ACTA Acta Sci. Pol., Administratio Locorum 23(3) 2024, 365–383.
https://czasopisma.uwm.edu.pl/index.php/aspal plISSN 1644-0749 eISSN 2450-0771 DOI: 10.31648/aspal.9789

ORIGINAL PAPER
Received: 31.12.2023 Accepted: 02.04.2024

AN ITERATIVE MODEL FOR THE DEVELOPMENT OF AN URBAN DEVELOPMENT STRATEGY – A CASE STUDY OF POLANICA-ZDRÓJ (POLAND)

Anna Bocheńska-Skałecka

ORCID: 0000-0003-4217-364X
Wrocław University of Environmental and Life Sciences
25 C.K. Norwida Street, 50-375 Wrocław, **Poland**

ABSTRACT

Motives: The current approach to the design of public space in cities is changing due to the global situation, i.e., the climate and health crisis, as manifested by the COVID-2019 pandemic. There is a need to develop and apply new, innovative research methods and techniques that allow both an in-depth knowledge of a given area and the monitoring of the changes that occur in this area. One of the proposals for such a framework is an iterative model based on the results of the analyses carried out during the research and design work using the research through design (RtD) method.
Aim: The aim of this study was to determine the applicability of the iterative process model for the development of urban strategy, particularly in terms of designing more resilient urban public spaces.
Results: The iterative process model was tested during consultation meetings on the development strategy for the municipality of Polanica-Zdrój. The design concepts developed during the research were an excellent support for illustrating the goals of the spatial policy of the municipality of Polanica-Zdrój as specified in the draft of its development strategy. They became the starting point for the future design process. A project with blue-green infrastructure (BGI) elements was included in the draft development strategy as an exemplary project for the development and modernization of tourism and tourism-related infrastructure of a supra-local, infrastructural and linear nature. A study using the RtD method supported the identification of opportunities and limitations associated with the implementation of BGI in the protected urban areas.

Keywords: crisis situations, design process, research through design (RtD), blue-green infrastructure (BGI), conservation protection

INTRODUCTION

Poland is a country of the Central and Eastern Europe region where programmes promoting and implementing green and then blue-green infrastructure started as early as 2014 (Pancewicz, 2021). Despite this, there is still a need to harmonise both the definition of blue green infrastructure (BGI) in the existing planning legislation and the strategies for implementing such infrastructure and promoting its benefits.

This article demonstrates that now is an opportune time, both globally and locally, to effectively introduce BGI into urban public space as a necessary element in making cities more resilient to contemporary crises.

✉anna.bochenska-skalecka@upwr.edu.pl

The current approach to designing public space in cities is changing due to the global situation, i.e., the climate and health crisis, as manifested by the COVID-19 pandemic (Kaczyńska, 2022; Noszczyk et al., 2022). The possibility of shaping urban public spaces (UPS) in two main directions has been explored:
- reducing the negative effects of climate change (e.g., 'urban heat island') (Shabb et al., 2022);
- improving the psycho-physical condition of people in a crisis situation (e.g., during a pandemic) (Crossley & Russo, 2022).

The recent amendment to the *Act on Spatial Planning and Development* (2023) in Poland has made the city (municipality) development strategy mandatory and has become the starting point for drafting a general plan in the city (municipality). The model, findings and recommendations contained therein will determine the directions of social, economic and spatial development.

This article presents the use of the research through design (RtD) (Bąba-Ciosek & Kucharczyk-Brus, 2022; Frayling, 1993) method in the municipal development strategy (Churski et al., 2021), using the example of Polanica-Zdrój as a tool to help design more resilient urban public spaces (UPS). The analysis of this case study, together with the conclusions and recommendations, based on previous conclusions from a number of multifaceted studies conducted on various urban public areas (Bocheńska-Skałecka & Walter, 2021; Lis et al., 2017), served the author to develop a model of how to proceed when designing UPS based on BGI. The proposed model can be used as a tool to support regenerative design. It is based on the designers' previous experience and lessons learned (lessons-learned design), on post-occupancy evaluation (POE) surveys of customer satisfaction and future users' needs, and research-based design problem studies. BGI enables the linking of UPS, including public green spaces (PGS), which have become fragmented as a result of the development of the urban fabric, especially in city centres. Many definitions of green infrastructure have been developed, including the following: Green infrastructure is: a strategically planned network of natural and semi-natural areas with other environmental features, designed and managed to deliver a wide range of ecosystem services. It includes green spaces (or blue if aquatic systems are concerned) and other physical features in terrestrial (including coastal) and marine areas. On land, green infrastructure is present in the rural areas and in urban settings (*European Commission, Directorate-General for Research and Innovation. EU missions – 100 climate-neutral and smart cities*, 2022). The systemic implementation of BGI in urban public spaces can improve the overall quality of life in a city (Di Sabatino, 2022; Nowak et al., 2023).

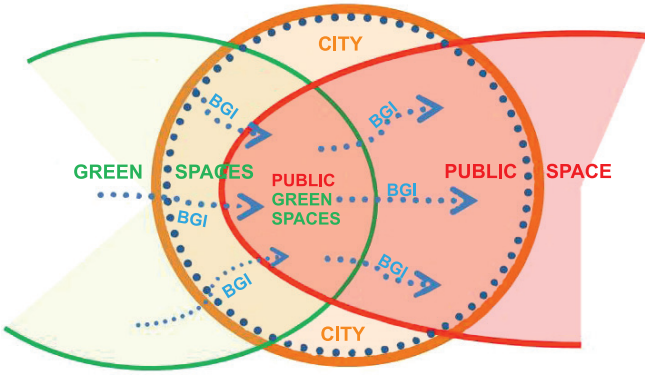


Fig. 1. Relationships in the city between public space (PS), green space (GS), public green space (PGS/UGS) and blue-green infrastructure (BGI) based on their definitions

Source: own elaboration.

On the other hand, the very definition of public space (PS) implies that one of the main design guidelines in its creation is to introduce design solutions that enhance the well-being of the environment. Public space is defined in the Act on Planning and Spatial Development as: "(…) an area of special importance for satisfying the needs of the inhabitants, improving their quality of life and promoting social contacts (…)" Act on Spatial Planning and Development, Journal of Laws 2023 item 977, Art. 2. point 6 (Poland), The global definition of public space proposed by the UN defines it as follows: "public space as all places that are publicly owned or of public use, accessible and enjoyable by all, for free and without a profit motive". The essence of public space as a common

✉anna.bochenska-skalecka@upwr.edu.pl

good implies its accessibility to all with no direct cost to the user, and also its spirit of "public service" without any purpose other than contributing to the overall quality of urban life.

LITERATURE REVIEW

Greening of urban public spaces – mitigating the effects of global warming

Recently, European cities have been increasingly implementing policies to adapt to climate change "according to "Podręcznik adaptacji dla miast. Wytyczne do przygotowania Miejskiego Planu Adaptacji do zmian klimatu – aktualizacja 2023" [Adaptation Manual for Cities. Guidelines for the preparation of a Municipal Climate Change Adaptation Plan – update 2023] (2023)". Their aim is not only to mitigate the negative effects of these changes, but above all to provide effective tools and structures for sustainable urban functioning in the future in line with the guidelines set out by European Union bodies (Shabb et al., 2022). Today, the natural resources of urban areas have been elevated to the status of an essential tool in the fight against climate change (Lamond & Everett, 2019). A strategically created network called blue-green infrastructure (BGI) serves urban agglomerations in the planning process to manage high quality biologically active areas (Nowak et al., 2023). BGI enhances the natural value of areas and thus increases their economic and social value. Creating and re-establishing BGI not only brings environmental benefits to the city, but often restores the cultural heritage of a place, such as historical park sites or garden settings (Wieczorek et al., 2022). The implementation of blue-green infrastructure (BGI) is not always easy and faces barriers such as low public awareness of the benefits of BGI (Lamond & Everett, 2019). In a sustainable approach to the development of modern cities, water resource management has an important part to play in improving the quality of the residential environment and the design of public spaces (Bocheńska-Skałecka & Walter, 2021). Contemporary urban public space development projects prioritise environmental benefits (protecting habitats, maintaining good water and air quality) and social and economic benefits (improving safety and comfort) while enhancing the aesthetic appeal of the space "according to European Missions. 100 Climate-Neutral and Smart Cities by 2030: Info Kit for Cities. (2021)". One idea to make the city more resilient to climate change is the 'sponge city' concept, where rainwater it is collected and used in times of drought (Yongjun et al., 2020). It should be noted that there is an increasing debate about the necessity or appropriateness of introducing greenery through BGI into the historic urban fabric, where it was initially present, precisely to mitigate the effects of the 'urban heat island' (Mikołajczyk-Kłębek, 2023; Pochodyła et al., 2021).

Urban green spaces as safe public spaces during a pandemic

Global breakthroughs affect human behaviour. Wars, epidemics, economic crises, groundbreaking inventions and ideas mean that nothing is the same as it used to be. The SARS-CoV-2 pandemic has changed the way public spaces are used, especially in cities (Kaczyńska, 2022; Wronkowski & Główczyński, 2021). In some parts of the world, the situation has returned to its pre-pandemic levels in recent months, However, this difficult time has shown that urban green spaces, in particular, have often become alternative public spaces for social interaction and have begun to serve new functions: places for business, education, socialising or simply working (Chęć-Małyszek, 2021). Governments around the world have responded to the public health threat by restricting the use of public spaces, including urban green spaces, to limit the spread of the virus. As a result, the last two years have seen publications presenting the first findings of studies on how the pandemic and its impact have affected the use of public spaces in cities (Pouso et al., 2020). Of particular interest is the research that attempts to test whether the pandemic has changed the public's perception of the impact of public green spaces on the quality of life in cities . The aim of this

✉anna.bochenska-skalecka@upwr.edu.pl

type of research is to rethink the urban landscape and develop design strategies for cities to become more resilient in times of crisis. Findings from a study in the UK "according to Crossley and Russo (2022)" show that the most common reasons for visiting public green spaces during the pandemic were to socialise, for health and exercise, to enjoy the landscape and pleasant weather, and to get fresh air and improve wellbeing. Studies in the UK but also in Poland and New Zealand (Herman & Drozda, 2021), sought to determine whether public perceptions of local green spaces and their impact on quality of life had changed following the experience of 'lockdowns' (Pouso et al., 2020). The health crisis also provided an opportunity to 'reinforce the planning importance' of public green spaces in cities, as public awareness of their role in the creation and functioning of resilient cities increased (Kopp et al., 2021).

Trends in the design of public spaces in the city (PS) using BGI

The study of the design problem (research-based design) provided the opportunity to select examples of public spaces (PS) as so-called 'good practices', which through their solutions, positively influence the environment and human well-being through the introduction of blue-green infrastructure (BGI) and/or nature-based solutions (NbS) and well-being design (WD). The main criterion was to assess whether the selected redesigned (modified) space could improve:
(a) microclimate,
(b) accessibility of use, including safety;
(c) public health;
(d) social integration.

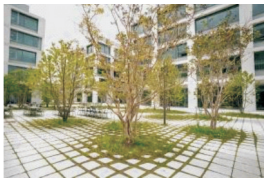
On the basis of pre-project analyses taking into account crisis situations (climate change, epidemics),

Table 1. Design directions for public spaces (PS), in which the applied solutions improve: microclimate, accessibility of use and safety, public health and social integration, using solutions: BGI, NbB, WD with examples

Type of space	Improvement area	Design solutions	Results
		BGI NbS WD	Increase / Decrease
1	2	3	4
1. Urban Valley  Sanlin Valley Park Shanghai, China, TLS (2019)	microclimate	+ ++	air quality / air temperatures biodiversity / urban heat island effect
	accessibility of use/safety	+ +	recreational area / wastelands, zoned meeting places / flood risk
	public health	+	physical activity outdoors / recreational area
	social integration	+	multifunctionality of the site / venues Main feature of the space: multifunctionality
2. Urban Forest  Dzintari Forest Park, Jurmala, Latvia, Substance (2010)	microclimate	+ ++	Increase / Decrease air quality / air temperatures biodiversity / urban heat island effect
	accessibility of use/safety	+ +	equal land use / damage to forest usage control / cover
	public health	+	physical activity outdoors / recreational area
	Social integration	+	multifunctionality of the site / venues Main feature of the space: multifunctionality

✉anna.bochenska-skalecka@upwr.edu.pl

cont. Table 1

1	2	3	4
3. Sponge City  Yanweizhou Park in Jinhua City Jinhua, China, Turenscape (2014)	microclimate	+ ++	Increase / Decrease air quality / air temperatures biodiversity / concrete pavement / urban heat island effect
	accessibility of use/safety	+	recreational area / wastelands, flood risk
	public health	+	physical activity outdoors / recreational area
	social integration	+	multifunctionality of the site / venues Main feature of the space: multifunctionality
4. Sensory Gardens  Zapopradzie Spa Park, Muszyna, Poland, The town and spa municipality of Muszyna, M. Wójtowicz, M. Weryńska, E. Kupiec-Wyrostek (2014)	microclimate	BGI NbS WD	Increase / Decrease
		++	air quality / air temperatures small-scale retention
	accessibility of use/safety	+	Inclusiveness / technical barriers zoned meeting places
	public health	+ ++	passive and active /outdoor activities / sensory experience
	social integration	+	recreational area /multifunctionality of the site / places for all / inequalities in the perception of space Main feature of the space: sensory experience
5. Brownfield Park  Martin Luther King Park, Paris, France, Atelier Jacqueline Osty (2014)	microclimate	+ ++++	Increase / Decrease air quality / air temperatures small-scale / concrete pavement retention / urban heat island "green" / effect energy
	accessibility of use/safety	+	Inclusiveness / wastelands
	public health	+	physical activity outdoors /urban farming
	social integration	++	meeting places / abandoned outdoor events / spaces Main feature of the space: multifunctionality
6. Pocket Parks  Pocket Park im Home4IT, Campus Roche, Kaiseraugst, Switzerland, Bryum (2018)	microclimate nnn	+ ++	Increase / Decrease air quality / air temperatures small-scale / concrete pavement retention
	accessibility of use/safety	++	foot traffic / car parks safe zones / traffic speeds
	public health	+	foot,bike traffic /green meeting places
	social integration	++	rest area /outdoor events / Main feature of the space: multifunctionality

Source: own elaboration based on analysis of examples selected by project teams research-based (case studies) pictures: (1) [www1]; (2) [www2]; (3) [www3]; (4) [www4]; (5) [www5]; (6) [www6] (2022).

✉anna.bochenska-skalecka@upwr.edu.pl

new challenges for urban public green spaces were formulated. It was considered necessary to design the space in a way that:
– facilitates the use of the space and maintains social distance;
– creates space for professional work (home office variant);
– provides transitional space between building interiors (outdoor learning);
– reinforces the healing function of the space ('green care', health function of greenery).

Features that contribute to the resilience of urban spaces are also highlighted:
– multifunctionality;
– inclusiveness;
– sensory experience.

Research conducted in recent years confirms the above (Giusti & Samuelsson, 2021; Kaczyńska, 2022; Pidlisna et al., 2023; Sharifi, 2019).

MATERIALS AND METHODS

A participatory and expert approach to the design of public spaces (PS)

Over the past few years, legislative bodies in Poland have been striving to make the municipal development strategy the supreme planning document for municipal management in the spatial planning system and to have it enshrined in legislation (Churski et al., 2021). The aim of the new provisions is to integrate spatial policy into development policy. As a result, the spatial dimension of integrated development strategies will be delivered through:
– targeting activities to specific areas and adapting them to the needs and capacities of those areas;
– defining the principles and objectives of spatial policy and the functional and spatial structure of the entity for which the strategy is being developed – model of the functional and spatial structure;
– findings and recommendations for the formulation and implementation of spatial policy.

It is essential that both the model and the findings are presented in graphic form. The strategy will be binding from 1 January 2026. The municipal development strategy is a long-term document. It is important in the context of legislative changes, as urbanisation processes and changes in the landscape of a municipality are not short-term phenomena (Fig. 4). The strategy takes into account environmental issues such as:
– rational (optimal) land use;
– development of blue-green infrastructure;
– counteracting the negative effect of urbanisation on protected areas.

The recommended way of preparing the strategy is the participatory-expert model, in which statistical and strategic analyses are the result of the work of external specialists and, together with other materials, form the basis for the work of a community team for developing the strategy, appointed by the municipal authorities (who are also part of the team). It is a document that is necessary for effective management of the municipality and for raising funds for projects. It also plays a role in involving the local community in municipal affairs.

The author's research and project experience (lessons learned) (Bochenska-Skałecka & Walter, 2021), shows that one of the main reasons why the implementation of BGI is problematic in Polish cities and municipalities is that the strategic development policy and spatial planning documents do not address the measures indicated in the paragraph above on a statutory basis. The current amendment to the most important Polish law on spatial planning changes this situation and makes it possible, and it is precisely the amendment and obligatory nature of the municipality's development strategy that will make it possible to implement BGI in the urban space more effectively.

The iterative process is a method of building, defining and refining a project, product or initiative. Teams that use an iterative development process gain the opportunity to create, test and amend until they are satisfied with the final result. When creating a city development strategy, the use of an iterative process seems more optimal than the waterfall model. The introduction of iterations aims

✉anna.bochenska-skalecka@upwr.edu.pl

to improve the product. This paper presents a case study where research through design (RtD) was used as an iteration. RtD is a method that uses the unique insights gained through design practice to provide a better understanding of complex and forward-looking design issues. Combining these elements in drafting a city development strategy seems very promising dude to the developmental nature of such a document. Such a combination makes it possible to incorporate new data, e.g. feedback from residents or responses to the effects of various crises, into the strategy at different stages and on the basis of ongoing monitoring. The results of the research conducted on the example of the Polanica-Zdrój development strategy, presented in this article show that this is a direction worth developing further, also due to the possibility of obtaining more and more diverse data. Below is a block diagram of the research procedure (Fig. 2) applied to the specific example of Polanica-Zdrój. However, it is a suggestion for a general research approach to rethinking the urban landscape and creating design strategies for cities to become more resilient in times of crisis.

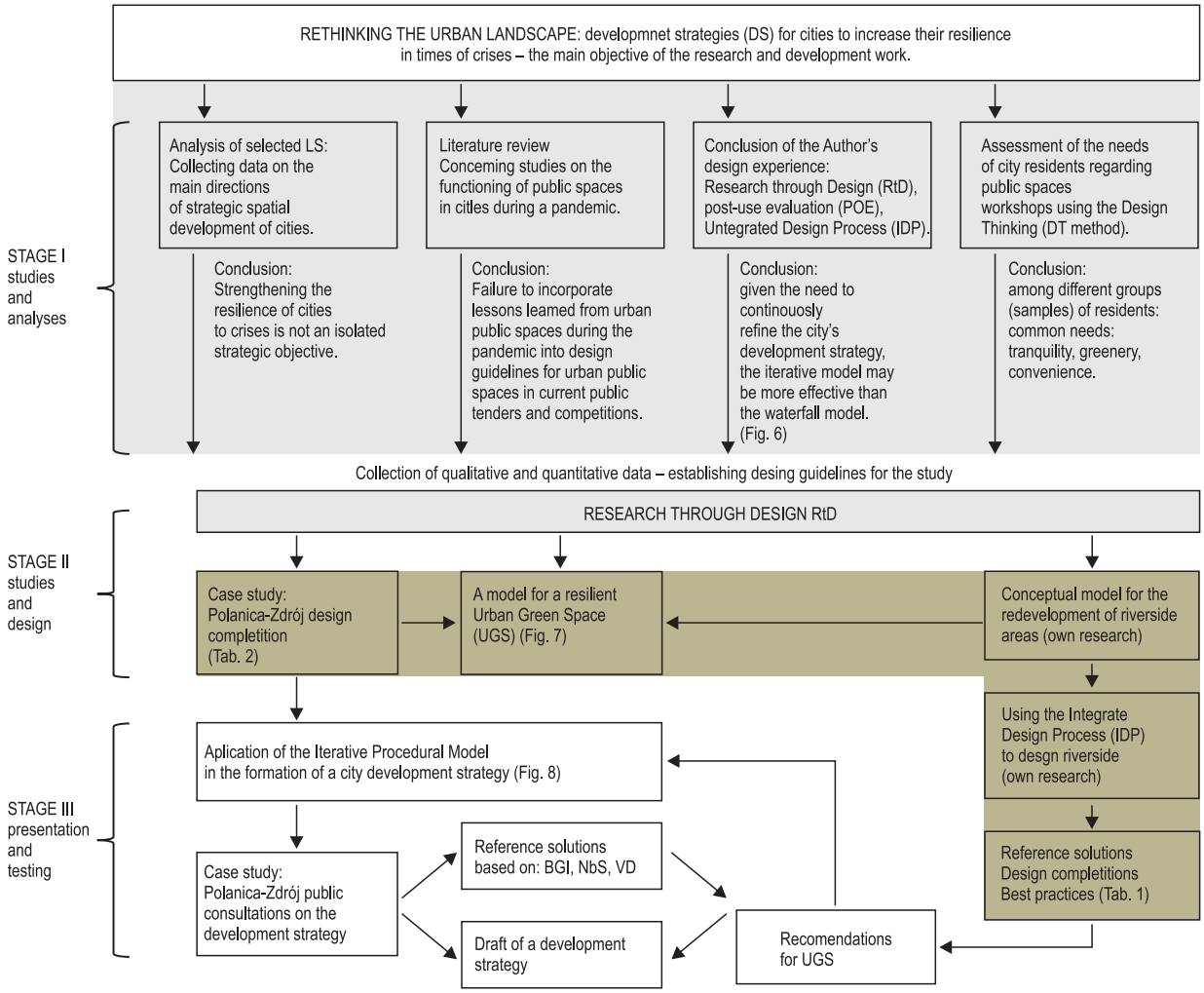


Fig. 2. Flow chart of the test procedure
Source: own elaboration.

✉anna.bochenska-skalecka@upwr.edu.pl

Description of case study area

Polanica-Zdrój is the youngest spa in Lower Silesia (Poland). Its intensive development, associated with the discovery of new mineral water springs and the construction of a railway line from Kłodzko, started at the end of the 19th century and the beginning of the 20th century. It was during this period that most of the guest houses and villas were built around the spa house with the "Wielka Pieniawa" pump room, as well as other sanatorium facilities. The villas built in this period are surrounded by gardens directly adjacent to the park complex: the Spa Park, the Chess Park and the Forest Park. Those gardens form a compositionally coherent green complex in the very centre of the city. On the south and south-west, they connect with the adjacent woodlands which are the buffer zone of the Stołowe Mountains National Park. Stary-Zdrój, the centre of Polanica-Zdrój, is an example of district designed according to the idea of a 'garden city' (Balińska, 1991). The entire town is included in the local spatial development plans and Stary-Zdrój is under the supervision of the conservation officer as part of the historical urban layout of Polanica-Zdrój (Fig. 3). Over the last twenty years, however, the urban layout has been disturbed by the introduction of buildings and technical infrastructure into an area originally intended for greenery and recreation. This has resulted in the partial fragmentation of the historical centre of the spa.

The municipality of Polanica-Zdrój has taken steps to improve this situation by including in the draft of its development strategy (Strategia Rozwoju Gminy Polanica-Zdrój na lata 2022–2027 [Polanica-Zdrój Municipality Development Strategy for 2022–2027]), the introduction of blue-green infrastructure (BGI) as one of the measures for the rational use of natural resources in order to achieve the horizontal objective of protecting the air and natural resources.

On the other hand, one of the measures enabling the fulfilment of the strategic objective of improving cooperation and communication in the municipality of Polanica-Zdrój is cooperation with universities in the use of research and scientific works, reports, analyses, projects, scientific publications for the development needs of the municipality. The main spatial policy objectives identified in the draft strategy include:

- improving the quality of life by raising the standard of living and the quality of the natural environment, transport accessibility and increasing investment attractiveness;
- conserving and restoring natural and landscape resources;
- protecting the cultural landscape and organising and completing the spatial structure;

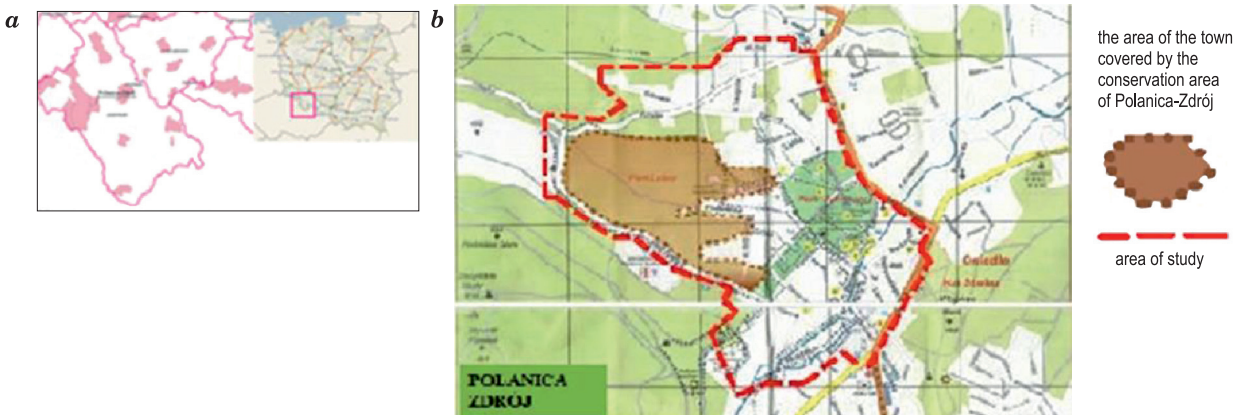


Fig. 3. Map of Polanica-Zdrój a) location b) Polanica-Zdrój with the marked conservation protection zone and the study area
Source: own elaboration based on Geoportal Otwartych Danych Przestrzennych, https://polska.e-mapa.net/?identifyParcel=020805_1.0002.239/3&showParcelInfo=1 (2023).

✉anna.bochenska-skalecka@upwr.edu.pl

– increasing the availability of public space, including cultivated green spaces.

The lines of action defined in the draft development strategy were linked to those included in previous documents, i.e. the Adaptation Plan of the City of Polanica-Zdrój to Climate Change: increasing the importance of small water retention, development of the blue and green infrastructure system (BGI), rainwater management; development of urban greenery, pedestrian routes and bicycle paths, and the Environmental Protection Plan of the City of Polanica-Zdrój for 2020–2023: protection against flooding and drought. Including the planning and implementation of BGI in so many strategic areas of intervention in the draft municipal development strategy confirms that it is an indispensable element in shaping the contemporary city. On the other hand, the presented case study (using the research through design (RtD) method in the process of consulting the development strategy of the municipality of Polanica-Zdrój), has made it possible to illustrate the potential of BGI also as an element integrating existing and newly designed public green space and stimulating health-oriented activities of public space users/health-oriented activities in public space.

Research through design (RtD) as a research method to support the planned actions in the development strategy of the municipality of Polanica-Zdrój

First, the municipal council adopts a resolution that sets out a detailed procedure and timetable for the preparation of the draft municipal development strategy, including the consultation procedure for this document (Fig. 4). This is the first stage of the formal procedure and the start of the work on the municipal development strategy.

In particular, forms that allow interaction and exchange of arguments between participants and the joint creation of new ideas are recommended. All meetings, workshops and discussions may also be held by means of remote communication, ensuring simultaneous transmission of vision and sound, which has become popular in 2020. The municipality of Polanica-Zdrój extended the public consultation formula by organising a design competition in cooperation with a university as an expert partner. In January and February 2022, there was an online public due to the pandemic, whereas, in May and June 2022, a workshop was held to present the results

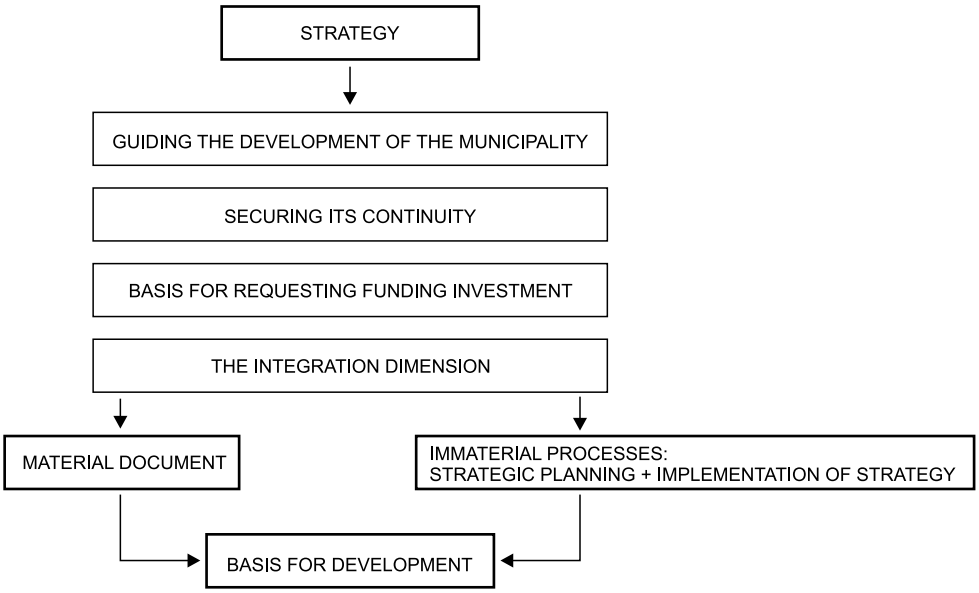


Fig. 4. City development strategy – idea
Source: own elaboration based on (Churski et al., 2021).

✉anna.bochenska-skalecka@upwr.edu.pl

of the design competition and a public exhibition of the competitions works was organised (the Spa House Hall in Polanica-Zdrój) (Fig. 5). The aim of the competition was to develop design concepts for a public space (PS) that would be connected to the existing parks in Polanica-Zdrój through the introduction of BGI. The municipality invited teams of landscape architecture students (the author of this article co-ordinated the work of the teams in terms of content and organisation with representatives of the municipality) to come up with solutions within the framework of a semester-long design exercise, which on the one hand would introduce elements of blue-blue infrastructure (BGI), and on the other hand would fit into the historical context of the spa and comply with the provisions of local law.

This situation made it possible to apply the research through design (RtD) method (Frayling, 1993) to the actions carried out during the consultation phase of the draft strategy and to obtain material for the development of a model for dealing with the design of urban public spaces (UPS) using BGI (Lis et al., 2017). At the consultation stage of the draft strategy, qualitative research techniques and techniques based on the research through design method were used, supported by creative potential (Pidlisna et al., 2023): selected inventive methods, i.e., brainstorming or design thinking (DT) (Pahl-Weber, 2017).

The individual stages of design concepts were completed by groups of students from the Faculty of Landscape Architecture (Master's degree). The studies and pre-design analyses covered:

- a description of the existing state of the site selected for the design work;
- archival research – literature and interpretative research on possibilities of implementing BGI in a situation similar to the one assumed (e.g., restrictions due to the conservation zone);
- compliance of the adopted project assumptions with the guidelines of the binding planning and strategic documents, including those included in the draft development strategy of the Municipality of Polanica-Zdrój.

Participants in the first (conceptual) design phase also included representatives of: the Municipality, the City Council, acting as consultants, and representatives of the local conservation authority. The resulting conceptual solutions were intended to serve as material for the development of implementation projects and the implementation of solutions, and as guidance for further actions described in the literature as phase three – design (Bąba-Ciosek & Kucharczyk-Brus, 2022; Stasiak & Kępczyńska-Walczak, 2023). The study was limited in its functional scope by the recommendations arising from the existing planning documents and its implementation time – a formally defined deadline (Churski et al., 2021) in relation to the public consultation period and the semester cycle of the academic year, and therefore there was no iteration at this stage. As a result, ten concepts were formulated

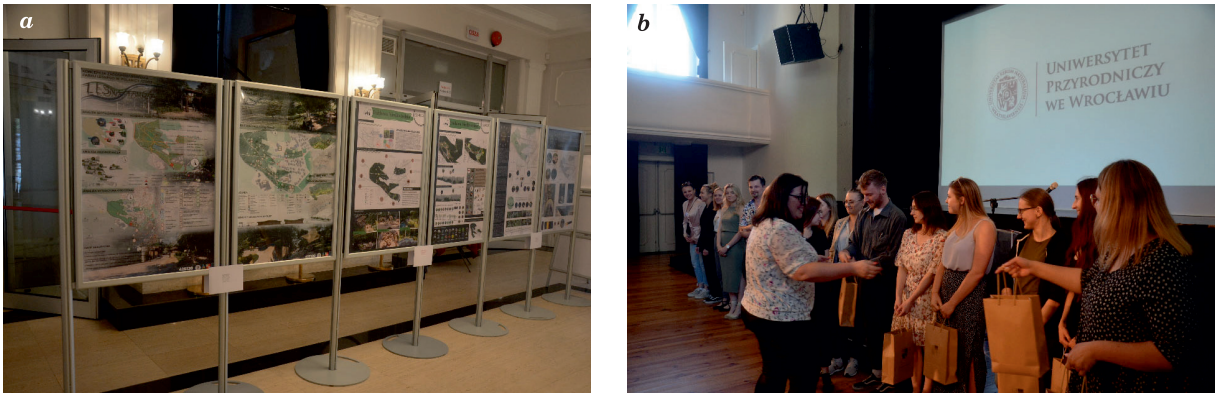


Fig. 5. Public announcement of competition a) results and exhibition of competition works in the Spa Theatre in Polanica-Zdrój, b) 2022
Source: own elaboration.

✉anna.bochenska-skalecka@upwr.edu.pl

that address the possibility of introducing BGI into urban public space to improve overall environmental well-being and enhance urban resilience.

RESULTS AND DISCUSSION

Design competition as a visualisation of the main objectives of the city development strategy

The main criteria for the evaluation of the competition entries were formulated based on applicable evaluation criteria for design competitions (Grzegorzewska et al., 2023) and the findings of the competition organisers. The members of the Competition Jury (10 persons) first scored each entry individually (an evaluation sheet with an explanation of the criteria and a score for each criterion (5) from 1 to 25 points), then the points awarded to each entry in each category were added up and finally the total points awarded to each entry were given. The jury awarded 1st, 2nd and 3rd place to the highest scoring entries and, after discussion by the jury, an honourable mention. The main evaluation criteria were:

- originality of the design concept: including innovative solutions for tourism and health-oriented recreation;
- the functionality of the solutions adopted: in terms of the systemic linking of public green spaces and the creation of multifunctional spaces (zoning);
- inclusiveness including attention to the needs of different user groups;
- how and to what extent it relates to the surrounding context;
- compatibility of the design concept with the guidelines contained in the Programme of Adaptation of the City of Polanica-Zdrój to Climate Change;
- the extent to which the multifunctional role of greenery is used in the design solutions applied.

As a result of the analysis of the design material, three main problem areas were identified in the design concepts. They include:

- presentations for the introduction of only new elements and objects of small architecture, pedestrian routes and greenery, Group C (three works, sample work no. 21374 tab. 2);
- concepts attempting to combine new recreational infrastructure with the introduction of a health-promoting function (health path, multisensory) and the design of a multifunctional space with zoning and the use of site conditions for the introduction of a new function: based on BGI/NbS solutions, Group B (two works, sample work no. 662113, tab. 2);
- design works focused primarily on the design of the site based on the BGI infrastructure and the implementation of innovative design solutions, but following a principle that corresponds to the vision of Polanica-Zdrój from the draft development strategy: *Resort in harmony. Between nature and modern technology. Between quality of life of all residents and the satisfaction of tourists,* group A (four works, sample no. 425120, tab. 2) and one job between types A and B (sample no. 468595).

This paper presents three design concepts that are the most representative examples of the highlighted problem areas (A, B, C) and that received the highest rating from the Jury and a fourth one that received a high rating (Jury's honourable mention) due to its focus on the issue of adapting the area to new user needs – the possibility of creating workplaces in the public green space (PGS).

The design concepts developed as part of the research work were an outstanding support for illustrating the objectives of the spatial policy of the municipality of Polanica-Zdrój specified in the draft of its development strategy. They became the starting material for the future design process. A project with BGI elements has been included in the draft development strategy as an exemplary project for the development and modernisation of tourism and tourism-related infrastructure of a supra-local, infrastructural and linear nature, the assumptions of which were agreed based on the research and design material obtained in the competition. A study using the RtD method made it possible to present the possibilities and limitations associated with the implementation of BGI in the areas of the city under conservation protection. A post-competition exhibition, organised

✉anna.bochenska-skalecka@upwr.edu.pl

Table 2. List of representative entries for the indicated problem areas according to the Jury's evaluation, indicating the number of solutions applied that can improve the microclimate, accessibility of use and safety, public health and social integration and the historical layout through the use of BGI, NbB, WD

Type and name of the competition entry	Improvement area	Design solutions	Results
1	2	3	4
A; 425120   Jury's evaluation: 1st place (960 points) Keynote: Forest stream	microclimate	BGI NbS WD	Increase / Decrease
		+ +++++	air quality / air temperatures biodiversity/ urban heat island small-scale / effect retention /
	accessibility of use/safety	++	recreational area / zoned meeting places / footpaths and walkways /
	public health	++	physical activity outdoors / recreational area/ sensory experience/
	social integration	++	multifunctionality of the site / venues Main feature of the space: multifunctionality
	historical layout	++	restoration of / fragmentation of the historical / green spaces layout
A/B; 468595  Jury's evaluation: honorable mention, 5th place (857 points) Keynote: Nature is a luxury for all	microclimate	BGI NbS WD	Increase / Decrease
		+ ++	biodiversity / urban heat island small-scale / effect retention
	accessibility of use/safety	+	usage control / damage to forest zoned meeting / cover places
	public health	+	physical activity outdoors / recreational area/
	social integration	++	multifunctionality of the site / outdoor workspaces/
	historical layout		
B; 662113  Jury's evaluation: 6th place (837points) Keynote: Health all round /Bear Paw Park	microclimate	BGI NbS WD	Increase / Decrease
		+	biodiversity /
	accessibility of use/safety	+	foot traffic/ zoning of functions/
	public health	+	physical activity outdoors / paths / health trail/
	social integration	+	a varied programme of uses/
	historical layout		

✉anna.bochenska-skalecka@upwr.edu.pl

cont. Table 2

1	2	3	4
C. 213742  Jury's evaluation: 8th place (734 points) Keynote: Trail of light	microclimate	BGI NbS WD	Increase / Decrease
		+	biodiversity /
	accessibility of use/safety	+	foot traffic/
	public health	+	passive and active / outdoor activities / paths /
	social integration		
	historical layout		

Source: own elaboration based on the results of the design competition (2022).

in a public building in Polanica-Zdrój, presenting all the design concepts together with their evaluation and justification, also became a form of public consultation. This also had an educational dimension in terms of justifying the implementation of BGI in the city.

A model for proceeding with the design of urban public spaces (UPS) based on BGI

Currently, European scientific and research and design activities in the natural, technical and social sciences are strongly focused on environmental protection (Gronowska et al., 2018). The interdisciplinary nature of this problem leads to the formation of research teams consisting of specialists from different scientific fields and the creation of interdisciplinary methodological frameworks for the research conducted. The need to develop and apply new, innovative research methods and techniques that enable both in-depth knowledge of a given area (providing up-to-date and detailed data and information) and monitoring of the changes taking place in it, as well as analysis of the possibilities and limits of its further development is particularly evident in the area of research into the design of a sustainable human habitat (Fig. 6). Given the need to minimise the negative effect of construction on the environment (the building sector is responsible for almost 40% of global greenhouse gas emissions, together with the road area it is as much as 75%, World Green Building Council data, XII, 2021), as well as the increasing participation in the development of public land and the need to involve local communities in climate change adaptation processes (Brink & Wamsler, 2017) – it is necessary to develop and verify a methodological framework for urban change. One of the proposals for such a framework is an iterative model based on the results of analyses carried out during the research and design work using the RtD method (Frayling, 1993).

The use of visual materials (Raaphorst et al., 2019) made it possible to obtain information about, on the one hand, the directions of transformation of urban public spaces as multifunctional (new functional, technical and technological solutions) and, on the other hand, the preferences of user (Kumar et al., 2016) regarding the use of urban public spaces in general and the perception of the "urban nature" of the landscape itself. The data and information obtained helped to develop a conceptual model (UPS), the essence of which is to identify diverse ways of using BGI as a necessary element of multifunctional urban

✉anna.bochenska-skalecka@upwr.edu.pl

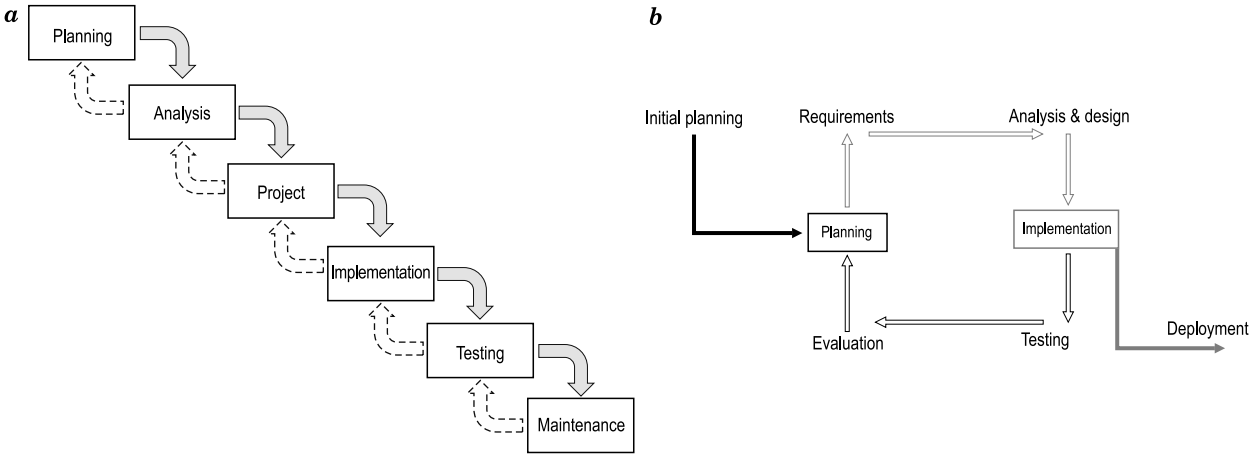


Fig. 6. Waterfall model (a) versus Iterative model (b)
Source: own elaboration based on: (a) W.W. Royce (1970); (b) Eby (2019).

public spaces. The conceptual model is a starting point for further research and also an auxiliary tool to "illustrate" how the UPS space is currently perceived. Assuming that the UPS is now a "pattern of urban character" or an "indicator of urban character" in the built/urbanised landscape (Fig. 7).

A meta-design framework has been identified to support further research and development activities aimed at improving the quality of the urban landscape (Fig. 8). Planned, future research will address the search for an optimal solution between meeting current (global) design standards in urban landscaping and preserving the unique character of urban areas. An iterative model can be a tool for strategies to develop more resilient cities together with individual conceptual models created using mixed methods (Eby, 2019; Larman & Basili, 2003).

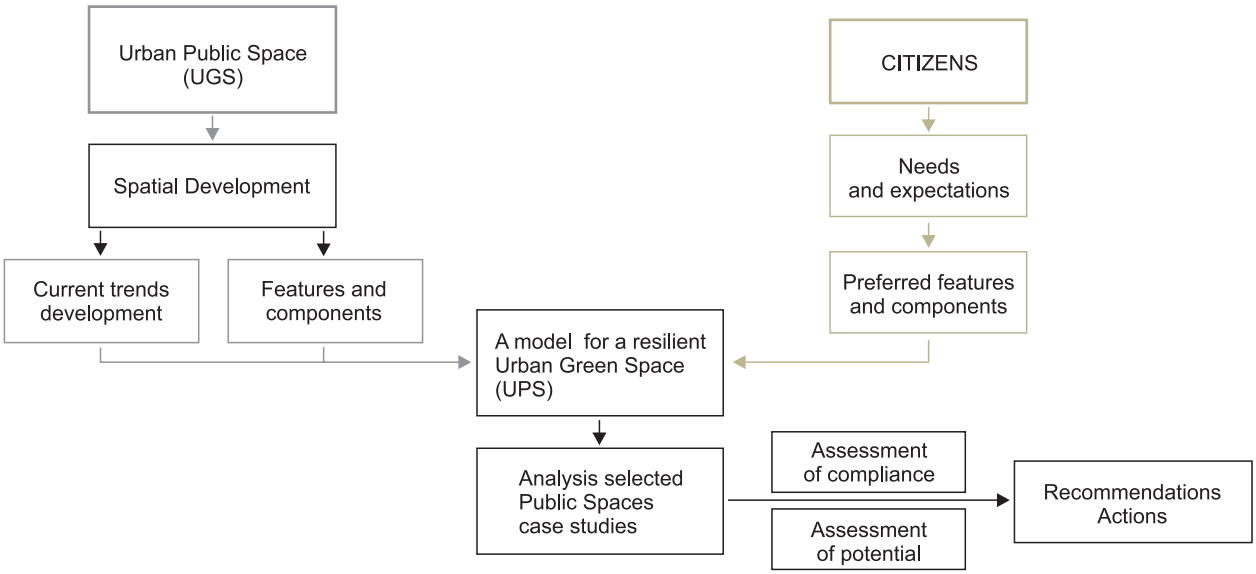


Fig. 7. Model Urban Green Space (UGS) on research through design (RtD)
Source: own elaboration.

✉anna.bochenska-skalecka@upwr.edu.pl

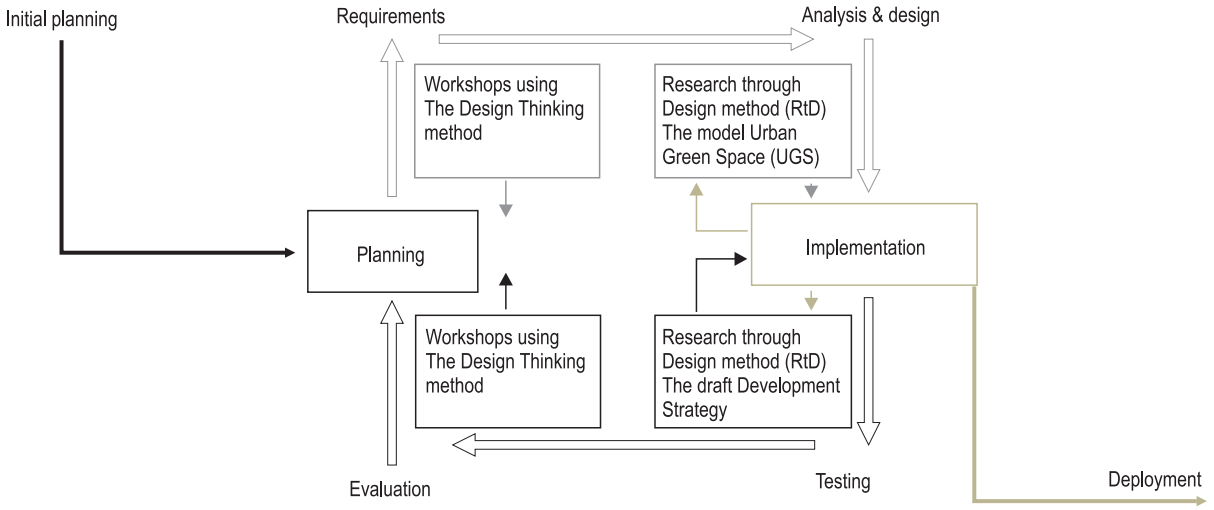


Fig. 8. Iterative process diagram showing the application steps of the method of research through design (RtD) and design thinking (DT) method
Source: own elaboration.

CONCLUSIONS

Improving the safe use of public spaces in the city, particularly PGS, is a shared responsibility between government and various stakeholders, including NGOs, the private sector, academia, and the media, and should be a priority in designing resilient and sustainable cities during both pandemics and other crises (Eltarabily & Elgheznawy, 2020). When implementing urban public space guidelines, local authorities and other government stakeholders should take into account the experience of urban population (Gubić & Wolff, 2022). For example, it seems relevant to include, as one of the design guidelines, the provision of a variety of options for the accessibility of spaces, as well as signing and monitoring of their use in competition announcements (Gubić & Wolff, 2022). The conclusions of this type of research, conducted in the post-pandemic period, highlight the need to standardise the meaning and measurement of quality of life in relation to urban design. This seems essential, as such spaces are a source of financial, social, environmental and health benefits for cities. It is also important in the context of the implementation of new urban green spaces, where the systemic introduction of BGI can improve their safe use.

It is essential to continue research with a representative sample of users on the changing uses of contemporary public spaces in cities. The results will be useful in shaping urbanised regions that face many, similar challenges related to population density and limited PGS, as well as unequal access during upcoming crises (da Schio et al., 2021). The conclusions of these studies should be incorporated into design guidelines for new public spaces or development strategies for cities. The design of inner-city public spaces (PS) with blue-green infrastructure (BGI) can help to create more safe zones in cities, which will contribute to increasing their resilience to various crises (European Missions. 100 Climate-Neutral and Smart Cities by 2030: Info Kit for Cities. 2021; Gubić & Wolff, 2022; da Schio et al., 2021). It is therefore important to include BGI design guidelines in urban development strategies and master plans in conjunction with conservation zone regulations (Kopp et al., 2021). The results of design competitions can help in this respect. Expert teams could formulate recommendations for designing public spaces in contemporary cities to make them more resilient to crisis situations through the implementation or reconstruction of BGI, and preserve their historical urban and architectural value. A deeper understanding of the relationship

✉anna.bochenska-skalecka@upwr.edu.pl

between quality of life and public green spaces in the city could contribute to improving the planning and design of these spaces so that they have the maximum impact on improving the quality of life in the city and strengthening the resilience of urban infrastructure in emergencies. Research into the potential for improving public green spaces so that they can be used safely in the event of future pandemics is of great interest and needs to be continued, particularly with a view to improving the development strategies of contemporary cities (Eltarabily & Elgheznawy, 2020). The scope of these improvements should address three, core areas:

– urban planning and policy;
– landscape design;
– green space management.

Multifunctionality, inclusivity, sensory experience are features that determine the resilience of urban green spaces and transform the nature of their use.

Author contributions: The author has approved the final version of the article. The author had contributed to this work as follows: Author. developed the concept and designed the study, Author. collected the data, Author. analyzed and interpreted the data, Author. drafted the article, Author. revised the article critically for important intellectual content.

Funding: This work was funded by the internal, university grant of (grant No. N110/0004/22).

Supplementary information: The author would like to thank the following institution for support in preparing the article: Municipality of Polanica-Zdrój (Poland).

Note: The results of this study have been previously presented in a different form, such as a posters and presentation at conferences: Przemyśleć zieleń. Zielona i błękitna infrastruktura w historycznej zabudowie śródmiejskiej [Rethinking green. Green and blue infrastructure in historic inner city development], (May 2023), XXV Forum Architektury Krajobrazu. Terapia zielenią – od Kopernika po współczesność [XXV Landscape Architecture Forum. Green therapy – from Copernicus to the present day] (December 2023).

REFERENCES

Balińska, G. (1991). *Uzdrowiska dolnośląskie. Problemy rozwoju i ochrony wartości kulturowych po II wojnie światowej* [*Lower Silesian spas. Problems of development and protection of cultural values after World War II*]. Wydawnictwo Politechniki Wrocławskiej [Publisher Wroclaw University of Technology].

Bąba-Ciosek, N., & Kucharczyk-Brus, B. (2022). Research by design jako metoda badawcza wspierająca planowane działania inwestycyjne na przykładzie adaptacji magazynu materiałów wybuchowych w kamieniołomie Sadowa Góra na przestrzeń wystawienniczą [Research by design as a research method to support planned investment activities on the example of the adaptation of an explosives magazine at the Sadowa Góra quarry into an exhibition space]. *Builder*, *301*(8), 46–49. https://doi.org/10.5604/01.3001.0015.9199

Bocheńska-Skałecka, A., & Walter, E. (2020). Application of the Integrated Design Process (IDP) Method to the Design of Riverside on the Example of Żmigród (Poland). *Sustainability*, *12*(16), 6684. https://doi.org/10.3390/su12166684

Brink, E., & Wamsler, Ch. (2018). Collaborative Governance for Climate Change Adaptation: Mapping citizen–municipality interactions. *Environmental Policy and Governance*, *28*(2), 82–97. https://doi.org/10.1002/eet.1795

Chęć-Małyszek, A. (2021). Criteria of livable public spaces quality. Case study analysis on the example of selected public spaces Lublin. *Teka nr 2 Komisji Architektury, Urbanistyki i Studiów Krajobrazowych, Oddział Polskiej Akademii Nauk w Lublinie* [*Portfolio No. 2 of the Commission for Architecture, Urban Planning and Landscape Studies, Lublin Branch of the Polish Academy of Sciences*], *55–75.* https://orcid.org/0000-0001-6004-0635

Churski, P., Ciesiółka, P., Kołsut, B., & Mikuła, Ł. (2021). *Koncepcja strategii rozwoju ponadlokalnego – materiał ekspercki dla potrzeb operacyjnych jednostek samorządu terytorialnego, opracowany na zlecenie Ministerstwa Funduszy i Polityki Regionalnej* [*Concept of supra-local development strategy – expert material for operational needs of local government units, commissioned by the Ministry of Funds and Regional Policy*]. Wydawnictwo Uniwersytetu im. Adama Mickiewicza w Poznaniu [Publisher of the Adam Mickiewicz University of Poznan].

✉anna.bochenska-skalecka@upwr.edu.pl

Crossley, A. J., & Russo, A. (2022). Has the Pandemic Altered Public Perception of How Local Green Spaces Affect Quality of Life in the United Kingdom? *Sustainability, 14*(13), 7946. https://doi.org/10.3390/su14137946

Di Sabation, S. (2022). Nature-based solutions for climate change: OPERANDUM Project. *Profile*, 404–405. https://www.openaccessgovernment.org/nature-based-solutions/126712/

Eby, K. (2019, update 2023). The Power of Iterative Design and Process. https://www.smartsheet.com/iterative-process-guide

Eltarabily, S., & Elgheznawy, D. (2020). Post-Pandemic Cities - The Impact of COVID-19 on Cities and Urban Design. *Architecture Research*, *10*(3), 75–84. https://doi:10.5923/j.arch.20201003.02

European Commission, Directorate-General for Research and Innovation. EU missions – 100 climate-neutral and smart cities (2022) (European Union). https://data.europa.eu/doi/10.2777/191876

Frayling, Ch. (1993/4). Research in art and design. *Royal College of Art, Research Papers*, *1*, 1–5.

Giusti, M., & Samuelsson, K. (2020). The regenerative compatibility: A synergy between healthy ecosystems, environmental attitudes, and restorative experiences. *PLoS ONE*, *15*(1), e0227311. https://doi.org/10.1371/journal.pone.0227311

Gronowska, B., Rakoczy, B., Kapelańska-Pręgowska, J., Karpus, K., & Sadowski, P. (Eds.). (2018). *Prawa człowieka a ochrona środowiska – wspólne wartości i wyzwania* [*Human rights and environmental protection – common values and challenges*]. Katedra Praw Człowieka i Administracji, Uniwersytet Mikołaja Kopernika w Toruniu [Department of Human Rights and Administration, Nicolaus Copernicus University in Torun].

Grzegorzewska, M., Kaczmarek, A., & Kirschke, P. (2023). Environmental Assessments in Architectural Competitions in Poland in the Years 2018–2022. *Buildings, 13*, 2839. https://doi.org/10.3390/buildings13112839

Gubić, I., & Wolff, M. (2022). Use and design of public green spaces in Serbian cities during the COVID-19 pandemic. *Habitat International*, *128*, 102651. https://doi.org/10.1016/j.habitatint.2022.102651

Hajto, M., Małgorzata, Bidłasik, M., Kuśmierz, A., Marcinkowski, M., Potapowicz, I., & Rajkowska, B. (2023). *Podręcznik adaptacji dla miast. Wytyczne do przygotowania Miejskiego Planu Adaptacji do zmian klimatu – aktualizacja 2023)* [*Adaptation Manual for Cities. Guidelines for the preparation of a Municipal Climate Change Adaptation Plan – update 2023*]. Klimada 2.0. https://ios.edu.pl/aktualnosci/podrecznik-adaptacji-do-zmian-klimatu-dla-miast/

Herman, K., & Drozda, Ł., Green. (2021). Infrastructure in the Time of Social Distancing: Urban Policy and the Tactical Pandemic Urbanism. *Sustainability*, *13*(4), 1632. https://doi.org/10.3390/su13041632

Journal of Laws of 2023, item 977 (consolidated text) (2023) (Poland) https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20230001688

Kaczyńska, M. (2022). Present security of the neighbourhood urban parks considering SARS-CoV-2 potential spreading – A case study in Ursynów district in Warsaw. *Acta Scientiarum Polonorum. Administratio Locorum*, *21*(3), 355–377. https://doi.org/10.31648/aspal.7491

Kopp, J., Frajer, J., Lehnert, M., Kohout, M., & Ježek, J. (2021). Integrating Concepts of Blue-green Infrastructure to Support Multidisciplinary Planning of Sustainable Cities [Integracja koncepcji niebiesko-zielonej infrastruktury jako narzędzie wspierania interdyscyplinarnego planowania Zrównoważonych Miast]. *Problemy ekorozwoju – Problems of sustainable development*, *16*(2), 137–146. https://doi.org/10.35784/pe.2021.2.14

Kumar, A., Lodha, D., Mahalingam, A., Prasad, V., & Sahasranaman, A. (2016). Using 'design thinking' to enhance urban re-development: a case study from India. *Engineering Project Organization Journal*, *6*(2–4), 155–165. https://doi.org/10.1080/21573727.2016.1155445

Lamond, J., & Everett, G. (2019). Sustainable Blue-Green Infrastructure: A social practice approach to understanding community preferences and stewardship. *Landscape and Urban Planning*, *191*, 103639. https://doi.org/10.1016/j.landurbplan.2019.103639

Larman, C., & Basili, V. R. (2003). Iterative and Incremental Development: A Brief History. *Computer*, *36*(6), 47–56. https://doi.org/10.1109/MC.2003.1204375

Lis, A., Bocheńska-Skałecka, A., Burdziński, J., Gubański, J., & Walter, E. (2017). Uwarunkowania przestrzenne, prawne i społeczne w aktywizacji terenów nadrzecznych. Model konceptualny [Spatial, legal and social conditions in the activation of riverside areas. Conceptual model]. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu* [*Research Papers of Wrocław University of Economics*], *467*, 154–162. http://dx.doi.org/10.15611/pn.2017.467.13

✉anna.bochenska-skalecka@upwr.edu.pl

Mikołajczyk-Kłębek, A. (2023). Eksperci: zieleń miejska może łagodzić skutki zmian klimatu [Experts: urban greenery can mitigate the effects of climate change] *Zielonagospodarka.pl*. https://zielonagospodarka.pl/eksperci-zielen-miejska-moze-lagodzic-skutki-zmian-klimatu-12570

Noszczyk, T., Gorzelany, J., Kukulska-Kozieł, A., & Hernik, J. (2022). The impact of the COVID-19 pandemic on the importance of urban green spaces to the public. *Land Use Policy*, *113*, 105925. https://doi.org/10.1016/j.landusepol.2021.105925

Nowak, M. J., Szulczewska, B., Legutko-Kobus, P., Giedych, R., & Oleńczuk-Paszel, A. (2023). Plany zagospodarowania przestrzennego jako instrument zarządzania zieloną infrastrukturą [Land use plans as an instrument for green infrastructure management]. *Studia BAS* [*BAS Studies*], *1*(73), 59–73. https://doi.org/10.31268/StudiaBAS.2023.05

Ostoi, S. K., Zivojinovi, I., Vuleti, D., Derksf, J., Daviesf, C., Lafortezza, R., Roitsch, D., Winkel, G., & De Vreese, R. (2021). The impact of the COVID-19 pandemic on the use of and attitudes towards urban forests and green spaces: Exploring the instigators of change in Belgium. *Urban Forestry & Urban Greening*, *65*, 127305. https://doi.org/10.1016/j.ufug.2021.127305

Pahl-Weber, E. (2017, February). *Urban Cooperation by Urban Design Thinking.* Presentation on Smart Sustainable Cities. Lyngby Campus, DTU, Copenhagen, Denmark.

Pancewicz, A. (2021). Climate-Friendly Cities – Blue--Green Infrastructure Activities. *IOP Conf. Ser.: Mater. Sci. Eng.*, *1203*, 022049.

Pidlisna, O., Simonova, A., Ivanova, N., Bondarenko, V., & Yesipov, A. (2023). Harmonisation of the urban environment by means of visual art, lighting design, and architecture. *Acta Scientiarum Polonorum. Administratio Locorum*, *22*(1), 59–72. https://doi.org/10.31648/aspal.8214

Pochodyła, E., Glińska-Lewczuk, K., & Jaszczak, A. (2021). Blue-green infrastructure as a new trend and an effective tool for water management in urban areas. *Landscape Online*, *92*, 1–20. https://orcid.org/0000-0002-9781-7230

Pouso, S., Borja, A., Fleming L. E., Gómez-Baggethun, E., White, M. P., & Uyarra, M. C. (2021). Contact with blue-green spaces during the COVID-19 pandemic lockdown beneficial for mental health. *Science of the Total Environment*, *756*, 143984. https://doi.org/10.1016/j.scitotenv.2020.143984

Raaphorst, K., van der Knaap, W., van den Brink, A., & Roeleveld, G. (2019). Visualization, participation and rhetoric: The discursive power of landscape design representations in participatory processes. *Journal of Landscape Architecture*, *14*(2), 42–53. https://10.1080/18626033.2019.1673569

Romańczak, A., & Siwiec, E. (2023). *Adaptation Manual for Cities. Guidelines for the preparation of a Municipal Climate Change Adaptation Plan – update 2023* [*Podręcznik adaptacji dla miast. Wytyczne do przygotowania Miejskiego Planu Adaptacji do zmian klimatu – aktualizacja 2023*]. https://ios.edu.pl/aktualnosci/podrecznik-adaptacji-do-zmian-klimatu-dla-miast/

da Schio, N., Phillips, A., Fransen, K., Wolff, M., Haase, D., Ostoi, S. K., Zivojinovi, I., Vuleti, D., Derksf, J., Daviesf, C., Lafortezza, R., Roitsch, D., Winkel, G., & De Vreese, R. (2021). The impact of the COVID-19 pandemic on the use of and attitudes towards urban forests and green spaces: Exploring the instigators of change in Belgium. *Urban Forestry & Urban Greening*, *65*. https://doi.org/10.1016/j.ufug.2021.127305

Shabb, K., McCormick, K., Mujkic, S., Anderberg S., Palm, J., & Carlsson, A. (2022). Launching the Mission for 100 Climate Neutral Cities in Europe: Characteristics, Critiques, and Challenges. *Front. Sustain. Cities*, *3*, 817804. https://doi.org/10.3389/frsc.2021.817804

Sharifi, A. (2019). Resilient urban forms: A review of literature on streets and street networks. *Building and Environment*, *147*, 171–18. https://doi.org/10.1016/j.buildenv.2018.09.040

Stasiak, P., & Kępczyńska-Walczak, A. (2023). Rozwiązania oparte na przyrodzie w Bejrucie [Nature-based solutions in Beirut]. *Builder*, *8*(313), 35–42. https://doi.org/10.5604/01.3001.0053.7552

Strategia Rozwoju Gminy Polanica-Zdrój na lata 2022––2027. Załącznik do uchwały nr IV/28/2022 Rady Miejskiej w Polanicy-Zdroju [Development Strategy of Polanica-Zdrój Muncipality for 2022–2027. Appendix to Resolution No. IV/28/2022 of the Municipal Council in Polanica-Zdrój], 75–79. https://www.polanica.pl/mieszkaniec/wazne-dokumenty

Sun, Y., Deng, L., Pan, S., Chiang, P., Sable, S., & Shah, K. J. (2020). Integration of green and gray infrastructures for sponge city: Water and energy nexus. *Water--Energy Nexus*, *3*, 29–40. https://doi.org/10.1016/j.wen.2020.03.003

White, M. P., & Uyarra, M. C. (2021). Contact with blue-green spaces during the COVID-19 pandemic

✉anna.bochenska-skalecka@upwr.edu.pl

lockdown beneficial for mental health. *Science of the Total Environment*, *756*, 143984. https://doi.org/10.1016/j.scitotenv.2020.143984

Wieczorek, I., Nowakowska, A., & Rzeńca, A. (2022). *Zabytkowa zieleń i jej rewaloryzacja w działaniach samorządu terytorialnego* [*Historic greenery and its revitalisation in local government activities*]. Wydawnictwo Narodowego Instytutu Samorządu [Published by National Institute of Local Government].

Wronkowski, A., & Główczyński, M. (2021). Miejskie otwarte przestrzenie publiczne w kryzysie – percepcja i zachowania przestrzenne użytkowników w trakcie pandemii COVID-19 [Urban public open spaces in crisis – users' perceptions and spatial behaviour during the COVID-19 pandemic]. *Rozwój Regionalny i Polityka Regionalna* [*Regional Development and* Policy], *56*, 61–79. https://doi.org/10.14746/rrpr.2021.56s.06

[www1] https://go.gale.com/ps/i.do?p=AONE&u=googlescholar&id=GALE|A601326071&v=2.1&it=r&sid=AONE&asid=07283771 [access September 2023]

[www2] https://www.substance.lv/ [access September 2023]

[www3] https://landezine.com/a-resilient-landscape-yanweizhou-park-in-jinhua-city-by-turenscape/ [access September 2023]

[www4] https://muszyna.pl/pl/1779/0/budowa-parku-zdrojowego-%E2%80%9Ezapopradzie%E2%80%9D-w-uzdrowisku-muszyna-%E2%80%93-etap-iii-.html [access September 2023]

[www5] https://www.paris.fr/lieux/parc-clichy-batignolles-martin-luther-king-2817 [access September 2023]

[www6] https://www.bryum.org/projekte/pocket-park/ [access September 2023]

✉anna.bochenska-skalecka@upwr.edu.pl