



PRIMARY RESEARCH

# Social sustainability with Urban Green Space (UGS) planning

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## Abstract

This paper aims to provide an approach and theoretical framework that indicates the importance of designing and planning Urban Green Spaces (UGS) for urban social sustainability. Sustainability is a widely used term in all urban development planning worldwide. Planning for urban social sustainability is one of the main pillars of sustainability that promote welfare and quality of life, which can be affected by the existence of nature in the city. UGS as the provider of social services such as recreational and physical activities and social interactions, are essential to promote the quality of life in urban areas, which is a key component of sustainable development. This paper applies an analytical- descriptive method for the critical review of key literature on UGS and social sustainability and aims to discuss the importance of UGS on urban social sustainability. The results demonstrate that designing and planning green spaces according to social aspects of sustainable development can be vital to improve the social sustainability of cities and promote the liveability of urban environments.

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## INTRODUCTION

Planning, designing and promoting sustainability of communities and residential areas are considered as sustainable development requirements (Al-Thani, Amato, Koç, & Al-Ghamdi, 2019; Nikolaou et al., 2019). Recently, urban expansion has increased all over the world. Such rapid urbanization is related to diminishing UGS and consequently decreased life quality (Dewan & Yamaguchi, 2009). Because of increased atmospheric pollution and changing microclimates in many cities all around the world (Schebella, Weber, Brown, & Hatton MacDonald, 2012). Moreover, increasing demand for housing inevitably increases the pressure to develop un-built urban areas such as UGS. This development has serious consequences for urban nature and for residential areas (Yli-Pelkonen & Niemelä, 2005).

The planning of cities in the last decades has been marked by the construction of buildings without paying more attention to green spaces that consequently have had an adverse impact on the urban areas' social sustainability.

Due to the great impact of green spaces on urban life, research interest in this area is growing (Taylor & Hochuli, 2017). In addition, green areas have been a major component of urban planning during the last century and have been justified on the basis of social services.

In many urban settlements, infrastructure demand to meet the needs of growing populations have been met through the development and modification of natural areas, such as open spaces, fields, parks, and wetlands (Byomkesh, Nakagoshi, & Dewan, 2012; Kong & Nakagoshi, 2006). The development of UGS is a significant task in cities regarding the increase of the population and urban constructions. In addition, because of the human need for green spaces to create a social, physical and spiritual balance, maintaining the ecological balance of cities is notable and vital (Goonetilleke, Yigitcanlar, Ayoko, & Egodawatta, 2014).

According to the 2030 Agenda of UN for Sustainable Development of green space importance in developing populous nations like Australia is recognized on a global scale"

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(Daker, Pieters, & Coffee, 2016). Green spaces play a pivotal role in supporting urban ecological and social systems (Barbosa et al., 2007). Healthy people, environments, and healthy human-environment interactions are synergistic relationships that cause cities sustainability (Liu et al., 2007). Therefore, UGS quality and human wellbeing are tightly correlated (Tzoulas et al., 2007; Tzoulas & Greening, 2011). UGS provides services that are vital for the welfare of urban dwellers (Alfsen, Duval, & Elmqvist, 2011). They offer an array of benefits, which support our physical, psychological, and social health (Jennings, Larson, & Yun, 2016). The provision and maintenance of such ecosystem services are highly dependent on proper urban planning (Colding, 2011). UGS creates opportunities for recreation, reducing stress and educational possibilities. Thus, it plays a significant role in creating socio-environmental conditions that increase human health and wellbeing (Wu, 2013). Urban social sustainability and having livable and resilient cities are tightly connected to UGS existence and planning (Aram & Alibaba, 2018; Jennings & Bamkole, 2019). This paper applies an analytical- descriptive method for the critical review of key literature on UGS and social sustainability and aims to discuss the importance of UGS on urban

social sustainability.

## LITERATURE REVIEW

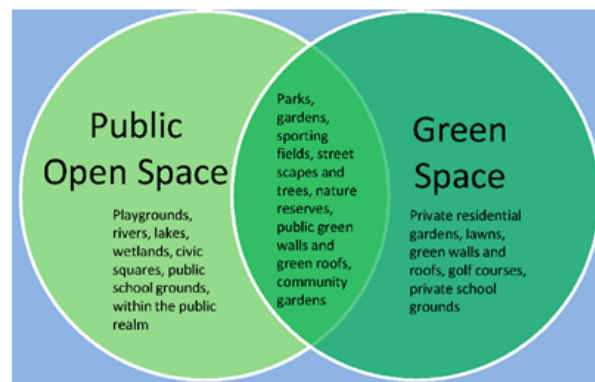
### UGS

According to a WHO report “there is no universally accepted definition of UGS. Generally, green spaces in urban areas are public parks; other definitions may also include private gardens, woodlands, children’s play areas, non-amenity areas (such as roadside verges), riverside footpaths, beaches, and so on” (World Health Organization, 2016).

There is a difference between definitions of UGS and open space; Open spaces are urban lands pieces which are not under any kinds of constructions and is accessible to the public, including:

- Green lands that covered with vegetation
- Schoolyards
- Vacant lots
- Public seating areas
- Playgrounds
- Public plazas

Therefore, open space is a vast term in comparison with green space. In another word, green space is one of the sub-categories of open spaces (City of Melbourne, 2018).



**FIGURE 1.** Overlaps between the green space and public open space (Source: (Davern, Farrar, Kendal, & Giles-Corti, 2017))

The prevalent definition of UGS that has been applied in studies in European countries is regarding the European Urban Atlas definition. “The Green Urban Areas as defined by Urban Atlas code 14100 include public green areas used predominantly for recreation such as gardens, zoos, parks, and suburban natural areas and forests, or green areas bordered by urban areas that are managed or used for recreational purposes. However, where relevant the overview includes studies that have used wider or more inclusive definitions of urban green space” (Haq, 2011).

Urban green space can be defined as urban land use with natural or unnatural vegetation cover which is eligible for both social and ecological efficiencies (Bahram, 2008). Also,

it can be seen as natural, semi-natural, or unnatural green lands, creating multiple advantages to people (Tzoulas et al., 2007). In addition, it’s mentioned “an open space situated within the urban area with a good vegetation cover planted deliberately or inherited from pre-urbanization vegetation and left by design or by default” (Jim & Chen, 2006). It also includes urban forest like other green spaces (Wu, 2013). For instance, parks, playgrounds, sports fields, streets green lines, different kinds of gardens, and remaining natural green surfaces (Davies et al., 2008). In addition, the term “green infrastructure” is used by some researchers to show UGS as a coherent planning entity (Ahern, 2007; Sandstrom, 2002). Therefore, UGS include parks, gardens

and recreation venues, as well as remnants of less modified, indigenous vegetation types (Venn, Kotze, & Niemela, 2003). UGS can create habitats for different kinds of species for preventing the loss of biodiversity (Niemelä, 1999). It also provides various advantages for cities and their dwellers besides creating venues for recreation and nature experiencing and they also significantly affect the quality of the urban environment and promote the property value and improve biodiversity (Rodenburg, Baycan-Levent, Van Leeuwen, & Nijkamp, 2001; Tyrväinen, 2001). Therefore, green spaces can also include recreational fields, urban agricultural areas for local food production, neighborhood parks, play spaces for children, rooftop and balcony gardens, community orchards and cycling, and walking routes. UGS decrease noise pollution, reduce the storage of carbon, also have a good impact on the interception of rainwater that its purification (Bolund & Hunhammar, 1999; Strohbach & Haase, 2012).

On the other hand, the natural atmosphere, generally defined as “green space” in the cities (e.g., greenways, urban parks, forests, private gardens) which is largely emphasized as a significant agent to people’s health ((Kondo, South, & Branas, 2015; Tzoulas et al., 2007), so it provides indirect and direct benefits to citizens’ health and wellbeing (Braat & De Groot, 2012).

The importance of UGS for urban life is recognizable by its potential to provide various ecological and social advantages for urban dwellers, like air filtration of residential areas (Jim & Chen, 2006) and cooling via trees shade (Bowler, Buyung-Ali, Knight, & Pullin, 2010; Gill, Handley, Ennos, & Pauleit, 2007), which was achieved by strategic planning on mitigation of effects of city heat island (Stewart & Oke, 2012).

### Social Sustainability

Regarding the concept of social sustainability, studies related to theoretical and empirical are insufficient. The literature review disclose that the concept of “social” was common into discussions related to sustainability (Eizenberg & Jabareen, 2017) Clarity of social sustainability concept and its maturity in terms of content and definition, or measurement tools are still unclear (Staniškienė & Stankevičiūtė, 2018). For having healthy and livable communities social sustainability is such a process that supports and enhances social interactions and cultural life quality among all kinds of people within local environments (Ziaesaeidi & Cushing, 2019).

Within a residential area, it can additionally be described

the origin of identity of society by offering accessibility to services in residential areas such as UGS (Chan & Lee, 2008; Dempsey, Bramley, Power, & Brown, 2011). It is possible that access to well-designed services inside residential areas can supply citizens with an experience of attachment, and the chance for more social interaction, health and, excessive welfare (Chan & Lee, 2008; Dempsey et al., 2011). Regarding literature review about social sustainability, there is a few studies that emphasis on social sustainability, while a wide literature exists on the all concepts of subdivisions of social sustainability such as social cohesion, social inclusion, social capital, and social exclusion (Dempsey et al., 2011).

### Urban Social Sustainability and Green Space

“The recently announced Sustainable Development Goals including a city-specific goal to make cities safe, livable and sustainable (Goal 11)” Regarding UN report, 2016. One of the dimension for this aim is straightly related to the UGS provision: Until 2030 create access to green and public spaces safely with accessibility for all people specially for elderly people, children, disabilities and women globally (Kendal, Lee, Ramalho, Bowen, & Bush, 2016).

A complex interaction between population growth, urbanization, economic development, and living environment are the main issues that sustainable development considers. The concept of “sustainability” has become a common interest among the scientific communities during the last few decades. An important measure for the translation of “sustainability” in planning is the availability of UGS and its best management (Yoong, Lim, Lee, Zakaria, & Foo, 2017).

Sustainable development is now seen to be universal and multidimensional. According to Figure 2, regarding the Bolund and Hunhammar (1999) the interpretation of “sustainability” is regarding the three components of sustainable development, specifically economy, society, and environment (Yoong et al., 2017). However, sustainable development of the social-ecological systems combines ecological and social dimensions (Zhou & Rana, 2012). Through an integrated social and ecological component of sustainability, both scientific and planning approaches to sustainable urban planning must be considered (Ramawami, Russell, Culligan, Sharma, & Kumar, 2016).

UGS and parks have multiple functions in making our living areas more sustainable. These can be including ecological (e.g., conserving biodiversity), social (e.g., socialization and healthy living) and economic advantages (e.g., tourism) (Byrne & Sipe, 2010).

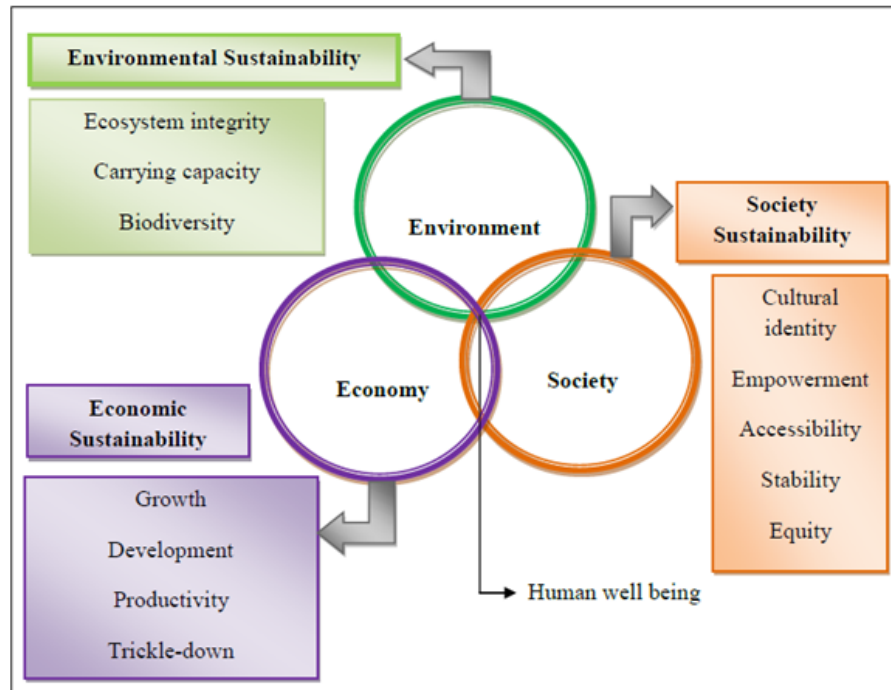


FIGURE 2. Key aspects of sustainability (Source: (Yoong et al., 2017))

Besides environmental criteria, quality of life issues (social) is the core of different concept of a sustainable community. Factors such as the area of public UGS per capita and recreational places are usually stated as significant aspects for liveable, pleasant, and attractive communities (Chiesura, 2004).

According to Burton (2003), "it is strongly believed that developing more sustainable community is not just about improving the abiotic and biotic aspects of urban life; it is also about the social aspects of community life, which is about people's satisfaction, experiences, and perceptions of the quality of their everyday environments".

Therefore, sustainability is the capability of the globe and its resources to continue forever. According to Prescott-Allen (1991) "Urban sustainability has been defined in various ways with different criteria and emphasis, but its goal should be to promote and enable the long-term wellbeing of people and the planet through efficient use of natural resources and production of wastes within a city region while simultaneously improving its livability, through social amenities, economic opportunity, and health, so that it can better fit within the capacities of local, regional, and global ecosystems".

Thus, urban sustainability is a multiscale issue that emphasizes urban and residential areas and can be achieved by continues management, citizen participation, and interactions among different governmental levels.

Significance of UGS in ecosystems has resulted in considerable work on UGS planning to develop the urban environment and increase the life quality (Li, Chen, & He, 2015) and social health support (Pereira, Karpouzoglou, Doshi, & Frantzeskaki, 2015). UGSs is a suitable tool for preservation of sustainability of living environment by purifying air quality, promoting the value of properties by their characteristics of aesthetic and amenity, and decreasing the costs of buildings ventilation. Additionally, UGS can offer recreation facilities as ecosystem services that are available to residents and visitors (Haq, 2011).

In addition, the city areas with enough green spaces are pleasing aesthetically and attractive to settlements and investors as this beautiful spaces promote the value of properties (Haq, 2011).

The relation between urban green areas and sustainable urban communities can be seen by the study of the value of UGS as the source of services for social life and vital to the human life quality, which is an important factor of sustainable urban development (Dickinson, 2018; Jennings et al., 2016; Prescott-Allen, 1991).

According to (Venn et al., 2003) "urban sustainability future will, therefore, focus on win-win opportunities that improve both human and natural ecosystem health in cities".

UGS is the spaces in and around urban areas that provide ecological and social benefits, promote sustainable living and support appropriate urban development. Hence, UGS

can be considered as a major tool for permanent support of social sustainability by the increasing life quality of people in the city (Mersal, 2017).

UGSs can provide a context in the cities for social engagement and ties. Therefore, understanding the definition of a socially sustainable cities according to services that UGS offer, can create more effective sustainable communities. It also promotes a sense of place and place attachment (Hur, Nasar, & Chun, 2010), and enhance community satisfaction (Lachowycz & Jones, 2013). Colding (2011) realized residential vicinity to parks is the major factor of using parks and doing physical activity; but this can also be influenced by the size of parks their aesthetic attraction and perceived safety (Evenson et al., 2006).

Physical and social functions of people can be improved when different kind of green spaces are around living and work places (Derr, Chawla, & van Vliet, 2017; Ziaesaeidi & Cushing, 2019).

## RESULTS AND DISCUSSION

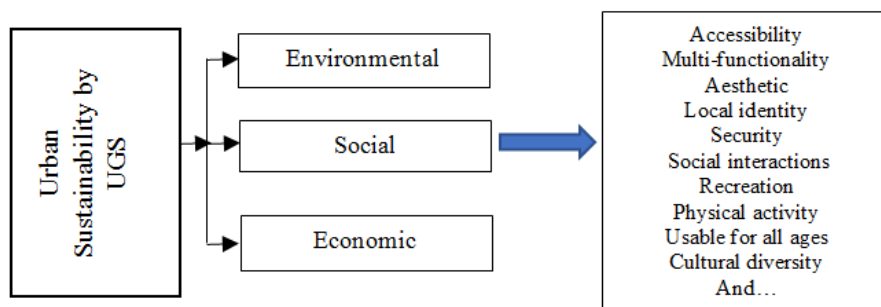
In recent years the planning of UGSs has been one of the major areas of special interest for planners. Now it is found

that sustainability indicators for development of urban areas should include more factors about UGS.

UGS has overlapping benefits with all sustainability (ecologic, social and economic) dimensions.

The social dimensions of UGS include participating to healthy and active lifestyles in communities, social justice by engaging all ages groups into green spaces, opportunities to have social interactions development (Jennings & Bamkole, 2019), and promoting of cultural life for different societies life in the city by creating a background to share ideas and feelings (Haq, 2011). In terms of main effects of UGS, presence of natural landscapes had the strongest correlation to neighborhood social capital (Hong et al., 2018). There is also a correlation between being close to the natural areas and wellbeing (Svendsen, Northridge, & Metcalf, 2012; White, Alcock, Wheeler, & Depledge, 2013).

According to Figure 3, UGS as one of the major elements of sustainability, affect the social sustainability in the cities by the different factors that cause cities more desirable living places. The factors that are required for optimal UGS planning should be investigated and considered by planners to achieve sustainable communities.



**FIGURE 3.** Urban sustainability from the social aspects of sustainability provided by UGS

For instance, accessibility to UGS, as one of the important factors, promote healthy behaviors such as cycling, walking, and gardening (Gebel, Bauman, Sugiyama, & Owen, 2011; Gong, Gallacher, Palmer, & Fone, 2014), that is highly correlated with physical activities (Frank, Kerr, Chapman, & Salis, 2007; Giles-Corti et al., 2005). Social interaction could be another factor that parks and other urban green spaces can creating shared locations for achieving it, and cause increasing levels of community support (Seaman, Jones, & Ellaway, 2010), and enhance engagement in socially-oriented activities (Yotti Kingsley & Townsend, 2006).

One of the important aspects of the social subsystem is to discover the relations between the spatial and structural features of ecosystem and society and the effect of the human activities on the social actions of the ecosystem (Zhao & Wen, 2012). Interactions between neighbors usually hap-

pen locally in recreational places, educational and religious environments and parks (Voelker & Kistemann, 2013). Public green space can provide wider social advantages as shared visiting places for different communities and urban districts ((Germann-Chiari & Seeland, 2004; Martin, Warren, & Kinzig, 2004). Access to UGS has contributed to increased physical activities, improvements to public health, and socialization of urban residents (Maas, Van Dillen, Verheij, & Groenewegen, 2009; Sugiyama & Thompson, 2008). It is thus essential to the livability of cities (Wolch, Wilson, & Fehrenbach, 2005). A positive correlation between the existing of UGS in the living atmosphere and people's welfare is shown by lots of scientific evidence (Maas et al., 2009), as it affects people's good feelings about their health and reduces mortality risks (Maas et al., 2009). The presence of vegetation in public spaces may push dwellers to outdoor



spaces that lead to more contacts by neighbors (Colding, 2011). Nature can raise a sense of community by promoting emotional dependency feelings to a neighborhood and people's sense of place, which could reduce loneliness feelings (Pretty, Andrewes, & Collett, 1994; Prescott-Allen, 1991). Physical activities of citizens are promoted by accessibility to urban parks (Sugiyama & Thompson, 2008). Therefore, social benefits related to being at green spaces for residents can affect spiritual and physical health by relaxation and reducing stress (Maas et al., 2009), and enhance mood and

self-esteem (Barbosa et al., 2007), as it can provide recreational opportunities such as doing sports, visit other people and have social interaction (Chiesura, 2004). Furthermore, UGS provides experiential learning regarding natural ecology (Irvine, Warber, Devine-Wright, & Gaston, 2013; Joh, Nguyen, & Boarnet, 2012; McMillan, 2007).

According to Table 1, there are some physical and non-physical factors that have participation in creating social sustainability in urban areas.

**TABLE 1.** Urban social sustainability: Contributory factors. Source: Dempsey et al. (2011)

Non-Physical Factors	Predominantly Physical Factors
Education and Training	Urbanity
Social Justice: Inter-and Intra-generational	Attractive public realm
Participation and Local democracy	Decent Housing
Health quality of life and well being	Local environmental quality and amenity
Social inclusion (and eradication of social exclusion)	Accessibility (e.g., local services and facilities/employment/green space)
Social Capital	Sustainable urban design
Community	Neighbourhood
Safety	Walkable neighbourhood: Pedestrian friendly
Mixed tenure	
Fair distribution of income	
Social order	
Social cohesion	
Community cohesion (i.e., cohesion between and among different groups)	
Social network	
Social interaction	
Sense of community and belonging	
Employment	
Residential stability (vs turnover)	
Active community organizations	
Cultural tradition	

UGS has an impact on crime rate. As an example, researches in Chicago recommends that green spaces are correlated with low crime rate (Kuo & Sullivan, 2001). In addition, UGS benefit the society and residential areas, especially for low-income citizens are important. They include trees and vegetation contribution to the mental and physical health of the people, and the provision of recreational opportunities and an outdoor classroom for environmental education (Csete, Horváth, et al., 2012). Zhou and Rana (2012) believe that "the social benefits of UGS, which include recreational opportunities, aesthetic enjoyments, adjusting psychological wellbeing and physical health, enhancing social ties, and providing educational opportunities". Therefore, planning and conserving UGS in the city is an important strategy to maintain social sustainability (Zhou & Rana, 2012). "Urban green space supports a broad spectrum of activities and interactions be-

tween people and nature and is considered critical to sustaining environmental function for the health of communities" (Villanueva et al., 2016). Sustainable cities patterns that focus on residents' safety and wellbeing are often those that are flexible, incorporate mixed uses, and are pedestrian-oriented (Giles-Corti, Kelty, Zubrick, & Villanueva, 2009). In addition, children and youth get positive effects of walkable neighbourhoods for their welfare (Müller-Riemenschneider et al., 2013; Villanueva et al., 2016).

Neighbourhoods with providing opportunities and construction of optimal built environment for people such as green spaces, help them to have interaction and develop their place attachment (Saelens & Handy, 2008).

Green spaces in residential areas can be best centres for activities as a community, which positively increase the community feeling by reducing density in different parts

of neighbourhoods, and also enhancing social interaction and inclusion within beautiful environments (Burton, 2003; Karuppanan & Sivam, 2011).

### CONCLUSION

UGS fulfill lots of functions in urban areas that benefit people's life quality of the increasingly urbanized community. Planning UGS contributes to creation conditions required for a healthy society, high-quality urban life and social sustainability, and cause maintaining an attractive urban environment.

This study has tried to explore the interlinkages between green spaces and social sustainability in urban life. Also, it offers a literature review about UGS and social sustainability and their connection to have sustainable and livable cities. To achieve social sustainability in the cities, considering important affecting social factors in UGS planning are neces-

sary because it will lead to social sustainability in the cities. Therefore, urban planning should pay special attention to creating green spaces for the social needs of urban areas. UGS is the natural city element which can provide a background to reach urban social sustainability by gathering people and nature together. Thus, planning, development, and maintenance of UGS are among the key elements of sustainable urban areas.

### LIMITATIONS AND RECOMMENDATIONS

This study has further room for improvement, and the limitations could be addressed in future. More research in future should continue to study the different effects of UGS on different aspects of sustainability in urban life. Furthermore, future research should clarify planning pathways to have more beneficial UGS regarding the social sustainability of cities.

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