled materials, construction and industrial waste), reversibility of the project and time savings. The research thus aims at providing recommendations for the implementation and development of associated policies of pop-up environments as temporary urban strategies that contribute to an appropriate, healthy, and sustainable development of the city.

Pop-up environments examples



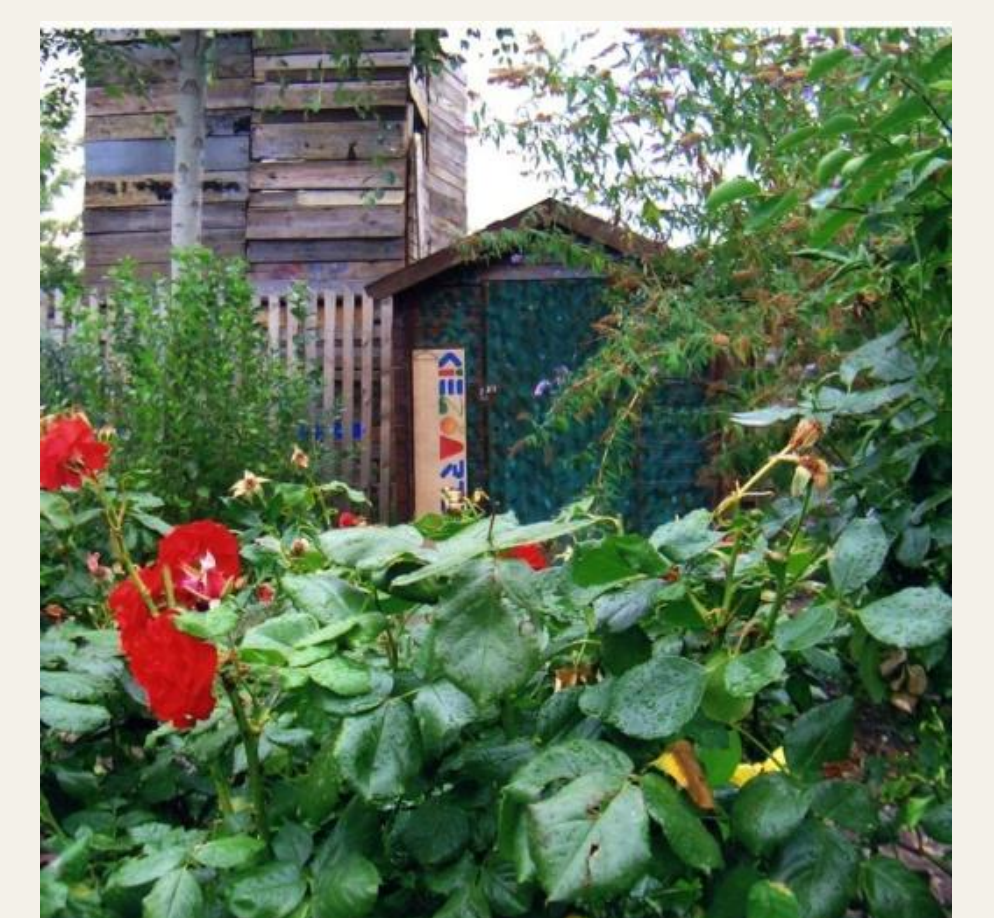
Limite-Limite Tower, Brussels, Belgium (© City Mine(d))



PROXY, San Francisco, USA (© Chris Woodcock for PROXY)



Floating School, Makoko, Lagos, Nigeria (© NLÉ)



Green interim usage in Pankow, Berlin, Germany (© S.T.E.R.N. GmbH)



Add-On 20 Höhenmeter, Vienna, Austria (© Michael Strasser)



Hovercraft, Paris, France (© raumlaborberlin)



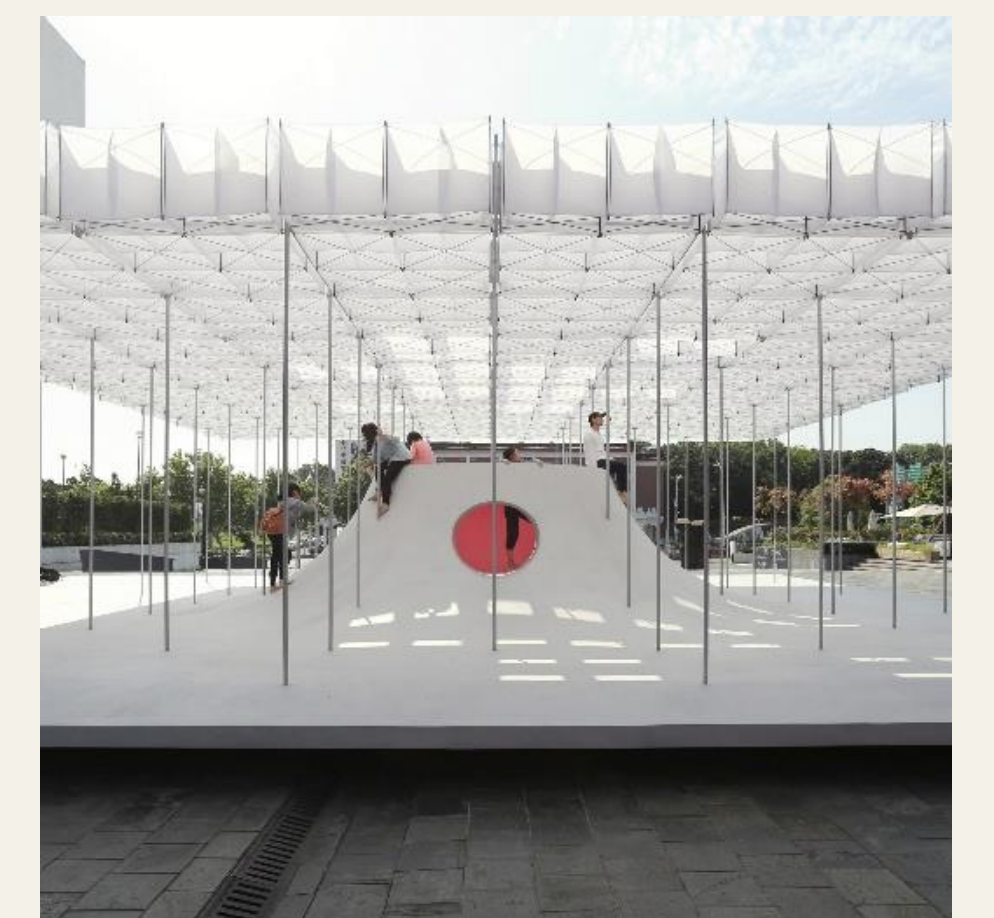
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