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The American University in Cairo  
Center of Sustainable Development

**Sustainable Management of Urban Green Spaces in Compact Cities: Case Studies from Cairo**

A Thesis Submitted to  
Graduate Program in Sustainable Development

In partial fulfillment of the requirements for  
the degree of Master in Science in Sustainable Development

by Nehal Mohsen Ali

(under the supervision of Dr. Khaled Abdel-Halim) \*

January 16, 2017

\*Added at the Public Policy and Affairs department

## Abstract

The management of urban green spaces in developing countries is a challenging issue today. The provision of services related to the maintenance of urban green spaces is an integrated aspect of urban green space management systems. With minimal awareness provided by the local authorities and the government entities, well-managed green spaces are deprioritized compared to other basic demands of society. The standards set forth by international institutions that feed into an integrated land management systems of the urban landscapes are vastly attainable, yet Egypt still remains isolated in this topic of research. The gap between the provision of services and the overall quality and performance of a sustainable urban green space will further be investigated in this research. This research considers the factors of contribution to the mismanagement of urban green spaces adduced by the governmental agencies as well as the community based management systems by analyzing the current management conditions. The development of the framework of indicators has been extracted from the sustainable approaches of urban green spaces from the literature leading to 5 key themes: governance set up, management arrangements, resource management, participatory roles, and environmental aspects. The research aims at providing a qualitative analysis of accessing the success/failure levels of two local case studies from Cairo, in order to propose an effective management practices with a comprehensive inclusion of a participatory form of governance and shared implementation systems to enhance the social, economic, and environmental benefits of the urban landscapes in Cairo, Egypt. Thus, promoting city attractiveness, a better efficacy in managing resources, and improving the overall wellbeing of urban dwellers in compact cities. The government based management site has failed to provide successful sustainable measures in all five themes and the community based management site has failed to provide sustainable measures in two themes: resource management and management arrangements. The study proves that the lack of inclusion of social participation, and a collaborative planning and management with shared decision making processes have led to the deterioration and decay of the overall quality of urban green spaces for the government managed case study, as for the community managed case study, resources and funding were key contributors to the failure of its management sustainability.

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## ABBREVIATIONS

UNESCO	United Nations Educational, Scientific and Cultural Organization
CCBA	Cairo Cleaning and Beautification Agency
GACB	General Authority for Cleaning and Beautification
UGS	Urban Green Spaces
SPUGS	Small Public Urban Green Spaces
TOD	Transit Oriented Development
EPA	Environmental Protection Agency
WHO	World Health Organization
NPS	National Parks Systems
ES	Ecosystem Services
SLM	Sustainable Land Management
ISO	International Organization for Standardization Committees
NUPS	National Urban Policy Study
GOPP	General Organization for Physical Planning
SDG	Sustainable Development Goals
MSEA	Ministry of State for Environmental Affairs
EEAA	Egyptian Environmental Assessment Agency
NACC	National Agency for Civil Coordination
GCUDC	Greater Cairo Utility Data Center
GBM	Government Based Management
CBM	Community Based Management

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## **I. INTRODUCTION**

### **A. Context and Justification**

Cairo suffers from a drastic lack of the landscape management, whether it is the misuse of resources, lack of efficient planning, mismanagement techniques, or the lack of implementing functional or aesthetically pleasing landscapes in the urban built environment. Urban planners and designers are lacking the knowledge into implementing a sustainable streetscape system in the country as well as creating functional and productive, socially and ecologically friendly urban public green spaces that enhances the quality of the environment for the local people and the local community to live, work and play. For the purposes of this research, methods of exploration will be further looked upon that can better analyze the reasons for the apparent mismanagement of the landscapes when it comes to achieving a sustainable open and productive urban green spaces for its inhabitants and coming up with new proposals or recommendations that can better suit the community into taking advantage of what the urban spaces have to offer.

What can be more enjoyable than transforming the urban green spaces that are currently a blank canvas in the center of the city to a green oasis where the people can enjoy their right to open public spaces and escape the high pace routine of the busy working day with their loved ones. The key is not only investing in the efforts to improve the appearance of the city but also to create a pedestrian friendly user, where neighbors can come together with their families in one open space to socialize and come closer to one another, breath in some fresh air, learn about the benefits of community gardening per se, enjoying festive events, and most importantly being part of achieving a cohesively sustainable built environment with having the luxury of walking to such spaces without driving for miles in the insanely busy streets of Cairo.

An examination of the literature will discuss the various terminologies used to describe or refer to the urban green spaces and how this within itself is causing a fallback in the literature because the terms used to describe the characteristics of spaces is not unified in the literature. Often in the literature there is a conflict between the terms urban green spaces, public spaces, as well as green spaces; agreeing on the categorization in the literature would aid in comparing and analyzing different studies and identifying useful and innovative results. By doing so, the academic valuation practices would increase their application for a more practical policy in urban planning.



Many scholars argue that the benefits of the development, conservation, restoration of urban green space interventions are clearly visible for various social, environmental and economical reasons but little evidence is available regarding the unintended effects of the urban green spaces. There is strong consensus relating to the concepts of green infrastructure, the concepts of ecosystem services; which are all integrative tools that can help support the planning and shape the policy making for developing a sustainable urban land management, but further efforts are required to make sure of their implementation in the planning process.

Current designers, city planners, and architects continue to struggle with designing or creating a socially vibrant interactive environment today (Hay, 1998) especially due to the increasing population within the urban environments and previously established compact cities where there is no room for expansion or development of more grey infrastructure. In addition, the feedback extracted from the users of the space will provide insights into which amenities, services, and types of management is believed to contribute to a well-managed and functional space.

The research assumes that by applying an efficient approach of the revitalization and restoration of the urban green spaces and enhancing the productivity, maintenance and operation, monitoring and evaluation of the existing urban spaces, it can create a high quality of life for the citizens and the local community by implementing planning policies and a set of standardization that can establish a set of structured guidelines regarding the urban landscape to better direct urban planners, designers, and the stakeholders into designing future developments, and further maintaining the existing ones and achieving a sustainable landscape management system in Cairo. The feedback is further needed to emphasize and support policy makers, planners, government officials into creating efficient guidelines that are applicable for the Egyptian context to improve the quality of life within urban communities and to be able to bridge the gap between practice and theory.

This being the case, we can begin to acknowledge the importance of embedding green spaces and the benefits of providing urban landscapes into our built environment by looking at the amount of proposed green areas implemented in the master planning of new cities such as the New Administrative Capital (Fig. 1), and Al Alamein City as shown in (Fig. 2). Not to mention the validity of Cairo 2050 Green Cairo concept of creating a green network system that contemplates to green invests and green housing units as shown in (Fig. 3). The pressure set forth on the implementation of attractive, lush urban landscapes within the strategic master plans of the new cities, will move the country towards achieving a new sustainable urban development.

The gap in the literature lies in the lack of research in regards to the sustainability assessments that should consider the local context into providing indicators for the local assessment of the management of urban green spaces. Such indicators enable the local authorities and urban planners to assess which aspect of urban green areas should be improved, and to establish respective planning decisions.

For the purposes of this research, the focus is on urban green spaces that are located within urban compact cities and not urban green spaces located within gated compounds and communities. This specific preference is chosen to conduct more in depth investigation and research because they are not well presented in the literature and especially in the MENA region in regards of their management systems. A lot of research is available on urban green spaces in Europe, Asia, and America, but little is known regarding the Middle Eastern context and Africa and they are poorly lacking in the literature. As Cilliers (2012) mentions in his research, there is an apparent lack of academic research that focuses on the ecosystem services of the urban green spaces in Africa.



Figure 1: The Capital Cairo, Wedian Green City (“The Capital Cairo – Cube Consultants | Visionary architects & planners,” n.d.).



Figure 2: New City Alamein, Achieving Sustainable Urban Development (“Home - alameen,” n.d.).

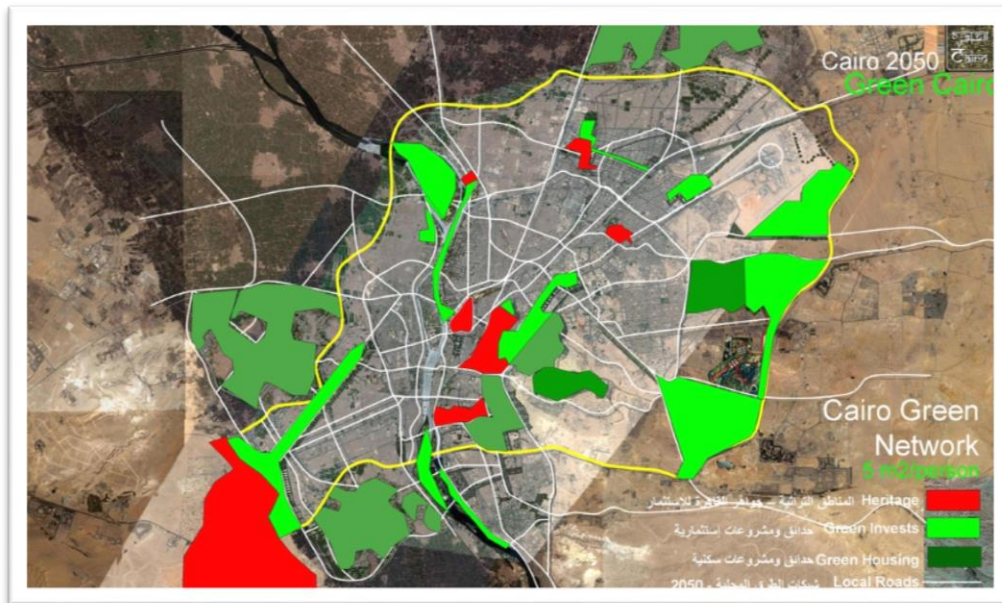


Figure 3: Cairo 2050 Green Cairo, (“The Capital Cairo – Cube Consultants | Visionary architects & planners,” n.d.).

This research will present three international best practices analyzing their management schemes focusing on different perspectives, and local case studies in Cairo to access whether they emphasize or deemphasize the wellbeing of its surrounding residents. A more critical discussion regarding the implementation of efficient guidelines, standards, and action plans will be examined in the literature.

## **B. Research Objectives & Thesis Hypothesis**

The proper management of urban green spaces has been significantly underutilized by the public authorities and governmental officials due to fulfilling the consumption needs of the basic demands of the population. The following objectives will address the aims of this research:

- providing a general overview of the factors that contribute to a sustainable management system
- analyzing the current management conditions of the urban green spaces in Cairo
- proposing an integrated management approach to enhance the social, economical, and environmental benefits of the urban landscapes in Cairo.

If applying an efficient approach of revitalization and restoration of the management and planning of urban green spaces and enhancing the productivity, maintenance, and monitoring, then it can create a high quality of life for the urban dwellers and the local community via designing future developments and achieving a sustainable landscape management system in Cairo. The research aims at providing a qualitative analysis of accessing the performance levels of the local case studies in order to propose an effective public policy of an integrated management approach to enhance the social, economical, and environmental benefits of the urban landscapes in Cairo, Egypt.

Addressing the afore mentioned objectives is important to the municipalities to better manage and make efficient use of urban green spaces within communities that better encourage a socio-environmental interaction. This research will also be able to close the gap between the pressures set forth by the conflict of interests between the governmental entities and the local citizens through analyzing both demands, needs, and aims when it comes to creating a successful model of urban green spaces. The feedback obtained from the users of the space as well as the professionals in the field will gain insights and complement the theoretical aspect of the research and together it can lead to future studies for further analysis that would improve the current management of ecosystem services.

The purpose of this research is to study the existing management systems currently being used and learn from the best practices to apply it to the Egyptian context to be able to see if it can fully reflect the perceptions and preferences of the local users. Along with the academic guidelines and existing theories and approaches, a better understanding of the criteria needed to achieve a socially, environmentally, economically and culturally sustainable urban green spaces will be established through the assessment of

local case studies. Eventually to move closer into achieving the sustainable development goals and creating a less harmful urban environment to our future generations to enjoy.

### **C. Thesis Organization**

Chapter one discusses the context and justification, the research objectives along with the thesis hypothesis, and the thesis organization. Chapter two focuses on the literature review regarding the historical and theoretical background, and the comprehensive management systems of urban green spaces. It is important to establish an initial background of how urban green spaces were functioning in the Khedive Ismail era and the history of garden cities and how they came about their evolution to the current status in order to uncover what instruments are needed to establish a successful and functioning urban space for the public use today. The second area of focus is on the economic benefit extracted from the provision of urban green spaces in the market. The literature acknowledges the importance of focusing on urban green spaces through the management and the governance delegations. With that being said, the policies of the green spaces within the urban developments will be discussed in this chapter as well as the strategic involvement in the decision making process, the concepts and types of governance. Influencing trends and new approaches to co-governance will be discussed along with the linkages between the socio-cultural objectives and the urban green spaces within the city.

Chapter three explores the methodological approaches that are taken in order to achieve the objective of this research. A qualitative analysis is engaged in this research study and the conceptual framework is presented in this chapter that outlines the organizational structure of the research. Then, two local case studies are further analyzed in terms of a set of indicators of sustainability in the Greater Cairo Region that will acquire different characteristics in terms of their management systems for a better comparison and assessment. Observations and interviews with governmental officials are also used as a method of data gathering that will aid in the analysis. The material used in providing the background to this research consists of (1) case studies analysis, (2) a semi structured interview with municipality officials, and (3) observations are used as a method.

Chapter four provides detailed information in regards to the complete analysis of the results founded from the assessment of the local case studies proposed. The forth method of collecting data, the survey questionnaires are presented in this chapter to support the findings of the research. The purpose of the survey is to occupy various public opinions regarding the current situation of the urban green spaces

and acquiring feedback from the community members to encourage public participation and social involvement.

Chapter five concludes with restating the research objectives and thesis hypothesis. Based on the feedback obtained from the case studies, observations, the interviews, and the survey questions, the implications of the results will become clearer in providing a set of recommendations for the policy makers, government officials, and the stakeholders to take action and apply a strategic management plan regarding the urban green spaces. The chapter discusses the conclusions, recommendations and future work.

## **II. LITERATURE REVIEW**

### **A. Historical Background**

New urban development settlements were constructed in Egypt up until 1973, for example Nasr City was constructed in 1960s. After the 1973 war, the construction of new cities in Egypt has become a strategic plan to encourage the socio-economical development of the country. The linkages between the urban green spaces and the real estate market value will be discussed in the next section of this research to provide a good base of how the implementation of green spaces can affect the socio-economic development of urban cities and towns. The strategic plan consisted of four main objectives: the decentralization of highly dense developments that was gathered around the Nile Delta, eliminating the urban sprawl, providing housing for accommodating the increasing population, and building sustainable settlements in the outskirts of existing cities in the desert. The strategy behind the planning of new self-contained towns close to existing towns was to take advantage of provision of employment for the citizens and providing services. Another reason was to provide for a more affordable land uses (Ahmad & Dmitrieva, 2014). The concept of developing sustainable self-contained cities, also associated the concepts of implementing sustainable urban green areas in new cities such as El Sadat city that was constructed as part of the first generation community development in Egypt between mid-1970s to the early 1980. Even though new settlements were constructed on the outskirts of existing cities in the desert, research has shown that the land suitability of planning green spaces in such towns is viable and achievable. This would contribute to the concept of bringing nature into the city enhancing the connectivity within segregated towns (Mahmoud & El-Sayed, 2011).

One of the most viable ways of conserving the history of the identity of a city is through the historical landscape settings (Abdel-Rahman, 2015). A country with an ancient history such as Egypt holds an infinite amount of biography regarding its open spaces. Cairo is one of the main growing cities in the Middle East today. Conventional urban planning has failed to incorporate this growth towards creating sustainable urban environments and because of this deficit, public urban spaces and particularly the green urban spaces are left to be occupied by the absence of the local inhabitants. In order to be able to fully understand the factors that contributed to the apparent mismanagement of the landscape of the city, one needs to analyze, research and study the causes of the great shift of the use of green spaces from the reign of Khedive Ismael to the current and existing situation. How the ideology for caring for the

landscape and integrating open green spaces as a major aspect in the urban planning of the country and following the European model way of transforming the built environment to the deterioration of the sophisticated and beautiful park remnants today due to the battle that we are constantly fighting to accommodate the urban sprawl and the building of the modern developments that are taking place today. The United Nations reports 2.5 million more people that will be added to the urban population by 2050. This expedites the importance of paying closer attention into finding solutions to better improve the quality of the urban life.

In the upcoming section of this research, the literature will start of by explaining the concepts of the Garden City and how it affected the urban development patterns in Cairo. From there the literature will discuss the current situation of the urban green spaces in Cairo as it moves out to the regional scale. As the literature continues to discuss the urban development patterns and the historical background of the urban green spaces and why it is important to the context of the research, one needs to discuss the basic definition of what urban green spaces are first. As mentioned in the introduction that one of the main reasons in regards to the drawback in the literature is the fact that the terminology used to describe the green spaces is not unified. To set the base for this research, the definition of urban green spaces and open green spaces will be derived from the Journal of Environmental Protection and the Environmental Protection Agency, as well as the World Health Organization.

The Journal of Environmental Protection defines urban green spaces as: ‘The definition of urban green spaces which is agreed on by ecologists, economists, social scientists and planners is public and private open spaces in urban areas, primarily covered by vegetation, which are directly (e.g. active or passive recreation) or indirectly (e.g. positive influence on the urban environment) available for the users.’

The Environment Protection Agency describes open green space as ‘any open piece of land that is undeveloped (has no buildings or other built structures) and is accessible to the public.’ Open spaces can include: schoolyards, playgrounds, public seating areas, public plazas, vacant lots, and green spaces (land that is partly or completely covered with grass, trees, shrubs, or other vegetation). Green spaces can include: parks, community gardens, and cemeteries. Open spaces provide residents with recreational areas that helps beautify the environmental quality of neighborhoods (EPA, 2017). Under the definition of the World Health Organization, ‘Urban Green Spaces’ are considered as urban spaces covered by vegetation of any kind, and this includes:



- smaller green space features (such as street trees and roadside vegetation);
- green spaces not available for public access or recreational use (such as green roofs and facades, or green space on private grounds); and
- Larger green spaces that provide various social and recreational functions (such as parks, playgrounds or greenways).

## 1. Garden Cities

The new movement of Garden Cities was introduced during the British occupation of Egypt between 1882-1956. The city of ‘Garden City’ in Egypt was born during the early 19<sup>th</sup> century by private investors under the provision of Khedive Ismail’s vision to Europeanize Cairo. Although it looks more like a modern European village (Fig 1), it was planned to resemble an English garden where quietness and security were achieved. Its beautiful landscape where trees were lining the streets, the gardens that filled the neighborhood, along with the breathtaking mansions and the mixed use context, that made the city more attractive and different from the rest of the Egyptian cities developed during that same time. The improvement of the quality of urban life when it comes to addressing the overpopulated cities and the over crowdedness due to urbanization was the goal behind Howard’s plan of designing garden cities (“garden city | urban planning,” 2012). Ebenezer Howard, a city planner that influenced urban planning around the world today, is the first to introduce the concept of Garden City in the late 18<sup>th</sup> century. His main strategy behind the garden city planning as summarized by the editors of the Encyclopedia Britannica (2012) were as follows:

- Purchasing large areas of agricultural lands located inside a ring fence
- Planning of compact cities that are surrounded by a green belt
- A sector hosting residents, industries, and agriculture in one city
- The limits set forth to restrain the sprawl of the city through the green belt
- The benefits of increasing land values for the interest of the town’s welfare

In his famous book ‘Garden Cities of To-morrow’ he introduces the contemporary concepts of urban development and urban growth, and he lays out the plans of how a Garden City should look like with providing very precise data regarding its acreages and population capacity (Fig. 4). The concept of the Garden City as Howard described it, he wanted public parks and private lawns to be spread throughout the city, where wide curvy roads took place ranging from 36 meters to 128 meters’ wide (Nairn, n.d) as

shown in (Fig. 5). The main idea was to combine the rural areas with the urban city together. He came up with the ‘Town-Country magnet’ (Fig. 6) where he laid out the benefits and challenges of living in a traditional town versus living in the countryside and combined them into a Town-Country model for urban planners to adopt. Howard talks about the Garden City model as the solution to solve the rapidly growing urbanization patterns. This is in fact the case with Cairo, and how the urban sprawl is slowly diminishing the agricultural lands in the countryside leading to the low land values outside the realm of the urban city; where a large population is moving to the city in search for jobs and services. As an urban planner, socialist, and a philosopher, Howard influenced many planners and many cities around the world with his visionary concepts of how the urban landscapes should be developed and laid out in order to have a modernized context where the best of both worlds meet. Bean fields and orchards; where fruit trees filled the area and the nourishment of the landscape with flowers and trees was prioritized. This transformation led to the drastic escalation of land values in the town during the early 19<sup>th</sup> century as mentioned by the author Samir Raafat (1998). Before then, when the ‘city of Cairo was laid out by Fatimid’s in 969-974...20% equaling to 30 hectares was devoted to open spaces’ (Nassar, 2013).

A brief history regarding Garden City in Egypt will aid in providing a background of how the city was designed, planned, and how it maintained its identity throughout the years and how it provides a good example for planning compact cities for the future. Frantz Sofio, Charles Bacos and George Maksud, were the three owners of the Nile Land and Agricultural Company in 1905; which were also the investors that initiated the start of the city that was influenced by Ebenezer Howard concept of Garden-City (Raafat, 1998).

Jose Lamba was an architect that was called upon to help create the new township and palace that was built for Khedive Ismail’s mother as well as the two palaces neighboring the area belonging to Ibrahim Pasha ("GARDEN CITY: A Retrospective, August 6, 1998," 1998). The surrounding area was all transformed to beautiful gardens and green spaces.

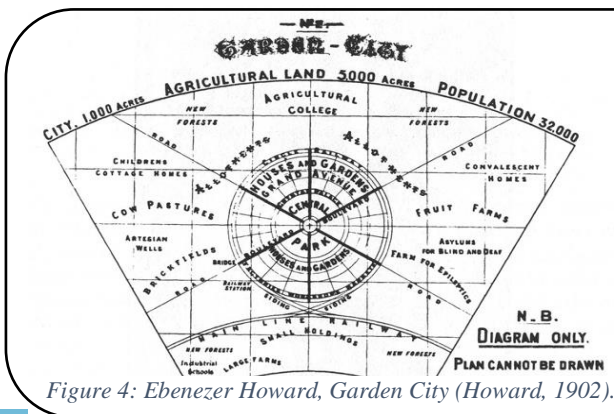


Figure 4: Ebenezer Howard, Garden City (Howard, 1902).

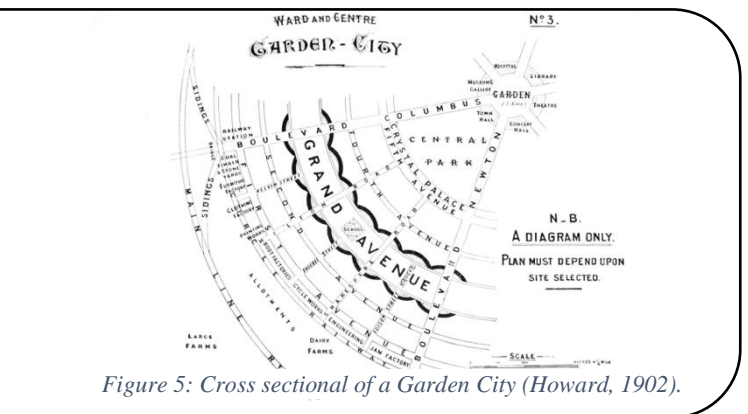


Figure 5: Cross sectional of a Garden City (Howard, 1902).

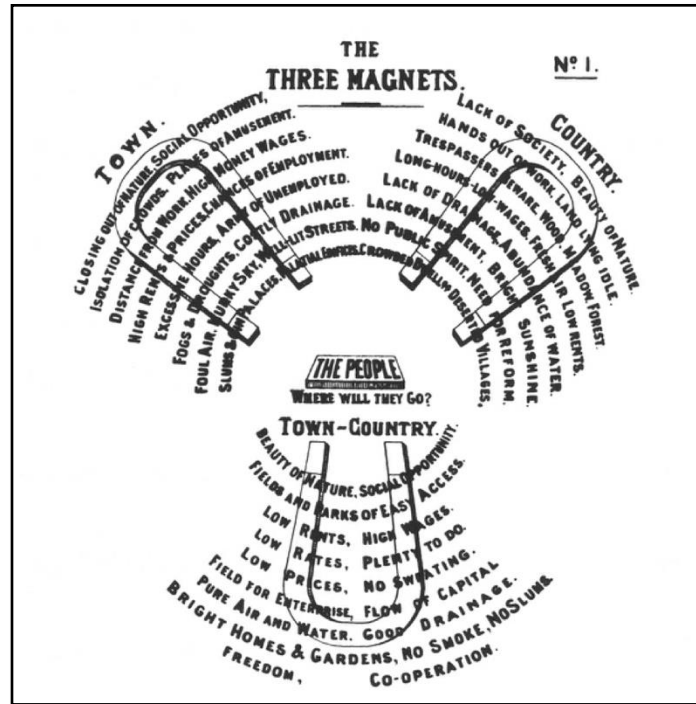


Figure 6: Ebenezer Howard, *The Three Magnets No. 1*, 1902, in *Garden Cities of To-morrow* (Canniffe, 2010).

Unlike any other district in Cairo, Garden City was known for its intertwining paths, roads and avenues (Fig. 7) as opposed to the traditional planning of cities with right angles, and straight linearity. Curvature infrastructure was adopted in the design of Garden city by Lamba as seen in (Fig. 8). The new township of Khedive Ismail was booming with greenery, appealing landscapes, wide avenues, public gardens with beautiful plantation all over the town. Lasting almost a decade with a well maintained urban green landscaped town and country, sadly, in the early 20<sup>th</sup> century, various palaces and some of the breathtaking urban landscapes were demolished and high rise hotels and commercial complexes dominated the area, such as the Four Seasons Hotel Building. It did not just stop there, the three heirs of Garden City’s biggest construction did not prefer to keep it as it was, and was sold to the first bidder during the real estate boom in the late 1970’s (Raafat, 1998). As Howard mentions in his book:

“Town and country must be married, and out of this joyous union will spring a new hope, a new life, a new civilization” (Howard, 1902).



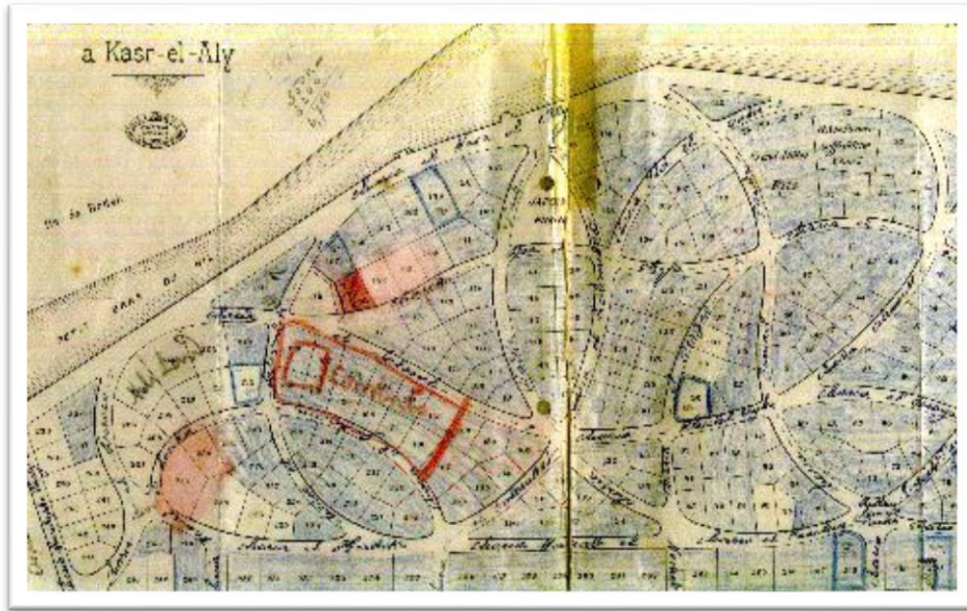


Figure 8 Spatial context of A Kasr-el-Aly in Garden City, Egypt ("GARDEN CITY: A Retrospective, August 6, 1998," 1998).

Starting off with discussing how the concept of Garden City came to be and how it connects to the local context, is an important feature for setting the sequence of the historical background of the urban green spaces in Cairo. It sets a better understanding of the great shift of history and how the country went from a green paradise and a well maintained green landscaped towns where people prioritized the urban green spaces from the reign of Khedive Ismael to the current situation where apparent mismanagement of the urban landscapes of the city is visible, and poorly maintained, depriving the residents of the community and the rest of the population the right to use these spaces.

## 2. Current Conditions of Urban Green Spaces in Cairo

Adding on to the historical landscape settings of Cairo, a more in depth discussion of the current situation of the management of the urban green spaces in Egypt will be presented in this section. With Cairo being the state capital and the largest city in Egypt in terms of its geographical size, population, and market, it is the most adequate realm to conduct our research. Further analysis of the current situation of the urban green spaces will portray a good representation of the country's management arrangements and interventions. Cairo is a classic example of how poorly planned urban green spaces can be.

As mentioned earlier, the continuous urban expansion in the cities, has posed a problem for its integration of landscape management. The governance structure, size, and scope, number and type of stakeholders involved can vary. The level of cooperation also varies, from information sharing and

consultation, to more formal models with shared decision-making and joint implementations. Finding application methods to lessen the growing consumption patterns of the Egyptian people that are placing an increasing pressure on the land and its rich resources and making them aware of the fact that by integrating a sustainable land management system within our community, we can move closer into achieving a better quality of life.

Egypt is currently lacking an open, functional, well maintained public green space where people, neighbors, families, and friends can come together to enjoy the outdoor sceneries, to engage in public events, to socialize with one another, get exposed to different cultures and habits of different groups of people, and also to escape the busy and chaotic long working hours.

The issue with the urban green spaces in the city is the simple truth that it is vacant, mismanaged, and wasted. It is a rich source of the landscape and the urban built environment and it is completely wasted by the users of the community and lack of actions are undertaken to revive and acknowledge its existence from the public management. It was once a functional green space where people came and spent some quality time with their friends loved ones, and now it is mistreated, misused, or in some cases closed to the public use. The city is losing the majority of its land due to urbanization, and building modern developments to accommodate the vastly growing population of the urban capital.

The greenbelts or street medians are supposed to act as a storm water management system, where the catchment of the storm water is slowly drained in urban street medians to infiltrate the plantation and recharge back in to the ground water system. What is noticed, are the concrete structured sidewalk and curb blocks that shield off the water from infiltrating those bio-swales; which is the primary purpose of the existence of medians, is to act as bio-swales to manage the overflow of water in rainy seasons. Storm-water runoff is the cause of water pollution in all urban areas. In heavy rainy seasons in the country, we notice the blockage of roads and enormous traffic congestion in the busy roads of Cairo, this is due to the failure to accommodate an effective well designed urban green spaces acting as a catchment body of the excessive flows of water in the streets causing further damage to the surrounding infrastructure. When rain falls into a natural patches of land whether it is covered by soil, sand, or greenery, the water is absorbed more efficiently into the surface charging the ground water. There are districts in Cairo where the plantation index or green space index per inhabitant is 0 (Takiya, 2002). As per the U.S. Environmental Protection Agency states, that the application of green infrastructure approaches helps mitigate flood protection, air pollution, and water management (2015). This is not to mention the benefits of the planted vegetation to reduce the carbon emissions from the car exhausts and from within the atmosphere, cleaning

air pollution, minimizing GHGs, and providing a better quality of life and well-being to the urban dwellers.

Driving across the city, we can notice the existence of urban green space availability, whether it is in the form of street medians, urban green spaces, or public squares. We notice the waste of the most valuable resource where the water that goes into irrigating these spaces is left to flood the vegetation. This is quiet ironic since we are suffering from the scarcity of water in the country. Irrigation hoses/pipes are left running for long periods of time which eventually kills the turf planted. If turf requires great amounts of water to survive, a valid question would be who is responsible for the management of these valuable resources left to go to waste. How are the urban green spaces managed in Cairo, and who is responsible for their management, who are the decision makers in regards to the urban green spaces, are viable questions to be answered in the context of this research.

There needs to be an urban getaway for the community to escape their private closed homes, and enjoy what the city green-scape has to offer. Urban green spaces that were once part of the initial planning of cities, where tree lines prospered the city of Cairo and the lush of an interactive public squares in the Khedive Ismail's era are currently gated off and deteriorating. The responsible stakeholders and public management as well as the social actions of the urban dwellers are to blame for such action leaving behind valuable land stagnant into serving its basic function and providing productive, functional, and aesthetically pleasing solutions to serve the local community.

#### **a) Management Challenges**

There is a clear indication that the urban green spaces are poorly managed in the city of Cairo. The government officials control the majority of resource management and decision making processes. Some of the preliminary obstacles faced by the managers of the urban green spaces in Cairo are listed in (Fig. 9). The urban green spaces provide a good basis of the sustainable contribution for a social, ecological, and economical aspects of our urban built environment. A more detailed briefing of each aspect will be further discussed in terms of the analysis of the case studies that will be mentioned in this research. The expectations applied along with conflicts of political interests and the varying participation roles are some of the sub-items under the management realm of urban green spaces that causes a dilemma in the management systems. Although the existing literature provides various strategies regarding the benefits of applying sustainable urban green spaces around the world, it does not provide a comparative analysis in terms of planning and management of urban green spaces in different contexts. This fallout is due to

the lack of data availability and the different classifications used in the field of research (Baycan-Levent & Nijkamp, 2009). Not all approaches that work in some countries, will always be successful if grouted into another context, as each context has to have its own tailored strategic planning.

As the urban green areas suffer a great amount in Cairo, it is contributing to the passive degradation of quality, the decreased amount of green space quantity, and the unfair distribution of the urban green spaces (Abdelaziz, 2012). Relating those problems with the context of Cairo; the ratio of urban green space to citizen is extremely low, not exceeding 1.2m<sup>2</sup> per person (Abdelaziz, 2012). In regards to the poor distribution of urban green spaces in Cairo, it is widely apparent that there exists a discrimination in the way urban green spaces are evenly distributed between the middle/high social strata and the lower class. In areas where upper middle, high class population as Zamalek, the abundance of urban green spaces is apparent with citizen quota of 10.9m<sup>2</sup> per person. On the contrary, poorer communities as Matariyah are left in despair of green spaces (Abdelaziz, 2012). The quality of the urban green spaces can be seen as destitute and underprivileged. The author states that the existence of poor quality of green spaces is the result of applying prototype designs without considering the needs of the users. The management officials are the ones to be blamed for this inconvenience since they fail to provide need based service provision interventions for the local community.

To conclude this section of research, one can sum up that collaborative planning, and joint implementation tenets are inadequate and nonexistent when it comes to the management of urban green spaces in Cairo. From planning to managing, and from developing to implementing and maintaining public green spaces, a unilateral management approach from the central government is on the lead of progressing. It is obvious that the institutional framework of the management entities responsible for the urban green spaces in Cairo, is getting higher on the line of centralization. It is controlled by a single authority directly under the central government with no traces of the integration of non-governmental actors in play. Urban green spaces in the city of Cairo, are poorly managed and planned leading to the deterioration of our valued resources to go to waste. This is due to the poor governance from the responsible agencies, which brings about the importance of discussing the governance issues in the local context in the next topic.



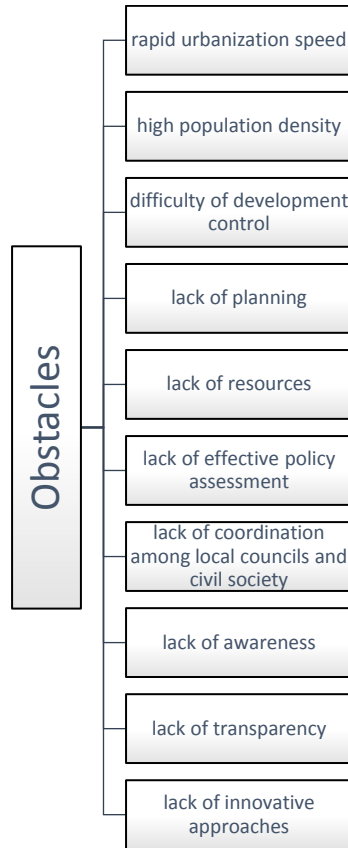


Figure 9: The obstacles faced by the government officials and managers in the city of Cairo.

**b) Governance Issues**

In reference to Baradei’s (2014) advice to the civil society as their role to speak up and peacefully object to the government’s actions and hold those accountable if they lack to deliver a public service if their needs in society are not considered. The civil society should raise the issue of restoring the urban green spaces where it can provide them their right to clean, functional green spaces to be properly designed, well maintained, and efficiently managed. A similar practice was approached in the USA in the 1800s, when the residents of an urban community raised the concern of preserving natural heritage sites to the government and asked to formalize a local agency for the conservation of national parks (NPS, 2000). The entity formed was under the control of the department of interior to supervise their interventions. Similarly, the management agencies of the urban green spaces in Egypt, are all under the provision of the local government. The NPS since then have been the responsible entity for the national parks in the USA with providing successful outcomes (Abdel-Rahman, 2015).

Governance is one of the major fallouts when it comes to managing urban green spaces in the context of Cairo especially if it is under the management of the local government. The national institutions

in Egypt are not well prepared to deal with the management of such a large pool of interests at once and especially that of the urban green spaces since it is not considered by the government as a basic necessity of life. Issue arise regarding the ownership and the access to resources especially in developing countries. Additionally, the roles played by the different participatory actors in the decision making processes are also crucial to access the sustainability of each actor and the role they play in the management system of the urban green spaces in Cairo.

Two institutions were poorly represented in the literature in regards to the Egyptian context that play an important role in the governance sector: Ministry of State for Environmental Affairs (MSEA) and, Egyptian Environmental Affairs Agency (EEAA). The EEAA role is to prepare plans and set policies on the national scale for environmental protection assessment and the role of the MSEA is to approve plans on the local scale in regards to areas with environmental value for example natural protected areas. Unfortunately, both institutions are not involved in the decision making processes of the management of the urban green spaces and neither are they integrated in the stakeholder collaboration regimes. Another institution that is not involved in the governance framework in the Egyptian context is the National Agency for Civil Coordination (NACC) also known as El Tanseek El Hadari is responsible for preparing policies and plans at the regional, national and local scale. The agency's role is to constitute policies in favor of the civil coordination, preparing plans for developing and improving urban areas, and to prepare designs for potential locations in the country (Moustafa, 2015).

The literature suffers from providing a sufficient overview of the overall governance and management schemes of the urban green spaces in Cairo. The roles and the duties of the different agencies and authorities are well presented through other research studies in the literature, but there is a lack of consensus on urban green spaces especially in the local context and the regional context as well. One can conclude that there are agencies that should be playing a big role in shaping the management and governance schemes of the urban green spaces in the country, but they are not prioritized or brought forward in the literature that links their mere existence to the urban green space management. The literature also lacks to mention who are the decision makers and the stakeholders of the green spaces in Egypt. Transparency is not a prioritized aspect when it comes to the governance and the management of governmental schemes in Egypt, which leads to the lack of consensus and data availability.

### 3. Sustainable Urbanization Policies in the Egyptian Context

Sustainable urbanization development is a method used in assessing the effectiveness of the Egyptian policies, laws and regulations in regards to sustainable development goals as well as the mechanisms that ensures the implementation of the urban planning concepts and strategies within the Egyptian context and the literature review imposed on the subject. Discussing the urban challenges being imposed, the pace of urbanization that is currently increasing faster than the national and local development or progression from the government's side, the involved agencies, ministries, organizations and the roles they play in developing new urban communities.

Sustainable Urbanization is the key to successful development with more than 2.5 billion people all over the world expected to be living in urban areas by 2050, the urgent need for a well implemented urban planning agenda and national policies that approaches the growth or the urban population highlights the need to reform a better approach to city management and focus on the smaller cities where most of the people are currently living (UCLG, 2014). According to a study from Ankara University, Turkey, states that when 'urbanization is applied to the field of urban development, it is assumed that sustainable urbanization can be secured only when master planning is directed to minimize travel needs, to promote public transportation, to conserve fertile agricultural lands, to avoid wasting other sensitive and non-renewable ecological resources and to enhance energy savings in building designs and layout' (Keles, 2001); which can be directly applied to the Egyptian context as well.

The rapid urbanization is the main cause that faces the urban development in Egypt and it is one of the main direct causes of the increase of informal settlements. Sustainable urban development should consider these undermined settlements as opportunities of urbanization rather than challenges as those cities have a potential in expanding and building upon the social, economical, and environmental aspects of development. As Rania Hedeya termed it 'cities can be engines of growth'. Only if cities are managed well and utilized better, than they can benefit from economies of scale. Cities bring people closer; they combine urban infrastructure, growth opportunities, benefits, employment, entertainment, services and goods in one close proximity where everyone can benefit; which is how compact cities are marked in the literature as being of high density, and mixed use developments.

Sustainable Urbanization policies have to be pushed upon to enable this urban growth and to be able to encompass a rapidly growing population and urbanization patterns and planning must be aligned

along with them to maximize the potential of the urban development process; not to mention to embed the sustainable development goals as part of the urbanization policies such as the effect of climate change, the urban infrastructure, the accommodation of population growth, and the environmental impacts caused from inefficient developments. A well effective governance approach for communities to reach their full potential for urban growth as stated by the authors and architects Dr. Mohamed Soliman and Dr. Ibrahim Shraf El-Din in their research of New Urban Communities in Egypt (2012) states: ‘with contrast to common opinion and despite its bureaucratic machinery, public enterprise can gain much prestige by sponsoring new town construction as an instrument for national improvement’.

The importance of aligning policies with the sustainable development goals is crucial because we as a community must build and design cities that are inclusive and are capable of sustaining our resources. ‘It is for this reason that UN-Habitat has been focusing on pilot interventions that result in the creation of sustainable, efficient and vibrant cities so they become engines of growth and also focuses on producing knowledge products and pilot projects that can provide evidence based research to the formulation of key policies’ was a statement in a report submitted for the UN-Habitat (Hedeya, 2014).

The Cairo Plan that was established in 1974, along with Cairo Structural Plan in 1982, and the National Urban Policy Study (NUPS), agree that policies for new communities are effective solutions encompassing a major population that resides in the Greater Cairo Region and moving away from the extermination of agricultural lands for the urban use (Soliman & Shraf-El Din). In light of this policy conformity, a supreme committee for new community development was formulated in 1979 and new communities in the desert land were established to better redistribute the population.

Answering the question of who is responsible into implementing and carrying out sustainable urbanization policies and urban development strategies and plans, the literature can argue that GOPP (General Organization for Physical Planning) is the entity in charge along with the Ministry of Housing as we can see in (Fig. 10) below the organizational structure of GOPP. The GOPP was established in 1973 and it is responsible ‘for setting the overall policies of urban planning and sustainable urban development; as well as preparing strategic plans and programs on the national, regional and local levels’ (“GOPP Establishments,” 2008). In 1982 when the physical planning law was issued, GOPP was transformed from being a consulting agency to an executive agency responsible for approving master plans with the help of local authorities and was also responsible for building their capacities in the urban planning sector. This

led to further revision addressing the urban development, mobilizing resources of the community and society, and acting as a backbone for the civil society to have more firm hands in order to be an active participant into shaping the policies and implementing them within their society with an emphasis exerted on establishing principals of sustainable development through strategic planning from the year 2004 all the way through 2008. This shift in the state body led GOPP to the issuance to law number 119 in the sustainable urban development building and planning law (“GOPP Establishments,” 2008).

To outline the responsibilities and the role of the GOPP are as follows:

- ❖ Proposing and developing legislations
- ❖ Establishing standards and preparing planning guidelines and manuals.
- ❖ Managing urban development at the national and regional levels
- ❖ Preparing and approving urban development plans
- ❖ Adopting cities cordons, villages urban boundaries and regulating planning and urban development
- ❖ Preparing urban indicators
- ❖ Developing GOPP employees and local authorities’ capacities
- ❖ Organizing conferences and seminars
- ❖ Exchanging information, endorsing agreements, organizing and participating in competitions (as they prepare pilot projects in different fields of planning).

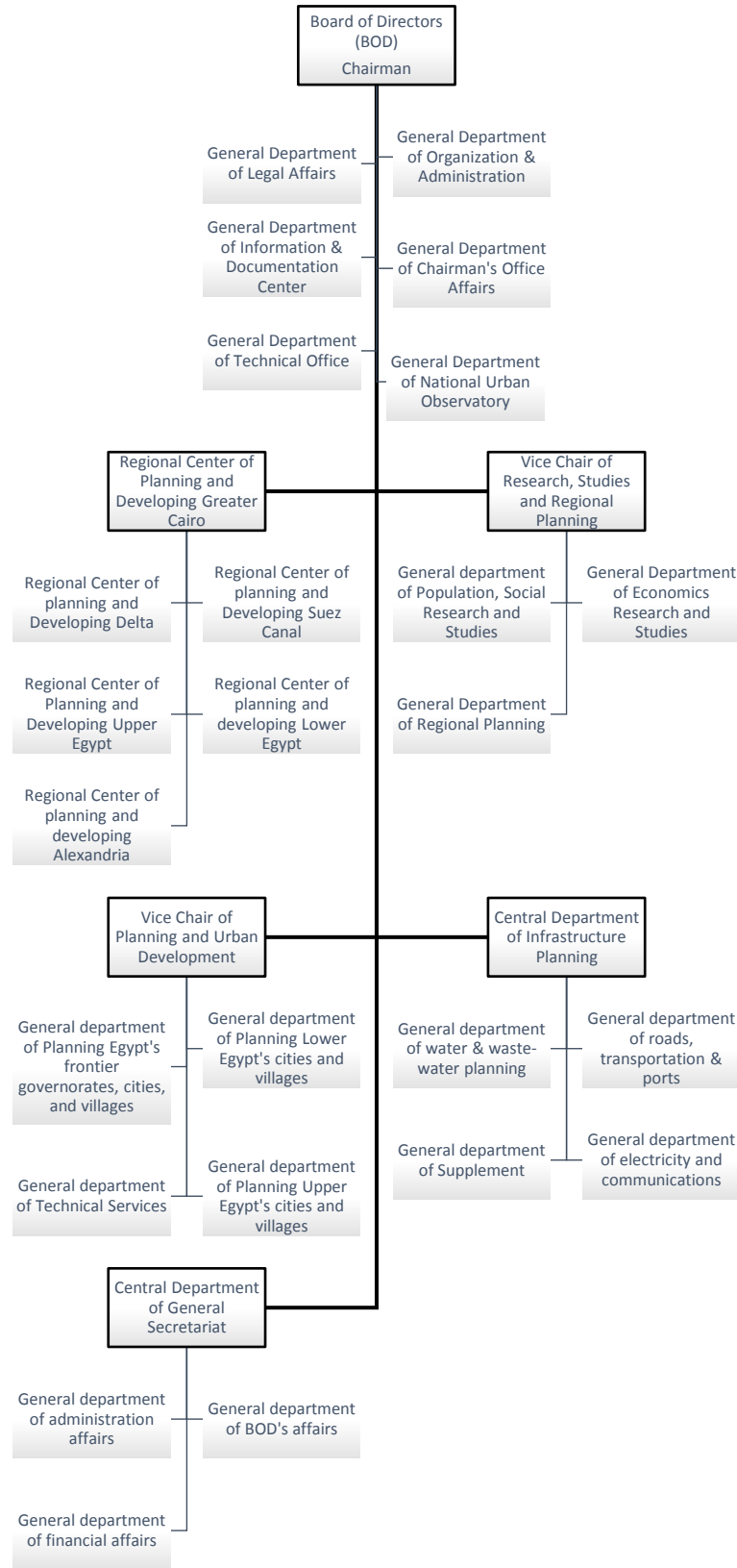


Figure 10: GOPP Organizational Structure ("GOPP Establishments," 2008).

Sustainable urbanization also discusses the importance of expanding out on desert lands, connecting the urban infrastructure to the existing towns and cities. This movement will accommodate the accelerating rates of population growth. Not to forget the emphasis into developing the existing smaller cities in the GCR, their structure, their identities, the maintenance and developing their re-growth measures. If this development would occur, we would begin to align the new urbanization policies with the existing cities. This will also lead into meeting the sustainable development goals on a global level such as: the poverty rates, the food security caused by the lack of agricultural lands being used for urbanization, promoting a well inclusive and sustainable economic growth and productive employment, building resilient infrastructure and sustainable industrialization; which feeds into goal number 11: making cities and human settlements inclusive, safe, resilient and sustainable, and much more SDG would be accomplished. (“Egypt – UN-Habitat,” 2012).

Based on a research done in 2013 through outlining the international law concept of sustainable development as it goes further into assessing the effectiveness of the Egyptian policies, laws and regulations in regards to sustainable development and providing recommendations on how to move towards a more sustainable urban development through managing the water systems which is the most urgent aspect faced in Egypt. The research states that Egypt’s current policies do not address such issues and that the environmental laws are currently either outdated or unenforced and unregulated (McKenna, 2013). Looking at the current situation, one still believes that there is potential and that Egypt is pushing to create new environmental policies, newer sustainable urbanization policies, new strategic planning to ensure successful integration and enforcement of the built environment, incorporating the global SDG’s as part of their own law and policy orders, and last prioritizing the decentralization approaches that will eventually lead the country to adopt more sustainable urban development practices. Having this in mind, we can look at the GOPP vision (Fig. 11) and how it plans to face the Egyptian urban planning and management challenges and how they go about approaching the mechanism of implementing sustainable urban developments.

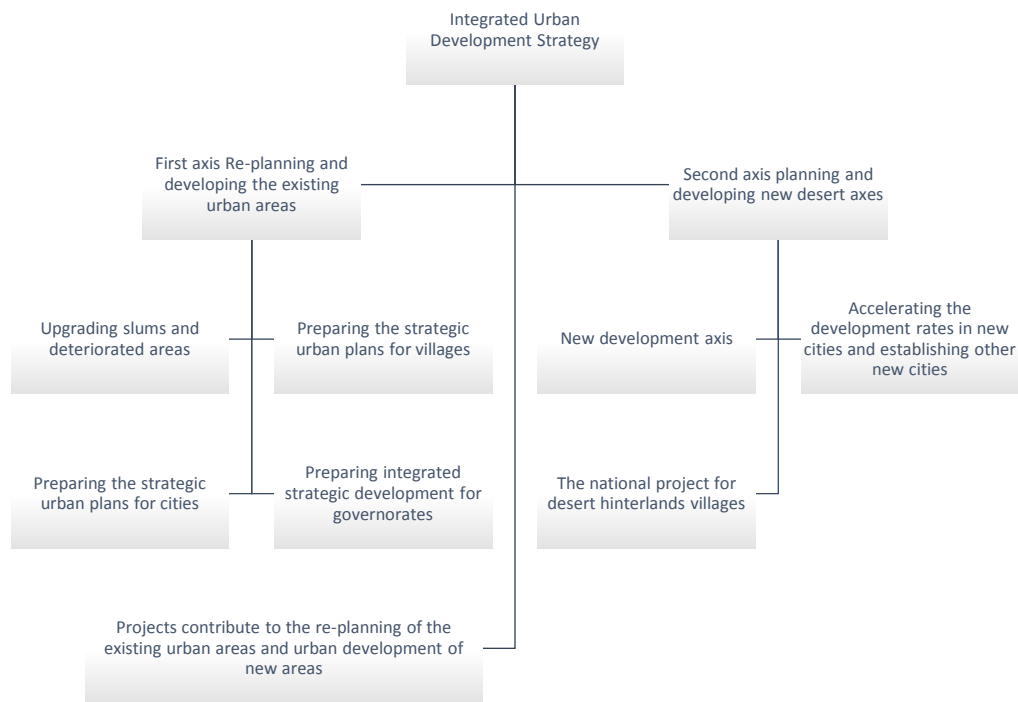


Figure 11: Vision for Facing Egyptian Urban Challenges (“GOPP Establishments,” 2008).

The urgent need to adopt new communities and implementing and enforcing sustainable urbanization policies into the city management systems that addresses different scales can and will move the country into solving the urban challenges that are currently faced. Vision 2030 is on the line into responding to these urbanization challenges and addressing the global SDG. The literature review agrees that if we move towards a ‘green infrastructure’ approach or an efficient design of sustainable cities we can increase the productive abilities of the national economy and raise the standard of living, utilizing our wasted resources, solving the water scarcity issue, protect what is left of our fertile agricultural lands, moving urbanization outside of GCR and into the desert area to better utilize the land uses of the country, creating successful and efficient provision of services and infrastructure that serves the better community, economy, culture, and environment, making sure to align the governance arrangement to obtain a sustainable urban development of a strategic planning system for further implementation in the country. (Appendix Table 11) provides a layout of what needs to be involved in a strategic plan of urban green spaces that can be used as a good model to follow in the Egyptian context.

In conclusion, the sustainable urban development approach discusses the planning the management visions that promotes interconnected green spaces, and a multi modal transportation system



as mentioned above. Sustainable urbanization is the key to a successful development as it can aid in benefiting from the economies of scale. With the rapidly increasing population growth in the country, urban planning policies and sustainable solutions need to be leading the planning development. The planning of new sustainable communities in Cairo is only the beginning of achieving a successful urban planning system. Thus requiring an integrated approach with an open decision making mechanism. The urban management systems should focus primarily on the environment shared by many agencies rather than the internal resources of one agency. Having discussed the roles of the GOPP highlights the potential that the urban planning systems can lead that can eventually lead the country to a more sustainable urban environment, but not alone. The literature highlights the participatory planning approach that emphasizes the involvement of the entire community in the strategic and management processes of urban planning. The urban developments need to respond to the dynamically changing urban conditions in the Egyptian context because conventional planning has failed to incorporate the rapidly growing population. Mixed and adaptive conditional models need to be adapted because the success of applying a mixed system lies at incorporating a multiplicity of decision makers. Besides incorporating a sustainable urban development system approach, one needs to look into the different ways of planting these concepts into the available context. Through the approaches that will be further discussed in the next section, we can start to think about the application methods of implementing the afore mentioned urban management and planning systems into our context.

## **B. Theoretical Background**

The previous sections of this research was more concerned with the local context as it highlighted the literature in various topics in regards to the historical background of the Egyptian context. This section of research will zoom out in scale to the regional context as it discusses the theoretical concepts involved in the application of different approaches of urban green spaces. Starting off by discussing the ecosystem services in Africa and why it is important, then the literature will discuss how ecosystem based adaptation approach can be converted to economical benefits at the global scale.

According to Cilliers (2012), ‘Ecosystem goods and services (ES) are described as the benefits humans derive directly or indirectly from ecosystem functions and are classified as supporting, provisioning, regulating and cultural services’. The immediate necessity to investigate in the research of the ecosystem services in Africa is due to the incredible increase of urbanization that it is facing.

According to Tibaijuka (2010), the urban population in Africa will more than likely double its 2007 level of 373.4 million as early as 2030. Looking at the literature and the amount of data and information available regarding the ecosystem services and goods of the urban green spaces in Africa, it is clear that it is tremendously lacking. The main objective of the research according to Cilliers (2012), is to move the policy makers, the general public, and the planners towards taking action regarding the biodiversity and the ES (ecosystem services). The most appropriate approach in order to apply knowledge about ES and their values in African cities, is through Ecosystem based adaptation. Durban, South Africa is considered one of the world's leaders in Ecosystem based adaptation approach within the environmental management system (Cilliers, Cilliers, Lubbe, & Siebert, 2012). A contrary opinion according to Niemela et al (2010), states that the implementation of the Ecosystem services approach in the urban planning even in developed countries is not always a successful procedure. Cilliers (2012) mentions that the tendency to pay more for housing properties close to urban green spaces in Africa could not be statistically proven like it is in Europe, although the housing prices that are in proximity of open green spaces in some areas in South African cities, were actually lower in prices than if it was further away.

Concepts of 'resource economics' is introduced in the literature of Durban, South Africa and it focused on the supply and demand as it was successful into converting the abstruse values of ecosystem amenities to monetary values which are more clear and concrete to the stakeholders and policy makers and it was an approach into meeting the basic needs for the less fortunate communities (Roberts et al. 2005). There were also a few attempts to apply monetary values to ecosystem services within urban areas (Roberts et al. 2005; Schuyt 2005; Lannas and Turpie 2009; TEEB 2011; Davenport et. al.2012). The constant perception and the eager to apply a more profitable use to open spaces in the city has slowly led to the deterioration of the public green spaces due to developing more urban infrastructure in the developing countries (Cilliers, 2009). From this research, one can conclude that there are few studies that have been conducted in African cities mainly because of the fact that urban ecosystems are not of a priority in the fields of research in the developing countries (Cilliers et al. 2009, 2011, 2012).

## **1. Urban Green Spaces and the Real Estate Value**

According to an existing review by Panduro & Veie (2013), green spaces were categorized into eight different kinds and measured their impacts on the housing prices using the hedonic price evaluation. Each green space was rated according to three implications: accessibility, maintenance, and negative

neighboring land use. The research came to find that the spaces that were rated high in terms of their maintenance levels and accessibility had a great impact on the surrounding housing prices, whereas the unattractive green spaces that scored low were associated with lower housing prices that were not well maintained regardless of controlling the surrounding negative land use activity. This research proves that green spaces are not homogeneous environmental amenities but rather a set of distinctive nodes with great impact on the housing prices (Panduro & Veie, 2013). Many reviews in the literature supported this study and the apparent link between the existence of green spaces and housing prices surrounding it; such as the research done by Barrera, Paecke, and Banzhaf (2016). The study confirms the same concept that the validity of green spaces is directly linked to the household incomes whether it is within developed countries, or developing countries. Thus, the higher the incomes, the larger the green space available, the higher the quality of these spaces, the higher the amounts of private green space. The literature came up with tools to better evaluate the location and quality within complex urban areas using a set of indicators, which are: 1) total area of green spaces per inhabitant, 2) spatial distribution and accessibility, and 3) the quality of green spaces based on the vegetation cover, shape and size. The research was conducted in the Metropolitan area of Santiago, Chile. These indicators resulted in clarifying the enormous differences of quantity of green space per inhabitant, the accessibility of the space, as well as the quality of the GS based on its vegetation cover. Whereas, the results proved that green spaces are indeed an effective strategy to minimize the areas that lack in vegetation cover (de la Barrera, Reyes-Paecke, & Banzhaf, 2016).

Aside from the total area, the spatial distribution, and the quality of green spaces, the overall quality of life is also affected by the existence of green spaces and especially in urban areas. As agreed by many authors, Chiesura, 2004; Lee and Maheswaran, 2011; Dobbs et al., 2014; Larondelle et al., 2014; Carrus et al., 2015; Marselle et al., (2015): ‘Green spaces (GS) are key elements for urban quality of life. They contribute to human well-being by providing ecosystem services such as climate regulation, capture of pollutants or flood regulation; they also promote the encounter of neighbors and community integration, and deliver a favorable place for health, relaxation and nature contemplation’. Because of the importance of the ecosystem services that are provided by the existence of the green spaces within cities with high population, this study classified green spaces as public goods, because they provide access to the citizens as well as providing a landscaped getaway for the residents, whether it is median strips, urban parks, roundabouts, sidewalks, etc. (Niemelä, 2014; Yao et al., 2014). Relatively, the size and the shape of green

spaces matters: therefore, the larger the size, the higher the diversity of the abundance of the ecosystem services.

‘The effective assessment of GS and its ecosystem service provision depends on quantity, quality and accessibility of GS’ (Chen et al., 2009; Wright Wendel et al., 2012; Zhou and Kim, 2013; Yao et al., 2014).

To compliment this study, a group of authors and researchers published their journal called: ‘Measuring the quality of public open space using Google Earth’ that the most widely used indicator to access green spaces is in-fact their total area in accordance to the total population (Taylor et al., 2011; Van Herzele and Wiedemann, 2003; Caspersen et al., 2006; Kabisch and Haase, 2013; ISO, 2014). Due to urbanization and the constant need to build housing units and infrastructure, the pressure on green spaces is constantly growing, and the more the environmental amenities and ecosystem services start diminishing (Livert and Gainza, 2014).

The planning of green spaces in a highly dense urban area is costly, and the housing rental pricing of the land uses associated with a green space is high as well. The divergence of green spaces in the urban environment is rarely given any attention in the literature. Differentiating different kinds of green spaces and unifying the capitalization between these spaces is important because it can ease the comparison between different studies in providing accuracy. By doing so, more efficient, practical policies for urban planning can be introduced. Green spaces provide various number of benefits, not just for the implicit impact on the housing units and the increase per capita infrastructural costs (economical benefits), but social amenities (recreational opportunities, social interactions between community members), and environmental benefits (floodway control, storm water management, climate change, improved air quality) are also attainable. Green spaces also aid in reducing the urban housing density by reducing the light and the noise levels (Panduro & Veie, 2013).

Based on the Journal of Environmental Protection (Vol.2, Issue 5), the environmental sustainability agenda should effectively incorporate an efficient distribution of green spaces within the urban areas as well as a certain level of qualitative improvements to assure the various roles played by the green spaces (Haq, 2011). In order to do so, an integrated approach regarding the monitoring, the planning, the design, and the maintenance of urban green spaces are required to improve the environmental

sustainability in cities. Urban green spaces are indeed an important contributor for a sustainable development overall. An effective urban planning using recent technology is required to contribute to the sustainability of the cities such as developing a method to maintain ecological balance using GIS, as well as developing green wedges is one of the desired strategies today. This proposed belt of green network will have a better quality of life on residents if they are provided, as well as enhancing contact with nature (Mahmoud & El-Sayed, 2011).

Interviews with planners from a recent study (Sandström, Angelstam, & Khakee, 2006) indicated that legislation is an important driver for green space planning concerned more with recreation and public health rather than biodiversity maintenance. GIS was mentioned to be an important tool to integrate knowledge within the planning process. Discussing how the implementation of biodiversity policies should be improved to better integrate natural and social sciences in education and policy implementation is an important factor to consider (Sandström, Angelstam, & Khakee, 2006).

An adequate development of a sustainable city is one of the most crucial challenges that we are constantly facing. Because UGS (urban green spaces) provide social, economic, psychological, cultural, and environmental services for the well-being of the citizens and for tourists as well, the development of sustainable cities and the development of urban green spaces are very important factors to consider since more than half of the world's population now live in urban areas (Haq, 2011). A study conducted by Nakagoshi (2008), introduces a program for developing green spaces in urban areas as well as applying landscape ecology principals in organizing green spaces. The research agrees that the urban green spaces play an important role in the urban ecosystems and in preserving biodiversity in urban areas to lessen the tension of urbanization and exploitation of resources. The study also agrees that this proposed network enhances the connectivity and reduces the fragmentation of the greenway system (Uy, P. D., & Nakagoshi, N., 2008).

In summary, the literature has proven that the urban green spaces are homogeneous amenities and they should be treated as a set of distinctive nodes with great impact on the housing prices. They also play an important role in increasing the per capita infrastructural costs. The literature validates that there is a direct link between the household income and the availability of green spaces. Hence, the availability of green spaces is an important factor, the afore mentioned studies would agree on finding a common denominator for evaluating the location and quality of the urban green spaces. The literature introduced three preliminary indicators and they are: the total area, the spatial distribution and accessibility, as well

as the quality of life in general that it provides as they contribute to the human well-being by providing socio economical and environmental benefits. The literature highlights the necessity to have a clear distinction between the different kinds of green spaces so it can create easier comparisons and provide more accurate results in the research. When discussing the urban planning techniques and how to better apply them to the intended context, new methods of technology such as GIS needs to be adapted, in better formulate accurate results in regards to accessing the economical values and the real estate benefits resulting from the availability and accessibility of the urban green spaces. The socio-cultural and environmental benefits are also as important in order to achieve a holistic sustainable urban environment.

## **2. Linking between the Socio-Cultural norms and the Urban Green Spaces**

Green spaces such as parks, sports fields, woodlands, natural meadows, wetlands or other ecosystems, represent a fundamental component of any urban ecosystem. Urban green areas create a sense of relaxation as well as physical activity, not to forget the noise insulation. Trees produce oxygen, and help filter out harmful air pollution, including airborne particulate matter which leads to moderating the temperatures (WHO, 2017).

Urban parks play a critical role in cooling down cities, and provide safe paths for cycling and walking as well as sites for recreation and social interaction. Recent studies show that physical inactivity that is linked to poor walkability and lack of access to recreational areas, accounts for 3.3% of global deaths (Zakaria, 2006). Implementing the concept of urban greenway systems in order to structure a better functioning community, and suggesting a model for integrating the concept of linked parks systems, will allow for a better connectivity and access to urban green spaces. Greenways are considered a response to physical and psychological pressures of urbanization. Concluded that circulation and open space systems are the basic organizing structures of any development (Zakaria, 2006). Green spaces are also important for the mental health; having that said, the benefits of having a functional green space, can accumulate various benefits such as: reducing health inequalities, improving well-being, and aiding in the treatment of mental illness. Some analysis suggests that physical activity in a natural environment can help remedy mild depression and reduce physiological stress indicators (WHO, 2017).

In 2013, Peschardt and Stigsdotter continued their previously done research (in 2012) on SPUGS ‘small public urban green spaces’ and focused their second half of their research on exploring more health benefits in regards to urban green spaces (UGS) because it can aid in providing helpful knowledge in order to have more concrete data and literature available on SPUGS. They began to explore the health benefits of the existence of green spaces among average users and stressed users and investigating the preferred park characteristics for both users. The users answered a ‘Perceived Restorativeness Scale- PRS’ survey and the SPUGS were analyzed using ‘Perceived Sensory Dimensions- PSD’ (describing the eight types of park characteristics mentioned earlier in the previous research). Significant associations were found when the restorativeness scale and the sensory dimensions were combined to see the direct relevance of the existing park characteristics and the restorativeness of the stressed users. Within the proximity of this research, it was found that the natural dimension of the space was the most important for the stressed users. This shows that park characteristics in designing SPUGS can be used for mental restoration, but it needs to be more developed and researched by practitioners to scientifically prove this data.

“We need restorative environments which allows our brain to recover”

(Kaplan & Kaplan, 1989).

The results indicated an apparent pattern that the most important perceived sensory dimensions for the users restorativeness of the SPUGS were ‘serenity’ and ‘socialism’, not to mention that ‘nature’ was on the top of the list for the stressed users. This study can act as a first step into understanding the exact physical park characteristics for restoration, and thereby developing this concept and research tool further for the urban planners and landscape architects for the future in order to better design SPUGS more efficiently for the health benefit of the users (Karin Kragisig Peschardt & Stigsdotter, 2013).

As Mona Mowafi, a sociologist at Harvard School states in her study, that there is a direct link between the increase of chronic illness and the lack of urban planning schemes in developed countries that failed to consider health measures into account. After conducting several analyses between the abundance of green spaces and the BMI (body mass index) amongst adults in Cairo, they have found no relevant association which was unpromising. One can assume that it is because of the over dependency on the delivery services in the country that adults are solely dependent upon and especially because of the busy lifestyles. The results of the study did not find associations between the provision of urban green spaces

and BMI reduction for Cairens, as it did in the western countries. This is due to the cultural differences and the fact that Egypt is a socially conservative environment and so providing green spaces for the purposes of recreation is not culturally accepted and especially for women. Urban parks are not designed to accommodate for the purpose of exercise and recreational activities. Taking functionality into account may aid the designers, and health policy professionals in utilizing such public spaces for the purposes of improving their public health.

Another research has been conducted by Usama Nassar that supports the study of Mowafi but from a slightly different perspective. Nassar's research discusses the urban space design used to enhance the physical activities and motivate a healthier social behavior towards living a healthy life by introducing opportunities within the urban green spaces in the integrated city fabric of Cairo. Not directly linking to the BMI of adults but to the overall wellbeing of the citizens. To support these findings, international as well as national research supports the fact that being able to change the built environment of the people and specifically the urban green spaces; it can affect the daily living habits of the people (Nassar, 2015).

Even though urban green areas are a necessary component for providing a sustainable and a well livable city as apparent in the previous literature, the World Health Organization still believes that little is known regarding the most effective ways to incorporate urban interventions on green spaces with maximizing the benefits and preventing the side effects; not to mention the unintended side effects as well. The intervention to improve the UGS delivers a positive socio-environmental, and health outcomes for all population groups, especially the lower socioeconomic strata as will be discussed further in the research.

The urban green space interventions are most successful when targeted from a multi approach system as mentioned by the Environmental Protection Agency earlier; through a local and an integrated approach. The World Health Organization confirms this intervention technique by also applying a 'dual approach' system. WHO states that these interventions are most effective when the physical improvement (design) is combined with a social engagement promoting the green space within the urban development and also improving the monitoring of the local green space management. To complement the intervention, Nassar (n.d), discussed in his study that the urban design guidelines in Cairo were to promote physical activity of users and to motivate the social change towards a healthy living through the implementation of urban green spaces as history has proven that the design of the urban spaces plays a crucial role in improving public health. A better assessment of settlement patterns on urban environmental quality, and the social wellbeing are required aspects in order to use green spaces as a design tool (Ridder, 2004). A



study published in 2013 suggested that urban green spaces improve people's wellbeing and quality of life. Researchers from the University of Exeter, using data from 5,000 households over 17 years, found that people reported lower levels of mental distress and higher degrees of life satisfaction when they were living in greener areas ("Green Space | Urban Green Space | Benefits of Green Space – Treeconomics," 2017).

In conclusion, the literature has proven that the existence of the urban green spaces has a great impact on reducing the health inequalities, it aids in the treatment of mental illnesses, and it improves the well being of the urban inhabitants overall. Creating an identity and a character for the city is an important aspect in providing for an attractive city, which supports the garden city concept mentioned earlier in this research. The socio-cultural norms also highlight the validity of recreational opportunities which is an important factor for the physical well being of urban dwellers. This section points out the importance of providing a linked park system to allow for a better connectivity into achieving a sustainable city overall. The literature further highlights that the best way to apply interventions is through a dual approach system where it combines the social engagement to the urban development. In order to use green spaces as a design tool in shaping our cities and the social well being of citizens, a better assessment of settlement patterns on urban environmental quality is required.

### **3. Theoretical Concepts of Urban Green Spaces**

Aside from the afore mentioned benefits that the urban green spaces provide in regards to the environment, the social, and economical benefits, the research looked at the concepts set forth by the literature in regards to achieving a sustainable landscape management system when it comes to the urban green spaces. A view of the intertwining concepts of *Green Urbanism*, *Green Infrastructure*, *Sustainable Streetscape systems*, and *Greenway systems*; and how they can act as new contemporary planning system to create a sustainable urban development to create a high quality of life within the highly populated, compact city of Cairo will be examined further in this section. Another major approach in the literature in regards to the management of urban green spaces in the city is *sustainable urbanization*, which will be further discussed in the next section of this research. Finding application methods to lessen the growing consumption patterns of the Egyptian population that is placing an increasing pressure on the land and its rich resources can help achieve the sustainable development goals. It is also important to integrate a productive sustainable land management system within our community, in order to live in a cleaner environment, and leading a better quality of life, and sustaining the resources for the future generations.

As mentioned in ‘The Little Sustainable Landscape Book’ the definition of a *sustainable land management (SLM)* refers to the way of managing a land management unit in a sustainable way for example: conservation areas, farmlands, agricultural lands, forests, urban green spaces etc. (Denier et al., 2015). Sustainable land management focuses on the local level of management and it targets single stakeholder groups (Denier et al., 2015). As discussed in the literature, a sustainable landscape needs to cover a full range of site specific needs such as ensuring that water is available for the surrounding households and for the irrigation of the surrounding green spaces, while providing food security measures, preservation of the natural amenities and the biodiversity, and finally providing income for the local community. The Term ‘sustainable land management’ emerged due to the existence of ‘*sustainable landscapes*’ in the literature; which was termed to describe the landscapes that are supposed to fulfill the sustainable development goals and providing the needs of the present without compromising the needs of the future generations. An *integrated landscape management* approach is a way of managing the landscape and the urban green spaces through the involvement of multiple stakeholders. In order to better understand the implementation of the integrated land management system within the studied context that will be later discussed in this research, the framework comprising of the key five elements: monitoring, multi stakeholder platform, shared understanding, collaborative planning, and an effective implementation must be readily available to further evaluate the spatial context of the site to achieve a sustainable development in line with a good governance approaches to further sustain the site (Mitchell, Scherr, Van Der Put, Lambertini, & Tercek, 2015).

According to Beatley (2000), green urbanism is the concept that engulfs both environmental and urban sustainability through addressing the policies, programs and designs for the intended context. It is by no means that incorporating the factors of sustainability and achieving a successful, and efficient outcome on ground is the biggest challenge for compact cities today. The findings in the literature in regards to Green Urbanism, Usama Nassar (2013) is leading the text to case studies and concept application within the Cairo region when he discusses the absence of principal application of green urbanism in Egypt. The journal discusses the concepts of green urbanism and how it can revitalize urban public spaces in order to achieve a sustainable model by using analysis and design approaches to create a high quality of life within the highly populated and socio-economical fragmented city of Cairo (Nassar, 2013). Some of the design characteristics of green urbanism in cities as stated by Beatley (2000) are: living within ecological limits while reducing ecological footprints; green spaces should be allowed to function in a natural cycle; achieving a comprehensive approach to the relationship between actors involved;

striving for a local and self-sufficiency through supporting the food production, economical market, and consumption reduction; promoting a sustainable social lifestyle; and creating more livable communities.

Adding on to Beatley definition, Mehaela (1993), further states that green urbanism ‘aims at promoting an energy efficient urban built environment that is striving to restore existing towns and redesign a post-industrial city center’. The principals of green urbanism as Steffen Lehmann states in his book are energy and materials, urban planning, socio-cultural aspects, and water and biodiversity (Fig. 12). He goes on to define what this principal is mostly concerned about in regards to introducing inner-city gardens, urban agriculture and green roofs to further maximize the resilience of the eco-system through the urban landscapes (Lehmann, 2010). Further analyzing the ways of application of an urban agricultural landscapes that is able to promote social and environmental sustainability is necessary into finding ways and solutions for creating a well-planned, productive landscape within the urban built environment that is able to incorporate economical values and one that serves the inhabitants of the local community and its local ecology.

Anthony Walmsley, an English landscape architect discusses the greenways and how they have been the topic of interest in the 21<sup>st</sup> century with their diversification over the years. The author goes into discussing the concept of Green infrastructure and how it is important to create an interconnected system of green spaces and the concept of *Smart Conservation* or in other words *Smart Growth*. The author also discusses the new urbanism theory and TOD (Transit Oriented Developments) and the establishment of *green corridors* that should be preserved and efficiently maintained for the purpose of establishing a well-functioning ecology in conjunction with the new urbanism and modern development. Transit oriented developments have started to gain notice when the city planners and engineers started to put more emphasis on vehicular movement rather than pedestrian movement (Hall, 1973). Today, the modern city is a direct result of the regulatory planning and the impacts of the automobiles. Green corridors can also be thought of the larger term for the streetscape systems and street medians that is already planned for within the urban infrastructure. *Sustainable Streetscapes* plays an important role in formalizing the sustainability of the surrounding community, as it is one of the influential factors that contribute to the success of the urban city. It contributes to the sustainability of cities through addressing the three pillars of sustainability on various levels. The streetscape is an approach used to describe the elements that make up the natural and urban fabrics and the efficient quality of streets (Reeman, 2012). A good approach to a sustainable streetscape add to the factors of achieving a sustainable green and compact city. The elements

that make up a sustainable streetscape system are referred to in the (Appendix Table 10). The management of a sustainable urban green space goes in line with a sustainable streetscape system because both concepts discuss the maintenance, as well as the design of the streets with all of its elements incorporated. The idea behind achieving an efficient streetscape system and restoring a sense of engagement within the urban green spaces through addressing the environmental, social and economical pillars of sustainability acts in a way into achieving a productive land and will benefit the civil society and the community, and the overall wellbeing of the residents and provide a better quality of life. The literature agrees that by protecting the open lands, it will help shape the patterns of growth in the region and it will proceed to feed into the greenway movement.

The concept of *Green Infrastructure*, also takes on a leading role in the literature when discussing the factors that contribute to a well sustained management of urban green spaces. Green infrastructure covers a wide array of concerns and especially water management. It is an approach that mimics the natural cycle of water management in the urban built environments. Green infrastructure is about finding solutions to the urban problems through mimicking its natural cycle and providing economical, and more efficient ways to enhance the quality of life within urban communities. For instance, instead of building highly expensive water treatment plants, plant more vegetation, trees, and restore wetlands to clean gray storm-water at its source (“What is Green Infrastructure?” 2016).

A recent study conducted in Dresden, Germany has discussed the concepts of ‘Green Infrastructure and Ecosystem Services’ and how the urban nature has managed to drain the benefits of the residents. In order to make cities fit for the societal challenges (climate change, healthy living, resource consumption), we need a better understanding of how to cultivate the concepts of compact cities that is in line with the development of the urban green spaces. Thus, discussing possible policy implementation into achieving a secured sustainable development within the urban built environment (Artmann, Bastian, & Grunewald, 2017). The literature points out the fact that the high quality soils are being destroyed due to urban sprawl and likewise, the food supply is being threatened as well due to the high consumption on the real estate market. It also highlights the importance of the public participation in order to have an integrative urban space planning that will guide the path to green cities.

*Urban Greening* is another term used in the literature to describe the public landscapes that brings together the environment with the urban dwellers. Urban Greening is an approach that is engulfed under

the broad concept of Green Infrastructure as regarded by the U.S. EPA (“Benefits of Urban Greening,” 2017). The benefits of urban greening are also similar to the benefits to the sustainable streetscapes from the literature’s point of view as they fall under the same umbrella of achieving a green infrastructure within the urban environment. Some of the benefits of the urban greening as mentioned in the article are stated in (Table 1).

Greenway systems have helped mitigate the loss of the natural spaces that are often associated with visual qualities, recreational areas, education, a sense of wellbeing, as well as the preservation of the natural ecosystem within the urban environment. Architect and urban planner, Khalid Imam at the Cairo University discusses the role of the urban greenway systems in planning the residential communities in a sub-urban development west of Cairo. Illustrating a concept of urban greenway systems in order to structure a better functioning community, and suggesting a model for the integration of a proper linked park and urban greenway system as it is considered one of the responses to deal with the physical and psychological pressures that urbanization is putting on the community. The planner also identifies a suggested procedure for integrating natural, recreational, and knowledge based cultural greenway corridor into planning future developments (Imam, 2006). Ebenezer Howard supports that the city should be bounded by a green belt to control the urban sprawl and the built up areas of the cities (Howard,1965). Today, more focus is given at widening streets to accommodate the heavy vehicular traffic in cities, even if it will come at the expense of taking away from the urban green spaces and street medians, taking down trees, and plantation, eliminating the identity of the roads.

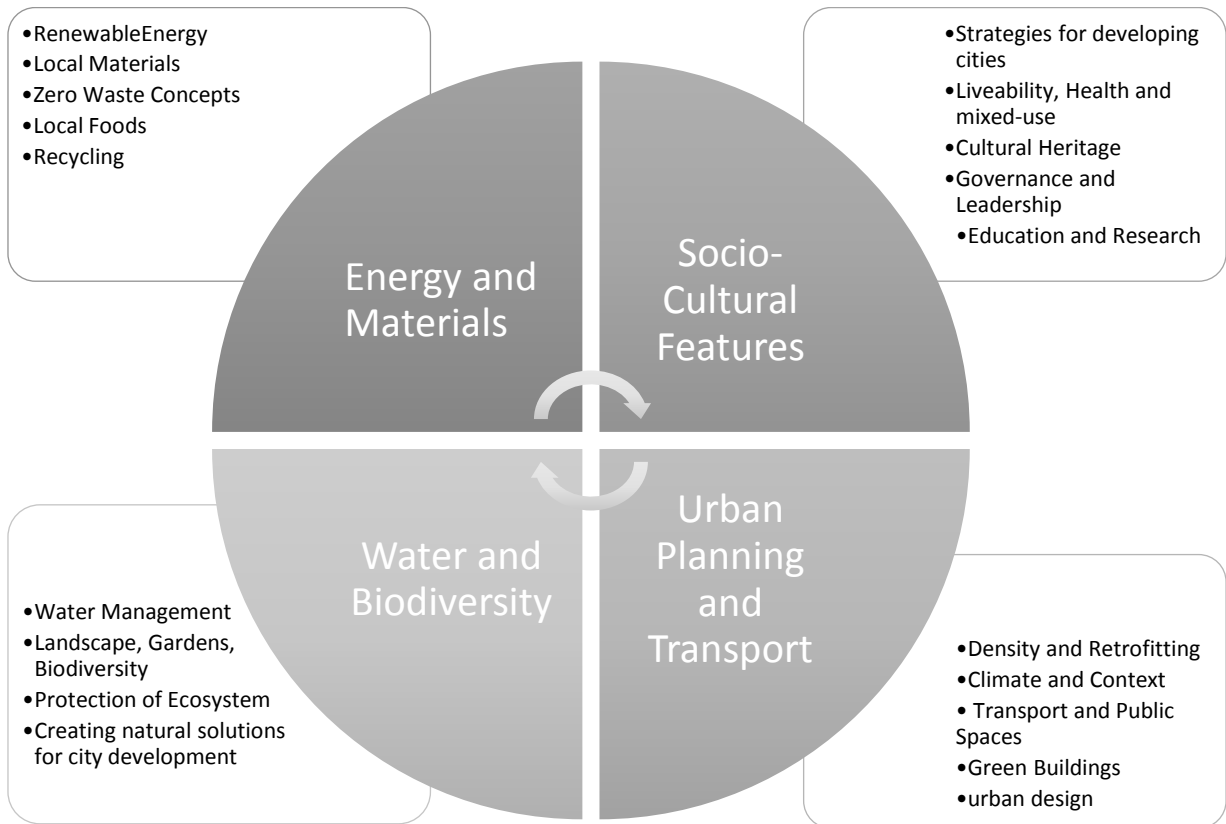


Figure 12: Pillars of Green Urbanism edited after Steffen Lehmann (Lehmann, S. (2010). Green urbanism: Formulating a series of holistic principles. SAPIENS: Surveys and Perspectives Integrating Environment and Society, 3(2).

Table 1: Benefits of Urban Greening (“Benefits of Urban Greening,” 2017).

<b>Benefits of Urban Greening</b>
Increase in property values and curb appeal along
Vegetation produces oxygen, minimizes air pollution, absorbs GHGs, reduces global warming effects
Urban bio-swales, and urban gardens along sidewalks reduce flooding, and water pollution
Calms the traffic therefore reduces crashes
Physical and mental barrier between streets and sidewalks
Provides natural habitats for ecosystems
Reduces crime rates
Promotes exercise and wellbeing of city dwellers
Increases the revenues in shopping districts
Absorbs noise and increases privacy
Builds neighborhood and civic pride
Sustainable communities and green cities
Creates identity to the neighborhood
Lower incidence of asthma

The idea of incorporating urban activities and mixed-use developments together within close proximity to facilitate accessibility of services is the idea of a compact city. Compact city approach is classified as ‘high density, mixed land use, pedestrian oriented habitation, the utilization of development reserves for construction projects and the structural transformation of former industrial areas or fallow land into service or residential areas of high quality, enabling the creation of both resource efficient systems and good, engaging design for attractive cities with good quality of life’ (Tappert, Klöti, & Drilling, 2017). The high dependency of vehicular modes of private transportation in the city should be limited, especially in a city as Cairo, with the heavy traffic congestion and the road conditions, and emphasis on other modes of transportation should be used such as biking, cycling, walking, as well as the usage of public transit. In a compact city, approaches need to be taken to support the human scale factor in order to provide a better quality of life and extra emphasis on the effects of the local environment. The literature discusses the advantages of the compact city with are: less dependency on private cars, lower gas emissions, and reducing the energy consumption (Panduro & Veie, 2013). The idea of a compact city discusses the factors of contribution to achieve a better quality of life through the diversification of the

city, preservation of green spaces, increasing accessibility, and the application of green infrastructure principals to provide a sustainable urbanization intervention within the city.

To conclude this section, the literature provides an overview of the different theoretical concepts of the urban green spaces and how they can be used as application tools in approaching the overall management of green spaces in compact cities. Concepts of green infrastructure has been continuously repeated and highlighted in the literature, especially when we focus our research on compact cities and how it links to urban green spaces. An integrated land management system is another approach used that helps in managing the urban landscape through the involvement of multiple stakeholders that revolves around a shared understanding, collaborative planning, and an effective implementation and monitoring. These approaches help in formulating an understanding of the factors that contribute to a sustainable management of urban green spaces and will aid in prioritizing the indicators for the local case studies. First, we need to look into the different kinds of management schemes in the literature to gather the full scope of sustainably managing urban green spaces.

### **C. Management of Urban Green Spaces**

The continuous urban expansion in the cities, has posed a problem for its integration of landscape management. The integrated landscape management is defined by the Global Canopy Program as ‘a way of managing the landscape that involves collaboration among multiple stakeholders, with the purpose of achieving sustainable landscapes’. The governance structure, size, scope, and type of stakeholders involved can vary. The level of cooperation and the degree of involvement of city administrations (Baycan-Levent & Nijkamp, 2009) also varies, from information sharing and consultation, to more formal models with shared decision-making and joint implementations. In order to better understand the implementation of the integrated land management system within the studied context, the framework comprising of the key five elements: monitoring, multi stakeholder platform, shared understanding, collaborative planning, and an effective implementation must be readily available to further evaluate the spatial context of the site. The following elements will further sustain the context through a good management approach (Mitchell, Scherr, Van Der Put, Lambertini, & Tercek, 2015). As Colding (2011) discussed in his research that a more compact growth scheme towards urban planning is needed.

Today, only a few countries have specific regulations that serve the landscape intervention approaches and its protection from the urbanization growth in cities. We suffer the lack of standards that



are aimed to protect the UGS from the damages of the human activities that are occurring as well as the restoration of the land moving towards a more industrialized based market economy. No rules are enforced to better regulate the use of the natural areas and the quality of the landscapes. There are only 12 countries out of 160 international organizations for standardization committees (ISO) that have passed standards regarding the protection of the landscape or efficient use of the landscape in general (Calleja-Perucho, Mazarrón, Pou-Merina, & Cañas-Guerrero, 2015). The authors further discuss the standardization of the landscape at the global level and comparing all international committees around the world and finding the most efficient ways in providing a global vision of the international regulations in regards to the urban landscapes. They divide the research to four main themes and they are: defining the terminology of the landscape, defining the landscape profession, discussing the rules of intervention in the landscape, and finally the landscape protection measures. They continue to discuss the benefits of standardization and the fact that it is helpful first to the developed countries that already have a well-established high quality landscape into aiding in developing landscape norms for the less developed countries that the deterioration of the landscape is apparent. This is because they can help aid and maintain the quality of the landscape for the under developed countries since they will be advocates for policy implementation measures that can contribute to the overall recovery of the natural spaces and for the purposes of this research the urban green spaces (Calleja-Perucho, Mazarrón, Pou-Merina, & Cañas-Guerrero, 2015). The literature is very helpful in a sense that it brings together all the documents and papers published regarding the standards and the specifications of the landscape; where it can be used as a good starting point for referencing the implementation standards. It also points out the gap in the knowledge in the landscape and how it is often misunderstood with other fields of investigation such as horticulture, agrarian, and construction fields of study. It also provides all the sources for all the international agencies, organizations, institutes, etc.; that share this common knowledge of landscape standards at the international level which is very helpful when it comes to applying a well-integrated land management approaches into the context in Cairo. This will lead to better maintenance techniques, operations as well as increase the productivity of the overall management of the urban green spaces. In order for green spaces to be well designed, maintained, and managed, the entities responsible for their planning, need to think more strategically in order to achieve specific objectives.

Contracting out services related to urban green space maintenance has been a common practice in the management of the landscapes around the world. This caused a challenge in monitoring the provision of services delivered, leaving the public management faced with a struggle to implement a functional

framework to better adapt new reforms of performance management (Lindholst, 2008). In a research conducted by Lindholst and efforts from the Danish Agency to improve the management of green spaces focusing on the historical parks and gardens, an ‘action research intervention’ was on the line of implementation to improve the management contracts of green spaces. The study introduced four main dimensions: specification, monitoring, pricing, and enforcement of service provisions and classified them under the ‘standard framework’ for accessing management schemes which included: specification, enforcement, pricing, and monitoring. The agency realized that the standard dimensions need to be revised further and so they came up with an ‘extended framework’ system which proposed a new set of dimensions: role of coordination, restraints of power, motivation, and communication (Lindholst, 2008).

While the design of the urban green spaces along with adequate funding are key measures in providing for a well-managed spaces, it is essential to facilitate the provision of the management schemes provided by international landscape standards and keep them in line with the contextual interventions. Coalitions are also prone to happening when it comes to the management and the governance of urban green spaces. There are pros and cons to each side of management systems. A research has been found based on data analysis and collection stating, that local coalitions are widely more common and prone to occurring compared to coalitions at the regional scale. Some of the mentioned fallbacks of the non-governmental stakeholders varies from the validity and viability of the long term involvement to lack of resources available which puts them at the weaker end of the scale to engage in strategic partnership of managing or leading a project.

When it comes to accessing the sustainability of the management of the UGS, assessment tools must be readily accompanied for to further analyze the data in hand. Accessing the decision making control, a socio-environmental impact assessment is necessary to better integrate social and environmental considerations when it comes to accessing the planning efficiency, development, and implementation of a project (William, 2000). When it comes to the assessment of the environmental impacts of the government’s policies and practices, an environmental audit is a necessary tool to analyze. This includes assessment tools used to measure the monitoring and evaluation of the provision of services as well. Various assessment tools are also in use in the field of managing urban green spaces when it comes to classifying the sustainability indicators such as: environmental action planning and management, sustainability appraisal, social auditing, and eco-management and audit system (William, 2000).

## 1. Non-governmental and Community Based Management

Comparative analysis has been conducted on European cities as part of the URGE project (Development of Urban Green Spaces to Improve the Quality of Life in cities and Urban Regions) and it considers urban green spaces as an influential contribution to the sustainability of cities. It aims to compare the availability and the current state of urban green spaces of the chosen cities. As mentioned in a brief by the World Health Organization (2017), “Urban Green Spaces is an important investment that local authorities can make on behalf of citizens and their wellbeing”. Urban green space intervention improves the quality of life for the neighborhood as a whole, and a broad range of stakeholders, government officials and community members need to be involved in the strategic planning of such spaces. These interventions serve the underprivileged areas like poorer communities and it reaches out to various population groups and promotes social participation. Community participation in the initial planning and design phases of the urban green space developments assures that the local needs are met. Besides involving the local residents into the planning phase, the local government needs to set a certain budget on the side to fund the facilitation of the community engagement. This also helps that the space developed will be occupied by the residents and community members since it is designed based on their needs. The collaboration between civil society actors and stakeholders can help the intervention of the urban green spaces to be more effective (WHO, 2017).

The World Health Organization has made recommendations to help support the collaboration between stakeholders, policy makers, and local community to promote the multi-approach collaboration between the different sectors such as environmental entities, transportation sector, health sectors, police departments in municipalities and social affairs sector, to help maximize the benefits and the use of the urban green spaces and prevent the negative impacts. The second recommendation is to partner with local business and NGOs to help fund the spaces and support the maintenance as well. Collaboration with academic entities, and research centers helps create an effective planning, monitoring and evaluation of such interventions and finally the fourth approach is to expand those interventions not only on the local level but on the regional and city scale levels to maximize the sustainability and the longevity of the spaces.

In regards to the community based management techniques and approaches, most of the studies that have been published whether it favors the community based management systems or the government based management, the literature has always favored and supported the dual approach when it comes to

the management of urban green space interventions because it couples the physical improvements with the social engagements, the local participation and the urban environment together to maximize the benefits of the interventions on the physical ground. As it is widely apparent that the local government retain a role in the decision making processes, local communities and non-governmental stakeholders need to also be involved in the decision making processes. There needs to be a change in the way we think about the duties of the various actors in our society and this action has been termed ‘government to governance’ (Buizer et al., 2015).

The involvement of multiple stakeholders has been increasing nowadays and the concept of decentralization has been gaining more attention in the public realm in the developing countries. This kind of involvement brings to our attention the ‘self-governance’ form which is the involvement of non-governmental actor group where they play a major role in the decision making and the management of the green spaces and the governmental authorities take on a distant role (Arnouts et al., 2012). As Kooiman (2003) likes to define self-governance as a form of governance where ‘the capacity of societal entities to govern themselves autonomously’ as a major integrated principal. Self-governance is a form of governance where the government depends on the capacities of the actors from the society or the market to independently govern themselves (VROM-Raad, 1998; Van Montfort & Oude Vrielink-van Heffen, 2006). Another approach to self-governance forms of management is that it can increase the societal coordination as well (Huygen et al., 2012).

Under the umbrella of community based management, the emergence of knowledge governance prevails. The governance of knowledge based management is when the community becomes independent on the use of knowledge and be able to manage itself and sustain itself (Bouwma, Gerritsen, Kamphorst, & Kistenkas, 2015). This concept plays a big role into the application of sustainable urban management systems. In line with this concept, knowledge governance is explained as ‘...organizing the development of knowledge in order to deal with societal problems. Knowledge governance is aimed at creating new insights, and innovative solutions which tempt actors to leave traditional insights and practices and get away from inert interaction patterns, stalemate negotiations, and interest conflicts’ (Van Buuren & Eshuis, 2010). This type of non-governmental management implies that the actors are continuously engaging in the learning process revolving around the development of knowledge as a self-effort process.

In order to analyze management arrangements in the European countries, there exists multiple ways in which non-governmental actors get a say in the decision making process whether it is within the planning, the management, and the design of the urban green spaces (Buizer et al., 2015); which can be

compared to the Egyptian context. Non-governmental and community based management approaches face structural difficulties when the lack of funding is existent and the vulnerability of such responsibility as the management and the maintenance is placed on authorities other than the government. When further consultation is needed in regards to ‘strategic involvement in the decision making process,’ the government does not only rely on private actors, but it can delegate ‘some’ of its decision making powers to the non-governmental authorities. When non-governmental actors both initiate and coordinate a project, then it can be argued that it is ‘initiated and led by non-governmental authorities’. Thus in this type of initiative, the government can indirectly play the supportive role by providing budgetary funding as well as agreeing on the managerial rights within the public properties (Buizer et al., 2015). A survey has been conducted as part of a data collection process in the previously mentioned study and it addressed the types of stakeholders that were involved in leading urban green spaces initiative in their opinion, and most participants scored highest on community groups, NGOs and businesses were on the same equilibrium. Sponsoring green space initiatives in the urban development can vary in the level of non-governmental actor engagement from secondary and reactive to leading and active (Arnstein, 1969).

## **2. Government and Municipal Management**

One of the main reasons for the consistent low quality of public services (ex. the maintenance and the management of the public spaces), is the lack of the local citizens to hold the government officials accountable; even though, the concept of indirect citizen participation is acceptable but there needs to be direct citizen participation in holding the government accountable (El Baradei, 2014) for the poor quality services that is provided to the citizens. A high level of control is managed by the government when it comes to planning, management, and design of urban green spaces. An analytical approach is needed to study the various forms of participatory management systems of government actors and non-government actors to be able to fulfill the required duty towards a good quality of public green spaces; which is readily made available through anticipating in a policy arrangement approach (Arts et al., 2006). When it comes to the evaluation of an efficient municipal management scheme, the transparency of the authority is questioned and how effectively can the entity manage its resources (Gilbert, 2009). The issue with the government management systems is the sustainability of the project after the implementation process has been initiated. Local attention is lacking when it comes to the procurement of the provision of services and the sustainability and self-dependency after the project assets are set in place. Delegation of powers and duties needs to be effectively reinforced and the concept of decentralization needs to be entailed in

depth in order for the operations and maintenance of the urban green spaces can effectively be planned and enforced.

As mentioned in a study by the World Bank regarding ways of improving the municipal management for cities (2009), it discusses four main reasons why it is incrementally challenging to improve the management techniques of the municipalities:

- ❖ larger cities to administer
- ❖ continuous rapid urban growth
- ❖ rising costs of urban investments
- ❖ increasing expectations of the quality of the municipal services

Along with the high demands of continuous infrastructure and services needed to provide for the growing urban population of the country (as Egypt), the municipal authorities are exceeding their resources and system capacities to respond for the demands of the citizens (Gilbert, 2009). Not to mention the economical challenges the country is facing and the devaluation of the local currency effecting the rising costs of the provision of services, systems, resources, etc. Government based management is a key player in managing the urban green spaces at the local level and the regional level as well, because they procure the capability of leading strategic decision making planning approaches that would lead to the expansion of the city as the country is becoming more and more urbanized (World Bank, 2008). The proposed strategy of the ‘World Bank Urban and Local Government Strategy (World Bank, 2000)’ believes that the municipalities are key providers for the local services as they improve the livability and the quality of life of the citizens.

There is a lack of communication between the citizens and the official government (Buizer et al., 2015). Initiatives led by government managed systems tend to fail because of the lack of citizen participation involvement from the initial phases of design and implementation, on the other hand, the community based management systems and initiatives led by the community lack in accessing adequate funding for the sustainability of the public spaces and the urban green space initiatives. A rerun of the duties and responsibilities and accessing the proficiency of each authority and delegating tasks to the associated actor that can exert efforts and provide a good quality outcome is a necessity in the Egyptian context.

### 3. Participatory Management and Co-governance

‘Governance’ has become a dominant concept, moving from the political science realm into a more practical policy domain (Bryant and Wilson, 1998; Kooiman, 1993; World Bank, 1991). It is more commonly used to describe a wide range of actors into governing a larger body of people or other authorizations, enterprises (etc.) in an equal, transparent participatory manner. Governance as agreed upon in the literature can be made up of institutional and political processes where decision making are seized and implemented (“Local Governance | United Cities and Local Governments,” 2014). Good governance approach is critically important because it acts as a governmental form of interaction between the urban communities and the citizens on a regular basis. Adding on to the definition of governance by the World Bank:

“Good governance is epitomized by predictable, open and enlightened policy-making, a bureaucracy imbued with a profession ethos acting in furtherance of the public good, the rule of law, transparent processes, and a strong civil society participating in public affairs. Poor governance is characterized by arbitrary policy making, unaccountable bureaucracies, unenforced or unjust legal systems, the abuse of executive power, a civil society unengaged in public life, and widespread corruption” (“Understanding the Concept of Governance,” n.d.).

In order to improve the local government to be able to maximize the efficiency of the administrative processes, expand the economic development, and to further ensure the sustainability of the environment and social inclusion, a good governance approach is needed and advocacy on decentralization is necessary (“Local Governance | United Cities and Local Governments,” 2014). Considering back in the past, where the land use planning and management were strictly viewed as governmental tasks, situations have shifted to where non-governmental organizations, private enterprises, and local communities are expected to get more involved in the decision making process (Cowell and Murdoch, 1999). In line with this shift, the development of ‘concepts of governance’ have been emerged across Europe, along with an increased prevalence of civil society organizations (Rosol, 2010). Aside from these trends, in reality, the government is still an active player in the planning and management of urban green spaces (Mattijssen et al., 2014; Hysing, 2009).

Participatory Governance is solely contextually based and what is considered a common practice in one context can be unusual for another. Participatory governance supports innovative approaches as

assured in the literature. To achieve an innovative governance approach, the actors involved must work under the compliance of willingness (Williams, 2000). Aside from the public management team to be willing to comply, the conference published brief also suggested a set of strategies that should be followed to allow for a coherent stakeholder participation such as: resource allocation, agreement on common interests, and a socio-economical equity. To further breakdown the measures of governance used in any management institution, Buizer (2015) has summarized the five types of involvement as follows:

1. Consultation on plans, which involves public authorities setting up a citizen- consultation process in relation to certain issues, plans or developments.
2. Strategic involvement in decision making, which involves public authorities delegating some of their decision-making power to non-government actors, while maintaining the final decision making powers.
3. Co-operative forms of management, which involves government actors inviting non government stakeholders to share rights and duties or facilitating projects initiated by non government stakeholders
4. Informal spontaneous attempts to influence policies or green space practices, where non government stakeholders spontaneously express their opinion or organize civic movements.
5. Informal green space management activities, where initiatives concerning green space management emerge in a bottom up way without significant government involvement.

Further discussing the importance of participatory and co-governance approaches in mobilizing the sustainability of the management of urban green spaces, Ronald William (2000) also suggest that the government actors that should be involved in the assessment are: politicians, physical urban planning agencies, waste management and water management agencies, and environmental management agencies should be involved in the decision making processes. Not to mention that the role of non governmental agencies, the local community, and local enterprises, also need to be involved in the decision making control to be able to provide for a collaborative management system.

After discussing the historical and theoretical background of urban green spaces, the urban planning and management systems, the socio-cultural and economical perspectives, as well as the various management types of urban green spaces, we can conclude that in order for urban green spaces to be sustainably managed, the following factors of contribution need to be available: joint implementation, collaborative planning between various stakeholders, mixed and adaptive conditional models need to be adapted, participatory governance approach (dual approach), and an involvement of the entire community in the strategic and management processes of urban planning and development needs to readily available



in order for urban green spaces to be sustainable. Looking at international best practices will help in understanding how other case studies were able to apply these factors within their context so we can learn from their trails and experience. International best practices will also add to the list of factors of contribution, and will help in formalizing the conceptual framework of this research.

#### **D. International Best Practices**

This section discusses three best practices. In the Brazilian case study, it is merely focused on the public squares in Sao Paulo, and how they are managed within the country as well as other public green spaces and the roles of the entities that are responsible for each. The second case study discusses the planning and management of urban green spaces of twenty-three European cities and it focuses on the planning and the policy perspective of management, and the third case study discusses the integrated management of urban green spaces in Guangzhou, China, and it is more concerned with the environmental perspective and the success factors that contribute to a well implemented strategic planning of urban green spaces in compact cities. The following case studies were chosen because they focus on different perspectives of concerns and they are located in different contexts around the world for a better comparison and evaluation.

##### *Case 1: Sao Paulo, Brazil*

In a study conducted on the city of Sao Paulo, Brazil, it focuses on the decentralization management of the public squares and how it contributes to the implications for the urban green spaces. Benchimol (2017) mentions in the published research that urban green spaces can be defined as “either public or private spaces, compromising of permeable soil and presenting the prevalence shrubby vegetation groups that have ecological, conservational or recreational roles and are open to the public (Myers, 1975).” More definitions of green spaces are provided in (Appendix Table 9) based on the literature and the public managers that were interviewed in this specific research.

Similar to the Brazilian demographics, Egypt shares the same disorganized process of urbanization patterns with less contribution to the enhancement of the urban green spaces and the lack of a more elaborate existence of public policies regarding the environmental potentials that urban green spaces offer. Even though the Brazilian Federal Constitution in 1988 affirmed that the society has a duty to protect its environment, it wasn't until 2006 when the municipal government passed out a law that regulated the

enactment of the components that made up the urban landscapes and enforcing the partnership with the society and their duties towards their local environment in the city of Sao Paulo. This decree has an essential role to play with the individuals and other legal entities to further construct and maintain public green spaces to better support the urban landscapes (Benchimol, Lamano-Ferreira, Ferreira, Cortese, & Ramos, 2017). Another similarity that the Brazilian context share in line with the Egyptian context, is the fact that public square, which are identified as part of the urban green spaces in this research, host a real estate marketing aspect to it that market the adjacent land available, if it was owned by a developer. This is the case that we find here in Egypt, public squares are also used to host real estate market, to represent the society and the historical achievements of the country (via heroic statue placement), a public meeting point for protesting against government actions, and a space for people to rest underneath the shades of the trees depending on the accessibility of the space (ex. Abbassia square/Tahrir square).

Having a closer look at the management model of Sao Paolo under a centralized (Fig. 13) and a Decentralized system will help examine the commonalities and differences between the two institutional frameworks of Egypt and Brazil when it comes to managing urban green spaces. An apparent commonality that stood out is the fact that the management of urban public green spaces in Egypt is allocated under the authority of “cleanliness and beautification” within the general authority of the local government, whose engineers hold a background degree in agronomy or biological sciences and the same lies in Sao Paolo, when it comes to the management of the public squares, they are managed by ‘administrative regions’ which is the same as the ‘municipal governments’ in this context and their employees also share the same educational background. This fact can bring to our belief that the public administration of both countries are supporting the environmental role more overly upon the social role when it comes to the management of the urban green spaces.



Figure 13: Centralized municipal management model (Benchimol, Lamano-Ferreira, Ferreira, Cortese & Ramos, 2017).

The importance of the urban green spaces is not just to quantify their footage overall, but it is as important to qualify these spaces as well (Benchimol, Lamano-Ferreira, Ferreira, Cortese, & Ramos, 2017). To access the evaluation of their benefits whether it is from an environmental, aesthetical, financial or social perspective, is where the difficulty comes in (Caporusso & Matias, 2008). Multiple studies have shown that vegetation is an important factor in accessing the urban environmental quality (Benchimol, Lamano-Ferreira, Ferreira, Cortese, & Ramos, 2017). The literature on this issue requires global attention to implement a well-managed system to improve the current status of the way urban green spaces are being managed. There still lies an administration gap between what needs to be implemented under the municipal government and what needs to be planned for under the municipal green and environmental secretary as shown in (Fig. 14).

The case study also used the government of Denmark as precedents to analyze their management schemes of the urban green spaces. They adopted a new system of performance management that can act as an improvement to the way they hire maintenance personnel of the urban landscapes including parks and gardens according to Lindholst (2008). Lindholst also presented a new set of principals relating to communication aspects, coordination, motivation, and a new model of power decentralization system; which can act as a good example to be followed and applied despite of the difference in context.

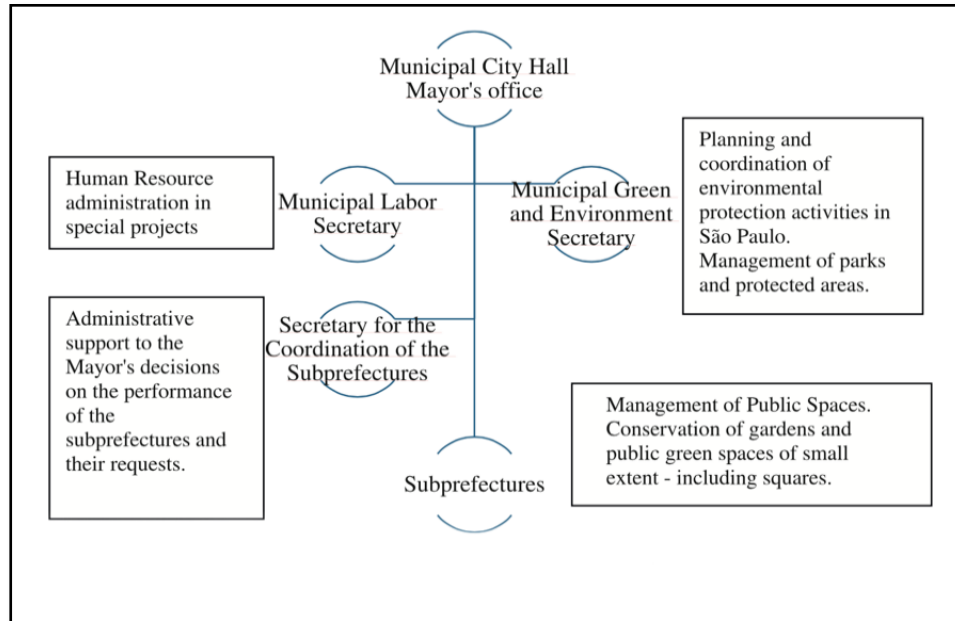


Figure 14: Decentralized Municipal Management Model: Administrative levels and their direct or indirect role in the management of the urban green spaces in the Municipality of Sao Paulo (Benchimol, Lamano-Ferreira, Ferreira, Cortese & Ramos, 2017).

Oliveira and Mascaro (2007), confirm that the inclusion of urban green spaces in the urban planning context is not an easy task, because of the continuous demands of society regarding the limits set forth on the public power overall, and also because of the vitality of the real estate market. Due to these reasons, the constant growth of the urban cities and the management policies do not always line with the common interest of the public. To confirm this study, taking into consideration the society demands need to be playing an effective role in the management process because including the community in the initial phase of planning can and will contribute to an effective performance and regulation of legal policies set forth on the urban green spaces (Azadi, Hafni, Zarafshani and Witlox, 2011).

### Case 2: 23 European Cities

The case study analyzes the current planning and management of urban green spaces of 23 different European cities in order to understand the factors that contributed to the success and the failure of their management schemes. The authors start off by maintaining the benefits of four perspectives of pillars of sustainability which are the social, environmental, economic and planning perspective. The planning perspective discusses the overall quality of green spaces as a unique characteristic to the city in

general. For example, their identity, attractiveness, and their ability to compete against other cities. Even though there are numerous benefits into enhancing the urban green spaces of cities, it is still under analyzed and acknowledged in terms of its planning and management.

### Goal, aims, objectives

The main aim of the research is to investigate the urban green spaces from a fifth perspective and it is the policy evaluation perspective. In order to acquire main features that lead to the strategic planning of the provision of services and its maintenance (Baycan-Levent & Nijkamp, 2009). The study objective is to compare the performance of urban green spaces of different European cities in regards to their decision making evaluation processes of planning perspective.

### Data Collection Methods

The data collection method was based on a highly intensive survey questionnaire the was given to experts within the municipality of each of the evaluated cities. The research used “rough set analysis” as a method in analyzing the data collected. This method is used in identifying the factors that contribute to the performance level of the UGS strategies applied in each city. The selection criteria were mainly the size of the city and the availability of data. Some barriers due to the language were experienced and thus decreased the number of the responses. Described below is the structure of the questionnaires provided and the different themes they addressed but an exact sample of the survey was not provided in the research.

The rough set analysis method main objective is to be able to synthesize the approximation of concepts from the acquired data (Baycan-Levent & Nijkamp, 2009). It also combines data with similar elements by looking at multidimensional measures that aids in minimizing the uncertainties of incomplete data (Baycan-Levent & Nijkamp, 2009). The analysis of the data was all done through using the (RSDA) system which is a software database system to further analyze the performance level of the urban green spaces. The questionnaire was sent via Email to 50 metropolitan areas addressing both large and medium sized cities where their urban green spaces are of a problem raising issue. Their selection of the city was simply based on the size of the availability of data. They were able to get feedback from 23 cities and the rest was facing difficulty with the language barrier of the managers of municipalities.

The research divided the cities into three groups: metropolises, big cities, medium sized cities and the questionnaires were further divided into 6 themes addressing: the quantity and availability, importance,

changes, financing, planning and level of performance. Each theme had its own evaluation criteria help the data entry into the software. They further interpreted the first theme via two variables and they are the proportion of green spaces in line with the total area viewed in percentages and the second variable is the proportion of the green spaces every 1000 inhabitants. The second theme they measured it via labeling whether it is of severe importance on a scale to less important. The third theme regarding the changes in the green space was measured by whether it is increased or decreased. The fourth theme regarding the finances was measured by whether there was an increase or decrease of budget. The fifth theme was measured using variables the first is whether the space was specially planned for or it was integrated within the urban planning initially, the second variable was measuring the amounts of departments that were responsible and the third variable was divided on a scale from very successful to no success at all.

### Results

The results show that there has been a great amount of decrease in the total area of the budget of UGS and there is always more than one department responsible for the planning and management of UGS. They also observed that the majority of the evaluated cities had an experience with citizen participation, they found a neutral equality between cities in regards of its planning. Schemes whether it was originally incorporated in the initial planning or if it was specifically planned for in this specific area. When the data was interpreted in a numerical value using the rough set analyzing method, the researchers were able to identify which of these themes was of most important and which were not significant. They found out that the highest frequency rate was regarding the proportion of green spaces with respect to the total area and the least important category was the planning scheme of the UGS scoring the lowest in data analysis importance level. The researchers were further able to analyze their sampled cities based on their successful level. The findings were very dynamic and all factors, variables were further dependent on one another.

### Conclusions

To conclude the findings of this case study, the researchers came up with five rules investigating the successful factors of the sampled cities in regards to their planning and management. Rule 1 was if there was only one department responsible for the UGS then (city x) would be successful. Rule 2 if the proportion of green spaces was between 10-15 % and the importance level of spaces is medium and there

exists citizen participation then (city x y z) would be of a successful example and so on. They were able to come up with four final factors that contribute to the success of planning and management of UGS: proportion of green areas, the changes in the total green areas over time, the number of responsible departments and finally the level of citizen participation of GS, the higher the total area of GS the more total participation involvement the higher the success level of GS and vice versa.

### Lessons Learned

By analyzing this case study further and closely investigating the methodological approaches they used in collecting the data and analyzing it, it helps in formatting the assessment techniques used in the local case studies from Cairo and how to interpret information in order to create a sub sequential indicator systems to measure the performance of the planning and management sectors that would lead to more strategic approaches to the policy evaluation that is contextually based. The case study was able to interpret the fact that by applying a good cooperative management system between the different authorities it can lead to a successful performance level in terms of planning and management of UGS. Through providing a participating management approach, the exposed challenge of the shared responsibilities can be converted to a successful model and advantages will be created.

### Case 3: Guangzhou, China

The second case study focuses on mitigating the co2 emission through the efficient use of managing the urban green spaces in fast growing cities Guangzhou, china. Reducing the carbon dioxide emission through the natural process of ecosystems is of great importance when it comes to mitigating global co2 levels/ besides the exemplary practices used in green buildings. This case study takes on a different perspective, it is more concerned with the climate change of the ecological perspective and how applying it on efficient integrated land use management system that help with controlling the co2 levels through the conservation of urban green spaces.

In 2000 Guangzhou merged two other counties in their provision of the district area which increased significantly to become one larger urban district. This brought about some challenges and opportunities to the city because this could mean more rural characteristics merging into urban districts where the best of both worlds are met. It was only then that the government realized to create a GS network that incorporated sustainable ecological aspects as part of their strategic plan of the city.

### Goal, aims, objectives

The aim of the study is to better analyze the planning of the mechanism used in managing UGS through applying an effective public policy of a well-managed integrated framework to enhance the functions of UGS and the reduction of co2 emission. This aim can be achieved through implementing a comprehensive strategic development plan system.

The study discusses the idea behind an integrated management and ways it is used to protect the water, land and coastal zones (2009). It mentions the ICZM which is the integrated coastal zone management that was introduced by the United Nations in Agenda 21. It discusses the good principals of the ICZM putting into consideration that the ICZM can be used for integrating concepts of UGS as well, as shown in (Table 2). By using these principals interchangeably, one can begin to understand the benefits of an integrated management system.

As mentioned in the first case studies that the management of UGS is divided between more than one responsible department and institution which is likely the case in Guangzhou, china as well. The local government in this case is responsible for issuing regulations and implementing direct management techniques related to the UGS. On the other hand, the spatial boundary, the land use zoning and the construction activities are the responsibility of the urban planning bureau as well as the land and resource bureau as shown in (Fig.15).

### Challenges

Some of the various challenges they faced was the lack of planning of development on the rural areas that involved a collaborative ownership form different groups (government and citizens) (2009). Other challenges they had to face were extreme rapid urbanization in the city which caused surrounding agricultural lands to be used for non-agricultural purposes. The ecological systems in the rural areas were very fragile and were prone to deteriorating due to the urban/rural dichotomy. The huge population density was another challenge due to the fact that rural areas surrounding the city were approved by the control government to be converted to urban districts.

Due to these challenges the government acknowledged the importance of conserving its natural environment such as prohibiting development on arable lands and providing intensive maintenance to the parks and square at the tourist attractive scene areas. Due to the boundary expansion that took place in 2000, the municipal government took initiative to implement a strategic development plan that encompasses the new boundary expansion.



Table 2: Eight Principals of Good ICZM (HUANG, LU, WANG, 2009).

<u>Eight Principals of Good ICZM</u> <u>'Coastal zones are substituted with urban green spaces'</u>
<p>Principal 1: A broad overall perspective (thematic and geographic) which will take into account the interdependence and disparity of natural systems and human activities with an impact on urban green spaces.</p>
<p>Principal 2: A long-term perspective which will take into account the precautionary principal and the needs of present and future generations.</p>
<p>Principal 3: Adaptive management during a gradual process which will facilitate adjustment as problems and knowledge development. This implies the need for a sound scientific basis concerning the evolution of the urban green spaces.</p>
<p>Principal 4: Local specificity and the great diversity of European urban green spaces, which will make it possible to respond to their practical needs with specific solutions and flexible measures.</p>

<p>Principal 5: Working with natural processes and respecting the carrying capacity of ecosystems, which will make human activities more environmentally friendly, socially responsible and economically sound in the long run.</p>
<p>Principal 6: Involving all the parties concerned (economic and social partners, the organizations representing urban green space residents, non-governmental organizations and the business sector) in the management process, for example by means of agreements and based on shared responsibility.</p>
<p>Principal 7: Support and involvement of relevant administrative bodies at national, regional and local level between which appropriate links should be established or maintained with the aim of improved coordination of the various existing policies. Partnership with and between regional and local authorities should apply when appropriate.</p>
<p>Principal 8: Use of a combination of instruments designed to facilitate coherence between sectorial policy objectives and coherence between planning and management.</p>

The municipal government in cooperation with the urban planning bureau required three main themes to the development of the long term strategy. They are: the incorporation of 5 well known universities of planning institutes, the focus on an urban ecological environment and the integration of documents by formalizing a dynamic strategic development plan. The objective of the strategy is that through establishing a natural ecosystem in line with the urban built environment, a well-integrated urban and rural ecology will be produced that would further feed into the sustainability of the city and add to its global comprehensiveness.

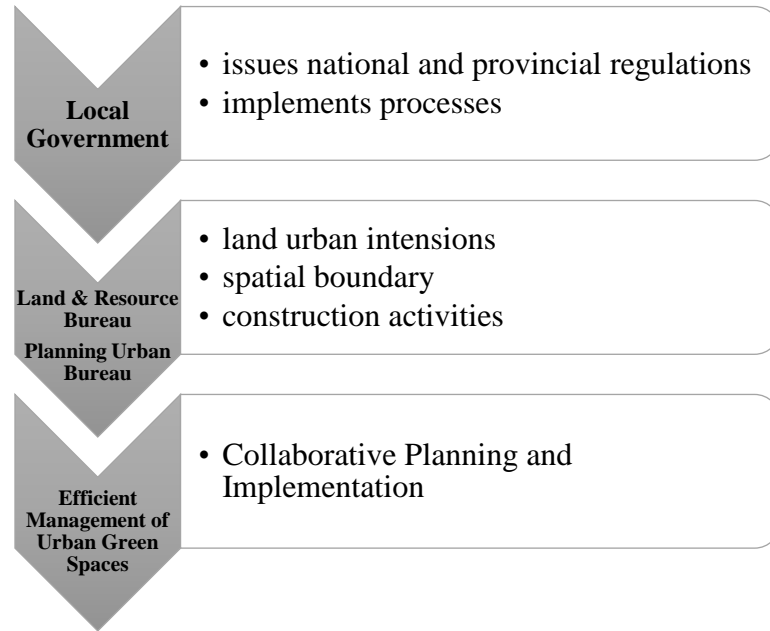


Figure 15: Complex Institutional Framework of Guangzhou, China.

In line with the above initiative, the environmental protection bureau of Guangzhou also launched an in depth research regarding the strategic plan for the city (Huang, Lu, Wang, 2009) protecting all of its green belts, green corridors and its water delta to avoid urban sprawl. The sustainable development plan of eco-city's purpose was to evaluate the indications of the urban ecological indicators of whether or not actions were taken quickly and the implementation of the plans started to be constructed to accommodate the quick development of the city. The development of the Reform Commission was the entity responsible for the implementation part.

### Results

The outcome of the research concluded that the different works of the departments got the approval from the municipal government. A set of an integrated strategical system incorporating ecological conservation systems, environmental approach and application of a sustainable development measure was the result. All the previous plans were then incorporated in the final comprehensive strategic development plan of the structure of the UGS that was further adopted after this initiation.

In 2002, the municipal and landscape bureau came up with The Green Space System Plan, where it discussed the green space elements of proposed areas to be conserved, but unfortunately the plan failed because it did not incorporate the complex land use rights of the planning permits of the urban districts. This was one of the main challenges that the municipal government had to face when it came to the

implementation of these plans. This case study proved that the efforts of protection and development of urban green areas in compact cities is way beyond the capacity of one municipal department or agency.

The government did not give up and came up with a three-year plan revolving around the integrated implementation approaches. The government then distributed the tasks amongst different entities to work on and made sure that each task matched their scope of capabilities and began to allocate resources for the project. They later succeeded in implementing the action plan which later provided economic benefits and created more employment opportunities for the city and the country overall.

### Conclusions

After struggling with incorporating an efficient management system in order to come up with a strategic plan for the conservation of UGS in the city of Guangzhou, china they were finally able to reach their goal. This outcome could not be done without integration of multiple institutions and entities together to produce an effective innovative solution for the city. The government was able to delegate the right tasks to the right institutional department after many trial and error experiences. The downfall of this case is the fact that non-governmental organizations and social participation were not involved in the formulation of the action plan. The objective of creating a well-structured strategic plan or an action plan was to shorten the gap between implementing policies of preserving natural environments with highly growing cities and providing a coherent approach to planning and management measures on how to control, plan, develop, and maintain urban green spaces to provide a better quality of life overall.

### Case study comparison

The following (Table 3) shows the common factors verses the differences between the case studies. Outcomes are elaborated in the table as well. These outcomes are similar to the recommendations that were extracted from the literature earlier in this research in regards to the factors that contribute to a well-managed urban green spaces.

Table 3: Compared analysis of international case studies and suggested outcomes.

Common Features	Differences	Outcomes
<ul style="list-style-type: none"> <li>• Discusses land use planning</li> <li>• Responsible entities one or more decision makers</li> <li>• Support cooperative governance</li> <li>• Application of strategic plans and management model</li> <li>• emphasis on involving the private sector and NGO's</li> <li>• Support the policy evaluation perspective</li> </ul>	<ul style="list-style-type: none"> <li>• Case 1&amp;3 focuses on ecological perspectives, Case 2 focuses on planning perspectives only</li> <li>• Case 1 concerned with estate market aspect</li> <li>• Outcome was based on factors of contribution in case 2 vs. one methodological approach in case 1.</li> <li>• Comparative vs. methodological analysis</li> <li>• Evaluated based on 23 cities vs. one city</li> <li>• Results in case 1 incorporated different criteria topics vs. results in case 2 was simply successful or not</li> <li>• Case 1 focuses on creating a decentralized system</li> </ul>	<ul style="list-style-type: none"> <li>• Delegating tasks to different institutions within their capacity.</li> <li>• Include the social participation</li> <li>• Principals relating communication and motivation is prioritized</li> <li>• Sharing of responsibilities is key</li> <li>• Sustainability of UGS management depends on legislative support</li> <li>• Application of cooperative management is essential</li> </ul>

By analyzing the three international best practices and comparing them to one another, one can conclude that the outcomes extracted are similar to the outcomes that the literature review introduced. Each case study targeted a different perspective of the management of urban green spaces, but what is noticed is that both the literature and the international case studies outcomes compliment one another, further adding to the factors of contribution to sustainable management of green spaces in the urban developments. The research is ready to extract key themes and main criteria that feed into creating the indicators to assess the performance levels of the local case studies in Cairo and discussing the conceptual framework of the study in the next chapter.

### III. RESEARCH METHODS & CONCEPTUAL FRAMEWORK

#### A. Conceptual Model

The conceptual framework classifies the sequence of the research starting with explaining the sustainable urban development aspects as listed in (Fig.16). The second phase of the research discusses the urban management and planning systems. Linking the sustainable development perspectives to the urban management systems used we begin to formalize a sustainable management of urban green spaces using examples from international best practices and analyzing them into assessing the local case studies from Cairo. The approaches taken into accessing the sustainable management of urban green spaces such as green infrastructure principals, sustainable streetscapes components, green urbanism, integrated land management, sustainable urbanization and compact cities all feed into providing a good comprehensive overview of the simple question ‘what makes up for a good urban green space’. From acknowledging these approaches, we were able to extract different perceptions, or methods of analyzing the productivity of the urban green spaces and formulating a set of indicators applying them to the local context. Factors of contribution and the analyzation of these approaches led to the five key indicators which are: governance set up, management arrangements, resource management, participatory roles, and the general aspects related to environmental benefits.

The Governance Set Up discusses the collaboration of the stakeholders, decision making control, and the resource mobilization. Measuring the extent of the collaboration between the involved stakeholders is a necessity to access if there is a joint implementation between the governmental agencies and the civil society. The degree of delegating some decision making power to non-governmental actors, even if the final decisions are still maintained under the supervision of governmental agencies. The resource mobilization measures the sufficiency of the funding provided, is there a fair division of funds between the different departments or responsible managers. Is the budget provided to the agencies cover the basic expenses of the urban green spaces, is it a specific percentage of the government’s budget delegated to the maintenance and beautification of the urban green spaces, or is there no guidelines associated with the provision of funds.

Management Arrangements contains four main criteria: communication and coordination, monitoring and evaluation, operations and maintenance, and financial management. Communication and coordination is concerned with the communication from within the agencies, and other institutions

involved, or from the responsible entity to the community members, the sharing of information is the focus of the aim of this indicator as well as analyzing the institutional framework overall, is it efficient, and clear, equitable, etc. Monitoring and evaluation is more concerned with how the responsible entity is taking measures into evaluating the urban green spaces, ways of monitoring taken if any. Is the responsible entity in line with their aims and objectives or not? Operations and maintenance is concerned with the standards and guidelines used to maintain the space, and quality level overall, are the spaces maintained efficiently and are there external nuisances occurring and if any what are the measures taken to protect the urban green spaces, as well as the equipment management and the technical aspect of the management arrangements. The financial management criteria are more concerned with the delegation of funding within the agency/community members, and whether or not there are economical incentives or punishments enforced.

Resource Management theme accesses the sustainability of the resource usage in terms of water and vegetation resources (resource availability), funding resources, and human resources. The first criteria analyses and availability of the water and plant resources, as well as their accessibility measures. This involves the types of water used for the irrigation system, other forms of watering hard to reach areas, measures of planning new water management techniques to supply for all sites. It accesses the probability of creating major changes of the water resource to lower the pressure on the scarcity of Nile water resources. Funding resources analyses the sustainability of production, whether sites are planned to provide for a yield production or whether any measures of generating income from recycling resources is in the plan of implementation. Human Resource criteria analyses the provision of sufficient labor workers, staff, gardeners to supply the needs of the urban green spaces. Is there a successful HR department that deals with the staff working, efficient hiring system, fair hiring systems, etc. Also an acknowledgement of motivational factors if existent in the management cycle is put into consideration.

Participation Roles is further divided into two main criteria: social participation and private partnerships. Social participation is considered one of the main indicators of accessing the sustainability of the urban green spaces. These criteria ask questions regarding the involvement of the citizens in the planning and implementation phases of the UGS, whether or not it is a priority to the managers or it is not prioritized as part of their objective of service delivery. Assessment of responsible roles and duties of the departments of the responsible agencies is also a concern in this section of analysis. This leads to the private partnership involved in the management systems. This area of discussion measures the degree of

involvement of private enterprises, local businesses, etc. Do private partnerships play a valid role in shaping the management of the urban green spaces and if they do in what ways.

The final key theme analyzed is the Environmental aspects, which discusses the size, location, and identity of the urban green spaces, the validity of the space usage in different times of the year, and measuring the accessibility of the space overall (recreational aspects). The third criteria are the natural environments and climate change measures. Are the urban green spaces mitigating the climate situation in the context applied, does it lower the heat island effect due to its vegetated surfaces, are the urban green spaces distributed well on the local, and the regional scale. Also in this section we assess the awareness levels of the citizens of their duties to their natural environments.

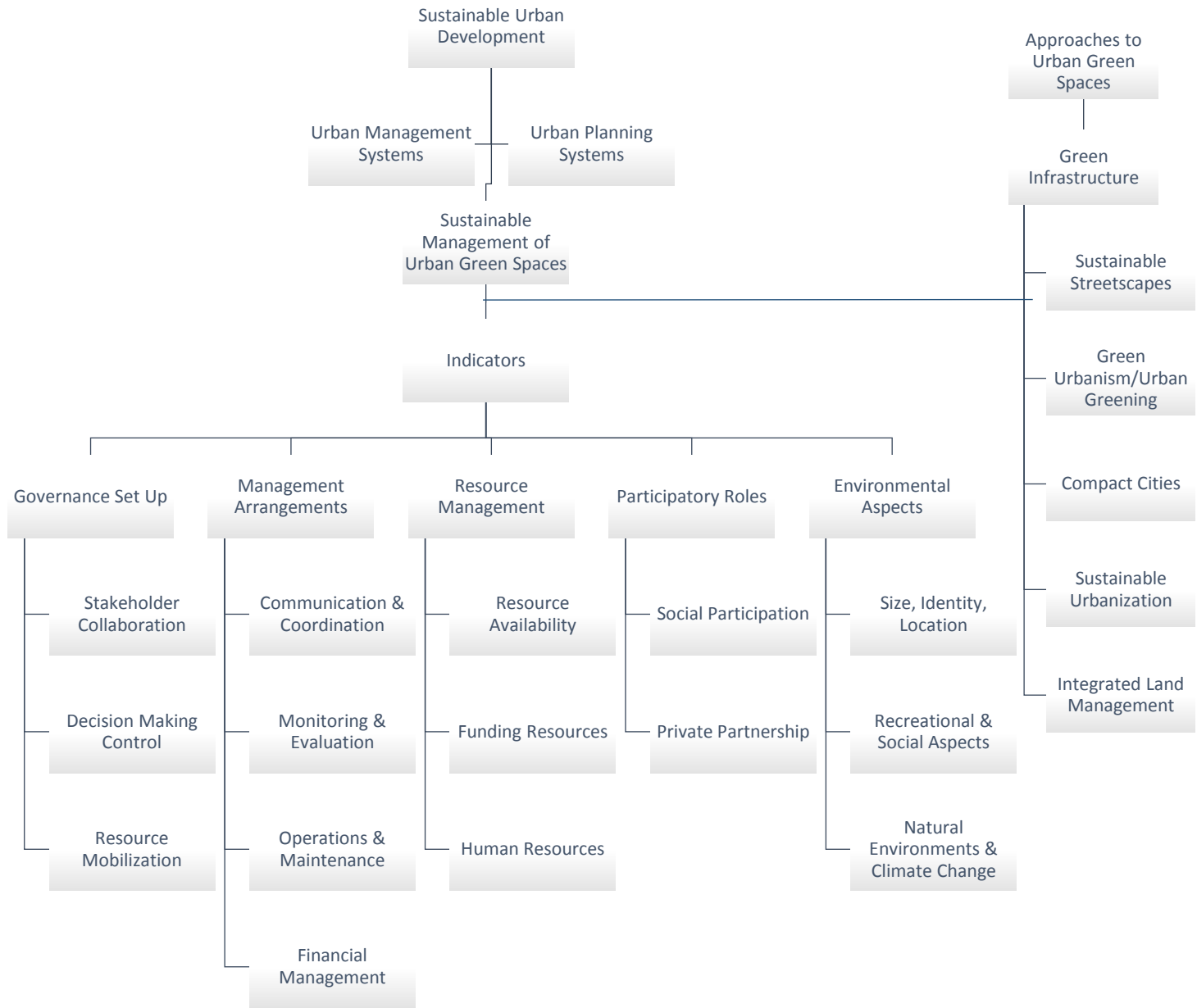


Figure 16: Conceptual Framework of Sustainable Management of Urban Green Spaces



## **B. Methodological Approach**

The study centers on a qualitative analysis in an attempt to measure the sustainability measures of the management systems of urban green spaces in Cairo, whether it is run by governmental institutions or community based management systems. Four main methods of data collecting are used in this research. First, the case studies from Cairo will be evaluated according to the five key themes explained earlier. The five key themes are later divided into 15 main criteria that feed into the evaluation process. Then a further break down of the main criteria was established through the form of questions called sub-criteria. Questions are in the form of a yes or no answers so it would aid in deciding the performance level of the analyzed cases. The questions are aimed at breaking down the analysis of the five key themes.

This method was chosen to access the performance level of the urban green spaces in the form of indicators that would/would not contribute to a sustainable management of urban green spaces in Cairo. Coming up with a set of indicators is an important method in accessing the management of urban green spaces because it provides information to support the formation of a policy initiative for the country as a whole as well as to ensure the efficiency of the implementation process that lies within the monitoring and evaluation sector of a policy sequence. Through the discussed indicators, we are able to pin point where the challenges and obstacles are occurring to better provide solutions and recommendations to further support the implementation of policies relating to the urban green spaces. As mentioned by (Gomes & Moretto, 2011) this kind of approach can aid in improving the social participation and identifying where the management went wrong and solving these mistakes.

After the introduction of the case studies, other forms of methodological approaches are used in the data collection, which are observation methods as a form of collecting data, interviews conducted with managers of the responsible institutions, as well as survey questionnaire for the local citizens to provide their opinion of their surrounding UGS. Observations were used here as a method because there is so much that one can observe physically on ground when it comes to the overall quality and the productivity of the urban green spaces. Which is reflected upon the holistic management schemes and performance of the responsible entities. Interviews with responsible managers whether they are governmental based managers from the Beautification Agency or community managers are used as a method in this research. The interview questionnaire reflected the factors of contribution to a sustainable urban green spaces and the institutional framework of the agency. The questionnaires included the roles of the agencies, their responsibilities, and the overall management set up of how urban green spaces are managed in Cairo. The

four methods of data collection will further aid in analyzing the case studies in the context of Cairo and better understand the pros and cons of each management system. The analyses were centered on how the indicators responded to the management of urban green areas and on the possibility of using these indicators to support the formulation and evaluation of the execution of sustainable management policies that are related to the urban green areas in Cairo.

## 1. Case Studies from Cairo

Two areas were chosen for evaluation against measuring the sustainability of management themes. An existing development in Nozha el Gededa area ‘Shaimaa street green space’ against another existing development in Nasr City ‘Misr-l-el-iskan green space’. The case studies are chosen as pilot analysis in the city of Cairo, hence they can represent the remaining urban green spaces in the local context and the rest of Egypt equivalently. The case study was chosen based on its management entity whether it is managed by the general authority for cleanliness and beautification which is a government entity as mentioned above or it is managed by the community. Nozha el Gededa is considered to be the first largest district in the eastern agglomerate of Cairo. Additionally, Nasr City (B) is also located in the eastern agglomerate of Cairo with Nasr City (Eastside B) being the second largest city, to be covered in green surface area. Hence, Nasr city is the second largest city in the eastern side of Cairo, it is divided into two areas (Nasr City A and Nasr City B). Nasr City A is the third largest area to be covered in green spaces after B-side. The government managed case study is located in the first largest green surface covered district in eastern Cairo, and the community managed site is located also in the eastern agglomerate of Cairo in the second largest green covered surface area. Both sites are located within a highly residential development as seen in (Image 1 & 2) below.



Image 1: Shaimaa street green space, Nozha El Gededa, Cairo.



Image 2: Misr lel Iskan green space, Nasr City, Cairo.

The surface coverage also includes gated parks and gardens. Gated parks do not necessarily mean that there are applied entrance fees associated, some gated parks are public and free of entrance. What is noticed is that all government based managed urban green spaces are gated, unless they are street medians and public squares. Even though some public squares till acquire a small structured fence around the square as opposed to high metal fences that cover the bigger scale green spaces within the rest of the city. When asked the reason behind gating all the public green spaces, the answer was simply ‘to keep it clean’.

Besides the two main case studies analyzed in this research, multiple smaller sites were also visited to accumulate a majority of the different kinds of urban green spaces (such as street medians, public squares, public gated parks, and open green spaces). Only the two sites mentioned above were analyzed further using the indicators of sustainable management, and a brief overview of other analyzed cases will be discussed below as well.

#### Joseph Titto – new axes development

The site is located next to the airport, on Joseph Titto axes road close to the Highkeystep area. This site was chosen by the Cairo governor to be further developed and beautified. The governor got in contact with the head of The Beautification Agency of Cairo, to further proceed with the project. He also decided that in order for the site to be developed further, it had to be covered in greenery. The governor decided that this area of development or this specific axes is considered the ‘identity of the country’ since it is located right outside the premises of the airport. A site visit was conducted to the site to observe the quality of the space as part of it were fully planted and another parts were still under construction. For this specific site, the local nurseries were not sufficient to supply for the 12-17-meter-long vegetated axes, and so extra measures were taken to provide the vegetation from the main nurseries outside the parameters of the city. The axes on one side are mixed use developments comprising of residential buildings and commercial areas, and on the other side lies the airport. The engineer responsible for this new development mentioned that one of the biggest challenges that she had to face in the preliminary phase of this project was the water source. The pipe that is reaching out to supply the street median capacity is not enough to cover the massive length of the project and so she had to reschedule the labor workers/gardeners into three different shifts instead of one to continuously water the vegetation since there is a lack of water coverage. In this site, the governor assistant is the one who designed the median as he is a consultant to the governor and so his designs were implemented instead of the local engineers responsible for the site. As this is not always the case with the urban green spaces. Regarding any project implementation in the country, the

entity responsible for the urban green spaces has to get in contact with the Greater Cairo Utility Data Center (GCU DC) for any information regarding the gas lines and electric line placements before the construction of any project to eliminate accidents. Another issue that was brought to my attention was the lack of labor workers in general. No hiring of gardeners is taking place since 2013, the central government has stopped any further hiring of gardeners since then. All gardeners that retire, get injured, or pass-away are not replaced causing a dilemma in this sector of human resources.

### Tahrir square – existing renovated development

In the case of the Tahrir square, the governor decided to renovate the square and apply new beautification methods to be applied. As we are all aware that this specific square has undergone a lot of major political changes throughout the past years and a major deterioration of the vegetated areas was the result. New vegetation was placed to better upgrade the quality and the aesthetics of the urban square, but because it is a major tourist attraction space, it is



Image 3: Tahrir Square, GBM

constantly struggling to keep its full quality standards. Issues arise from the nuisances that people cause in the square such as, the lighting fixtures being broken, littering in the premises, and the irrigation systems being ‘played with’ and unplugged from its place. The responsible entity which is the Beautification Agency is exerting all efforts needed to repeatedly upgrading the fixtures being damaged by the visitors, again because this is considered ‘the face of the country’. Replacements of lighting bulbs, cleaning labor workers are on a full run every day to pick up the litter caused by the people, and irrigation systems being fixed on a weekly basis depending on the severity of the damages caused. A mini structured fencing unit is placed around the square as shown in (Image 3) as a way of limiting people out from stepping onto the vegetated area and exhausting the turf planted.

### Case 1: Shaimaa street green space – government based management

Coming to our first case study which is the Shaimaa green space located in El-Nozha El Gededa area in Sheraton, where the scale of the urban green space is a lot larger than that of the medians and the squares. It is located in a medium-high developmental area of residential housing. This site was initially



Image 4: Shaimaa St. gated urban green space

implemented in the urban planning of this area to be a park space for the surrounding residents and so initial measures of water resources were taken into consideration for the irrigation of the urban green space. The site is gated and locked at all times except when gardeners are maintaining the space. Barely are residents of the surrounding community using the space for recreational purposes. There are two copies of the keys allocated with the engineer and the other is with a local

resident that represents the rest of the community members in this area. This green space is designed by the local engineer when she was first appointed to this specific location three years ago. Before this time, the space was left unmaintained, with dying trees and vegetation to take over the urban space. The hardscape of the site was already existent and implemented a while back when the space was planned.

A brief interview was conducted with the responsible engineer to acknowledge the management measures taken for this site. She mentions that one of the biggest issues with the site is the fact that it was unoccupied and unmaintained on all levels. Reviving the green space needed much time, effort, and



Image 5: Planter beds in front of Shaimaa green space

funding. She mentioned that because of the lack of resources provided from the responsible governmental entity to supply for such space, she had to ask the community members to aid in funding the site and supplying her with resources such as vegetation to maintain the space. As we observe in (Image 4) the deterioration of the turf planted and the uncleanliness of the space with trash and the lack of care provided. Even-though the reasoning behind creating fences around these urban spaces is keeping them clean, and thus, they are not well kept and solid waste still finds a way to rest on the green covered surfaces of these sites. (Image 5) shows planter beds created by the agency along the sidewalks of the Shaimaa site to avoid the sprawl of

surrounding cafes to place their tables in front of the park space, as they still lack the resources in providing them with plants and vegetation to beautify the aesthetic look of the space. (Table 6) below analyses the

site in more depth based on the five key themes that are distinguished from the literature into accessing the success level of the urban green spaces. Another issue was the lack of gardeners available on hand. As mentioned earlier that no new gardeners are hired, and departed gardeners are not replaced. If there is a new development or renovation of an existing site taking place, ‘gardeners from the surrounding areas are taken to supply the demands of the new space, and in this case, I have to manage four different sites with only two gardeners, since they took my workers to perform work on another site, and this is causing me to fall behind on my work.’ The government institutions lack the resources to provide for their scope of coverage of green spaces. Stated by the appointed engineer ‘I always have to ask for help from the local residents to provide me with material that I need such as pest control products, I asked the agency for them and they didn’t have the extra funding to spare me the products needed to save my trees, but thank god the residents here were able to get it for me, and the trees in my gardens are undergoing recovery.’ Public participation is a necessity when it comes to the management of urban green spaces even if it is managed by a government entity. As the researchers suggest that the inclusion of local citizens, should be more emphasized because the residents or the local community will make the process of planning easier as well as ‘guiding the purposes of the urban green spaces’ more efficiently (Benchimol, 2017).

### Case 2: Misr-lel-Iskan green space – community based management

The second case study is managed solely by the community members in Nasr City. This site was chosen because its characteristics resemble a lot of other urban green spaces scattered around the city of Cairo and so using this site as a case study is a good representation of the rest of the urban green spaces

run by the community. The site is located in the midst of residential buildings and it resembles the first case study in scale. The characteristics of the site includes: its location within the residents, the use of the space, the quality of space in general (its cleanliness), its accessibility, and its vegetation covers.

The management of the site is run by a main community member, but the surrounding neighbors are also involved in all decisions that are taken. No



decision is taken without consulting the rest of the community members if this would be the best fit for the site or not. No data was available regarding on whether this space was originally planned for or if it was randomly allocated to be an urban green space during the construction phase since it was previously owned by a development company and now it is left to the local residents to manage the place after the company moved out and sold the residential development area. The engineer taking care of the site which is also a local resident of the community said ‘when the company moved out, the site was left unmaintained and accumulating dirt for the longest time, so the community members gathered and conducted a meeting and decided that they will manage the space and maintain it themselves, it was only then that I decided to take responsibility and I hired a gardener to take care of the place. I care for plants as it cleans the air and I think it was a duty of mine to take care of it.’

Some of the challenges that the community faced was the fact of allocating the funding to hire a gardener, and providing the resources and vegetation of the space as seen in (Image 6). He mentions that at first it was hard to convince the people to tip in for the maintenance of the green space but then people cooperated and paid a fee that was evenly distributed among all residents that overlook the space. Another issue, was holding the gardener accountable into providing for the space and maintaining a set schedule of maintenance with him. ‘When the gardener does not show up, I have to personally go and trim the trees, and water the plant, which takes up a lot of time and effort, I honestly do not know of a way to keep the gardener accountable but I do the best I can along with the other members of the community, we take shifts into caring for the space’ were the exact words of the responsible engineer. Looking at (Table 6) in the next chapter, we can begin to analyze the success/failure levels of performance associated with the community based managed sites.

## 2. Observations as a method

Observing the two different sites, and paying a visit to both locations, physical observations were used as a method of analysis in this research. Observing the two different sites, and paying a visit to both locations, physical observations were used as a method of analysis in this research. When it came to visiting the government based sites, the responsible engineer for that specific site accompanied me, explaining the issues they had to face, and provided a little brief of the history of the site. The challenges they had to face, the projects on the line of construction if any, were also explained further by the responsible engineers. Observations were very helpful in a sense that information was extracted whether through the point of view of the engineer or through personal interpretations of the site analysis. The GBM case study overall scored higher on the cleanliness level, since the CBM case study was not gated and it was open to the public.

Minimal control was enforced on who enters the space and who doesn't. UGS that were located generally throughout the Sheraton area (and many areas around the Cairo region) that are supposed to be under the supervision of government entities were lacking water resources, and general provision of services as well and left to deteriorate and diminish in providing a good quality of environmental benefits and aesthetical benefits. These ignored urban green spaces, can provide a good asset for the surrounding residential

*Image 8: Wasted resources, GBM*



*Image 7: Terraced urban green space neglected under the supervision of Beautification Agency in Sheraton, Heliopolis.*



buildings into increasing their property value, if properly maintained as shown in (Image 8). Hence mentioned earlier in the literature review that urban green spaces provide a higher value of housing properties in general. In terms of management, the urban spaces that are maintained by a government entity had absolutely no association with the social participation and

the inclusion of the surrounding residents in terms of planning, management, and the implementation of strategies. This leads to the visible waste of resources as shown in (Image 7). On the other hand, the community based managed urban green spaces scored higher in the citizen participation, where all decisions were collaborated between the community members. This causes a sense of ownership of the





*Image 9: Solid waste located on gated Shaimaa St park space.*

space, which increased its sense of inclusion within the urban community and a more integrated management approaches. Some factors are not within the scope of work from either managers and it is more related to the political structure of the country and the central government overall. In regards to the CBM case study, keeping an eye of the space from the citizens of the place, feeds into a constant monitoring and evaluation of the space. As opposed to the urban green spaces that are managed by government entities, the engineers,

work on a shift basis and set hours within a day; where, the engineers do not live in the same community as their allocated sites are existent, and so a lack of direct monitoring exists. Neither of the case studies were very concerned with the recreational aspects of the space, as they are both concerned with the environmental and aesthetical value provided by the green space. The aesthetics in this context is simply the availability of green vegetation and not much concern is provided in regards to the cleanliness aspect of the term. As we can observe in (Image 9, & 10) that solid waste and landscape wastes are still covering the surfaces of park spaces. Another difference that was noticed through observation was the amount of effort put into providing for each site. A feel of obligation and a forced duty was sensed from the sites allocated through the government management, as opposed to a sense of personal preference and methodological perspective regarding the caring for the CBM sites was observed. The citizen care for the space because they want to, as it is a face for their living community. This sense is based on personal observations, and not a fact. Some sites located on major axes or in front of military basis or governmental entities, were well managed and supplied for, but this is not the case with the rest of the sites, which is found to be ironic. If there is a capacity for maintaining and managing such green spaces, keeping up with a good standard, how this is not interpreted and copied on all other sites? Is a question to ask, if the provision of services in the local context, is dependent on its location and proximity to other governmental entities.



*Image 10: Landscape waste unremoved from Shaimaa St. park space.*

### 3. Interviews

The questionnaires incorporated four thematic groups of questions resembling the same key themes used for the indicators: (1) Governance set up (decision making control, stakeholder relationship, policy evaluation, funding sources, etc.); (2) Management arrangements (monitoring and evaluation assessments, institutional frameworks, operations and systems, flexibility etc.); (3) Resource management (maintenance measures, availability, service delivery, etc.); (4) Participation roles (roles of agency, responsibilities, planning and implementation elements, citizen participation, actors, etc.); and (5) Environmental aspects (accessibility, size of green spaces, distribution, quality, climate change, etc.). The types of questions asked reflected the questions that were used in the analyzing the performance of the case studies as mentioned in (Table 6) in the next chapter. The types of questions were revolving around the overall management and sustainability of the urban green spaces. The challenges faced by the agency, the actions conducted to address these obstacles, future works, the institutional set up of the agencies responsible for the management of urban green spaces, the duties of each department within the agency, etc. The scale of the questions were broad, some were open ended questions and some were closed questions inquiring simple yes/no answers. The interviews provided very assertive and helpful feedback regarding this topic of research. The managers were very helpful in providing the answers to all questions that aided in formulating a complete overview of how these urban green spaces are being managed in Cairo. The institutional framework discussed later in this research in regards to Cairo governorate, is the same in all the governorates in Egypt.

#### *Institutional Framework and Participatory Roles*

Managers in The Beautification Agency which is the one entity responsible for the management of urban green spaces in Cairo were interviewed, along with site engineers responsible for each site of the analyzed case studies. The managers were quite helpful in providing information regarding the agency and the management of the urban green spaces and the roles of each department under the agency. The Cairo Cleanliness Agency is another institute responsible only for the cleanliness of the spaces and not necessarily the management. (Figure 17) below shows the institutional framework for the UGS in Cairo and in all other agglomerates around the country, as it follows the same institutional framework.

The GACB is broken down into five different agencies/departments, each of which have its own role when it comes to the management of the UGS. The Beautification Agency is responsible for urban green spaces in general including all green covered surfaces overall if it does not lie within a private property and/or gated communities. This includes public squares, street medians, distinctive parks (gated parks with applied entrance fees), public parks (gated parks without entrance fees), Nile front corniche area, and residential squares. In regards to the residential squares, they are small pouches of vegetated covered surfaces along the sides of residential buildings. Even though they are supposed to be under the management of the agency, but in the real world, they are managed by the community members and the owners of the surrounding buildings. The distinctive parks have a fixed entrance fees of 3 LE which pays in for the maintenance of the services provided such as, public bathrooms, cafes, and security measures.

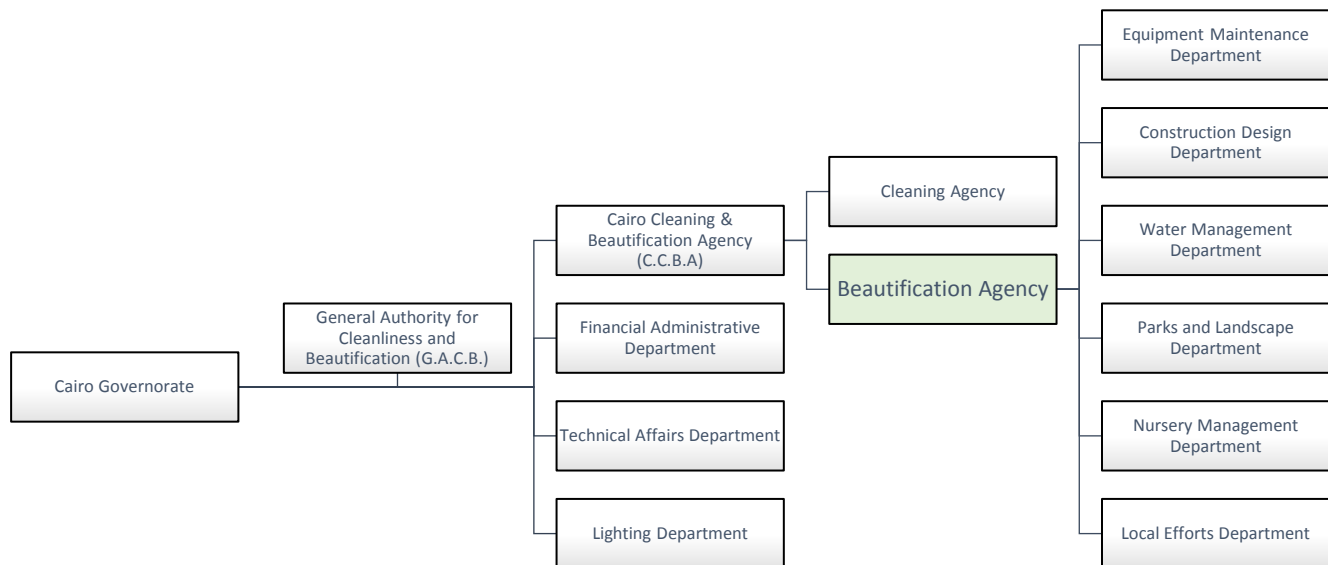


Figure 17: Institutional Framework for urban green space management in Cairo.

The Cleaning Agency is responsible for the cleanliness of the urban green spaces and their surrounding areas. They are also responsible for collecting the landscape wastes from all sites and disposing it in the nearest landfill. The landscape waste is not reused into making compost or for mulching, but instead it is thrown to decompose along with the other wastes. The district managers of each city can sometimes offer their help when it comes to waste collection, but it is very seldom when it occurs. Cut down tree trunks and other wood trimmings are sold to contractors in the wood market. The amount of wood gets weighted and sold per kilo, the funds are dispersed back in to the agency's bank. The agency

only deals with certain contractors for years liable via a lifetime contract between the contractor and the agency and no external contractors are allowed to enter this cycle. The financial affairs department is responsible for the accounting measures of the authorization, the finances, the human resources, and the overall management of the agencies/departments. As for the technical affairs department they are responsible for the equipment management such as the lawn mowers, loaders, trucks, etc. used in any of the agencies, whether the water trucks or the waste collection trucks and their maintenance. Finally, the Lighting department is responsible for any fixtures of lighting that exist inside the urban green spaces regarding their installation and maintenance.

Cairo Cleaning and Beautification Agency is further divided into two main agencies and they are: The Cleanliness agency and the Beautification agency. The Beautification agency is then divided into six departments: equipment maintenance, construction design, water management, parks and landscapes, nursery management, and local efforts department. Each of the following departments is under the diligence of a general manager that reports directly to the head of the BA (Beautification Agency). The equipment maintenance department is responsible for the maintenance of the heavy equipment as well. Does this department within the BA collide with the responsibilities and duties of the technical affairs department under the GACB? Or do both departments work together and where does the threshold lie in controlling each entity's scope of work, is a valid question that raises a flag in this research. The roles within the institutional framework involved within the BA is listed in (Fig. 18) for a better understanding of the management actors within the agency and its organizational structure.

The construction design department is responsible for the design of the urban green spaces, but some exceptions are made based on the decisions of the Governor. As mentioned earlier, the Joseph Titto site was designed by a consultant engineer appointed by the governor himself. Also, for some sites, the allocated engineers are the ones who design the space. Set standards to define the duties and roles of each department or entity responsible for the management of urban green spaces, still remains a missing piece to the complex institutional framework puzzle. Construction engineers when designing urban green spaces, they tend to be stuck on symmetry and traditional ways of design concepts. This realm is apparent in all parks and urban green spaces that one comes across. Whether it is a straight line of trees in the center of the street medians or a planted row of trees and vegetation along the sidewalks on either side, or even geometrical shaped planter beds. There is no emphasis on creative thinking and contemporary forms of landscape design to provide for creating an identity to the space. Another important aspect of design that

has been noticed to be lacking, is the landscape design standards. There is no requirement or design standards that are enforced upon the engineers to abide by.

The water management department is responsible for the provision of water to all urban green spaces and the type of irrigation used in each site, including fixing any damages to pipes, and installation. Some urban green spaces, use drip water irrigation systems and some use the traditional irrigation systems. This is highly dependent on the location of the UGS. As informed by the engineers and managers that drip water irrigation systems are installed mainly on main axes (street medians) where there is no high access for pedestrian traffic across the urban green spaces and that the surrounding citizens do not cause any external nuisances to the site. This is mainly dependent on the behaviors of citizens, but again this is not a requirement with very few sites across Cairo that acquire drip water irrigation systems.

Park and Landscape department is responsible for the implementation of urban green spaces including parks, trimming and pruning of trees and vegetated areas, planting planter beds, and beautifying the district. Even though the implementation of urban green spaces is one of the department's responsibilities, no attempt of future spaces is on the line of implementation, since there is 'no room for expansion' as stated by managers in charge. In some cases, the authority for roads and transportation, decides on changing the maneuverability of the streets, by re-planning the road arteries. This causes closing off of some roads (or U-turns) and providing accessibility elsewhere. In cases as this one, the roads and transportation authority submits its requests to the governor, and the governor delivers the message to the agency to start the construction work. There are many vacant lands within the city, the one might wonder why it is not used for a park space, or an urban green space, and this is due to the fact that not all areas are owned by the agency. For example, a vacant land that exists in Nasr city, where there are traces of vegetation that once existed, is not owned by the agency and so is not of their responsibility. When the managers were asked if this neglected area belonged to the agency, the answer was 'these areas are still under the supervision of the urban planning authority and it has not been handed over to us for maintenance or beautification'. There is a protocol in order to hand over urban green spaces to the CCBA, and it is: the space needs to be actively vegetated, and acquires a source of water for the irrigation procedures. Lacking these two requirements, the agency rejects to take accountability for the space. Last, but not least, the department responsible for the nursery management is in charge for plant production. There are three main nurseries distributed around Giza, and Cairo but they serve only the Cairo region: Barageel nursery, Ein Shams, and Ter'et Ismailiya nursery.

Surprisingly, there is a local efforts department which is responsible for the awareness training programs taking place in local schools, governmental entities, civil associations, youth centers, and mosques. Another duty of the department is implementing ‘free’ urban green spaces for the civil society, which is then handed over to the community for maintenance measures. The successful measure of this department is the fact that it is in line with the civil society’s needs and they deliver the service free of charge for the community. A current gap lies in the mere existence of this department is the fact, that the community members are not aware of such an option and therefore not aware of their rights towards recommending a space for planning and implementation; this causes a lack in the communication and coordination sector of the institutional framework.

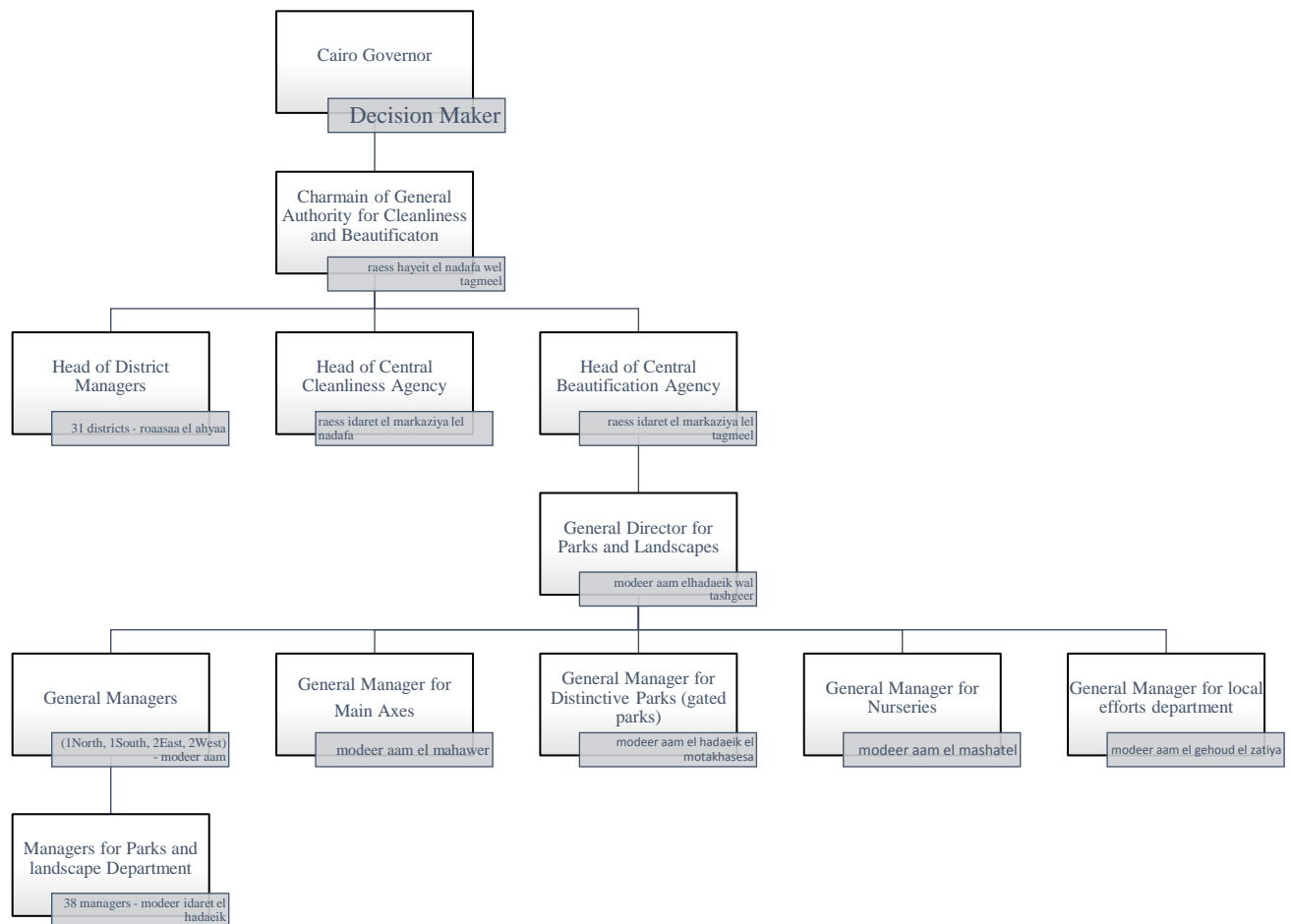


Figure 18: Roles within the institutional framework under The Cairo Cleanliness & Beautification Agency.

The institutional framework of the agency is quiet complex and irregular in its organizational structure. The duties and responsibilities of the departments is not defined and it tends to blend with the duties of the General Authority of Cleanliness and Beautification, with decisions and exceptions being made solely by the governor of Cairo. There is no strategic plan that is used as a guideline for the planning, implementation, development, and management of urban green spaces as they are contingent and subject to change at any given time. The agency is being faced with multiple challenges and obstacles to overcome when it comes to the urban planning and management of urban green spaces. Some factors are internal as some are external factors with no control from the local agency to overcome these challenges as they are tied by a limited role to play in the overall organization of the urban green spaces, and higher institutions are in control of the local management of the UGS.

### Challenges

A cumulative agreement on the challenges faced within the agency are listed below in (Table 4) along with the actions taken to overcome the existing challenges. One of the main challenges is the lack of labor workers/gardeners in the agency. This is causing a huge delay in providing and maintaining the urban green spaces as opposed to all other problems combined. ‘Even with the lack of resources that we have to face, if there are no gardeners, how will we use these resources, there is no way’ were the words of the General Director for Parks and Landscapes in the Central Beautification Agency. The hiring process is not within the agency’s scope of responsibility. The final say comes from higher authorities such as the President, Prime Minister, and the central government. Even though there is a dropout in the number of gardeners and engineers hired, the ‘higher institutions’ think there is populous amount of staff from within the agency and that is the exact reason behind their cessation of the hiring process since 2010. It is not of a concern regarding the titles associated to the staff or what their duties are, the concern is in the total number of hired staff overall. There is indeed a numerous amount of administrative staff hired in the agency, but a lack of executors to fulfill the job needs and demand is the main issue the agency is facing. The same goes with the firing process, the agency is exempted from this responsibility. On quote from the general director of the agency “the administrative body is sacred, it is the distribution that needs to be further developed.”

Aside from the lack of gardeners, another major challenge is the lack of awareness and vandalism from the public. A big factor of maintaining the vegetation and trees in specific is pruning, this process

removes the dead, or damaged branches, preventing pests from damaging the rest of the tree. Thinning the canopy also allows for more air circulation and sunlight to enter the tree, which benefits the overall health and growth of the tree. Because of the lack of awareness to the citizens' knowledge of gardening, it is believed that thinning or pruning is in fact 'killing the tree', which is an issue that the agency and the engineers have to deal with on a daily basis. It is this kind of awareness to the citizens that needs to be further developed and continuous actions are being taken to control this misunderstanding.

External factors also affect the quality and maintenance of the urban green spaces, such as the use of the space by labor workers/ carpenters; where they are found to be 'awaiting for a job intake' and resting on the vegetated turf along with their equipment and working materials. This kind of action damages the turf since heavy trafficked friction on the turf eventually wears it off and kills it. This is another external issue that is being continuously faced by the agency and actions of reporting them to the district administration are being taken on a daily basis as well, but unfortunately, they keep coming back. Filing a complaint against this kind of action, only solves the problem at this state of time, but it is not a sustainable form of solution to keep them permanently off the urban green spaces. Other obstacles being faced is the lack of water resources. Most of the water being used in the irrigation systems in the country is turbid water directly from the Nile, or it is potable water. The country is facing a scarcity of water resources and it is scored low in the world water scarcity threshold at 738 meters cubed per capita quota in 2008 (WHO, 2017). This is due to the rapid growth of the population density and the limited quantity of the Nile water resources. Managers were asked about the usage of the water delegated for the irrigation of the landscape and an average usage was provided at 40 cubic tons of water per feddan yearly. A major dilemma that occurs when potable drinking water is in use of the irrigations of urban green spaces, is the fact that it decreases the water intake to the surrounding resident buildings drastically during the periods of irrigation. This is due to the limited water supply and the pressure set forth by the scarcity of water resources. There is a three-year protocol between the agency and the water company where the agency gets billed per m<sup>3</sup> of water usage a fixed discounted amount monthly regardless of their total usage. There used to be meters installed monitoring the water intake for the landscape irrigation, but they got damaged and never replaced; which acts for the benefit of the agency.

The landscape equipment being used in the country are all imported from countries all over the world, hence no equipment is being manufactured locally. With any misuse of these mowers, or any mechanical damage that occurs, the agency had to outsource maintenance workers to fix the high tech equipment, causing them a lot of money. After years of relying on outsourcing, the agency decided to take



the lead and create a maintenance department for fixing all the landscape equipment such as the lawn mowers. This has been proven to save a lot of funding resources and to allocate it somewhere else within the budget of the agency. The capacity building for this specific department is still work in progress as there are still many equipment that are laying around in the storage awaiting to be fixed and reused.

*Table 4: Challenges and actions of overcoming existing challenges.*

<b>Challenges</b>	<b>Actions</b>
Lack of awareness and vandalism	a) Talking with people and convincing them if trees are trimmed they will live longer b) Teach people of their awareness to their surrounding and how to deal with it.
Lack of Human resources	required to work over-time shifts to cover demands
Lack of water resources	No solid efforts have been put into solving this issue (out of scope of responsibility)
Local nurseries unable to comply with the demands of the plantation needed	Planting our own vegetation locally and buying more plant species
Damaged equipment	Build capacity into fixing own equipment instead on relying on outsourcing maintenance workers
Presence of labor workers/carpenters sitting in public squares awaiting jobs	Reporting to the district managers to escort them out of vegetated areas so they do not ruin the turf planted

The Beautification Agency deals with three main nurseries, one of which is more than 45 acres of various plants and species, and for every district/city there is a local nursery to allow for a faster delivery of vegetation if needed within this area. Local nurseries do not always carry various types of vegetation, as in fact they hold three main types of vegetation that are continuously being used in all site locations as sited by one of the engineers. This causes a lack of innovative design of the urban green spaces since the engineers are limited to work with only three different types of vegetation, and so they are forced to rely on other sources of service delivery (such as the local community members and surrounding citizens) as mentioned above in the case studies. It is found ironic, that the main nurseries have the capacity of providing for all urban green spaces with this amount of surface coverage, but yet the local nurseries are not well fed with these resources. Planting and grouting own vegetation in the local nurseries and providing for new plant species in the local nurseries is another work in progress but it is still not enough to supply even one urban green space to fulfill its needs and scale.

### Green Space distribution in Cairo

One of the major indicators of a sustainable management is the size of the urban green spaces as opposed to the overall green space per capita. Provided in (Table 5) are some numbers of surface coverages of the four agglomerates of Cairo, divided into 1 northern, 1 southern, 2 eastern districts, and 2 western districts. The United Nations states that in order to have a good ration of coverage per capita, the total green space per capita needs to be equal to 30m<sup>2</sup>. *For the purposes of this research, no calculations have been measured due to the methods of analysis approached in this study.*

Table 5: Total surface coverage of urban green spaces in Cairo.

	Districts	Total area of green space (m <sup>2</sup> )	Total green space per capita (feddan)	Total green space per capita (m <sup>2</sup> )
1	Northern district	201,404 m <sup>2</sup>	5.25 feddan	22,050 m <sup>2</sup>
2	Western district	976,316 m <sup>2</sup>	unknown	unknown
3	Eastern district A	88,851 m <sup>2</sup>	17 feddan	71,400 m <sup>2</sup>
4	Eastern district B	84,345 m <sup>2</sup>		
5	Southern district A	325,452 m <sup>2</sup>	15 feddan	63,000 m <sup>2</sup>
6	Southern district B	2,316,290 m <sup>2</sup>	16.5 feddan	69,300 m <sup>2</sup>

## IV. Case Study Analysis

### A. Assessment of Indicators of sustainable management

The following table analyzed the data collected from the previous methodological approaches as mentioned in the afore chapter to better assess the sustainability of the two case studies from Cairo. This form of structured data portraying has been borrowed from the literature, and customized towards the local case studies. It has been thought of as a tool to be used for future assessment of any site in the context of Cairo, Egypt to better assist with measuring the sustainability of the performance and success levels. An empty copy of the table classified below can be found in (Appendix Table 12) for managers, stakeholders, decision makers to better access future sites to provide for a better monitoring and evaluation methods to better the quality of the urban green spaces.

Table 6: Indicators of a Sustainable Management of Urban Green Spaces (Successful, Partial Success, Not Successful, Not Applicable).

5 Key themes	15 Main criteria	93 Sub criteria	Success level									
			Shaimaa GS (GBM)				Misr-lel-Iskan (CBM)					
			S	P	N	N	S	P	N	N		
A. Governance Set up	A1. Stakeholder Collaboration	A1.1 Is there collaboration within the institutions/citizens involved?		*				*				*
		A1.2 Are stakeholders all government institutions?			*							*
	A2. Decision Making Control	A1.3 Is there collaboration between the government officials and the civil society?		*								*
A1.4 Is there private sectors involved within the stakeholders?				*			*					
A3. Resource Mobilization	A2.1 Is there political/citizen will to better the management skills? A2.2 Are there more than one decision takers involved? A2.3 How is the degree of citizen participation in the decision making control? A2.4 How is the intensity of district administration involvement?	A1.5 Is the degree of social participation/local communities efficient?			*			*				
		A3.1 Are the funding sufficient for the scale of projects provided?			*			*				*
		A3.2 Do government agencies cooperate with private sectors for funding aiding?			*			*			*	
		A3.3 Is there a proper division of funding among different departments/households?		*			*		*			*
		A3.4 Does the funding come from the authorization's own revenue budget?			*			*				*
		A3.5 How are the funding allocated yearly? Is it a specific % of the country's budget or is it not specified?			*			*				
		A3.6 Is there a fixed budget(NS) for the UGS authorities or is it project-based (S)? (Budget provided from the central government to the local authorities yearly/budget from responsible citizen to cover space expenses)?				*		*				
A3.7 Does the government enforce 'economic punishments' on local authorities/community for the lack of proper service delivery?			*			*						
B. Management Arrangements	B1. Communication & Coordination	B1.1 How are spaces promoted? Is there a strategical plan for picking new development sites?			*					*		
		B1.2 How is the knowledge of the engineers/community members about the function/aims of areas?	*				*					
		B1.3 Can citizens promote a space for developing/greening?	*				*					
		B1.4 Is it easy for the citizens to communicate to the managers regarding natural disasters occurring (ex. Trees falling and damaging private properties)?		*			*					
		B1.5 Is there a clear followed institutional framework within entities?			*							*
	B2. Monitoring & Evaluation	B2.1 Is there ongoing information gathering about the use of spaces? B2.2 Is there activities involving citizens to participate in evaluating the UGS? B2.3 Is there ongoing monitoring from within the institutions/members regarding the performance of the staff/gardeners? B2.4 Are authorities/members keeping up with their aims and objectives? B2.5 Does the monitoring and evaluation fulfills the urban planning policies? B2.6 Does the management arrangement follow changes and future demands?	B2.1 Is there ongoing information gathering about the use of spaces?	*		*		*				
B2.2 Is there activities involving citizens to participate in evaluating the UGS?			*		*		*					
B2.3 Is there ongoing monitoring from within the institutions/members regarding the performance of the staff/gardeners?			*		*		*					
B2.4 Are authorities/members keeping up with their aims and objectives?				*			*					
B2.5 Does the monitoring and evaluation fulfills the urban planning policies?				*			*					
B2.6 Does the management arrangement follow changes and future demands?			*				*					

	B3. Operations & Maintenance	B3.1 Are staff well trained and well qualified? B3.2 Is there a set schedule for maintenance team linking the needs of the space? B3.3 Are there activities involving the citizens in the maintenance of the spaces? B3.4 Is there plans to change the irrigation systems at site where there are no water resources? B3.5 Is there plans on manufacturing/buying (CBM) own equipment locally? B3.6 How is the quality of the UGS in terms of cleanliness? B3.7 Is there any measures taken to protect the landscape elements installed on sites (lighting fixtures, irrigation systems, etc.) B3.8 Is there a use of sustainable materials been used in the design of UGS?	*	*	*	*	*	*	*
	B4. Financial Management	B4.1 Is there work delayed in terms of implementation due to lack of funding? B4.2 Are the methods of collecting money from residents easy? B4.3 Are there incentives for performance levels for engineers? B4.4 Are there incentives for performance levels for labor workers? B4.5 Are there 'economic punishments' enforced upon the citizens for littering?	*	*	*	*	*	*	*
C. Resource Management	C1. Resource Availability	C1.1 Do the local nurseries sustain the district needs? C1.2 Is there constant need to buy plants from main nurseries, further out in the city? C1.3 Are water resources accessible to all sites? C1.4 Is the type of water used for landscaping recycled water or grey water? C1.5 Are cars providing water coverage for hard to reach sites, energy sufficient? C1.6 Is there a variety of plants used on site? C1.7 Do the nurseries provide a variety of locally grown vegetation? C1.8 Is edible water used for the irrigation of sites? C1.9 If there are sites that do not have a water resource, is there major changes done in the reconstruction plan of the irrigation systems to provide water? C1.10 Is the above process implemented on a timely manner? C1.11 Do the institutions/members have the capacity to provide the vegetation needs for all sites?	*	*	*	*	*	*	*
	C2. Funding Resources	C2.1 Is the delivery of resources (vegetation) sustainable/affordable? C2.2 Does the cost of construction of the site sustain itself? C2.3 Does the site provide economical revenue directly to the agencies/institutions? C2.4 Is the revenue related to a yield production? C2.5 Is there revenue generated from the recycling of landscape wastes? C2.6 Is the revenue generated match the services provided quality of spaces? C2.7 Does the local community provide funding for UGS if needed?	*	*	*	*	*	*	*
	C3. Human Resources	C3.1 Is the capacity of HR sufficient to provide for the load of work? C3.2 Is there acknowledgement for motivational factors? economic or psychological? C3.3 Do workers have a good knowledge of plants and the landscape? C3.4 Are workers getting replaced due to retirement, injuries, death? C3.5 Is the hiring process controlled by the managers or is it higher entities? C3.6 Is there constant training provided by the managers for improving the capacity building skills of workers and engineers? C3.7 Is there programs to create awareness to users on how to deal with their landscapes? C3.8 Does the management support innovative design ideas?	*	*	*	*	*	*	*
D. Participation Role	D1. Social Participation	D1.1 How is the degree of involvement of citizens in the initial phase of the project? D1.2 Are the citizens involved in participating in the implementation phase? D1.3 Is there collaborative planning between the users and the managers? D1.4 Are citizens involved in participating their feedback/opinion against an action taken by the authorities? D1.5 Is social participation a priority for the managers? D1.6 Are roles/duties distributed correctly and defined amongst responsible entity?	*	*	*	*	*	*	*
	D2. Private Partnership	D2.1 Is there private partnership involved in the management of UGS? D2.2 Would governmental actors collaborate or allow private partnership? D2.3 Is the provision of commercial billboards along the edge of UGS efficient? D2.4 Are private businesses allowed to use the public UGS for their own benefit? D2.5 Do private entities economically support the management of UGS?	*	*	*	*	*	*	*
E. Environmental aspects	E1. Size, Identity, location	E1.1 Are UGS of an appropriate size regarding surrounding citizens? E1.2 Does it provide a green belt connecting residents to businesses? E1.3 Does it support people to travel by foot or bicycle? E1.4 Is there external nuisances causing disturbance in the spaces? E1.5 Are the UGS distributed well within its overall urban context? E1.6 Is the urban green space easily accessible to its surrounding residents?	*	*	*	*	*	*	*
	E2. Recreational aspects	E2.1 Are recreational aspects prioritized to the managers? E2.2 Does the space provide different uses during different seasons? E2.3 Do spaces provide different experiences? E2.4 Are the services/facilities hygienic (bathrooms)?	*	*	*	*	*	*	*
	E3. Natural environments and climate change	E3.1 Does it provide a noise barrier between residential buildings and the roads? E3.2 Does it provide a visual screen? E3.3 Is there a priority given for biodiversity accommodation in the planning? E3.4 Do the spaces adapt to the local climate situation? E3.5 Are environmental aspects prioritized in the planning of the UGS? E3.6 Are citizens aware of their duties against their natural environment?	*	*	*	*	*	*	*

- (S) stands for successful, (PS) stands for partial success, (NS) is not successful, and (NA) is not applicable; this is based whether or not the question is directed for government based Management only or for community based management.
- Private sectors can also be substituted with community members.
- Managers could mean the government entity responsible or the community member that is responsible for the UGS.
- GBM stands for government based management and CMB stands for community based management.

## B. Results & Discussions

The field observations through the two case studies, demonstrate to which extent the sustainability measures are existent within the two case studies. We can measure the areas according to the five indicating key themes. (Table 7) below summarizes the main indicators to achieve a sustainable management system of urban green spaces in the city of Cairo. And thus, the outcomes of the table will be discussed with more focus on positive and negative aspects that is directly related to each theme, and providing conclusions based on the analysis of the sustainable management of the urban green spaces in the case study of Cairo. The analysis is categorized based on the success level based on the sub criteria. For example, if more than 50% of the sub criteria are successful then the main criteria are considered successful, if the majority of the sub criteria is equal to 50% of the total number of questions provided in this section, then the main criteria is considered partially successful, and if the majority of the sub criteria is less than 50% then the whole main criteria is considered unsuccessful. Successful factors are indicated in green, partially successful is indicated as blue, and not successful factors are indicated in red. If the sub criteria have an equal number of success levels equated (**Successful**, **Partial Success**, **Not Successful**), then it is considered under either criteria and the success/failure explanation is highlighted in the color of its performance level.

Table 7: Analysis of Indicators for Sustainable Management of GBM and CBM.

Government based management			Community based management	
Success level	Main Criteria	Description	Main Criteria	Description
<b>S</b>	<ul style="list-style-type: none"> <li>- Communication &amp; coordination</li> <li>- Natural Environments &amp; Climate Change</li> </ul>	<ul style="list-style-type: none"> <li>• Engineers hired through the agency have a good knowledge of the function of the UGS</li> <li>• citizens are able to promote a space for development through the local efforts department, the agency (depending on the availability of resources) plant the site and hands it over to the local community for maintenance</li> <li>• sub criteria fail due to the lack of strategic planning and the vague institutional framework that has no boundaries and unclear management</li> <li>• UGS always provide a visual screen due to the existence of vertical vegetation</li> <li>• UGS provide for local climate conditions in the country, as it reduced the heat island effects.</li> <li>• No consideration provided for planning for biodiversity such as plants that attract different kinds of birds for example.</li> </ul>	<ul style="list-style-type: none"> <li>- Stakeholder collaboration</li> <li>- Decision Making Control</li> <li>- Resource Mobilization</li> <li>- Communication &amp; coordination</li> <li>- Monitoring &amp; Evaluation</li> <li>- Social Participation</li> <li>- Private Partnership</li> </ul>	<ul style="list-style-type: none"> <li>• All stakeholders and decision makers are community members collaborating together to make best decisions for the UGS site.</li> <li>• The yearly budget is <i>flexible</i> depending on the needs of the space to accommodate its necessities.</li> <li>• Communication and coordination measures are smoothly structured. There is constant monitoring over the site, since there is more than one decision maker and community members involved and all act as an eye watching over the space to keep it safe and clean.</li> <li>• Citizens are very well involved in the management of the UGS. Private partnerships and businesses are allowed depending on the offer. As opposed to GBM no commercial billboards are existent since UGS that are CBM</li> </ul>

		<ul style="list-style-type: none"> <li>The agency is well aware of the environmental factor provided in terms of minimizing the CO2 emissions as well as the aesthetics benefits provided.</li> </ul>	<ul style="list-style-type: none"> <li>- Size, Identity, Location</li> <li>- Natural Environments &amp; Climate Change</li> </ul>	<p>are usually located on side roads and not main roads.</p> <ul style="list-style-type: none"> <li>Size is appropriate to surrounding locations, identity of the space reflects the residents living in the community, the location is always within residential buildings and in the center of a bigger urban slot.</li> <li><b>No consideration provided for planning for biodiversity such as plants that attract different kinds of birds for example.</b></li> <li>Visual and noise screening are major assets in all UGS with the provision of tall trees, reducing CO2 emissions from cars, providing good air quality, and acting as noise barriers from the surrounding cars, as well as reducing head island effects.</li> <li>No obstacles installed on site that would obstruct the functionality of the space.</li> </ul>
PS	<ul style="list-style-type: none"> <li>- Financial Management</li> <li>- Size, Identity, Location</li> </ul>	<ul style="list-style-type: none"> <li>Even though there are incentives provided by the governor for gardeners and by the agency for engineers for acknowledgement of good performance, <b>this criterion also fails in providing economic punishments enforced on the citizens for littering, and some projects are delayed due to the lack of funding.</b></li> <li>UGS are of an appropriate size accommodating the surrounding residents</li> <li><i>Dependent on the context</i> it can provide the function of connecting residents to business</li> <li>UGS are easily accessible to residents, there is a copy of keys with designated community member but residents barely ask for the keys for usage and tend to rely on recreational centers</li> </ul>	<ul style="list-style-type: none"> <li>- Resource Availability</li> </ul>	<ul style="list-style-type: none"> <li>No variety of plants used on sites that are managed by community members, since no engineers or landscape architects are the responsible members, and for ordinary residents any greenery would be sufficient.</li> <li>Vegetation is bought from nurseries in the city, as there are an abundant number of nurseries surrounding the site. The overall landscape aesthetics and using different kinds of plants on site is not of a priority as much as a bunch greening is.</li> <li><b>Water used is edible potable water from the surrounding buildings, and not recycled water. This is not the fault of the responsible entity; it is the water resource company overall in the country as a whole.</b></li> </ul>
NS	<ul style="list-style-type: none"> <li>- Stakeholder Collaboration</li> <li>- Decision Making Control</li> <li>- Resource Mobilization</li> </ul>	<ul style="list-style-type: none"> <li>Proved to be lacking a degree of social participation, no private sectors are involved, and all stakeholders are governmental institutions.</li> <li><b>There is minimal collaboration between the different governmental entities involved in the stake-holding but it needs to be further developed and improved.</b></li> <li>Lack of political will to improve management skills</li> <li>There is only ONE decision maker when it comes to the management of UGS- governor which leads to its low scoring of performance levels. No citizen participation involved by any means in the DMC. District involvement is vague and not accurate.</li> <li>Total budget of the agency is not enough to supply for the needs of UGS. No help is improvised from the private sector. The total budget provided to the agency is <i>fixed</i>, does not incorporate the fluctuation of the currency and standards of living (does not consider</li> </ul>	<ul style="list-style-type: none"> <li>- Operations &amp; Maintenance</li> <li>- Financial Management</li> <li>- Funding Resources</li> <li>- Human Resources</li> </ul>	<ul style="list-style-type: none"> <li>Needs improvement on holding a gardener accountable for his maintained work schedule. Gardeners show up to work whenever they please, and no measures being taken to hold them accountable.</li> <li>Issues with the equipment used to maintain the space is not readily available with the gardener. Gardener does not come equipped, because of budget issues, no measures of buying own equipment is on the line of implementation. This causes some delay.</li> <li>Some Community members do not cooperate with collecting fees which effects the overall budget, so then the difference is distributed amongst the other residents to make up for the drop.</li> <li>No incentives given for the gardener, as he is not liable for</li> </ul>

	<p>- Operations &amp; Maintenance - Monitoring &amp; Evaluation</p> <p>- Resource Availability - Funding Resources - Human Resources</p> <p>- Social Participation - Private Partnership</p> <p>- Recreational Aspects</p>	<p>the increased expenses of equipment, materials, and products)</p> <ul style="list-style-type: none"> <li>• Lack of economic punishments enforcement from higher forms of governmental institutions if lack of service provision is existent.</li> <li>• Citizen participation is lacking in the operations and maintenance measures, no plans are induced to use recycled water for irrigation, no measures of protecting planning elements on site and no sustainable material usage in implementation of new or existing sites</li> <li>• Maintenance staff are trained but more capacity building is necessary in this department. More efficiency requirements for the maintenance schedules of gardeners in regards for their allocated and assigned sites, more improvements are needed to keep the UGS clean and free of wastes.</li> <li>• Implementation of evaluating measures need to take place, the district managers are not reliable and not keeping up with monitoring and evaluation methods of the agency.</li> <li>• District managers are responsible for this sector, some sites are found poorly maintained and no punishment measures are taken to better the UGS. The agency is faced with consistent external nuisances and insistency on fixing damaged material, replanting plants is taken place.</li> <li>• Improvements needed on the use of recycled water instead of potable water, with some site are hard to reach so expensive and unsustainable methods of providing water is used.</li> <li>• No variety of vegetation used on UGS, which effects its quality and attractiveness levels, agency does not use the resources they have efficiently and it is dependent on the site context whether extra plantings used or not (reasons unknown).</li> <li>• UGS are not used for urban agriculture or for yield production, tried and failed attempts under old governor due to negative behaviors of the residents.</li> <li>• Quality of services in parks are not hygienic (bathrooms), cafes are not always existent.</li> <li>• No traces of social participation by any means and not in the plan of future involvement.</li> <li>• Private partnership is only existent for collecting revenue from the billboards placed along the sidewalks.</li> <li>• Private Event planners can rent a space out for festival events for kids and holidays.</li> <li>• No priority is given at providing recreational use of UGS only environmental aspects are considered and prioritized, UGS are not considered for socializing, pet walking, relaxing, jogging, etc.</li> </ul>	<p>- Recreational Aspects</p>	<p>working schedule causing more issues.</p> <ul style="list-style-type: none"> <li>• No economic punishment for littering from residents but moral punishments are applied, and sometimes nuisance causers are forbidden from entering the space through the monitoring of the doormen of surrounding buildings and rest of community members if any damages are applied from a specific person.</li> <li>• For an UGS that does not provide any sort of recreational activities, events, festivals, it does not provide economic revenue to the supplier. Also no yield production is existent in this space. But environmental benefits are applied and achieved from these green spaces.</li> <li>• Some experienced issues with the knowledge of the gardeners regarding pest control needs to be improved and developed.</li> <li>• No priority is given at providing recreational use of UGS only environmental aspects are considered and prioritized, UGS are not considered for socializing, pet walking, relaxing, jogging, etc.</li> <li>• Hence, it is not gated, observations have proved that it is widely used by kids, and teenagers for recreational uses more than GBM spaces (running, playing games, etc.)</li> </ul>
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The table (7) summarizes the detailed analysis of both case studies from Cairo, government based management and community based management. Main criteria under the same theme are grouped together to better help access the sustainability of the management systems of the urban green spaces proposed. In order to support those results and to tie them with the recommendations, the forth methodology of collecting data is used in this section to retrieve a better understanding of what the local community has to say in regards to the urban green spaces, and how they wish it could be modified to better fit the needs of the society and to increase the usage of the spaces.

### Citizen Survey/questionnaire

As proven social participation is an important factor of analysis when it comes to the sustainability of urban green spaces, and so a short survey has been conducted to find out the opinions of 45 urban dwellers in the city of Cairo, from various cities to collect a broad view of opinions. One specific characteristic of the survey takers, that they should not be living in gated communities. Otherwise, it is an open survey for all residents of Cairo. The survey included questions regarding their personal opinions of the overall design, function, status, maintenance and the management of urban green spaces in Cairo. The sample for the questions is listed in (Appendix Table 13). Out of 45 surveyors, 35 said that urban green spaces were mismanaged and poorly maintained, which is about 75% of the total number of surveyors, 11% said it was beautiful, and 9% said it was functional space for their own needs, and 5% mentioned it was both aesthetically pleasing and functional. The answer to this question is contextually based, with no residents living in gated compounds, since this is privately managed urban green spaces and it is not part of this research. 44 answered that they would like to have more open, clean, maintained parks for families. 60% stated that they would like to see private sector involvement and NGO's in the management of the urban green spaces. Their main reasoning falls behind the fact that private sector would be:

- more user oriented, more funding would be provided, better use of resources, and better quality
- more innovative thinking in terms of design and planning
- better if the public authorities had strict guidelines and legalizations followed by the public sector, which is in part a cooperative governance where the public authorities delegated some tasks of decision making and sharing rights to the private sector, while maintaining a final decision making powers
- balanced development between private, public, and civil society



- an efficient organizational structure and system overall
- provide a branding for the private sector in terms of advertisement, which provides a win-win situation as long as the urban green spaces are properly maintained
- efficient forms of monitoring and evaluation of spaces
- more 'busy' taking care of the urban green spaces as government officials took care of other important tasks regarding the basic needs of people
- better investment in the community in terms of creating an identity

The majority of the surveyors emphasized the collaborative form of management is the best way of managing the urban landscapes, in a way that it can and will shape the future of the country, the economy, the identity, the quality, the governance, and the management overall. One surveyor mentioned that even if the urban green spaces were to be developed more efficiently, he/she would not occupy the space due to the socio-economical issues regarding the segregation of the social strata when it comes to the usage of the UGS. He/she continue to state that urban green spaces attract lower social class strata and a major cultural segregation that arises due to the difference in awareness whether mentally, or behaviorally. Due to the strong emphasis that our culture and society puts on the social differences of people, the urban green spaces will always lack the occupancy of different groups of people together in one shared space. 44 surveyors confirmed that if the UGS are further developed into a socially friendly, higher quality green spaces that included the following characteristics, they would be more than pleased to occupy and use the space more efficiently and further increasing the quality of life and the well being of residents:

- beautiful landscaping and innovative interactive designs
- proper seating areas
- more user friendly leisure activities
- recreational activities (such as field tracks for jogging and exercising, and bike lanes)
- water features
- efficient security
- no gates and fences
- accessibility
- festivos events for educational purposes
- cultural and arts programs

- stationed grilling areas
- activities for kids
- shading features
- inclusion of small businesses and startup events
- trash bins that are kept clean and not damaged
- more flowers and colorful spirits for uplifting
- more trees
- more community awareness programs (teaching community members how to take care of green areas, and community gardening programs).

There has been a strong emphasis on the removal of fences on gated parks and the urban green spaces, which based on the interviews conducted with the managers in the Beautification Agency is one of a required feature to keep a space clean. This in itself is a major conflict of interest that lies between the governmental agencies and the needs of the community members within the civil society. A well-managed and designed Urban green spaces can reflect a new social structure. (Benchimol, Lamano-Ferreira, Ferreira, Cortese, & Ramos, 2017); which were the same words emphasized by the local citizens through the taking of the questionnaire. Moving towards an integrated management of resources, the following diagram (Fig. 19), can be provided as a sustainable solution to be incorporated in the management of urban green spaces.

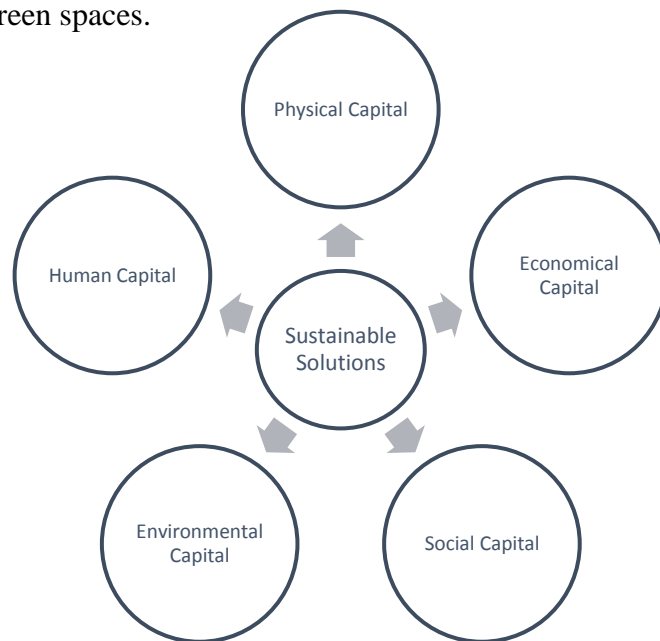


Figure 19: Sustainable solution for an integrated management of resources (Sweillam, 2017).

### C. Findings

The key indicators of the sustainable management of urban green spaces which were used in evaluating and analyzing the case studies from Cairo will be discussed in more depth and conclusions will be suggested in this section. As noticed that there are quite a number of criteria that did not meet the sustainability of the management of urban green spaces under the government management supervision. Hence, governments are not the only entities responsible for the management and the development of green spaces (Azadi, 2011), community based management spaces also lack some indicators of sustainability. Government based management sites have been proven to fail the sustainability of management schemes in the following areas: governance set up, management arrangements, resource managements, participation roles, and environmental aspects. Even though some main criteria passed the sustainability test, but overall it failed the key themes of the sustainable management assessment. Community based managed sites have passed the following themes: governance set up, participatory roles, and environmental aspects as well. CBM failed to pass the full indicators of the management set up, and the resource management themes. Some themes are on the line of passing in the CBM and only minor changes need to be implemented or improved in order for them to pass the sustainability assessment measures, such as the management arrangement theme. From this we can comprehend that in order to achieve a participatory and collaborative management, we need to combine both management schemes together to achieve a full sustainable management of urban green spaces in Cairo as indicated in (Figure 20). Further recommendations will be proposed to strengthen and/or implement some strategies to sustain the management of the urban green spaces in Cairo.



Figure 20: Participatory and Co-governance management schemes

## D. Conclusions

The analysis indicates that there is a strong centralized management system controlling the urban green spaces in Cairo. It is possible to find out the management of the urban green spaces is centralized because of the afore mentioned framework; where the decision making control is limited to one actor when it comes to the government based sites. Some measures of indicators were on the verge of being integrated under a successful level of performance, but the lack of certain actions, and processes classified it under the unsuccessful performance. Results are evenly weighted between the successful and unsuccessfulness of both management systems and if there is the political will to merge the two systems together, we would be left to benefit the full prosperity of a sustainable management system of urban green spaces, parks, and landscapes in the city of Cairo. Further analyzing the governance procedures, we can conclude that the type of involvement used in regards of the UGS is strictly controlled by government actors and only due to their lack of capacity coverage, that community based management schemes exist, proving themselves to better manage the urban green spaces. Encompassing a cooperative form of management which involves the government sector engaging non-governmental stakeholders and private entities, enterprises, and the civil society to share their experiences and expertise in a joint implementation and collaborative thinking, will lead to rewarding results and advantages to all parties involved. The cross fertilization of knowledge is a gain to all of society including nongovernmental and governmental actors. Shared measures of social participation and the involvement of the citizens in all phases of planning, management, and implementation of the urban green spaces will bring Cairo to a new level of sustainability and advancements. Besides the incorporation of a social participation, funding resources, resource mobilization, and financial management were also another common denominator that was presented in the analysis playing a big role into accessing the sustainability of the urban green spaces. Attracting funding approaches where the private sectors are able to participate into financially providing for the urban landscapes in the country is an advantage to their sustainability.

## V. Recommendations and Conclusions

### A. Reflections

The proper management of urban green spaces has been significantly underutilized by the public authorities and governmental officials due to fulfilling the consumption needs of the basic demands of the population. Better approaching the literature and extracting what the experts in the field have said in regards of a well managed urban green spaces, and providing a general overview of the factors that contribute to a sustainable management system and analyzing the current management conditions of the urban green spaces in Cairo, this research reflected at providing a qualitative analysis of accessing the performance levels of the case studies provided in order to propose an effective public policy of an integrated management approach to enhance the social, economical, and environmental benefits of the urban landscapes in Cairo, Egypt.

### B. Conclusion

One of the main conclusions of this study is that the government plays a critical role in overall quality and performance levels of urban landscapes in Cairo, and in all other governorates in Egypt, since they are managed under the same authority. This does not mean that the government should continue to play the role of a single actor. The influential role of public authorities and the civil society should be emphasized since they are not profit providing spaces and also because urban green spaces not purposefully designed for yield production. The role of the state should be developing an effective institutional framework, providing awareness to change the user behaviors against damaging the spaces, communicating different views and perceptions, and collaboratively controlling the implementation, planning, and management of the urban green spaces lying in the midst of the compact city of Cairo.

This study has found that a single stakeholder and a single decision maker does not contribute to a sustainable performance of urban green spaces. The sustainability of the management of urban green spaces lies at the hands of the politicians, policy makers, and governmental officials (governors, ministers, etc.) through incorporating a joint implementation system along with the involvement of the local community, the private sector, landscape architects, and urban planners in order to balance the various objectives of the rest of the stakeholders where good implication of managing synergies and trade-offs is prioritized for the benefit of the civil society on the local scale, and the socio-economical benefits on the regional scale, and the environmental benefits at the global scale. All stakeholders need to have a similar

priority objective and aim in order to better manage the participatory roles of each stakeholder involved. The stakeholders and the decision makers need to come from within the local community. Only successful measures will be achieved if the stakeholders are appointed from within the local citizens where they share the same experience as the rest of the community so they can better manage the challenges faced in regards to maintaining a sustainable urban green space in Cairo. A high level of coordination amongst the collaborative stakeholders within the urban greenspaces is one of the main required aspects to ensure the sustainability of a long term viable and functioning urban green spaces in Cairo.

### **C. Recommendations and Future work**

Feeding into a more sustainable management of urban green spaces, the Local Agenda 21 provides for a sustainable development action plan in incorporating a comprehensive and participatory approach for the development of urban green areas that can act a good example to follow for future integrated approaches. Through accessing the factors of contribution to a mismanaged urban green spaces, and introducing sustainable management approaches from the literature to come up with a set of indicators to analyze the local case studies from Cairo, we are able to pin point the gaps in the system and the pressures set forth on the conflict of interest between the governmental agencies and the civil society. Although we have found that not all of the challenges can be easily solved via the scope of the agency, nor the community members alone, recommendations can still be proposed:

1. Create an urban landscape standard model stating the accessible public urban green spaces in the country that includes:
  - ❖ A review that provides the values of urban green spaces to local communities (achieved benefits), and their duty towards providing for their natural environments.
  - ❖ Standards of appropriate size and coverage per capita (distribution) that is context based
    - Ratio of urban green space per inhabitant (based on international standards) and create an action plan to follow to reach that goal.
    - Provide a distance proximity (precise number value) where people can travel by foot to find an accessible urban green space in their community regardless of the social strata of the area.
  - ❖ More stringent government policies when it comes to new urban planning standards for example if a road is x meters wide, the street medians should be designed at a minimum

of (% value) of the width of the road. Including access points for pedestrian crossing if fenced in.

- ❖ Qualities and principals of a sustainable streetscape application system
2. Advertise and market for community training classes in urban green spaces for residents to attend (every district should have its own R&D center to provide training that is well advertised to the community via TV and social media)
    - ❖ workshops on community gardening from practitioners from the local authorities and experts in the field
    - ❖ Ongoing community awareness programs
    - ❖ Training and tips on how to lower our daily consumption patterns
  3. Political Will: the governmental agencies should be keen on prospering the quality of the service provided, it should allow more leeway for the civil society to participate in the decision making processes. This can be done through holding public hearings and better communication between the local committees and the public officials. Both stakeholders can work together on an action plan for the next 10 years. Nevertheless, a better communication approach can be accessed through E-government initiatives where it can act as an efficient dissemination for providing data on service delivery between the two actors.
  4. Clear standards for continuing monitoring and evaluation methods of service delivery. A review system to further evaluate the sustainability of a project within the urban environment.
  5. An E-platform linking the citizens to local councils, officials, and stakeholders for which to access volunteering opportunities regarding the maintenance of UGS. If the residents are interested in the project, and the government is lacking the funding to provide for extra labor workers, the residents can volunteer to help in the construction phase of a project and in return provide them with incentives such as coupons, or vouchers to acknowledge the motivational factors of younger population to be involved with their community.
  6. Policy enforcement of economical punishments on citizens regarding littering and perhaps jail time for destroying the quality of public property.
  7. Developing long term financial management opportunities
  8. Incorporating the challenges faced in the planning perspectives and policy systems.
  9. Implementation of strategies of management improvements to the UGS linking agencies roles with international strategies and prioritizing the social participation strategies, and SDGs.

10. Better emphasis on connecting the green to the grey infrastructure.
11. Introducing new tools of science such as remote sensing, GIS/GPS.
12. Incorporating new energy saving techniques for water transportation.

As stated in the results of this study, the sustainability of managing urban green spaces lies through the collaborative forms of management. In order to encompass a socio-political support approach, the urban green spaces need to be: publicly accepted (social participation) and obtaining good leadership (stakeholders), incorporating good financial support systems (Baycant-Levent et al., 2004), and supporting the local natural environment when it comes to the water resources, local planted vegetation, implementing identity characteristics, and an integrated land management supporting systems that are tailored to the context. (Table 8) summarizes the recommended added values of implementing a sustainable management of urban green spaces in Cairo.

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| <ol style="list-style-type: none"> <li>A. To create tourist attraction and increase tourism revenue</li> <li>B. To increase permeability rate</li> <li>C. To create awareness</li> <li>D. To create programs in new areas for implementation</li> <li>E. To increase the green area per capita</li> <li>F. To restore degraded areas</li> <li>G. To increase social participation</li> <li>H. To mitigate use of resources</li> <li>I. To increase connectivity between towns and villages</li> <li>J. To increase maintenance productivity</li> <li>K. To provide for better quality of living</li> <li>L. To increase health benefits for residents</li> <li>M. To minimize air pollution and emissions</li> <li>N. To encourage non-governmental actor involvement</li> <li>O. To support innovative Implementation and design</li> <li>P. To provide recreational areas and leisure space for dwellers</li> <li>Q. To promote land value and local economy</li> <li>R. To create accessibility for people</li> <li>S. To increase property values</li> <li>T. To support natural environments</li> </ol> |
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*Table 8: The 22 recommendations of Cairo urban green area systems.*

Through a collaborative management and a participatory governance approach, the aforementioned governmental institutions that were poorly presented and not involved in the management framework of the UGS are: EEAA, MSEA, and NACC. Even both institutions are concerned with the environmental perspective of projects, they can still be involved in providing for a comprehensive



sustainable strategic plan for the management of UGS, as providing for the environmental benefits is providing for the overall quality of life in communities. The EEAA can aid in preparing the plans and setting policies on the local scale to customize to local context regarding accessing the environmental benefits. MSEA can aid in approving the action plans set for the by the EEAA and promoting expansion sites with environmental value and reformatting the land use zoning patterns for developing and increasing the surface area of urban landscapes. The NACC would play a big role when it comes to public participation and the involvement of the civil society in the decision making and coordination measures and can act as the middle man between the governmental agencies and the local community members. It can collaborate with the efforts and duties of the local efforts department within the agency to prepare policies and planning measures in favor of the citizens to improve the overall quality of urban green spaces and to design interactive and innovative spaces for the public use.

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## APPENDIX

Table 9: Definition of urban green spaces and squares, according to literature and from the interviews with the managers of the squares of the municipality of São Paulo, SP (SOURCE: (Benchimol, Lamano-Ferreira, Ferreira, Cortese, & Ramos, 2017).

Green space	
Author	Definition
Benini & Martin (2011)	<b>A public green space</b> is every free space ( <b>green or leisure space</b> ) for communitarian use and features <b>some kind of vegetation</b> (natural or planted), that can make an <b>environmental</b> contribution ( <b>photosynthesis, evapotranspiration, shading, permeability, conservation of the biodiversity and mitigation of the effects of the air and sound pollution</b> ) and is also used for <b>social, ecological, scientific or cultural purposes</b> .
Caporusso & Matias (2008)	<i>"... a concept fit for urban green spaces must take into consideration that they are a kind of free urban spaces <b>mainly composed by permeable ground, arboreal or shrubby vegetation</b> (including the street trees, once they have a range of influence that allows them to play the role of a green space), <b>open to the public or not</b>, that play a minimal ecological, aesthetical and leisure role".</i>
United States Environmental Protection Agency (EPA 2017)	The definition of urban green spaces is included in the concept of open space which <i>"is any open piece of land that is undeveloped and is accessible to the public"</i> . This concept also includes schoolyards, playgrounds, public seating áreas, public plazas, vacant lots.
Harder, Ribeiro, & Tavares (2006)	This noun is applied to several kinds of <b>urban spaces that provide the interaction of human activities with the environment"</b> .
Silva & Vargas (2010); Priemus (1999)	"it fulfills some relevant roles such as <b>to produce oxygen, to cool the air</b> through the transpiration, and to absorb pollutants".
Mishra & Pandit (2011)	<b>Outdoors public spaces</b> , in urban areas, <b>predominantly permeable</b> , featuring soil, grass, trees or shrubs. Covered by vegetation, they are <b>directly used for active or passive recreation, or indirectly used due to its positive influence on the urban environment, they are accessible and fulfill the various needs of the citizens and, therefore, contribute to the quality of life in the cities or urban regions</b> .
Balooni, Gangopadhyay & Kumar (2014)	<b>Provide social, ecological and economic benefits</b> and contribute to enhance the lifeability, fairness and sustainability in the cities.
Managers of squares in the city of São Paulo.	Green spaces are all the gardened areas featuring arboreal or shrubby vegetation. That means, areas that feature vegetation or are permeable.

Table 10: Elements of Sustainable Streetscape (Reeman, 2012).

<b>Elements of Sustainable Streetscape</b>	
Sidewalks	Pavement is an essential component of any streetscape. "Sidewalks should be designed to provide safe, attractive, interesting and comfortable spaces for pedestrians by providing well designed and coordinated tree planting, lighting and street furnishings". To achieve sustainable streetscape paving materials should be selected for reflectivity, green manufacturing, local sourcing and permeability".
Planters	Planters add color, texture and interest to a streetscape and can help define and separate spaces. They help define primary building entrances, and enhance esthetic value. Planters placed on walkways should not create congestion or block pedestrian traffic, and placement on street corners should not obstruct driver's view. They can be installed at seating areas, along the edges of parking lots, in pedestrian plazas, and in clustered furnishing areas". "Stormwater planters also play an important role in sustainable urban design by minimizing stormwater runoff, reducing water pollution, and creating a greener and healthier appearance of the built environment by providing space for plants and trees near buildings and along streets
Street Furnishing	Street furniture shall be consistent and coordinated in design, materials, colors and styles that will be complementary to the architectural style. The placement and design of the elements should be coordinated to avoid visual clutter. These elements may include Lighting Fixtures, Waste Receptacles, Benches, Signage, and Bicycle Racks.
Benches	Benches are important public resources that contribute to make the city an enjoyable space for pedestrians". "The purpose of seating is for waiting and resting and areas along walkways provide welcome relief to pedestrians, and a place to sit together, interact, and observe. Seating on street corners must not obstruct driver's views". "Benches are usually placed at bus stops". It is preferred to be made of sustain- able materials or recycled materials in order to achieve economic efficiency and sustainable streetscape.
Lighting	Lighting is an important element in streetscape, as it should contribute in creating safe and esthetically pleasing public spaces". "All pedestrian areas should be lit at night, and lighting should be used to confirm the elements of landscaping, decoration, and important buildings". All lighting fixtures should be energy efficient and provide minimal light emissions to prevent night sky pollution.
Trash receptacles	Trash receptacles may be the most used streetscape element and should be conveniently located for pedestrian traffic near benches, bus stops, and other activity nodes. At a minimum, one trash receptacle should be placed at every corner". Materials that are utilized in trash receptacles should be sustainable, or recycled materials to achieve sustainability in streetscape.
Street corners	Street corners provide increased pedestrian space and opportunity for social interaction through the placement of benches and site furnishings as well as a safe refuge while waiting to cross the street. They also provide shorter crossing distances for pedestrians.
Trees and Landscape strips	Landscape strips are an effective treatment between sidewalks and streets to create a buffer from moving vehicles and street noise, and help pedestrians feel more comfortable walking along the street". They help streetscape to be sustainable by establishing raingarden.
Rain-gardens	A raingarden is a garden bed which is designed to treat storm-water. As water falls onto and enters the garden it is passed through a filter media which is planted with vegetation. Treated stormwater



	is then fed back into the drainage system or left to infiltrate into the ground below. When integrated into streetscapes, raingardens can provide a greener solution to treating stormwater and reduce the demand on potable water to water the plants
Signage	Signage plays an important role in creating a comfortable urban environment by establishing a visual guide and orientation tool for both pedestrians and drivers". "The signage style should be clear, and timeless and flexible. Solar sign should be used in streetscape, because it has long lifetime, and spreads the information more effectively". "Signage will describe sustainable technologies and practices within the streetscape and raise awareness of their associated environmental benefits. Signage system should be designed to utilize environmentally friendly materials and simple construction methods
Bus shelter	Bus shelters are structures located at some bus stops to protect passengers from weather. All bus stops should be marked by bus stop signs and provided with benches and trash receptacle". "The sustainable approach of streetscape encourages the addition of a green roof to each bus shelter to have a larger effect on environmental quality, and makes it with recycled materials.
Medians	Medians are an effective method of making a streetscape more pedestrian friendly". "Landscaped medians can dramatically alter the visual character of street for both motorists and pedestrians". "Medians serve three primary purposes: to separate opposing traffic, to provide space for planting, and to provide a refuge for pedestrians crossing the road". Medians can contribute toward achieving sustainable streetscape by establishing raingarden in green area, using sustainable materials in pavement, or using solar street lights
Curbs	Curbs are defined as the edge of the sidewalk where they meet the street and act as a barrier to prevent vehicular traffic from riding up onto the sidewalk. Curb ramps provide a connection from the sidewalk to street for people in wheelchairs, people pushing strollers, children on bicycles, and delivery services. Curb ramps are required at all intersections and crosswalks, including mid-block crossings.
Bicycle facilities	Designing sustainable streets should include identifying needs and accommodating bicycles just as for other vehicles in the traffic mix. Streets should be designed and constructed to safely accommodate known and encourage bicycle use. The fundamental needs of bicyclists are twofold: safety while moving in traffic and convenient, safe and secure parking
Crossing	Crosswalks are a critical part of the pedestrian network. "Enhanced crosswalk paving can make motorists more aware of pedestrian activity". "Streetscape should be enhanced by special paving at crosswalks to designate safe pedestrian circulation.

Table 11: The process of “What is involved in preparing a green space strategy?” (“Green Space Strategies,” 2004).

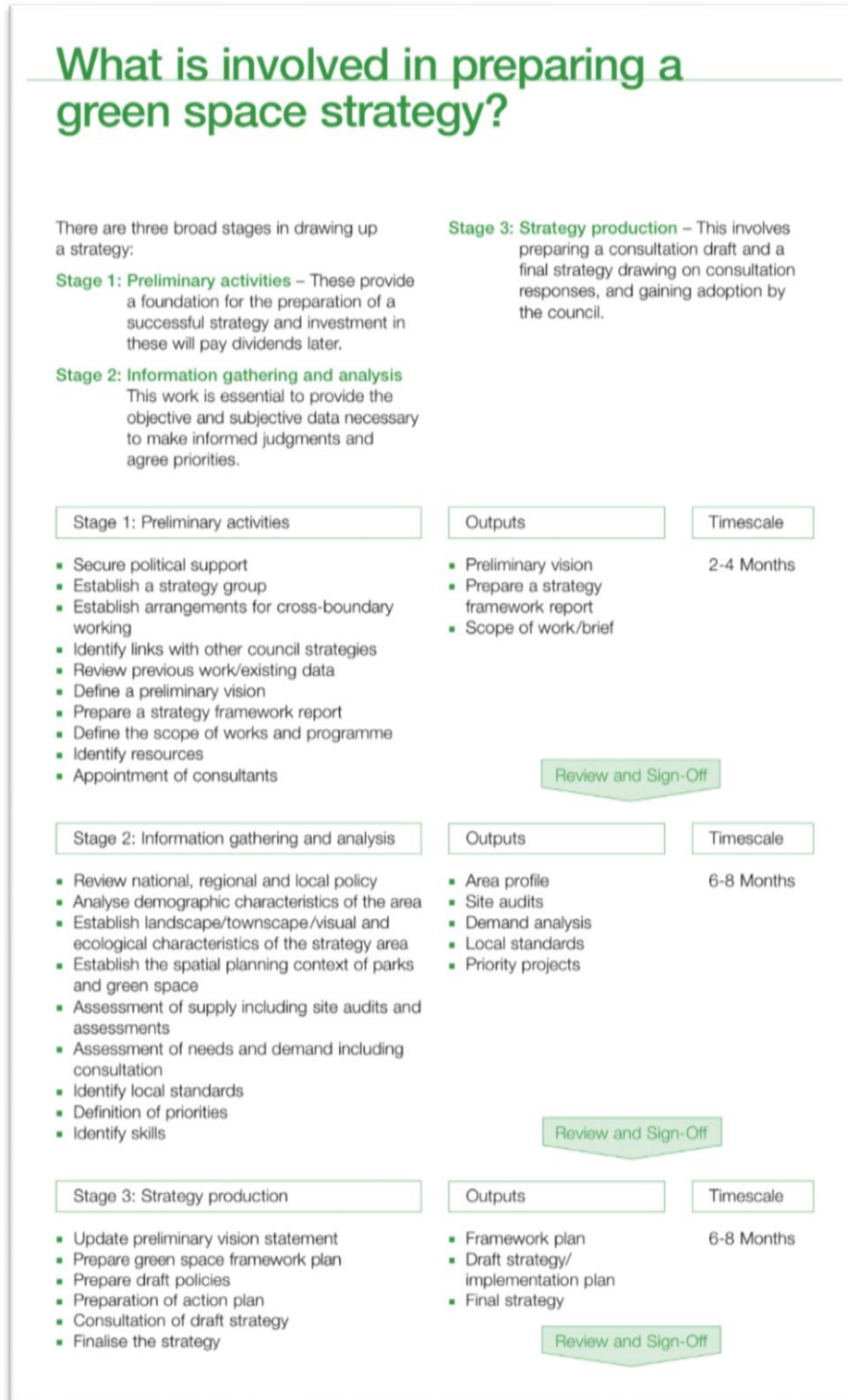


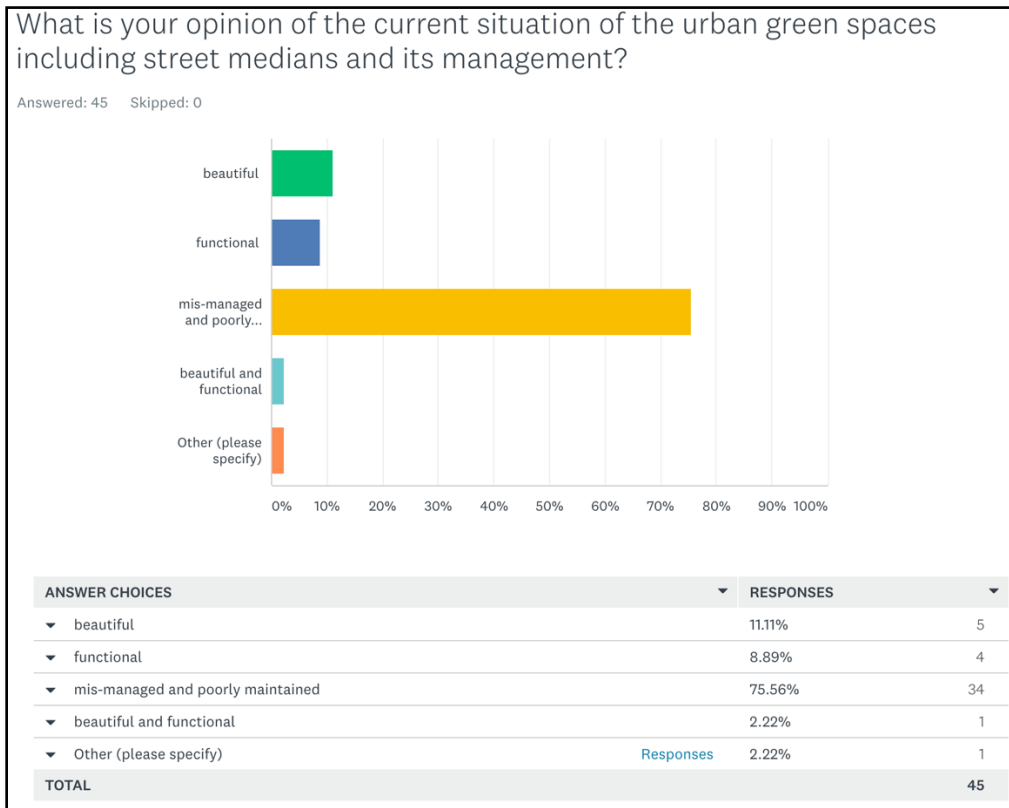
Table 12: Sustainable Management Indicators of Urban Green Spaces.

5 Key themes	15 Main criteria	93 Sub criteria	Success Level			
			S	PS	NS	NA
A. Governance Set up	A1. Stakeholder Collaboration	A1.1 Is there collaboration within the institutions/citizens involved? A1.2 Are stakeholders all government institutions? A1.3 Is there collaboration between the government officials and the civil society? A1.4 Is there private sectors involved within the stakeholders? A1.5 Is the degree of social participation/local communities efficient?				
	A2. Decision Making Control	A2.1 Is there political/citizen will to better the management skills? A2.2 Are there more than one decision takers involved? A2.3 How is the degree of citizen participation in the decision making control? A2.4 How is the intensity of district administration involvement?				
	A3. Resource Mobilization	A3.1 Are the funding sufficient for the scale of projects provided? A3.2 Do government agencies cooperate with private sectors for funding aiding? A3.3 Is there a proper division of funding among different departments/households? A3.4 Does the funding come from the authorization's own revenue budget? A3.5 How are the funding allocated yearly? Is it a specific % of the country's budget or is it not specified? A3.6 Is there a fixed budget(NS) for the UGS authorities or is it project-based (S)? (Budget provided from the central government to the local authorities yearly/budget from responsible citizen to cover space expenses)? A3.7 Does the government enforce 'economic punishments' on local authorities/community for the lack of proper service delivery?				
B. Management Arrangements	B1. Communication & Coordination	B1.1 How are spaces promoted? Is there a strategical plan for picking new development sites? B1.2 How is the knowledge of the engineers/community members about the function/aims of areas? B1.3 Can citizens promote a space for developing/greening? B1.4 Is it easy for the citizens to communicate to the managers regarding natural disasters occurring (ex. Trees falling and damaging private properties)? B1.5 Is there a clear followed institutional framework within entities?				
	B2. Monitoring & Evaluation	B2.1 Is there ongoing information gathering about the use of spaces? B2.2 Is there activities involving citizens to participate in evaluating the UGS? B2.3 Is there ongoing monitoring from within the institutions/members regarding the performance of the staff/gardeners? B2.4 Are authorities/members keeping up with their aims and objectives? B2.5 Does the monitoring and evaluation fulfills the urban planning policies? B2.6 Does the management arrangement follow changes and future demands?				
	B3. Operations & Maintenance	B3.1 Are staff well trained and well qualified? B3.2 Is there a set schedule for maintenance team linking the needs of the space? B3.3 Are there activities involving the citizens in the maintenance of the spaces? B3.4 Is there plans to change the irrigation systems at site where there are no water resources? B3.5 Is there plans on manufacturing/buying (CBM) own equipment locally? B3.6 How is the quality of the UGS in terms of cleanliness? B3.7 Is there any measures taken to protect the landscape elements installed on sites (lighting fixtures, irrigation systems, etc.) B3.8 Is there a use of sustainable materials been used in the design of UGS?				
	B4. Financial Management	B4.1 Is there work delayed in terms of implementation due to lack of funding? B4.2 Are the methods of collecting money from residents easy? B4.3 Are there incentives for performance levels for engineers? B4.4 Are there incentives for performance levels for labor workers? B4.5 Are there 'economic punishments' enforced upon the citizens for littering?				
C. Resource Management	C1. Resource Availability	C1.1 Do the local nurseries sustain the district needs? C1.2 Is there constant need to buy plants from main nurseries, further out in the city? C1.3 Are water resources accessible to all sites? C1.4 Is the type of water used for landscaping recycled water or grey water? C1.5 Are cars providing water coverage for hard to reach sites, energy sufficient? C1.6 Is there a variety of plants used on site? C1.7 Do the nurseries provide a variety of locally grown vegetation? C1.8 Is edible water used for the irrigation of sites? C1.9 If there are sites that do not have a water resource, is there major changes done in the reconstruction plan of the irrigation systems to provide water? C1.10 Is the above process implemented on a timely manner? C1.11 Do the institutions/members have the capacity to provide the vegetation needs for all sites?				

	C2. Funding Resources	C2.1 Is the delivery of resources (vegetation) sustainable/affordable? C2.2 Does the cost of construction of the site sustain itself? C2.3 Does the site provide economical revenue directly to the agencies/institutions? C2.4 Is the revenue related to a yield production? C2.5 Is there revenue generated from the recycling of landscape wastes? C2.6 Is the revenue generated match the services provided quality of spaces? C2.7 Does the local community provide funding for UGS if needed?				
	C3. Human Resources	C3.1 Is the capacity of HIR sufficient to provide for the load of work? C3.2 Is there acknowledgement for motivational factors? economic or psychological? C3.3 Do workers have a good knowledge of plants and the landscape? C3.4 Are workers getting replaced due to retirement, injuries, death? C3.5 Is the hiring process controlled by the managers or is it higher entities? C3.6 Is there constant training provided by the managers for improving the capacity building skills of workers and engineers? C3.7 Is there programs to create awareness to users on how to deal with their landscapes? C3.8 Does the management support innovative design ideas?				
D. Participation Role	D1. Social Participation	D1.1 How is the degree of involvement of citizens in the initial phase of the project? D1.2 Are the citizens involved in participating in the implementation phase? D1.3 Is there collaborative planning between the users and the managers? D1.4 Are citizens involved in participating their feedback/opinion against an action taken by the authorities? D1.5 Is social participation a priority for the managers? D1.6 Are roles/duties distributed correctly and defined amongst responsible entity?				
	D2. Private Partnership	D2.1 Is there private partnership involved in the management of UGS? D2.2 Would governmental actors collaborate or allow private partnership? D2.3 Is the provision of commercial billboards along the edge of UGS efficient? D2.4 Are private businesses allowed to use the public UGS for their own benefit? D2.5 Do private entities economically support the management of UGS?				
E. Environmental aspects	E1. Size, Identity, location	E1.1 Are UGS of an appropriate size regarding surrounding citizens? E1.2 Does it provide a green belt connecting residents to businesses? E1.3 Does it support people to travel by foot or bicycle? E1.4 Is there external nuisances causing disturbance in the spaces? E1.5 Are the UGS distributed well within its overall urban context? E1.6 Is the urban green space easily accessible to its surrounding residents?				
	E2. Recreational aspects	E2.1 Are recreational aspects prioritized to the managers? E2.2 Does the space provide different uses during different seasons? E2.3 Do spaces provide different experiences? E2.4 Are the services/facilities hygienic (bathrooms)?				
	E3. Natural environments and climate change	E3.1 Does it provide a noise barrier between residential buildings and the roads? E3.2 Does it provide a visual screen? E3.3 Is there a priority given for biodiversity accommodation in the planning? E3.4 Do the spaces adapt to the local climate situation? E3.5 Are environmental aspects prioritized in the planning of the UGS? E3.6 Are citizens aware of their duties against their natural environment?				

- (S) stands for successful, (PS) stands for partial success, (NS) is not successful, and (NA) is not applicable; this is based whether or not the question is directed for government based management only or for community based management.
- Private sectors can also be substituted with community members.
- Managers could mean the government entity responsible or the community member that is responsible for the UGS.
- GBM stands for government based management and CMB stands for community based management.

Table 13: Sample of the citizen survey questionnaire.



Would you want to see more users of the space and more interactions?

Answered: 44 Skipped: 1

RESPONSES (44) TEXT ANALYSIS MY CATEGORIES

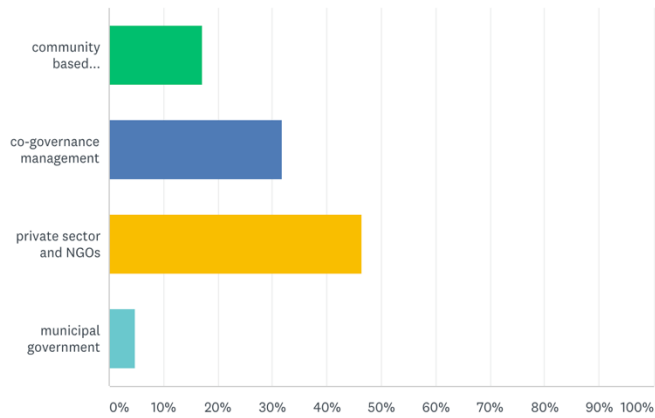
Categorize as... Filter by Category Search responses

Showing 44 responses

yes	11/11/2017 10:31 AM	<a href="#">View respondent's answers</a>
Yes	11/10/2017 8:02 PM	<a href="#">View respondent's answers</a>
Yes	11/9/2017 4:24 PM	<a href="#">View respondent's answers</a>
Yes	11/8/2017 11:05 PM	<a href="#">View respondent's answers</a>
Yes	11/8/2017 8:46 PM	<a href="#">View respondent's answers</a>
Yes		

## If you would change the way these urban green spaces are managed, how would you better manage them?

Answered: 41 Skipped: 4



ANSWER CHOICES	RESPONSES
community based management	17.07% 7
co-governance management	31.71% 13
private sector and NGOs	46.34% 19
municipal government	4.88% 2
<b>TOTAL</b>	<b>41</b>

Comments (3)

RESPONSES (3) TEXT ANALYSIS MY CATEGORIES

Categorize as...

Filter by Category

Search responses

Showing 3 responses

**All together for every situation, one would be needed**

11/8/2017 5:31 PM

[View respondent's answers](#)

**It doesnt matter who will manage it.. what matters is the outcome**

11/7/2017 6:25 PM

[View respondent's answers](#)

**Combination of social participation and governmental participation**

11/7/2017 6:20 PM

[View respondent's answers](#)

### Do you support urban agriculture and community gardening or not? Why?

Answered: 43 Skipped: 2

**RESPONSES (43)** TEXT ANALYSIS MY CATEGORIES

Categorize as... Filter by Category Search responses

Showing 43 responses

yes, as urban agriculture is essential part to urban development	11/11/2017 10:31 AM	<a href="#">View respondent's answers</a>
Yes	11/10/2017 8:02 PM	<a href="#">View respondent's answers</a>
Yes, it can reducing heat island effect, it could be economic for whoever decides to do that, and it looks good	11/9/2017 4:24 PM	<a href="#">View respondent's answers</a>
Yes, it strengthens community ownership and gurantees sustainable managment	11/8/2017 11:05 PM	<a href="#">View respondent's answers</a>
Yes	11/8/2017 8:46 PM	<a href="#">View respondent's answers</a>
Yes of course That's a way to make a difference in our Lives		

### Do you think if it is managed by the private sector it would be better or worse and why?

Answered: 43 Skipped: 2

**RESPONSES (43)** TEXT ANALYSIS MY CATEGORIES

Categorize as... Filter by Category Search responses

Showing 43 responses

it would be better of course, but if the private sector cooperated with the public sector this could shape the future	11/11/2017 10:31 AM	<a href="#">View respondent's answers</a>
The questions holds two answers...better, yes if it is for the public and not privatised. Because in case it is privatised to special sector then what was the point of managing them except creating more boundaries	11/10/2017 8:02 PM	<a href="#">View respondent's answers</a>
it can be better if the government has strict guidelines and legalization that are followed by private sector, to avoid negative scenarios as poor maintainance or extreme profit oriented strategies	11/9/2017 4:24 PM	<a href="#">View respondent's answers</a>
Neither, the private , public and people partnerships provide balanced development	11/8/2017 11:05 PM	<a href="#">View respondent's answers</a>
Yes,better quality	11/8/2017 8:46 PM	<a href="#">View respondent's answers</a>

## If the urban green spaces around your homes were to be developed to fit your needs, would you occupy the space?

Answered: 42 Skipped: 3

RESPONSES (42) TEXT ANALYSIS MY CATEGORIES

Categorize as...

Filter by Category

Search responses

Showing 42 responses

for sure

11/11/2017 10:31 AM

[View respondent's answers](#)

Yes

11/10/2017 8:02 PM

[View respondent's answers](#)

Not really, because urban green spaces in Cairo is influenced by socio-economic issues in the social fabric of Egypt, they often attract lower social classes, as a spontaneous cultural segregation arises due to the actual difference in education, income, etc. of the visitors. This results in making urban green space not an equally friendly space for every social level in the community.

11/9/2017 4:24 PM

[View respondent's answers](#)

Sure

11/8/2017 11:05 PM

[View respondent's answers](#)

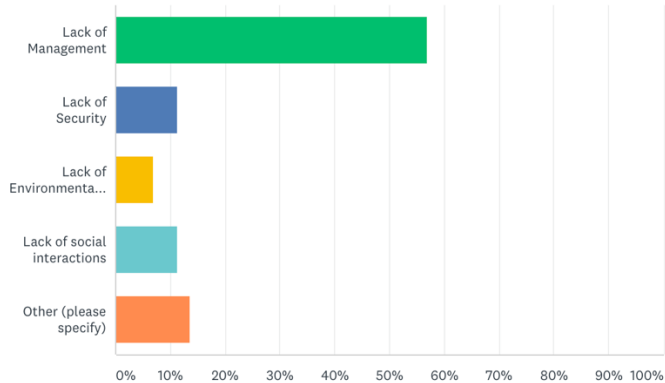
Seating and landscape

11/8/2017 8:46 PM

[View respondent's answers](#)

## What is your most concern with the urban green spaces?

Answered: 44 Skipped: 1



ANSWER CHOICES	RESPONSES
▼ Lack of Management	56.82% 25
▼ Lack of Security	11.36% 5
▼ Lack of Environmental Benefit	6.82% 3
▼ Lack of social interactions	11.36% 5
▼ Other (please specify)	Responses 13.64% 6
<b>TOTAL</b>	<b>44</b>



How would you like to see the green space outside your home look like?  
(Features, programs, events, educational purposes, etc.)

Answered: 41 Skipped: 4

**RESPONSES (41)** TEXT ANALYSIS MY CATEGORIES

Categorize as... Filter by Category Search responses

Showing 41 responses

I would love to see more recreational activities, events and special monthly programs that change according to users needs and interests  
11/10/2017 8:02 PM [View respondent's answers](#)

Clean, well maintained green areas, water features, educated security guards, and less fences or no fences at all.  
11/9/2017 4:24 PM [View respondent's answers](#)

Accessible, diverse activities, well maintained  
11/8/2017 11:05 PM [View respondent's answers](#)

Around my home all I need is more green and seatings  
11/8/2017 8:46 PM [View respondent's answers](#)

Events and educational purposes  
11/8/2017 6:25 PM [View respondent's answers](#)

social use with agricultural

What is the current situation of your urban green spaces surrounding your homes?

Answered: 41 Skipped: 4

**RESPONSES (41)** TEXT ANALYSIS MY CATEGORIES

Categorize as... Filter by Category Search responses

Showing 41 responses

Unused unfortunately surrounded by gates and fences and no one is using them  
11/10/2017 8:02 PM [View respondent's answers](#)

Not good and not bad, on a scale from 1 to 10 it is 5, where 10 is perfect, and 1 is very poor.  
11/9/2017 4:24 PM [View respondent's answers](#)

Unsecured and poor in services and accessibility  
11/8/2017 11:05 PM [View respondent's answers](#)

We have a land in front of my house that was planned to be a garden (by the government) and the (government) rents it as a parking  
11/8/2017 8:46 PM [View respondent's answers](#)

Elobour club  
11/8/2017 6:25 PM [View respondent's answers](#)

there is some, no one take care, lots of garbage, points to hide some bad people, and scary sometime to the Girls at night