


ICUP2022

International
Conference on
Urban Planning



ICUP2022

PROCEEDINGS

Serbia, Niš, November 9-10, 2022



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ENABLING SUSTAINABLE TRANSFORMATIONS THROUGH PLACE-BASED URBAN DESIGN EDUCATION

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ABSTRACT

Global climate change influences on human settlements, create a new context and change the purpose of urban design education. It requires not only new urban design knowledge and skills, but most of all, it implies a different way of understanding the future of cities and, crucially, capabilities to shape it through immediate practical action. Education is recognised as the main leverage of this necessary professional and mindset capabilities shift. Therefore, academic architectural education started to evolve, searching for more effective educational methods and techniques. Future urban designers capable of enabling sustainable urban transformations should be prepared to cope with many uncertainties in a co-creative and integrating manner, in which resilience, adaptation and innovation, are becoming the keywords. In this paper, we present and discuss the outcomes of the education model developed under the integral theoretical framework of place-based education, applied at the bachelor's and master academic level at the University of Belgrade Faculty of Architecture over the last seven years. We argue that urban design education aimed to produce effective local responses to climate challenges needs to be learned through realistic problem-solving and in contact with stakeholders. The results indicate that this education model provides not only new professional competencies profile but also creates a niche of innovation that indirectly influences the building up of local social capital necessary to enable sustainable urban transformations.

Keywords: *urban design; climate change; sustainable urban transformations; place-based education; niche of innovation*

1. INTRODUCTION

Ensuring a healthy life in cities has reached the peak of attention across the planet in the past two years while facing the challenges of overstraining the health care system caused by the COVID-19 pandemic. Numerous health problems in cities are coming to the forefront of broader social attention and criticism, which require effective action and long-term sustainable results (Tsouros, 2015; UN-Habitat & WHO, 2020; WHO&WB, 2017). The complexity of fulfilling this requirement is reflected in the growing number of dichotomies within the public discourse on urban sustainability. The global health crisis is believed to be the result of a long-term mismatch between urban practices and global sustainable development policies. The

major economic recession in 2008-2009. (Robinson, 2012) pointed out the weaknesses of the global economy and redirected the focus of national policies towards economic recovery and development. This economic recession coincided with the culmination of the global urbanization trend, when for the first time in history more than half of the world's people live in cities (Zhang, 2016). The concentration of the population in cities has significantly increased the complexity of production and consumption of resources for life (IPCC, 2018) and the complexity of urban technological and infrastructural requirements (Coyle & Simmons, 2014). These challenges, currently reach the climax, with significant global political turbulences and enacted severe energy crises in the Europe. After more than five decades of the global discourse on sustainable development, at this moment more than ever, increasing the environmental footprint along with global climate change and expected severe socio-economic changes, position sustainable urban development in the place of challenges 21st century. There is strong discussion among scholars that facing the actual challenges of sustainable urban development requires continuous globally coordinated but local goal-driven proactive management and action (Geels, 2004; Watson, 2009; UN-HABITAT, 2010; Hens, 2010; Geels, 2011; O'Brien, 2012; Santander & Garai-Olaun, 2016; Mensah, 2019), and accordingly new innovative approaches and means of planning, design, and organization of the use of urban spaces that could enable sustainable transitions (Markard & Truffer, 2008; Jørgensen, 2012; McCormick et al., 2013; Parsons et al., 2016; Loorbach & Shiroyama, 2016). The need for sustainable transformations of cities and new approaches is underlined by the resolution of the global Agenda for Sustainable Development until 2030 (2015) and the Sustainable Development Goals (SDGs), especially Goal 11 - sustainable cities and communities, and Goal 3 - health and well-being. The New Urban Agenda (2017), as a framework for the localization of the 2030 Agenda and the achievement of the SDGs in the context of cities, as well as the New Leipzig Charter - The Transforming Power of Cities for the Common Good (2020), represent the basic policy framework for the realization of global and European agreements on sustainability at the urban level. Finally, the New European Bauhaus Initiative (2020) links the European Green Deal (2019) to everyday life and living spaces, calling on all Europeans to "imagine and build a sustainable and inclusive future that is beautiful to our eyes, minds and souls" together". The core basis of all this policies implementation is the social capacity to collaborate, that is, to co-create new effective solutions and actions (Mauser et al., 2013; Frantzeskaki & Kabisch, 2016; Morello, Mahmoud, & Gulyurtlu, 2018). Therefore, the future architects, involved in urban design and planning, must be competent not only to produce sustainable urban solutions, but also, to lead, or actively participate, in the process of social transition, influencing other stakeholders and decision-makers to understand and recognise the strategic values of new and innovative action approaches (Gruenewald, 2003; Geels F., 2004; Geels F. W., 2011).

The urban development of cities in Serbia, in the last two decades, is still characterized by processes of social and economic transition, with consequent negative trends in the processes of urbanization and territorial development as stated in the Spatial Plan of the Republic of Serbia (2021). The key institutional framework for the localization of the Agenda 2030, the SDGs, and the New Urban Agenda in the cities of Serbia is the Sustainable Urban Development Strategy of Republic Serbia (2019), which recognizes six priority areas of sustainable urban interventions: 1) brownfield sites and industrial zones; 2) illegal construction; 3) urban matrices and central urban zones; 4) areas with a concentration of social problems, 5) areas with a threatened environment and 6) cultural heritage. In the context of Serbia, with inadequate solutions for the new plurality of interests within the market economy the post-socialist socio-economic transition imposed additional challenges to urban sustainability, in comparison to the named global (Vujošević, Zeković, & Maričić, 2012). Urban planning was practised as technocratic and exclusively expert-based in most cases (Zekovic, Vujošević, & Maričić, 2015; Mitić-Radulović & Lalović, 2021). To strengthen and ensure citizen participation in urban planning, and enable co-creation, the legislative changes in Serbia in 2014, introduced Early Public Consultation (EPC) as the first of the two milestones in the formal urban planning procedure when the government communicates the urban plan with the broader public. As a relatively new planning instrument in a society with a long tradition of centralised planning, EPC did not have a significant role in ensuring the sustainable transition until two years ago, when the first cocreation of the Detailed urban plan of Linijski park occurred (Mitić-Radulović & Lalović, 2021).

In this research, considering named global and local specificities and challenges, achieving sustainability in the context of Serbian cities is presumed as a complex problem, that requires synergistic and immediate action by the whole society. From the perspective of the architectural profession, solving the problem of urban sustainability in the 21st century requires finding new ways, techniques, and tools for effective action in the present moment with a qualitatively cumulative effect for future generations. Thus, the role and the performance capacity of architects and urban planners must change significantly compared to the usual ones.

From service providers, architects should transform into innovators and leaders of change towards local, and at the same time, global sustainability. Accordingly, the substance and learning method of academic curricula for architects must be fundamentally improved and changed to provide the graduates capable enough to face complex problem solving, even in small-scale architectural or urban design. Additionally, in many social contexts, such as Serbia, there is another challenge for young professionals: to be able to “cope and survive” in interaction with “old” professional approaches, which are predominant in practice. In that sense, in the University of Belgrade – Faculty of Architecture special attention was given to the development of academic curricula related to sustainable urban development that could build capacities of architects and architect-urbanist that can take the new, necessary role of leaders of change.

This article focuses on presenting the results of the application of a new educational model that was implemented in the last seven years of the National accreditation cycle. In the next chapter, the theoretical and conceptual background of the new education model will be described. Then the case study of experiences of the University of Belgrade – Faculty of Architecture will be presented and discussed, focusing on the impact on urban design and planning practice. In the end conclusion of this case study will be presented.

2. PLACE-BASED URBAN DESIGN EDUCATION FOR 21ST CENTURY

2.1. Urban design education conceptual model

Climate change is recognized within the scientific community as a multi-dimensional, complex, vague, and dynamic problem (Esbjörn-Hargens, 2010; IPCC, 2018), which means that different areas of human existence can influence and be influenced by climate change and that effects of climate change are at the same time interdependent and unpredictable. Climate change is not simply an environmental problem, it is about the human capacity of individuals and communities to respond to threats (Barnett, Matthew, & O’Brien, 2008). It is closely related to how humans perceive themselves in the world, how humans both create and respond to change and how they sustain development in balance with nature (O’Brien, 2012). Therefore, the integral approach is recommended as necessary, as a response to global calls for an end to the age of fragmentation in the field of sustainable development (Brown, 2007; Esbjörn-Hargens, 2009; Esbjörn-Hargens & Zimmerman, 2009). The Integral Sustainable Development approach is assuming the critical realism position, claiming that there are four distinct domains of reality that always must be considered simultaneously (Esbjörn-Hargens, 2009): - individual interiors, like psychology and consciousness of stakeholders; - individual exteriors, such as behaviours and routines, - collective interiors, like values, culture and worldview, and – collective exteriors, such as system organisations, and the physical environment. According to integral approach practitioners (Brown, 2007), if a particular methodology only considers one or two dimensions of reality, in most cases collective exteriors and maybe interiors, it addresses only “half” of the picture and therefore has a higher chance of failure (Lalović, Živković, Radosavljević, & Đukanović, 2019).

Although climate change is a global problem, it needs local and place-based solutions to confront its challenges. On one side, cities are particularly sensitive to climate change due to the high population density and construction. On the other, cities, as built environments and socio-ecological systems, are responsible for GHG emissions that intensify climate change (IPCC, 2018). Consequently, the climate-responsive approach to urban development emphasizes the need for activities to minimize negative impacts on climate, and adaptation strategies to face the consequences of climate change that cannot be avoided. A literature review reveals three main exposure urban units to climate change: - building integrity, which refers to the smallest spatial urban unit consisting of a building parcel and immediate surrounding, - urban green space, which refers to an urban neighbourhood spatial scale, and - human health and comfort which refers to a metropolitan scale of problem-solving (Živković & Lalović, 2011). Local climate-responsive urban planning, considers all main exposure units to climate change simultaneously, aiming to innovate measures and anticipate the actions, in urban design at both strategic and detailed levels, that will help their cities adapt to future climate change (Živković & Lalović, 2018). These measures need to be efficiently implemented. So, therefore, they must be adjusted to the local context, considering all domains of its urban reality integrally. All of this puts forward the importance of knowing and understanding specific local socio-economic and environmental conditions while looking for adequate design, which could be achieved only through intense communication and collaboration of all stakeholders and the public, that is, co-created, co-designed and finally co-implemented (Mauser et al., 2013; Frantzeskaki & Kabisch, 2016; Morello, Mahmoud, & Gulyurtlu, 2018).

2.2. University of Belgrade – Faculty of Architecture sustainable urban design courses - case study description

Urban design architectural education is oriented toward developing students' awareness, knowledge, skill, and abilities concerning urban space articulation as expected learning outcomes (Milovanović Rodić, et al., 2013). Any given learning task in urban design education is aimed to tackle one of three psychological domains: a) cognitive, which revolves around knowledge, comprehension, and critical thinking; b) psychomotor, which involves manipulative or physical skills; and c) affective, that describes the way people react emotionally, and relates to the development of values, appreciation, empathy, and attitudes that result from the learning process. Therefore, four educational formats are set to achieve these goals: seminar, studio, elective courses, and workshops. They are used as an opportunity to apply problem-based learning, aimed not only at comprehending the facts but also at developing relevant thinking strategies. Although learning about urban and urban design theories and concepts mostly happens in seminars, the basic learning unit in most bachelor's and master's urban design academic programs is an urban design studio, that enables students to connect theoretical knowledge with urban design methods and techniques while working in a specific urban context and applying "learning by doing" approach (Milovanović Rodić, et al., 2013). However, the prevailing author-oriented and transmission model of urban design education reduces studio works to passive abstract practices, disciplinary content, and technological skills, distanced from natural, social, and cultural realities. Such an abstract and general approach to education dismisses the idea of place as a primary experiential and educational context (Gruenewald, 2003), and disregards an integral view of reality. Therefore, the premise for grounding education in urban design to be adequate for current sustainability demands is place-based learning. The "place" is conceptualised as the centre of the experience, a meaningful context of human perception shaped by our experiences and culture (Gruenewald 2003). Place-based education is an approach to learning that builds upon natural and human geographies of place to create authentic, meaningful, and engaging, personalized learning experiences for students. It evolves from aspiration to overcoming the division between conceptual knowledge and living experience by directing students' attention to local places and communities (Živković & Lalović, 2018). Place-based teaching and learning are situated in realistic places, promote learning rooted in local conditions and use local surroundings as a context to integrate the curriculum into wider society. The place-based curriculum seeks to establish different connections with the environment and to motivate students for deeper engagement with their surroundings, including people, to promote local sustainability. It fosters cross-disciplinary and intercultural informed contextualisation of studied places' natural, cultural, and socioeconomic attributes (Živković & Lalović, 2018).

The University of Belgrade – Faculty of Architecture integrated a place-based education model in a series of courses, starting from the design studio of Bachelor of Architecture level of study, to Master level of study, with a series of theoretical discourse and elective seminars and design studios related to different aspects of urban sustainability transformations (Živković & Lalović, 2018). For this case study, which focuses on the effects of place-based urban design education on sustainable transformations, two learning formats were chosen for the analysis: - Design Studio 02a: Sustainable Urban Communities – introduced in second year of Architecture Bachelor's studies, and, - Theoretical ground of sustainable development - theoretical discourse seminar introduced at the second year of Master studies of Architecture. The method of carrying out theoretical and practical learning is based on the 4MAT didactic pedagogical model of Bernice McCarthy (2000) and combines several methodical tools and techniques, such as interactive presentation, focus group, comparisons, critical discussion, auto reflection and reflection, carrying out the process of student cognition through 4 methodical phases: 1. understanding meaning - why? 2. adopting concepts -what? 3. acquiring skills -how? 4. Adaptation - what if? (Živković & Lalović, 2018). Each level of learning represents a methodological and logical whole that provides students with different packages of understanding, knowledge and skills concerning urban sustainability in an integral way and across different spatial scales as illustrated in Figure 1. Additionally, place-based learning was additionally supported with the communication and interaction with the end users and key stakeholders, to strengthen the motivation of students, but also aiming to influence the problem cognition and perception of possible solutions of stakeholders. The assumption is that students' problem-solving approaches, unburdened with "daily" problems and practice constraints could influence the stakeholders toward "out of box" thinking.

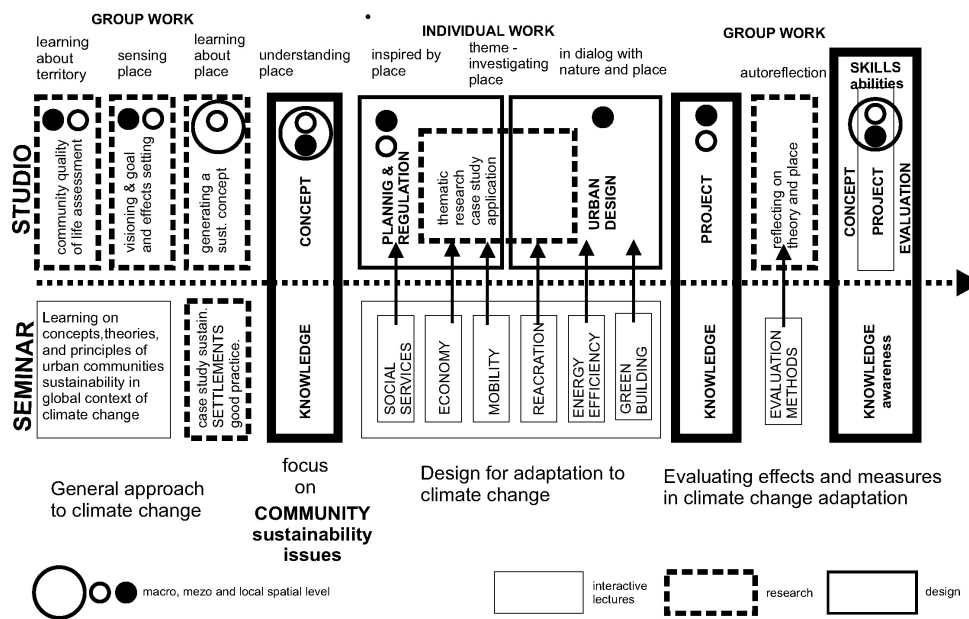


Figure 1: Structure and learning process of place-based urban design education applied in “Design Studio 02a: Sustainable Urban Communities”, and in “Theoretical ground of sustainable development” where the “studio” place-based application is part of the exam task (Živković & Lalović, 2018).

The place-based model was successfully applied within named courses over the last National accreditation period of seven years addressing the actual sustainability problems in the context of Serbian cities of a specific real context, striving to involve the local community and at least one of the significant stakeholders of the City of Belgrade, which is chosen due to possibility to organise direct interaction. The overview of the sustainability topics and realised collaboration with stakeholders is presented in Table 1.

Table 1: Overview of the sustainability topics and realised collaboration with stakeholders within the curricula

Study level	Course	School year 2015/16 theme	School year 2016/17 theme	School year 2017/18 theme	School year 2018/19 theme	School year 2019/20 theme	School year 2020/21 theme	School year 2021/22 theme
BArch	Sustainable communities' studio	Urban housing renewal for Bežanijska kosa	Resilient housing solutions for Ovča	Sustainable urban transformations of IMT industry	Localization of SDGs in transformation of Donji Dorćol	Localization of SDGs of Dunavski kej	Zemun Healthy Community	Settlements of Belgrade 2041 – new housing models
	in collaboration with	Local community	Local community City of Belgrade, Secretariat for Investment	Local community Town Planning Institute (TPI) of Belgrade	Local community TPI of Belgrade	Local community, TPI of Belgrade, City of Belgrade – Main Urbanist Office, Secretariat for Environment, Centre for Experiments and Urban Studies (CEUS)	Local community TPI of Belgrade,	Local community TPI of Belgrade – Main Urbanist office
MArch	Theoretical ground of sustainable development	Exploring sustainability policies over the Globe Regions	Integral analysis of open public spaces sustainability in Block 45 in Belgrade	Simulation of a participatory web tool to support CLLD a case study of Negotin	The concept of universal design within the sustainable development of Europe	NBS catalogue and co-creation pathway	Exploring the concept of a Healthy City through the EU sustainable practices	Exploring the sustainable practices of European cities
	in collaboration with	/	/	Within the bilateral Italian-Serbian International Research project	“Limitless” association Ministry of social affairs of RS Zero 2021 award	CLEVER Cities (Horizon 2020) project City of Belgrade – Main Urbanist office, Secretariat for Environment, CEUS (Mitić-Radulović & Lalović, 2021)	CLEVER Cities project City of Belgrade – Main Urbanist office, Secretariat for Environment, CEUS	CLEVER Cities project City of Belgrade – Main Urbanist office, Secretariat for Environment, CEUS

2.3. Discussion of the results

Reflecting on the success of implementing the place-based education model into analysed formats several important experiences should be stressed out. Firstly, placed-based education that is aimed at enabling sustainability transformation in a specific context presumes good connections of academic staff with crucial stakeholders' representatives, including the public and civil sector. In this case, it took more than two years to establish them and to increase the significance of students' participation in actual urban problem-solving, as Table 1. represents. For the academic staff involved it was also a learning process. It brought fine-tuning of the abilities to communicate and transfer the latest research not only to students but to disseminate it directly to the wider public and decision-makers, through public workshops, exhibitions, and presentations. From the student's perspective the experience of being involved in direct communication with stakeholders, not only citizens but also with different authorities of the City of Belgrade, professionals, etc., was highly evaluated through annual queries. It brought additional motivation for work and strength to perform the learning tasks beyond "work as usual". From the perspective of stakeholders involved, the interaction with students and their research and design proposal was valued as inspirational and innovative. Over the years, the attitude of stakeholders changed and could be described as increased openness to new and different ideas. In the second place, applying the place-based education model within the seminar format represents a more significant challenge than within the format of Studio, also visible in Table 1. However, the experience and results gained indicate that is definitely worth the effort for several reasons: - it increases the number of different place-based studies and significantly scales up the comprehension of applied knowledge and understanding of students, - it increases the possibility of connecting the students work from different levels of study (as it was experimented from 2017), and - at the and it opens the possibility of masters student to gain first scientific or professional reference under the tuition of mentors. In this case, since it is the seminar in the second year of master's studies when students have five years of education almost finished, it was possible to engage them in themes which are related to scientific research projects of the faculty, or later to international scientific research projects. The applicative part of learning, with the seminar format, was done out of the formal class, within their exam research on the chosen place-based polygon. This learning approach also enabled fruitful critical theoretical and conceptual discussion during the classes. Finally, large number of students developed significant self-esteem, and social connections that enabled them to be employed after the graduation.

3. CONCLUSIONS

This article focuses on urban design education since it represents the field of the confluence of architecture on one side, and the urban planning profession on the other. In most contexts and Serbia, the architects are dominantly responsible for architectural and urban design and are significantly involved in the urban planning process with many other professions. However, the position and role of architects in the field of urban development changed with planning conceptual changes toward collaborative concepts and the enactment of strong sustainability policies. That is why the significant re-examining of academic architectural education curricula over the last two decades. In Serbia, lacking strong policies and strategies, and with practice eager to exploit the investor initiatives, the role of the architect-urbanist, and even the architect degraded to a level of simple documenting and articulating the decisions of decision makers, or investors. This trend is highly publicly criticised as "investor urbanism", and is the reflection of their lack of power and capacities to influence the decision-making process. The placed-based education opens the opportunity to shift the architect's role from the mere observer to the proactive creator of solutions. This case study results show that this education model enables a significant change not only in academic education effectiveness but also in urban practice, influencing indirectly stakeholders by challenging their modes of thinking and seeing the reality with visible conceptual shifts and innovative solutions, implying that education could be one the most critical leverages of necessary global sustainable urban transition.

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REFERENCES

1. Barnett, J., Matthew, R. A., & O'Brien, K. (2008). Global environmental change and human security. Chapter in *Reconceptualizing security in the 21st century* (Ed. H.G. Brauch), Berlin: Springer.

2. Block, T., & Paredis, E. (2013). Urban development projects catalyst for sustainable transformations: the need for entrepreneurial political leadership. *Journal of Cleaner Production*, Volume 50, 181-188.
3. Brown, B. C. (2007). The four worlds of sustainability: Drawing upon four universal perspectives to support sustainability initiatives. <https://nextstepintegral.org/wp-content/uploads/2011/04/Four-Worlds-of-Sustainability-Barrett-C-Brown.pdf>
4. Coyle, E. D., & Simmons, R. A. (2014). *Understanding the Global Energy Crisis*. West Lafayette: Purdue University Press. Retrieved from <https://library.oopen.org/handle/20.500.12657/30124>
5. Edwards, M. G. (2010). *Organizational Transformation for Sustainability, An Integral Metatheory*. New York: Routledge.
6. Ernst, L., Dinther, R. d.-V., Peek, G., & Loorbach, D. (2015). Sustainable urban transformation and sustainability transitions; Conceptual framework and case study. *Journal of Cleaner Production*, 112, 2988-2999. <http://dx.doi.org/10.1016/j.jclepro.2015.10.136>
7. Esbjörn-Hargens, S. (2009). An overview of Integral Theory - An All-Inclusive Framework for the 21st Century. Integral Institute, Resource Paper No. 1, 1-24.
8. Esbjörn-Hargens, S. (2010). An Ontology of Climate Change, Integral Pluralism and the Enactment of Multiple Objects. *Journal of Integral Theory and Practice*, 143-174.
9. Esbjörn-Hargens, S., & Zimmerman, M. E. (2009). *Integral ecology: Uniting multiple perspectives on the natural world*. NY: Random House/ Integral Books.
10. Frantzeskaki, N., & Kabisch, N. (2016). Designing a knowledge co-production operating space for urban environmental governance—Lessons from Rotterdam, Netherlands and Berlin, Germany. *Environmental Science & Policy*, 62, 90-98. <https://doi.org/10.1016/j.envsci.2016.01.010>
11. Geels, F. (2004). Understanding system innovations: a critical literature review and a conceptual synthesis. Chapter in *System innovation and the transition to sustainability: theory, evidence and policy evidence and Policy* (Ed. B. G. Elzen), pp. 19-47, Cheltenham: Edward Elgar.
12. Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental Innovation and Societal Transitions*, 1(1), 24-40.
13. Gruenewald, D. A. (2003). The Best of Both Worlds: A Critical Pedagogy of Place. *Educational Researcher*, Vol. 32, 3–12. <https://doi.org/10.3102/0013189X032004003>
14. Hens, L. (2010). The challenge of the sustainable city, *Environment, Development and Sustainability* (12), 875–876, <https://doi.org/10.1007/s10668-010-9259-3>
15. IPCC. (2014). *Climate Change 2014: Impacts, Adaptation, and Vulnerability, Part A: Global and Sectoral Aspects*. United Kingdom and New York, Cambridge University Press, Cambridge.
16. IPCC. (2018). *Global Warming of 1.5°C. 2018: The Intergovernmental Panel on Climate Change*. doi:<https://www.ipcc.ch/sr15/>
17. Jørgensen, U. (2012). Mapping and navigating transitions—The multi-level perspective compared with arenas of development. *Research Policy*, 41(6), 996-1010.
18. Lalović, K., Živković, J., Radosavljević, U., & Đukanović, Z. (2019). An Integral Approach to the Modeling of Information Support for Local Sustainable Development—Experiences of a Serbian Enabling Leadership Experiment. *Sustainability*, 11, 2675. <https://doi.org/10.3390/su11092675>
19. Loorbach, D., & Shiroyama, H. (2016). The Challenge of Sustainable Urban Development and Transforming Cities. In G. o. Transitions, & W. J. Loorbach D. (Ed.). Tokyo: Springer.
20. Markard, J., & Truffer, B. (2008). Technological innovation systems and the multi-level perspective: Towards an integrated framework. *Research Policy*, Volume 37, 596-615.
21. Mauser, W., Klepper, G., Rice, M., Schmalzbauer, B., Hackmann, H., Leemans, R., & Moore, H. (2013). Transdisciplinary global change research: the co-creation of knowledge for sustainability. *Current Opinion in Environmental Sustainability*, 5(3-4), 420-431.

22. McCormick, K., Anderberg, S., Coenen, L., & Neij, L. (2013). Advancing sustainable urban transformation. *Journal of Cleaner Production*, 500, 1-11.
23. Mensah, J. (2019). Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences*, 1-21.
24. Milovanović Rodić, D., Živković, J., & Lalović, K. (2013). Changing architectural education for reaching sustainable future: A contribution to the discussion. *Spatium*, 29, 75-80.
25. Mitić-Radulović, A., & Lalović, K. (2021). Multi-Level Perspective on Sustainability Transition towards Nature-Based Solutions and Co-Creation in Urban Planning of Belgrade, Serbia. *Sustainability*, 13, 7576. <https://doi.org/10.3390/su13147576>
26. Morello, E., Mahmoud, I., & Gulyurtlu, S. (2018). CLEVER Cities Guidance on co-creating nature-based solutions: PART II - Running CLEVER Action Labs in 16 Steps. Deliverable 1.1.6, CLEVER Cities, H2020 grant no. Retrieved from https://clevercities.eu/fileadmin/user_upload/Resources/
27. Nevens, F., Frantzeskaki, N., Gorissen, L., & Loorbach, D. (2012). Urban Transition Labs: co-creating transformative action. *Journal of Cleaner Production*, 50, 111-122.
28. O'Brien, K. (2012). Global environmental change II: from adaptation to deliberate transformation. *Progress in Human Geography*, 667-676. doi:10.1177/0309132511425767
29. Parsons, M., Fisher, K., & Nalau, J. (2016). Alternative approaches to co-design: insights from indigenous/academic research collaborations. *Current Opinion in Environmental Sustainability*, 20, 99-105. <https://doi.org/10.1016/j.cosust.2016.07.001>
30. Robinson, W. I. (2012). "THE GREAT RECESSION" OF 2008 AND THE CONTINUING CRISIS: A Global Capitalism Perspective. *International Review of Modern Sociology*, 38(2), 169-198.
31. Santander, A. A., & Garai-Olaun, A. A. (2016). Urban Planning and Sustainable Development in The 21st Century, Conceptual and Management Issues. *IOP Conference Series: Earth and Environmental Science*, Volume 44, Issue 3. <https://iopscience.iop.org/article/10.1088/1755-315/44/3/032005/meta>
32. Tsouros, A. D. (2015). Twenty-seven years of the WHO European Healthy Cities movement: a sustainable movement for change and innovation at the local level. *Health Promotion International*, 30 (1). doi:<https://doi.org/10.1093/heapro/dav046>
33. UN-Habitat & WHO. (2020). Integrating health in urban and territorial planning: A sourcebook for urban leaders, health and planning professionals. UN-Habitat and WHO. Retrieved from <https://unhabitat.org/integrating-health-in-urban-and-territorial-planning-a-sourcebook-for-urban-leaders-health-and>
34. UN-HABITAT. (2010). Planning Sustainable Cities, UN HABITAT Practices and perspectives. Nairobi, Kenya: United Nations Human Settlements Programme (UN-HABITAT).
35. Vujošević, M., Zeković, S., & Maričić, T. (2012). Post-Socialist Transition in Serbia and Its Unsustainable Path. *European Planning Studies*, 20(10), 1707-1727 .
36. Watson, V. (2009). 'The planned city sweeps the poor away...': Urban planning and 21st century urbanisation. *Progress in Planning*, Volume 72 (Issue 3), 151-193.
37. WHO&WB. (2017). Tracking universal health coverage: 2017 global monitoring report. WHO & The World Bank. https://www.who.int/healthinfo/universal_health_coverage/report/2017/en/
38. Zeković, S., Vujošević, M., & Maričić, T. (2015). Spatial regularization, planning instruments and urban land market in a post-socialist society: The case of Belgrade. *Habitat International*, 48, 65-78.
39. Zhang, X. Q. (2016). The trends, promises and challenges of urbanisation in the world. *Habitat International*, 54(3), 241-252. <https://doi.org/10.1016/j.habitatint.2015.11.018>
40. Živković, J., & Lalović, K. (2018). Place-Based Urban Design Education for Adapting Cities to Climate Change. Book of Conference proceedings: PLACES AND TECHNOLOGIES 2018 - Keeping up With Technonolgies to Adapt Cities for Future Challenges (pp. 641 -651). Belgrade: University of Belgrade –Faculty of Architecture.