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C O N T E N T S

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CLIMATE CHANGE, CITIES, COMMUNITIES AND EQUITY IN HEALTH

The way we plan and build cities affects not only the quality of urban spaces but also living conditions and environmental health. Planning and design decisions can exacerbate health risks for populations, or they can foster healthier urban environments, communities, and lifestyles. This becomes especially important in the context of climate change and its impact on the urban environment. Flooding, heat waves, rain storms, extreme hot days, and droughts endanger human and environmental health, whereby, not all community members are affected equally.

To be able to develop strategies and interventions that contribute to the health and well-being of urban inhabitants and communities, architects, planners, and urban designers should be able to better understand the relationship between climate change, urban health, and the design of the built environment. All this requires a shift in education towards more interdisciplinary, inclusive, and innovative pedagogies.

As a step towards accomplishing this goal, the Erasmus+ project “Climate Change, Cities, Communities and Equity in Health” (CliCCHE) used a multidisciplinary approach to develop innovative teaching methods and tools for healthy urban regeneration through climate adaptation that were tested in different national contexts (Italy, Cyprus, Portugal, and Serbia).

This special issue of the Serbian Architecture Journal (SAJ) is dedicated to the contributions from the research network established through the CliCCHE project, and presents a collection of articles addressing the climate change – urban health - urban planning & design - education nexus, written by researchers from four of five partnering institutions: Universita Degli Studi Di Camerino, Italy; The Cyprus Institute, Cyprus; Consiglio Nazionale Delle Ricerche, Italy; ISCTE - Instituto Universitario De Lisboa, Portugal; University of Belgrade, Serbia.

The first paper (D’Onofrio, Brownlee and Camaioni) presents the new CliCCHE educational methodology that supports climate-proof and healthy urban regeneration through participatory approach. The methodology builds upon direct confrontation with the experience of local communities, supports the use of unconventional educational tools, and aims to train students, citizens and local stakeholders to become informed and active participants in regeneration process. The application of proposed methodology in the context of San Benedetto del Tronto (Italy) confirms its usefulness and provides a valuable feedback for further improvement.

The focus of second contribution (Carlucci and Kyprianou) is on exploring health and socioeconomic implications of urban regeneration amidst climate change, building upon a systematic literature review and SWOT analysis within a European context. To support integrating health promotion and socio-economic resilience into climate-oriented urban regeneration, the paper synthesize evidence on key strategies, opportunities, and challenges and highlights the risks of neglecting either technical or social dimensions in regeneration planning.

Participatory urban games that contribute to better planning practices is the topic of the third paper (Cachado, Di Giovanni, Madeira da Silva). Recognizing the new role of the architect as a “promoter of local intervention initiatives”, and of creative social strategies capable of generating socio-territorial innovation, the authors develop a new participatory urban game “Stone Soup” as a part of the CliCCHE project, and reveal and discuss its potential applying it in the context of Lisbon (Portugal).

How CliCCHE methodology can be applied for participatory urban design education is the topic of the fourth paper (Jovanović, Slavić, Drobnjak). The paper presents and discusses the key methodological steps and selected educational tools applied in two UB Master of Architecture academic courses (compulsory "Studio Project – M02U_Participative Urban Design" and the elective "Public Art and Public Space"), and implement them in the city of Valjevo (Serbia) as a partner city in the CliCCHE project.

The result of these educational endeavors is a new generation of architects, equipped with new awareness, knowledge and skills considering relations between climate change, health and urban planning and design, and the last paper in this SAJ special issue confirms this. The paper is written by a former UB Master of Architecture student (Mladenović) who participated in both CliCCHE related courses, and through her PhD studies continued research on relevant issues. In this paper, she investigates the urban planning potential for guiding cities towards the concept of a Healthy City in the context of climate change, by creating and applying the initial 2-step methodological framework that evaluates level and key themes of health-planning integration in urban plans, taking Valjevo (Serbia) as a case.

We hope that the contributions in this special issue will manage to shed the light on the key problems, issues and potentials regarding linking climate change and urban health with architecture and urban planning/design education, and demonstrate how new interdisciplinary and innovative pedagogies can help build more inclusive, healthy and climate proof cities.

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RENOVATE UNIVERSITIES' EDUCATIONAL OFFERINGS ON CLIMATE ADAPTATION IN PARTNERSHIP WITH COMMUNITIES AND STAKEHOLDERS

ABSTRACT

The topic of climate change is highly relevant to university education, yet current educational methodologies lack action-oriented, practical approaches. The Erasmus+ Cli-CC.HE Project aims to establish a partnership among the university sector, citizens, local stakeholders, practitioners, and public administration to develop a new educational methodology focused on climate adaptation and population well-being in cities. The methodology is based on three main aspects: direct confrontation with the experience of the population and local stakeholders; training of students and citizens and local stakeholders to become informed and active interlocutors of adaptation proposals affecting their territory; and application of unconventional educational tools that facilitate sharing of knowledge and elaboration of design solutions for adaptation. The methodology was developed based on the insights gained from university workshops conducted with the Project partner universities and local workshops held in each of the four cities involved in the project. This paper focuses on the experience gained in the San Benedetto del Tronto (Italy) workshop, which brought together a significant community of students, citizens, and local stakeholders to develop climate-proof urban regeneration proposals that prioritise the health and well-being of inhabitants.

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KEY WORDS

HIGHER EDUCATION
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LOCAL COMMUNITIES AND STAKEHOLDERS
URBAN REGENERATION
KNOWLEDGE INTEGRATION

1. INTRODUCTION

Finding answers to current crises, such as climate change, poses great challenges to contemporary society and educational systems (Reid et al., 2021). Universities are in an ideal position to explore concepts related to climate change, to engage a wide range of disciplinary knowledge (Washington-Ottombre et al., 2018; Molthan-Hill et al., 2021), to disseminate knowledge, methods, and tools to enable holistic governance and planning (Huitema et al., 2016), and make a concrete contribution to the necessary paradigm shift towards the regeneration of contemporary cities (De Gregorio, 2021; Palazzo et al., 2017). Nevertheless, climate change education remains an understudied topic. Only a handful of studies have attempted to conceptualise and define the skills, knowledge, and competencies associated with it (Mochizuki et al., 2015; Hindley et al., 2018; Moltan-Hill et al., 2019). Experiences and innovations from university research are not easily transferred into the teaching programs of universities. The latter mainly focus on the general concepts of "climate literacy" and risk description (Clary et al., 2012; Ellwein et al. 2014; Huxster et al. 2015; Ratinen et al., 2020; Veron et al. 2016; Asshoff et al., 2021) while often leaving out the aspects related to action and practice (McKenzie, 2021). Simply teaching students "facts" about climate change produces knowledge, but not commitment to addressing it (Singer-Brodowski et al., 2018; Wals et al., 2016; Reimers, 2024). In contrast, students should be trained for action (Di Giusto et al., 2018) and the University should cultivate their ability to be agents of change, rather than spectators (Reimers, 2020a), encouraging them to seek possible and shared solutions to problems. To overcome this gap, some advocate the need for a multidimensional approach that can capture the multiple cultural, psychological, professional, and institutional perspectives of climate change (Reimers; 2020b) and to strengthen in students the ability to think systemically in order to empower them to contribute to the resolution of real problems (Brundiers et al., 2021).

To promote this change of pace, scholars propose, on the one hand, the creation of a new framework of collaboration between scientific, technological, engineering and humanistic disciplines (Olazabal et al., 2024), to achieve as complete an understanding of the phenomena as possible (Dilling et al., 2019) and develop sustainable (Morales et al., 2023; Leal Filho et al., 2021) and concrete solutions; on the other hand, the integration between scientific knowledge and the knowledge of local actors and communities (Katiliūtė et al., 2019; Leal Filho et al., 2019). Indeed, numerous studies have shown that climate adaptation is highly dependent on communication and interaction between different actors and organisations in a way that encourages learning processes that create flexibility and balance between different types of knowledge (Lidskog et al., 2019); others suggest shifting the focus to community contexts, which require interdisciplinary and place-based approaches (Leichenko et al., 2020). The literature suggests that confrontation between universities and local actors (Gruber, 2017; López et al., 2022) could be facilitated by building networks and partnerships:

Students and universities to develop field experiences that encourage them to understand the needs and priorities of local communities for climate adaptation (Bodolica et al., 2021; Karpudewan et al., 2017; UNESCO, 2017). In this collaborative effort, universities would assume the role of "anchor institution" (O'Farrell et al., 2022), and could develop a more comprehensive role in place-based policy making;

local communities and stakeholders to become aware of their responsibility to protect their living environment, using the University's experience and knowledge (Goldner et al., 2018).

The reflection developed in this article raises the following questions:

1.How direct confrontation with the experience of local people and stakeholders can help build a multidisciplinary educational model focused on climate adaptation, aimed at university students;

2.How local communities and stakeholders can benefit from this confrontation and thus become informed and active stakeholders to support adaptation projects affecting their territory;

3.What are the educational tools that most facilitate knowledge sharing in the field of climate change governance, planning and resilient design that engage local authorities, stakeholders and communities to represent their needs and priorities?

The reflections in this article refer to the Erasmus+ Project Cli-CC.HE "-Climate change, cities, communities and Equity in health" and its application within one of the four local laboratories, that of San Benedetto del Tronto (Italy). The latter were activated during the project and involved a large community of students, citizens and local stakeholders. The scope of consideration was developed within an existing neighbourhood, where the local government is willing to begin discussions with the population on urban regeneration actions involving the city's public spaces.

2. MATERIALS AND METHODS

Cli-CC.HE is an Erasmus+ KA220-HED - Cooperation Partnerships in Higher Education project, bringing together the multidisciplinary expertise of four universities (University of Camerino, Univerzitet u Beogradu, The Cyprus Institute , Iscte - Instituto Universitario de Lisboa) and a research center (IFT- CNR) from Europe. The challenge of the project is to develop an educational framework for urban regeneration based on integrated knowledge across disciplines that are rarely collaborative. This approach aims to improve understanding of the root causes of current and future environmental and health crises. In addition to this challenge, there is that of equipping university students in technical disciplines (engineering and architecture) with the knowledge and tools to develop informed and realistic design proposals for climate change adaptation, in synergy with local communities, stakeholders and local governments, to facilitate the planning and design of sustainable and effective urban regeneration interventions, capable of positively impacting the quality of life and well-being of residents.

The project develops an interdisciplinary methodological framework centred on four "core documents," characterised into seven main educational activities, and an educational toolkit. The four "core documents" deal with the organisation of prior knowledge in the field of climate change and adaptation (R1); the definition of the main aspects of the methodology (R2); the selection of tools that enable its application (R3); and the dissemination of results within universities and to local communities (R4). The main contents of the seven teaching activities, shown in Tab.1, have been detailed in sheets describing their: educational objectives, main theoretical references, expected learning outcomes, skills needed by teachers, etc.

The seven educational activities find their specific place within 4 s of articulation of the methodological pathway. In each of them, the involvement of students and local stakeholders is planned, albeit for different purposes.

A1 Integrated vision of "Urban health" regeneration Building an integrated view of urban regeneration to enable students to acquire basic knowledge about 'climate change adaptation and the risks of climate impacts to urban health; potentials, obstacles, threats that adaptation actions offer to city regeneration
A2 Local inquiry and mapping: get to know the neighborhood from above and from within Development of local surveys and mapping of the neighborhoods being tested using a top-down and insider approach. This is a "layering" activity that allows the selection and combination of information that comes from expert knowledge and the experience of those living in the places.
A3 Health and climate profile Construction of a climate and health profile to identify health risks in the urban environment today and in the future based on scientific knowledge and field surveys and comparison with city residents' perceptions of climate change.
A4 Evaluation framework Construction of an overview of the main critical issues and potentials of the different study areas, which will be the reference for the development of subsequent urban strategies in the different local contexts.
A5 Project scenarios Construction of future visions (BAU Scenario and "Shared and Sustainable Scenario") to structure reflections on the possible evolutions of the environmental, urban and social context of the study neighborhood under the test of climate change.
A6 Project proposals selection Selection of project proposals configured as detailed concepts and solutions, with reference to benefits for different health/climate change sectors and different stakeholders and social groups.
A 7 Results communication and dissemination Communication and dissemination of results in order to help students understand the importance of project "visibility" and the importance of conveying the significance and benefits of the project to both the general public and stakeholders involved in the regeneration project, etc.

Table 1. The 7 activities of the "Cli.CC.HE" Methodology.

The first phase, "Background & problem specification", concerns the theoretical construction of the background and specification of the problems of climate adaptation and urban health within the scientific debate and through comparison with current practices in Europe. It is mainly reserved for students, with support from teachers and experts from different disciplinary fields who facilitate the in-depth study of the main issues of the climate challenge in cities. The second phase, "Mapping", concerns the construction of knowledge of the study areas (the neighbourhoods of the four cities associated with the project: San Benedetto del Tronto, Strovolos, Valjevo and Lisbon), according to a "top-down" and "inside-out" look. The aim is to develop fruitful synergies between the technical knowledge supported by the cultural backgrounds of the different disciplines involved in urban regeneration processes and the knowledge that comes from the experience of those who inhabit, operate, and administer the places under study. The third phase, "Design Development & Selection", focused on adaptation design by constructing climate scenarios and their potential impacts on citizens' health, and by selecting alternative design solutions for adaptation. This phase saw the activation of local co-design workshops, through which urban regeneration proposals were developed and shared through the exchange of information and ideas among students, citizens, stakeholders, and experts.

Finally, the fourth phase, "Communication & Dissemination," involved dissemination, through the activation of the project website (https:// Cli-CC. HE .org/) and the realisation of multiplier events, which involved students, researchers, citizens and local stakeholders in multiple activities aimed at disseminating the project results in unconventional and engaging ways, such as: exhibitions, public art performances, video mapping, etc. Each of the four phases the methodological path articulation was characterised with reference to: the general objectives and topics and answers to the question "Why?"; the participating target groups (Teachers, Students, Tutors, citizens, community, stakeholders) Who?; the place of performance (in the classroom or in the neighborhood)Where?; the expected results (What?); and the timing (When?) (Tab.2).

Table 2. Articulation 3rd Phase: "Design development and selection".

Why? **General objective and topic**	1. Main environmental and social vulnerabilities and threats 2. Adaptation options	3. Project Concept 4. Project proposal selection
Who? **Target group participant**	Students/ Teachers/ Tutors/ Local Stakeholders	
Teachers' activities	Scenario analysis	Examples of adaptation measures and best practices
	Selecting project proposals (checklist through public participation)	
Classroom students' activity	Preparation and coordination of the Workshop Scenario	
Where? **The extension and delimitation od the territory under scrutiny**	**In class** Laboratory Lectures/ Seminars	**In the neighborhood** Scenario Workshop EASW Results of the Urban Games Immersive reality /Interactive tool
What? **The Expected outcomes of the activity**	-Ability to recognize and assess the risks of climate change for health and living spaces in the neighborhood under study -Understanding the importance of comparing different skills and needs in the selection of actions and projects for adaptation to climate change Development of an ethics of responsibility towards the risks of climate change	-Ability to focus on different future scenarios and to choose the most suitable one -Understanding the role of the community and different stakeholders participation in decision making
When? **Timing of the activities**	Total amount of 12 hours	
Outputs / deliverables	Report: summary test about the result of the EASW Scenario Workshop Project Concept Map Oral and design presentation scenario workshop results	
Tools proposed	**1- Project proposal Selection** Checklist Healthy Urban Planning Checklist Cities Generator Selecting Project Proposal through public participation **2- Decision-Making Process** Scenario Building	

A1 Integrated vision of "Urban health" regeneration	Debate (CYI); Expert Panel (CYI); Flipped classroom (CYI); Self-Study activity (CYI
A2 Local inquiry and mapping: get to know the neighborhood from above and from within	Data Collection and best practices examples (UNICAM); Walking as a research method (ISCTE); Recording fieldnotes (ISCTE); Interviewing (ISCTE); Photo Elicitation (ISCTE)
A3 Health and climate profile	Climate profile LadyBug Suite (UNICAM)
A4 Evaluation framework	SWOT analysis (UNICAM); Place Standard with climate lens (UNICAM); 15 minutes proximity (ISCTE); RETEACH Questionnarie (CNR)
A5 Project scenarios	Stone Soup Urban Game (ISCTE); REBUS Renovation of public Building and Urban Spaces, version for Cli-CC.HE Urban game (UNICAM); Immersive reality software (CYI); EASW Scenario Building (UNICAM)
A6 Project proposals selection	Check-list: Healthy urban planning (UBFA); Check-list: Healthy Cities Genrator (UBFA); Selecting Project Proposal through public participation (UBFA); Debate (CYI)
A 7 Results communication and dissemination	Audio /Oral presentation (UBFA); Printed presentation: posters ad leaflets (UBFA); Public art presentation (UBFA)

Table 3. Methodological activities and tools associated with the seven methodology activities.

Finally, the Cli-CC.HE methodology uses an "Educational Toolkit" comprising lectures, seminars, workshops, video tutorials, and about 20 other educational tools, as shown in Tab. 3.

The variety and articulation of these tools, which are also accessible on the project website, are the result of the diverse disciplinary expertise of the researchers involved, including architects, urban planners, physicists, technologists, engineers, public art experts, urban planners, anthropologists, and computer scientists. The provided tools facilitate investigation of the neighbourhoods under study from various perspectives and in a malleable manner. A singular tool may be utilised in multiple activities, though with varying connotations; similarly, certain activities may alternately pertain to more than one tool. Some of these tools are inherently disciplinary, enabling a more profound comprehension of the settlement, environmental, social, and demographic attributes of the neighbourhood to be regenerated, in established ways specific to the disciplines of architecture, urban planning, and technology (e.g., classroom debate, group assignment, data collection LadyBug Suite-Tutorial; etc, etc.). Other tools encourage confrontation with the experiences

of local people and stakeholders in non-traditional ways for technical faculties (e.g., immersive reality and interactive tools; urban games; Place Standard Tool; Scenario Workshop EASW; public art; visual surveys, etc.).

With reference to the general questions posed as the basis for this article, the Cli-CC.HE Project provides:

- Direct involvement of the local community and stakeholders at all stages of applying the methodology. It uses a multidisciplinary and multiscale approach that facilitates the discussion and reception of ideas and suggestions from local communities and stakeholders involved in the workshops, local co-design workshops, and Multiplier events.
- Skills enhancement by the local community, stakeholders, and municipal representatives through collaborative mapping and codesign activities. The aim is to use the lessons learned to improve their own lifestyles (in the case of the community) and, for stakeholders and municipalities, to foster the application of climate-proof design solutions and techniques in the planning and design of cities to be regenerated.
- The use, within each phase of the methodological path, of a very diverse range of survey, evaluation, and design tools, selected and used as needed to meet the needs of the study area and the characteristics of the local communities and actors involved. These include unconventional tools such as urban games, augmented reality, video mapping, neighbourhood walks, interviews, and questionnaires to facilitate discussion and incorporate ideas and suggestions from all actors within co-design tables and multiplier events.

The methodology and educational toolkit were evaluated at the four local laboratories, one in each city associated with the project. This paper presents the findings of one of the local workshops: San Benedetto del Tronto, a city of 45,000 inhabitants situated on the Adriatic coast of the Marche Region, which is a prominent tourist destination. The workshop, coordinated by the School of Architecture and Design of the University of Camerino, was held in the Sant'Antonio neighbourhood, one of the city's most densely populated areas, with approximately 7,000 inhabitants. The neighbourhood is experiencing significant climate-related challenges, including rising temperatures and heat-island formation in the densest areas, as well as frequent flooding from extreme weather events. The area is also affected by heavy traffic congestion and air pollution. The availability of green areas is limited and dispersed.

3. RESULTS

The training course of the San Benedetto del Tronto- Sant'Antonio Neighbourhood Workshop ran from February to November 2023. It involved 78 students from the School of Architecture of the University of Camerino, 3 representatives of the public administration, 2 technicians from the urban planning and public works offices, 3 stakeholders representing trade associations, 10 economic operators in the neighbourhood, 60 citizens, 3 teachers and 5 doctoral students. The workshop was held in both university classrooms and neighbourhood spaces, as well as in the Oratory of St. Anthony's Church within the neighbourhood. In consideration of the general objectives outlined in the Introduction, with respect to Objective 1, the instruments used to execute the diverse array of project activities facilitated a comprehensive and nuanced understanding of the neighbourhood and its inhabitants. This understanding was shaped by the interactions and confrontations among the various subjects engaged in the experimentation. Table 4 presents the number of tools utilised across the distinct phases of the project and the subjects involved.

Table 4. Distribution of tools in the project phases.

	Activities	Tools and actors involved
Phase 1	**A1 Integrated vision of "Urban health" regeneration**	Audio /Oral Presentation (Students and Teachers) Debate (Students) Self-Study (Students) Expert Panel (Stakeholders and Students)
Phase 2	**A2 Local inquiry and mapping**	Data Collection and best practices examples (Students and Teachers); Walking as a research method (Students and citizens); Interviewing (Stakeholders and Students)
	A3 Health and climate profile	LadyBug Suite (Students and Teachers)
	A4 Evaluation framework	Place Standard with climate lens Stakeholders and Students) 15 minutes proximity (Students, Stakeholders and Citizens)
Phase 3	**A5 Project scenarios**	EASW Click Scenario Building (Students, Stakeholders and Citizens) Rebus Urban Games (Students, Stakeholders and Citizens)
	A6 Project proposals selection	Check-list: Healthy urban planning (Students, Stakeholders and Citizens) Selecting Project Proposal through public participation (Students, Stakeholders and Citizens)
Phase 4	**A 7 Results communication and dissemination**	Audio /Oral presentation (Students) Printed presentation: posters ad leaflets (Students); Exhibition (Students, Citizens) Videomapping (Students)

The activities of the first phase, which took place on the University's campus, focused on building, through discussion between faculty and students, a knowledge base on urban regeneration, climate impacts, and risks to human health. External experts from various disciplines (agronomists, historians, urban planners) also contributed to this phase to provide a comprehensive view of the impacts of climate change on territories and people, through ex cathedra lectures and a "public debate." The "debate" format integrated the concepts of topics "prepared" by students with the assistance of the lecturers with "extemporaneous" topics, prompting students to focus on particular issues rather than theoretical or procedural elements. The results of this initial phase were presented by students in the form of reports and posters. The topic under discussion was: Are European cities and communities prepared to address the impacts of climate change? A comparative analysis of hypotheses. This highly interactive style of debate required effective teamwork and a comprehensive, well-reasoned argument.

The second phase focused on the construction of technical knowledge of the neighbourhood's anthropic, environmental, and social features. The getting to know the neighbourhood "from above" activity involved the collection of data and examples of best practices covering both examples of cataloguing socio-demographic data on the neighbourhood and interpretive maps of environmental, urban planning, infrastructural aspects, etc., as well as documents covering: the history and events of the neighbourhood, projects, plans and programs of the Municipality. These documents were discussed by students, researchers, and teachers at the local workshop to understand the neighbourhood, its distinctive places and functions, its inhabitants and visitors, the expectations of citizens, actors, and the municipal administration, and the physical and environmental constraints of the area. The results of this analysis enabled students to interpret the quantitative and qualitative data characterising the neighbourhood, thereby developing interpretive maps and knowledge of the neighbourhood. This technical knowledge was enriched with the knowledge of local actors, according to the "from within" approach through the use of unconventional tools such as "walking as research method" and "15 minutes proximity" questionnaires to passersby and commercial operators.

These methods allow us to consider realities and scales that are not usually observed and can be discovered by visiting the neighbourhood and walking with those who know the area well, capturing people's experiences. The results of this second phase involved students' construction of maps, which were discussed with citizens, stakeholders, and administrators at local workshops (Fig. 1).

Fig. 1 - Local Workshop activities in the Sant'Antonio neighborhood.

Knowledge refinement also covered present and future climate risks and health impacts. This again integrated technical knowledge by applying technical tools such as the "Ladybug" Suite and existing climate studies with people's perceptions of risk. Through the construction of the "Risk pErcepTion and willingnEss to pAy on Climate cHange (RETEACH) questionnaire, an attempt was made to investigate citizens' knowledge and perception of the impacts of climate change in their everyday lives. The low awareness of climate risks that emerged during the questionnaire administration was addressed through the application of the Tool "Place Standard with climate lens" (Hasler, 2018) and the construction of climate scenarios, with support from the Tool "Scenario Building Guidelines" (Duinker et al., 2007). Through the application of the latter, the third phase allowed the working tables to understand climate emergencies and evaluate possible choices between two possible scenarios: the BAU_"Business-as-usual" scenario and the S&S_Shared and sustainable scenario. The first maintains the current "status" of places, and leaves everything as is, taking responsibility for assessing the consequences, dealing with an expected climate framework that will evolve in a certain way. The second scenario can address the major climate change issues raised in the assessment phase, including hopes, expectations, threats, and the expected risks and negative repercussions of careless decisions on the health and well-

Fig. 2 - Scenario construction by students (Baffi, Crocetti, Falcioni), citizens and stakeholders.

being of populations. Scenario construction took place through discussions among local people, public administration, engineers, local professionals, and stakeholders, and formed the basis for the development of adaptation design proposals (Fig. 2).

The latter made use of the “REBUS ® - REnovation of Public Buildings and Urban Spaces” Urban Game” tool. This is a game/simulation for the planning and design of urban areas aimed at improving the comfort of public spaces for heat island mitigation (Farné, 2017) through artificial and NBS (Nature Based Solutions). The design phase concluded with validation of the project proposals (Fig. 3) using checklists that weighed the performance of the design solutions. The last phase of the project involved dissemination. Complete dissemination of the results of the local workshops was conducted in conjunction with the multiplier event “Water for a friend.” Dissemination activities included a workshop on water protection as a resource and the opening of two exhibitions (Fig. 4). The exhibitions’ content sparked intense debate among students, educators, administrators, and the public on the future of San Benedetto del Tronto. The dissemination activity involved 86 students, 10 professors, 4 academic institutions, 2 representatives of public governance, and about 30 citizens and technical experts.

Fig. 3. Example of project proposal (Baffi, Crocetti, Falcioni).

Fig. 4. Exhibition of workshop work at the "Water for a Friend" Multiplier Event.

The following are the main results of the project with reference to the objectives stated in the introduction:

- With reference to Objective 1 explicated in the introduction, the confrontation with the different actors of urban regeneration allowed students to experience the need and, at the same time, the difficulty of dialogue with the end users of their design activities and the opportunity to use tools that are sometimes outside their technical and cultural background to foster understanding and confrontation with local actors. At the same time, it made them understand that some steps in the methodology require a level of knowledge and depth that is difficult to transfer to everyone, and that the role of each disciplinary knowledge will still have to be claimed.
- With reference to Objective No. 2, we can certainly say that the various participants in the working tables have shown in the face of an initial lack of knowledge and awareness of climate phenomena and health impacts in the initial phase, as evidenced by the questionnaire "RETEACH, 'a growing interest, verified in the activities of the application of the tools ' Place Standards 'and' Scenario Building ". We are unable to date the practical effects of this growth on citizens and local stakeholders. On the contrary, it is already possible today to verify the legacies of this project for the Municipality. It had the opportunity to acquire the knowledge and tools of the project and transfer them into its own plans and programs. This possibility was incentivised by the provision to the Administration of "Urban Guidelines oriented to health and climate change mitigation practices," which contain the typological adaptation solutions outcome of the local workshop activities, resulting in interest by the Technical Offices in evaluating the effects of climate change within the new Local Urban Plan.
- To answer the third question about which tools facilitated the sharing of knowledge between students and the local community more than others, it is useful to refer to the questionnaire administered to students, citizens, and teachers at the end of the project. During the "joint intensive course," which spanned all four local workshops of the Cli-CC.HE project, and all project partners, teachers, and students were invited to offer brief commentary on the methodology and the critical elements addressed during the "application in local workshops." The reflection that developed, which was summarised through the administration of a questionnaire (Fig.5), highlighted how within Activity 1 "Integrated vision of "Urban Health" Regeneration,"

there is a need to increase the basic knowledge of climate change at the beginning of the educational journey due to the difficulty on the part of students, especially those at the beginning of their careers to confront such complex issues. Activity 2, “Local inquiry and mapping: get to know the neighborhood from above and from within,” was highly appreciated and proved particularly meaningful. Therefore, it was proposed to consider it a flexible, modular tool to be applied according to the characteristics and timing of university courses. For Activity 3. “Health and climate profile,” the need to pay more attention to the health effects of climate change was highlighted. The questionnaire administered cannot be the only tool for constructing a neighbourhood’s climate profile. Possible improvements include greater involvement of local health agencies and greater availability of health data, both of which are often difficult to obtain. For Activity 5 “Project Scenario”. It was noted that scenario building should be simplified to avoid replication of problems already solved with other tools. To this end, the toolkit’s bulletin board and web tutorial have been simplified to improve understanding among students, citizens and local stakeholders. No particular problems were highlighted for activities 4 “Evaluation framework”, 6” Project proposals selection” and 7 “Results communication and dissemination”. In view of these evaluations, the assessment of the application regarding the methodology and tools used for educational provision is undoubtedly positive. Possibilities for improvement mainly concern basic preparation on climate change impacts and the use of simplified tools for climate risk identification and scenario building. The methodology needs to be made more user-friendly because it is new to students in architecture schools. Interest, however, in unconventional tools, such as urban games, questionnaires and the Place Standards tool, is a good example for future implementation of the methodology. Refinement of it is taking place in other experiments, such as within the Urban Design Laboratories of the School of Architecture and Design at the University of Camerino.

4. DISCUSSION

The existing literature indicates that the prevailing higher education models for climate change are inadequate. This is because they are overly focused on theoretical teaching and teacher professionalism, and are reluctant to engage with the various dimensions of change (cultural, psychological, professional,

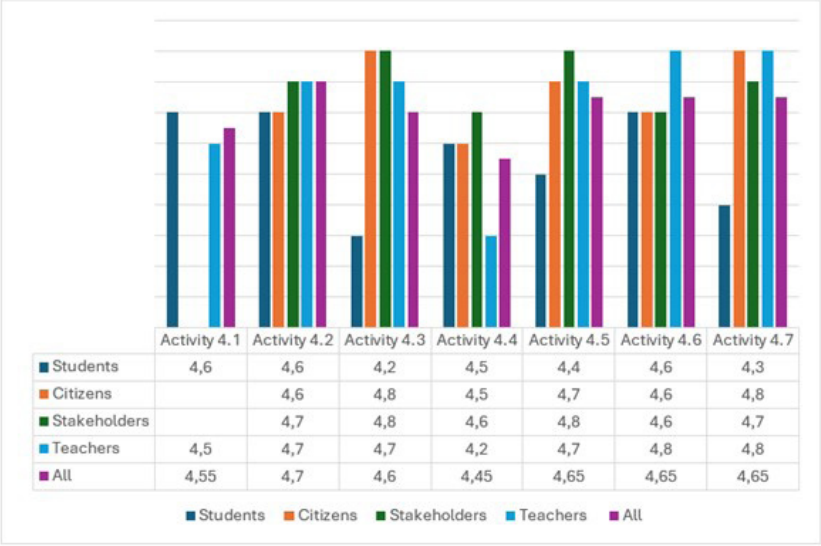

Fig. 5 - Evaluation of the Activities carried out in the local workshop by students, citizens, stakeholders, teachers.

institutional, and political) (Reimers et al., 2020). These different dimensions require an interdisciplinary and multi-actor approach. This project confirms the thesis of some scholars that the creation of a multi-actor network coordinated by the University improves students' awareness, facilitates their understanding of future scenarios, and stimulates them to engage in action through place-based learning (Leininger-Frézal et al., 2023). Student participation in these networks could provide an 'opportunity to acquire specialised action-oriented climate knowledge that is very difficult to build through more traditional modes of learning (Fraser et al.,v2006; Wu et al., 2019).

This approach breaks with established patterns of top-down education by fostering innovative, multilateral relationships among teachers, students, local communities, and stakeholders (Brundiers et al., 2020). It promotes the values of a participatory democracy in which everyone is involved and held accountable to the climate (Fadeeva et al., 2014). Although there is widespread recognition of the value of a multi-actor learning network approach in fostering education in the context of climate change (Boyd et al., 2010; Sol et al. 2018), experiences in the field are rather lacking (Jrogenson et al., 2019). There

persists reticence “toward collective social action” even though it is deemed necessary (Reimers, 2021). Among the few projects that aim to overcome existing gaps in the field of climate change education by seeking to create multi-actor networks to improve climate knowledge and action are some European projects, such as the Erasmus+ Project, “UCCRN Education: Climate Resilient Urban Design, Planning and Governance & Capacity Building”(https://www.uccrn.education/) which aims to establish synergies between leading research and educational institutions, with governments and local communities to simplify climate action in cities; and the European Union’s Horizon Europe “AGORA project”. This project involves a partnership of citizens, civil society organisations, academics, experts, policy makers, entrepreneurs and other actors engaged in the co-design and co-creation of innovative climate adaptation-oriented solutions (https://www.cmcc.it/projects/agora-a-gathering-place-to-co-design-and-co-create-adaptation). With respect to these projects, the proposal of the Cli-CC.HE Project , realises an original approach, because it links the innovations that may be created by the establishment of networks to the renewal of the University’s educational programs, promoting training across the board, of students in the first place, but also of citizens, stakeholders and local governments, called upon to become change-makers for the climate. To this end, Cli-CC.HE has developed an interdisciplinary training and knowledge co-production approach that integrates research and participatory analysis. This approach facilitated the examination of the nexus between academic methods, local knowledge, and place management practices. This has enabled understanding of the cultural and social determinants of climate change and of the monitoring and addressing of the challenges (Irahola et al., 2021) in the areas under study. Cli-CC.HE identified ways to assess conditions and develop adaptation proposals using a variety of tools, including unconventional ones such as augmented reality, public art, and urban games. Some of these tools were found to be more effective or easier to use, and were therefore preferred in discussions with local communities within the working tables. This long and rather complex path had its strongest element in the activation of co-design workshops with local communities, stakeholders and public administration. The activation of the workshops was easier in cities where the University had a long-standing relationship with the local area and public administration, and where established relationships could therefore be leveraged. The establishment of mixed working tables, including students, administrators, citizens and stakeholders, facilitated discussions. As for the workshop in San Benedetto del Tronto, it proved to be an engaging and convivial experience that provided a valuable learning opportunity for all participants. In response to the questions posed at the beginning of this article, we can extend the reflections on the results of this project accrued in the San

Benedetto del Tronto workshop to a reasonable degree of approximation to the other local workshops as well:

1. The activities conducted in the local workshops, which brought together students, citizens, stakeholders, professionals, administrators, and municipal officials, were a moment of collective reflection on the critical issues facing cities and the need to prepare for climate change. The workshop results were transmitted to local governments through the formulation of guidelines for urban regeneration. In addition, some universities (Unicam and University of Belgrade) were offered the opportunity to initiate or strengthen collaboration with municipalities through the signing of agreements to integrate the results of these experiences into urban plans and projects. This collaboration is characterised by a high level of commitment and is further strengthened by other initiatives, including the establishment of a partnership to prepare the Program Document for the New General Urban Plan. Consequently, within the context of a "Collaborative Alignment Framework" (Walker et al., 2023), the involvement of the local community is a crucial safeguard for the future.
2. The role of students in facilitating community engagement with issues of climate change and adaptation, and their impact on daily life, has been crucial in fostering a closer relationship between the community and the University. The activation of the co-design tables facilitated direct contact with students, fostering dialogue and enabling confrontation without bias and limitations. In this confrontation, students learned to reconcile people's needs with technicians' knowledge, and to fully understand the reasons for any conflicts that may arise. The implementation of specialised tools for confrontation facilitated the emergence of disparate perspectives while emphasising the need for conflict resolution to identify optimal adaptation scenarios. In addition, confronting communities enabled students to gain a comprehensive understanding of the importance of a culture of adaptation and of their role as future technicians in educating citizens and local governments.
3. In terms of available tools, Cli-CC.HE allowed the different stages of the methodology to be approached with a variety of them, thus allowing their relative effectiveness to be assessed both in terms of training students and training citizens and administrators. It was found that students experienced difficulties in approaching technical tools for assessing climate impacts, such as Ladybug). These difficulties are likely attributable to the fact that for many students Cli-CC.HE

represented their first experience with climate adaptation. In contrast, both students and citizens expressed general satisfaction with more accessible tools, including urban games, public art, video mapping, virtual reality, exhibitions, and neighbourhood walks (Thoma et al., 2023).

4. In terms of risk, the most significant that has emerged from these experiences is the fear, expressed informally by citizens, that the chosen educational path will not have practical consequences and that, that is, the administration will not fulfil its commitments in the regeneration of the city. Among students, the main concern is the risk of discontinuity in an interdisciplinary educational pathway addressing the climate challenge. Among faculty, there is a commitment to integrating climate change as a structural element of university curricula, rather than treating it as an isolated topic.

5. CONCLUSIONS

Climate-proof urban regeneration projects need to originate from collective and collaborative action that requires the stimulation of diverse and unconventional tools that can transcend disciplinary boundaries, overcome difficulties and resistance, and encourage students to identify and describe problems and potential solutions for adaptation and health in cities, thus facilitating a true integration of approaches and ideas. Students must be offered opportunities to engage in experiential learning through internships and educational pathways that facilitate their interaction with issues arising from climate change in their real-world contexts (Bodolica et al., 2021). This educational opportunity should include establishing collaborative relationships with government departments, local communities, NGOs, and local stakeholders (Tang, 2019) to instil a sense of urgency and responsibility in students and to help the same communities and local stakeholders become aware of these issues and enact appropriate behaviours towards their living spaces. The Cli-CC.HE project has developed an educational methodology that:

1. builds on interdisciplinary and multi-actor knowledge networks to address the complexity of climate change and, through co-design, develop possible and shared solutions to real problems in cities. The direct confrontation with local stakeholders allowed students to understand the different points of view and expectations of local

actors, which were articulated through the use of participatory tools that advanced the confrontation by reconciling different positions and sensitivities.

2. makes local communities more aware of the risks of climate change to their living places and to their own health. Bottom-up approaches based on community experiences are also promoted to break down mistrust of top-down-imposed knowledge models. Co-design tables, in this case, play a key role in bringing people together, broadening the discussion from the city's physical spaces to everyday lifestyles and behaviours, thereby also constituting a moment of reflection on personal commitments to adaptation.

3. uses traditional tools to interpret urban contexts, in synergy with more user-friendly tools that, through the experience of gaming, augmented reality, video mapping, questionnaires, etc., bring people into contact with problems and possible solutions.

The limitations of this methodology relate to its limited ability to affect students' education when applied occasionally in training workshops, as was the case with the CliCCHE Project. It should be used in regular university courses with longer learning sessions than in workshops. This would allow a better transmission of basic interdisciplinary knowledge and some benchmark best practices, which are essential to strengthen students' awareness of such a complex subject. This need emerged in the same questionnaires administered to faculty and students at the end of the project. Another important limitation could relate to the expectations of local communities and actors, who may see their demands betrayed if the public administrations do not follow up on the proposals resulting from the co-design pathways. In this case, the construction of Adaptation Design Guidelines, as an outcome of the participatory pathways, is a valuable tool to facilitate the transfer of knowledge gained into the plans and projects of the public administrations involved. Finally, a further limitation of the methodology is represented by the non-provision of a monitoring phase, i.e., of evaluation at a distance in time of the outcomes achieved with reference to the objectives of the project and the possible positive effects on the educational profiles of students and on the expectations of local communities and stakeholders. The provision of a monitoring phase could be useful to make changes and or updates to the methodology and tools in order to improve their effectiveness.

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RENOVATE UNIVERSITIES' EDUCATIONAL OFFERINGS ON CLIMATE ADAPTATION IN PARTNERSHIP WITH COMMUNITIES AND STAKEHOLDERS

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EXPLORING HEALTH AND SOCIOECONOMIC IMPLICATIONS OF URBAN REGENERATION AMIDST CLIMATE CHANGE

ABSTRACT

Unlike some temporary disasters, climate change poses a long-term threat, particularly to urban health, affecting both humans and the environment. Urban regeneration offers an opportunity to revitalise cities, promoting urban health and employing strategies that consider future citizen needs and the roles of cities in addressing the climate change challenge. These strategies must address both expected and unforeseen impacts, viewing cities as dynamic entities capable of change. Research has predominantly focused on mitigation strategies to reduce the magnitude of climate change impacts and on adaptation strategies to prepare for them. In cities, green spaces and new materials have been analysed to enhance climatic conditions and human comfort, reflecting the multifaceted relationship between urban health, well-being, and environmental preservation and restoration. Further investigation is expected to increasingly explore the socio-economic dimensions of climate change and urban health. However, it is important not to overlook the essential role of physical actions in addressing urban challenges, avoiding carbon lock-in situations. Community-based adaptation and participatory planning are needed components for an effective climate change counteraction, and inclusive, community-driven approaches address various urban vulnerabilities, promoting equitable health benefits across different population groups. Ultimately, achieving urban health equity requires concerted technical and non-technical thinking, with city regeneration projects focusing on efficient, adaptable physical designs and cohesive social structures.

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KEY WORDS
CLIMATE CHANGE
URBAN HEALTH
URBAN REGENERATION
ADAPTIVE STRATEGIES
MITIGATION STRATEGIES

1. INTRODUCTION

Over the last two decades, populations worldwide have been confronted with a series of prolonged and overlapping crises, including severe economic downturns, socio-political disruptions, public health emergencies, and escalating climate-related anxieties (Panu, 2020). While certain disasters are temporary and can be mitigated within a relatively short timeframe, climate change represents a chronic and systemic threat whose impacts permeate ecological, social, and economic systems. This is particularly evident in urban contexts, where climate change increasingly undermines both human health and environmental quality (IPCC, 2022). Urban areas, home to more than half of the global population in 2018 and projected to host an even greater share in the coming decades (UN, 2019), function as the epicentres of economic productivity, cultural exchange, and technological innovation. However, they are also concentrated sites of vulnerability. High population density, intensive energy consumption, limited green space, and dependence on complex infrastructure systems render cities highly susceptible to the compounded impacts of climate change, including urban heat island (UHI) effects, flooding, air pollution episodes, and the exacerbation of social inequalities (Nazarian et al., 2022). Urban regeneration, defined here as the integrated process of revitalising urban environments through physical, environmental, social, and economic interventions, presents a critical opportunity to align climate change mitigation and adaptation objectives with the promotion of urban health (UN Habitat, 2021). As a strategic framework, regeneration can transform derelict or underutilised spaces into resilient, inclusive, and health-promoting environments that address both current and future needs. This transformation requires conceptualising cities not as static infrastructures, but as dynamic, adaptive systems capable of continuous renewal in response to environmental, demographic, and technological change (Villalbí & Ventayol, 2016). Historically, climate change-related research has tended to focus on

discrete elements of the nexus between environment, health, and urban systems, often privileging the biophysical impacts of climate hazards or the engineering aspects of mitigation measures, while neglecting their broader socio-economic dimensions (Agache et al., 2022). Recent scholarship underscores the necessity of integrating mitigation strategies, which reduce the magnitude of climate impacts (e.g., reducing greenhouse gas emissions), with adaptation strategies, which strengthen resilience to unavoidable climate stresses (Monteiro et al., 2022). The urban context provides a unique platform for such integration, where physical interventions, such as the implementation of green infrastructure, climate-responsive building materials, and sustainable mobility systems, can be complemented by governance reforms, participatory planning, and social equity measures. From a public health perspective, climate-sensitive urban regeneration is increasingly recognised as a means of delivering both direct and indirect health benefits. Direct benefits include reductions in heat-related morbidity and mortality, improved air quality, and enhanced physical and mental well-being through increased access to nature (Frumkin et al., 2017). Indirect benefits encompass the socio-economic co-benefits of regeneration, such as job creation, reduced healthcare costs, and strengthened community cohesion (Herrmann et al., 2018). However, translating these benefits into equitable outcomes remains contingent on deliberate efforts to address structural inequalities in resource access, political representation, and environmental exposure (López-Bueno et al., 2020). The urgency of such integrative approaches is underscored by the lock-in risks inherent in urban development. Without careful planning, investments in carbon-intensive or maladaptive infrastructure can perpetuate environmental degradation and social inequities for decades, constraining the potential for low-carbon transitions (Seto et al., 2016). Conversely, strategically designed regeneration projects can leverage synergies across multiple policy domains, energy efficiency, biodiversity conservation, housing affordability, and public health, to create self-reinforcing cycles of sustainability and well-being (Schmidt & Walz, 2021).

This paper seeks to advance the discourse on urban regeneration by explicitly examining its health and socio-economic implications in the context of climate change. Building upon a systematic literature review and SWOT analysis conducted within a European scope, we identify and synthesise evidence on the strategies, opportunities, and challenges of integrating health promotion and socio-economic resilience into climate-oriented urban regeneration. The analysis foregrounds both physical interventions (e.g., nature-based solutions, sustainable materials, climate-proof infrastructure) and governance mechanisms (e.g., participatory planning, community-based

adaptation, policy integration) as dual pillars for achieving urban health equity and climate resilience. By consolidating findings from diverse disciplinary perspectives, urban planning, environmental health, climate science, and socio-economic policy, this study aims to:

- Elucidate the pathways through which urban regeneration can simultaneously deliver health and socio-economic benefits under climate change conditions.
- Highlight the risks of neglecting either technical or social dimensions in regeneration planning, particularly in relation to equity and lock-in effects.
- Propose a conceptual framework for climate-sensitive, health-oriented regeneration that is adaptable to diverse urban contexts.

In doing so, the paper contributes to both the academic literature and the policy discourse on climate change adaptation and mitigation, offering evidence-based recommendations for practitioners, decision-makers, and communities seeking to design urban regeneration projects that are not only climate-resilient but also socially inclusive and health-promoting.

2. CLIMATE CHANGE AND URBAN VULNERABILITY

The impacts of climate change on urban areas are neither uniform nor evenly distributed. Cities concentrate populations, infrastructure, and economic activities, amplifying both exposure to climate-related hazards and the sensitivity of social and ecological systems to such hazards (IPCC, 2022). The urban fabric, characterised by extensive impermeable surfaces, dense built forms, and modified microclimates, often exacerbates climate risks through phenomena such as the urban heat island (UHI) effect, reduced evapotranspiration, and impaired natural drainage (Nazarian et al., 2022). These environmental modifications intersect with socio-economic disparities, producing complex patterns of vulnerability that require integrated and multi-scalar responses.

While the underlying drivers of vulnerability are globally relevant, European cities present specific features that shape climate risk profiles. Temperate and humid subtropical climates dominate much of the continent, with urban areas facing seasonal extremes of heat and precipitation (Kyprianou et al., 2023). Aging infrastructure, high population densities, and historical urban forms can complicate retrofitting for resilience, particularly in heritage districts where

conservation requirements may limit the scope of physical modifications (Rosso et al., 2017). Moreover, the continent's policy environment, anchored in binding legal instruments such as the European Climate Law (Regulation (EU) 2021/1119), the Nature Restoration Regulation (Regulation (EU) 2024/1991), and the Regulation on serious cross-border threats to health (Regulation (EU) 2022/2371), offers both opportunities and challenges for coherent, health-sensitive adaptation and mitigation planning (European Parliament, 2021, 2024; Monteiro et al., 2022). These frameworks establish long-term targets for climate-neutrality and ecosystem restoration and strengthen preparedness for climate-related health risks, thereby shaping national and municipal regeneration strategies and resource allocation for urban health equity.

The systematic literature review underpinning this study identifies heat-related hazards as the most intensively studied climate threat in European cities, followed by flooding, air pollution episodes, and droughts (Kyprianou et al., 2023). Heatwaves and UHIs compound thermal stress, particularly in dense city cores where anthropogenic heat emissions, low vegetation cover, and high thermal mass interact, resulting in elevated ambient temperatures (Ketterer & Matzarakis, 2014). This heightened thermal environment increases risks of heat-related illnesses, cardiovascular and respiratory morbidity, and mortality, especially among older adults, children, and individuals with pre-existing health conditions (López-Bueno et al., 2020). Flood risks, both pluvial and fluvial, are also significant in urban areas, where extensive impermeable surfaces accelerate runoff, overwhelm drainage systems, and exacerbate water quality issues (Claessens et al., 2014). Although flood protection measures are present in many European cities, climate change is projected to intensify precipitation extremes, requiring infrastructure upgrades that can be an opportunity to adopt nature-based flood mitigation strategies (Epelde et al., 2022).

Air pollution, driven by both local emissions (e.g., traffic, industry) and transboundary transport of pollutants, interacts with climate variables to influence pollutant dispersion, chemical transformation, and population exposure (Steeneveld et al., 2018). For instance, elevated temperatures can accelerate the formation of ground-level ozone, while stagnant atmospheric conditions during heatwaves can trap pollutants near the surface, compounding respiratory and cardiovascular health risks (Daghistani, 2021).

Urban vulnerability is shaped by three interrelated factors: exposure to climatic hazards, sensitivity of populations and systems, and adaptive capacity to anticipate, cope with, and recover from impacts (Villalbí & Ventayol, 2016).

Exposure is spatially differentiated; low-income and marginalised communities often reside in more hazard-prone areas, such as floodplains, poorly ventilated housing clusters, or neighbourhoods lacking tree cover, due to historical patterns of segregation, disinvestment, and zoning decisions (Appolloni et al., 2020). Sensitivity is influenced by health status, age, occupation, and housing conditions, while adaptive capacity depends on access to resources, information, and institutional support (Herrmann et al., 2018). The evidence suggests that climate change will exacerbate existing urban inequalities, as vulnerable populations tend to have less access to adaptive measures such as air conditioning, flood insurance, or healthcare (Schmidt & Walz, 2021). Moreover, these groups often have limited political representation, constraining their ability to influence planning decisions that affect their resilience (Foshag et al., 2020).

Beyond direct health effects, climate hazards can trigger systemic risks in urban settings. For example, heatwaves can reduce labour productivity, strain energy systems through increased cooling demand, and disrupt transportation networks (Roetzel et al., 2010). Flood events can damage housing, infrastructure, and utilities, displacing residents and undermining local economies (Luber & Prudent, 2009). Such impacts often cascade across sectors, with economic losses feeding back into reduced municipal revenues, constraining the resources available for climate adaptation and social support (Seto et al., 2016). These interdependencies underscore the need to approach urban vulnerability not solely as an environmental or engineering problem but as a multidimensional challenge spanning public health, social policy, economic planning, and environmental governance (Agache et al., 2022). Effective responses require recognising the nexus among climate change, urban health, and socio-economic systems, ensuring that interventions are both technically sound and socially equitable.

In summary, climate change amplifies existing urban vulnerabilities through the interaction of environmental hazards, socio-economic inequalities, and infrastructural constraints. Addressing these challenges demands a systemic approach that integrates physical interventions, social equity considerations, and institutional coordination, a theme that underpins the subsequent analysis of urban regeneration as a health and resilience strategy.

3. GREEN INFRASTRUCTURE, MATERIALS, AND URBAN DESIGN

Green infrastructure, innovative materials, and climate-responsive urban design are central pillars of climate-oriented urban regeneration. These physical interventions simultaneously contribute to mitigation, by reducing greenhouse gas emissions and improving energy efficiency, and adaptation, by enhancing resilience to climatic hazards such as extreme heat, flooding, and air pollution (Kyprianou et al., 2023). Their integration into regeneration projects can deliver direct environmental improvements, substantial health benefits, and significant socio-economic co-benefits.

Nature-based solutions (NBS), including urban forests, street trees, green roofs, vertical gardens, and restored waterways, are among the most frequently studied and implemented strategies in European urban regeneration (Mutani & Todeschi, 2020; Epelde et al., 2022). These interventions mitigate the urban heat island (UHI) effect by providing shade and enhancing evapotranspiration, reducing surface and ambient air temperatures, and consequently lowering the incidence of heat-related illness (Ketterer & Matzarakis, 2014). In addition to thermal regulation, NBSs improve air quality by filtering particulate matter and absorbing gaseous pollutants (Steeneveld et al., 2018), while also contributing to noise reduction, biodiversity enhancement, and stormwater management (Claessens et al., 2014). Parks, community gardens, and green corridors promote physical activity and social interaction, yielding mental health and social cohesion benefits (Mosca et al., 2021; Frumkin et al., 2017). However, the literature also warns of potential risks, such as allergenic plant species, emissions of biogenic volatile organic compounds that can contribute to ozone formation, and maintenance challenges in resource-limited municipalities (Appolloni et al., 2020). Careful species selection, ongoing maintenance planning, and integration with public health monitoring are therefore essential.

Urban design strategies that incorporate green infrastructure often address hydrological resilience alongside thermal comfort. Permeable surfaces, bioswales, and constructed wetlands can attenuate runoff, improve water infiltration, and reduce the risk of pluvial flooding during extreme precipitation events (Epelde et al., 2022). In coastal cities, vegetated buffer zones can also serve as natural flood defences, protecting infrastructure and communities from storm surges (Claessens et al., 2014). These systems deliver multiple co-benefits, from reducing urban water pollution to providing habitat for pollinators and other wildlife, supporting broader ecosystem services. Importantly, hydrological design must anticipate projected climate conditions to avoid under-dimensioning or over-reliance on engineered grey infrastructure (Kyprianou et al., 2023).

Regeneration projects increasingly employ cool materials, reflective coatings, and advanced composites to improve thermal performance and energy efficiency. Cool roofs and solar-reflective pavements reduce absorbed solar radiation, lowering surface and surrounding air temperatures (Middel et al., 2020; Rosso et al., 2017). These interventions can decrease building cooling loads, reduce urban heat stress, and extend infrastructure lifespan by minimising thermal expansion cycles. Building envelope retrofits using high-performance insulation, phase-change materials, and low-carbon construction materials contribute both to mitigation, by reducing operational energy demand, and to adaptation, by improving indoor thermal comfort (Carlucci et al., 2015). However, material interventions must be context-sensitive; for example, applying reflective pavements in areas with high sky view factors may inadvertently increase mean radiant temperature, worsening outdoor thermal comfort (Karakounos et al., 2018).

Urban form, street orientation, aspect ratios, building heights, and spatial distribution of open spaces play a decisive role in microclimate regulation. Regeneration projects that optimise urban geometry can improve natural ventilation, enhance shading, and maximise daylight while preventing excessive heat gain (Ketterer & Matzarakis, 2014). Integrating vegetation within this geometry amplifies these effects, creating shaded, well-ventilated public spaces that encourage outdoor activity and social interaction even during warm periods (Rosso et al., 2022).

The most effective regeneration strategies combine green infrastructure, climate-responsive materials, and optimised urban form into integrated design approaches. For example, a regeneration project might pair street tree planting with reflective pavements and modified building setbacks to enhance both pedestrian comfort and stormwater infiltration (Kyprianou et al., 2023). Such synergies yield multiple co-benefits: reduced heat stress, improved air quality, increased biodiversity, enhanced real estate values, and improved community well-being (Schmidt & Walz, 2021). However, the success of integration depends on long-term maintenance, monitoring, and adaptive management. Without sustained investment and cross-sectoral coordination, initial gains may be lost, and physical assets may degrade prematurely (Foshag et al., 2020).

4. URBAN REGENERATION AS A HEALTH STRATEGY

Urban regeneration, encompassing physical redesign, environmental enhancement, and socio-economic revitalisation, offers a powerful framework for simultaneously addressing the environmental and health challenges posed by climate change. By integrating mitigation and adaptation strategies into regeneration projects, cities can transform hazard-prone, degraded, or underutilised spaces into resilient, inclusive, and health-promoting environments (UN Habitat, 2021).

In the context of climate change, urban regeneration is more than a spatial or architectural exercise; it is a multidimensional process that aligns urban design with public health objectives and environmental sustainability (Villalbí & Ventayol, 2016). The approach recognises cities as dynamic and complex systems capable of adaptation, where interventions at multiple scales (i.e. building, neighbourhood, and city-wide) can generate co-benefits for climate resilience, human well-being, and socio-economic stability (Frumkin et al., 2017). A key insight from the systematic literature review is that regeneration projects often prioritise physical interventions, such as vegetation enhancement, cool materials, and energy-efficient building retrofits, due to their measurable environmental benefits and visibility (Kyprianou et al., 2023). However, the long-term success of such projects depends equally on non-technical dimensions, including community participation, governance integration, and equitable distribution of benefits (Herrmann et al., 2018).

Mitigation strategies embedded in regeneration include urban design and land-use planning that reduce greenhouse gas emissions, promote sustainable mobility, and enhance energy efficiency (Karakounos et al., 2018). Adaptation measures often focus on enhancing urban microclimates, increasing green cover, managing stormwater, and climate-proofing infrastructure (Epelde et al., 2022). Importantly, these strategies are not mutually exclusive; their integration can yield synergistic effects. For instance, green roofs reduce building space cooling loads (mitigation) while also lowering ambient temperatures and improving stormwater retention (adaptation) (Mutani & Todeschi, 2020). Policy-based adaptation measures, such as design guidelines, zoning regulations, and green infrastructure standards, form a strong component of regeneration projects in Europe. These frameworks can institutionalise resilience by embedding climate and health considerations into planning processes, ensuring that regeneration does not inadvertently increase exposure or entrench inequalities.

The health co-benefits of climate-sensitive regeneration are diverse and well-documented. Physical health improvements include reductions in heat-related morbidity and mortality through UHI mitigation (Ketterer & Matzarakis, 2014), better air quality through vegetation and low-emission mobility (Steeneveld et al., 2018), and increased opportunities for physical activity in accessible, walkable neighbourhoods (Rosso et al., 2022). Mental health and well-being benefits arise from improved access to green and blue spaces, which foster relaxation, social interaction, and a sense of place (Mosca et al., 2021). These effects are particularly valuable in urban environments where stress, isolation, and environmental degradation can erode quality of life (Frumkin et al., 2017). Environmental health outcomes, such as enhanced biodiversity, improved soil and water quality, and reduced pollutant loads, also indirectly support human health by improving ecosystem services (Schmidt & Walz, 2021).

One recurrent theme in the literature is the risk of carbon lock-in, situations in which poorly designed regeneration results in long-term reliance on carbon-intensive technologies or maladaptive configurations (Seto et al., 2016). For example, energy-intensive cooling systems introduced to address heatwaves may increase emissions and exacerbate climate change over time if not paired with efficiency measures or renewable energy sources (Roetzel et al., 2010). Regeneration offers the opportunity to break such cycles by prioritising flexible, modular, and low-carbon designs. This requires foresight in planning to anticipate future climate scenarios, demographic changes, and technological advances, ensuring that interventions remain relevant and effective over decades (Kyprianou et al., 2023).

While the physical dimensions of regeneration are often well-advanced, governance integration remains a critical bottleneck. Misalignments between municipal, regional, and national policies can create gaps or redundancies in adaptation and mitigation planning (Foshag et al., 2020). Limited cross-sectoral coordination between urban planners, public health agencies, and environmental departments can further hinder the delivery of co-benefits (Herrmann et al., 2018). Successful regeneration for climate and health depends on multilevel governance that enables knowledge sharing, aligns incentives, and mobilises diverse resources. This governance framework must also institutionalise mechanisms for community engagement, ensuring that residents have a voice in shaping the physical and social environments that affect their health and resilience (López-Bueno et al., 2020).

5. SOCIOECONOMIC IMPLICATIONS OF CLIMATE-ORIENTED URBAN PLANNING

Urban regeneration that integrates climate change adaptation and mitigation is not only an environmental or public health strategy; it is also a socio-economic intervention. The configuration of regeneration projects influences employment, economic growth, real estate dynamics, infrastructure costs, and, critically, the distribution of benefits and burdens across different population groups. As the literature shows, these socio-economic implications are often decisive in determining the political feasibility and long-term sustainability of climate-oriented urban planning (Kyprianou et al., 2023).

A central socio-economic dimension of climate-oriented regeneration is equity, the fair distribution of both the benefits and the costs of urban transformation. The review indicates that climate change impacts, such as heat stress and flooding, disproportionately affect low-income and marginalised communities, who often have less access to adaptive resources, such as air conditioning, insurance, and green space (López-Bueno et al., 2020). Without deliberate safeguards, regeneration can exacerbate these inequalities through green gentrification, where environmental improvements drive up property values and displace vulnerable residents (Ling et al., 2020). The SWOT analysis conducted in Kyprianou et al. (2023) identifies inequalities as a recurrent theme across strengths, weaknesses, opportunities, and threats. While regeneration can reduce vulnerability by improving housing, infrastructure, and access to nature, it can also deepen disparities and enhance gentrification, if benefits accrue disproportionately to already advantaged groups (Kyprianou et al., 2023). Thus, equity-oriented design requires policies such as affordable housing quotas, anti-displacement measures, and targeted investments in underserved neighbourhoods.

Regeneration projects can stimulate local economies through construction, retrofitting, and maintenance activities, generating both short-term jobs and long-term employment in green sectors (UN Habitat, 2021). For example, NBSs, including urban forestry, green roofs, and wetland restoration, require skilled labour for design, installation, and upkeep, creating opportunities for workforce development (Mutani & Todeschi, 2020). Energy efficiency upgrades and the deployment of renewable energy infrastructure in regenerated areas can reduce utility costs for households and businesses, freeing up income for other expenditures and stimulating economic activity (Roetzel et al., 2010). At a systemic level, health improvements from reduced pollution and heat stress can lower public healthcare expenditures, yielding indirect fiscal benefits (Herrmann et al., 2018).

Despite these benefits, the literature emphasises the economic risks of carbon lock-ins, in which urban investments commit cities to costly, carbon-intensive, or unsuitable trajectories. Inadequate regeneration can also generate ongoing maintenance costs that outweigh benefits, particularly if materials or systems degrade faster than expected or require specialised servicing (Daghistani, 2021). Moreover, if climate projections are underestimated during the design stage, regeneration investments may fail to provide adequate protection against future hazards, necessitating costly retrofits or emergency responses (Seto et al., 2016).

Climate-oriented regeneration can enhance urban competitiveness by improving quality of life, environmental performance, and resilience, factors increasingly important for attracting residents, businesses, and tourists (Rosso et al., 2022). Cities that proactively integrate climate adaptation and health promotion into their planning can differentiate themselves in global networks, positioning themselves as innovation hubs in sustainable urbanism (Monteiro et al., 2022). However, this competitive framing must be balanced with inclusivity goals. Regeneration that focuses solely on attracting investment risks, prioritising high-value districts over marginalised areas, thereby undermining city-wide resilience and health equity (Ling et al., 2020).

Governance structures and the degree of community participation in regeneration mediate socioeconomic outcomes. The literature underscores that participatory planning, where citizens, stakeholders, and local organisations are actively involved, enhances social capital, trust in institutions, and collective problem-solving capacity (Foshag et al., 2020). These intangible assets can have long-term socio-economic value, fostering networks that support emergency response, neighbourhood maintenance, and mutual aid during crises. Community-driven approaches also help align regeneration with local needs and preferences, reducing the risk of underutilised or rejected interventions (Frumkin et al., 2017). However, participation must be inclusive and accessible, avoiding *pro forma* consultation that reinforces existing power imbalances (Kyprianou et al., 2023).

6. COMMUNITY PARTICIPATION AND EQUITY

While technological innovation and physical interventions are vital for climate-oriented urban regeneration, the literature repeatedly emphasises that their success ultimately depends on governance structures and the degree to which communities are engaged in the planning, implementation,

and stewardship of regeneration projects (Kyprianou et al., 2023). Without inclusive participation, even technically sound projects risk misalignment with local needs, fostering distrust and exacerbating social inequities.

Participatory planning recognises citizens as co-producers of urban space, rather than passive beneficiaries of expert-driven design (Frumkin et al., 2017). By integrating local knowledge, lived experiences, and community priorities into decision-making, cities can develop interventions that are more contextually relevant, socially acceptable, and resilient over time (Foshag et al., 2020). Evidence from the systematic review of Kyprianou et al. (2023) shows that community-driven adaptation measures, such as neighbourhood-based greening initiatives, local cooling centres, and participatory mapping of heat-vulnerable areas, enhance both the effectiveness and equity of climate responses. These initiatives not only address immediate hazards but also strengthen social capital, improving collective capacity to respond to future shocks. Ensuring equity in participation requires proactive measures to involve marginalised groups who are often underrepresented in urban governance processes. Vulnerable populations, including low-income residents, the elderly, migrants, and those in informal housing, may face barriers to participation such as language differences, limited access to information, or competing economic pressures (López-Bueno et al., 2020). To overcome these barriers, regeneration processes must adopt inclusive engagement methods, such as multilingual outreach, accessible meeting formats, childcare provision during consultations, and collaboration with trusted local organisations. Without these measures, participatory processes risk reproducing existing power imbalances and legitimising inequitable outcomes (Herrmann et al., 2018).

Community participation in regeneration yields a range of co-benefits that extend beyond the immediate climate and health objectives. Engagement processes can foster trust between residents and institutions, create opportunities for local employment in project implementation, and encourage behavioural changes, such as energy conservation or active transportation, that further reduce emissions and improve health (Rosso et al., 2022). Moreover, participatory approaches can generate bottom-up innovation, where residents propose solutions that might be overlooked in top-down planning, such as informal cooling strategies, culturally appropriate public space designs, or low-cost retrofitting methods (Foshag et al., 2020).

Multi-level governance is essential for embedding participation and equity into regeneration projects. This involves coordination across municipal, regional, and national levels, as well as collaboration between governmental

bodies, non-governmental organisations, academia, and the private sector (Kyprianou et al., 2023). In Europe, these governance arrangements are increasingly informed by "Health in All Policies" approaches that aim to integrate health and equity considerations into decision-making across sectors, including spatial planning, climate mitigation, and adaptation (Green et al., 2021; *Health in All Policies (HiAP) Framework for Country Action*, 2014). At the same time, they interface with EU climate and health legislation, such as the European Climate Law, the Nature Restoration Regulation, and the Regulation on serious cross-border threats to health, ensuring that local regeneration contributes to legally binding climate-neutrality, biodiversity restoration, and health-preparedness objectives (European Parliament, 2021, 2022, 2024). When institutional frameworks mandate participatory processes, through legal requirements, funding conditions, or performance indicators, engagement is more likely to be meaningful and sustained. Furthermore, integrating equity metrics into project evaluation can help ensure that regeneration delivers proportional benefits to disadvantaged communities. These metrics may include measures of health improvements, access to green space, housing affordability, and resilience capacity across different socio-economic groups (López-Bueno et al., 2020).

7. CONCLUSIONS

Climate change presents a persistent and multidimensional threat to urban environments, affecting both human and environmental health while interacting with entrenched socio-economic inequalities. Urban regeneration, when strategically designed and inclusively governed, offers a unique opportunity to align climate change adaptation and mitigation with the promotion of health equity and socio-economic resilience. However, effective regeneration depends on integrating physical interventions, such as green infrastructure, climate-responsive materials, and optimised urban form, with non-technical measures that embed participation, equity, and multi-level governance into planning processes. From an environmental and health perspective, regeneration can directly reduce exposure to hazards such as extreme heat, flooding, and air pollution through interventions like nature-based solutions, permeable surfaces, and advanced building materials. These measures yield co-benefits that extend beyond hazard mitigation, improving mental and physical well-being, enhancing biodiversity, and contributing to climate mitigation through reduced energy consumption. However, the evidence warns that such interventions must be context-specific to avoid unintended consequences, such as reflective pavements increasing mean radiant temperatures in certain

configurations. It must be designed to prevent carbon lock-ins that could constrain future adaptation pathways. Socio-economic outcomes are equally significant. Regeneration can deliver economic co-benefits, including job creation, reduced healthcare costs, and enhanced urban competitiveness, but without equity safeguards, it may also contribute to green gentrification and displacement. Targeted policies, such as affordable housing provisions, anti-displacement measures, and equitable distribution of public investments, are necessary to ensure that benefits accrue to vulnerable populations who are most at risk from climate change. Participation emerges as both a principle and a mechanism for ensuring that regeneration addresses local needs and priorities. Inclusive, community-driven planning enhances social capital, builds trust in institutions, and can generate bottom-up innovations that improve project effectiveness. In conclusion, the path toward climate-ready, health-promoting, and socio-economically inclusive cities lies not in isolated technical fixes, but in integrated strategies that view urban regeneration as a dynamic, participatory, and adaptive process. By aligning environmental sustainability with public health and social justice, regeneration can serve as a transformative tool, turning climate challenges into opportunities for building resilient, equitable, and vibrant urban futures.

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“STONE SOUP”: A PARTICIPATORY URBAN GAME FOR BETTER PLANNING PRACTICES

ABSTRACT

If urbanism and architecture have the tools to conduct urban planning practices, when the objective is to adopt a participatory approach, there are several ways to implement it.
“Stone Soup” is an urban game that aims to improve urban planning practices through community participation. More specifically, we developed it, considering adaptation and mitigation to climate change on the one hand, and urban health on the other.
The name derives from a Portuguese myth in which a substantial soup is made from sparing ingredients. In the game form, it was developed in the context of the CliCCHE Erasmus+ project, integrating a participatory approach.
In this article, we will review participatory approaches in architecture and in urban planning in the Portuguese context. After that, we will describe the “Stone Soup” urban game, one of the methodological tools proposed in the context of CliCCHE. This tool aims to take the perspectives of different social actors into account, from residents and local associations to municipal technicians, architects, and academic professionals, and to encourage urban planning strategies more adequate to the present and to the climate challenges of our cities, promoting equal and horizontal participation.

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KEY WORDS
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1. PARTICIPATORY PROCESSES IN ARCHITECTURE. THE CASE OF PORTUGAL

In the context of the CliCCHE project, as mentioned in this volume in different ways, the authors of this article had the opportunity to contribute with their expertise in social sciences, urban studies, and architecture. When the moment of building a methodology arose, we made suggestions trying to integrate these different disciplinary perspectives. In this article, we dedicate special attention to describing the "Stone Soup" tool, a participatory methodological tool that will be explained after presenting the Portuguese context, considering participatory processes in architecture. The final part of the article is dedicated to recounting the experiences with the "Stone Soup" urban game and analysing the results, thereby showing the potential and limitations of this tool, which can be useful for sustainable urban planning. Urban games can be considered as an engaging training course based on game simulation, not necessarily associated with digital games, oriented towards the construction of visions, scenarios and projects for the future. The players (students and citizens who take part in them) experience forms of interaction through a game form - they learn and interact with each other (Brkovic Dodig & Groat, 2019; Traetta, Toto & Lombardi 2021). Mela Kosher offers specific suggestions for designing an urban game, warning that attention should be paid to the game's physical demands (Kocher 2019: 273).

Urban games are often linked to participatory processes that, in architecture, are framed within a debate encompassing the discipline's history, mainly from the mid-1950s onward. The debate over participation in public housing neighbourhoods began primarily in the 1970s. For that matter, one of the references is the Italian architect Giancarlo De Carlo, who defines how the architect should dialogue with others, especially the project's users, aiming to build an architecture of participation (De Carlo, 2013).

Following De Carlo, form and context are interconnected, and the architectural process is not linear, but reticular, composed of networks and actors. The author believed that architectural forms modify human behavior and that a system of complex forms the context, and sometimes contradictory, social forces (De Carlo, 2013: 48). To address the issue between architectural form and social context, he calls for an architecture of participation, guaranteed "when everyone intervenes equally in the management of power (...) or when power no longer exists because everyone is directly and equally involved in the process of decision-making" (*Idem*: 61).

One of the most notable participatory processes in the Portuguese context was the SAAL (Local Ambulatory Support Service). The program was launched in 1974, by order of the then Secretary of State for Housing and Urban Planning, the architect Nuno Portas.

Presenting itself as an instrument of political action, it was, without doubt, an unprecedented experience on the national scene in terms of what we today call participatory processes, becoming an alternative for resolving the housing problems of the time (Madeira da Silva et al., 2016). Following this singular experience in the panorama of architectural practice in Portugal, others followed, the foundations of which derive from SAAL (see authors who have extensively analysed it, as Bandeirinha 2007, Costa & Costa, 2022, etc).

In 1974, the housing situation in Portugal was worrying. It was estimated that the country lacked more than 600,000 dwellings and around 25% of the population was in unlivable conditions (Bandeirinha, 2007: 68). Therefore, SAAL fits into a particular political period in Portuguese history, shortly after the end of the dictatorial regime, which occurred with the Carnation Revolution on April 25, 1974, and within the scope of PREC – Ongoing Revolutionary Process— which had a set of actions that included housing and other areas related to social rights.

Nuno Portas stated that the most original feature of the program was, perhaps, the ability to delegate management to the residents' associations, "so that participation does not become just another illusion or a more sophisticated form of co-optation, there needs to be a true influence or decision-making power on the part of those who want to participate" (Portas, 1984: 26).

Fig. 1 - Film cover of the "As Operações SAAL" of João Dias © Manuel Dias. Source: https://www.agendalx.pt/events/event/as-operacoes-saal-de-joao-dias/

Fig. 2 - Presentation of an architectural model in a SAAL operation, 1976 © Fernando Bagulho. Photo taken from Pires, C. (2023, 15 April). Operações SAAL: pode a habitação em Lisboa aprender com este sonho de Abril?. *A mensagem*. Source: https://amensagem.pt/2023/04/25/operacoes-saal-habitacao-lisboa-sonho-de-abril/

Despite lasting just over two years, it was a program that turned into a process (Santos, 2024: 46) because it knew how to combine architectural design with self-construction, and the right to housing with the right to the city (Lefebvre, 1967), dialoguing between the various levels of governance - State and local power - and with popular participation (Portas, 1986).

The first results began to appear when the program was revoked. The architect Teotónio Pereira considered SAAL as a "program dead at birth, just when its practical results were beginning" and "At the time of the Ministerial Order that "shifted" SAAL's competence to the municipalities, 169 operations were in operation across the country, involving almost 42 thousand families. There were 2,259 homes under construction and the start of another 5,741 was imminent." (Bandeirinha, 2007: 14; 52-53). Despite its short existence, this program produced interesting results, being perceived as best practice in international literature (e.g., the Casabella journal) and continuing, even today, to be an innovative reference in the Portuguese context.

However, the spirit of service and dialogue between experts and populations tended to be lost, and, with isolated exceptions, there were no similar experiences until the end of the 20th century. The populations were not called to participate, not even when, in the 1990s, a large-scale social housing policy was implemented.

In the 2000s, the international financial crisis changed the paradigm of architect participation in society. As De Carlo puts it, "If until then the theme of participation in architecture focused largely on the perspective of user integration throughout the entire 'architectural operation'" (De Carlo, 2010), from that moment on, the place and the role of the architect in the social territory where he or she intervenes, changed. (Madeira da Silva et. al., 2016). Portugal was no exception. Therefore, from 2008 onwards, the change in the social and economic context led the architect's activity to a paradigm shift in relation to professional practice: the traditional model developed in a studio centered on the cycle that goes from commissioning the project to the construction of the building continued, but new architectural intervention practices emerged, including activities related to society's intervention in the implementation of projects. These new practices, called "emerging practices", an expression used by Luís Santiago Baptista to define the production of "young Portuguese architects in times of crisis" (Baptista, 2014: 20), granted the intervention and practice of the architect greater participation from society and, alongside that, a greater relevance of the cultural, social, ethical and political dimensions, together with the technical and aesthetic dimensions, of their work.

At the international level, new critical concepts emerge challenging the architect's participation in society, and pointing to greater proactivity by the same architect in defining territorial intervention strategies – this is the case of the Urban Curating concepts (cf. Bunschoten, 2003); unsolicited architecture (cf. Bouman, 2007); Critical Spatial Practice (cf. Miessen, 2010); Space Agency (cf. Awan et al., 2011).

Following the international trend of a critical approach, the architect Inês Moreira (2010) refers to the term "spatial practices", in the context of the production made by young Portuguese architects. According to Inês Moreira, these practices indicate 'an "undoing" of the authorial centrality, of drawing or of the dominant «architecture»" (Moreira *apud* Baptista, 2012: 99), insofar as "the authors involved enunciate economic issues, corporate and architectural policies and expose the desire to build a collective project' (*Ibidem*). Although they do not recognise themselves as a generation, the practices of these young architects are characterised, according to Baptista (2011), by collective organisation and/or interdisciplinary collaboration. They are even nicknamed 'generation z' by *arq.a* magazine (cf. Baptista, 2011), considering the previous generations x and y, identified by Pedro Gadanho and Luís Tavares Pereira, in the 'Metaflux' exhibition in 2004. Ferreira (2014) highlights an important aspect to maintain: the architect must assume himself as a promoter of local intervention initiatives, and creative social strategies can generate socio-territorial innovation (Ferreira: 2014). Scientific literature on the architectural profession in the context of current transformations is scarce. There are two surveys commissioned by the Order of Architects in 2006 (Villaverde Cabral and Borges, 2006) and in 2013 (cf. Ravara et al., 2013), in addition to a book, by Pedro Brandão (2006), which allow us to understand the evolution of the profession of architects in Portugal. However, little or no emphasis is given in these studies to the "emerging practices". These practices were presented in the following years at Exhibitions, such as "GENERATION Z#1 collectives of architects" in 2009, held at the Order of Architects' headquarters, where different collectives participated (such as Kaputt, alteliermob, the Embaixada and the Blaanc). Another exhibition to be highlighted was *Tanto Mar, Portugueses fora de Portugal*, presented at the Belém Cultural Center (CCB) in 2014, whose curators were part of the ateliermob. It is no coincidence that Ateliermob was the main stakeholder of Iscte for the CliCCHE project. Their perspective on collaboration and participation was crucial for this collective.

In addition to these exhibitions, there were other moments of publicity, such as the cycle of Conferences "Os Universalistas" in 2018, which was held at the *Casa da Arquitetura*, where, together with renowned architects, collectives

such as Embaixada, Artéria, Error 43, the Fala, the DEPA, and the COMOCO attended and participated. Despite the relatively scarce literature, the magazine *arq.a* published three volumes dedicated to Generation Z (between October 2009 and December 2011), along with a volume of the journal A21 (May 2010), which cover theme was "Map of young spatial practices" (*Mapa de Jovens Práticas Espaciais*), a research by the aforementioned architect Inês Moreira. To conclude this section, it is important to note that there is a common denominator among young architects from Generation Z: they see themselves as promoters of local intervention initiatives and of creative social strategies capable of generating socio-territorial innovation.

2. THE MAKINGS OF THE STONE SOUP

The "Stone Soup" tool was developed within the framework of the CliCCHE project, which aimed to develop training programs for higher education students and urban planning professionals to enhance planning competencies, considering climate change and its effects on urban health, as well as the adaptation and mitigation of these effects. The project started with a literature review (Kyprianou et al., 2023); after that, the teams from the five participating universities (Università di Camerino; Cyprus Institute; National Research Council CNR; University of Belgrade; ISCTE) elaborated the teaching methodology, which included the production of specific tools. This methodology stipulated that the training program involved selecting a case study that could be a city neighbourhood, in which a planning action would ultimately be exercised to improve sustainable urban life, considering specific environmental problems of a given population and place. To this end, an important section of this methodology is dedicated to deepening knowledge about the location and the target population, which we termed "Local Inquiry and Mapping- Getting to know the neighborhood from above and from within".

Within this context of deepening knowledge of local reality, a set of qualitative methodological tools were adapted: i) "15 Minutes Proximity", based on 15 minutes-city concept (Moreno et al., 2021), which aims to understand the accessibility to a variety of services within a 15-minutes timeframe in a given territory; ii) "Interviewing," which, as the name suggests, focuses on the interview as a qualitative methodological tool, facilitated by the suggestion of developing an interview guide and informed consent; iii) "Photo Elicitation," aimed at knowing better the local population either through photographs previously taken by the population (showing photo albums) or through images recorded in the moment and explained by the residents;

iv) “Recording Fieldnotes,” proposes that students/researchers write down about what they observe during fieldwork (including reflections, descriptions of events, etc); v) “Walking as a Research Method,” intended to carry out territorial knowledge with the assistance of residents, through informed and informative walks. Finally, the “Stone Soup”, an experience of a participatory activity that can also be considered, to a certain extent, an urban game, which we will describe subsequently, is also part of this package. In total, the Toolkit comprises 24 fully described activities, incorporating classic pedagogical tools such as debates and the presentation of works, as well as diverse environmental condition-monitoring activities. All these tools can be consulted and utilised in the project results at www.clicche.org.

Returning to the main topic of this paper: What is the “Stone Soup” urban game, and why did we give it this name?

The “Stone Soup” name comes from the traditional Portuguese legend with the same name. We draw upon the book “Portuguese Legends” in Costa’s (2014) version. Briefly, the story tells of a monk who was begging in the plains and, feeling tired, knocked on the door of a wealthy but miserly farmer. The monk picked up a stone from the ground and said he could make a good soup from it. The farmer didn’t believe him, so the monk asked for a pot to demonstrate how he would do it. After putting the pot on the fire, he added the stone and asked for a cabbage leaf, which the farmer gave him, then a small piece of bacon, which the farmer provided, then a carrot, a potato, and a drizzle of olive oil. As these were small quantities, the farmer kept providing the ingredients without noticing he was doing so. In the end, he was amazed by the soup made with a stone, which seemed to him an authentic miracle.

In the game form, the tool was designed as an assessment instrument for an already completed planning project or as a participatory tool for new projects or parts of a planning project. Considering a specific location, a certain area, whether it be a neighbourhood with easily identifiable boundaries or other types of territorial parcels, the objective is to ensure the participation of the local population, while also gathering contributions from academia and public administration.

It is important to stress that the “Stone Soup” participatory urban game is not a digital tool, but an analog educational game. It involves the engagement not only of trainees, research and teaching staff, and populations, but also of so-called stakeholders, which in this case were embodied by local associations linked to the chosen territory, environmental associations, and personnel somehow connected to local administration.

As a game that aspires to effective participation, one of the objectives is to ensure this activity provides a safe space where contributions are anonymous, so everyone feels comfortable expressing suggestions for improving their territory and, sometimes, evaluating previous practices in the territory where they reside or work.

Fig. 3 - Pot with post-its used in the workshop in São João de Brito's neighbourhood. Photo: Teresa Madeira da Silva, 2023.

The metaphor can be described as follows: the stone represents the future; the pot represents the neighbourhood/territory in question; the different ingredients (which in practice are post-its of different colours) represent categories to be improved or transformed.

Translating each color into ingredients and their respective categories, we have: olive oil, represented by yellow post-its, alluding to the project/planning; carrot, represented by orange post-its, alluding to local health; meat, represented by pink, suggesting issues related to toxicity, different types of pollution, or specific environmental challenges; cabbage, represented by green, obviously referring to green spaces; and finally water, represented by blue post-its, referring to water management. All of them are cross-cutting issues for urban territories.

As in the Stone Soup Portuguese legend, the outcome of this game is a lesson for all participants. So, in the end, a summary of the activity should be made, including the idea or ideas that everyone agrees with, along with the diversity of thoughts and suggestions that emerge throughout the game.

Therefore, how is the "soup" made in practice?

This tool, which can also be considered an urban (non-digital) game, should preferably be conducted at a table with chairs where all participants can sit, and lasts approximately 90 minutes, sufficient time to prepare and serve a soup figuratively. In terms of materials, a large pot, a wooden spoon, post-its in five different colours (blue, pink, orange, yellow, and green), a stone, and pens or pencils (one per participant) are needed. A whiteboard or other vertical support is also necessary to organise the written material.

Participants include students, teachers, research staff, local community members (residents who may or may not be involved in local politics, people from one or more local associations), individuals linked to local administration, which in the Portuguese case typically corresponds to parishes and city councils, in various domains, from institutions under municipal supervision (examples: a library, an environmental office, a municipal service such as water and sanitation), to schools and other areas. In practice, the selection of local participants depends on the specific themes defined by the activity organisers and the existing partnerships between universities/schools and local institutions. Regarding the number of participants in Stone Soup, it should ideally not exceed 25 people to ensure effective participation.

The Soup will be prepared by the activity mediator, considering the following steps:

- The pot with the wooden spoon and the stone are placed in front of the mediator;
- The mediator will explain the game, and this task may take about 10 minutes: he or she will explain the game, including all steps;
- The mediator distributes post-its in different colours to each participant and shows the pot where the "ingredients" will be placed;
- The mediator invites the participants to write their suggestions in a few words on the post-its (whether for improvement, new implementation, etc.);
- Each participant will place their post-its in the pot (the task of writing and placing the post-its should take 15 minutes at most):
- The mediator mixes the "ingredients".

This way, it will be impossible to know who wrote what. This is where this game differs from other similar ones using post-its, as these are mixed, regardless of whether they were written by university teachers, local inhabitants, local administration personnel, etc. This step is central because it guarantees the de-hierarchisation of each person's social positionality, and explaining this condition at the beginning of the activity is equally important in ensuring a safe space for active participation.

- The facilitator asks for two volunteers to stick the post-its on a board, organising them by colour, a task that will take about 10 minutes;
- One of the volunteers will then read the content of the post-its, without interruptions, so that everyone in the room has a global and total notion of the contents;
- After this, all participants may intervene if they wish, with the common objective of identifying the most recurrent suggestions and discussing the diversity found.

During the time for interventions, one of the participants will make a summary that will be shared in the end in a written, oral, and/or visual format, as long as the recording of the result and its sharing with the relevant parties (architects, urban planners, local officials, etc.) is ensured.

3. SOUPS THAT HAVE ALREADY BEEN MADE

The first time we put this tool into practice was within the scope of the CliCCHE project, precisely with the intention of testing the tool before including it in the Toolkit. Therefore, all tools have been tested before becoming part of the CliCCHE Toolkit. The testing of each tool was carried out by students linked to the universities participating in the project, who, along with researchers and teachers, evaluated the degree of success in implementing the tools. In the case of tools developed in the Portuguese context, Sopa da Pedra proved to be one of the most successful, based on students' experience and subsequent evaluations. Some tools also include e-learning versions. A PowerPoint presentation is accompanied by an audio description of the development of this same tool.

In the Portuguese case, the students who put the tools into practice did so within the scope of the Workshop "How to make Healthier Places?", with activities at Iscte (mainly lectures and debates), at the Coruchéus Library, in the Parish of Alvalade, Lisbon, and in the neighbourhood of São João de Brito, in the same parish. The library served as a place where data and results from interactions with residents of the São João de Brito neighbourhood were worked on. Before holding the workshop, the project's coordination in the Portuguese context established partnerships with several entities, including the Residents' Association of the aforementioned neighbourhood and, of course, the Coruchéus Library.

Fig. 4 - Map of the São João de Brito's neighbourhood. Source: Google Earth, adapted by the authors.

UPPER FIGURE

Fig. 5 - São João de Brito's neighbourhood. Photo: Teresa Madeira da Silva, 2023.

RIGHT FIGURE

Fig. 6 - São João de Brito's neighbourhood. Photo: Teresa Madeira da Silva, 2023.

Sopa da Pedra is activated on the last day of the workshop, after the display of the results produced by the students enrolled in the Workshop. In this first soup, students, teachers, researchers (from ISCTE and LNEC), neighbourhood residents, library staff, and two people from the Zero association, dedicated to protecting the environment, participated. This set of differentiated roles was specifically aimed at the diversity of participants and at an equitable approach to their roles, so that all contributions counted equally. The game took place as previously described. However, in terms of writing on the post-it notes, despite being asked to write an expression or a short sentence, some people wrote several lines in small font.

The reference context was an urban planning action carried out before the workshop (about a year earlier) in the District of São João de Brito, initiated by Lisbon Council. Given the presence of the CliCCHE project in the neighbourhood and the knowledge acquired by students and residents, all categories (local plan, water management, green spaces, pollution, and health) were included in the game, leaving the soup complete with all the ingredients.

Regarding the local plan (yellow), the post-its referred to recent works and to what should be considered to improve the spaces. For example, there is a need for more organised, fair parking; more social spaces; greater security; and a neighbourhood van to help with mobility. In terms of health, this dimension ended up being associated with pollution, green spaces and accessibility, that is, with health problems linked to climate change and possible adaptations/ solutions, but also with mental health, which was interesting to verify.

Regarding green spaces, there was unanimity among the social actors who collaborated in the game. In other words, the need for more and better green spaces was mentioned, along with more specific topics such as arranging waiting spaces, using local flora to improve spaces, and creating more shaded spaces.

Regarding pollution/toxicity, the pink post-it, there was also unanimity on one aspect: removing the airport from the city, as the neighbourhood is directly adjacent to Humberto Delgado International Airport. Excessive noise caused by planes is seen as the biggest problem, even though residents contacted at the workshop mentioned that they had become accustomed to the noise over time. One of the solutions presented, which could be applied in the short to medium term, is vegetation barriers, which greatly dampen noise not only from the airport but also from the circular road network. For water management, the need to regulate its use was highlighted through training, planning, and environmentally more favourable suggestions for the water economy.

Following the reading of all the post-its, there was a debate that lasted around 25 minutes. In total, 20 people participated in the game: 7 students, 4 stakeholders, 3 residents of the parish of Alvalade (2 from the São João de Brito neighbourhood), 3 from the organisation Iscte (teachers and researchers), 1 observer, and 2 public administration members.

Fig. 7 - Making of the Stone Soup during the workshop. Two volunteers stick the post-its on a board. TMS, 2023.

Fig. 8 - Making of the Stone Soup during the workshop. One of the volunteers read the content of the post-its. TMS, 2023.

After this first experience, which was well received by the participants, the pan, the wooden spoon and the stone were taken to two other experiments, as part of scientific dissemination activities, promoted within the scope of the research center where the tasks were developed. from the Portuguese team at CliCCHE, the CIES (Centre for Research and Studies in Sociology) at ISCTE. The first was at the European Researchers' Night 2023, and the second, as part of the celebration of Science and Technology Week 2023.

At the European Researchers' Night there was an opportunity for us to present this tool. It was an activity carried out over the course of an hour. People passed by the CIES stand, and the game was presented to children, young people and adults several times, both in Portuguese and in English. Participants were invited to write a suggestion for urban planning improvement in one or more Post-it categories/colours as long as they referred to the city of Lisbon. They could also leave their email addresses so we could send them the results, but no one did. Still, we kept the post-its.

The event in the context of Science and Technology Week, 2023 edition, took place at ISCTE precisely on National Scientific Culture Day, November 24th. Sopa da Pedra was one of the activities carried out with high school students. We had a class from a high school to play the game. The space chosen to think during the game was the school of the students present, including the school spaces and utilities. Everyone participated by writing on post-its. This time, however, we subdivided the participants into categories, so each subgroup had a post it color. The students made improvement suggestions and raised concerns, and they got involved in the game, showing contentment.

These two experiences, held beyond the CliCCHE project, show that the Stone Soup game is a flexible tool that can be implemented with groups of different ages and in diverse spaces.

Fig. 9 - Presentation of the methodological tool «Stone Soup» at the European Researchers' Night, September 2023. Photo: Sofia Rocha

Fig. 10 - World Science Day, Iscte, November 24th 2023. Photo: Caterina Di Giovanni, 2023.

4. CONCLUDING REMARKS

The “Sopa da Pedra” tool is not very different from other pedagogical tools that use sticky notes to attract participation from different types of actors (Christensen et al. 2020). However, considering the various experiences so far, the fact that it intends to be a safe space (where different social actors, from different social positions, are brought together with no distinction, because all ingredients go into the same pot) is interesting and was valued positively.

When reflecting on the significance of participatory methodologies, including this kind of analogue educational game, it is important to keep in mind that, despite their prevalence and relevance being beyond doubt, it is not easy for the results of participatory decisions to be actually taken into account in urban planning. A group of authors warn us of this, such as Eriksson et al. (2022), who investigated the effects of this type of participation, analysing a set of projects, and concluding that citizen participation, when it conflicts with legislation, ends up being ignored, since it has no chance of being carried out. Also, the goals projected by public policies might be a setback in this process, especially when residents don’t feel represented by them.

A policy decision embodies a unique normative entity, constructed around sets of normative understandings (Fischer, 2000), that might not align with the directions desired by citizens. This gap between citizens' expectations and policy decisions is one of the issues to be resolved in public participation.

According to Falanga (2018, p. 301), "citizen participation has often become the instrument for political, economic, and social elites to reinforce predefined agendas with renewed legitimacy", leading to a "façade" of participation process in public decision-making with no effective operationalisation. The path to making the participation process effective in urban planning remains difficult and requires an appropriate evaluation of participatory processes in public policy.

To actually take into account the voice of citizens in urban planning, good conditions are needed to organise and ensure participation (Eriksson et al. 2002, see also Mort, Rodriguez-Giralt & Delicado 2020). Based on the experience with the "Stone Soup" tool, we can say that participants better understand the plans for their places of residence when the information is clear, and expectations are not disproportionate to what is foreseen.

Without intending to convey a new idea about urban planning and local participation, it is central that the current movement of young architects who incorporate participation into their projects is gaining strength, especially given the urgency of the climate crisis.

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PARTICIPATORY URBAN DESIGN - THE EXAMPLE OF INTERNATIONAL PROJECT CLICCHE

ABSTRACT

Throughout the cycle of CliCCHE project (January 2022 – January 2024), University of Belgrade – Faculty of Architecture was applying its principles and results in regular classes and research and thus widely promoted the mission, vision and values of the CliCCHE project within its own academic community. In addition, during that entire period, most of the practical research and educational activities were realized in the city of Valjevo, the local academic partner of the project, in permanent cooperation with the most relevant institutions from the public, private and civil sectors. One of the main aims was achieved - development and testing of new experiences in teaching and studying at technical faculties of European universities in order to improve knowledge about strategies for adapting to climate change and for mitigating the impact on human health within urban regeneration projects. Therefore, it was a very significant experience for the students as well as for the teaching staff beside all challenges that were emerging during the process. The aim of the research is to explore the topic of urban health through the results of an international project and to present a possible methodology for implementing specific teaching techniques in accordance with the knowledge gained during two years of work on a scientific project. Accordingly, the scientific contribution of the paper refers to additional steps in the process of disseminating the results achieved in a scientific project.

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KEY WORDS
PARTICPATORY URBAN DESIGN
EDUCATIONAL PROCESS
URBAN HEALTH
MITIGATION STRATEGIES

1. INTRODUCTION

The concept of "urban health" and its significance in enhancing the quality of urban living spaces has been part of international discussions for decades. However, it was only with the 2016 "New Urban Agenda" that health was officially recognized as a crucial indicator of sustainable urban development (CliCCHE, About, 2024). While these topics are gaining traction in scientific discourse, they have yet to be integrated into university curricula, particularly in light of the pandemic, which highlights the critical connection between urban design and health. To address the disconnect between education, research, and professional practice, "Climate Changes, Cities, Communities and Equity to Health (hereinafter CliCCHE)" project aims to bridge these gaps by implementing an innovative transdisciplinary educational approach and utilizing unconventional tools to tackle the impact of climate change on urban health and equity in the context of urban regeneration in European cities. Project CliCCHE focuses on creating and testing innovative non-formal learning experiences to boost student motivation, engagement, and participation in urban design. During the two-year period of the project, this educational approach was developed collaboratively with input from citizens, professionals, and public administrations, aiming to achieve specific objectives such as enabling students to assess climate change impacts on urban health and equity, and fostering interest in urban regeneration through participatory activities like simulation games. By utilizing immersive virtual environments and public art, CliCCHE seeks to influence public administration practices, enhance citizen awareness of climate change effects, and establish a framework for defining adaptation strategies that can be adapted across EU countries.

One of the crucial parts of the CliCCHE project was the implementation of the "The Healthy Urban Planning Working Method" (hereinafter R2) in several subject curricula and with the help of the "Educational toolkits for healthy urban planning and urban participation" (hereinafter R3). University of Belgrade – Faculty of Architecture (hereinafter UB) had two such courses: compulsory course "Studio project – M02U_Participative Urban Design" (hereinafter PUD) and elective course "Public Art and Public Space" (hereinafter PaPs). The research polygon was the city of Valjevo in the Republic of Serbia.

It can be said that the mission, vision and values of CliCCHE project (CliCCHE, Home, 2024) were successfully promoted through the implementation of the R2 and R3 in two UB courses during the two-year period. In response to the pressing challenges posed by climate change and urban sustainability, the CliCCHE project has generated impactful results through its comprehensive research and educational initiatives at the UB.

2. THE HEALTHY URBAN PLANNING WORKING METHOD (R2) AND EDUCATIONAL TOOLKITS FOR HEALTHY URBAN PLANNING AND URBAN PARTICIPATION (R3)

Based on the research on mitigation and adaptation strategies of climate change effects on human health in urban areas, "The healthy urban planning working method" was developed within the CliCCHE project (CliCCHE, R2 Healthy urban planning Teaching Methodological Guidelines, 2024). One of the main goals of this method was its application within educational programs to equip teachers and students with the skills and knowledge to address and respond to climate change issues, in cooperation with stakeholders from the public, civil, and private sectors of society. By considering alternative health-based design scenarios, future professionals in the field of urban design can help these stakeholders better understand the proposed actions and endorse the anticipated impacts. During the R2 application process, the aim was for students to acquire knowledge about how interventions in the field of urban regeneration can be conducted with an awareness of the importance of urban health and adaptation to climate change. Also, the idea was that the whole process focuses especially on the cooperation with the public administrations, because of the future development of urban policies based on assessments of climate risks and the health status of the population. The R2 was summarized in an e-learning mode, which consists of an introduction to the method, and guidelines for its application intended for students in the form of seven short thematic videos:

1. ‘Integrated vision of “Urban health” regeneration’ (hereinafter A1) (CliCCHE, 4.1. Integrated vision of “Urban health” regeneration, 2024) is conceptualized so that learning outcomes should make student able to understand the challenges of living in urban environments, have knowledge of strategies how to adapt to and mitigate the impacts of climate change, to identify design options for urban regeneration, to improve urban health and to understand the role of community participation in decision making.

2. “Local inquiry and mapping: Get to know the neighborhood from above and from within” (hereinafter A2) (CliCCHE, 4.2. Local inquiry and mapping, 2024) should help that students achieve the ability in interpreting the quantitative and qualitative data that characterize the neighborhood and the ability to describe the various activities developed in a concise and effective manner, with the correct use of the technical language and ability to interpret the needs of different stakeholders, especially local population and public administration.

3. “Heath and Climate Profile Model” (hereinafter A3) (CliCCHE, 4.3. Heath and Climate Profile PartA, 2024; CliCCHE, 4.3. Heath and Climate Profile PartB, 2024) is significant for understanding of climate change impact on human health, and of using digital tools linking urban planning to human health. Thanks to this step, students should be able to build present and future climate scenarios and to understand and generate a thermal comfort map.

4. “Framework for model Evaluation” (hereinafter A4) (CliCCHE, 4.4. Framework Evaluation, 2024) can help students to achieve the ability to interpret the needs of the neighbourhood and its community, as well as the ability to understand the hierarchy of problems, resources, threats and opportunities by different stakeholder categories.

5. “Project Scenarios” (hereinafter A5) (CliCCHE, 4.5. Project Scenarios, 2024) offers to students the ability to recognize and evaluate the risks of climate change for health and living spaces in the neighborhood under study, to understand the priorities in the selection of adaptation and mitigation actions with reference to the health risks of the inhabitants of cities and urban spaces. Also, it offers them to recognize the importance of comparison with other disciplinary knowledge in addressing the issues of climate adaptation and to understand the importance of comparing different skills and needs in the selection of actions and projects for adaptation to climate change.

6. “Project proposals selection” (hereinafter A6) (CliCCHE, 4.6. Project proposals selection, 2024) provides students with different concepts and methods of evaluation and decision making, as well as an understanding of the evaluation concept in relation to different stakeholders’ interests. Also, they can gain skills to perform analysis and evaluation of urban design proposals, to communicate the results of an expert’s evaluation to different stakeholders, to moderate discussion between stakeholders in order to make a selection of urban design proposal.
7. “Results communication and dissemination” (hereinafter A7) (CliCCHE, 4.7. Results communication and dissemination, 2024) refers to gaining knowledge on different communication, presentation or dissemination formats, to understanding of the logic of their use in relation to different types of results and audiences and to understanding the importance of communication and dissemination activities for success of participatory project. Students can also achieve communication and presentation skills in different media, for different audiences and for different purposes.

In order to apply this method, using multiple tools was necessary to achieve adequate results due to the complexity of the research project. For that purpose, the “Educational toolkits for healthy urban planning and urban participation” were developed within the CliCCHE project (CliCCHE, R3 Educational toolkits for healthy urban planning and urban participation, 2024). Explanations for various tools were created in the form of a web tutorial for each of them. During the application of the R2 method within several courses, different teams used different combinations of the tools. The team from the University of Belgrade-Faculty of Architecture has used several tools within two subjects, such as:

1. “Climate Profile Ladybug Suite” (CliCCHE, Climate Profile Ladybug Suite, 2024) is a tool able to evaluate initial design options through solar radiation studies, analysis of view, and sun hour modelling. Integration with visual programming environments enables instant feedback on design modifications and a high degree of customization.
2. “Debate” (CliCCHE, Debate, 2024) should be used, in a word, for convincing the listener that your side of the proposition is desirable. Using it, students can learn to be thorough and accurate, to analyze, to distinguish between the vital and the unimportant, to prove their statements, to support every statement with valid evidence and sound reasoning-and they can learn to demand the same sort of proof for the

statements of others, to present ideas in a clear and effective manner, to think under pressure, to make decisions quickly and accurately.

3. “Printed presentation_posters and leaflets” (CliCCHE, Printed presentation posters and leaflets, 2024) as the most explicit way of presentation represents the most expressive means of communication with the general public. Displaying the poster enables viewers to ask questions about the project and the benefits it can provide, and the leaflets are portable printed materials useful for conveying additional information to audience. Posters enable viewers to ask questions about the project and the benefits it can provide, and leaflets are portable printed materials that help convey additional information to the audience.
4. “Public art presentation” (CliCCHE, PUBLIC ART Presentation, 2024) provides a sensory representation of the project results through public artworks, public art installations, public art events and other artistic aids exposed or performed in public spaces, freely accessible to all. It could be in form of visual art, performing arts, literature, music, film, digital art, street art etc. The public artworks stimulate viewers to ask questions about the project and the benefits it can provide. It is important to know that public art does not solve problems.
5. “Recording Fieldnotes” (CliCCHE, Recording Fieldnotes, 2024) refers to recording the material with the tools for observing during walking through the district with the help from who lives or have specialized information on the territory.
6. “Scenario Building Guidelines” (CliCCHE, Scenario Building Guidelines, 2024) aims to develop future visions that intend to favor structured reflections on the possible evolutions of the environmental, urban, and social context of the neighborhood under study.
7. “Selecting project proposals through public participation” (CliCCHE, Selecting project proposals through public participation, 2024) represents a process of analysis, evaluating and comparing alternatives (or options). It is necessary to facilitate decision-making about the future development of the area and the role of the planner is to present and mediate public discussion of the alternatives.
8. “Self study” (CliCCHE, Self study, 2024) is a self-directed approach to the acquisition of knowledge and/or competence in which students plan and carry out learning activities on their own, carried out under the guidance of an instructor. In this case, it specifically aims to

familiarize students with the principles of urban regeneration, design solutions to improve urban health and a better understanding of diverse stakeholder motivations.

9. "Walking as a research method" (CliCCHE, Walking as a research method, 2024) refers to the activity of walking as an interdisciplinary method, used in art/architecture as well as in social sciences. It is useful whenever researchers and students have a small amount of time to get to know the case study. The activity requires walking with someone who knows the territory well, capturing people's experience and considering realities and scales that are usually not observed. It allows one to observe the territory and at the same time to conduct an informal interview made on foot as a "walk along".

In order to create a flexible application of R2 method, it was formed in such a way that it is open for further upgrading and application in new conditions and specific thematic polygons in the field of healthy urban planning of cities.

3. APPLICATION OF THE CLICCHE RESULTS R2 AND R3 ON THE WORK WITHIN COURSES

As mentioned before, the R2 was directly applied to UB courses PUD and PaPs, with the help of R3, over a two-year period. The challenges in the research polygon, the city of Valjevo, were relatively straightforward: air pollution, insufficient parking spaces, the emergence of potential heat islands, the use of individual fireplaces, and a general lack of shade in specific areas of the city due to a shortage of trees. Students in both subjects were on a study program "Maser Academic Studies in Architecture", so they were mature enough to understand these topics in a more extensive way than their colleagues from the bachelor level.

Subject "Studio project – M02U_Participative Urban Design" or PUD, with its 17 ECTS during one semester, was ideal for the main application of the R2 method. The primarymary goal of the subjectto introduceoduceempowerer students to work in the field of participatory urban design, i.e., to expertly work on urban projects in complex urban areas with the active involvement of the public, local communities, and other relevant stakeholders in the processes of urban planning, design, and implementation. Throughout the course, students have the opportunity to enhance their knowledge in real-world settings through collaboration with various stakeholders from the public, private, and civil sectors. The application of CliCCHE results R2 and R3 was carried out in

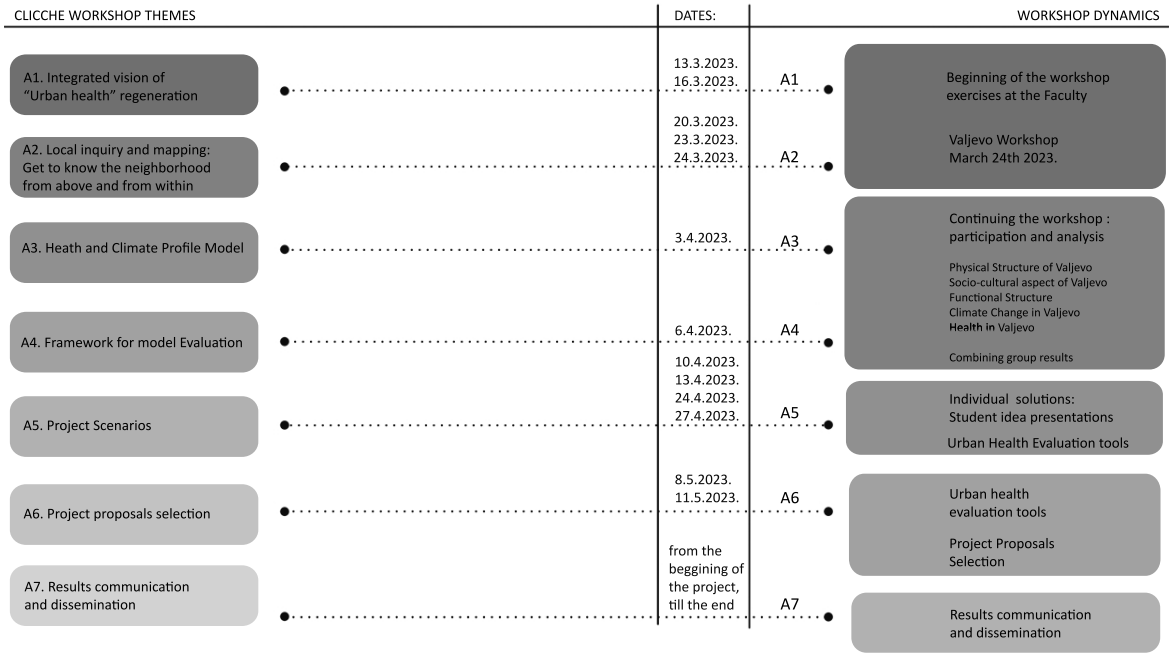


Fig. 1 - Graph depicting CliCCHE workshop themes adaptations for PUD

an intensive manner during the spring semester 2022/23 school year, which was consolidated under the term "University of Belgrade Local workshop" (hereinafter Lw4) (CliCCHE, Lw4 University of Belgrade (UB), Serbia, 2024). Figure 1 shows the implementation of R2 elements during specific periods of the semester in a more detailed manner.

As it can be seen, seven R2 themes were applied to the study process in the form of four thematic blocks (A1-A6) and fifth (A7) which was actually intertwined with all others.

During the first block, themes A1 and A2 were implemented. First of all, students and teachers have filled out the previously prepared questionnaire developed by the CliCCHE project team. Then, students were introduced to concepts of healthy city urban design, and shared their previous knowledge on the topics of climate change, ecology, and their relations to city design. They conducted research on the city of Valjevo and identified key stakeholders related to the mentioned topics. This was a sort of preparation for the research on the site. Soon after, the meeting in the Municipality of Valjevo was held.

Many stakeholders from public administration as well as from the civil and private sectors came to discuss challenges and opportunities for improving Valjevo's urban design, which could result in better health conditions, higher satisfaction among the people, and mitigation of climate change. Afterwards, participants filled out the previously prepared questionnaire prepared by the CliCCHE project team, and after the meeting, a site tour was organized by public administrators. It was followed by a spontaneous discussion between the students and citizens interested in these topics, during which citizens filled out the questionnaire while students were helping them.

The second block was in relation to the themes A3 and A4. It has begun with a SWOT analysis across five aspects: physical structure, functional aspects, socio-cultural characteristics, climate change, and people's health. To support this part of the process, several appropriate tools for urban health evaluation were used. The "Healthy Urban City Generator" has helped them integrate health planning into an urbanism project by considering factors such as air quality, noise pollution, and the accessibility of green spaces. The "Healthy Urban Planning Checklist" is similar to the one mentioned previously. It focuses on the health impacts of urban design projects on the city and considers factors such as walkability, access to healthy food, and public transportation availability. Finally, the "Healthy Built Environment Checklist" was used as a tool to evaluate the health impacts of urban design projects and built environments. Based on previous conclusions, students have developed 10 draft solution proposals for theme A5. Each solution addressed several problems and had an explanation of how it solves or mitigates that problem.

In relation to theme A6 "Project proposals selection", the next step was implemented as a workshop in the form of a simulation game. Each student was assigned the role of one stakeholder important to the implementation process, which was previously analyzed during the first and second blocks of R2 implementation. Students were trying to express their opinions and, from their stakeholder perspective, explain which projects are best suited to the topic of health and climate change, how much they contribute to the city of Valjevo, and what they think needs to be further improved.

Finally, the R2 theme A7, dissemination and communication of the achieved preliminary and final results, was carried out successfully throughout the semester. The results were promoted even outside the academic institution and presented to the general public thanks to the CliCCHE website, as well as the Instagram, Facebook and YouTube accounts managed by the CliCCHE team.

The elective subject “Public Art and Public Space” (PaPs), with 3 ECTS over one semester, is directly related to the previously mentioned tool “Public art presentation”. Its primary goal is to enable students to understand the activities in the process of planning, designing and realization of projects, which are accomplished by the interdisciplinary action of artists, architects, planners, and designers, as well as various forms of participation of the public and the local community. In relation to health and climate change in Valjevo, it has been beneficial for the development of a creative way to spread awareness of these important topics. Many creative public art projects were developed during the fall semester of the school years 2021/22 and 2022/23, and some were realized in the city of Valjevo in November 2023. On both subjects, during the R2 implementation process, a wide range of ideas and possibilities emerged from students’ work. Although air pollution in the city of Valjevo represents the most significant environmental problem, the students’ projects have also offered solutions to other problems in the city, related to climate change, people’s health, and equality.

4. RESULTS AND CHALLENGES

The outcomes of this project have been prominently showcased, not only in Valjevo but also at Serbia’s leading exhibitions, emphasizing the importance of public engagement and collaboration. By disseminating findings through various media channels and public presentations, the project has successfully raised awareness and fostered dialogue around urban regeneration and health equity. The initiatives and projects developed through CliCCHE demonstrate the potential for innovative solutions that address urban challenges while enhancing community well-being and environmental resilience.

Effective communication and dissemination are crucial for projects like CliCCHE to extend beyond the confines of their academic institutions. To reach a wider audience, CliCCHE utilizes various platforms, including a CliCCHE official website, as well as the Instagram, Facebook, Twitter and YouTube accounts managed by the CliCCHE team. The website showcases the project’s vision, mission, and values, and provides updates on past workshops and upcoming meetings, both online and in person. On the other hand, CliCHE accounts are complete and fully populated with posts, effectively showcasing key updates and enhancing visibility.

Additionally, website offers information on CliCCHE related activities on UB courses PUD and PaPs during the school years 2021/22 and 2022/23

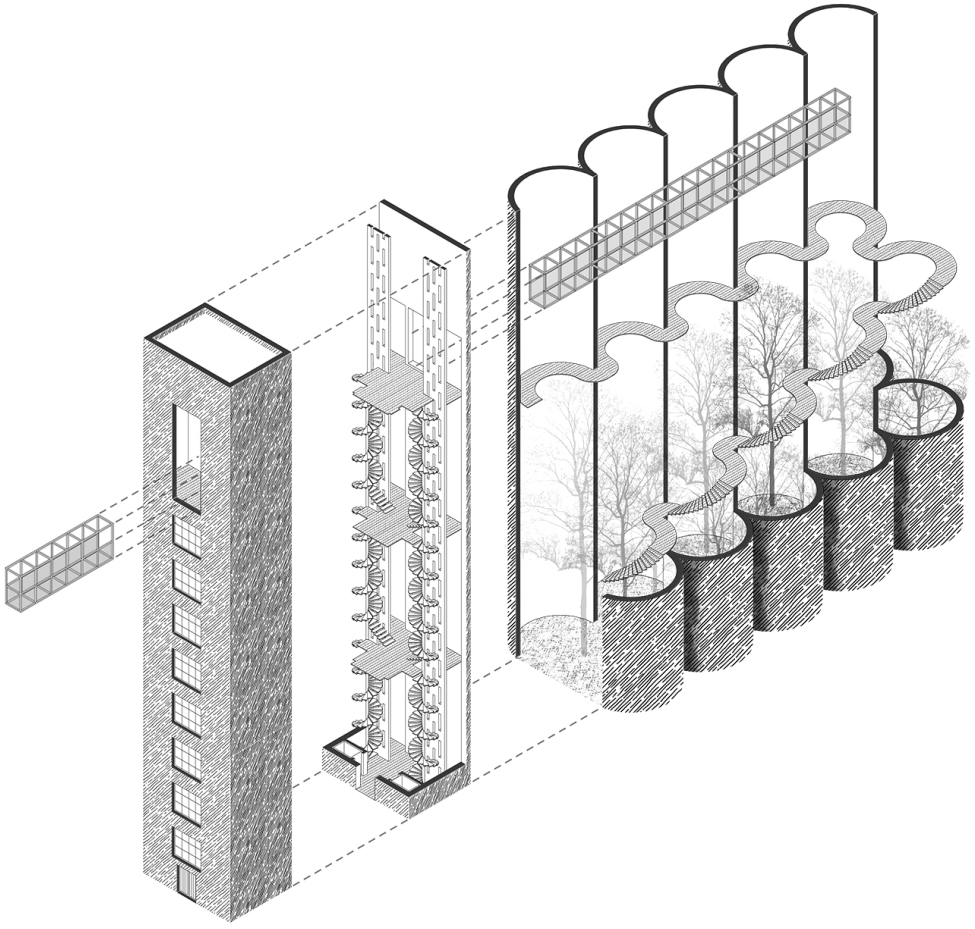
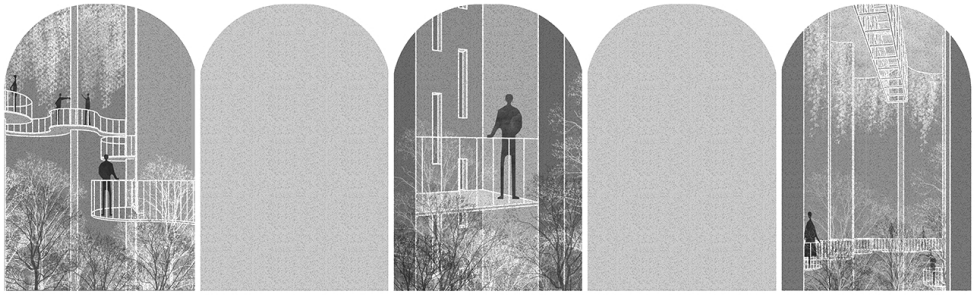


Fig. 2 - Visualization of the best evaluated project within the course PUD, “Oxygen Factory” by Nikola Markovic



(CliCCHE, add1 Participatory Urban Design Master Studio_school year 2021-2022, 2024; CliCCHE, add3 Public Art & Public Space + Urban Open Spaces, 2024; CliCCHE, add4 Participatory Urban Design Master Studio_ school year 2022-2023, 2024). The most important additional result represents the book "CliCCHE Participatory Urban Design" (Đukanović, et al., 2023). It is a reflection of the UB students' work during the school year 2022/23, carried out within the broader framework of the Erasmus+ European initiative CliCCHE. Its main goal is to reframe how we teach, research, and understand the relationship between urban regeneration and the human condition.

Implementation of R2 and R3 within courses PUD and PaPs proved to be a good basis for creating a methodology for working with students and introducing them to the topic of dealing with the consequences of climate change and its manifestations in urban areas. The creation of student solutions, in addition to the results obtained based on extensive analysis, was largely based on a survey conducted by students in Valjevo with the local population. A wide range of projects with different topics in focus referred to lack of green infrastructure, air pollution, river pollution, impaired human health, heat island, the emission of exhaust gases, activations the population and take care of health, a higher level of comfort in the urban fabric, collection of recycling waste, its further use and raising awareness about recycling, mental and physical health of people and dealing with is the storm water.

Each project made by students is briefly described below (Đukanović, et al., 2023):

- "Better Line" by Iva Bajić - The project proposes a conceptual solution to address various environmental issues in Valjevo, such as air and river pollution, by enhancing green infrastructure, purifying the river, and promoting community engagement to foster awareness and care for the environment.
- "WSUD" by Filip Mijailović - The project aims to revitalize the unhealthy area around the NIS pump in Valjevo by implementing detention pools to mitigate pollution and heat from the surrounding asphalt and concrete, ultimately enhancing the environment's quality and attractiveness while activating the right bank of the Kolubara River.
- "CIKLO" by Ivana Tomić - The project focuses on redesigning the street by eliminating vehicular traffic in certain areas and integrating bicycle pathways, thereby reducing exhaust emissions and promoting public health and well-being through increased active transportation.

- “Urban Garden” by Hristina Tomašević - The project aims to enhance comfort in the city’s central streets by addressing air pollution, noise, heat islands, and the lack of green infrastructure through activating street fronts, introducing bicycle paths, and incorporating adaptable green spaces and urban gardens to improve urban quality and residents’ health.
- “Recycling” by Edita Ljalja - The project focuses on recycling waste collection and raising awareness by installing recycling stations in public parks and educational institutions, fostering a new, eco-conscious lifestyle in Valjevo. These playful, multi-functional stations, with containers for various types of waste, also serve as outdoor learning spaces, helping reduce illegal landfills and encouraging sustainable practices among the youngest generation.
- “Urban Mini-Forests” by Jelena Ilić - The project proposes creating urban mini-forests in Valjevo to combat air pollution, reduce heat islands, and insulate against noise, with key locations incorporating additional features such as educational spaces, rest areas, and playgrounds to enhance community engagement.
- “City Botanist” by Jana Mijailović - The project envisions a sustainable urban oasis that blends nature and architecture, promoting mental and physical health, supporting biodiversity, and combating air pollution through community activities, including a farm market, sensory garden, and healing garden.
- “Oxygen Factory” by Nikola Marković (Figure 2) - The project aims to transform the derelict brownfield site of Valjevo’s old silos, once a symbol of air pollution, into a green space that produces oxygen.
- “UMBRELLA” by Milica Spajić - This project focuses on stormwater management in Valjevo’s urban centre by increasing surface porosity, installing rainwater collection systems, and adding multifunctional structures like inverted umbrellas to provide shade and water retention, while also connecting the city centre to the coast through green infrastructure and rest areas. “HEALING CORNERS” by Teodora Živković - This project for Valjevo builds on the Ladybug Climate analysis, introducing a “Climate Tile” pilot to manage 30% of excess rainwater from climate change, using bioreceptive concrete to reintegrate natural water cycles into the urban environment.
- “Work process tracking” by Tamara Mladenović - In this project, the student was tasked with monitoring the CliCCHE workshop and studio

projects throughout the semester, culminating in a book "CliCCHE Participatory Urban Design" (Đukanović, et al., 2023). that documents the process, a poster presentation, and a comprehensive analysis of Valjevo, which serves as the foundation for individual projects.

The outcomes of the CliCCHE project, along with the research and educational efforts of the UB, were showcased not only in Valjevo but also at Serbia's most prestigious exhibitions, the Salon of Architecture and the Salon of Landscape Architecture in 2023. These results were widely disseminated through mass media, daily newspapers, TV shows, websites, and social media platforms like Instagram, Facebook, and Twitter. Public presentations, art installations, and lectures drew hundreds of attendees in Valjevo, while thousands more engaged with the exhibitions nationally. Taking into account the viewership of local TV programs, the visibility of these results likely reached tens of thousands.

As a special event in the work process, the "Joint Intensive Course" was held in Lisbon (CliCCHE, C2 Joint Intensive Course, 2024). The event lasted for four days and each university held a presentation on how the R2 was implemented in their working contexts.

This diversity was very desirable and everyone had the opportunity to learn from other professional branches. Also, during this event, a workshop was held in which students were divided into four international teams, where each team was assigned one project theme in relation to one of the partner cities. These projects represent direct application of the "Public art presentation" tool developed by the UB team, and they were the inspiration for the Multiplier events, which were realized a few months later. Each project made by students is briefly described below :

- In relation to the "SOS AIR" event in Valjevo, the "Smokey Mirror" project was developed to raise awareness about the health risks of air pollution in the city, mainly caused by coal-fired furnaces for heating. Despite residents being aware of the issue, financial barriers often prevent a transition to cleaner alternatives. The group proposed installing a red-painted "smederevac" stove with a mirror inside in the city center as a metaphor, symbolizing the community's role in contributing to the poor air quality.
- In relation to the "I never thought that trees are so important to the city" event in Stravolos, the project addressed the lack of trees while demonstrating how trees and shade can mitigate urban heat islands.

A group of students conducted a straightforward experiment using colored ice, placing one bottle in the sun and another in the shade to illustrate how shade slows melting, effectively conveying the benefits of trees to younger audiences.

- In relation to the "Water as a friend" event in San Benedetto del Tronto, the group of students aimed to address the city's flooding issues by framing the problem positively. They suggested installing musical buckets on the main street in front of schools and the government building, which would produce various sounds when tapped, creating an interactive play area for children while simultaneously raising awareness among adults about the flooding resulting from heavy rains.
- In relation to the "Forever Communities" event in Lisbon, the group of students focused on the issue of noise pollution in a neighbourhood near the airport, where residents frequently rely on earplugs to cope with the sounds of planes during takeoff and landing. They proposed constructing a "safe space for the ears" in the form of a pop-up, transparent house that would provide sound insulation, enabling residents to enjoy a quieter atmosphere while encouraging community involvement by inviting children to decorate it with Lisbon's signature ceramic tile patterns.

In November 2023 the Multiplier event "SOS AIR" was held in the city of Valjevo (CliCCHE, E2 SOS AIR, 2024) and all results of their work were publicly presented to different stakeholders and the local community within and in front of the "Cultural center of Valjevo".

5. CONCLUSION

By integrating practical research and interdisciplinary collaboration with public, private, and civil sectors, the CliCCHE project has developed a framework that not only enhances technical knowledge but also fosters a deeper awareness of the social and environmental responsibilities of future architects. Throughout the process, students have acquired critical knowledge on assessing the health impacts of urban environments, understanding climate change projections, and applying participatory design methodologies. They have learned to engage with diverse stakeholders, navigate complex data, and utilize digital tools and simulations to model urban interventions. Through the process, we also realized that some topics, such as the Ladybug Climate analysis, require specialized expertise.

These areas of inquiry benefit from the involvement of experts who bring a depth of knowledge and technical precision, ensuring that students are exposed to cutting-edge approaches and solutions. This realization underscores the importance of interdisciplinary collaboration, not just across sectors but also across fields of specialized knowledge. This is where the true potential lies: the lessons learned throughout this cycle provide valuable insights into how architectural curricula must evolve to address contemporary crises, underscoring the vital role of academia in shaping more resilient, health-conscious urban environments.

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TOWARDS HEALTHY URBAN PLANNING IN VALJEVO: ASSESSING LIMITS AND POTENTIALS OF URBAN PLANS

ABSTRACT

Cities today are increasingly exposed to various challenges, including climate extremes, pollution, and declining quality of the urban environment, that endanger urban health. In response, the Healthy City concept is developed and becomes crucial, as it implies the integration of qualitative aspects of public health and ecological sustainability in all phases of urban planning.

This paper relies on the insights of the interdisciplinary Erasmus+ project CliCCHE - Climate Change, Cities, Communities and Equity in Health, which aimed to support healthy urban planning by developing specific educational methods and tools. The project was implemented through cooperation between academic institutions across the Europe and local administrations and communities. In Serbia, Valjevo was selected as a city for a case study since it was assumed that medium-sized cities are particularly affected by these challenges due to inadequate infrastructure but also to how urban planning documents integrate health issues.

The main goal of the paper is to examine the urban planning potential for guiding cities towards the concept of a Healthy City. Based on the literature review, the initial 2-step methodological framework for assessment of local urban plans is developed that evaluates level and key themes of health-planning integration and tests the potential for urban health improvement through CliCCHE educational projects. The results point to key gaps in current plans, but also to potential opportunities that could improve urban planning and contribute to a healthier and more sustainable urban environment.

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KEY WORDS
HEALTHY CITY
CLIMATE CHANGE
URBAN PLANNING
URBAN DESIGN
PUBLIC HEALTH
VALJEVO

1. INTRODUCTION

Healthy urban environments are a key goal for urban planning and design today. The negative effects of urbanization are globally recognized as threats to environmental, economic, and social health, and as such require clear design, planning, and strategic measures to achieve more sustainable urban environments. In addition, cities of all sizes are increasingly affected by climate extremes that amplify these adverse effects and cause new threats to urban health. Complexities and urban uncertainties that arise this way present significant challenges for urban planners and architects (Susskind, 2010;Krishnan, Aydin, Comes, 2023).

For that reason, the concept of a Healthy City is introduced and becomes a central focus of city planning (Barton&Tsourou, 2000; Corburn, 2013; Wang, Jiang, & Li, 2021). Urban planning and design are recognized as tools for promoting the health and well-being of cities and communities (Barton, H., Grant, M., Mitcham, C., Tsourou, C., 2009). In the context of climate change, the Healthy City concept unfolds through two main approaches. The first is mitigation, which includes mitigating the effects of climate extremes, and the second is adaptation, which implies greater resilience and the ability to adapt the environment to new conditions (Barton, 2017; Capolongo et al., 2018;). It is predicted that in the future the greatest environmental risks will be related to weather events, including overheating, more prominent urban heat islands, rising sea levels, increased storms, and rainfall (UN-HABITAT, 2011). Moreover, due to excessive urbanization, cities will be particularly vulnerable to floods (Elliot, Torres-Matallana, Teebken, 2025). These risks can significantly affect economic dislocation, migration, and the occurrence of disease in urban environments (Barton, 2017). In response to these problems, healthy urban planning should be developed to support the implementation of the Healthy City concept through city development strategies, policies, and planning documents.

In parallel, research on integrating health issues into urban planning and design evolves, aiming to inform and support national and local practices. Existing research takes into account that urban planning is a complex process involving a large number of stakeholders and that urban plans are the product

of this process that 'provide guidelines and standards for the growth and development of towns and cities, while ensuring compliance with local laws and regulations' (Pasquali, 2024). Most studies have addressed the theme of *health-planning* integration in a broader sense, providing insights for planning as a process (Barton & Grant, 2012). This mutual relationship between health and planning is seen as them being 'natural allies' (Barton, Grant, Mitcham & Tsourou, 2009). On the other hand, research on how to assess the potential of planning documents to support the implementation of the healthy city concept is recognized as important (Barton & Grant, 2012), but remains scarce. To address this gap, this paper narrows the focus from the broader theme of the planning process to the initial assessment of urban plans as their products that reflect values and knowledge that guide urban development.

The research focuses on assessing the health dimension of urban plans and aims to answer: How can urban plans be assessed for their potential to support the concept of Healthy Cities? By acknowledging that urban plans should not be viewed as finished products, but as 'evolving instruments that undergo continual revisions and updates' (Brody, 2003; Adolfsson, Lindblad, Peackock, 2021) it aims to support development of healthy urban planning. The paper outlines a two-step methodological framework for evaluating the limits and potentials of plans for accommodating the concept of Healthy Cities and applies it in a local context using case study methodology. This framework is based on a theoretical literature review along with an overview of the tools for urban health evaluation. Based on assessments using the proposed framework, the paper identifies the limits and potentials of urban plans and explores them through CliCCHE student pilot projects. These projects test and confirm the detected potentials, thereby suggesting improvements to urban plans towards healthier cities.

The research context is provided by the international, interdisciplinary Erasmus+ project CliCCHE - Climate Change, Cities, Communities and Equity in Health. The project CLICCHE was implemented in Serbia in cooperation with the local government of the city of Valjevo as a partner. The project lasted three years. Universities from several European countries (Portugal, Italy, Cyprus, and Serbia) participated in the project together with their students, in cooperation with local partner cities, various actors, and stakeholders. To represent the Serbian context in which medium-sized cities are particularly affected by public health challenges, the city of Valjevo has been chosen as a case study due to its relevance to the topic. Valjevo faces serious environmental challenges, including high air pollution, weaknesses in waste management and overall governance, insufficient protection of the rivers

running through the city centre, and poorly located industrial facilities. City residents are dissatisfied with the quality of their urban environment, and non-governmental organizations are trying to bring these issues to the forefront. For this reason, Valjevo was used as a case study to assess how planning potentials can be evaluated for the holistic application of the Healthy Cities concept. Findings of this research informed the topics by students at the University of Belgrade – Faculty of Architecture within the CliCCHE project. Examples of their projects will be illustrated at the end of the paper, together with the feedback that their projects give to further inform potential of the local plans.

2. HEALTHY CITIES CONCEPT AND PLANNING

2.1 Healthy City concept

According to the World Health Organization (WHO) - "Healthy cities are places that deliver for people and the planet. They engage the whole of society, encouraging the participation of all communities in the pursuit of peace and prosperity." The idea of a healthy city emerged in the late 70s and early 80s of the twentieth century, in the fields of medicine and public health. World Health Organization, first initiated the 'Healthy Cities' project in 1978, to promote public health in urban areas (UWE Bristol, n.d.). *Healthy Cities* is a 'long-term international development project'. It aims to place health among the first and most important considerations in the decision-making, management, and planning processes of cities (WHO, 1997). Although the project initially focused on health promotion through health campaigns and the behaviour of the urban population, it soon became clear that this principle has limited reach if the rest of the urban environment does not support a healthy lifestyle.

The theoretical basis of the concept is well illustrated through Barton and Grant's 'The Settlement Health Map' (Figure 1), through which the complex relationship between people's health and various factors of the environment they live in can be analysed. Authors place a person or a community in the center, at the inner circle of the map, around which the factors of influence from the narrowest to the broadest act concentrically. The diagram shows the different spheres of the living environment that affect the health of an individual (Barton, & Grant, 2012).

The authors classify lifestyle as the closest factor to health. Next are the influences of the community, local economy, activities, the built environment, and finally, the entire natural environment. The furthest and widest circle represents the global ecosystem and macroeconomic forces, political decisions,

and climate change itself, which shape the entire context for the functioning of cities and communities. The authors themselves suggest that this map can serve as the basis for a tool for urban environment analysis, as it includes a spectrum of significant characteristics for each urban space. Theoretical models like this one have influenced the rise of many strategic tools for urban health evaluation, planning, and more.

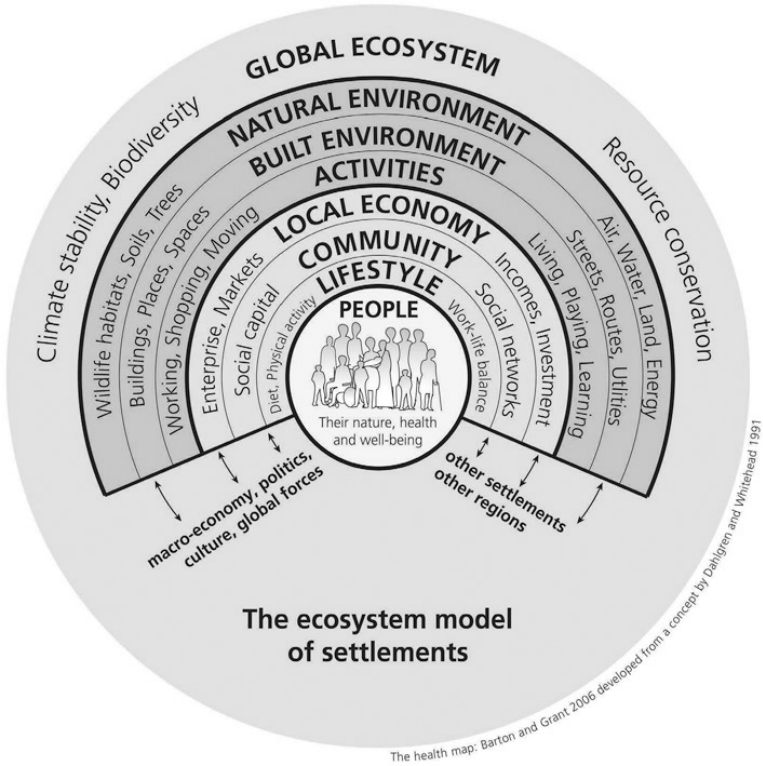

Fig. 1 - . The Settlement Health Map, Barton and Grant 2006. developed from the model by Dahlgren and Whitehead, 1991.

2.2. Healthy urban planning

Healthy urban planning refers to creating cities and communities that actively promote and protect the health and well-being of their residents and contribute to the health of ecosystems at all levels. It recognizes that the urban environment significantly impacts physical, mental, and social health. Therefore, the concept involves integrating health considerations into all aspects of urban planning, from the design of buildings and public spaces to transportation systems and access to resources.

"Healty Cities" project developed through several research phases that gradually strengthened the relationship between health and urban planning. Phase II and III put the focus on the *integrated planning* of healthy cities (WHO, n.d.) and since then, WHO has been working with planners to develop guidelines for the urban planning of healthy cities. The role of planning was further stressed through *HUP - healthy urban planning initiative*, which aims to gather, educate, and engage planners in the healthy cities project. As a result, the publication A WHO Guide to Planning for People was created. It defined twelve goals for the sustainable development of healthy cities. The most important goals were the promotion of a healthy lifestyle, regular physical activity, social cohesion, accessibility, quality housing and more (Barton, Grant, Mitcham, Tsourou, 2009). The "Healthy Cities" concept and approach to urban planning are also implemented through EHCN, the European Healthy Cities Network, which applies strategic and planning guidelines for the improvement of their environments.

Today, it is assumed that the concept of a Healthy City should be applied at all levels of city planning and design. It is widely accepted that health does not depend solely on medical care but, to a large extent, on the characteristics of the everyday environment. Poor urban planning can easily lead to poorer lifestyles, reduced active recreation, poor nutrition, and safety. Therefore, the approach to health in cities should be holistic and comprehensive, and combined with equally important aspects of the physical, social, economic and natural environment quality.

2.3. Assessing the health dimensions of urban plans: levels and themes

To assess the health dimensions of urban plans, it is crucial to identify the most relevant evaluation methods and factors that contribute to healthy urban planning. In this section, a literature review will be contucted to help create the initial methodological framework for assessing the limits and potentials of urban plans to support the Healthy City concept. Two main approaches for evaluating integration of health into urban planning are revealed that focus on: a) Levels of health integration into urban planning and b) Thematic areas of integration formalized through specific evaluation tools and indicators of health in urban spaces.

a) Level of health integration into urban planning

As a part of the WHO Healthy Cities research phases, Burton and Grant (2012) give significant insights into how to evaluate the integration of health into planning, and recognize three different levels of integration:

- The first level is basic and involves recognising the essential role of settlements in sustaining life. In planning, this means 'provision of shelter, access to food and clean water, fresh air and effective sewage treatment'. The authors conclude that in Europe this level is already present to a large extent. It has become normal and is taken for granted, while this is not the case with settlements in other parts of the world. They believe that excessive urbanization leads to difficulties in implementing even this basic level of health planning.
- The second integration level is based on the fact that many characteristics of the environment affect people's health and well-being. This includes parks (for providing opportunities for physical activity and access to fresh air), and gardens (for access to fresh food), but also bicycle networks for active movement, and a safer environment with reduced dependence on cars. The emphasis is on the often fragmented approach to these characteristics, which are conditioned by economic forces and urban development policies. These are often driven by other priorities.
- At the third level, the concept of health is fully integrated into planning. In this case, health is not a concept within the plan, but plans are formed for health as the main idea. In the formation of the plan, all necessary actors participate together to achieve this goal. Here, the focus is on the element of unified cooperation with the goal of 'pursuing economic objectives without creating unhealthy settlement form' (Barton & Grant, 2012). These levels of linking health and planning were considered key, and the authors used them in a later analysis of the development of Healthy Urban Planning within the WHO Healthy Cities project.

b) Thematic evaluation of the potential of urban plans to support Healthy City concept: Tools and indicators

The Healthy City concept relies on the principles of resilience, sustainability and guidelines for sustainable urban development. The principles of these different paradigms have major overlaps and are by no means mutually exclusive. While resilience strategies aim at mitigating climate extremes through greening, reducing urban heat island effects (UHI), increasing stormwater storage, flood management and more, the Healthy City concept

guides along similar lines. Improving these factors leads to improvements in overall health and well-being. The concept has already been sufficiently operationalized for implementation in projects and plans through frameworks and toolkits made for the more straightforward implementation in urban planning and design, as well as for evaluating existing spaces. Each of these evaluation tools provides an important set of indicators for evaluating the potential of plans to accommodate health, and they have many similarities.

These tools are heavily based on the existing healthy cities literature and are very useful for research, practice, and educational process. For example, the Healthy City Generator is an online tool that allows users to review the characteristics of the area and health indicators interactively.. The tool enables entering the data on existing spaces into its online generator, which, for a given local context, provides improvement guidelines for a healthier city. Their indicators include five themes: density, mobility, variety, landscape and housing and energy. Each theme is divided into more precise indicators, such as walkability, cyclability, availability of public open spaces, services, green coverage, blue spaces, housing quality, and many more.

Another useful tool is the Healthy Built Environment Checklist that promotes a well-designed built environment that ‘can help reduce risks and improve health outcomes’(NSW Health). It is an Australian practical tool from NSW (New South Wales) for health, building, and planning professionals. It proposes pre-checklist activities, such as understanding the plan in question, what is being proposed, who created it, the relation to other relevant policies, the context, equity, and promoting site visits. The checklist integrates 11 themes in this order: healthy eating, physical activity, housing, transport and connectivity, quality employment, community safety and security, open space and natural features, social infrastructure, social cohesion and connectivity, environment and health, and environmental sustainability and climate change.

Specific focus on application in urban planning has the Healthy Urban Planning Checklist (2014) (Figure 2) which “aims to promote healthy urban planning by ensuring that the health and wellbeing implications of local plans and major planning applications are consistently taken into account” (NHS, Healthy Urban Planning Checklist). The checklist aims to ‘promote healthy, successful places for people to live and work in’, by ‘providing homes, jobs, and services’. It consists of 4 key thematic areas, which cover different dimensions of a healthy urban environment. Each area contains a series of specific questions and guidelines that enable the analysis of the existing state of the city space, along with the planned interventions.

Each of the four main topics: Healthy Housing, Active Travel, Healthy Environment, and Vibrant Neighborhoods, includes planning issues and the related urban health and well-being problems. The checklist can also be used in the planning or evaluation phase of existing documents.

A comparison of the presented tools reveals that they take into account almost the same health criteria. Each tool emphasizes a healthy environment, access to fresh food, opportunities for active living and recreation, active transportation, diverse social infrastructure, connectivity, access to basic needs such as adequate housing, etc. Although these checklists function similarly

Figure 2 - Healthy Urban Planning Checklist (2014). (Source: https://unhabitat-urbanhealth.org/download/healthy-urban-planning-checklist/)

Theme	Planning issue	Health and wellbeing issue
1. Healthy housing	• Housing design • Accessible housing • Healthy living • Housing mix and affordability	• Lack of living space - overcrowding • Unhealthy living environment – daylight, ventilation, noise • Excess deaths due to cold / overheating • Injuries in the home • Mental illness from social isolation and fear of crime
2. Active travel	• Promoting walking and cycling • Safety • Connectivity • Minimising car use	• Physical inactivity, cardiovascular disease and obesity • Road and traffic injuries • Mental illness from social isolation • Noise and air pollution from traffic
3. Healthy environment	• Construction • Air quality • Noise • Contaminated land • Open space • Play space • Biodiversity • Local food growing • Flood risk • Overheating	• Disturbance and stress caused by construction activity • Poor air quality - lung and heart disease • Disturbance from noisy activities and uses • Health risks from toxicity of contaminated land • Physical inactivity, cardiovascular disease and obesity • Mental health benefits from access to nature and green space and water • Opportunities for food growing – active lifestyles, healthy diet and tackling food poverty • Excess summer deaths due to overheating
4. Vibrant neighbourhoods	• Healthcare services • Education • Access to social infrastructure • Local employment and healthy workplaces • Access to local food shops • Public buildings and spaces	• Access to services and health inequalities • Mental illness and poor self-esteem associated with unemployment and poverty • Limited access to healthy food linked to obesity and related diseases • Poor environment leading to physical inactivity • Ill health exacerbated through isolation, lack of social contact and fear of crime

and ask similar questions, the Healthy Urban Planning Checklist is chosen for the methodological framework in this paper since it is mostly focused on urban planning and best fits into the local context of Serbia, taking into account the structure of plans, and urban problems such as healthy air, soil, and transport management. These issues primarily relate to themes of Active travel and Healthy environment of the checklist, and they will be used for further planning assessment.

2.4 Framework for evaluating the urban plan's potential to support the concept of Healthy Cities

Literature review reveals the complexity of assessing the potential of urban planning to support the implementation of the Healthy City concept. On one hand, it is important to understand the general level of integrating health into urban planning, while on the other hand, it is important to reveal how specific health-related thematic areas are covered throughout urban plans. For this reason, this paper proposes an initial model for evaluating the urban plan's potential to support the concept of Healthy Cities, through a two-step methodological framework:

1. *Level of integration*. The first step relies on three levels of integration between planning and health, as set by Barton and Grant (2012), through which the basic concept of the plan and its goals are assessed. It should recognize at which level the plan is connected with the topic of health: whether only at the basic level of providing public services, at the mid-level where health is a concept within the plan, or at a holistic level when plans are formed for health.
2. *Thematic evaluation*. The second step involves the use of the Healthy Urban Planning Checklist to thematically structure and operationalize key urban health issues, and to assess how the plan responds to them, specifically regarding active travel and a healthy environment.

In relation to Active Travel, relevant issues will be analyzed in relation to specific questions:

- Promoting walking and cycling: Does the proposal promote cycling and walking through measures in a travel plan, including adequate cycle parking and cycle storage?
- Safety: Does the proposal include traffic management and calming measures, as well as safe and well-lit pedestrian and cycle crossings and routes?

• Connectivity: Does the proposal connect the public realm and internal routes to local and strategic cycle and walking networks and public transport?

• Minimizing car use: Does the proposal seek to minimize car use by reducing car parking provision, supported by the controlled parking zones, car-free development and car clubs?

In relation to Healthy Environment, relevant issues will be analysed in relation to specific questions:

• Construction: Does the proposal minimize construction impacts such as dust, noise, vibration and odours?

• Air Quality: Does the proposal minimize air pollution caused by traffic and energy facilities?

• Noise: Does the proposal minimize the impact of noise caused by traffic and commercial uses through insulation, site layout, and landscaping?

• Open space: Does the proposal retain or replace existing open space and, in areas of deficiency, provide new open or natural space, or improve access to existing spaces? Does the proposal set out how the new open space will be managed and maintained?

• Play space: Does the proposal provide a range of play spaces for children and young people?

• Biodiversity: Does the proposal contribute to nature conservation and biodiversity?

• Local food growing: Does the proposal provide opportunities for food growing, for example by providing allotments, private and community gardens, and green roofs?

• Flood risk: Does the proposal reduce surface water flood risk through sustainable urban drainage techniques, including rainwater storage, use of permeable surfaces, and green roofs?

• Overheating: Does the design of buildings and spaces avoid internal and external overheating, through the use of passive cooling techniques and urban greening?

Having established the theoretical foundation of Healthy Urban Planning and the evaluation framework, the next section introduces Valjevo as the selected case study within the CliCCHE project. This two-step evaluation framework

will be used to identify limits and potentials, which will provide a basis for improving plans and, in turn, guide cities towards the Healthy Urban Planning goal. The results of the thematic analysis, problems and key areas of interest, will be used to explore the potential for improving urban health through CliCCHE student projects. Their outcomes additionally confirm the identified directions for enhancing urban planning and will be presented in next the section.

3. THE CLICCHE PROJECT AND VALJEVO CASE STUDY

Valjevo is a city in western Serbia, with an area of approximately 905 km², and a population of around 59,000 city residents. According to data from 2011, the entire municipality counts more than 90,000 people (Odsek za razvoj i privredu Valjevo, n.d.). The city's biggest challenges stem from its geographical position and management. Valjevo is located in a valley between hills carved by the Kolubara and Gradac Rivers, which flow through the city center. South of the city are protected natural areas of exceptional features, 'Gradac River Gorge', and the Divčibare mountain, which have long been exposed to attempts at excessive construction and urbanization, leading to new planning laws and building restrictions. The Gradac River, with its natural environment, is considered by residents to be the most important natural asset of the city. This leads to residents' dissatisfaction with the river basin upkeep. On several occasions throughout history, Valjevo experienced severe flooding of the city center from the Kolubara River. The issue was partially mitigated with the construction of a large concrete embankment. Apart from floods, residents of Valjevo cited air pollution and poor waste management as the city's most prominent environmental problems. In addition to these issues, the city is experiencing overheating due to the lack of green spaces, permeable surfaces, trees, and shade. There is growing concern about the further destruction of the natural environment and major negative impacts on public health. These characteristics, urban form, and risks led the CliCCHE project to choose Valjevo as a city partner and an adequate case study for evaluation and learning. All these challenges were in focus for the CLICCHE project, which assessed climate vulnerability, the vulnerability of public spaces, a polluted city center, and many other problems.

The CliCCHE project and workshop with the students consisted of seven themes:

A1. Integrated vision of 'Urban Health' regeneration,

A2. Local inquiry and mapping: Get to know the neighborhood from above and from within,

A3. Health and Climate profile Model,

A4. Framework for model Evaluation,

A5. Project Scenarios,

A6. Project proposals selection,

A7. Results communication and dissemination.

Through local inquiry and mapping (A2), this paper, as well as student projects, gained insights into the problems in Valjevo, which further focused on planning analysis and students' choice of themes for their projects. With detailed Health and Climate profile of the city (A3), and theoretical and practical frameworks for model evaluation (A4), students created their project scenarios (A5), which were ultimately checked using the same frameworks also used in this paper. The results of their projects and this paper (A7) together provide inputs that can be implemented back into city plans.

3.1. Healthy Urban Planning In Valjevo, Serbia

The structure of Valjevo's plans follows the common structure of plans in Serbia. The plans are ranked according to their significance and the scale at which they address problems. Serbia distinguishes two types of plans: spatial and urban plans. Spatial plans cover larger parts of the country (areas and regions). Urban plans are divided into strategic (General urban plan – GUP), general and detailed plans (general regulation plans – PGR, detailed regulation plans – PDR), addressing entire cities or their parts. The strategic urban plans in Serbia contain wider-scale objectives, strategies, and recommendations for city planning and management. These plans are more likely to incorporate the idea of global concepts of sustainability, resilience, and health. These concepts are often not implemented in general regulations and detailed plans. Recent tendencies in Serbian planning practice emphasize integrated urban development strategies for strengthening local planning capacities (Čolić, 2015). Therefore, in this paper, GUP Valjeva and PGR 'Center' Valjeva will be analyzed, as the current plans for this city.

3.2. General Urban Plan of Valjevo, 2013 (GUP)

The first plan in question is the General Urban Plan of Valjevo, 2013 (GUP).

a) Evaluating the level of health integration into plans

The General Urban Plan of Valjevo does not use the terminology from the concept of the Healthy City, nor does it mention the concept directly. The plan incorporates health as a public service, but does not explicitly include it in its goals. Using Barton and Grant's system of three-level health and planning integration (Barton& Grant, 2012), GUP would be found to cover only the first basic level, with limited indication of second-level integration. The main goals of the plan include meeting the needs of current and future residents for a general improvement in the quality of life, sustainable and rational planning through democratic management of natural and created resources, flexibility in the use of space, improvement of the uniqueness of Valjevo with historical places and monuments, improvement of traffic accessibility and connectivity of all parts of the city.

b) Thematic evaluation: Evaluating the plan's potential through the Healthy Urban Planning Checklist

Table 1. gives more detailed insights into the plan's topics and main ideas.

The analysis of the plan using the Healthy Urban Planning Checklist shows that the plan promotes walking, cycling, and running by proposing a new green corridor for recreation. The plan mentions forming cycling lanes wherever possible alongside the streets. The safety of pedestrians is also considered important, though the introduction of slow traffic zones, similar to those in the previous plan. Regarding connectivity, the plan recommends that the main cycling paths connect major recreational areas and different parts of the city, which directly affects health in the urban environment. Minimizing car use is only slightly present, with guides for cleaning the streets of excessive parking and abandoned vehicles. The second part of the 'Healthy Environment' checklist showed that noise was addressed through spatial zoning, but is not related to noise during construction or from traffic. Regarding air quality, direct guidelines are provided for improvement through the replacement of public transport fuel types and the promotion of electric vehicles. However, this remains only at the conceptual level, which is an expected characteristic of a strategic plan. As for open spaces, there are a number of rules for arranging and maintaining greenery. The most important of all is the planning of new green spaces for recreation that would connect different parts of the city.

Healthy Urban planning checklist		General Urban Plan of Valjevo, 2013 (GUP)	
		Issue	Yes / No / Not relevant Comment
	Active Travel	a.Promoting walking and cycling	The document mentions planning of a green corridor for recreation, including walking, running, and cycling tracks. Also, the plan recommends the formation of cycling lanes in those streets where there is a possibility to build cycling paths the account of other public areas should be provided for their construction'.
		b. Safety	'In the zones of an enhanced conflict between pedestrian and motor traffic, predict the introduction of slow-traffic zones and physical barriers to speed limit.'
		c. Connectivity	The plan recommends that 'the main routes and cycling paths through areas of GUP should connect major recreational areas and zones in the city and out of the city, as well as the main parts of the city and with the city center'.
		d. Minimizing car use	There are some improvements regarding reducing the car use by: for safe and unobstructed movement of pedestrians by surfaces provided for their movement ... it is necessary to clean these areas from vehicles, especially parked and abandoned'.
	Healthy Environment	a. Construction	The plan deals with noise protection by space zoning, but not in the context of noise during construction.
		b. Air Quality	The plan provides inputs into changing the vehicle drive from diesel to bio-gas, while promoting electric car use, which would improve the overall air quality. Moreover, the plan also gives some indicators of minimising small-scale residential heating sources while implementing city heating systems.
		c. Noise	The plan does not view noise as an important problem
		d. Open space	The plan manages open spaces and greenery in many ways. It promotes protection and improvement of the city's green infrastructure, insists on dedicating more areas to green spaces, promotes the increase of the total area of the plans of the green areas in terms of protection from all forms of instability and land erodability, rational use of free land, and biological and environmental equilibrium environments'.
		e. Play space	The plan mentions the playgrounds for children, their noise protection, and the presence of the playgrounds in public facilities, but does not elaborate in further detail.
		f. Biodiversity	Nature conservation is not entirely present in the plan. The plan does mention managing 'groundwater lands and watercourses, through the provision of organized collection of solid waste and wastewater collection with adequate channeling and implementation in the city sewer system'.
		g. Local food growing	The plan proposes urban gardens.
		h. Flood risk	The plan does indirectly discuss flooding, drainage techniques, storing rainwater, and re-use of rainwater.
		i. Overheating	The development of better city gas heating networks would help manage costs for heating during winter.

Table 1 - Healthy Urban Planning Checklist on General Urban Plan GUP, Valjevo, 2013.(Source: Author)

There are also ideas for urban gardens togrow local food, thatare missing from the general regulation plan (PGR), which will be discussed next. The plan also directly explains the methods of flood protection, stormwater drainage, excess water storage, and reuse. However, all of these ideas primarily persist at the level of possibilities.

3.3. General Regulation Plan 'Center' for Valjevo, 2014. (PGR 'Center' Valjevo)

The second plan that will demonstrate problem identification is the General Regulation Plan 'Center' for Valjevo (PGR 'Center' Valjevo) from 2014.

- *Evaluating the level of health integration into plans*

The objectives of the central city zone plan do not directly address health through urban planning. Similarly to the previously discussed GUP, no terminology is used that would expertly connect this plan with the concept explored in the literature. The plan explicitly mentions that it is necessary to define the urban space according to the 'real interests of citizens', capacities, scales, values, and features of the environment, but not health. One of the plan's goals, goal 4, aims to affirm the ecological requirements and values of the existing environment, as well as to integrate the functional and design aspects of the banks of the Kolubara and Gradac rivers into the wider environment. Other goals of the plan relate to improving the overall structure of functional amenities and public spaces, defining a traffic concept, ensuring an attractive, recognizable, and contextually relevant design, and the multifunctional use of space with various leisure activities. There is an increase in interest in adequately dealing with riverbanks, as an 'integrative spatial, content, environmental and functional factor in the formation of the Central River Basin'; and through 'qualitative planning guidance of pronounced trends in urban life that show a tendency to accept the river after decades of indifference' (PGR Valjevo, 2014). This can be interpreted as an insufficient use of the potential for recreation and physical health, though this is open to interpretation. Certain factors are recognized as endangering urban space, but not primarily as health challenges, rather as functional and aesthetic weaknesses of the space. Air pollution, noise, or other direct health risks are not specified, nor are there guidelines for improvement, although in other documents of Valjevo, this is precisely defined as the main problem of the city and the greatest risk to the health of the population. Due to the fragmented integration of health in this plan, it is evident that health can be recognized only at the first and perhaps second levels established by Barton and Grant. b) Thematic evaluation: Evaluating the plan's potential through

the Healthy Urban Planning Checklist. The following table (Table 2) provides an overview of plans content inside the Healthy Urban Planning checklist. Analyzing the plan through the Healthy Urban Planning Checklist reveals additional measures the plan proposes. Looking at theme ’2. Active travel’, it is clear that there are some direct indications of promoting walking and cycling, by proposing spaces for car parking, green areas, and bicycle lanes.

Healthy Urban planning checklist		General regulation plan „Center’ Valjevo, 2014.
	Issue	Yes / No / Not relevant Comment
Active Travel	a.Promoting walking and cycling	The plan proposes to make spaces for car parking, green areas, and bicycle lanes along the streets of adequate width. The plan also mentions the concept of ’park and bicycle’, but only briefly. There is no further development of the cycling network.
	b. Safety	The plan proposes some traffic management for the safety of pedestrians, urging to ’Enable the introduction, tagging and marking of slow driving zones’, but also only briefly.
	c. Connectivity	While there is no direct approach to connectivity, the plan does indirectly mention the importance of functional connections between public spaces and the two sides of the river.
	d. Minimizing car use	There is no improvement regarding car use; the plan only proposes some regulations for existing parking and plans for making new parking areas. There is no ’car sharing.
Healthy Environment	a. Construction	There is no mention of construction management.
	b. Air Quality	The plan does recognize the problem of air pollution to some extent, but provides no further explanation, except for some indirect measures of planning underground parking areas and hot water infrastructure management.
	c. Noise	There is also no noise reduction management, apart from the indirect planning of compatible functions in residential areas, for instance, which somewhat manages the use of space.
	d. Open space	The plan does manage open green areas directly, by regulating biodiversity, and calling for further enhancement of the quality of greenery in public open spaces and private plots.
	e. Play space	Play space is mentioned briefly when writing about educational and kindergarten areas and parks.
	f. Biodiversity	Nature conservation is not very present in the plan. The plan does mention managing ’groundwater lands and watercourses, through the provision of organized collection of solid waste and wastewater collection with adequate channeling and implementation in the city sewer system’.
	g. Local food growing	There are no guides for urban food cultivation or gardens.
	h. Flood risk	The plan directly discusses flood protection measures, but without a focus on sustainable principles.
	i. Overheating	Internal and external overheating is not mentioned, apart from indirect development of green spaces which would reduce the UHI effects.

Table 2 - Healthy Urban Planning Checklist on General Regulation Plan “Center” Valjevo, 2014. (Source: Author)

Unfortunately, it remains unclear whether the city's cycling network will undergo further development. Regarding safety, the plan introduces slow-driving zones, but this is more of a guiding idea than a ready-for-implementation plan. There is some mention of connectivity in the plan, but the idea behind it is more functional than intended to support human interaction and well-being. The plan also lacks thought in minimising car use. Theme '3. Healthy environment' brought to light more on the issues of urban health. There is no mention of construction management in the plan, and there is also seen in a lack of recognition noise as an issue (both in construction and traffic). Air quality is considered important; however, no direct measures are provided to address this issue. Management of green areas is directly included in the plan, with regulations to protect biodiversity and guide enhancements to the quality of open spaces and private plots' greenery. The play spaces are mentioned only briefly, which does not translate as a major interest in the plan. Local food production is also not present, and the plan could provide more guidance on both flood risk management and overheating.

3.4. Discussion

The concept of health in urban planning is indirectly present in the General Urban Plan of Valjevo. The plan acknowledges several factors that threaten health. Firstly, air pollution is measured primarily from traffic and industry, and guidelines are given for relocating industry and, therefore, reducing pollution. Noise is also recognised as a problem, with proposed acoustic zoning that prescribes permitted noise levels for different zones (e.g., residential, educational). These measures can be interpreted as part of a wider concept of healthy cities, but they are not integrated into a holistic approach to health. Health appears in the plan only through the general goal of 'improving the quality of life'. Improvement solutions are more technical and infrastructural. In conclusion, integration of health and planning remains primarily at the basic level with no clear indications for holistic health measures.

PGR 'Center' Valjevo should rely on GUP's strategic measures. It does not contain explicit health goals. It also only partially recognizes problems that may have an impact on health, such as the need for coastal development, increased traffic safety, and availability of green areas. Still, these problems are not covered by the broader topic of health, and are more problematic from the perspective of functional or ecological goals. There is a lack of consideration for aspects such as excessive heating and cooling of spaces, the implementation of precise strategies to address air pollution, and the management and maintenance of public spaces. Both plans have similar problems:

- They integrate health only at a basic level, with possible indications of a second level according to Barton and Grant (2012). The first integration level originates from adequate measures of planning public health services, and providing basic life amenities. The second integration level is evident in the presence of valuable public space development ideas, including the development of new green areas, connecting the two sides of the Kolubara River, arranging public transport, fuel, and city heating, among others. However, these ideas do not seem to be developed enough to be implemented, and at their core, they are not focused on the problem of public health or healthy cities. They directly address other urban problems, but only indirectly and occasionally promote health, which is why the second level integration is concluded to be only partial. The third health-planning integration level would require unified cooperation among all actors involved in developing the urban plan. This level is missing from Valjevo plans; health is not their core driving force that guides every other category (Table 3).

Level of integration	**GUP Valjevo**	**PGR „Centar" Valjevo**	Comparison conclusions
The first level: health as a part of basic services and living conditions	**Present.** Recognized basic risk factors, proposed relocation of industry, acoustic zoning, etc. Emphasis on infrastructural solutions and technical measures.	**Present.** Recognized individual problems that focus on functional and environmental goals, directly and indirectly affecting health.	Both plans achieve the first level of health integration through basic services and protective measures.
The second level: health as a quality of space, active mobility, ecology, and connection	**Partially present.** The plan offers several measures. However, the measures have not been strategically developed for implementation, and are not directly framed as a part of a healthy city concept.	**Partially present.** Certain aspects are covered (flood risk regulation, minimal protection of biodiversity, and some provisions on open spaces).	Both plans have partially reached the second level of health planning integration, but lack further strategic improvement measures.
The third integral level: health as a guiding planning principle	**It's missing.** Health is not explicitly defined as a leading goal, nor is there any coordination of actors aimed at the concept of a healthy city.	**It's missing.** There is no strategic placement of health, and no upgrading of GUP guidelines into a holistic system.	No plan achieves the third health-planning integration level: **health is not seen as a direct driver of Valjvo's urban development.**

Table 3 - Levels of health-planning integration in Valjevo, GUP and PGR

- The thematic evaluation through the Healthy Urban Checklist confirmed the conclusions from the previous part of the analysis, while revealing separate topics that have a stronger or weaker presence within the plan. The structural overview of topics enabled a more precise look on health problems, highlighting all the shortcomings of the plans. GUP has more strategically comprehensive measures towards healthy development, which is expected due to the nature of the plan. The issues of promoting walking and cycling, safety and connectivity, but also enhancing open spaces, biodiversity, and managing flood risks, were addressed in more detail. On the other hand, within the general regulation plan, most of these topics are not adequately addressed. This lower-level plan does include flood risk management and some open space and biodiversity regulation. It remains unclear and limited in other themes, not profoundly addressing them. Both plans contribute the least to the theme of minimizing car use. They are also uncertain in improving air quality, even though it is one of the main environmental problems of the city. This difference between the strategic and regulatory plan confirms the still insufficient integration of health into planning, but it also reveals the potential for urban improvements toward Healthy Urban Planning in Valjevo.

The detected problems reflect a deeper level of issues in city planning. Indicators that appear in the urban environment point to specific areas that should be investigated. In this case, the indicators pointed to the planning documentation, which is not conceived holistically, but deals with certain problems partially, through different plans. Although these plans offer some insight into health values, they are not sufficiently connected. This shows disconnection and a lower extent of understanding of these issues between different planning levels. Identified plans' problems and key thematic potentials of HUP improvement for Valjevo are spatially addressed through the CLICCHE students' projects that will be presented in the next section.

4. TOWARDS HEALTHY CITY THROUGH CLICCHE STUDENTS' PROJECTS

The CLICCHE project and workshops in Serbia tested topics that were detected in the previous chapter as necessary for achieving public health. The students followed the same thematic potentials in their projects (Table 4) demonstrating how the pilot projects can spatially test these potentials, which could lead to the improvement of the plan and overall HUP process. The student projects responded to these shortcomings.

Project	Themes	Levels of implementation
Better Line (Iva Bajić)	Green infrastructure, riverside activation, health	The project answered the lack of green infrastructure in the city center, and also combated air pollution.
WSUD (Filip Mijailović)	UHI mitigation with water-sensitive urban design for health	Detected the location in the city center next to the river, with evident problems of overheating due to the inadequate functional layout, and no greenery. River proximity led the concept towards sustainable use of water – WSUD.
CIKLO (Ivana Tomić)	Active mobility and cycling	Re-designing streets to accept cycling trails within the city center; active mobility.
Urban Garden (Hristina Tomašević)	Well-being in space, UHI, air pollution mitigation	Engaged in enhancing comfort within the city center through reducing air pollution and UHI (urban heat islands).
Recycling (Edita Ljalja)	Waste management	Dealt with the topic of recycling for better waste management.
Urban Mini Forests (Jelena Ilić)	Green infrastructure	Focused on adding mini-rest intervention points throughout the city, also for reducing heat islands and increasing environmental health potential.
City Botanist (Jana Mijailović)	Fresh food and wellbeing	Had a similar principle to Urban Garden, to access fresh food and physical activity.
Oxygen Factory (Nikola Marković)	Air pollution mitigation and urban regeneration	The project involved the idea of air purification through the regeneration of the brownfield location of the former silos site in the city center.
Umbrella (Milica Spajić)	Waste water re-use	Based on the concept of designing with and for rainwater and atmospheric water in public space
Healing Corners (Teodora Živković)	Well-being	Proposed points for rest, city greening, enhancing biodiversity, and reducing UHI.

Table 4 - Student projects and their chosen themes, (Source: Author)

The project ‘WSUD’ is a good example how student projects contribute valuable feedback for plan improvement. The project redesigned a space around a gas station in the city center, connected to the historical area and the Kolubara riverside. The decision to choose the topic of WSUD (Water-sensitive urban design) for tackling neighborhood problems came from the previously detected spatial and environmental issues.

- The project focused on minimizing the effects of excessive use of concrete and asphalt, poor air quality, strong traffic intensity, lack of vegetation, and dominance of surface parking spaces. The immediate vicinity of the Kolubara River and the historical city center led to many opportunities

for health-planning connections. It developed four functional zones with different levels of 'healthy city' and 'WSUD' concept integration. It recognized that the quality of the natural environment affects people's health and well-being, making it a strong contributor to the second level of health-planning integration provided by Barton and Grant. Moreover, it was designed by having public health and well-being as the primary, fundamental goals. This shows the presence of the third level of health-planning integration, where health is fully integrated into the project.

- The project was evaluated through the Healthy Urban Planning Checklist. It designed a green zone, with bioswales, water detention pools, play spaces, and recreation spaces; a blue zone surrounding the Kolubara River for active use, movement and health; connecting different recreational areas and developing new ones; and an orange and red zone dedicated to social and recreational activities, with water features in design. Promoting walking and cycling was achieved through the implementation of cycling lanes in the park along the Kolubara River. The proposal included cutting down driving lanes and proposed integral streets for traffic calming. It minimized car use by recommending new underground parking areas instead of large surface parking. This measure helped minimize air pollution caused by traffic. Non-permeable ground materials were replaced by large green recreational areas. These areas also enhanced children's play by creating safe, natural spaces and promoting biodiversity. One of the essential strengths of this proposal is found in the design for minimizing flood risks. The use of water as a design element, including water detention basins, reservoirs, and shallow pools, contributed to diminishing overheating.

Therefore, the project relied on the principles of healthy cities to propose multi-layer interventions that connect environmental, social, and health components of the space. Such experiments can be used as an analytical tool for detecting weakness in urban tissue. Figure 3 illustrates these strengths of the project. The WSUD project confirmed that the application of different levels of integration of health and planning, as well as the improvement of special thematic aspects, can significantly contribute to the overall health of the city of Valjevo.

The greatest potentials are reflected in the topics of spatial integration and connectivity, active use, green areas, and reducing air pollution. The project confirmed the problems detected during the analysis of Valjevo's plan, showing the importance of incorporating these issues into future plans.

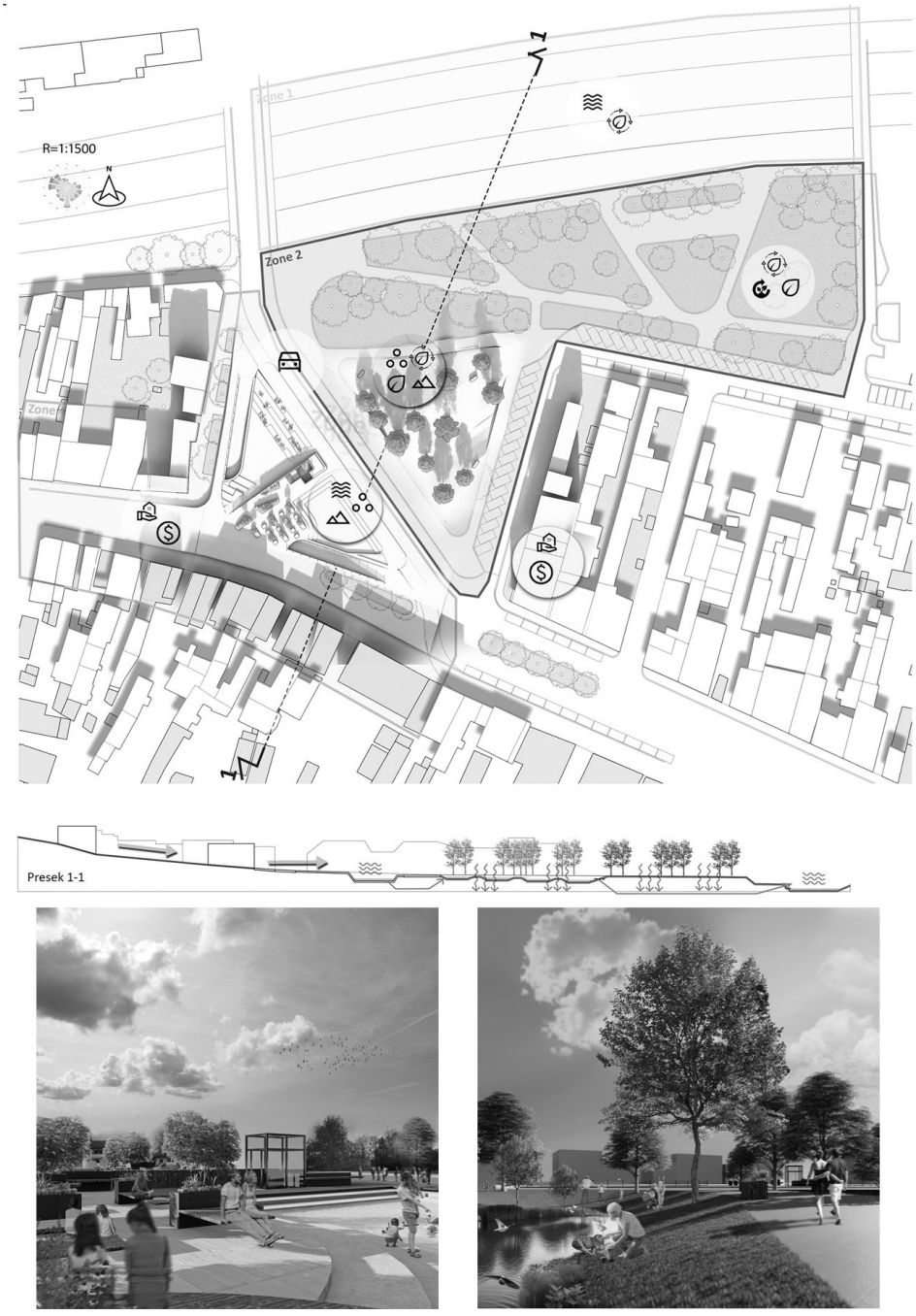

Fig. 3 - WSUD project (author: Filip Mijailovic for CLICCHE workshop in Belgrade)

5. CONCLUSION

To contribute to healthy urban planning, this paper developed an initial methodological framework for assessing the potential of urban plans to support the Healthy Cities concept and applied it to the case of Valjevo city in Serbia, as a part of CliCCHE project.

The analysis results indicate the benefits of the two-stage evaluation of the potential of the plans. The first part of the analysis, following the three-step evaluation model of Barton and Grant, enables an initial recognition of the plan's values, goals, and structure. In the case of Valjevo, the level of health integration is found at the first level (public services), and only partially at the second level (significance of recreational areas, connectivity, coastal development, etc.). The third level, which fully integrates the concept of health with planning and design, is not yet evident here, revealing the absence of a holistic healt strategy. The second part of the analysis revealed the key potentials for integrating this third level of health into planning. The Healthy Urban Planning Checklist exposed both limitations and opportunities for integrating the Healthy City concept into the planning documents related to specific thematic areas. Existing plans do contain some fragmented health guidelines, but they do not place health as a key goal. Instead, they remain focused on goals that may contribute to health indirectly, through functional and aesthetic improvements. At the same time, thematic areas with the most pronounced shortcomings also represent the greatest potential for improvement.

These results formed the basis for testing the potential to integrate health issues into urban planning and design through student projects developed following the CliCCHE methodology. The themes that were reexamined corresponded to key problems identified in the analytical phase. Students' projects provided a great opportunity to incorporate feedback into the plans, confirming that educational projects are valuable tools for developing healthy urban planning.

Assessing local laws and strategies of urban planning and health is of crucial importance for a better understanding of deeper issues visible in planning documents. This means that the lack of integration of health is not a matter of only urban planners and their knowledge, but also government structures, laws, and strategies. On one hand, urban plans (as planning products) are framed by laws that define their technical and legal contents and highlight topics that are explicitly intended to be covered by the plan. On the other hand, from an institutional point of view, in Serbia, health is the responsibility of the health sector, while planning belongs to the urban and spatial planning sector,

and there is still no intersectoral coordination at the state level. Therefore, to develop healthy urban planning, it is of great importance to promote health strategies on a broader scale, stressing the importance of these issues and generating more potential for systematic integration of planning and health. This can be promoted through the cooperation of international and local stakeholders, local institutions, and governments, who could significantly influence the development of policies in the direction of “health-driven” strategic development of cities.

The same methodological framework for assessing the limits and potentials of urban plans can be applied anywhere in Serbia and in other countries, while taking into account the local specificities. The paper calls for further examination of the evaluation of the potential of plans, to increase knowledge in this area, and gather new, important insights for creating local plans that will guide the future development of healthy cities.

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CliCCHE Climate Change, Cities, Communities and Equity in Health, https://cliccheCliCCHE.org/e2-sos-air/, https://cliccheCliCCHE.org/ https://cliccheCliCCHE.org/

A B S T R A C T S : S E R B I A N

OBNOVA OBRAZOVNIH PONUDA UNIVERZITETA O PRILAGOĐAVANJU KLIMATSKIM PROMENAMA U PARTNERSTVU SA ZAJEDNICAMA I ZAINTERESOVANIM STRANAMA

Rosalba D'Onofrio, Timothy Daniel Brownlee, Chiara Camaioni

Tema klimatskih promena je veoma relevantna za univerzitetsko obrazovanje, ali trenutnim obrazovnim metodologijama nedostaju akciono orijentisani, praktični pristupi. Projekat Erasmus+ Cli-CC.HE ima za cilj da uspostavi partnerstvo između univerzitetskog sektora, građana, lokalnih zainteresovanih strana, stručnjaka iz prakse i javne administracije kako bi se razvila nova obrazovna metodologija usmerena na klimatsku adaptaciju i dobrobit stanovništva u gradovima. Metodologija se zasniva na tri glavna aspekta: direktno suočavanje sa iskustvom stanovništva i lokalnih zainteresovanih strana; obuka studenata i građana i lokalnih zainteresovanih strana da postanu informisani i aktivni sagovornici u predlozima za adaptaciju koji utiču na njihovu teritoriju; i primena nekonvencionalnih obrazovnih alata koji olakšavaju razmenu znanja i razradu dizajnerskih rešenja za adaptaciju. Metodologija je razvijena na osnovu uvida stečenih na univerzitetskim radionicama sprovedenim sa univerzitetima partnerima projekta i lokalnim radionicama održanim u svakom od četiri grada uključena u projekat. Ovaj rad se fokusira na iskustvo stečeno na radionici u San Benedetu del Tronto (Italija), koja je okupila značajnu zajednicu studenata, građana i lokalnih zainteresovanih strana kako bi razvili predloge za urbanu regeneraciju otpornu na klimatske promene, koji daju prioritet zdravlju i dobrobiti stanovnika. nosti spomenika, nudeći okvir za buduća istraživanja jugoslovenske memorijalne arhitekture.

KLJUČNE REČI: VISOKO OBRAZOVANJE, KLIMATSKE PROMENE I URBANO ZDRAVLJE, LOKALNE ZAJEDNICE I STEJKHOLDERI, URBANA REGENERACIJA, INTEGRACIJA ZNANJA

'STONE SOUP": A PARTICIPATORY URBAN GAME FOR BETTER PLANNING PRACTICES

Rita, Cachado, Caterina, Di Giovanni, Teresa, Madeira da Silva

Ako urbanizam i arhitektura imaju alate za sprovođenje praksi urbanističkog planiranja, kada je cilj usvajanje participativnog pristupa, postoji nekoliko načina za njegovu implementaciju.
„Kamena čorba" je urbana igra koja ima za cilj poboljšanje praksi urbanističkog planiranja kroz učešće zajednice. Konkretnije, razvili smo je, uzimajući u obzir adaptaciju i ublažavanje klimatskih promena s jedne strane, i urbano zdravlje s druge strane. Naziv potiče od portugalskog mita u kojem se od štedljivih sastojaka pravi obilna čorba. U obliku igre, razvijena je u kontekstu projekta CliCCHE Erasmus+, integrišući participativni pristup. U ovom članku ćemo razmotriti participativne pristupe u arhitekturi i urbanističkom planiranju u portugalskom kontekstu. Nakon toga, opisaćemo urbanu igru „Kamena čorba", jedan od metodoloških alata predloženih u kontekstu CliCCHE. Ovaj alat ima za cilj da uzme u obzir perspektive različitih društvenih aktera, od stanovnika i lokalnih udruženja do opštinskih tehničara, arhitekata i akademskih stručnjaka, i da podstakne strategije urbanističkog planiranja koje su adekvatnije sadašnjosti i klimatskim izazovima naših gradova, promovišući jednako i horizontalno učešće.

KLJUČNE REČI : ALAT ZA UČEŠĆENJE, URBANO PLANIRANJE, URBANA IGRA, PARTICIPACIJA, DONOŠENJE ODLUKA, URBANO ZDRAVLJE, KAMENA SUPA

ISTRAŽIVANJE ZDRAVSTVENIH I SOCIOEKONOMSKIH IMPLIKACIJA URBANE REGENERACIJE USRED KLIMATSKIH PROMENA

Salvatore Carlucci, Ioanna Kyprianou

Za razliku od nekih privremenih katastrofa, klimatske promene predstavljaju dugoročnu pretnju, posebno po zdravlje gradova, utičući i na ljude i na životnu sredinu. Urbana regeneracija nudi priliku za revitalizaciju gradova, promociju zdravlja gradova i primenu strategija koje uzimaju u obzir buduće potrebe građana i uloge gradova u rešavanju izazova klimatskih promena. Ove strategije moraju da se bave i očekivanim i nepredviđenim uticajima, posmatrajući gradove kao dinamične entitete sposobne za promene. Istraživanja su se pretežno fokusirala na strategije ublažavanja kako bi se smanjio obim uticaja klimatskih promena i na strategije prilagođavanja kako bi se pripremili za njih. U gradovima su analizirani zeleni prostori i novi materijali kako bi se poboljšali klimatski uslovi i ljudska udobnost, što odražava višestrani odnos između zdravlja gradova, blagostanja i očuvanja i obnove životne sredine. Očekuje se dalja istraživanja sve više istražuju socio-ekonomske dimenzije klimatskih promena i zdravlja gradova. Međutim, važno je ne zanemariti suštinsku ulogu fizičkih akcija u rešavanju urbanih izazova, izbegavajući situacije zaključavanja ugljenika. Adaptacija zasnovana na zajednici i participativno planiranje su neophodne komponente za efikasno suzbijanje klimatskih promena, a inkluzivni pristupi vođeni zajednicom bave se različitim ranjivostima gradova, promovišući jednake zdravstvene koristi za različite grupe stanovništva. Na kraju krajeva, postizanje jednakosti u zdravstvu u urbanim sredinama zahteva usklađeno tehničko i netehničko razmišljanje, pri čemu se projekti obnove gradova fokusiraju na efikasne, prilagodljive fizičke dizajne i kohezivne društvene strukture.

KLJUČNE REČI: KLIMATSKE PROMENE, URBANO ZDRAVLJE, URBANA REGENERACIJA, STRATEGIJE ADAPTACIJE

'PARTICIPATORY URBAN DESIGN – THE EXAMPLE OF INTERNATIONAL PROJECT CLICCHE

Predrag Jovanović, Stefan Slavić, Boško Drobnjak

Tokom celog ciklusa projekta CliCCHE (januar 2022 – januar 2024), Univerzitet u Beogradu – Arhitektonski fakultet je primenjivao njegove principe i rezultate u redovnoj nastavi i istraživanjima i time široko promovisao misiju, viziju i vrednosti projekta CliCCHE unutar sopstvene akademske zajednice. Pored toga, tokom celog tog perioda, većina praktičnih istraživačkih i obrazovnih aktivnosti realizovana je u gradu Valjevu, lokalnom akademskom partneru projekta, u stalnoj saradnji sa najrelevantnijim institucijama iz javnog, privatnog i civilnog sektora. Jedan od glavnih ciljeva je ostvaren – razvoj i testiranje novih iskustava u nastavi i studiranju na tehničkim fakultetima evropskih univerziteta kako bi se unapredilo znanje o strategijama prilagođavanja klimatskim promenama i ublažavanja uticaja na ljudsko zdravlje u okviru projekata urbane regeneracije. Stoga je to bilo veoma značajno iskustvo za studente, kao i za nastavno osoblje, pored svih izazova koji su se javljali tokom procesa. Cilj istraživanja je da se istraži tema urbanog zdravlja kroz rezultate međunarodnog projekta i da se predstavi moguća metodologija za implementaciju specifičnih tehnika nastave u skladu sa znanjem stečenim tokom dvogodišnjeg rada na naučnom projektu. Shodno tome, naučni doprinos rada odnosi se na dodatne korake u procesu diseminacije rezultata postignutih u naučnom projektu.

KLJUČNE REČI : PARTICIPIVNI URBANI DIZAJN, OBRAZOVNI PROCES, URBANO ZDRAVLJE, STRATEGIJE SMANJIVANJA EFEKATA

KA ZDRAVOM URBANOM PLANIRANJU U VALJEVU: PROCENA OGRANIČENJA I POTENCIJALA URBANISTIČKIH PLANOVA

Tamara Mladenović

Gradovi su danas sve više izloženi različitim izazovima, uključujući klimatske ekstreme, zagađenje i opadajući kvalitet urbane sredine, koji ugrožavaju zdravlje gradova. Kao odgovor na to, razvija se koncept Zdravog grada i postaje ključan, jer podrazumeva integraciju kvalitativnih aspekata javnog zdravlja i ekološke održivosti u svim fazama urbanog planiranja. Ovaj rad se oslanja na uvide interdisciplinarnog Erazmus+ projekta CliCCHE - Klimatske promene, gradovi, zajednice i jednakost u zdravlju, koji je imao za cilj da podrži zdravo urbano planiranje razvojem specifičnih obrazovnih metoda i alata. Projekat je sproveden kroz saradnju između akademskih institucija širom Evrope i lokalnih administracija i zajednica. U Srbiji je Valjevo odabran kao grad za studiju slučaja, jer se pretpostavilo da su gradovi srednje veličine posebno pogođeni ovim izazovima zbog neadekvatne infrastrukture, ali i zbog načina na koji dokumenti urbanističkog planiranja integrišu zdravstvena pitanja. Glavni cilj rada je ispitivanje potencijala urbanog planiranja za vođenje gradova ka konceptu Zdravog grada. Na osnovu pregleda literature, razvijen je početni dvostepeni metodološki okvir za procenu lokalnih urbanih planova koji procenjuje nivo i ključne teme integracije zdravstvenog planiranja i testira potencijal za poboljšanje urbanog zdravlja kroz obrazovne projekte CliCCHE. Rezultati ukazuju na ključne nedostatke u trenutnim planovima, ali i na potencijalne mogućnosti koje bi mogle poboljšati urbano planiranje i doprineti zdravijem i održivijem urbanom okruženju.

KLJUČNE REČI : ZDRAV GRAD, KLIMATSKE PROMENE, URBANISTIČKO PLANIRANJE, URBANISTIČKI DIZAJN, JAVNO ZDRAVLJE, VALJEVO

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