From city in the park to "greenery in plant pots": The influence of socialist and post-socialist planning on opportunities for cultural ecosystem services

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A B S T R A C T

The paper examines the links between the cultural ecosystem services concept, political ideologies and urban planning. In particular, it investigates the extent to which cultural ecosystem services were considered in urban planning in socialist and post-socialist Zagreb. We conducted a content analysis of three socialist and two post-socialist plans of Zagreb and interview transcripts with urban planners and academics. To take account of the relational character of cultural ecosystem services, we assessed the extent to which urban planning facilitated opportunities for human–ecosystem interactions rather than individual cultural ecosystem services themselves. This revealed planning factors that helped promote and discourage conditions for CES to arise. The findings indicated that socialist planning facilitated interaction opportunities to a wider extent than post-socialist planning, mainly by providing abundant, fair-sized, well-distributed green spaces with clearly outlined functions. The proposed assessment approach could be implemented in the planning process to evaluate how conditions for CES generation are provided by the current planning cycle and inform the process in the following cycle.

1. Introduction

Ever since the Millennium Ecosystem Assessment (MEA, 2005), researchers have attempted to translate the ecosystem services (ES) concept into practice. Yet, understanding, assessment and implementation of ES in planning continue to face difficulties (Grunewald et al., 2021; Kabisch, 2015). The resistance of some types of ES, especially cultural ecosystem services (CES), to quantification and monetisation hinders their integration in planning (Grunewald et al., 2021) and makes the ES assessment incomprehensive by addressing only measurable services (Martin et al., 2018; Milcu et al., 2013). The process is further inhibited by the increasing popularity of related concepts such as nature-based solutions, nature's contributions to people, landscape functions and green infrastructure (Grunewald et al., 2021; Radford and James, 2013). Nevertheless, many ES, despite not being labelled as such, have been included in contemporary and historical urban plans of cities around the world, including Berlin, New York, Stockholm, Melbourne, and Italian and Portuguese cities (Cortinovis and Geneletti, 2018; Geneletti et al., 2020; Mascarenhas et al., 2015; Rall et al., 2015; Wilkinson et al., 2013).

Recreation has been the most common CES dealt with in these plans. This is because recreation is easier to map and identify than most other CES (Chan et al., 2012; Cooper et al., 2016). CES other than recreation are often treated as a residual category in ES assessments, after accounting for other services (Huu et al., 2018). Understood broadly as nonmaterial nature's contributions to human wellbeing, CES resisted for a long time the submission to the widely accepted ES cascade model (Haines-Young and Potschin, 2010), which conceptualises the service production process as a cascade starting with biophysical structures and processes which produce services that sustain human life and generate contributions to human wellbeing (benefits). Benefits shape cultural values, which in turn influence human–ecosystem interactions. Consequently, studies often failed to discriminate between cultural services, benefits and values (Blicharska et al., 2017), which obscured the CES provision process (Fish et al., 2016) and sometimes led to double-counting (Hernández, Morcillo et al., 2013).

Clearly, human involvement in the production of CES is indispensable (Chan et al., 2011; Fischer and Eastwood, 2016). In an attempt to relate CES to the ES cascade model, Fish et al. (2016) proposed that CES are understood as "relational processes and entities that people actively

create and express through interactions with ecosystems" (Fish et al., 2016, p. 211) (Fig. 1). These are represented by mutually reinforcing cultural practices (forms of interactions, e.g., recreation, observing) and environmental spaces (spatial contexts of interactions, e.g., park grassland, riverbanks). The interactions may result in contributions to human wellbeing in terms of "the identities they help frame, the experiences they help enable and the capabilities they help equip" (Fish et al., 2016, p. 212). The contributions correspond to the level of cultural ecosystem benefits (CEB) in the ES cascade model. The utility of this framework for land use policy is that it distinguishes between plannable, material elements (spaces and practices) and non-plannable, immaterial components (benefits).

To help translate this model to planning, Tandarić et al. (2020) proposed the "hatch and grow" strategy for planning for urban CES, which recognised that many of the benefits derived from urban nature cannot be predictably manufactured but emerge organically from relational interactions between ecosystems and individuals (Fischer and Eastwood, 2016; Raymond et al., 2017b). Rather than planning urban ecosystems to produce particular CES, the strategy advocates providing diverse opportunities for human–ecosystem interactions. In the context of declining contact with nature among urban residents (Soga and Gaston, 2016) and consequent impacts on nature conservation (Dickinson and Hobbs, 2017; Pyle, 2003), CES have been recognised as a way to increase contact with nature (Andersson et al., 2015). Indeed, direct and meaningful contact with nature is vital in forging an emotional connection with nature (Lumber et al., 2017; Pyle, 2003) and in urban areas this can be encouraged by integrating ecology and landscape design (Kowarik, 2019). Planners should aim to provide opportunities for relational interactions with urban nature (Fischer and Eastwood, 2016; Fish et al., 2016) via networks of urban green and blue spaces (UGBS), which at the same time provide urban ES such as air quality regulation, noise attenuation, and recreation opportunities (Dickinson and Hobbs, 2017; Hansen, 2018; Pauleit et al., 2011).

This study focuses on urban planning in Zagreb, Croatia, after the Second World War. The primary objective of this paper is to understand how opportunities for human–ecosystem interactions were planned in socialist and post-socialist Zagreb. Green spaces were provided abundantly in former socialist countries in Eastern Europe, which implies possibly greater opportunities for human–ecosystem interactions compared to the post-socialist period (Badiu et al., 2019; Hirt, 2013). The reintroduction of the free market and private property in the

post-socialist period introduced development on green land plots (Hirt, 2015). This change in socio-political context may reveal important insights about the role of urban planning in providing ES, yet there have been relatively few studies of urban ES in Eastern Europe (Poniży et al., 2017; Valánszki et al., 2019; Zwierzchowska et al., 2018). The second objective of the study is to examine how political ideologies have influenced the provision of CES. In addition to documenting Zagreb's planning history, this research provides more general insights into planning strategies for maximising cultural ecosystem benefits in cities. We address the following research questions:

(1) To what extent did urban planning provide opportunities for human–ecosystem interactions that might co-produce diverse CEB?
(2) How did socialist and post-socialist ideologies influence the provision of opportunities for human–ecosystem interactions?

2. Research approach

We start from the assumption that the planning provision of CES is more accurately assessed via Fish et al.'s (2016) framework than by CES categories from MEA (2005) that were usually used in previous studies. The contemporary understanding of CES as relational processes and entities indicates that the engagement with ecosystems is not straightforward. There are many situational factors and individual responses that influence human–ecosystem interactions and the generation of CEB (Fish et al., 2016; Ishihara, 2018). Hence, planners cannot predictably prescribe particular CEB for particular locations. To facilitate UGBS planning in the context of such idiosyncrasy, Tandarić et al. (2020) proposed the 5P framework that thematically categorises factors influencing the CES cascade. The framework consists of five factors: place, people, past, purpose, and practices. Table 1 presents the 5P factors and markers for evaluating how each factor can be considered in urban planning.

3. Materials and methods

3.1. Study area

Zagreb is the political, economic and cultural centre of Croatia. It grew dramatically during the socialist period (1945–1991) (Fig. 2) when
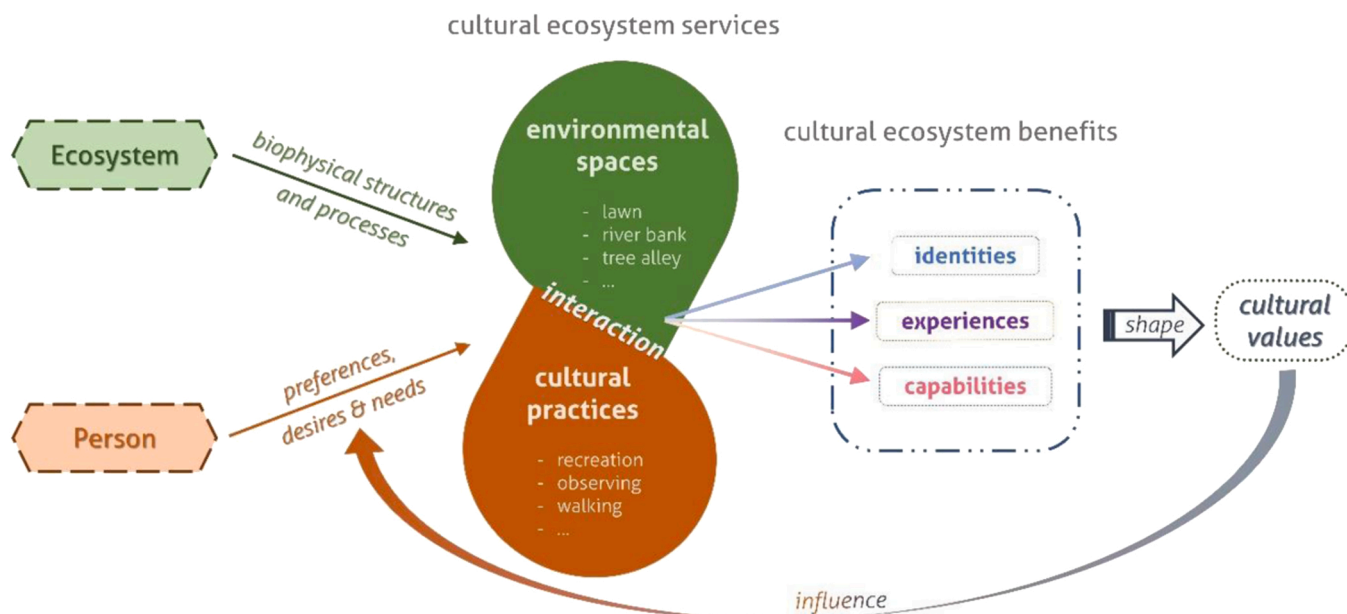

Fig. 1. The CES cascade modified from Fish et al.'s (2016) framework.

Table 1

Markers of the 5P framework relevant at the planning level adapted from Tandarić et al. (2020).

5 P factor	Factor description	Markers
Place	How might ecosystems distribution, location, size, and design affect human–ecosystem interactions?	distribution of UGBS on a city scale; location of UGBS within neighbourhoods; internal diversity and design of UGBS;
People	How might socio-demographic trends affect human–ecosystem interactions from a long-term perspective? Were prospective users' preferences, desires and needs considered?	socio-demographic trends in the planned area; prospective users' preferences, desires and needs regarding UGBS distribution and design;
Past	How might the historical trends or events affect current human–ecosystem interactions?	the historical appearance of the place where a UGBS construction or reconstruction is planned; traditional use of the place where a UGBS construction or reconstruction is planned;
Purpose	How might the purpose reflected in the ecosystems' location, design, equipment, and diversity affect human–ecosystem interactions?	direct-use functions; general socio-ecological functions; functional diversity of UGBS;
Practices	How might the cultural practices of other users affect human–ecosystem interactions?	contemporary cultural practices; anticipated cultural practices

Note: marker descriptions are given in Appendix A.

state-stimulated industrialisation doubled its population—from 325,000 in 1948 to 707,000 in 1991 (DZS, 2005). Socialist urban planning was greatly influenced by Le Corbusier's functionalist approach and blocks of flats were built in parkland settings (Blau and Rupnik, 2007). The reintroduction of the market economy in 1991 thoroughly changed the planning system, and housing tended to be built more densely.

3.2. Data collection

To examine the planning of opportunities for human–ecosystem interactions, we combined two sources: urban plans of Zagreb and interviews with urban planners and academics.

3.2.1. Urban plans of Zagreb

We obtained the plans of Zagreb from the City Office for Strategic Planning and Development. In the studied period, four urban plans of Zagreb were made (in 1953, 1971, 1986, and 2003). The first socialist urban plan (1953 Plan) was made immediately after the Second World War and anticipated expanding the city south towards the River Sava by applying Le Corbusier's conception of towers in the park. This proved too expensive to realise in the post-war conditions and the plan was not adopted. However, it greatly influenced the planning approach over the following decades. The 1971 General Urban Plan (GUP) set various quantitative standards and norms for developing new neighbourhoods and districts, and UGBS within them, by 2000. The plan sharply separated housing, business and industry in space. The weakening of the functionalist approach propelled the creation of the 1986 GUP much before 2000. While still somewhat based on the quantitative approach, the new GUP emphasised the consolidation and revitalisation of the
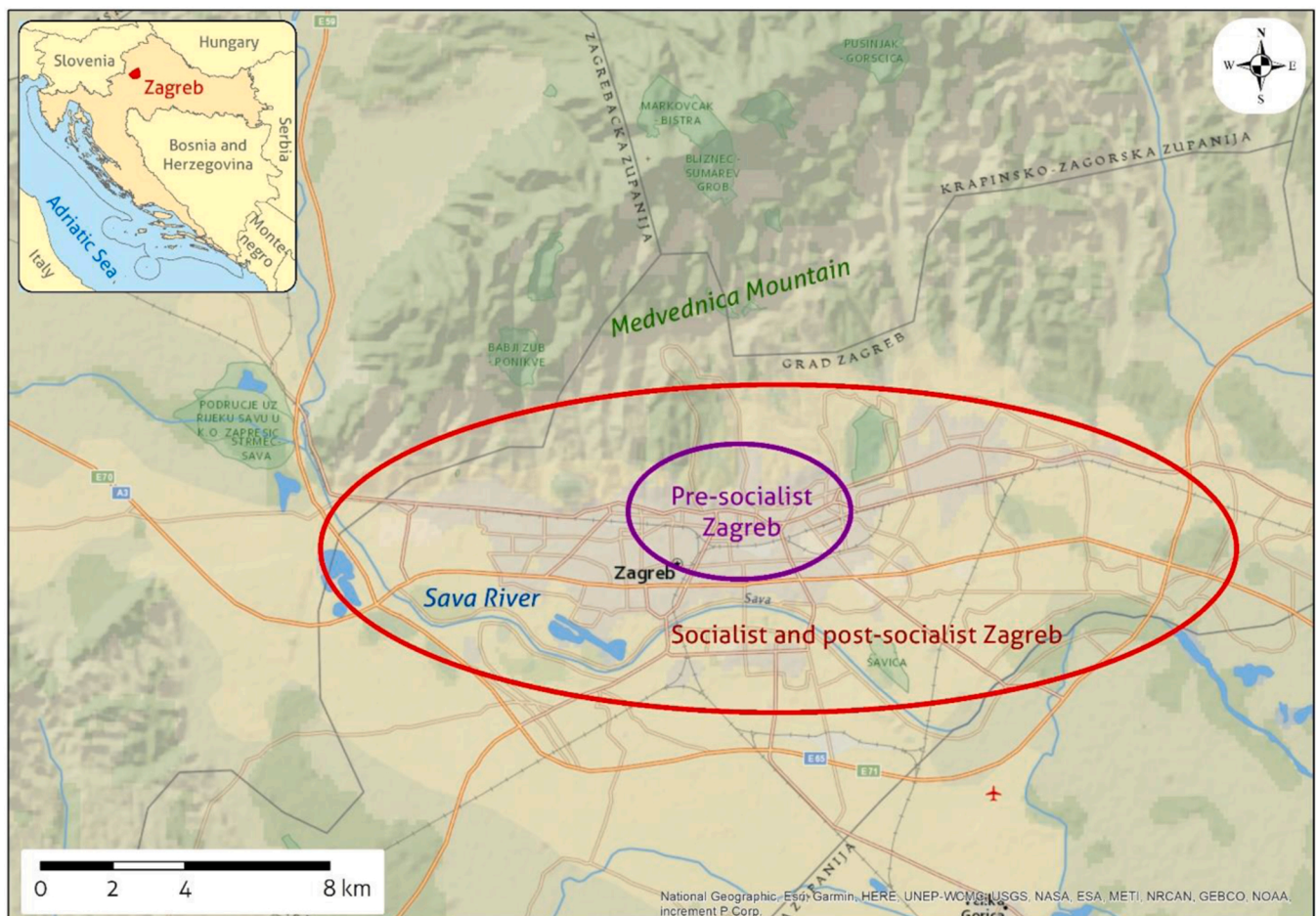

Fig. 2. Approximate spatial coverage of pre-socialist, socialist and post-socialist Zagreb.

existing city. This meant infilling the unbuilt plots and reconstructing the old structures, as well as denser housing.

The 1986 GUP was loosely followed in the 1990s because transitional planning legislation re-instated private property and replaced the city administration with private investors such as land developers. The post-socialist GUP of 2003 allowed political decisions to overpower professional planning principles (Doklestić, 2015). The plan introduced rules for highly consolidated, moderately consolidated and non-consolidated zones, thus generalising the city territory into three categories. The 2003 GUP was amended in 2007, 2009, 2013 and 2016, mostly with limited location-based changes to the land-use plan. This study analyses the three socialist plans, the 2003 GUP, and its 2016 iteration.

3.2.2. Interviews

We recognise that planning practice is a broader and more complex and dynamic activity than the planning provision prescribed in urban plans. Hence we interviewed planners who participated in the planning processes in both periods as well as academics who studied planning processes and their results in urban space. Semi-structured interviews with ten urban planners and eight academics from various disciplines were conducted between August 2019 and January 2020. Twenty-six planners were identified from urban plans and the planning literature and 39 % of them agreed to participate. Five were active in both periods and five only in the post-socialist period. Similarly, twenty academics were identified in the academic literature based on the criteria of research scope covering urban planning and/or UGBS. In total, 40 % of academics responded positively to invitation to participate, coming from the fields of sociology (3), landscape architecture (2), urbanism (1), geography (1), and anthropology (1). Interview protocols were structured and administered in a way to enable extending the discussion on any question/topic where relevant. The topics included UGBS planning documents, principles, norms, stakeholders and changes between socialist and post-socialist contexts. Interviews lasted between 42 and 171 min (mean 104 min).

3.3. Data processing

Interviews were audio-recorded and transcribed verbatim in Croatian. The analysis was carried out in Croatian in order to avoid loss of meanings and subtle indications that could not be translated into English. Transcribed interviews were organised in the NVivo 12 software package. Data were organised regarding the 5P framework factors and markers identified in Section 2 and cohorts, and coded accordingly. Similarly, relevant provisions from urban plans were organised regarding the 5P framework factors and markers and coded accordingly. We employed directed content analysis (Hsieh and Shannon, 2005) to process the data. The first stage included content analyses of each urban plan according to the 5P framework markers identified in Section 2 (see Appendix A). We assessed each marker by identifying textual features and/or map evidence as well as interpreting the overall content. In the second stage, a content analysis of interview transcripts was performed separately for the socialist and post-socialist periods, according to the same 5P framework markers as in the plan analysis. This involved documenting the planning context, applications and evaluations of the planning processes and their spatialised results.

In the third stage, each marker in each content analysis (i.e., five plans, two periods for interviews) was scored following an assessment protocol (provided in Appendix A), whereby the dominance of each marker within each 5P factor was assessed by calculating the proportion of times it was mentioned relative to other markers. Then the total 5P factor score was calculated for each content analysis by summing up the scores of individual factors divided by five. The total 5P factor score for urban plans represents the formal minimum extent to which opportunities for human–ecosystem interactions were facilitated by a plan in the period of its implementation. The total 5P factor score for interviews represents the estimated actual extent to which opportunities for human–ecosystem interactions were facilitated by urban planning in a given period (socialist/post-socialist).

4. Results

4.1. Urban plans

Content analysis of urban plans revealed that socialist plans formally facilitated greater opportunities for human–ecosystem interactions than post-socialist plans (complete results are presented in Appendix B). The scores calculated for each of the 5P factors in each plan (Fig. 3) showed that consideration of 5P factors, and associated opportunities for human–ecosystem interactions, varied across plans. Maximum scores were for the 1971 GUP, with the 2003 GUP containing the least consideration of 5P factors. The trend line (represented by the solid red line in Fig. 3) indicated that the minimum extent to which opportunities for human–ecosystem interactions were formally facilitated was generally higher in the socialist period and lower and more stable in the post-socialist period. The slight increase in the value for the 2016 GUP compared to the 2003 GUP indicates a possible shift in the trend. Both socialist and post-socialist plans contributed to the extent of interaction opportunities primarily within *place* and *purpose* factors. *Practices* factor was not considered in socialist plans, whereas post-socialist plans did not address *people*, *past*, and *practices* factors.

The content related to human–ecosystem interactions was relatively small in all analysed plans, particularly among post-socialist plans. In general, socialist plans showed more extensive and elaborate consideration of factors influencing the distribution, design and function of UGBS than post-socialist plans, which mainly retained and maintained the inherited landscape structure. The socialist approach of prescribing a minimum area of UGBS according to socio-demographic trends (e.g., residents' age profile) was abandoned in post-socialist plans. Neither socialist nor post-socialist plans specifically considered prospective residents' preferences, desires, or needs.

The purpose of UGBS in all socialist plans was defined through three main social goals: (i) public health, (ii) urban hygiene, and (iii) opportunities for outdoor sports, recreation and leisure. In contrast, post-socialist plans neither explicitly nor implicitly stated those or any other goals directing the provision and distribution of UGBS. Historical appearance and traditional use of locations intended for UGBS were partly considered in socialist plans (mainly in terms of autochthonous vegetated areas and cemeteries), whereas post-socialist plans did not show adequate consideration of place histories. No plans considered how UGBS were used (activities or cultural practices).

4.2. Interview transcripts

Based on the content analysis of interview transcripts (complete results are presented in Appendix C), scores were calculated for each of the 5 P factors for the socialist and post-socialist periods. Those scores (Fig. 4) indicated a drop in 5P factors *place*, *people*, and *purpose* after the socialist period. Interview statements verified that nine out of twelve 5P markers were explicitly considered in spatial planning in the socialist period, in contrast with only two in the post-socialist period. Factor scores based on interview transcripts showed greater fluctuation between periods (solid lines in Fig. 4) than averaged factor scores for socialist and post-socialist plans (dashed lines in Fig. 4). The divergence in the former was most significant in the *people* factor in the socialist period and the *purpose* factor in the post-socialist period.

The much greater difference in total 5P factor scores between the socialist and post-socialist periods was established in the interview analysis (0.47–0.08 = 0.39) than the plans analysis (0.42–0.19 = 0.23). This likely arose because interviews referred to a much broader range of planning scales and aspects than the urban plans. In addition to the city-scale planning in GUPs with the limited number of regulations
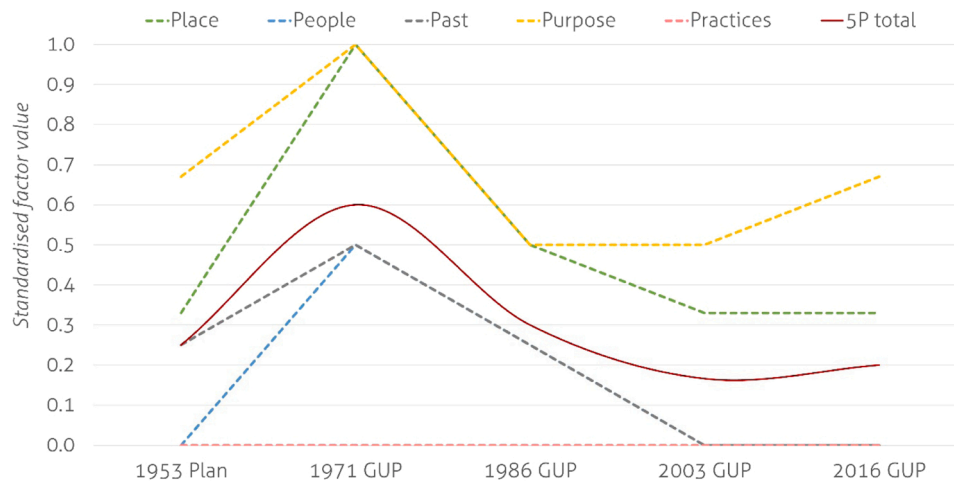
Fig. 3. Factor scores of the 5P framework assessment of the five urban plans of Zagreb.
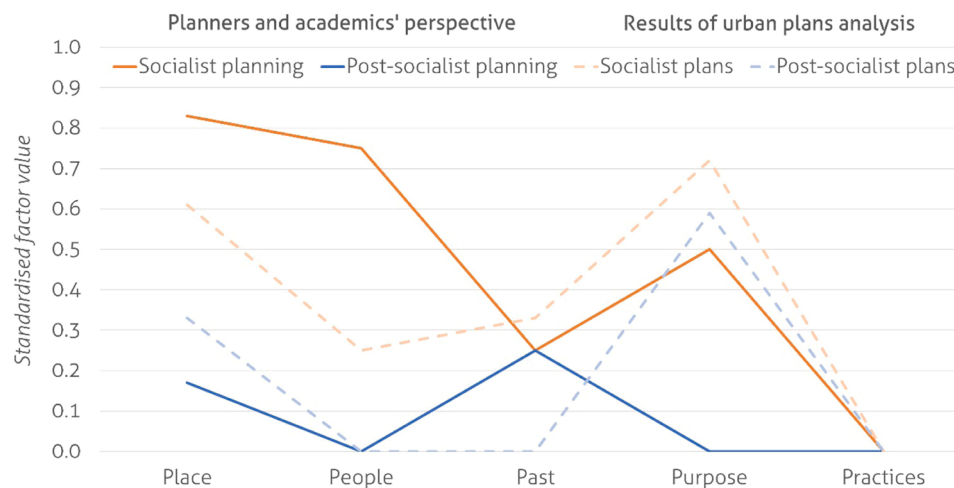

Fig. 4. Comparison of average factor scores of the 5P framework assessment of socialist and post-socialist urban plans and interview transcripts in Zagreb.

applicable at lower spatial scales, interviews also provided information about detailed planning (both in terms of detailed/implementation plans that were subordinate to GUPs and practical experiences from planning processes), interaction with national planning legislation and stakeholders, as well as assessment of planning processes, approaches, and outcomes in temporal perspective.

In general, both planners and academics agreed that post-socialist planning reduced the provision of UGBS and opportunities for human–ecosystem interactions. Despite generally criticising the quantitative approach in the socialist UGBS planning, interviewees agreed that the approach ensured relatively abundant and evenly distributed UGBS across Zagreb, whereas the post-socialist provision fails to provide sufficient green space for many uses. In contrast to the results of the content analysis of plans, planners claimed that in the socialist period, citizens were surveyed about interventions in their living environments, which included UGBS. However, such surveys disappeared from post-socialist planning, which headed towards a rather monodisciplinary service (dominated by architects). In line with results from the plans, cultural practices performed in UGBS were not assessed nor considered in either period.

5. Discussion

Our research analysed differences in CES between socialist and post-socialist periods of urban planning in Zagreb. While opportunities for

urban residents to engage with nature were considered at all time periods, the two methods employed—content analysis of plans and expert interviews—highlighted that formal and informal mechanisms for CES provision did not always align. Written plans denoted what environmental spaces (e.g., UGBS) were prescribed, yet planners' decisions often varied from these. This illuminated the complexity of UGBS planning, a multitude of scales and venues in which it operated, and nuances between formal requirements (what was prescribed) and planners' decisions (what planners were free to decide). In the following sections, we discuss findings in the contexts of research questions, practical implications of the proposed assessment framework, as well as conceptual and methodological implications.

5.1. Planning provision of diverse opportunities for human–ecosystem interactions

Urban planning in Zagreb focused mainly on *place* and *purpose* factors, which correspond to the dimensions traditionally addressed in spatial planning (Pegan, 2007). The literature also shows that UGBS planning approaches are predominantly focused on spatial (location, distribution, size, connectivity, accessibility) and functional (multi-functionality, green-grey integration) variables (Brown, 2008; Di Marino et al., 2019; Haaland and Konijnendijk van den Bosch, 2015; Pauleit et al., 2011). *People* and *past* factors were considered less frequently: they involve adjustments with social dynamics over time, whereas

physical urban structures are relatively static and resistant to changes (Gandelsonas, 1998). The problem of green gentrification has only recently entered the urban planning discourse (Rigolon and Németh, 2020; Sharifi et al., 2021). The *practices* factor, which includes patterns in UGBS use and could provide essential insights for UGBS planning and design, was never explicitly addressed, although equipment implies considering practices such as sitting on benches, strolling, or children playing.

Differences between what aspects of UGBS were planned in urban plans and what by practitioners themselves indicate the complex role of urban planning in facilitating CES. Considerable planning activity took place between the plan adoption dates that affected the provision of opportunities for human–ecosystem interactions. Some activities were prescribed in lower-scale plans, while others were part of unspoken principles and rules followed in plan drafting and implementation stages. The most striking example was the practical implementation of the Corbusian greenspace matrix, which no plan mentioned explicitly (Cvetnić and Klemenčić, 2008). This demonstrates that analysing urban plans alone cannot provide a complete picture of urban planning's facilitation of CES.

Trends in the 5P factor scores determined from both urban plans and interview transcripts showed higher values in the socialist than post-socialist period. This suggests that socialist planning facilitated opportunities for human–ecosystem interactions to a wider extent than post-socialist planning. To our knowledge, this study is the first study that has explicitly looked at how the planning provision of CES has evolved over a period of socio-political transition. Although the case of Zagreb is directly comparable only to other post-socialist cities, it demonstrates that the influence of socio-political context on urban planning paradigms and practice can have longstanding legacy effects on the provision of CES. Below, we discuss results from this study in relation to international literature on UGBS provision and diminishing contact with nature.

Even though informal green spaces and urban wilderness are increasingly recognised for enabling contact with nature in cities (Kowarik, 2021; Włodarczyk-Marciniak et al., 2020), formal UGBS provision is still considered an essential prerequisite for enabling interactions with urban nature (Lin et al., 2014; Soga et al., 2015). Our analysis showed that post-socialist UGBS planning in Zagreb mainly concerned those locations that were already included in the socialist plans. This ties in with the decrease in the provision of UGBS widely reported for other post-socialist countries (Badiu et al., 2019; Hirt, 2012; Kabisch and Haase, 2013; Kristiánová, 2016). It is assumed that the extent of provided opportunities is a function of the number of UGBS users (normalised by total UGBS area) and the diversity of cultural practices performed in UGBS. Our findings suggest two hypotheses for further research: (1) the average number of users in socialist UGBS would be greater than the average number of users in post-socialist UGBS in Zagreb, and (2) the average diversity of cultural practices performed in socialist UGBS would be greater than average diversity of cultural practices performed in post-socialist UGBS in Zagreb.

Most research in the field of diminishing contact with nature relates to Western cities with few insights from socialist and post-socialist countries (for exceptions see Djokić et al., 2016; Whitehead, 2005). While we did not explore diminishing contact with nature per se, the opportunities for human–ecosystem interactions undoubtedly influenced that process. In that sense, our findings suggest that the influence of urban planning on contact with nature in Zagreb was more positive in the socialist than post-socialist period. However, contact with nature did not necessarily decrease after 1990. Most of Zagreb's spatial expansion occurred in the socialist period and post-socialist plans mainly preserved the inherited UGBS. It follows that many opportunities for human–ecosystem interactions provided in the socialist period survived and remained available after 1990. This is in contrast to some studies which determined the loss of functions in socialist UGBS during the post-socialist period (Klimanova et al., 2021; Kristiánová, 2016).

5.2. How political ideologies shape opportunities for human–ecosystem interactions

Despite the changing dynamics shown in Fig. 3, all socialist urban plans of Zagreb set a wider formal minimum extent to which opportunities for human–ecosystem interactions were provided than post-socialist plans. Interviews indicated that the divergence in the estimated actual extent between the two periods was probably even more extensive. The main differences were identified in terms of (i) typology and function of UGBS, (ii) socio-demographic trends, and (iii) UGBS distribution and design.

5.2.1. Typology and function of UGBS

Although functions of UGBS were considered in both periods, socialist planning was found to have had a more diversified UGBS typology and focused more on multiple direct-use and general socio-ecological functions of UGBS than post-socialist planning. This is primarily due to the functionalist orientation of the socialist regime. Indeed, the functionalist approach to urban nature was innate to Marxist socialist ideology (Pepper, 1993; Tulloch, 2015). Urban space was supposed to bolster socialist society by creating a favourable living and working environment to stimulate productivity (Vukić, 2007). Urban nature was entrusted with supporting urban hygiene (aeration, air purification, insolation) and providing the opportunities for recreation and leisure for working people, thus facilitating relaxation and good physical condition, which would reduce both sick leave and healthcare costs and provide good public health (Antolić, 1953; Stanić, 2016).

The practical importance of urban nature's functions was reflected in the balanced built and green spaces ratio in socialist-planned neighbourhoods. This was implemented following the Corbusian concept of 'towers in the park' (Cvetnić and Klemenčić, 2008), which can be read from the 1953 Plan, provisions of the 1971 GUP and socialist neighbourhoods erected over the 1960s and 1970s (Fig. 5). Moreover, parks, children's playgrounds, and sports and recreational grounds were systematically nested into the Corbusian greenspace matrix to facilitate the accessibility of direct-use UGBS within walking distance from homes. The land for such efforts was secured by the nationalisation of peri-urban land in Croatia (Tandarić et al., 2019) as in other socialist states (Whitehead, 2005).

Declining values of the 5P factors for the 1986 GUP reflect the weakening of the functionalist approach which resulted in denser construction and more compressed green spaces between buildings. The reintroduction of private property and abolition of the land expropriation instrument after 1990 completely changed the urban planning context. Adjusting the planning system to stimulate private investments resulted in generalised and simplified functions of UGBS land use, much like in other central European post-socialist cities (Kristiánová, 2016; Vujošević, 2004). Along with that, the UGBS typology was deprived of function and reduced to different degrees of construction allowed in UGBS, blurring the line between public and private interests (Knežević, 2003; Svirčić Gotovac, 2010).

In practice, this permitted the indulgence of influential individuals and organisations' wishes. On the one hand, it allowed replacing 'natural' and recreational elements with commercial ones like shops and cafés (cf. Haase et al., 2018; Zupan and Büdenbender, 2018). On the other hand, the authorities were given political leverage to allow construction in UGBS. Several interviewees recalled a recent case from 2013 when the authorities authorised building a large church in Savica Park. When citizens' resistance and protests prevented the construction, the authorities decided to refigure the park into a highly artificial public space, which was once again prevented by people stopping machinery from entering the park. The residents' opposition to such reconstruction implies that they were aware of the potential loss of opportunities for human–ecosystem interactions and connections they formed with the place.

Fig. 5. Left: 1953 Urban Regulation Plan of Zagreb: proposal for the area south of the railway (Antolić, 1949). Right: The Corbusian-style neighbourhood of Siget (Hrg, 1999).

5.2.2. Socio-demographic trends

Socialist planning solutions were usually based on expertise and rarely sought and accounted for laypeople's input (Hirt, 2005). Consequently, the provision of different types of UGBS in the socialist period was planned according to projected socio-demographic trends. These informed the norms for size, function, and content of UGBS at different spatial scales. This facilitated the availability and accessibility of diverse UGBS across socialist urban space in Zagreb. While urban plans provided no evidence of surveying citizens' preferences, desires, and needs, interviewees pointed out that immediate problems in citizens' living environment were surveyed at a local scale. This was facilitated by the decentralised planning system at the district level.

The situation worsened after 1990 with the centralisation of administration and planning systems. The technocratic approach could not guide urban development in the dynamic conditions of diverse public and private initiatives and investments (Hirt, 2005). Private

investors' requests for business freedom led to loosening planning provisions. The end of the need for baseline studies resulted in the loss of many disciplines from the planning system, especially social sciences and humanities (Cavrić and Nedović, Budić, 2007). The provisions regarding minimum greenspace area were transferred from general to detailed plans, which interviewees claimed were initiated or sometimes even drafted by investors themselves. The devaluation of expert opinion and growing power of private investors was repeatedly given as the reason for the critical lack and low quality of UGBS in post-socialist residential areas.

5.2.3. UGBS distribution and internal diversity

Socialist planning considered the provision of an even distribution of diverse UGBS across Zagreb at different spatial scales more than post-socialist planning. The technocratic approach aimed to harmonise UGBS distribution with demand for them and provide the design that

would stimulate physical activity and thus contribute to the public health goals. Even though not explicitly named in the plans, the omnipresence of a Corbusian greenspace matrix was ensured through the rule that UGBS "should occupy at least 60% of a neighbourhood area" (GUP, 1971, p. 18). This effectively meant that there were opportunities for human–ecosystem interactions throughout most housing and commercial areas. This modernist approach, with tower blocks in a parkland setting, was often criticised in the West, and sometimes in socialist cities too, because of the cramped and poor quality living conditions (e.g., Dakić and Kritovac, 1973). However, the quality of the green spaces has improved over the years as the trees have become more established, as highlighted in interviews and literature (e.g., Klarić-Jelenski, 2020).

The high proportion of unbuilt space is almost unimaginable in post-socialist settings because of land privatisation. One interviewed planner (40/M) describing post-socialist neighbourhoods stated that "*all unbuilt areas are de facto either mandatory passages for fire trucks or roofs of garages which had to be greened. The rest of the greenery is in plant pots.*" The development of new parks was enabled via 'city projects', which were supposed to regulate the development of new urban areas in public–private partnerships. This instrument, however, was loosely regulated, especially in the 2003 GUP. On the other hand, pressure on undeveloped land plots reserved for UGBS increased along with interests in building profitable new housing and shopping centres (Gulin Zrnić and Vranić, 2015). Such pressure aligns urban development in Zagreb with other post-socialist cities (Djokić et al., 2018; Haase et al., 2018; Zupan and Büdenbender, 2018).

5.3. The need for a novel approach to assessing CES in urban plans

In this study, we followed the CES cascade model conceptualised by Fish et al. (2016) which understands CES as relational processes and entities which people value for their contribution to their wellbeing. The relationality of CES implies that each person responds to and interacts with an ecosystem following their own preferences, desires, needs, and values they hold (cf. Raymond et al., 2017b). If CES are subjective and person-based (Chan et al., 2016; Fish et al., 2016), then planning for CES means facilitating opportunities for human–ecosystem interactions through which people would be able to co-produce CES and generate CEB rather than planning for particular CES.

Previous assessments of CES in urban plans used the ES categorisation from MEA: Wilkinson et al. (2013) assessed nine different CES, Cortinovis and Geneletti with their associates (2018; 2020) assessed recreation as the only representative of CES, whereas Rall et al. (2015) assessed CES as a single subcategory of ES. These studies all assessed CES using a similar natural-science paradigm as other MEA categories of ES, without accounting for CES' relational character (Chan et al., 2011; Raymond et al., 2017a). In addition, CES assessed by Wilkinson et al. (2013) correspond to different elements of the ES cascade: services (*Recreation and ecotourism*), benefits (*Sense of place, Aesthetic, Inspirational, Educational and knowledge, Health*) and values (*Cultural heritage values, Spiritual and religious values*) (cf. Blicharska et al., 2017). Dissolving the distinction between those elements, which can be planned to different extents, makes it unclear analytically from where the benefits then arise (Fish et al., 2016). Haines-Young and Potschin (2018) developed the Common International Classification of Ecosystem Services (CICES), which accounted for the ES cascade in all categories. However, Maund et al. (2020) study showed that not all CES can be sufficiently captured by CICES.

We argue that a limited number of moulded categories of CES cannot reflect their relational and subjective nature and can therefore yield very limited operational insights into how planning can stimulate the generation of contributions to human wellbeing. In that sense, Tandarić et al.'s (2020) "hatch and grow" strategy replaces the making of objective categories with co-produced diverse CES that correspond with individuals' preferences, desires, needs, and values. Such an approach positions CES better within the planning context by outlining two ways

in which planning can facilitate opportunities for human–ecosystem interactions: by providing spaces for interaction and support for cultural practices. This is operationalised through the 5P framework, which gathers the factors relevant for planning those opportunities (Tandarić et al., 2020).

5.3.1. Insights for assessing CES in the urban planning context

Assessing how CES are considered in urban planning may be required when evaluating the planning approach to facilitating human–ecosystem interactions and reducing the diminishing contact with nature. The results can illuminate aspects that can be improved and inform overall UGBS planning. Here we outline and discuss practical recommendations arising from the results of this study.

1. **Combining different types of knowledge can improve assessment of CES opportunities**. Because of its orientation on plannable aspects, the 5P framework was useful for content analyses of urban plans and interview transcripts. It allowed limitations in different data sets to be recognised. Combining the results of different datasets analyses allowed better contextualising of findings from individual dataset analyses and enabled a more precise estimation of the extent to which urban planning facilitated human–ecosystem opportunities. Besides general urban plans and interviews with urban planners and academics, the possible relevant datasets include the planning legislation, lower-scale plans, and literature documenting, analysing, reviewing, and critiquing the planning documents, projects, practice and approaches.

2. **Assessment should account for what analysed data can and cannot tell**. The scoring approach to the content analysis of the plans is intended to provide indicative rather than determinative results. For instance, the combined interpretation of findings from plans and interview analyses illustrated that plans did not reflect accurately the planning practice of the period in which they had originated but instead approximated the general planning stance towards the provision of interaction opportunities. Data had to be interpreted with caution. For example, the plans sometimes omitted addressing certain aspects, such as rules for observing existing vegetation or landforms when planning new UGBS, which were typically dealt with in practice.

3. **Different datasets feature different reliability**. It is essential that assessment accounts for data reliability. Our findings illustrated that the data from urban plans is bounded by spatial scale and formal planning principles that may only be loosely followed in practice. On the other hand, interviews with planners and academics may provide rich insight into the planning practice, plan implementation, and the interplay between formal procedures and broader social, political and economic circumstances. In addition, interviews depend on subjective impressions of people, which may become distorted over time. When it comes to historical considerations, this study showed that people are more likely to remember positive than negative experiences and impressions from the past (Leist et al., 2010).

4. **Assessment scores should be read and interpreted carefully**. The interview statements corroborated the assumption that, rather than reflecting the actual extent of opportunities provided in space, urban plans set the formal minimum extent of the interaction opportunities for the period they were implemented. For instance, while urban plans did not prescribe consideration of the historical appearance of places for which UGBS construction is planned, some individual planners voluntarily observed it and thus possibly facilitated better opportunities for human–ecosystem interactions. On the other, total 5P factor scores based on the interview statements appeared to reflect the actual extent of the interaction opportunities for a given period; however, due to the lower reliability of historical interview data, we interpreted them in the context with findings from analysed plans. It is also important to acknowledge that the reported extent of the interaction opportunities may be larger for some 5P factors and

smaller for other factors than the formal minimum extent (see Fig. 4) because of the differences in the scale and information contents between different datasets.

5. **The assessment result should inform planning**. The 5P framework is designed to evaluate how different relevant markers contribute to the facilitation of interaction opportunities. However, assessing each value also outlines shortages that planning failed to account for, resulting in a lower-than-maximum score. Moreover, even the maximum-scored markers may point to possible advances that could improve opportunities for human–ecosystem interactions. In cross-temporal assessments, such as this one, comparisons of how each marker was considered in different periods (or plans) may also reveal abandoned positive contributions that might be re-evaluated and possibly re-implemented.

5.4. Implications for the planning process

Although this study was restricted to Zagreb, the approaches and paradigms implemented reveal the CES-related implications relevant for the planning process in post-socialist cities. First, contact with urban nature can only be formally provided via planning enough UGBS in neighbourhoods and protecting informal UGBS from development. Greening neighbourhoods could provide varying opportunities for intentional and incidental encounters with urban nature (Beery et al., 2017) and have a measurably positive effect on communities' behaviour and sense of place (Kelbaugh, 2000). Planning abundant UGBS in socialist Zagreb critically improved the opportunities for human-–ecosystem interactions, and the extensive Corbusian greenspace matrix is considered one of the key qualities of socialist neighbourhoods in the 21st century (Klarić Jelenski, 2020; Svirčić Gotovac, 2009). The most recent construction of new neighbourhoods in Zagreb and other cities reflects the demand for 'living in the park' (e.g., Green Side Residence or 4_Tornja). However, it should be noted that such developments in non-socialist settings may lead to *green gentrification* (Campbell-Arvai and Lindquist, 2021) and require careful planning.

Second, planning small UGBS and supplying plants in pots (as was the case in post-socialist neighbourhoods in Zagreb) cannot support meaningful human–nature connections and generating diverse CES. The 21st-century planning must ensure extensive, distributed and interconnected UGBS that people will want to interact with and could relate to. While both planning systems in Zagreb neglected citizens' preferences, desires, needs, and values, socialist planning defined the needs for UGBS based on projections of socio-demographic trends. This resulted in well-distributed and accessible UGBS across the residential quarters. In addition, spatial opportunities for physical activity were provided to support public health. In a world where obesity and related health issues are increasing, the provision of accessible and attractive UGBS contributes to better public health (WHO, 2016). Surveying citizens' preferences, desires, and needs and their involvement in planning could greatly improve and advance the opportunities for human–ecosystem interactions and attract more users to UGBS. The study of the participatory potential of inhabitants by Careva et al. (2018) indicated twenty UGBS in Zagreb for which participants proposed and agreed upon improvements that would increase their use. Finally, engaging citizens in UGBS stewardship would promote even firmer relational connections with local ecosystems (Andersson et al., 2015).

Third, urban plans should mandate that UGBS be planned as multifunctional public spaces instead of grassed patches satisfying provisions requiring a certain percentage of natural terrain in neighbourhoods and/ or decorations increasing the price of nearby flats. Socialist UGBS were supposed to facilitate recreation and leisure, maintain urban hygiene, and improve public health. Such a multifunctional role is in line with recent calls for planning and designing UGBS to provide multiple and varied ES (Pauleit et al., 2011) while at the same time providing opportunities for interactions with nature and the generation of CEB. Multifunctional green infrastructure consisting of varied UGBS and

Corbusian-style green spaces has a great potential for increasing connectivity between larger UGBS. This would at the same time improve the quality of the environment, ecological conditions for urban wildlife (Di Marino et al., 2019) and provide better opportunities for intentional and incidental encounters with urban nature.

Finally, it should be noted that formally planned UGBS do not necessarily translate to greenspace access, use or perception. This is often so due to the technocratic approach to planning, where decisions are made without consulting the prospective users. For instance, the generous provision of interconnected UGBS in Halle-Neustadt, Germany, in both the socialist and post-socialist periods did not result in their usage because of the negative perception of an entire urban section in which UGBS were located (Haase et al., 2021). On the other hand, informal UGBS (such as collective urban gardens or meadows) may attract a number of users and provide numerous ES, thus complementing the provision of planned UGBS (Włodarczyk-Marciniak et al., 2020). Urban planning should thus involve prospective users in conceptualising and decision-making processes.

6. Conclusion

The increasingly recognised relational nature of CES has been rarely accounted for in assessments of ES in urban plans. This suggests that urban planning cannot effectively facilitate the provision of particular CES, but it can and should facilitate the opportunities for meaningful human–ecosystem interactions from which CES will arise and generate contributions to human wellbeing. In this paper, we assessed the extent to which opportunities for human–ecosystem interactions in Zagreb were facilitated through socialist and post-socialist urban planning. The findings indicated that interaction opportunities were facilitated to a wider extent in the socialist than post-socialist period. Socialist planners systematically planned UGBS across urban space, ensuring their availability, accessibility and suitability for prospective users while at the same time contributing to various social goals. In attempts to distance planning from the socialist ideology and facilitate private investment, the post-socialist lawmakers largely deregulated the planning system, which resulted in a considerable reduction in the provision of additional UGBS, and, consequently, the new interaction opportunities.

The proposed approach to assess CES in urban plans successfully identified markers relevant in urban planning that influenced the extent to which planning facilitated the opportunities for human–ecosystem interactions. This approach accounts better for the planning provision of CES than approaches applied in earlier studies. Moreover, by considering dimensions of CES that can be directly addressed by urban planning, it can serve as a valuable tool for improving the extent to which interactions opportunities are facilitated by planning in practice. The application of the approach revealed that assessment of planning provision of CES should be based on different data sources to understand how opportunities were planned, while accounting for how reliable each dataset is and what it can and cannot tell. Furthermore, assessment findings need to be interpreted carefully, which is especially relevant for urban plans that set formal minimum for UGBS and vary in terms of the degree of implementation. The (C)ES assessments should be part of the planning process and inform it to avoid shortages from the previous planning period.

The analysis of planning consideration of CES in Zagreb demonstrated that post-socialist plans and planning legislation discouraged the provision of opportunities for the CEB generation compared to the socialist period. If CES are to be leveraged to increase the quality of life, reconnect people with nature and achieve sustainability, future plans for Zagreb and cities worldwide should systematically address green and blue spaces. Besides planning abundant UGBS, they should be strategically distributed, interconnected and multifunctional, i.e., able to provide multiple ES. Yet, to ensure meaningful human–nature interactions, UGBS planning must be a collaboration between planners and prospective users.

Declaration of Competing Interest

None.

Data availability

Data will be made available on request.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.landusepol.2022.106309.

References

WHO, 2016. Urban Green Spaces and Health: A Review of Evidence. WHO Regional Office for Europe,, Copenhagen.

Andersson, E., Tengö, M., McPhearson, T., Kremer, P., 2015. Cultural ecosystem services as a gateway for improving urban sustainability. Ecosyst. Serv. 12, 165–168. https://doi.org/10.1016/j.ecoser.2014.08.002.

Antolić, V., 1949. Regulacioni plan i direktivna regulaciona osnova Zagreba. Arhitektura 2, 5–30.

Antolić, V., 1953. Direktivna regulatorna osnova Zagreba (prijedlog). Zavod za urbanizam NOGZ,, Zagreb.

Badiu, D.L., Onose, D.A., Niţă, M.R., Lafortezza, R., 2019. From "red" to green? A look into the evolution of green spaces in a post-socialist city. Landsc. Urban Plan. 187, 156–164. https://doi.org/10.1016/j.landurbplan.2018.07.015.

Beery, T.H., Raymond, C.M., Kyttä, M., Olafsson, A.S., Plieninger, T., Sandberg, M., Stenseke, M., Tengö, M., Jönsson, K.I., 2017. Fostering incidental experiences of nature through green infrastructure planning. Ambio 46, 717–730. https://doi.org/10.1007/s13280-017-0920-z.

Blau, E., Rupnik, I., 2007. Project Zagreb: Transition as Condition, Strategy, Practice. Harvard University, Graduate School of Design,, Barcelona.

Blicharska, M., Smithers, R.J., Hedblom, M., Hedenås, H., Mikusiński, G., Pedersen, E., Sandström, P., Svensson, J., 2017. Shades of grey challenge practical application of the cultural ecosystem services concept. Ecosyst. Serv. 23, 55–70. https://doi.org/10.1016/j.ecoser.2016.11.014.

Brown, G., 2008. A theory of urban park geography. J. Leis. Res. 40, 589–607 (https://doi.org/Article).

Campbell–Arvai, V., Lindquist, M., 2021. From the ground up: using structured community engagement to identify objectives for urban green infrastructure planning. Urban For. Urban Green 59, 127013. https://doi.org/10.1016/j.ufug.2021.127013.

Careva, K., Lisac, R., Pletenac, T., Vukić, J., 2018. Istraživanje participativnog potencijala građana u planiranju javnog prostora grada Zagreba. Zagreb.

Cavrić, B., Nedović–Budić, Z., 2007. Urban development, legislation, and planning in post-socialist Zagreb. In: Stanilov, K. (Ed.), The Post-Socialist City: Urban Form and Space Transformations in Central and Eastern Europe after Socialism. Springer Netherlands, pp. 385–410. https://doi.org/10.1007/978-1-4020-6053-3_19.

Chan, K.M.A., Satterfield, T., Goldstein, J., 2012. Rethinking ecosystem services to better address and navigate cultural values. Ecol. Econ. 74, 8–18. https://doi.org/10.1016/j.ecolecon.2011.11.011.

Chan, K.M.A., Goldstein, J., Satterfield, T., Hannahs, N., Kikiloi, K., Naidoo, R., Vadeboncoeur, N., Woodside, U., 2011. Cultural services and non-use values. In: Kareiva, P., Tallis, H., Ricketts, T.H., Daily, G.C., Polasky, S. (Eds.), Natural Capital: Theory and Practice of Mapping Ecosystem Services. Oxford University Press, Oxford, pp. 206–228. https://doi.org/10.1093/acprof:oso/9780199588992.003.0012.

Chan, K.M.A., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez–Baggethun, E., Gould, R.K., Hannahs, N., Jax, K., Klain, S.C., Luck, G.W., Martín–López, B., Muraca, B., Norton, B., Ott, K., Pascual, U., Satterfield, T., Tadaki, M., Taggart, J., Turner, N.J., 2016. Opinion: Why protect nature? Rethinking values and the environment. Proc. Natl. Acad. Sci. USA 113, 1462–1465. https://doi.org/10.1073/pnas.1525002113.

Cooper, N., Brady, E., Steen, H., Bryce, R., 2016. Aesthetic and spiritual values of ecosystems: recognising the ontological and axiological plurality of cultural ecosystem 'services. Ecosyst. Serv. 21, 218–229. https://doi.org/10.1016/j.ecoser.2016.07.014.

Cortinovis, C., Geneletti, D., 2018. Ecosystem services in urban plans: what is there, and what is still needed for better decisions. Land Use Policy 70, 298–312. https://doi.org/10.1016/j.landusepol.2017.10.017.

Cvetnić, R., Klemenčić, M., 2008. O imaginarnim kartama Južnog = Novog Zagreba. Zarez 10, 16–17.

Dakić, S., Kritovac, F., 1973. Okolina je proces: teoretske mogućnosti jedne nove prakse. Arhitektura 26, 35–38.

Di Marino, M., Tiitu, M., Lapintie, K., Viinikka, A., Kopperoinen, L., 2019. Integrating green infrastructure and ecosystem services in land use planning. Results from two Finnish case studies. Land Use Policy 82, 643–656. https://doi.org/10.1016/j.landusepol.2019.01.007.

Dickinson, D.C., Hobbs, R.J., 2017. Cultural ecosystem services: characteristics, challenges and lessons for urban green space research. Ecosyst. Serv. 25, 179–194. https://doi.org/10.1016/j.ecoser.2017.04.014.

Djokić, V., Ristić Trajković, J., Krstić, V., 2016. An environmental critique: impact of socialist ideology on the ecological and cultural sensitivity of Belgrade's large-scale residential settlements. Sustainability 8, 914. https://doi.org/10.3390/su8090914.

Djokić, V., Ristić Trajković, J., Furundžić, D., Krstić, V., Stojiljković, D., 2018. Urban garden as lived space: informal gardening practices and dwelling culture in socialist and post-socialist Belgrade. Urban For. Urban Green 30, 247–259. https://doi.org/10.1016/j.ufug.2017.05.014.

Doklestić, B., 2015. Zagreb kakav ni/je. UPI2MBOOKS,, Zagreb.

DZS, 2005. Naselja i stanovništvo RH [WWW Document]. Naselja i stanovništvo Republike Hrvatske 1857.–2001. URL ⟨http://www.dzs.hr/Hrv/DBHomepages/Naselja⟩ i stanovnistvo Republike Hrvatske/Naselja i stanovnistvo Republike Hrvatske.htm (accessed 4.26.18).

Fischer, A., Eastwood, A., 2016. Coproduction of ecosystem services as human-nature interactions – an analytical framework. Land Use Policy 52, 41–50. https://doi.org/10.1016/j.landusepol.2015.12.004.

Fish, R., Church, A., Winter, M., 2016. Conceptualising cultural ecosystem services: a novel framework for research and critical engagement. Ecosyst. Serv. 21, 208–217. https://doi.org/10.1016/j.ecoser.2016.09.002.

Gandelsonas, M., 1998. The city as the object of architecture. Assemblage 37, 128. https://doi.org/10.2307/3171359.

Geneletti, D., Cortinovis, C., Zardo, L., Adem Esmail, B., 2020. Reviewing ecosystem services in urban plans. Planning for Ecosystem Services in Cities. Springer,, Cham, pp. 7–20. https://doi.org/10.1007/978-3-030-20024-4_2.

Grunewald, K., Bastian, O., Louda, J., Arcidiacono, A., Brzoska, P., Bue, M., Cetin, N.I., Dworczyk, C., Dubova, L., Fitch, A., Jones, L., La Rosa, D., Mascarenhas, A., Ronchi, S., Schlaepfer, M.A., Sikorska, D., Tezer, A., 2021. Lessons learned from implementing the ecosystem services concept in urban planning. Ecosyst. Serv. 49, 101273 https://doi.org/10.1016/j.ecoser.2021.101273.

Gulin Zrnić, V., Vranić, D., 2015. The voids of Novi Zagreb: the clash of modernist planning legacy and contemporary spatial practices. In: Obad Šćitaroci, M. (Ed.), Cultural Heritage – Possibilities for Spatial and Economic Development. Arhitektonski fakultet u Zagrebu, Zagreb, pp. 132–137.

GUP, 1971. Generalni urbanistički plan grada Zagreba. Urbanistički zavod grada Zagreba, Zagreb.

Haaland, C., Konijnendijk van den Bosch, C.C., 2015. Challenges and strategies for urban green-space planning in cities undergoing densification: a review. Urban For. Urban Green 14, 760–771. https://doi.org/10.1016/j.ufug.2015.07.009.

Haase, D., Wolff, M., Schumacher, N., 2021. Mapping mental barriers that prevent the use of neighborhood green spaces. Ecol. Soc. 26 https://doi.org/10.5751/ES-12675-260416 (art16).

Haase, D., Dushkova, D., Haase, A., Kronenberg, J., 2018. Green infrastructure in post-socialist cities: evidence and experiences from Eastern Germany, Poland and Russia. In: Tuvikene, T., Sgibnev, W., Neugebauer, C.S. (Eds.), Post-Socialist Urban Infrastructures. Routledge, London, pp. 105–124.

Haines–Young, R.H., Potschin, M.B., 2010. The links between biodiversity, ecosystem services and human well-being. In: Raffaeli, D.G., Frid, C.L.J. (Eds.), Ecosystems Ecology: A New Synthesis. Cambridge University Press, Cambridge, pp. 110–139. https://doi.org/10.1017/CBO9780511750458.

Haines–Young, R.H., Potschin, M.B., 2018. Common International Classification of Ecosystem Services (CICES) V5. 1 and Guidance on the Application of the Revised Structure,, Nottingham.

Hansen, R., 2018. Multifunctionality as a Principle for Urban Green Infrastructure Planning – Theory, Application and Linkages to Ecosystem Services. Technischen Universität München.

Hernández–Morcillo, M., Plieninger, T., Bieling, C., 2013. An empirical review of cultural ecosystem service indicators. Ecol. Indic. 29, 434–444. https://doi.org/10.1016/j.ecolind.2013.01.013.

Hirt, S.A., 2005. Planning the post-communist city: Experiences from Sofia. Int. Plan. Stud. 10, 219–240. https://doi.org/10.1080/13563470500378572.

Hirt, S.A., 2012. Iron Curtains: Gates Suburbs and Privatisation of Space in the Post-socialist City. John Wiley & Sons,.

Hirt, S.A., 2013. Whatever happened to the (post)socialist city. Cities 32, S29–S38. https://doi.org/10.1016/j.cities.2013.04.010.

Hirt, S.A., 2015. Planning during post-socialism. In: Wright, J.D. (Ed.), International Encyclopedia of the Social & Behavioral Sciences. Elsevier, Amsterdam, pp. 187–192. https://doi.org/10.1016/B978-0-08-097086-8.74028-1.

Hrg, S., 1999. Zagreb: A Millennium-old City for the New Millennium. Studio Hrg,, Zagreb.

Hsieh, H.-F., Shannon, S.E., 2005. Three approaches to qualitative content analysis. Qual. Health Res. 15, 1277–1288. https://doi.org/10.1177/1049732305276687.

Huu, L.H., Ballatore, T.J., Irvine, K.N., Nguyen, T.H.D., Truong, T.C.T., Yoshihisa, S., 2018. Socio-geographic indicators to evaluate landscape cultural ecosystem services:

a case of Mekong Delta, Vietnam. Ecosyst. Serv. 31, 527–542. https://doi.org/10.1016/j.ecoser.2017.11.003.

Ishihara, H., 2018. Relational values from a cultural valuation perspective: how can sociology contribute to the evaluation of ecosystem services. Curr. Opin. Environ. Sustain. 35, 61–68. https://doi.org/10.1016/j.cosust.2018.10.016.

Kabisch, N., 2015. Ecosystem service implementation and governance challenges in urban green space planning – the case of Berlin, Germany. Land Use Policy 42, 557–567. https://doi.org/10.1016/j.landusepol.2014.09.005.

Kabisch, N., Haase, D., 2013. Green spaces of European cities revisited for 1990-2006. Landsc. Urban Plan. 110, 113–122. https://doi.org/10.1016/j.landurbplan.2012.10.017.

Kelbaugh, D., 2000. Three paradigms: new urbanism, everyday urbanism, post urbanism – an excerpt from the essential common place. Bull. Sci., Technol. Soc. 20, 285–289. https://doi.org/10.1177/027046760002000406.

Klarić Jelenski, M., 2020. Kvaliteta života starije populacije u novozagrebačkom naselju Travno kroz aspekt korištenja javnih zelenih površina. University of Zagreb.

Klimanova, O., Illarionova, O., Grunewald, K., Bukvareva, E., 2021. Green infrastructure, urbanization, and ecosystem services: the main challenges for Russia's largest cities. Land 10, 1292. https://doi.org/10.3390/land10121292.

Knežević, S., 2003. Kontinuitet i tradicija – stvarnost, mogućnosti i izgledi. Čovjek i Prost. 3–12.

Kowarik, I., 2019. The "Green Belt Berlin": establishing a greenway where the Berlin Wall once stood by integrating ecological, social and cultural approaches. Landsc. Urban Plan. 184, 12–22. https://doi.org/10.1016/j.landurbplan.2018.12.008.

Kowarik, I., 2021. Working with wilderness: a promising direction for urban green spaces. Landsc. Archit. Front. 9, 92. https://doi.org/10.15302/j-laf-1-030025.

Kristiánová, K., 2016. Post-socialist transformations of green open spaces in large scale socialist housing estates in Slovakia. Procedia Eng. 161, 1863–1867. https://doi.org/10.1016/j.proeng.2016.08.715.

Leist, A.K., Ferring, D., Filipp, S., 2010. Remembering positive and negative life events: associations with future time perspective and functions of autobiographical memory. GeroPsych 23, 137–147. https://doi.org/10.1024/1662-9647/a000017.

Lin, B.B., Fuller, R.A., Bush, R., Gaston, K.J., Shanahan, D.F., 2014. Opportunity or orientation? Who uses urban parks and why. PLOS One 9, e87422. https://doi.org/10.1371/journal.pone.0087422.

Lumber, R., Richardson, M., Sheffield, D., 2017. Beyond knowing nature: contact, emotion, compassion, meaning, and beauty are pathways to nature connection. PLOS One 12, e0177186. https://doi.org/10.1371/journal.pone.0177186.

Martin, J., Mongruel, R., Levrel, H., 2018. Integrating cultural ecosystem services in an ecosystem satellite account: a case study in the Gulf of Saint-Malo (France). Ecol. Econ. 143, 141–152. https://doi.org/10.1016/j.ecolecon.2017.07.005.

Mascarenhas, A., Ramos, T.B., Haase, D., Santos, R., 2015. Ecosystem services in spatial planning and strategic environmental assessment – a European and Portuguese profile. Land Use Policy 48, 158–169. https://doi.org/10.1016/j.landusepol.2015.05.012.

Maund, P.R., Irvine, K.N., Dallimer, M., Fish, R., Austen, G.E., Davies, Z.G., 2020. Do ecosystem service frameworks represent people's values? Ecosyst. Serv. 46, 101221 https://doi.org/10.1016/j.ecoser.2020.101221.

MEA, 2005. Ecosystems and Human Well-Being: Synthesis a Report of the Millennium Ecosystem Assessment. Island Press,, Washington. https://doi.org/10.1196/annals.1439.003.

Milcu, A.I., Hanspach, J., Abson, D.J., Fischer, J., 2013. Cultural ecosystem services: a literature review and prospects for future research. Ecol. Soc. 18, 44–88. https://doi.org/10.5751/ES-05790-180344.

Pauleit, S., Liu, L., Ahern, J., Kaźmierczak, A.E., 2011. Multifunctional green infrastructure planning to promote ecological services in the city. In: Niemelä, J.K. (Ed.), Urban Ecology: Patterns, Processes, and Applications. Oxford University Press, Oxford, pp. 272–285.

Pegan, S., 2007. Urbanizam: uvod u detaljno urbanističko planiranje. Sveučilište u Zagrebu, Arhitektonski fakultet,, Zagreb.

Pepper, D., 1993. Eco-Socialism: From Deep Ecology to Social Justice. Routledge,.

Poniży, L., Majchrzak, W., Zwierzchowska, I., 2017. Cultural ecosystem services of urban green spaces – supply and demand in the densely built-up areas. Poznan Old Town Case Study. IOP Conf. Ser.: Earth Environ. Sci. 95, 052009 https://doi.org/10.1088/1755-1315/95/5/052009.

Pyle, R.M., 2003. Nature matrix: reconnecting people and nature. Oryx 37, 206–214. https://doi.org/10.1017/S0030605303000383.

Radford, K.G., James, P., 2013. Changes in the value of ecosystem services along a rural–urban gradient: a case study of Greater Manchester, UK. Landsc. Urban Plan. 109, 117–127. https://doi.org/10.1016/j.landurbplan.2012.10.007.

Rall, E.L., Kabisch, N., Hansen, R., 2015. A comparative exploration of uptake and potential application of ecosystem services in urban planning. Ecosyst. Serv. 16, 230–242. https://doi.org/10.1016/j.ecoser.2015.10.005.

Raymond, C.M., Giusti, M., Barthel, S., 2017b. An embodied perspective on the co-production of cultural ecosystem services: toward embodied ecosystems. J. Environ. Plan. Manag. 61, 778–799. https://doi.org/10.1080/09640568.2017.1312300.

Raymond, C.M., Frantzeskaki, N., Kabisch, N., Berry, P., Breil, M., Nita, M., Geneletti, D., Calfapietra, C., 2017a. A framework for assessing and implementing the co-benefits of nature-based solutions in urban areas. Environ. Sci. Policy 77, 15–24. https://doi.org/10.1016/j.envsci.2017.07.008.

Rigolon, A., Németh, J., 2020. Green gentrification or 'just green enough': do park location, size and function affect whether a place gentrifies or not? Urban Stud. 57, 402–420. https://doi.org/10.1177/0042098019849380.

Sharifi, F., Nygaard, A., Stone, W.M., Levin, I., 2021. Green gentrification or gentrified greening: metropolitan Melbourne. Land Use Policy 108, 105577. https://doi.org/10.1016/j.landusepol.2021.105577.

Soga, M., Gaston, K.J., 2016. Extinction of experience: the loss of human-nature interactions. Front. Ecol. Environ. 14, 94–101. https://doi.org/10.1002/fee.1225.

Soga, M., Yamaura, Y., Aikoh, T., Shoji, Y., Kubo, T., Gaston, K.J., 2015. Reducing the extinction of experience: association between urban form and recreational use of public greenspace. Landsc. Urban Plan. 143, 69–75. https://doi.org/10.1016/j.landurbplan.2015.06.003.

Stanić, I., 2016. Sport za svakoga. Sportske aktivnosti radničke klase u Hrvatskoj od 1945. do početka 1960-ih. Hist. Zb. 69, 121–140.

Svirčić Gotovac, A., 2009. Utjecaj društvenih aktora na procese gentrifikacije i pauperizacije: primjer Zagreba. Sveučilište u Zagrebu,.

Svirčić Gotovac, A., 2010. Aktualni revitalizacijski i gentrifikacijski procesi na primjeru Zagreba. Sociol. i Prost. 48, 197–221.

Tandarić, N., Watkins, C., Ives, C.D., 2019. Urban planning in socialist Croatia. Hrvat. Geogr. Glas. 81, 5–41. https://doi.org/10.21861/HGG.2019.81.02.01.

Tandarić, N., Ives, C.D., Watkins, C., 2020. Can we plan for urban cultural ecosystem services. J. Urban Ecol. 6, juaa016 https://doi.org/10.1093/jue/juaa016.

Tulloch, L., 2015. Is Emile in the garden of eden? Western ideologies of nature. Policy Futures Educ. 13, 20–41. https://doi.org/10.1177/1478210314566729.

Valánszki, I., Jombach, S., Kovács, K.F., Ahmed, A.A., Mendez Garzón, F.A., Balha, G., 2019. Cultural ecosystem services and local identity – a ppGIS case study from Budapest metropolitan region. In: Proceedings of the Fábos Conference on Landscape and Greenway Planning. University of Massachusetts Amherst, Amherst, p. Article 14. https://doi.org/10.7275/2wzc-ff82.

Vujošević, M., 2004. New-old power game in urban planning in Yugoslavia and obsolete planning methodology. The Case of the Master Plan of the City of Belgrade 2021. Der Donauraum 44, 33–38.

Vukić, F., 2007. Socialist lifestyle and mass consumption. Project Zagreb: Transition as Condition, Strategy, Practice. Harvard University, Graduate School of Design,, Barcelona, pp. 234–238.

Whitehead, M., 2005. Between the marvellous and the mundane: everyday life in the socialist city and the politics of the environment. Environ. Plan. D: Soc. Space 23, 273–294. https://doi.org/10.1068/d372t.

Wilkinson, C., Saarne, T., Peterson, G.D., Colding, J., 2013. Strategic spatial planning and the ecosystem services concept – an historical exploration. Ecol. Soc. 18, 37. https://doi.org/10.5751/ES-05368-180137.

Włodarczyk–Marciniak, R., Sikorska, D., Krauze, K., 2020. Residents' awareness of the role of informal green spaces in a post-industrial city, with a focus on regulating services and urban adaptation potential. Sustain. Cities Soc. 59, 102236 https://doi.org/10.1016/j.scs.2020.102236.

Zupan, D., Büdenbender, M., 2018. Moscow urban development: neoliberal urbanism and green infrastructures. In: Tuvikene, T., Sgibnev, W., Neugebauer, C.S. (Eds.), Post-Socialist Urban Infrastructures. Routledge, London, pp. 125–141.

Zwierzchowska, I., Hof, A., Iojă, I., Mueller, C., Poniży, L., Breuste, J., Mizgajski, A., 2018. Multi-scale assessment of cultural ecosystem services of parks in Central European cities. Urban For. Urban Green 30, 84–97. https://doi.org/10.1016/j.ufug.2017.12.017.