

Original article

Horticultural and Ecological Assessment of Public Gardens and Parks at Benghazi City during Last Five Decades

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ABSTRACT

Gardens and parks play significant and major role from ecological and environmental point of view. The presence of trees, plants and greenery in public gardens and resorts helps to cool the surrounding environment, reduce air pollution and improve air quality. They can also support pollinators and wild life like bees, butter flies and birds by providing a diverse range of flowering plants and habitats for urban wildlife. Despite of the ornamental plants were very limited, and the workers and specialists in this field were very rare, the municipality of Benghazi tried to provide the horticultural structures like plant nurseries, training programs and investing in employees and providing opportunities for their development. During years from 1990 to 2023, the number of gardens and parks was jumped to more than 127. Recently, more horticultural care was noticed not only in the governmental sector but also in the private one while the number of ornamental nurseries increased, private agricultural companies established, and more plants were imported and introduced to the city. Because of lack of information, we tried to analyzed and assayed the gardens and parks situation from horticultural and ecological point of view at Benghazi city from 1973 to the present using available information with focusing on the development of this sector to provide more data base for the authorities, interests and researchers.

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INTRODUCTION

With the continuous increase in population, transportation, factories, urbanization and the vertical and horizontal expansion of housing [1,2], there has become an urgent need to expand green spaces like gardens and parks. Gardens and parks play significant

and major role from ecological and environmental point of view. The presence of trees, plants and greenery in public gardens and parks helps to protect the surrounding environment, reduce air pollution and improve air quality, local climate regulation and storm water management [3-5]. By providing habitats and connectivity, they can support urban biodiversity and provide cultural ecosystem services [6]. They can also support pollinators and wild life like bees, butter flies and birds by providing a diverse range of flowering plants and habitats for urban wildlife. In addition, they have psychological benefits that include stress reduction, improved mental-well-being, connection with nature and opportunities for social interactions [7,8].

Gardens in Libya are considered relatively new, as they began to appear during the period of the Italian occupation in both Tripoli and Benghazi. The first public garden in Libya was established by General Rodolfo Graziani near Tripoli shortly after his arrival there in 1912. This garden featured many exotic plants from around the world, including some

species that had never before been seen on Libyan soil. Later, the Italian were using trees providing shade from hot desert sun or places for people to gather socially. This included palms, eucalyptus and others with flowers such as roses or jasmine bushes.

However, gardens in Benghazi increased in development during the last periods of the twentieth century, and throughout this period, gardens and parks began to spread slightly and in limited numbers and types of plants. During the period from the 1970s until the end of the previous millennium, it began to increase in a more developed manner. By the end of 2023, gardens achieved a significant increase compared to what was previously [9], but this increase was not carefully studied, as many of the plants that were imported and planted in gardens, public roads, as well as parks.

Plants imported and used in like these projects should be adapted to the nature of the region, whether in terms of their adaptation to climatic conditions, soil, or otherwise. Therefore, it is expected that some of these plants will disappear within a short period due to their inability to adapt, or they will become invasive plants.

Because of lack of information on gardens in Libya, especially in Benghazi city, this work tries to shade some light on gardens development, numbers and their plants and provide more information to authorities, interests and researchers from the horticultural and ecological point of view from 1970s to 2023.

METHODS

Study area

Benghazi city is located in Northeastern coastal region of Libya at 20° and 4' of eastern longitude, and 32° and 7' of northern latitude. Climatically it is classified as arid zone while the maximum rainfall occurs in winter and early spring. Mean annual rainfall is 121ml and the mean temperature degree at this city is 25 C°. According to census in 2000, Benghazi city has a population of 871000, and in the last census the number of populations reached 1,207,250 in 2020 [10].

Data analysis

This work was depending on analyzing and assaying the gardens and parks situation at Benghazi city from 1973 to the present using available information, maps, different visits to the locations, collection of plants, personal contacts with experts and agricultural engineers in administration of public gardens of Benghazi, personal experience, publications ...etc. with focusing on the development of this sector to provide more data base for the authorities, interests and researchers.

RESULTS AND DISCUSSION

Parks

There are three large parks in the city of Benghazi, which locally called "Montazah". They vary in size from one to another (Figure 1). What is notable about these parks is that they were originally natural places that were modified to be used as public parks or gardens. The most important, largest and oldest of them is the Benghazi Tourist Park, which was established in 1956. The natural area in which the park was located was exploited during that period to utilize it as a place for entertainment and a public park for people. It occupies an area of 46 hectares and is interspersed with green lawns in a large area, as well as trees that were previously used for forests such as eucalyptus, pine, casuarina, or olive trees that were originally present in the region in account of 225 trees. In 1982, it was renewed and rebuilt to become a park for the city of Benghazi, and this park became distinguished by the presence of a number of animals, most of which were brought from Africa and Asia, and some of the natives and locals, in addition, entertainment places for children. The green lawns form a large area of this park, occupying most of the area and may reach about 75% of the total area of the park with keeping the previous trees as they before.

The second one is located at the eastern entrance of the city "Abu dazira" with an area of about 25 hectares. The name was coming from the nature of the place that appeared as an island in the center of the lake (Figure 1). This park was established in the beginning of the eighties of the last century on a natural area containing a natural lake, which occupies about half of the park's area and connected to the sea by underground canals, and therefore, the water has high salinity. The rest of the area consists of green spaces "*Cynodon dactylon*, commonly known as Bermuda grass", wooden umbrellas, a round restaurant in the middle of the lake and a cafeteria for serving light meals. The sides of the lake are surrounding in all directions by the reed plant "*Phragmites communis*", which is the distinctive plant of this park as it is an amphibious plant. The number and abundance of trees and shrubs is very limited. The Arabian acacia tree and fan palm "Washingtonia" are considered the most widespread plants in this park. According to shortage of water during 1980s, the authority was advised to reduce the agricultural area by increasing the investment using building gust houses which designed by plants can tolerate the drought and suitable with the area like date palms "*Phoenix dactylifera L.*".

Finally, the third place is the Al-Jalaa Park, that established in 1989 and occupies an area of approximately four hectares. This garden is distinguished by the huge, long-lived eucalyptus trees that were originally present before this place was converted into “Korean style park” (Figure 1). Most of the garden’s area is occupied by green areas of the herbaceous *Lolium perenne*, common name perennial rye grass, fan palms, *Ficus nitida* L, *Delonix regia* (Bojer) Rafin, *Jacaranda mimosifolia* R.Br., and *Eucllyptos* trees with a group of other shrubs like *lantana camara* L., *Hibiscus rosa-sinensis* L., *Jasminum officinale* L. and others.

Gardens

Public gardens in the city of Benghazi were considered very limited at the beginning of the seventies of last century, and this period is an extension of the sixties (like teacher garden in the down town). At the end of the seventies appeared the 23rd of July Park (Figure 4), which is located on Benghazi Lake, with around total area of 38 hectares. This garden contains ficus, pine, eucalyptus, casuarina, fan palms, date palms, and oleander plants. Through the five-year plans at the end of the seventies and beginning of the eighties, it began to gradually expand in establishing gardens in different areas of Benghazi, where their number reached about 25 gardens in the whole city. This number gradually increased from 1990 to 2023 and reach 127 public gardens with varied area from 4000 to 18000 m². Despite the expansion in the establishment of gardens, the total area of gardens does not represent the internationally recognized ratio to members of society, as it constitutes this area is a very small percentage of the total city and the individual’s need for green spaces compared to group of countries. For example, the area in Britain is 20 square meters per person, and Germany is 35 square meters per person [11]. As for the Arab countries, in Egypt, it is 4 square meters per person [12]. While it was 1 million m² of Benghazi in the total area at 2010, with a population of 1.08 million capita which means around 1 m² for person.

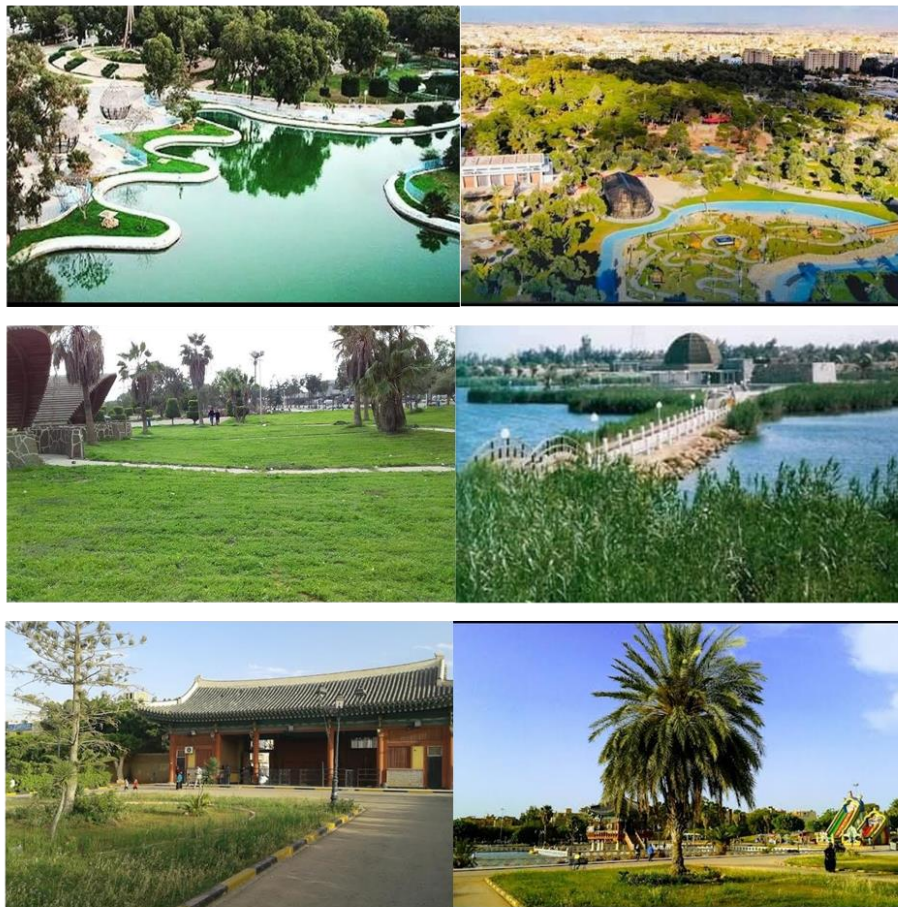


Figure 1. parks of Benghazi city. Top, Benghazi Park, middle Abojzira and Al-Jalaa Park “down”. Photos were obtained from (GBGS)

Gardens establishment problems

The most important problems in establishing public parks and gardens in Benghazi are mostly divided in two classes; the first is management absence and human resources including the lack of reliance on scientific foundations, municipal budget, land allocated for parks, the lack of a general classification at the state level that determines the quality and areas of parks, the lack of awareness among some citizens and their failure to maintain them. The second one is environmentally like the failure to choose suitable plants, the unsuitability of the soil of many parks for agriculture, and the lack of irrigation and lighting networks.

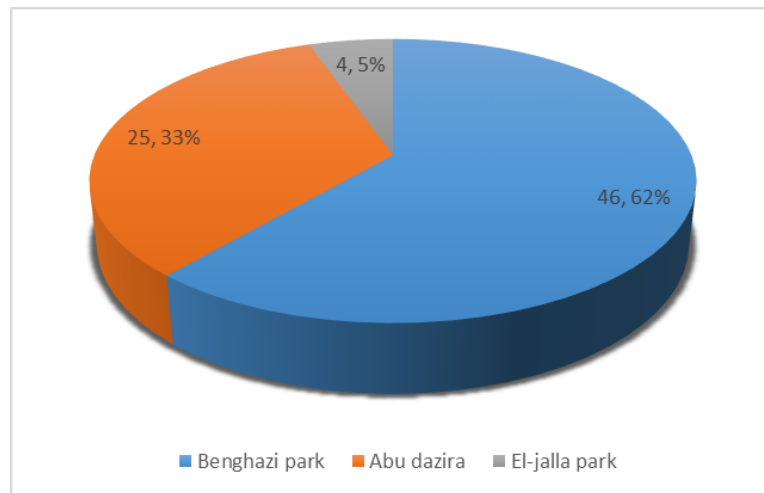


Figure 2. The total area of Benghazi parks in hectares.



Figure 3. The largest open garden (23th July Garden) located at the lake of Benghazi with an area of 18 hectares. Note the fan and date palms.

Irrigation systems

Irrigation systems in public gardens and parks in the city of Benghazi until the 1980s were by distributing irrigation points in different squares of the garden and then connecting them to flexible plastic pipes to use in the irrigation process. This has been the case in most public gardens since their establishment in the colonial Italian period until the second half of the eighties, where the automatic irrigation system occurred during the development of Benghazi Park and the establishment of Al-Jalaa Park, which depends on the use of automatic sprinkler systems (pop up) to irrigate the garden plants. Recently, this system is become widespread in all gardens at the city but exposes to defects because of absence of maintenance.

Horticultural structures (Nurseries and greenhouses)

Table 1 shows the development of nurseries from 1970s to 2023. The nurseries used for the propagation of ornamental

and other various plants were considered relatively few during the seventies, most of which were affiliated with the Ministry of Agriculture at the time. These nurseries existed in both Al-Hawari region, which is designated for the propagation of forest plants, and the Bouatni region, which is also designated for the propagation of fruit plants and ornamentals. While two ornamental plant nurseries were used to manage the public gardens that belonged to the municipality of Benghazi, to be used for provision and storage ornamentals that were grown in gardens during that period. Most of these plants were purchased and imported locally from Tripoli and other regions.

The forest plant nursery in Al-Hawari region, that specialized in production of trees used in forestation, and were also used to plant public gardens in the city of Benghazi. Among these plants were eucalyptus, pine, casuarina, and others. In most cases, like this nursery propagated easy to propagate and limited plants. As for the private sector, in the late seventies and the beginning of the eighties only two private nurseries were existing.

The administration of Benghazi Gardens and Parks Authority was established during the first half of the 1980s, which supervised most of the parks and nurseries specialized in the production of ornamentals. An agricultural land with an area of four hectares was prepared as a major center for the production of ornamental plants and the private nurseries were fully belonged to public sector. Table 1 and figure 4 show the number of nurseries from seventies until 2023, as well as the distribution of these nurseries within the city of Benghazi.

The greenhouses specialized in the propagation and production of flowers like rose and indoor ornamental plants were very rare. Using transparency plastic sheath greenhouse was common while the glass ones were absent. These facilities were affiliated with the Department of Agriculture in the city of Benghazi or central nursery of ornamentals that authorized by Benghazi parks administration, and both were not very productive.

From table 1, it is clear that the number of nurseries in the private sector has increased steadily starting in the 1990s and continuing until 2023, and on the opposite side, the governmental ones were despaired. They all generally import flower and ornamental plants from Egypt or Tripoli, and then sell them. In most cases, no type of plants is propagated in these nurseries, and if this exist, they are in limited numbers and limited nurseries. The development in increasing the numbers in nurseries is due to the increased demand for purchasing plants among citizens in the city of Benghazi, as well as increasing the spatial area for the distribution of nurseries within the city, noting that most of these nurseries are located and distributed along the road leading from Al-Hadayek to Al-Hawari area (Figure 4).

Table 1. Development of number of horticultural structures (Nurseries) at Benghazi city from 1973 to 2023.

Year	Governmental	Private
1970s	2	4
1980s	4	0
1990s	2	5
2000s	1	8
2010s	1	12
2020s	0	20

Plants of gardens

Plants constitute the main element of garden design and are chosen after full study and knowledge of the nature of their growth and the distinctive characteristics of each one. It is placed in the appropriate place to serve the purpose required for its cultivation and use. The plants selected should perform their required role to the fullest extent and their growth should be appropriate for the local environment.

Trees and shrubs

The trees used in forests are the primary trees planted in public gardens and parks, examples of which is include Eucalyptus, Pine, Casuarina and vertical and horizontal cypress. the shrub *Nerium oleander* L. is considered as one of the most important shrubs that were used in the public gardens in the city of Benghazi (Figure 5). It was perhaps the most common shrub due to its great ability to tolerate drought and harsh environmental conditions, in addition to its flowering beauty. This shrub was widely appeared in the seventies, but after that its widespread gradually began to decrease due to its capability to host insects like aphid, in addition its toxicity. Thus, it was an attempt to replace it using other shrubs like *Hibiscus rosa-sinensis* L. and *lantana camara* L. by those in charge of managing public gardens and parks.

One of the most shrubs is *Myoporum parvifolium*, which is used as hedge plant in public gardens in the seventies and the beginning of the eighties. Chosen this shrub might because it requires less water and a fraction of the maintenance. It was then replaced by *Dodonaea viscosa* (broadleaf hop bush), which was brought from Tripoli in the eighties.

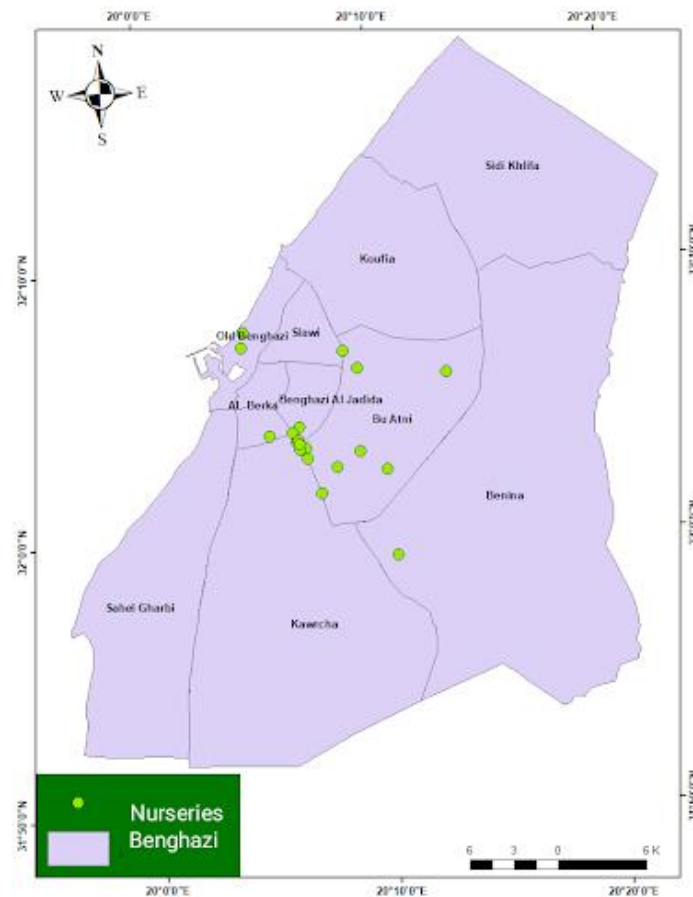


Figure 4. Distribution of ornamental plant nurseries at Benghazi city.

The fast-growing dense evergreen foliage tree *Ficus nitida* is one of the trees that were planted at the beginning of the public gardens in the city, and it appeared since the sixties. Due to the climatic and environmental factor in the city, and the suitability of these tree to these conditions, it has been chosen to be planted on a large scale in many public gardens and the main streets. Its cultivation increased during the nineties of the last century until the present days.

Royal Poinciana tree *Delonix regia*, also called flamboyant tree or peacock tree, began to spread greatly in the beginning of the nineties of the last century due to the beauty of its flowers, the speed of its growth, and its tolerance to the environmental conditions in the region. This tree is criticized for their short flowering period, as well as the fall of leaves during the winter period. Recently, *Tecoma stans* took place as one of most plants in Benghazi. It is distributed ever where and in every city of Libya, not only the gardens but even in houses. Its beautiful flowers and fast growth rate could be reasons to select this plant.



Figure 5. Few numbers of *Nerium oleander* shrubs at 23rd July park planted in 1970s.

Palms

The date palm tree *Phoenix dactylifera* L. is one of the oldest flowering species cultivated for its sweet fruit and gardens. The palm tree is one of the first plants used to decorate the streets and public gardens in the city of Benghazi, since the Italian occupation period, and they are still used until the present in any gardening programs. It is noted that the most widely used palm tree is the date palm. Then, at the beginning of the eighties of the last century, *Washingtonia robusta* (known by common name as the Mexican fan palm, or Mexican washingtonia) was introduced into the gardens and the main streets especially in the city center. In 1991, one of the disturbed areas in Dubai Street was cultivated by fan palms using young seedlings to become “Fan palm garden” which now a day is occupied around 3 hectares with health and long palms (Figure 6). In addition, some isolated fan palms were dispersing their seeds on the soil under and now form “Fan palm islands”. During the previous period and at the beginning of 2020, many large date trees were transplanted to decorate the streets, but a large percentage of about 95% of these trees were died compared to that were planted at the beginning of the nineties of the last century “in one site 14 palm trees were transplanted and completely dead with percentage of 100%” (Figure 7). This may be attributed to little knowledge of those responsible for this operation, as well as insufficient time for transportation and planting, the lack of various agricultural operations immediately after transportation especially watering continuously to avoid drought of the root system. In addition, the age factor of the palms. While those planted as suckers or offshoots of stem are more successful and that is appeared clearly in date palm cultivation in the streets during Italian period and also in Abu dzira park in the 1990s.



Figure 6. Mexican fan palms *Washingtonia robusta* decorate streets and gardens. Here, the palms appeared as isolated garden.



Figure 7. The palm trees transplanted in different locations of the city. Left, transplanting in 1998 was succeed with 80% while the others were completely “100% in 2022” dead (right).

Lawns

They are perennial or annual green grassy plants that cover large areas of gardens and parks. In addition to the role of green spaces in treating the climate, they perform planning and functional purposes in the garden, as covering the space leads to linking the different parts of the garden together and achieving unity and interconnection between the parts of the garden.

Lawns represent one of the most important plants used in public gardens, and their use has recently increased steadily and significantly, forming large areas of the city gardens. With a historical look at the development of the use of lawn grasses, we find that there are three types used in public gardens and parks (Table 2). They began with Bermuda grass (*Cynodon dactylon* (L.) Pers.) at the end of the seventies and the beginning of the eighties, especially in the Benghazi Park, then at the end of the 1980s, ryegrass (*Lolium perenne* L.) was imported from Italy to be used in green areas in Al-Jalaa Park. In 2007, knotgrass (*Paspalum distichum* L.), which forms large flat mats, was introduced to the city of Benghazi from Tripoli, and it have become the common landscape plant since that time (Figure 8). The usage of all plants like Bermuda grass has gradually disappeared and subsequently, has largely ended.

Table 2. Types and species of grasses use in gardens and parks from 1970s to 2023.

Plant species	Common name	Time period
<i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	1970s
<i>Lolium perenne</i> L.	Perennial ryegrass	1989
<i>Paspalum distichum</i> L.	Knotgrass	2007



Figure 8. The lawns of *Paspalum distichum* L. in different locations of Benghazi city in 2023.

The standards

The standards or planning rates and proposed percentages of green spaces for parks and gardens generally depend on the local conditions of each city and the nature of its communities. Each individual city resident is allocated a proposed and specific area rate for this purpose, and some Arab and international standards in this field are as follows; in the Arab Republic of Egypt, 4.2 (m²), Berlin 40- 50 (m²), Stockholm 50-60(m²), Chicago 30-60 (m²), this rate is per person as public gardens and green spaces [13].

Population is constantly increasing especially in urban areas because 50% of the world population live in cities (3.5 billion people), and it is estimated to rise to 5 billion people by 2030 [14]. Libya is not exceptional, while around 81.7 % of the population is urban with a number of 5,626,565 people in 2023 [18]. It was found that population had a growing rate about 1.13% per year. The current average population change was estimated by around 80 million per year [15]. This fact can be noticed in population increase of Benghazi (Figure 9), while it was 0.65 million in 2005 and the current population duplicated to about 1.2 million in 2020. Even though this happened but the total area of urban green spaces, which include urban parks, street trees, residential lawns [16], is still facing shortage.

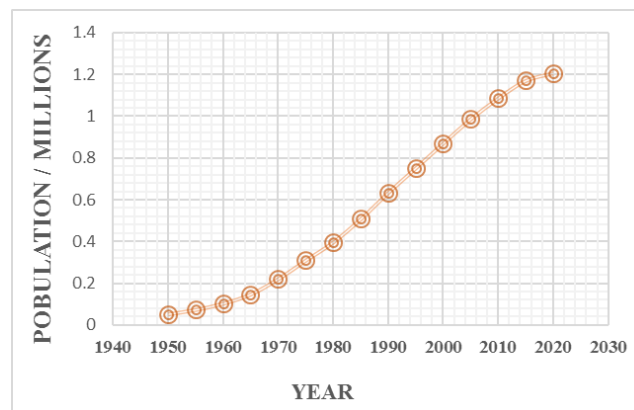


Figure 9. Estimates for the population of Benghazi, Libya for five-year periods between 1950-2022. Data from

The number of alien plants escaping from cultivation into native ecosystems is increasing steadily. currently at least 75% of the global naturalized alien flora is grown in domestic gardens. Non-native plants introduced through horticulture like English Ivy (*Hedera helix*, can have significant impacts on native ecosystems [17]. This including the loss of native species, changes in ecosystem dynamics, and reduced ecosystem services. It is important to carefully consider the potential invasiveness of plants used in horticulture and take measures to prevent the introduction and spread of invasive species. This including, in example, lack natural enemies (predators or diseases) in their new environment, may allowing them to spread rapidly and dominate the ecosystem [18].

From our survey, it is clear that must of ornamentals used in urban vegetation of Benghazi city were introduced (Table 3). Despite a little number of introduced plants were found in Benghazi gardens during 1970s and 1980s, this number was increased during recent years and considered to be higher because of increasing treading of non-native species throw the bordered neighbor countries like Egypt. and lack of control and authorities' power at the present to managing this process. Thus, the strategies which take in account must aim to improve the understanding of the drivers of horticulture-related plant invasions, forecast the potential impacts of global environmental change, and develop regulations and management practices that minimize the risks associated with non-native plants in horticulture [19]. In addition, encourage of production ornamentals locally especially the native ones.

Here, some proposed strategies which aim to improve management of gardens and parks at Benghazi city those must take in account. One of important functions in management practices is development of regulations based on scientific research and knowledge [11,17,18]. Public awareness campaigns, informing, educating, and convincing the public about the importance of plants and gardens in ecosystem is essential part need more attention. This might help in decreasing risks of the potential impacts of global environmental change, non-native plants in horticulture and encourage public to increase the green area on their private responsibility.

Benghazi classified as arid zone with long drought period with hot shiny days almost the year especially in summer season, therefore, using evergreen trees can tolerate like these conditions is very considerable. Because of its ability, more knowledge about its previous use, low plant insects and infections, low maintenance practice and costs, *Ficus nitida* is highly recommended. Insert other plants with different color in the future suitable to the surrounding environment, in example, using *Delonix regia* or *Tecoma stans* in trees. In addition, reduction of use lawns on large scale and constitute these programs utilizing shrubs from the natives as groups might reduce water loss.

Even though *Eucalyptus* trees work as a part of urban vegetation in the city since Italian occupation, a number of this plant in average old of 70 years were cut during 2023 (Figure 10). From historical and ecological point of view and growth characteristics, this plant is recommended to any plan to planting the surrounding open areas as green belt of Benghazi. This help to decrease the impacts of dust storms which come from the south directions, in addition, to reduce the effect of direct sun ray and subsequently, lower the soil evaporation. The green belt is a project was planned from the Libyan government, and it is aim was surrounding the cities like Tripoli [22] and Benghazi by green public spaces to reduce the lack of urban vegetation in the city. Unfortunately, this project has stopped due of several reasons and this is the chance to release it again.

Understanding of the drivers of horticulture-related plant invasions, can help in preventing further plant invasions and managing the existing non-native plants which minimize their risk. Implementing comprehensive monitoring and early detection programs can help in identifying and managing horticulture-driven plant invasions at an early stage. This can involve the use of tools and techniques for detecting, managing, and monitoring invasive species. Research on cultural and social values can help in understanding the factors influencing the introduction of new plant species.

Table 3. Some introduced ornamentals at Benghazi city recorded in Libyan flora in different life forms and use. Data were obtained from Eifitouri et al., 2022 and different resources.

Trees and shrubs	Dwarf shrubs
Araucaria excelsa R.Br.	<i>Justicia adhatoda</i> L.
Phoenix canariensis Chaband.	<i>Schinus terebinthifolius</i> Raddi,
Phoenix dactylifera L.	<i>Catharanthus roseus</i> (L.) G. Don
Chamaerops humilis L.	<i>Nerium oleander</i> L.
Jacaranda mimosifolia R.Br	<i>Tecoma stans</i> var <i>.stans</i> Juss.
Delonix regia (Bojer) Rafin	<i>Hibiscus rosa- sinensis</i> L.
Parkinsonia aculeata L.	<i>Lantana camara</i> L.
Cassia grandis L.	
Casuarina equisetifolia Forst.	Herbal plants
Thuja orientalis L.	<i>Calendula officinalis</i> L.
Azadirachta indica A.Juss.	<i>Helianthus annuus</i> L.
Melia azedarach L.	<i>Canna indica</i> L.
Albizia lebbek (L.) Benth.	<i>Dianthus caryophyllus</i> L.
Acacia cyanophylla Lindley,Bot	
Acacia farnesiana (L.) Willd.	Climbers
Ficus benjamina L.	<i>Bougainvillea glabra</i> Choisy.
Ficus elastica Roxb.	<i>Jasminum officinale</i> L.
Eucalyptus camaldulensis	
Eucalyptus erythrocorys F. Muell.	
Eucalyptus gomphocephala DCL.	
Eucalyptus torquata Luehmann	



Figure 10. Eucalyptus trees with age of 70 years in trees street Alqawarsha “left” while it appears with other plants in garden established in 1970s “Right”.

Plan to develop and increase green areas in side or new expansions surround the city using selected plants as groups that would able to raise the rates of green spaces per person in Benghazi city. Maintenance regularly and continuously for greenery in gardens and streets. However, gardens benefits depend on number of factors including management [6]. Thus, support and encouraging the authority persons of gardens with enough budget and tools, in addition, treat this unit administrative and financially as independent unit will lead to improve their situation. These steps might help to achieve Sustainable Development Goals (SDGs) that set out by the United Nation in 2015 and cover issues such as climate change, water and sanitation, sustainable cities...etc. and [21].

CONCLUSION

From this work, it is clear that most of ornamentals used in urban vegetation of Benghazi city were introduced and this number was increased during recent years and considered to be higher because of increasing trading of non-native species through the bordered neighbor countries. Thus, the strategies which take in account must aim to improve the understanding of the drivers of horticulture-related plant invasions, impacts of global environmental change, and develop regulations and management practices that minimize the risks associated with non-native plants in horticulture. In addition, encourage of production ornamentals locally especially the native and wild ones. Because of lack of control and authorities' power at the present, the role of non-governmental associations is very important in managing this process by increase their activities in this side.

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التقييم البستاني والبيئي للحدائق العامة والمتنزهات بمدينة بنغازي خلال العقود الخمسة الماضية

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المستخلص

تلعب الحدائق والمتنزهات دوراً هاماً ورئيسياً من الناحية البيئية ويساعد وجود الأشجار والنباتات والمساحات الخضراء في الحدائق العامة والمنتجعات على تبريد البيئة المحيطة وتقليل تلوث الهواء وتحسين جودته. ويمكنها أيضاً دعم الملقحات والحياة البرية مثل النحل والطيور من خلال توفير مجموعة متنوعة من النباتات المزهرة والموائل للحياة البرية في المناطق الحضرية. ورغم أن نباتات الزينة كانت محدودة للغاية لندرة العاملين والمتخصصين في هذا المجال إلا أن بلدية بنغازي حاولت توفير الهياكل البستانية مثل مشاتل النباتات وبرامج التدريب والاستثمار في العاملين وإتاحة الفرص لتطويرهم. وخلال الأعوام من 1990 إلى 2023، قفز عدد الحدائق والمتنزهات إلى أكثر من 127 حديقة. وفي الآونة الأخيرة، لوحظ المزيد من الاهتمام بالبستنة ليس فقط في القطاع الحكومي ولكن أيضاً في القطاع الخاص، من خلال أزيد عدد مشاتل الزينة والشركات الزراعية الخاصة التي تم تأسيسها. وفي غياب الرقابة وجهات الاختصاص تم استيراد المزيد من النباتات الغريبة وإدخالها إلى المدينة. ونظراً لنقص المعلومات في هذا الجانب حاولنا تحليل ومعاينة وضع الحدائق والمتنزهات من الناحية البستانية والبيئية في مدينة بنغازي منذ عام 1973 حتى الوقت الحاضر باستخدام المعلومات المتاحة مع التركيز على كيفية تطوير هذا القطاع لتوفير المزيد من قاعدة البيانات لجهات الاختصاص والباحثين.

الكلمات الدالة: المنشآت البستانية والحدائق والمتنزهات والنباتات الحضرية والتقييم البيئي.