

COLLABORATIVE AND PARTICIPATORY DESIGN OF COMMUNITY SPACES AT LOCAL AND MUNICIPAL LEVEL – A MULTI-METHOD APPROACH

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ABSTRACT

The participatory design of urban areas - incorporating local residents needs and initiatives - is increasingly recognised as vital for enhancing quality of life and promoting environmentally friendly solutions. In the framework of sustainable urban development and the New European Bauhaus (NEB), the revitalisation of a former industrial site in Zeitz serves as a central example of how such approaches can drive both social and environmental sustainability.

Drawing on the discourse of ‘Democracy and Design’, this contribution emphasises that true democratic participation empowers citizens to shape their environments and helps mitigate power imbalances. To achieve this, methods that enable active citizen participation and prospective user integration should be explored by integrating innovative concepts such as the Para-Persona, Beyond-Human-Persona and sustainability persona into the project process.

Additionally, we propose reading the city as a patchwork to reveal both physical and metaphorical boundaries between social groups. Extended reality (XR) and collaborative platforms are employed to overlay shared visions onto existing urban landscapes, thereby bridging these divisions and enabling immersive, inclusive planning experiences. XR facilitates the communication of planned content before its realisation, engaging residents in envisioning multiple concrete futures alongside digital community walls and crowd innovation challenges.

Through this multi-method approach, a holistic framework is developed that utilises local resources, addresses urban challenges and empowers residents to actively contribute to a sustainable and resilient urban future.

Keywords: Participatory design of urban areas, sustainability, design methods

1 INTRODUCTION

Urban planning has evolved significantly since the late 19th and early 20th centuries. Early models such as Howard’s Garden City promoted self-sufficient communities that balanced work, housing, and recreation within green spaces [1]. Later, Le Corbusier’s vision in ‘La Ville Radieuse’ advocated for a functional, highly ordered urban layout with separate zones for living, working, and leisure [2]. This approach was later challenged by figures like Robert Moses, whose top-down, automobile-centric projects modernised cities at the expense of existing neighbourhood structures and social cohesion [3, 4]. Over time, critiques by planners such as Jane Jacobs [5] helped shift the paradigm toward more integrated and participatory approaches. The sustainable development ideas from the Brundtland Report [6] and emerging concepts like Smart Cities and New Urbanism [7] further reoriented urban planning toward inclusivity, flexibility, and ecological responsibility. Integrated Planning initiatives [8, 9] and participatory practices - as emphasised in works like The Community Planning Handbook [10] - underscore the importance of involving citizens in the planning process. Bonsiepe [11] also highlights the need for design practices that empower citizens, allowing for a more holistic integration of both human and non-human interests in urban spaces.

To summarise, some approaches represent a move away from the top-down, expert-driven models of the past towards more inclusion, technology integration and ecological responsibility in urban development. It can be seen that there is still potential for the inclusion of diverse human, non-human

and non-user interests in a holistic, inclusive approach and their integration into the design of urban spaces, where for several methods and tools have been developed and published. This leads to the Research question: What are the potentials and limitations of approaches of Persona-Methods, XR and Beyond-Human-Persona-based planning tools in complementing traditional participatory urban design methods?

2 CONTEXTUALISATION | THE CITY OF ZEITZ

Zeitz has undergone two major transformations and is facing another transformation in the near future: For nearly 150 years, lignite mining shaped the region, transforming the landscape and defining work and community life. After German reunification, Zeitz faced and faces economic challenges. Until the 1990s, ZEKIWA was the undisputed market leader in the German stroller industry and delivered their products throughout the whole EU, but economic shifts led to its decline. The site where this project is being implemented is the industrial wasteland of the former factory - large parts of which are either destroyed or in urgent need of structural stabilisation. The coal phase-out is inevitable due to climate change. The uncertainty and justified concerns about the future can be eased, at least in part, through this project. Rather than being overwhelmed by transformation - as happened in the 1990s - this project seeks to create a positive transformation experience, one that is actively shaped by the community. By embracing sustainable economic and social opportunities, the project aims to design new ways of living, working, and engaging in culture that reflect both ecological responsibility and the unique character of this place. The deep emotional connection to the ZEKIWA site provides a foundation for a community-driven, identity-building process, turning Zeitz into a model for sustainable innovation and circular economy - not as a passive recipient of change, but as an active participant in shaping its own future.

3 PHILOSOPHIES

This contribution presents an approach for designing sustainable cities, that is both participatory and inclusive. By involving citizens in decision-making and fostering interaction, communal spaces emerge to support shared visions for the future. Such participatory design enhances sustainability and quality of life while reducing setbacks in long-term projects by establishing a solid foundation for guidelines and design parameters. In some cases, the approach presented in this contribution is a concept that is still in the process of being implemented. The contents should therefore be understood as an initial outline of a well-founded approach.

Within the New European Bauhaus Initiative (NEB) and the revitalisation of Zeitz, participatory urban design is gaining importance. The focus is on the inclusive redesign of industrial wastelands and old industrial buildings - a crucial opportunity for smaller Eastern German cities to transform unused areas into functional, liveable spaces. Designing sustainable cities requires not only advanced technologies but also a commitment to values and ethics that address both human and non-human needs, redefining the city by recognising personal resources as drivers for change.

The concept of reading the city as patchwork reflects the divided physical and metaphorical spaces among social groups. In Zeitz, these divisions appear in abandoned industrial zones alongside revitalised areas, as well as in socioeconomic disparities. XR can bridge these gaps by overlaying shared visions onto existing environments, reducing social boundaries and ensuring equal opportunities for all citizens to co-create communal spaces. Allowing all social groups to participate and vote on design concepts supports good choices through reflective practice. Collective deliberation increases the chance of viable, sustainable solutions, reinforcing empowerment and genuine participation as cornerstones of resilient urban futures.

The approach of this contribution employs methods that enable active citizen participation while giving voice to less visible stakeholders and the environment. The objective is to develop a holistic framework that considers residents' needs, environmental factors, and long-term sustainability- one that will be further evaluated and disseminated within a larger research project.

In a Citizen App we develop within this project, users access a "Select a Future" experience at several predetermined points around the city. They can compare and vote on pre-designed approaches or quickly sketch or describe new ideas, creating a "Community Option" forwarded to the relevant authorities. This concept will first be applied to the historic ZEKIWA factory site, a local landmark that once employed many in Zeitz.

Many residents, including children and relatives of former workers, share a deep emotional connection to the factory - a former economic anchor of the city. By allowing them to shape the building's next

phase, the Citizen App leverages this historical tie and fosters intergenerational engagement. Former ZEKIWA workers and their descendants can collectively propose, visualise, and vote on new uses for the site, integrating the city’s industrial heritage into its future. After implementation at the ZEKIWA factory, this approach will extend to other locations, strengthening connections among citizens, local authorities, and the broader urban environment.

4 METHODS

Innes and Booher [12, 13] highlight that participatory planning improves decision quality and project acceptance. Therefore, practices such as workshops, focus groups, surveys, co-creation sessions, scenarios, role-playing exercises, and online platforms are promoted.

The concepts of Para-Persona and Beyond-Human-Persona¹ offer innovative ways to integrate diverse perspectives into participatory development. These methods encourage thinking beyond traditional, anthropocentric planning. In our project, while primary engagement tools like voting in XR are human-focused, we incorporate the Beyond-Human-Persona as an essential ecological lens to ensure environmental factors (e.g., local flora, fauna, and other non-human elements) are considered. This integration promotes a more democratic and holistic approach to city planning.

Using these methods provides a comprehensive view of the urban environment that accounts for both human and ecological factors. This multidimensional perspective helps create sustainable, inclusive, and future-ready urban spaces while fostering participatory discourse and holistic solutions to improve long-term quality of life. Throughout a collaborative process, transparent communication is key. Arnstein’s [14] “ladder of citizen participation” underscores the importance of transparency and feedback in participatory processes (cf. [15]). Wherefore we include the XR-Technology within the Citizen App to form an inclusive creation of Users and Personas as their representation. To assess the suitability of the proposed methods, their strengths and weaknesses are presented in Table 1 and discussed below to explore potential combinations.

Table 1. Overview about the proposed methods

| Method | Potentials | Limitations |
|--|---|---|
| Extended Reality for participatory planning | <ul style="list-style-type: none"> enables immersive previews of planned urban changes. facilitates communication of complex urban design concepts. enables interactive citizen participation. | <ul style="list-style-type: none"> may divide issues (lack of devices/digital literacy). requires development effort for realistic and functional XR content. addresses privacy concerns and public acceptance challenges. |
| Para-Persona | <ul style="list-style-type: none"> reaches marginalised and excluded groups not visible. addresses social inequalities in planning processes. promotes inclusive design of urban spaces. | <ul style="list-style-type: none"> requires in-depth preliminary studies to identify underrepresented groups. cannot independently address existing power imbalances. |
| Beyond-Human-Persona-Approaches | <ul style="list-style-type: none"> encourages holistic thinking beyond human-centred planning. strengthens biodiversity and ecological awareness. | <ul style="list-style-type: none"> difficult to operationalise in traditional urban planning processes. requires political acceptance and interdisciplinary collaboration. |

Extended Reality (XR)

The application of the technology enables all data to be brought together and representations of real users as well as influenced entities to be designed and made tangible in order to provide a basis for joint decision-making.

Para-Persona Method [17, 18]

This method ensures that marginalised and less-visible communities are represented. Traditionally, such groups have faced barriers based on social, ethnic, or economic factors. Furthermore, there are even non-Users who do not want to use or participate but are also affected by decisions. By leveraging XR and voting features within the Citizen App, our approach democratises decision-making, allowing

¹ In this contribution, we use the Beyond-Human-Persona as a collective term and include the sustainability persona in the concept of including the needs of other non-human entities.

everyone to participate and vote. Workshops or focus groups further identify the needs and obstacles of those typically excluded, thereby promoting inclusivity and social justice.

Beyond-Human-Persona Method [20]

This approach goes beyond traditional boundaries by including non-human actors. It considers interactions between humans, animals, plants, and their shared environment. By integrating ecological factors, planners can create greener spaces that promote biodiversity and improve residents' well-being. This expands the focus on human needs by examining relationships among all actors, including feedback from environmental organisations to address non-human needs.

Extending traditional personas, the sustainability persona [16] [19] incorporates “environmental needs” and sustainability objectives and summarises them in global perspective but also small scale effects, into urban planning, giving natural entities a “voice.” By developing scenarios, planners can evaluate impacts on the environment, community, and resources. This method supports citizen workshops as the Beyond-Human-Persona and thus is understood as one approach.

Approach

Involving residents in decision-making processes through XR in the first place and later within the project through workshops, surveys, and community forums will help to gain a deep understanding of local needs and challenges, therefore we propose to go through the following steps:

1. **Identification and Analysis of Stakeholders:** Comprehensive stakeholder analysis is crucial. Reed et al. [21] describe methods for identifying stakeholders and their relevance in sustainable environmental assessment.
2. **Implementation of the Para-Persona Method:** As introduced by Augustin et al. [17, 18], this method ensures marginalised groups are included by identifying barriers to participation.
3. **Integration of the Beyond-Human-Persona-Approaches:** The extension to include environmental needs, as detailed by Wiesner et al. [20] and Kokoschko et al. [16, 19], provides a framework for integrating sustainability into planning.
4. **The Citizen App, with its XR and voting features**
The Citizen App, with its XR and voting features enables better communication between citizens and stakeholders.
5. **Evaluation and Adaptation:** Regular evaluation is essential for continuous improvement, as outlined by Alkin [22].

Figure 1 shows an abstract visualisation of the process where one can identify the above highlighted methods.

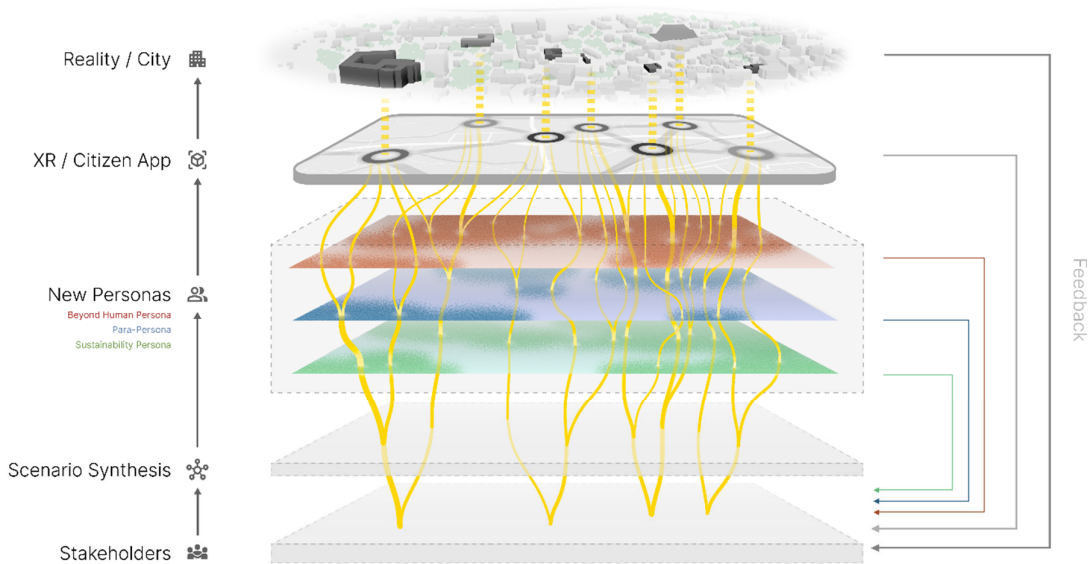


Figure 1. Schematic representation of a multi-layered XR-supported participation system for participatory urban planning

The figure illustrated pursues a holistic approach in which ideas are developed together with the stakeholders and then enriched and filtered through the integration of different persona methods. The persona data in turn consists of stakeholder data, which creates a cycle of system improvement. Subsequently, the resulting concepts are made tangible for citizens by means of XR experiences and, by offering a choice of different variants, citizens are involved in the design process, enabling broad participation and a broad discussion of the planning projects. This highly inclusive approach aims to significantly broaden perspectives on urban development and thus contribute to more informed and holistic decisions.

In this way, the system contributes to broadening perspectives on urban development through a highly inclusive process.

In our approach to democratic city planning, we distinguish between human-focused methods - using human personas and the Para-Persona Method for marginalised groups - and non-human considerations addressed by sustainability- and beyond-human personas. Although ecosystems, wildlife, or natural resources cannot vote, including these additional personas ensures they influence planning decisions. The Citizen App, with its XR and voting features, primarily connects people and authorities; meanwhile, the sustainability- and Beyond-Human-Personas integrate the perspectives of non-participatory entities, ensuring that urban planning proactively addresses both human and ecological dimensions

5 CONCLUSIONS

Participatory workshops and co-design sessions are key components in implementing the introduced methods. In these settings, residents, planners, designers, and other stakeholders come together to develop creative solutions. By applying the Beyond-Human and sustainability persona methods in these workshops, complex problems can be addressed, and holistic designs can be created. This collaborative process fosters a sense of community and allows local knowledge and expertise to be incorporated into planning.

Furthermore, by recognising and actively working to dissolve 'patchwork' boundaries between different social and economic groups, participatory design aligns with Bonsiepe's [11] vision of design as a truly democratic and empowering practice. The inclusion of marginalised voices, in combination with XR tools that make future scenarios tangible, ensures that urban space is co-created rather than dictated.

A focal point of participatory urban design lies in public spaces and community areas. Parks, playgrounds, and pedestrian zones should be designed to encourage social interaction and benefit all residents. By considering the non-persona and integrating ecological elements, these spaces can become inclusive and health-promoting meeting points.

In conclusion, a participatory approach that includes the non-persona, Beyond-Human-Persona, and sustainability persona enables comprehensive and sustainable urban planning. By considering the needs of all residents, the environment, and future generations, urban planners can create urban areas that are inclusive, liveable, and environmentally friendly. This approach not only promotes citizen satisfaction but also contributes to a resilient and sustainable urban future.

Outlook

In the further course of the project, the approach developed in this contribution will be implemented and evaluated. The results will be incorporated into the redesign of the Zeitz region and made available to the public so that, subsequently, collaborative and participatory urban planning/design can be adapted and prepared for other interest groups, countries, and municipalities.

REFERENCES

- [1] Howard E. *Garden Cities of To-Morrow – Being the Second Edition of "To-morrow: A Peaceful Path to Real Reform"*. Swan Sonnenschein & Co., Paternoster Square, London, 1898.
- [2] Le Corbusier. *Le couvent Sainte Marie de la Tourette construit par Le Corbusier – Album, Nefs et clochers*, Ed. du Cerf, Paris, 1960.
- [3] Moses R. *Public works – A dangerous trade*. McGraw-Hill, New York, 1970.
- [4] Mumford L. *The city in history – Its origins, its transformations, and its prospects*. A Harvest book, Harcourt Inc, San Diego, 1989.
- [5] Jacobs J. *The Death and Life of Great American Cities*. Vintage Books, New York, 1992.
- [6] Brundtland G. H. Report of the World Commission on Environment and Development – Our common future. *World Commission on Environment and Development*, United Nations Documents, United, Oxford, 1987.

- [7] Calthorpe P. *The next American metropolis – Ecology, community, and the American dream*. Princeton Architectural Press, New York, 1993.
- [8] Europäische Kommission. ESDP - European Spatial Development Perspective – Towards balanced and sustainable development of the territory of the European Union. *Europäische Kommission*. Office for Official Publications of the European Communities, Luxembourg, 1999.
- [9] Faludi A. and Waterhout B. *The Making of the European Spatial Development Perspective*. Routledge, 2012.
- [10] Wates N. (Ed). *The community planning handbook – How people can shape their cities, towns and villages in any part of the world*. Polytechnic of Central London. Earthscan, London, 2000.
- [11] Bonsiepe G. Democracy and Design.
- [12] Booher D.E. and Innes J. E. Network Power in Collaborative Planning. In *Journal of Planning Education and Research* 21 (2002), Heft 3, S. 221-236. <https://doi.org/10.1177/0739456X0202100301>.
- [13] Innes J. E. and Booher D. E. Reframing public participation: strategies for the 21st century. In *Planning Theory & Practice* 5 (2004), Heft 4, S. 419-436. <https://doi.org/10.1080/1464935042000293170>.
- [14] Arnstein S. R. A Ladder of Citizen Participation. In *Journal of the American Institute of Planners* 35 (1969), Heft 4, S. 216-224. <https://doi.org/10.1080/01944366908977225>.
- [15] Gaber J. Building “A Ladder of Citizen Participation”. In *Journal of the American Planning Association* 85 (2019), Heft 3, S. 188-201. <https://doi.org/10.1080/01944363.2019.1612267>.
- [16] Kokoschko B., Augustin L., Schabacker M. et al. Potentiale der Persona-Methode im Kontext der nachhaltigen Produktentwicklung. In: *Entwerfen Entwickeln Erleben 2024: Menschen, Technik und Methoden in Produktentwicklung und Design*. Technische Universität Dresden, 2024, S. 1-14.
- [17] Augustin L., Kokoschko B., Wiesner M. et al. Toward a comprehensive definition of the non-user. In *Proceedings of the Design Society: DESIGN Conference 1* (2020), S. 1853-1862. <https://doi.org/10.1017/dsd.2020.124>.
- [18] Augustin L., Kokoschko B., Wolfram A. et al. Defining the Non-user: A Classification of Reasons for Non-use. In Chakrabarti A., Poovaiah R., Bokil P. et al. (Hrsg). *Design for Tomorrow—Volume 1 – Proceedings of ICoRD 2021, Smart Innovation, Systems and Technologies*. Springer Singapore, 2021, S. 339-349.
- [19] Kokoschko B. R., Augustin L. and Schabacker M. et al. Expansion of the persona method based on its potential for sustainable product development – In preparation for Print. In Chakrabarti A., Poovaiah R., Bokil P. et al. (Hrsg). *Design for Tomorrow - Vol. 3 – Proceedings of ICoRD 2025 | Responsible and Resilient Design for Society*. Springer, Singapore, 2025, n.n.
- [20] Wiesner M. and Kokoschko B. Beyond-Human Personae – Visualising Ecosystem perspectives for sustainable Innovation [in Preparation for Publication]. In *Proceedings of E&PDE 2024*, 2024.
- [21] Reed M. S., Graves A., Dandy N. et al. Who's in and why? A typology of stakeholder analysis methods for natural resource management. In *Journal of environmental management*, Vol. 90 (2009), Iss. 5, pp. 1933-1949. <https://doi.org/10.1016/j.jenvman.2009.01.001>.
- [22] Alkin M. C. and Vo A. *Evaluation Essentials – From A To Z*. Guilford Press, New York, 2018.