

Can Church Gardens Represent a Valuable Recreation Alternative in Cities?

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1 ABSTRACT

Urban green infrastructure is a key element in improving quality of life and creating an appropriate framework for sustainable, resilient and inclusive cities. Also, achieving a coherent spatial planning based on development of urban green infrastructure can be an useful solution to negative changes related to environmental quality, segregation and ecosystem services. We use church gardens in Bucharest as a case study to understand how these small green spaces can be integrated into urban planning.

The paper aims to analyse the potential of church gardens as recreation areas at city level in Romania. The analysis focused on three major aspects – the spatial distribution of churches, the accessibility of green spaces located in church gardens (calculated both for adults and elderly people as most important groups accessing the gardens) and the characteristics of those gardens in terms of facilities, use and problems (based on a field survey filled for a 20% sample of the 287 churches in Bucharest).

The results showed that the homogenous spatial distribution of churches with green gardens makes them accessible for residential areas located far from traditional green recreational areas. In Bucharest, the service areas of churches with green spaces cover 84% of the residential areas when accounting for the adult's walking speed and 61% when accounting for elderly people. Green spaces in church gardens amount to over 25 ha in Bucharest, with an average of 1737 square meters per garden, representing a surface which could be designed to respond better to the population needs. The major challenges identified in the church gardens are (a) the use of green space for other purposes than recreations, such as storage space for construction materials (31.5%), waste (17.5%), temporal constructions (12.3%) or car parking (21%), and (b) quality of vegetation.

Our study highlights that through their number and distribution church gardens can represent an alternative to large green areas if they are opened to the population and used for organising activities and events. Their importance and potential could be increased if designed for such purpose. Such analysis can be useful in the planning process of small urban green areas in order to integrate them into urban management process.

Keywords: recreation, accessibility, church gardens, green infrastructure, inclusion

2 INTRODUCTION

The new 2030 Urban Agenda and the Sustainable Development Goals SDGs (specifically SDG 11) reveal the need for public green space interventions to achieve sustainable urban development (UN, 2015). Such actions are required in order to achieve sustainable, resilient and inclusive human settlements which is the goal of multiple international initiatives.

Urban green spaces are highly important both from ecological and social perspectives (Kabisch and Haase, 2013). From an ecological point of view, they provide regulating and supporting ecosystem services, such as climate mitigation (de la Sofia et al. 2019; Jarosińska and Gołda, 2020), regulating the temperature of the indoor and outdoor environment (Liberalesso et al., 2020; Wang et al., 2014), flood control (Latinopoulos et al., 2016; Sun et al., 2019), noise reduction (Sakieh et al., 2017), pollution control (Ariluoma et al., 2021), and providing a habitat for urban biodiversity (Tzoulas et al., 2007, Jabben et al., 2015). The social benefits provided by urban green spaces are related with opportunities for recreation, nature observation,

socialisation, artistic, educational and scientific activities, sports and their role in improving both physical and mental health (Dickinson and Hobbs, 2017; Kabisch et al., 2017). Moreover, urban green spaces increase aesthetics and quality of life (Enssle and Kabisch, 2020; Razak et al., 2016).

In the past decades, many studies have focused on the analysis of large urban green spaces, mainly parks and urban or periurban forests, addressing various topics such as the services they generate (Demuzere et al., 2014), their potential to control pollution (Saaroni et al., 2018), their role in promoting social cohesion (O'Brien et al., 2017), the planning principles behind them (Gradinaru & Hersperger, 2019) and administrative aspects (Meerow and Newell, 2017). There are also studies related to the connectivity of urban green spaces and the integration of these areas into spatial planning (Langemeyer et al., 2020) in order to increase the green surface within the cities.

The new paradigm of urban growth promotes compact cities as solution for reducing the human impact on the environment by controlling urban sprawl, preserving natural and seminatural areas around cities and minimising the need for private transportation (Artmann et al. 2019). However, these cities have to include enough green areas to compensate for the deep human transformation and the pollution generated. The development of compact and green cities faces many challenges, such as the existing high density of previously built areas, the high number of inhabitants and the property regime of urban spaces, with many falling under the realm. In this context, small urban green spaces could represent a viable alternative to parks and urban forests and a potential solution for environmental issues in urban areas, especially since they can be developed both independently and complementary to other urban functions (e.g. institutions, commercial areas, residential areas). Peschardt et al.(2012) defined small urban green spaces as places that must have at least some vegetation, their own entrance, and distinguishable boundaries which separate them from surrounding public space. Also, Peschardt and Stigsdotter (2013) mentioned that for a green space to be considered small it must have an area less than 5000 square meters.

Small urban green areas include categories such as pocket parks, residential green areas, playgrounds (Olsen et al., 2019), institutional gardens such as school gardens (Ioja et al., 2014) or church gardens, green roofs (Langemeyer et al., 2020; Shafique et al., 2018) and green walls (Fastenrath et al., 2020). The scientific interest in these areas varies a lot according to the intensity of their use, the targeted population, their frequency in urban areas and the challenges related to their inclusion in a coherent network. Playgrounds, for example, are a hot topic, many studies are focusing on their role, both positive (place for physical activities and contact with nature) (Cohen et al., 2020; Raney et al., 2019) and negative (spaces which may contain chemical contaminants or parasites from other species) (Berman et al., 2018) in children's health.

Church gardens are not a frequently discussed topic in the scientific literature. There are several publications which analyse more widely subjects like church gardens, cemeteries or sacred forests (Byers et al., 2001; Rae, 2021). Most of the publications focus on their contribution toward increasing urban biodiversity (Skorka et al. 2018) and recreational and regulation functions of the cemeteries. Also, they provide valuable information regarding their evolution, floristic characteristics and socio-cultural use (North et al., 2017).

Since in Romania church gardens are considered a distinct type of urban green areas within the broader category of institutional gardens (Romanian Parliament, 2007) we explored their potential to improve the residents' quality of life through cultural ecosystem services. A study in Poland showed that church gardens could perform new functions related to recreation and education, they could contain playgrounds for children, secular exhibition and animal cribs related to traditional holidays (Kaczyńska, 2020). As yet the cultural services provided by urban sacred sites have not been examined in urban sustainability debates, they require investigation because urban sacred sites are often managed for different objectives than other formal urban green spaces.

Only few studies have focused on the potential of small green spaces in increasing the connectivity and multifunctionality of urban spaces (see for example Ioja et al., 2014). Our study will focus on church gardens with the aim to fill the gap related with the assessment of their potential to represent a valuable recreation alternative in cities. The objectives of the paper are to: (1) assess the spatial distribution of church green spaces in Bucharest, (2) evaluate the accessibility of church green spaces for the local community and (3) identify the characteristics of church green spaces and their potential for representing valuable recreation alternatives.

3 STUDY AREA

Bucharest is the capital city of Romania, the largest city in the Central and Eastern Europe. It has a population that exceeds 1.83 million inhabitants (Eurostat, 2019) and a surface of 242 square km. Bucharest was a capital for the past three and a half centuries and this status is visible in the planning and design of the city. After the fall of the socialist regime in 1989 the centralised planning system was replaced by chaotic development and urban sprawl due to the shift to private ownership of land and the weak legislative system (Grădinaru et al., 2020).

After 1989 the surface of urban green infrastructure in Bucharest diminished as a result of land conversion into commercial and residential areas (Iojă et al., 2014). Urban parks have lost around 60 hectares between 1989 and 2019, currently covering around 790 ha (Badiu et al., 2019) but small green areas have been equally threatened especially due to the restitution process that affected pocket parks, neighbourhood greens and other areas which once transferred into private property were transformed into built areas (Onose et al. 2020). Due to public pressure related to urban green spaces, in the last years emerged a tendency of creating new green areas, most of them located on previously abandoned land within or near residential areas.

Many churches in Bucharest are centuries old and represented a vector of urbanisation preceding the building of the residential areas they are currently serving. During the socialist era, in the context of an outspoken opposition between state and church, many churches in Bucharest were demolished, moved or their gardens were diminished making place for the socialist blocks of flats or major transport infrastructure. Most of the churches in Bucharest are Christian orthodox, they are usually physically separated from other urban functions and not always open for the public.

4 METHODOLOGY

We developed a spatial database containing the location of the churches in Bucharest, including all categories of churches (e.g., orthodox, catholic, protestant) located in independent buildings. We used two sources of information: the website of the National Heritage Institute (CIMEC, 2008) and the Open Street Map database (retrieved online from the Geofabrik website). The location of each church was validated using the satellite base map provided by ESRI in ArcGIS Pro (ESRI, 2018). The spatial database contained the build-up area within the church garden and the green space (excluding cemeteries) and information regarding the names, confession, categories of green areas and vegetation coverage and surface.

We identified and validated 287 churches in Bucharest, most of them belonging to the following confessions: Christian orthodox (77%), Christian catholic (3.14%), Baptist (4.53%) and Adventist (5.92%). We also identified 25 places of worship of other confessions. We included in the analysis only the stand-alone locations and excluded the ones arranged inside residential buildings or multifunctional ones.

In order to perform the accessibility analysis, we built a Network dataset based on the open access street layer provided by Open Street Map. The network was configured for walking and included two alternative modes – for adults and elderly people, these two categories being the most probable to use church green areas since they visit these places more often. Based on a literature review, we used an average walking speed of 0.8 m/s for elderly people (Montero-Odasso et al, 2004) and 1.42 m/s for adults with normal weight (Browning et al, 2006). We performed the accessibility analysis using the Service Area wizard in ArcGIS Pro 10.2 and highlighted areas at 5-, 10- and 15-minutes walking distance (see Table 1) from the churches having a green area in their garden. We also calculated the surface or collective and single-family residential areas located in the delineated service areas to highlight the share of urban population having access to these objectives and the potential they have to represent recreation areas.

	Distance walked in 5 minutes (m)	Distance walked in 10 minutes (m)	Distance walked in 15 minutes (m)
Adults	240	480	720
Elderly	427	854	1282

Table 1: Distances used in the accessibility analysis derived based on the average walking speed for adults and elderly people

To identify the characteristics of the gardens, we conducted a field survey to a sample of 57 churches, representing 20% of the total number. The field work was carried out during the summer season (June-July 2020) so aspects related with the green areas could be observed. The survey included items addressing (1)

general information about the church (i.e., confession, surroundings, establishment period), (2) characteristics of the gardens (i.e., endowments, use of the garden) and (3) green space characteristics (i.e., categories of green spaces, floral composition, vegetation problems). Statistical analysis was used to analyse the information.

5 RESULTS

5.1 Spatial distribution of church green spaces in Bucharest

Our analysis highlighted the concentration of churches in the old central part of the city, almost half of the identified churches being located inside the first ring of the city, a surface of around 28 square km representing less than 10% of the city’s surface.

Only 52% (149 locations) of the churches identified in Bucharest have green spaces within their gardens, with great variations between confessions (Fig. 1). Christian orthodox churches represent 92% of the 149 locations that have green spaces and 62% of those which don’t (85 out of 138). The orthodox confession is the only one for which the churches with green spaces are in greater number (almost 60%) than those which don’t.

It is interesting to notice that, contrary to the confession, the location of the church doesn’t significantly influence the presence of the green space. Therefore, 53% of the churches located inside the first road ring of the city, and 50% of those located outside, have green spaces within their gardens.

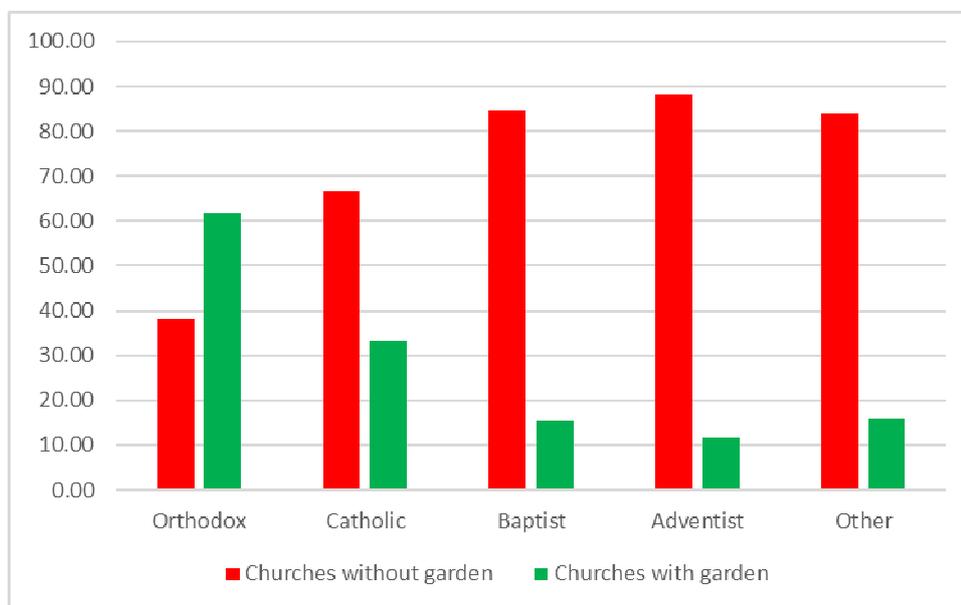


Fig. 1: Distribution of green spaces between churches of different confessions

The surface of the green spaces located within the gardens varies from a few square meters to 1.84 ha (18400 square meters), with an average value of 1737 sqm of green space per garden. Overall, green space located within church gardens in Bucharest have a surface of 25.71 ha.

5.2 Accessibility of church green spaces for the local community

The accessibility analysis highlighted the high potential church gardens have as recreation alternatives for the local population. Even if only half of the identified churches have green areas inside their gardens, they are homogeneously distributed at city level and could serve as recreation areas for an important number of residents.

There are significant differences in terms of accessibility between the two groups included in analysis. Adults, who walk faster, enjoy a good accessibility to churches with green areas inside their gardens across the city. Only far peripheral areas lack churches with green spaces, some of them actually lacking churches at all. The situation changes when taking into consideration the limited mobility of elderly people. Apart from the old central part of the city, which is enclosed by the first road ring, almost all neighbourhoods have areas without access to churches with green spaces from the point of view of elderly people (Fig. 2). Their

limited mobility heavily restricts the distances they can cover in a given amount of time and also their resistance to effort.

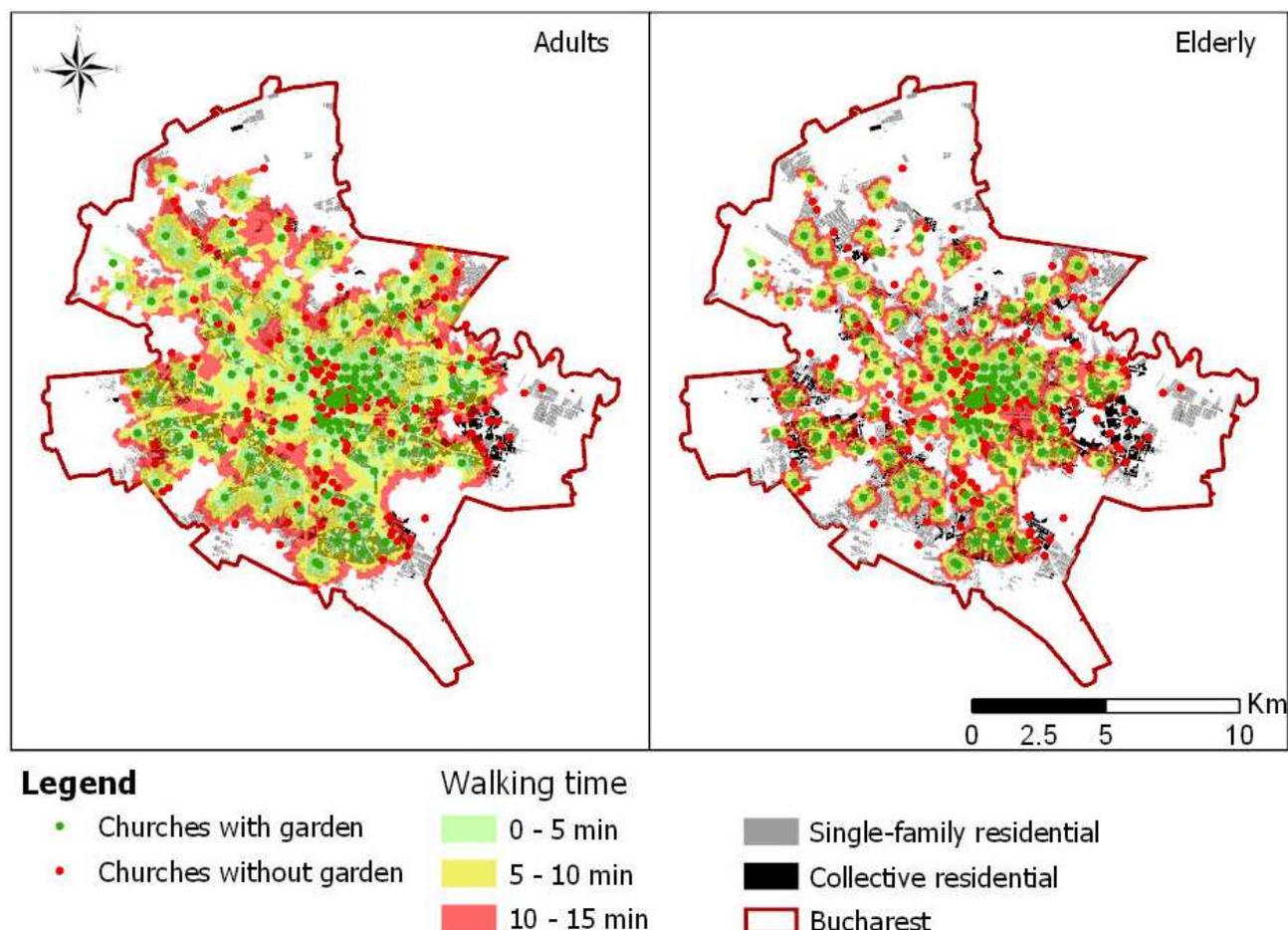


Fig. 2: Service areas of churches with green spaces in their gardens (calculated for adults (left) and elderly people (right))

We assessed the surface of residential area located in the proximity of churches with green spaces in their gardens as measure of the percent of population with access to them (Table 1). The analysis showed that in case of the services areas established for adults, only 13.79% of the residential areas had very low or no access to green areas in churches gardens. Collective residential premises have a better access to green areas in church gardens then single-family homes, 93% of the former having very good (less than 5 minutes), good (5-10 minutes) and satisfactory (10-15 minutes) access compared with only 82% among the latter. It is interesting to highlight that, for both categories of residential areas, the larger surfaces are found in the immediate proximity of churches, with double or triple extension in the first two areas of access (under 5 minutes and 5-10 minutes) compared with the third one (10-15 minutes).

Walking time	0-5 min		5-10 min		10-15 min		over 15 min		Residential surface ha
	ha	%	ha	%	ha	%	ha	%	
Adults									
Collective residential	942.03	37.30	1021.943	40.46	378.34	14.98	183.287	7.26	2525.6
Single-family residential	1258.91	32.06	1287.5	32.79	674.11	17.17	706.37	17.99	3926.89
Total	2200.94	34.11	2309.443	35.79	1052.45	16.31	889.657	13.79	6452.49
Elderly									
Collective residential	418.36	16.56	689.1	27.28	645.22	25.55	772.92	30.60	2525.6
Single-family residential	652.77	16.62	788.78	20.09	747.1	19.03	1738.24	44.27	3926.89
Total	1071.13	16.60	1477.88	22.90	1392.32	21.58	2511.16	38.92	6452.49

Table 2: Surfaces of residential areas located inside the service areas of churches with green spaces in their gardens

In the case of the service areas established for elderly people, the distribution of the residential areas is more balanced. An important share of the residential areas doesn't have access to green spaces in church gardens – 30.6% in the case of collective residential and 44.27% in the case of single-family residential. The results showed that around 17.5% of total residential areas (20.7% of collective residential and 15.4% of single-family residential) has very good access to green spaces in church gardens for adults, but not for elderly people (Fig. 3). The same situation is also characteristic for 12.9% of residential with good access (5-10 minutes walking distance) in the case of adults, but not in the case of elderly people. In contrast, the residential surfaces with satisfactory (10-15 minutes walking distance) and low access (over 15 minutes walking distance) are larger in the case of elderly people.

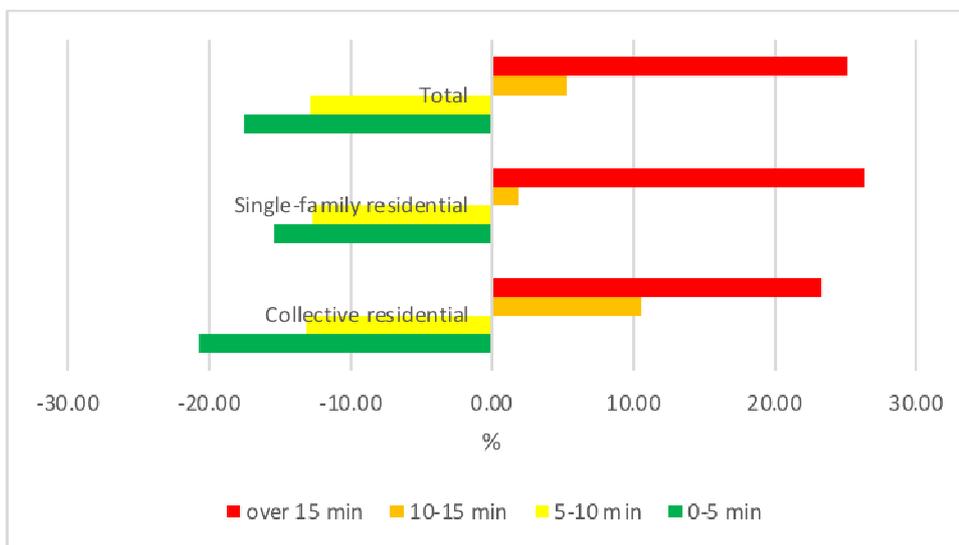


Fig. 3: Difference between the shares of residential areas inside the services areas calculated for the elderly and for the adults

5.3 Characteristics of church green spaces

The field survey highlighted that the most common urban functions found in the proximity of churches in Bucharest are collective residential (86%), single-family residential (51%), commercial areas (42%) and parking lots (37%).

Beside the main building, church gardens enclose a variety of land uses within their perimeter, such as buildings used for rituals (e.g., outdoor worship, weddings, burials, shrines and so on), bell towers, alleys, parking lots, green spaces, statues and playgrounds. The diversity of these elements depends on the church confession and age, the available surface and the protection regimen of the location. The majority of the surveyed churches had a private garden (85%), but these gardens did not always include green areas. Some of the churches without garden are located within cemeteries which generally can't be associated with recreational activities.

The vegetation in church gardens is diverse, the majority including hardwood species (82%), coniferous (58%) and shrubs (79%) and sometimes very dense. Commonly, shrubs can be used as a green alignment which separates alleys and green spaces or are used as a replacement for hedges. The lawn is another common green element, encountered in 74% of the surveyed cases. The grass areas cover between 0 and 90% of the gardens' surface and from case to case the degree of maintenance varies. Almost half of the sample is characterised by the presence of flowers, both in flowerbeds or in hotchpotches. Church gardens are characterised by the presence of some random recreational elements like benches and playgrounds.

The major issues identified in the church gardens are (1) the use of green space for other purposes, such as storage space for construction materials (31.5%) or waste (17.5%), presence of temporal constructions (12.3%) or car parking (21%) and (2) low quality of vegetation. Around half of the gardens have problems related with dry vegetation, either advanced (43%) or medium (7%) and 11% host invasive plant species (e.g., *Ailanthus altissima*). Almost 20% of the gardens don't have any problems and 23% are facing other categories of problems (Fig. 4).

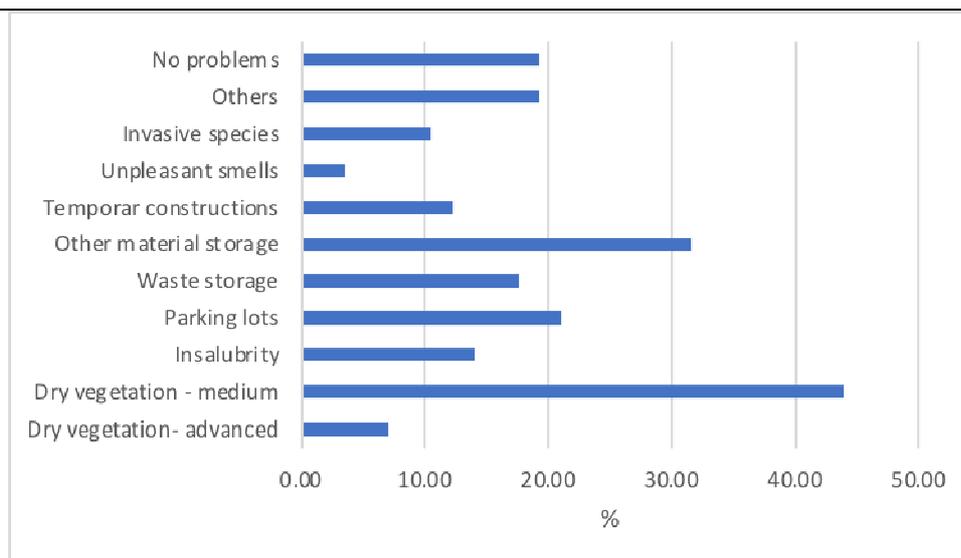


Fig. 4: Percentage of church garden issues

6 DISCUSSION

Using Bucharest as a case study, we showed that church gardens can represent a valuable recreation alternative. Currently, only around 50% of the churches in Bucharest have green spaces in their gardens. This is partially due to the transformations suffered in the socialist era, but also to the financial capitalization of all resources, to the changes in legislation and consumption patterns of the society and to the lack of awareness related with the determinants of a high quality and healthy urban environment. In the last years many administrators chose to transform the green spaces in chapels since the need for this category of services has increased.

Collective residential has the highest accessibility to green spaces in church gardens. This is due to the fact that these areas were almost entirely built during the socialist era and therefore planned from the beginning to include all necessary services. They were usually built on older single-family residential areas from which churches were the only preserved buildings. Single-family residential areas can be planned (especially the historical lots) or unplanned, especially the newly built ones and therefore their access to churches widely varies.

The high number and the homogenous distribution in the city, could make church gardens an interesting and feasible option for recreation and social activities despite their small surface (approximately 3% compared with urban park surface in Bucharest). The accessibility analysis showed a high potential of church gardens to represent a nearby and easy to reach green area especially for adults. The limited mobility of elderly people makes this option suitable only for around half of them, but it is important to mention that some residential areas with good and very good access to church gardens are located outside the area of influence of urban parks. Therefore, the green areas in church gardens could represent the places where elderly residents from these neighbourhoods could experience nature.

Church gardens can provide both regulatory and cultural ecosystem services. Depending on the gardens' arrangements and endowments, they can host a wide variety of recreational activities (e.g. playgrounds, lecture clubs, places for boardgames, places for meditation, social spaces), but they can also improve the aesthetics of the neighbourhood and population wellbeing (de Lacy and Shackleton, 2017). Currently there is almost no infrastructure meant to increase the role of these spaces in social activities. Less than half of the gardens have such infrastructure and it is mainly represented by benches. Financial aspects are generally directly related to the design and activities carried out inside church gardens. The greatest challenge related to church gardens is to stop their transformation into artificial areas and to reverse the process in those areas where it is still possible. Another important aspect is related with the fact that part of the church gardens is only opened to the public during service, which seriously affects their potential of representing places for social interaction.

Our study highlights that through their number and distribution church gardens can represent an alternative to large green areas if they are open to the population and used for organising activities and events. Their importance and potential could be increased if designed for such purpose. Our findings are in line with research conducted on other small urban green spaces, such as school green areas (Ioja et al 2014) and pocket parks (Nordh and Ostby, 2013). Information on their distribution, accessibility and characteristics can be useful in the planning process of small urban green areas in order to integrate them in urban management process.

Greening the church gardens could contribute, beside the already discussed socio-cultural role, to increasing the amount of regulatory ecosystem services these areas provide minimising the negative effects produced by rainfall water (Saaroni et al, 2018), the level of noise generated by outdoor services and the heat island effects. These improvements could also contribute to minimising the potential of conflict occurrence involving churches.

One of the limitations of the study is the lack of spatial representation of the population number which was replaced by the surface of residential area by category. Also, the study didn't consider the availability or reservation of people to use green areas in church gardens as recreation areas nor the fact that church gardens are sometimes private property and therefore not necessarily available for public use.

7 CONCLUSION

The surface of green areas inside church gardens is rather small in comparison with urban parks, urban forests or other categories of green areas within the city. However, due to their number, the good position they have in relation with the residential areas and their high accessibility, this category of small green areas has the potential to become an important element within the city if properly designed and maintained. The aesthetics and management of church gardens must comply with certain regulations if they are to be integrated in a coherent spatial urban planning.

Church gardens may represent an alternative to traditional green areas through the services they could provide since they could be designed to fulfil spiritual and religious needs ensuring a peaceful environment. Such needs aren't properly satisfied in crowded urban parks where the surface is often insufficient to host all categories of activities.

Our study could represent a starting point in planning and designing church gardens as part of the urban green infrastructure and in giving them a higher importance from a socio-cultural point of view.

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