Public Attitudes about Urban Lawns:

Social Opportunities Provided by Urban Lawns in Lund, Sweden

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Abstract-**Since the 19th century, urban lawns have gradually taken center stage to become one of the main sources of greening in many cities around the world. The current published research on planting technology, maintenance techniques, the impact of lawn maintenance, preferences for manicured lawns and the biodiversity protection for historical lawns as topics, has developed and increased over time. However, what has been less researched is the relationship and interplay between the perceptions of urban residents and their use of urban lawns. More specifically, our research focused on the question of how residents view, socialize and utilize city lawns accessible to them.**

To provide some insight into this area of urban lawn use, our research study was conducted in Lund, Sweden a city that uses lawns as their main form of greening. To accomplish the study's objectives the city's lawns were grouped into the following categories:(1) park lawns, (2) residential neighborhood lawns, (3) lawns around public buildings, (4) lawns surrounding residential buildings, (5) lawns along greenways and (6) lawns along roads. By means of distributed open-ended questionnaires the researchers discovered two important findings. First, the socialization patterns and utilization of lawns differed between the six categories due to various factors which included the suitability of the land use. The data also showed that the efficiency of planting lawns in certain areas impacts the ability to access areas for socialization activities (i.e. roadsides and greenways). Secondly, the study revealed that the planting collocation and service facilities of lawns greatly influences residents' ability and opportunities for social interaction.

Two other study findings were of interest namely that (1) the utilization of lawns among Lund's working class was somewhat lower than that of students; and (2) that socialization and use of lawns were not necessarily related to the user's accustomed environmental background. Subsequently, this article discusses key themes that include residents' attitudes, beliefs and opinions about the interaction of socializing and the meaning of those interactions in an urban environment. It is our purpose that this article spurs a more robust international dialogue about pragmatic lessons urban planners may learn about future designing efforts of urban green space in newly developing cities and established ones already confronting modern space and housing challenges.

Keywords: lawns, socio-ecological systems, sustainable urban landscape, Lund

I. STUDY BACKGROUND

Going back as far as the 1870s, lawns began to take shape as gathering spots for social interaction and neighborhood beautification. New York City's Central Park and Brooklyn's Prospect Park, both designed by world renowned landscape designer Frederick Law Olmsted, are among the premier examples of well-conceived public lawns during that time.[1] Today, public lawns are common not only as cover types in parks, but also have been introduced as green spaces abutting and surrounding residential buildings, government buildings, on roadsides, in front of gas stations, grocery stores, schools, churches as well as in stadiums and on playgrounds (Garrett,2012).[2]As the fastest type of expanding cover type and vegetation, the "lawn" has progressively claimed center stage, in recent decades, in landscape architecture discussions focusing on ideas about designing efficient and beautiful green space in many cities around the world. (Moore, 1978, 1981; Robbins et al., 2003; Niu Xiaocheng,1998; Zhou Miaoxin, 2003). A literature review of current available research discloses a focus mainly on planting technology, maintenance techniques, the impact of lawn maintenance, preferences for manicured lawns and the biodiversity protection for historical lawns. Ongoing research efforts mainly focus on these topical areas. However, there is a need to understand the role urban lawns play in the lives of everyday residents and persons who utilize them in a rapidly changing modern environment. This article is the result of conducted research sponsored by China's Peking University and in collaboration with international

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[1]From Wikipedia, http://en.wikipedia.org/wiki/Lawn.

[2] Howard Garrett is a landscape architect. He received his Bachelor of Science degree in Park Administration and Landscape Architecture from Texas Tech University in 1969 and has devoted his life to establishing a leadership role in the natural organic marketplace. He provides advice on natural organic gardening, landscaping, pet health, pest control and natural living. http://www.healthyorganiclawn.com/history/,2012.

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research scholars to help inform ideas about urban lawn design, use and public perception.

China is the second largest economy today. As China continues to grow under the current wave of urbanization, it seeks to create useful design plans to facilitate development of community areas for urban residents use and by extension encourage more human interaction and socialization. In most Chinese cities that already have urban parks, including those in Hong Kong, public accessibility to urban lawns is prohibited and largely exclusive and private and prohibited making social interaction with various type persons much more difficult (Alex, Jim, 2011; Yu Kongjian et al., 2001,2003). The overuse and overcrowding coupled with a reduced amount of available open access public parks has become a serious issue. Rapid urbanization and the increased demand for housing to accommodate the large numbers of persons migrating into the cities has also impacted the design and retention of public lawns as that land is used for high rise buildings and other necessary infrastructure. Thus, existing open public green spaces or open access areas were lost, plowed under or removed. However, a recent study conducted in China suggests that destroyed open lawns can be recovered under certain maintenance conditions if per capita green area reaches 20 square meters (Yao Dequan, 2010). This would suggest that more lawns can be designed but that such design, because of limited space would have to be practical, perhaps smaller and well thought out.

As stated at the outset of this article, noticeably less research attention has been given to the impact of designing lawns and preserving them, as well as the emphasis on accessibility and the improved quality of life that they can add to residential urban life and to the people that interact with them. By interact we mean the way people utilize lawns, or perceive them as desirable places to socialize, recreate and participate in physical activity. Therefore, our study was conducted in the city of Lund, Sweden, which has a long history of using lawns as the main form of greening and where public accessibility is not an issue. The study, surveyed the use of lawns by residents on a city scale, and explored the public's attitudes about the social function and utilization of lawns in Lund.

Some previous studies have concentrated on negative aspects related to the impact of lawn maintenance on the environment, optimization and alternative planting. Those aspects include data and discussion about the detrimental affects some greening efforts can and have caused to the natural environment. These studies, conducted in various countries around the world represent a global perspective about possible dangers associated with growing and maintaining lawns.

For instance, research conducted in the U.S. found that using chemical pesticides in large areas of American public and private lawns has led to air pollution and consumption of large amounts of water and other energy sources. In addition, landscape fragmentation, resulting from expansion of lawns, has caused concern among wildlife activists who worry about adequate protection of all wildlife and especially birds from the environmental dangers they face. Furthermore, several studies in Europe and the U.S. show that lawn mowing has generated increased noise and air pollution (Priest et al., 2000) as well as polluting the groundwater from chemicals (i.e. fertilizers, pesticides) spread on the lawn (Kaplan, 2007). This is set in contrast to the method of using natural grazers such as cattle, deer and other animals to maintain lawns while at the same time providing protection of the environment (Long, 2002).

Research out of Canada also documented the negative environmental effects caused by lawns. The researchers concluded that this greening method has greatly contributed to environmental pollution due to the amount and use of pesticides and herbicides. The study cited the high cost of labor and financial resources necessary to maintain well-preserved lawns. Based on their own ideas of achieving the greatest ecological potential for large residential areas, the researchers suggested that approximately half the lawns in residential areas be replaced by native plants or traditional lawns. One particular study conclusion suggested reducing lawn areas within public and private property (Robbins et al., 2003). U.S. research also seems to high light the negative effects of lawn greening on the environment. Those researchers argue that excessive maintenance, (i.e.irrigation, fertilization and frequent pruning) causes reduction of biodiversity taking from the environment without offering benefits (Falk, 1980).

Research out of Denmark analyzed the environmental disadvantages resulting from expansion of urban lawns from the perspective of land use and land cover. As the largest part of land cover in Denmark, lawns were regarded by researchers to have no functions especially not social; in contrast to trees. These researchers concluded that trees had a recognized functional value of improving environmental/health, aesthetics and recreational value for urban communities. The research proposed that more trees may be planted on lawns in industrial zones, institutional zones and residential areas (Attwell, 2000). Other research commented on the impact of planted areas on the microclimate showed that trees significantly affect the thermal environment (Lin et al., 2010); dry regions, parks/playgrounds that provide ample shade and protection from dust in summer, and large lawns and flower beds without shade around or within them contribute little to the recreation possibilities of the inhabitants: ordinary citizens, elderly, and children alike, to rest, relax, or play on a hot sunny day (Givoni, 1991). In short, negative evaluations on lawns mainly center on considerable increased threats to the ecological environment, energy consumption, microclimate and the population's health.

It would seem, judging by the examples stated above, that greening might be viewed more negatively as opposed to a more positively disposed endeavor. However, that is not the case. Despite the fact that some research shows some issues of concern about green lawns and their not being totally ecologically healthy, (Steinberg, 2006) the U.S. spends nearly $40 billion a year on lawn care. This type of expenditure underscores that the perceptions of persons regarding positive greening run the range between somewhat embracing to all encompassing. The positive effects highlighted in these research studies show a possible correlation on the type of lawn (i.e. manicured, highway, woody and overgrown).

As mentioned previous studies have concentrated on the population's preference for urban landscapes. A study conducted in Ohio showed that students preferred neat landscapes besides more trees in residential area, for example,

a manicured lawn, clipped shrubs and colorful flowers indicate the owner's care for the community. This is consistent with earlier studies which show such preference (Zheng et al., 2011). Other research in U.S. suggested that although prominent, woody vegetation is only a part of the biotic environment in an urban setting, well-kept lawns and cultivated flower gardens are other features important to the residents (Crow et al., 2006). This seems to confirm the findings of earlier studies that concluded residents prefer natural-looking but managed landscapes (Axelsson-Lindgren, 1995; Ribe, 1989).

In addition, to preferences for natural-looking lawns, neatness and "smoothness" were also identified as important factors contributing to an attractive landscape (Nassauer, 1995; Kaplan et al., 1989).[3] Data out of the United Kingdom found that while 'neat lawns' and 'flower beds' were among the most popular features in Botanical garden, the same features of Endcliffe Park[4] did not receive the same popularity, in this park, natural features such as 'trees', 'woods and woodlands', 'water stream and ponds', and 'natural paths' were among most preferred landscape features consistent with previous studies (Schroeder, 1985; Anderson and Stokes,1989;Yang and Brown,1992; Sullivan,1994). These findings seem to confirm the idea that people's perceptions are associated with the whole landscape rather than individual landscape elements, and that the general public appreciate formal landscape features as well as naturalistic landscape features, especially when these are properly contextualized within the overall character of the area (Özgüner, Kendle, 2006).

A few studies explored the attitudes and perceptions of landscape preferences among various social classes. For example, a survey among Arizona, U.S. showed that lower-income homeowners, as compared to higher-income home-owners, were more than twice as likely to prefer pictures of a manicured lawn for the front yard relative to a wild desert (Larsen and Harlan, 2006). There was some data to suggest that people's opinion or preferencemight be changed as they begin to understand more about the sustainability of ecological functions and lawns planning (Henderson et al., 1998). Our study in Lund also noticed a difference in use and socialization patterns expressed various social and economic classes

This changing perception is noticeable in the work of Froment and Domon (2006) which looked at lawns within the highway landscape and revealed that proximity within natural settings was greatly appreciated by users and ecological management. The researchers Bjerkeet al. (2006) reported, based on their findings, that moderate to densely populated vegetation scenes received the highest preference ratings in parks and other green areas in Norwegian cities. In other studies ground cover (i.e. lawns, flower beds, etc.) increased property values for bungalows and cottages. Interestingly, highly dense vegetation in the vicinity of a property was found to reduce its property values (Troy, Grove, 2008).Although shrub land and forest trees may increase biodiversity and create new wildlife habitat, such type of vegetation has limited attraction to users because it affects people's vision and reduces their sense of safety. Regarding planting in urban green land, these scholars studied and suggested that there should be a balance between the increase of biodiversity and the leisure needs of users (Zipperer et al., 1992; Talbot et al., 1984; Ulrich et al., 1991, 1992).

II. STUDY METHODS

Our research study mainly explored two important themes related to lawns that could possibly be of interest and benefit to countries and planners facing rapid urbanization like China. The two themes are: (1) the socialization patterns and utilization of lawns; and (2) the social interaction possibilities and efficiency of lawns. In order to get a good grasp about the issues the researchers chose Lund, Sweden as the study site, since the lawn is the main greening form for the city (Fig.1). Secondly, accessibility to the lawns was a consideration during site selection because lawns are extensively used by residents all year around. Thirdly, with a history of construction for thousands of years, the city has diverse forms of open green space, and the places attached by lawns also show different varieties in three major urban parks[5], and lawns in functional lands of new urban areas which were largely developed under the influence of modernism concepts of urban planning and construction after 1930s. Lastly, Lund has as its hub a university, ranked in the top 100 universities in the world, and thus attracts a diverse student and academic faculty body from all over the world bringing various perspectives to the city. Hence, the city was chosen as the site for this study as the data gathered from the different contexts and land uses combined with a diversity of residents allowed the researchers to gather useful information that they might bring back to their own environment.

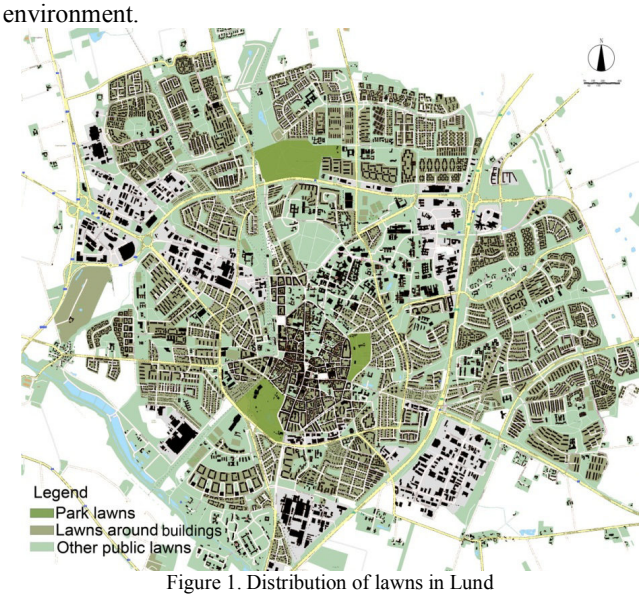


Figure 1. Distribution of lawns in Lund

[3] Nassauer(1995) and Kaplan et al. (1989) showed that there was a preference for smoothness. Smoothness is defined as the uniformity of and shortness of ground texture.

[4] Endcliffe Park is a public parkrepresenting a typical naturalistic landscape in Sheffield city.

[5] Stadsparken, a Baroque parkbuilt in 1860s, is located in the southeast downtown areaof Lund. BotaniskaTrädgården,is a botanical garden in the downtown southwest section that has existed in Lund since 1690. Today the park contains over 7 000 species of vegetation. St. Hans Bachar, is a British garden-style park i.e. reclaimed from a garbage dumping ground in the north of the city in 1970s.

Data collection

The research classified urban lawns into six categories according to urban landscaping contexts. To accomplish the study's objectives the city's lawns were categorized accordingly: (1) park lawns, (2) residential neighborhood lawns, (3) lawns around public buildings, (4) lawns surrounding residential buildings, (5) lawns along greenways and (6) lawns along roads (Fig.2). Open-ended questionnaires were used by the researchers to obtain data and information on the use and evaluation of urban lawns by participants. The study consisted of open-ended questionnaires handed out at various chosen locations around Lund. These questions were developed to gather data for the study. The answers were then entered into a newly created database and subsequently analyzed. The participants were asked to recall the frequency, duration for each time, types of activities etc. of various categories of lawns used throughout the year. Then classification of the survey results was done based on the purpose of using lawns.

Figure 2. Classification of urban lawns

Questionnaires with a self-addressed envelope and paid postage were handed out by the researchers, during the period of May- August 2009, to residents in three urban parks (Stadsparken park, BotaniskaTrädgårdenpark, St. Hans Bacharpark), a green space in downtown area named Lundagård, and fifteen neighborhoods scattered throughout the city including Kämnärsvägen, Delphi, Kobjer, Klostergården etc. A total of 190 questionnaires were distributed and received 102 answers by mail. The survey response rate was approximately 54%.

The questionnaire began with discussions on usage in any of the six types of urban lawns. The participants were asked to recall the frequency, duration for each time, types of activities etc. of various categories of lawns used throughout the year. Next the questionnaire addressed issues related to the social attributes of the six types of urban lawns. Open-ended questions as a data collection tool was used and asked the following: "What's your overall view on each of the six types of lawns in Lund city", "Where do you use lawns frequently", "Where is your favorite lawn", "How far is the lawn where you go most",. Then the participants were asked to give more input as to their answers and to mark the related spatial information on the corresponding map. Socio-demographic variables such as age, gender, occupation, commuter and others variables was collected. The chart below demonstrates the type of information gathered:

TABLE I. CHARACTERISTICS OF THE SAMPLE

	Student	Non-student	Total
Number	61	41	102
Gender(female/male)	41/20	21/20	62/40
Mean age(SD)	23(3)	43(15)	31(14)
Grow up place (Sweden/other countries)	45/16	29/12	74/28
Commuting tools (public transport /private car)	59/2	31/10	90/12

III. RESULTS

A. *Influence of land use on the social function and efficiency of lawns*

The study's second objective involved identification of activities engaged in while visiting urban lawns. The data reported that social interaction, relaxation, exercise and city functional substitutes were the primary activities undertaken while using urban lawns by study participants (Table 2). In stark contrast to a previous survey, conducted in the United Kingdom about 1450 parks which declared that the reasons people visit urban parks are mainly for getting close to nature, and it is clear similar with the reasons why people visit the countryside (Open space, 2007) social interaction, in the form of "hanging out with friends," was the most frequent reason given by participants in this study for using public urban lawns. Relaxation, or the opportunity to escape the urban bustle, temporarily unwind and possibly contemplate or enjoy the time in natural setting was the second type of activity reportedly engaged in while at public lawns. The most common forms of relaxation in favorable weather, was sunbathing (either lying down or sitting)either on park lawns, residential neighborhood lawns and lawns surrounding residential buildings is illustrated in Table 2.

Exercise placed third among the activities followed by "city functional substitutes". The city functional substitutes recognize that lawns provide opportunity for residents to replace some activities that usually occur inside buildings such as concert halls, libraries, restaurants, stations or residences from indoor to outdoor spaces (Table 2). Park lawns are used mainly for social interaction, relaxation and exercise. Lawns surrounding residential buildings are similar to lawns around public buildings as they provide respite for readers and relaxation related activities.

TABLE II. CLASSIFICATION OF PUBLICACTIVITIES ON LAWNS IN LUND

Activity types	Activities	PL	RNL	PBL	RBL	GWL	RL
Social interaction		**77%**	**42%**	**31%**	**34%**	**4%**	**0%**
	Hang out with friends (party/chatting)	57%	19%	29%	17%		
	Barbecue with friends or family	43%	17%	2%	24%		
	Play game with friends	17%	10%		5%		
	Play with kids	7%	5%		5%	4%	
	Festival celebration	5%					
	Other organized activities			7%	2%		
	Watch people around	5%	2%	2%			
Relaxation		**73%**	**44%**	**15%**	**31%**	**16%**	**0%**
	Sunbathing	38%	26%	5%	19%		
	Sitting or Lying	33%	19%	7%	14%	10%	
	Get fresh air &enjoy green atmosphere	21%	14%	5%	2%	14%	
	Ski	10%					
	Pickingdandelion	5%					
	Painting	5%					
Exercise		**66%**	**41%**	**0%**	**14%**	**9%**	**4%**
	Walking	36%	24%			9%	
	Play football&other ballgames	24%	14%		10%	7%	
	Jogging	19%	2%				
	Walking dog	5%	10%		5%		4%
	Cycling	5%					
	Horseback riding	2%					
City functional substitute		**43%**	**30%**	**74%**	**46%**	**20%**	**10%**
	Reading or listening music	26%	21%	24%	19%	5%	
	Having lunch	5%		45%			
	Take a break			48%	2%	7%	
	Discussing (work or study)			5%			
	Pass through		5%	14%	24%	7%	5%
	Waiting friend or bus		5%	5%	4%	5%	5%

Note: The percentage in the table refers to the proportion of respondents to all participants. PL:Park lawns; RNL:Residential neighborhood lawns; PBL:Lawns around public buildings; RBL:Lawns surrounding residential buildings; GWL:Lawns along greenways; RL:Lawns along roads.

B. Social function and efficiency of urban lawns

The study also looked at certain features of lawns to see what kind of impact they may have, if any, on participants' . Respondents were asked what their favorite public lawns in Lund were and the basis for their answer. Lawns in Stadparken, Botaniquetrad garden, Lundagård in the downtown area and other two lawns around public buildings (Skrylle Garden & Domkyrkan) were identified by 64% of participants as among their favorite public spaces. Location and maintenance are strong factors and have some influence on the functional use and efficiency of lawns.[6]Approximately 36% of participants use urban lawns because of their location and cite certain advantages, such as "being close to house", "near the downtown area" and "proximity to adjoining neighborhoods. Secondly, participants were asked their opinion about what aspects of lawns/lawn design located in Lund needed improvement. The survey highlighted that "planting collocation" and "having service facilities around" significantly impacted use of urban lawns. Service facilities mainly refer to rest seats, trash cans, toilet, sink, small shops etc.

Data shows that the most significant function of park lawns, compared with other categories, is to provide the public with expanded outdoor meeting and activity places. With the existence of lawns, people gather together and have increased opportunities chances to have social interaction (i. spontaneous conversations, invitations to join in on group play activities) with each other. Answers provided by respondents revealed a personal connection and satisfaction with urban lawns and persons using them.[7]

Comparing these findings and comments to ideas about residential greening efforts the researchers discovered that according to most residents "the main purpose of residential neighborhood lawns is to create a green, silent and friendly living atmosphere." These considerations are noted when seeking housing or living accommodations.[8] In China, both approaches should be considered so as to please the

[6]One retired Swedish lawn user noted that the lawns in Botaniquetradgarden is her favorite public lawns in Lund, because they are more than just lawns but also include a variety of trees, bushes, and flowers.Another comment from a young Vietnamese student stated her fondness for lawns with trees and flowers. She though it made the landscape shifting as seasonal changes just beautiful. Stadparken is a baroque garden built in the 19th century.

[7]Park lawns are open for everyone. 77% of the participants use park lawns as a meeting place and recreational place as well. The following are stated comments by participants for using park lawns: "There are a lot of people in them. The people who are in them are important to socializing opportunities. I don't like to enter an empty park. [Female, 21, student, from Sweden];I love them and admire Sweden's philosophy about using the lawn for recreation.[Female, 31, Student, From Lithuania]; They are nice and bring people together. In the summer, there is always someone I know there. And it's public so everybody is always welcome…They are good for many activities such as sports, but also just for sitting and talking with friends."[Male, student, 21, from Sweden]

8The neighborhood lawn is a good alternative to streets with fresh air, space and silence, I think it is important for the life of the town and for people who live there. [Female, 64, retired archaeologist, from Sweden]; They are needed to give the neighborhood a soft atmosphere and decrease the feeling of in prison…mostly relaxing a few minutes or barbeque with friends, but they are needed not only for the activities performed on them but for the atmosphere they bring. [male, 22, student, from Sweden]

populations affected as well as to design practical functioning green spaces.

Visual service and open space become more important for resident preferences indicate that more light into the houses is desirable. This "visual service" gives the effect of a second living room and attracted residents inside their homes to participate in outdoor activities such as study, picnicking, playing outdoor games, sunbathing and talking to friends.

A look at lawns around public buildings gives as yet another insight into the attitudes and perceptions of people that utilize them. Compared with other categories of lawns, the main function of these located around public buildings is somewhat unique in that it improves the layout of urban outdoor space visually and provides open space for particular use such as having lunch or taking a break between classes or during working time.[9]

The visual function of lawns along greenways which is aimed at improving spatial orientation, creating a sense of safety and providing pleasurable scenery for people riding bicycles. Based on these direct effects, it would seem that lawns along greenways promote the frequency of using more sustainable means of transportation including riding bicycle, walking or roller-skating.[10]One way to achieve a more practical use might involve of separating the traffic to make pedestrians safer. However, this kind of separation while possibly improving foot traffic might pose serious safety concerns for cyclists due to the speed and noise of the automobiles. Accidents with cars and other cyclists becomes a real concern as well. In addition, the separation may also pose other environmental and pollution concerns since cars would be concentrated in one area perhaps idling. Although it was originally thought that roadside lawns would beautify the environment, such as the wider lawns used along Lund's green belts, our study could neither confirm nor deny the validity of this thinking. Therefore, more research may be needed to firmly establish either a positive or negative effect to utilizing roadside green spaces in China. It may be advantageous to rethink design so as to make the best use of precious green space opportunities.

C. *Influence of land usage on the social efficiency of lawns*

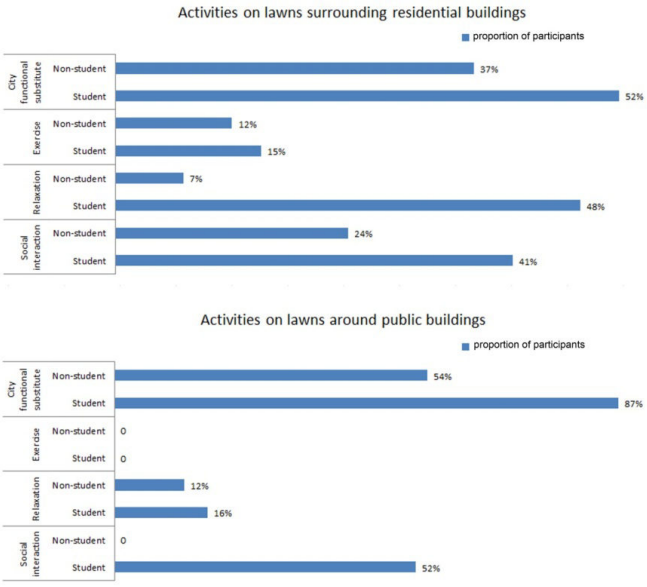
The social efficiency of lawns is mainly reflected through usage frequency and duration each time by participants. The data shows the difference of usage level of all categories of urban lawns from the participants is significant (Table 3).

Study findings identified a significant difference in the use of urban lawns between students and working people. The usage level of lawns surrounding residential buildings and lawns around public buildings by students is more than double that of working people. Students' average usage level of lawns surrounding residential buildings (i.e. dormitory buildings, apartment buildings) was found to be 1.6 hours per week, or twice that of working people. Students' average usage level of lawns around public buildings (i.e. school buildings, public library) was 0.7 hours per week, again approximately more than double that of working individuals.

After analyzing the activities that students and working participants engage in on residential and public lawns, the study showed that the proportion of student participants on each type of activities is higher than working participants. Results of the study's data comparing students with working participants can be found in Figure 3. Highlights from the table about student/non-student use in residential and public building lawn settings are seen in the table below.

TABLE III. USAGE LEVEL OF URBAN LAWNS

Usage level		PL	RNL	PBL	RBL	GWL	RL
Frequency	Never	2%	18%	21%	37%	66%	85%
	Once a month	15%	18%	21%	11%	15%	6%
	2-3times a month	35%	27%	38%	21%	7%	3%
	1-6times a week	33%	27%	10%	16%	2%	5%
	Every day	15%	10%	10%	15%	10%	1%
Average frequency (time/week)		2.4	1.8	1.3	2	1	0.25
Duration each time (min)	Max	154(10-480)	69(5-300)	42(4-240)	67(2-600)	7(3-45)	1(1-15)
	Min	25(1-120)	12(1-60)	7(1-30)	9(1-100)	2(1-15)	0.3(1-5)
	Average	57(6-180)	33(3-180)	20(2-120)	26(1-240)	4(2-25)	0.6(1-6)
Average usage level (hour/week)		2.3	1	0.4	0.9	0.1	0



9For instance: Betters the working environment and gives you a calming effect. [Male, 22, student, from Italy];They are perfect for people to relax on breaks or lunch from school or work or just look out from ward or office, it is very beautiful. [Female, 35, teacher, from China]

10They look good and make you want to take the bike instead of car or bus. [Female, 19, student, from Sweden];I take bike to school quite often and the lawns along the bicycle ways make my journey to the school more enjoyable and healthy. [Male, 28, student, China]

Figure3. Comparison of activity types of users on lawns surrounding residential buildings and lawns around public buildings

D. *Relationship between social function and efficiency of lawns and user's environment background*

Our study findings indicate that there was no clear relation between usage level and activities and research participant "environmental background" in any of the six categories of urban lawns. By "background" we mean the climate conditions and culture of a person's country /region of origin and one they are accustomed to. Therefore, people share similar behavioral needs and engage in similar activities on green open spaces under specific temperature, climate and other natural environmental conditions. Thus persons are able to adapt to their current surroundings and not necessarily to the surroundings where they were born or reared. For example, research conducted in the U.S. found that there are major differences in the use, preferences and motivation for outdoor recreation of immigrants and their descendants compared to the mainstream white population in North America(Gentian, 2011).

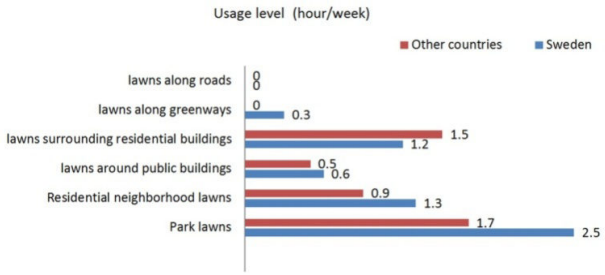


Figure 4. Usage level of lawns among participants from Sweden and other countries

The 102 respondent participants come from 29 different countries(Fig.4). The usage level of park lawns by Swedes is higher than that of participants from other countries. In spite of different usage level of park lawns, the two groups do engage in similar activities on them (Fig.5). Based on the information provided, the researchers opined that the reason for higher Swede use is that some respondents were unfamiliar with the area, unsure of the surroundings and were new to the country with few friends to take them around. It was recorded that on average these participants use park lawns less frequently than Swedes; the average use frequency by participants from other countries was 1.9 times per week, less than 2.5 times per week by Swedes, this limiting the amount of social interactions they could engage in. Overall, the types of activities on various kinds of lawns do not differ significantly in the background of growth places. It illustrates that it is one of the important principles that we should design the environmental space suitable for people to go out for activities on the basis of the natural conditions.

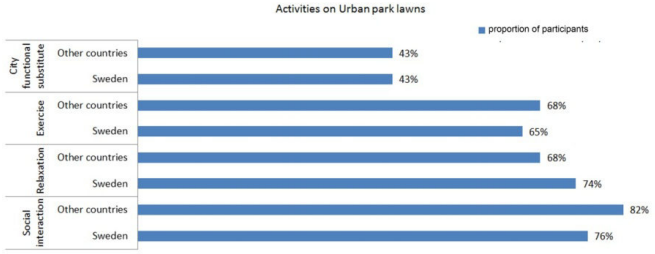


Figure 5. Comparison of activity types of users on park lawns

IV. STUDY DISCUSSION

The focus of our study was to examine lawns, their efficiency and the possibilities they provide as well as the impact they have on residential urban life and the people that interact with them. By interact we mean the way people utilize lawns, or perceive them as places to socialize, recreate and participate in physical activity or see as something desirable or not. The study, surveyed the use of lawns by residents on a city scale, and explored the public's attitudes about the social function and utilization of lawns in Lund. The study was conducted in the city of Lund, Sweden, which has a long history of using lawns as the main form of greening and where accessibility was not an issue. The researchers were optimistic that any lessons learned might be important and useful to China in their ongoing and future urban architecture landscaping projects.

As the most accessible form of green space, lawns provide strong leisure functions due to their open nature (Tobey, 1975). Mowed lawns may be used for active outdoor activities such as playing football, playing Frisbee, kite flying and dancing, and passive activities such as picnics, sitting, etc. (Zipperer et al., 1992). Playing on lawns can also reduce the possibilities of injury to the elderly and to children (Yao Dequan, 2010). A study from Edinburgh found that park lawns support many types of leisure activities such as playing football, sitting, sunbathing and picnics(Goličnik et al., 2010). Research has also supported that in addition to providing leisure space, lawns also have high cultural value (Trudgill et al., 2010).

For lawns with a lower use level such as along greenways and roads, their social functions mainly are impacted by a variety of issues. Thus concerns about safety, visual accessibility, sense of direction or purpose were cited as key considerations resulting in their limited use. On the premise of keeping the visual service functions, the two categories of lawns may need to be reconfigured and replaced by pastures, meadows, or other rural vegetation with higher ecological value (Robbins et al., 2003), as shown in Fig.6.

Figure 6. Improvement proposal of lawns along roads

Looking at influences surrounding lawn use from a global perspective, climate also affects people's feelings and characteristics of usage of lawns. Different regions should choose where to plant lawns based on its local characteristics. Otherwise, there is a possibility that the urban planning design might be ineffective and that there would be little or no residents using urban lawns. For example, in subtropical or tropical areas, people have few chances to use outdoor lawns due to hot and humid climate throughout the year, which proved once again that climate affects people's outdoor behavior (Stathopoulos et al., 2004).

Hence, from a construction perspective the lawn becomes a passive greening form in high density areas of cities. With the economic development in recent years, the price of urban land in major cities, especially in downtown areas, has been rising significantly. This raises issues as to the amount of land available for use as a lawn. It also speaks to the suitability of the types of vegetation planted within them. Since more and more underground spaces are developed for whether public buildings or residential communities, tall arbors, with complex developed rooting systems, cannot be planted on public green spaces above these areas. The practical nature of a lawn fits well within this context. Moreover, with less prophase investment, quick return and other characteristics due to industrial production methods, lawns provide many developers opportunities to make up the number to meet requirements of green space ratio. The study selected the place as an individual case, not coving the above issues.

V. CONCLUSION

Urban lawns provide residents with opportunities to interact with each other, to connect with nature, and to engage in exercise thus encouraging a shift from playing indoors to taking the activity to an outside venue. Although the design of urban lawns differ, as in the case of those constructed by solely by means of the built environment, many lawns are able to incorporate aspects of nature or use natural elements to provide urban residents with the opportunity to physically engage and touch trees, scrubs, woodlands, water features and other natural landscaping features all out of doors. To the extent that urban lawns can offer residents these services in a practical and functional way depends on the environmental context and adequate thoughtful land use planning.

Urban residents worldwide express a desire for contact with nature and each other (Matsuoka, Kaplan, 2008).This study revealed that urban lawns embedded in urban green open spaces have the ability, not only to provide urban residents with the opportunity to stay outdoors and connect with nature like trees, woodlands, water body and other natural features, but to provide urban residents the opportunity to socially interact with each other. The study also showed that these social opportunities are driven and can be maximized by three key aspects: land use, planting collocation and service facilities.

This study identified two other important yet unexpected findings. The first is that usage of urban lawns may be linked to socio-economic factors and lifestyles conducive to having more time and wanting to spend that time outdoors. Lund's working class lawn usage differed significantly and was somewhat lower than that of students. Second, the data suggest pedestrianization and social function efficiency in lawn use was not necessarily related to the user's accustomed environmental background. The finding is of interest because it is takes the opposing position to a result in a previous study which showed that there are major differences in the use, preferences and motivation for outdoor recreation of immigrants and their descendants compared to the mainstream white population in North America (Gentin, 2011) based on certain environmental behavioral patterns. On one hand, it illustrates that behavioral characteristics with which people use environment are related to the climate, hydrology and other natural conditions of users' present locations.

These specialized arrangements were not identified in Lund. This study suggests that by creating available green space not previously existing may be an impetus to changing people's attitude and behavior about outdoor lawn space and activities. Therefore, when planning different regions, developers should select appropriate types of ground cover according to the specific natural conditions of the region and types of vegetation. For example, a suggestion would be to adjust urban lawns from a city scale, especially those lawns with lower level functioning (fewer service facilities) and low usage efficiency level (i.e. lawns along greenways and roads) and replace them with pastures, meadows, or other rural vegetation with higher ecological value. Study findings show that 66% of participants never use lawns along greenways, while the small amount of usage is mainly to sit and rest on the way and to walk dogs; 85% of participants never use lawns along roads, while the small amount of usage is mainly for those non-essential activities, such as waiting for cars or friends for a short time, going a shortcut, etc.

Other categories of lawns could also be improved by moderately increasing the vegetation density (Bjerke et al, 2006) especially flowering trees and the service facilities. To make these adjustments might achieve a balance between improving the ecological and environmental benefit of urban green space while satisfying user's demands for leisure space. The choice as to the types of greening that should be used must be based on the outdoor activities of local users, which is often missing in work environments (Forsyth, 2007; Frick, 2007). Designers and planners need to recognize that people's limited outdoor activities now are not necessarily related to their long-term lifestyle choices. In an effort to increase social interaction, increased practical thought should be given to the efficiency and social function of any designed urban lawn. Research of lawns from the economic perspective such as investment and maintenance is an important research direction in the future.

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