

Evaluation of Alexandria Zoological Garden

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ABSTRACT: Alexandria Zoological Garden (Alex Zoo) began in 1907 as a small menagerie in 1916, Antoniadis Gardens was redesigned to be able to display some animals and birds. Alex Zoo has an area of about 26 acres located in Smouha district, Alexandria, Egypt. An evaluation was carried out to determine the situation of Alex Zoo to see whether it matches the international standards of zoological gardens and whether the zoo was meeting the goals, roles, and benefits of similar zoological gardens. Results from site observations as well as the statistically analyzed questionnaires indicated several facts: concerning the reason for visiting Alex Zoo, most of the studied sample said that they visit the zoo mainly for entertainment and recreation then for education. The majority of visitors were not satisfied either about the gardens of Alex Zoo, or about the general situation and components of the zoo. Most of the visitors were not satisfied about the zoo entrances and accessibility since there is no possibility for the visitors to enter the zoo area using their cars because all the zoo entrances are provided with stairs since Alex Zoo level is higher than the level of surrounding area. As for the walkways circulation, the old design of Alex Zoo allows a kind of easy movement of visitors between animal exhibits since the streets is used only for pedestrians. The majority of visitors were upset since there is no possibility for wheel chaired disabled visitors to move into the zoo through the different entrances to reach the first level of the zoo unless being carried over by other visitors. On the other hand, the majority of visitors were satisfied about the safe barriers of visitors which keep them away and safely from the primary barriers around the perimeter of enclosures. There are no wayfinding signs or maps indicating the location and direction to any animal exhibit. The cleaning level was another point of dissatisfaction since most of the visitors were greatly upset because the accumulation of dirt and garbage everywhere. The majority of visitors were also not satisfied about the area and facilities of the children playground. Most of the visitors were not satisfied about the garden maintenance, lawns, flowers and other ornamentals, number and variety of garden plants. On the other hand, they were almost satisfied about the number and distribution of shade trees in the zoo since they were planted over one hundred years. With respect to the animal's area of Alex Zoo, the majority of visitors expressed their great satisfaction about the success of Alex Zoo designer to create a considerable level of exhibit simulation. In the same level of success, the majority of visitors were greatly satisfied about using good, safe and illusive animal barriers. Most of the visitors were partly satisfied about the presence of animal labels to obtain reasonable information about animals and how they live in the wild. But above all, the majority of visitors were greatly dissatisfied due to the low number of animals in the zoo, the cleaning level of animals and exhibits, as well as the absence of tour guides in the zoo.

Keywords: Zoological Gardens, Alexandria Zoo Evaluation, Landscape Gardening, visitors perception, illusion design.

INTRODUCTION

Human populations have been fascinated by animals and have been displaying them in some form of captivity for centuries. Menageries, which are some collections of caged animals appeared long ago in Egypt, Rome, China and

India (Hancocks,1971; and Polakowski,1987). Zoo is a collection of wild animals in captivity. It may include also zoological gardens, biological parks, safari parks, bird parks, reptile parks, aquariums as well as insectariums (Catibog- Sinha,2008).

Modern zoos have many roles including conservation, recreation, research, and education (WAZA, 2006), but it should be reported, however, that the major role of zoos is to protect and secure the endangered animal species. Designers of zoological gardens intend to show, within an enclosure, the natural habitat of the animal, introducing ecological themes and conveying information about the habitats and the behavioral biology of the animals (Harrison, 1991; Hoage and Deiss,1996; and Croke,1997). The animal exhibit design approach , in addition to satisfying the animals' physical, psychological, and social needs, should recognize that the exhibit attempts to present an illusion of the wild (Jones,1985; and Polakowski,1989).The dilemma of exhibiting wild animals in an artificial environment requires the need to create perceptual deceptions in the visitor's mind. Illusions can be created in animal exhibits to stimulate the animals' natural habitat, to produce an environment similar to the animals' one, as well as to emphasize the ecological relationships between animals, plants, and man.

If we divided the zoo exhibit into animal and visitor areas, the animal habitat is that area exclusive to the animal while the visitor area is the domain of the visitor. Some type of barriers usually separates them from each other (Bitgood, 1999), Zoo plantings are very important when designing natural exhibits. Plants fulfill several basic needs including creating shade for visitors and animals, cover for the animals, other behavioral needs of the animals, depending on the species; visual barrier for animals to avoid other animals; and definition of space for people and animals (Graetz,1995). Coe (1983) defined zoo horticulture and plantings as the application of horticultural knowledge, which express the understanding of plants, their needs and characteristics of zoo layouts.

Zoos should provide parking areas that are accessible, easy to find and close to the entrance gates. Visitors should find safe and comfortable parking facilities (CLRdesign, 2004). The presence of adequate number of entrances is also of prime importance. On the other hand, since visitors spend sometime walking through the different zoo exhibits, they need to have good and adequate resting places and shading pergolas (Graetz, 1995; and CLRdesign, 2004).

Signs and labels are very important components of modern zoos. Zoological gardens are able to increase the interest level of visitors with living animals and then increase their interest by using information signs or labels which indicate some important information about the animal and its wild habitat (Mosca, 1982). Several authors remarked that signs or labels complete the full educational experience provided by zoological gardens (Hirschi and Screven,1988).The aim of the study is to evaluate the situation of Alexandria zoological gardens in order to prove whether or not it matches the international standards of zoological gardens as fully described by the World Association of Zoos and Aquarium (WAZA).

MATERIALS AND METHODS

A sample of 250 of Alex Zoo visitors was randomly selected, they received the questionnaires, and with the help of the researchers, they answered the different points and items of each questionnaire. Results were collected and analyzed by Chi² – test (Snedecor and Cochran, 1989). In order to obtain reliable results, meetings, interviews and extensive discussions were made with the visitors representing the selected sample. In addition, it was of great importance to make several visits to Alex Zoo in order to observe the situation of the gardens as well as the visitors perception and impression about the zoo and its components, either in the visitors area or in the animals area.

RESULTS AND DISCUSSION

1- Distribution of the studied sample of visitors according to their personal data and interests:

Results published in Table (1) showed that 49.2% of the selected sample of visitors were males while 50.8% of the sample were females, which gives a clear indication that both males and females were found to be almost equally concerned with visiting Alex Zoo. Regarding the educational status of the visitors, it was noticed that the majority of Alex Zoo visitors were educated, either medium educated (47.6%) or highly educated (44.4%), whereas, only 8.0% of the visitors were non- educated, which means that the educated people are much concerned about zoo visiting or even zoo importance in our life.

On the other hand, parents and children presented the highest percentage of visitor groups (73.6%), followed by friends and school mates (22.0%), while neighbors presented the lowest percentage of Alex Zoo visitors (4.4 %). Most of the selected sample (60.8%) showed that they are keen to visit the zoo , while 38.0% said that they are very keen to visit Alex Zoo which they believed to be of a top priority for them. Only 1.2% of the selected sample said that they are not attracted to visit the zoo. This give an impression that visiting zoos became a common knowledge for the people since 98.8% of the selected sample were either keen or very keen to visit Alex Zoo.

Concerning the reasons for visiting Alex Zoo , most of the studied sample (80.4%) said that they visit the zoo mainly for entertainment and recreation, while 17.2% for education. On the other hand, unfortunately, very few visitors said that they visit the zoo either for research (1.2%) or to have some information about animal conservation (1.2%). The reports and findings of Patrick and Tunnicliffe (2013) support these results. Lessow (1990) and Frost (2010) and many other researchers stated that public perceptions persist that zoos are places for entertainment and that 60% of the US zoo visitors state that the zoos are places for education.

Table (1). Distribution of the Alex Zoo studied cases according to their personal data and interests

	No	%
Sex:		
Male	123	49.2
Female	127	50.8
Educational status:		
Non- educated	20	8.0
Medium educated	119	47.6
Higher educated	111	44.4
Visitors relationships:		
Friends and school mates	55	22.0
Neighbors	11	4.4
Families (parents and children)	184	73.6
Are you keen to visit Alex Zoo		
No	3	1.2
Yes	152	60.8
Very keen	95	38.0
Reason for visiting Alex Zoo		
Conservation	3	1.2
Entertainment and recreation	201	80.4
Education	43	17.2
Research	3	1.2

2- Distribution of the Alex Zoo studied sample according to the general satisfaction towards the zoo

In order to see how sufficient are the gardens of Alex Zoo as well as the general satisfaction of visitors towards the zoo and its components, Table 2 clarified the fact that the majority of Alex Zoo studied sample (60.8%) believed that the zoo and gardens are not sufficient, 53.6% of the tested sample expressed their dissatisfaction about the general situation and components of Alex Zoo which means that the zoo have not fulfilled their needs. On the other hand, only 6.8% of the tested sample showed that Alex Zoo is sufficient with regard to their needs, while, 14.8% of the tested sample were highly satisfied about the gardens and components of Alex Zoo as well as the general situation.

Table (2). Distribution of the Alex Zoo studied sample according to sufficiency and satisfaction

	No	%
Degree of sufficiency		
High	17	6.8
Moderate	152	60.8
Low	81	32.4
Min. – Max.	32.0 – 49.0	
Mean ± SD	57.56 ± 11.49	
Median	58.0	
Degree of satisfaction		
High	37	14.8
Moderate	134	53.6
Low	79	31.6
Min. – Max.	32.0 – 85.0	
Mean ± SD	55.26 ± 11.62	
Median	55.0	

3- Opinion of the studied sample about the hardscape components of the visitors area:

Results presented in Table (3) could be summarized as the following:

(1) Entrances and zoo accessibility:

Most of the tested sample are not satisfied about the entrances and accessibility of Alex Zoo. Alex Zoo has 5 entrances (Fig.1), four of these entrances are accessed by the public (entrances number 1,2,3 and 4), but the entrance number 3, which is, the first entrance on Albert Alawal Street, is the most accessed by the visitors due, presumably, to transportation and parking problems. All of the entrances of the garden are provided with stairs since the zoo level is higher than the level of surrounding streets. This means that there is no possibility for the visitors to use cars inside Alex Zoo, only pedestrians are allowed to enter, which explains why most of the tested sample of visitors is not satisfied about Alex Zoo entrances as well as zoo accessibility. Moreover, the accessibility is more complicated for disabled people; it will not be able for wheelchair disabled to access the garden easily and safely. It is very important to provide any zoo with adequate number of gates to make a safe, easy, comfortable and attractive access for the visitors into the zoo areas as well as to easily and comfortably evacuate visitors out of the zoo (CLRdesign,2004). The staired entrances of Alex Zoo may be an obstacle confronting the process of evacuation especially when we are speaking about disabled visitors.

(2) Parking areas:

More than 65% of the visitors are dissatisfied due to the absence of reasonable parking areas for the zoo visitors. As stated above, no possibility for any car to access into the zoo area, they are allowed to park in the main street of Albert Alawal in addition to a limited place between the zoo area and Antoniadis

Botanical Gardens. No other place is available for parking, which makes a real problem for the garden visitors (Fig.1.). Parking and associated access facilities are of great importance in the design of zoological gardens. Well-planned parking is essential to remedy any chronic shortage of on-site parking, which inconveniences zoo visitors and the surrounding neighborhoods (CLRdesign,2004). Zoo should provide parking areas that are accessible, easy to find and as close as possible to the zoo's entrance. Visitors should find parking facilities that are safe, comfortable and attractive. Unfortunately, visitors of Alex Zoo use the street of Albert Alawal to park their cars unsafely; this explains the reason for their dissatisfaction.

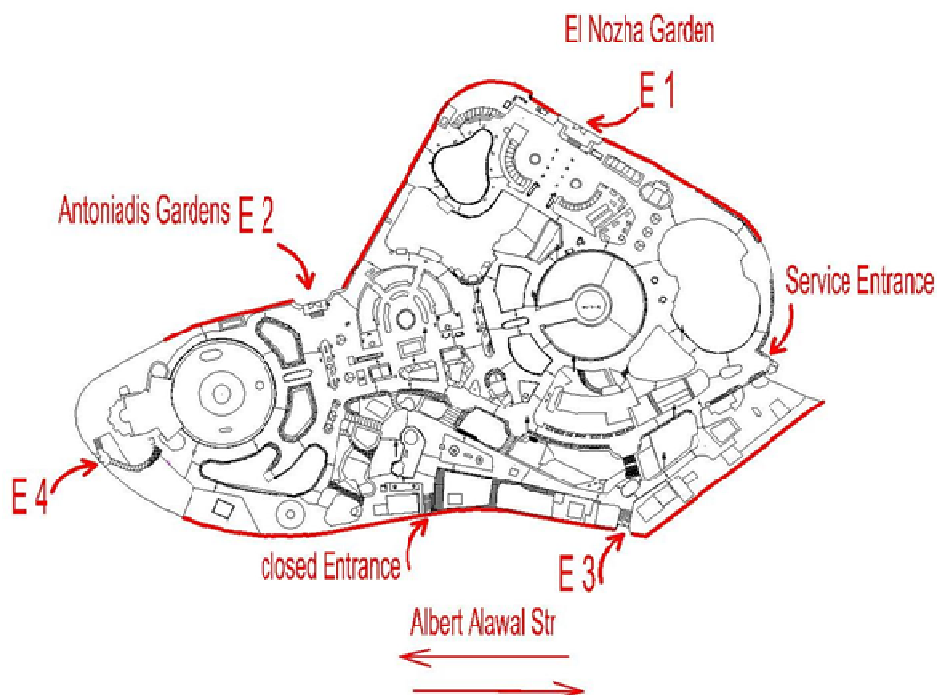


Fig. (1). Alex Zoo map showing the zoo entrances (E1, E2, E3, E4) as well as the possible parking areas (marked in red).

(3) Walkways circulation:

About 39% of the visitors are not satisfied with the walkways circulation inside Alex Zoo, but, nevertheless, about 38% are partly satisfied. As a matter of fact, the old design of Alex Zoo allows a kind of easy movement of visitors between animal exhibits since the streets is used only for pedestrians (Fig.2.).

Walkways should have a running slope not more than 5% and a cross slope not more than 2% in order to avoid the risk of falling as well as to provide enough slope for drainage (Tranter *et al.*,1991 and Kirchner *et al.*,2008). The width of the walkways should not be less than 90 cm which permits one-way traffic for

wheelchair or walker users. Paths of at least 150 cm allow side-by-side walking, passing of two persons and are wide enough for a wheelchair to make a 180 degree turn (Brawley, 2007). The streets or walkways of Alex Zoo were found to be wide enough (from 3.4m to 19.10m wide), which ensures a smooth movement of visitors throughout entire space of the gardens.

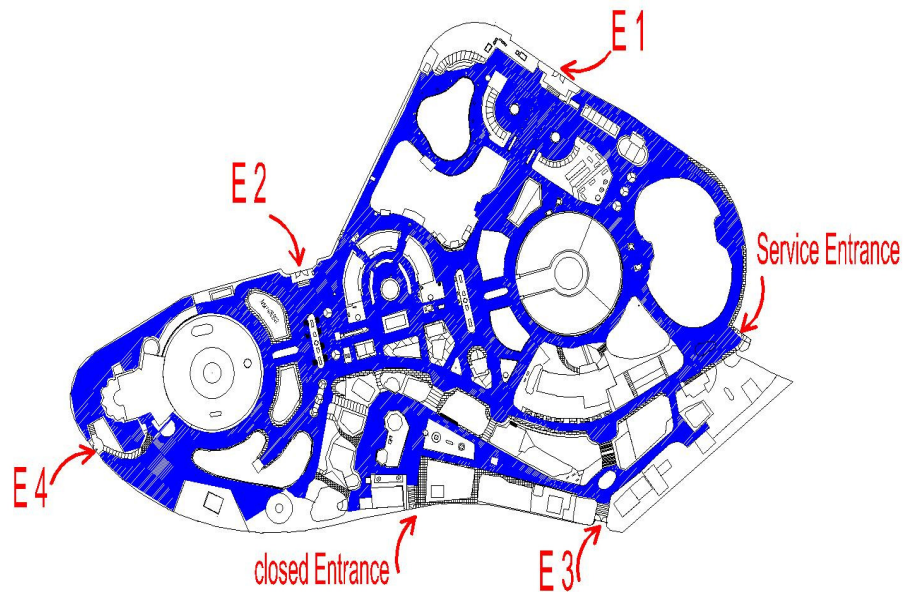


Fig. (2). Alex Zoo map showing the walkways circulation connecting all parts of the zoo together (marked in blue).

(4) Walkways for disabled:

Alex Zoo is architecturally built on two levels; a lower level to the north (on Albert Alawal Street), and a higher level to the south, facing Antoniadis Botanical Gardens. Alex Zoo itself (including the two levels) is situated above the level of the streets surrounding the garden from all directions; it looks a hill (Fig.3.).This explains why the different entrances are provided structurally with stairs leading from surrounding streets to the zoo itself. On the other hand, the two levels of Alex Zoo are connected with six stairs, well distributed over the connection area in addition to only two ramp walkways for disabled, one to the right and the other to the far left. This means that visitors should use the entrance stairs at first to reach the first level of the zoo where there is no possibility for wheelchairs to move through the entrances to reach the first level unless being carried over by other visitors. Wheelchaired disabled visitors can enjoy visiting most of the animal enclosures on their chairs either in the first or in the second level. This is why most of the tested sample of Visitors were not satisfied about the situation of walkways and how for they help disabled.

Nevertheless, it was found that the running slope of the ramp walkways of disabled fit the standards of Tranter *et al.*(1991) and Kirchner *et al.*(2008) who reported that the running slope of walkways in such cases should not be more than 5% to avoid falling as well as providing enough slope for easy movement as well as drainage . The width of both ramp walkways was found also suitable since they exceed the ranges mentioned by Brawley (2007).

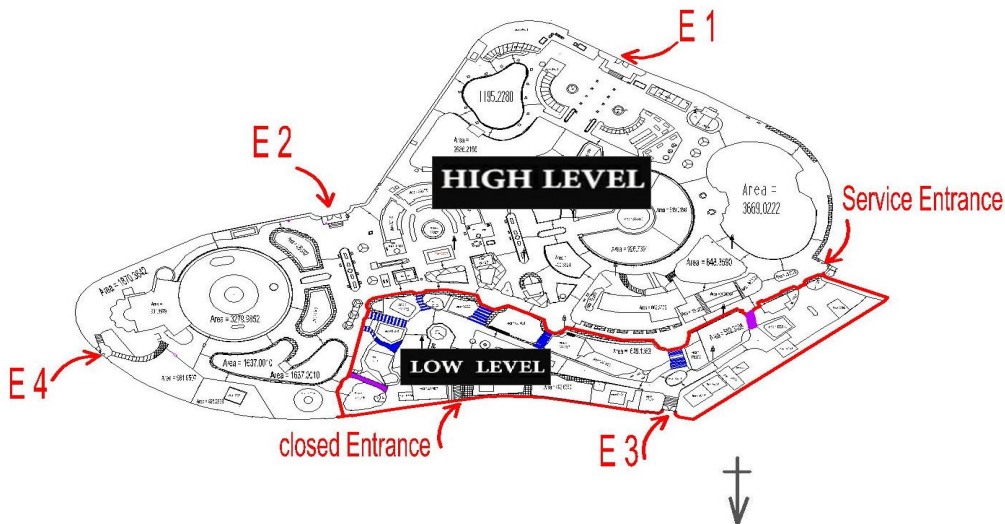


Fig. (3). Alex Zoo map showing that the garden was designed on two levels, a lower level to the north and a higher level towards south. The two levels are connected together by six stairs (marked in blue) and two ramp walkways for disabled (marked with purple) .

(5) Lighting of the parks:

About 36% of the visitors said they are not happy about lighting of the zoo parks,34% were partly satisfied. The number and distribution of lighting units in the gardens are very weak in spite of the importance of lighting at night especially in winter times. Good lighting can help to avoid falls and assist visually impaired people to detect boundaries (York, 2009). Lighting the parks allows visitors to use the space safely after dark (Cooper–Marcus and Barnes, 1995). Nevertheless, 30% of the tested sample of visitors was quite satisfied about lighting the park, this is due to the regulations of Alex Zoo, since the closing time in summer is 4 P.M. and in winter is 5P.M., which means that the visitors of Alex Zoo are allowed to visit the garden, usually, during daytime before sunset. Night is only for service activities and not for the public.

(6) Zoo art and sculpture:

About 83% of the tested sample was not happy due to the absence of any kind of sculpture or art pieces in Alex Zoo. The use of rocks, tree logs, sculpture as well as other artistic pieces might be of great benefit to enrich the garden design of zoo visitors open places (Minter, 1995). Art can convey powerful message in

zoological gardens, and many zoos contain excellent pieces of art within their grounds (Rees, 2011). Some sculptures show animals, while other show people such as the founders of some gardens, etc. Unfortunately, Alex Zoo design does not contain any outstanding sculpture in the visitor's area. Very few lion statue were used in specific places such as those on front of the administration building.

(7) Water elements of landscape:

It was found that 76% of the visitors were not satisfied since Alex Zoo didn't contain any kind of landscape water component (running water, water falls, fountains...). It is one of the great disadvantages of Alex Zoo that the design doesn't comprise using water components in the landscape although water is an important hardscape element used by landscape architects in such designs (Booth, 1983). Water possesses several physical properties that influence the purpose and method by which it can be used in landscape architectural design; plasticity, motion, reflectivity and sound.

(8) Pergolas and other shelters:

Young (2001) reported that zoo visitors spend sometime through the different parts of zoo exhibits. The zoo design must include a comfortable outdoor microclimate to prolong visit duration as well as to protect visitors from winds and extremes in temperature, sun rays, as well as rains. Umbrellas or buildings such as pergolas could be used to provide protection from the sun (Carstens, 1998). Unfortunately, due to the lack of such pergolas in Alex Zoo, 71% of the visitors were not satisfied about that. The zoo garden outdoor spaces should be designed to make picnic areas for group gatherings, activities, and socializing. Umbrellas, pergolas, chairs and tables become then important hardscape components of the zoo design (Brawely, 2007). There are some scattered old-made garden chairs in Alex Zoo; most of them are broken and not good to be used by visitors so that the majority of visitors sit down on the ground everywhere. There are very few garden chairs provided with umbrellas, they are also old made and in need to good maintenance and repair.

(9) Visitor safety barriers:

It was found that the majority of the visitors are either satisfied (55.20%) or partly satisfied (26.40%) about the safety barriers of visitors in Alex Zoo. Visitors need to be kept away from the primary barriers around the perimeter of an enclosure for their own safety. Rees (2011) reported that the visitor barriers include: concrete walls, rope fences, wooden guard rails, low hedges, chains, and chain-link fence or mesh. Most of the visitor barriers in Alex Zoo are concrete walls (lions, monkeys) or metal posts (elephants, lions) and in most cases they are usually chain-link fences or mesh type (birds, monkeys, ...). But, nevertheless, although it is known that visitor barrier construction should take into account the need to keep visitors, especially very small children away from the animal barriers, many visitors in Alex Zoo break through barriers or climb others to be in a direct contact with the animals either to feed, touch or to have a nearby photo with the

animals which makes a big problem for animals and keepers in the same time rather than exposing visitors to a great danger.

(10) Wayfinding signs:

Most zoos guide their visitors around their site by providing a map and signs indicating the location of each exhibit (Rees, 2011). Administrative signs, on the other side, mark the entrance, orient the visitor to the garden, provide information and give direction to specific location such as rest rooms. The wayfinding sign in Alex Zoo do not appear at the moment in a good way, 40% of the studied sample of visitors was not satisfied about using wayfinding signs in Alex Zoo and about 34% were partly satisfied. Unfortunately, Alex Zoo has no wayfinding signs at the moment, it has no official map either announced or printed in a pamphlet. The cages and enclosures have signs but there are no wayfinding signs leading to them. There are few administrative signs on the entrances, there are two boards hanged on the wall of one of the entrances showing the regulations and rules to be followed by visitors.

(11) Cleaning level:

The majority of Alex Zoo visitors were not satisfied about the cleaning level of the visitors area (71.60%) and 25.20% were partly satisfied, whereas only 3.20% were satisfied about the cleaning level of the gardens. As a matter of fact, Alex Zoo is provided with probably hundreds of garbage boxes distributed over the visitors area, but due to the great daily number of visitors especially in holidays, garbage accumulates causing a severe pollution. Visitors say they find wastes scattered over the total area of the garden because the garbage boxes are not enough from one point and collecting these wastes by the garden authorities does not happen quickly, or several times everyday. Of course Alex Zoo has provided many kinds, shapes, colours of trash baskets which do not look well for the visitors, furnishings in the zoo should generally be standardized as to type, size and overall character through the zoo to provide over visual continuity and easy recognition (CLRdesign, 2004).

(12) Rest rooms:

It is not surprising to find more than 75% of the tested sample of visitors not satisfied about the number, shape and cleaning level of rest rooms. The plan of Alex Zoo (Fig.4.) contains only four rest rooms, the first in the lower level nearby the main entrance number 3, whereas, the others are located in the higher level. The number of toilets in a zoo has a positive relationship with both of the total area of the zoo as well as the expected daily number of visitors (CLRdesign,2004).In a place such as Alex Zoo, the presence of only 4 toilets which are distributed over 26 acres (about 100,000 m²) and are expected to be used by many thousands of visitors everyday make it a big disaster. Moreover, the four toilets were found to be in a very bad condition for humans to be used.

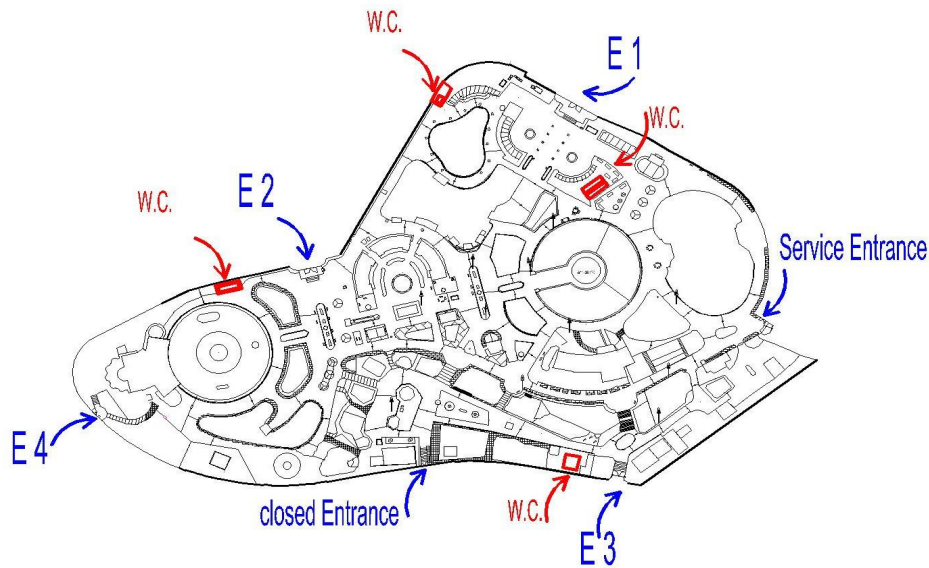


Fig. (4). Alex Zoo map showing the number and locations of the rest rooms (marked in red).

(13) Cafeterias, number and distribution:

Its again a matter of argument since more than 40% of the visitors expressed their dissatisfaction while about 35% were partly satisfied. Zoo garden services are very important items to be presented to encourage visitors to come and visit a specific zoo (Rees, 2011). Alex Zoo has a single cafeteria which is not used now. The only places to get food or drinks are few vendors displaying their products on the stairs of garden entrances or in some places inside the garden, the quality of products as well as the level of service are extremely bad.

(14) Availability of photographer:

Exactly as in the case of cafeterias, most of the visitors were not happy about the service, where more than 46% were not satisfied since there is only a single photography kiosk which is usually closed. No post cards for the zoo are available too.

(15) Children playground area:

The majority of visitors (63.30%) expressed their dissatisfaction about the area specialized as children playground as well as the playing facilities. Zoos are primarily places of entertainment (Frost, 2010). Lessow (1990) reported that zoo in developed countries compete with other attractions for the leisure time of visitors, while zoos in less-developed countries are one of the few available places for recreation. Nevertheless, Alex Zoo has an area of about 2600m² specialized as a children playground; it is located nearby the huge monkey exhibit, the place most favored by children (Fig.5.). The place is provided with many facilities for the enjoyment of children in order to attract them and their families to stay longer in the zoo.

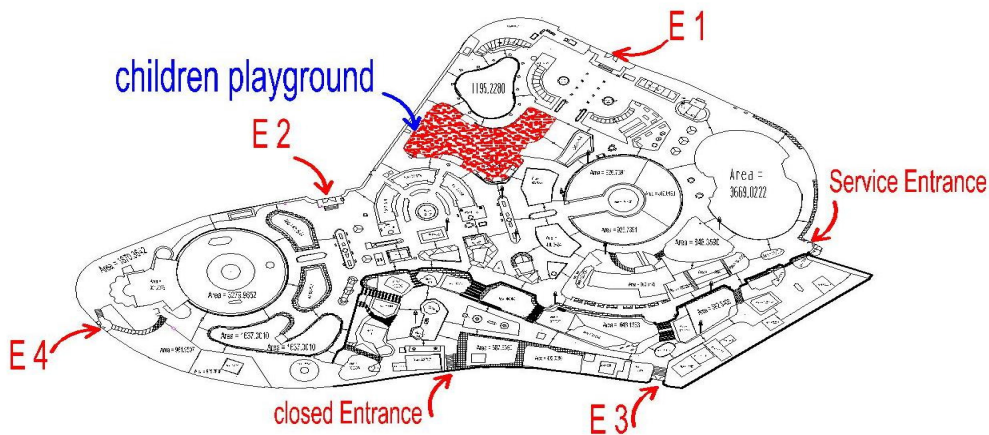


Fig. (5). Alex Zoo map showing the location of the children playground or children activity area (marked in red).

Table (3). Opinion of the studied sample about the general features and components of Alex Zoo, with respect to the hardscape components of the visitor's area.

	Degree of satisfaction						Mean	SD	χ^2
	Satisfied		Partly		Not satisfied				
	No.	%	No.	%	No.	%			
1. Visitors area:									
1.1. Hardscape components	72	28.80	75	30.00	103	41.20	2.01	0.77	7.016*
Entrances and zoo accessibility									
Parking areas	28	11.20	58	23.20	164	65.60	1.46	0.69	122.528*
Walkways circulation	56	22.40	96	38.40	98	39.20	1.83	0.77	13.472*
Walkways for disabled	50	20.00	74	29.60	126	50.40	1.70	0.78	36.224*
Lighting of the parks	75	30.00	85	34.00	90	36.00	2.06	0.81	1.400
Zoo art and Sculpture	13	5.20	28	11.20	209	83.60	1.22	0.52	285.608*
Water element of landscapes	13	5.20	47	18.80	190	76.00	1.29	0.56	211.736*
Sitting places and Pergolas	16	6.04	55	22.00	179	71.60	1.35	0.60	173.864*
Visitor safety barriers	138	55.20	66	26.40	46	18.40	2.37	0.78	56.192*
Wayfinding signs	64	25.60	86	34.40	100	40.00	1.91	0.77	7.904*
Cleaning level	8	3.20	63	25.20	179	71.60	1.32	0.53	182.888*
Rest rooms	15	6.00	47	18.80	188	75.20	1.31	0.58	203.336*
Cafeterias, number and distribution	59	23.60	89	35.60	102	40.8	1.83	0.79	11.672*
Photographers availability	59	23.60	74	29.60	117	46.80	1.77	0.81	21.752*
Children playground area	22	8.80	69	27.60	159	63.30	1.45	0.65	116.312*

χ^2 p: p value for Chi-square test

*: Statistically significant at $p \leq 0.05$

4- Opinion of the studied sample about the softscape components of the visitors area:

Results presented in Table (4) indicated the following:

(1) Garden maintenance:

Most of the zoo visitors (49.60%) are not satisfied with respect to the garden maintenance and the cleaning level of the gardens. Good garden maintenance gives a pleasant welcome shape to the zoo and creates a healthy atmosphere, on the other hand, for visitors, workers and animals as well. Young (2001) explained the importance of the presence of a maintenance programme for any garden, for example, plants; pruning, plant replacement, feeding, irrigation, grass mowing, etc. The general appearance of the gardens of Alex Zoo looks miserable due to the lack of a maintenance programme. Coe (1983) reported that the maintenance of plantings of a given zoo is commonly considered to be the weakest point of zoo development. This is because the original zoo design, the construction and the maintenance are often carried out by three separate parties, none really understanding the intentions or needs and viewpoints of the others. Lack of a decision-making capacity is responsible for this bad situation in Alex Zoo.

(2) Lawns shape and area:

Unfortunately and surprisingly the majority of the tested sample of visitors (more than 55%) was not satisfied about the shape and area of lawns in the public places of Alex Zoo. The total area of Alex Zoo as previously stated is about 100,000 m², nevertheless, the total area of lawns is just very few square meters, the other area became just soil without turf grasses at all. This occurred due to the huge number of visitors every day in addition to the lack of the maintenance programme. The importance of lawns in any garden is not negotiable. Green lawns make a background for other plants and create a feeling of space (Carpenter *et al.*, 1975). Lawns are absolutely very essential component of the landscape especially in picnic areas of the zoo such as children playground area which devoid completely, unfortunately, from any centimeter of turf grasses.

(3) Flowers and other ornamentals:

Most of the visitors complain because of the absence of flowering bedding plants in Alex Zoo (more than 44%). Flowers and different kinds of ornamental plant species are very important components especially at zoo entry and between animal exhibits (CLRdesign, 2004), the situation in Alex Zoo is again miserable.

(4) Shade trees:

Graetz (1995) stated that shade trees fulfill several basic needs; among these are shade for visitors and animals, modulation of views and perceptions. They serve to hide undesirable objects, screen potential cross views and bad views beyond. There are several shade trees in Alex Zoo, they are doing excellent function as stated above, they were planted since many decades, so they have respectable age and size. This reflects the opinion of the selected sample of visitors where about 31% were satisfied, 34% were partly satisfied, and 34% were not satisfied.

(5) Number and variety of garden plants:

There are very few number and variety of ornamental garden plants, a problem of maintenance and funding. About 43% of the visitors are partly satisfied about the variety of garden plants in Alex Zoo. It is again a great problem of garden design facing the administrative staff of Alex Zoo. The joy of colour and varieties in the garden needs skills to contrive successfully, especially as it involves designing with the fourth dimension, time; it will affect the garden visitors negatively (Carpenter *et al.*, 1975 Minter, 1995).

(6) Plant labels:

There are no plant labels at all in Alex Zoo. This explains why 83.60% of the visitors expressed their dissatisfaction for the absence of plant labels. We must remember the statement of Ashraf (2000) who said that Botanic Gardens have been designated for plants and Zoological Gardens for animals. A botanic garden can exist without animals but no zoological garden is complete without plants. Both plants and animals are then considered to be important in the context of education, conservation and research. They both contribute positively to entertainment.

Table (4). Opinion of the studied sample about the general features and components of Alex Zoo, with respect to the softscape components of the visitor's area.

	Degree of satisfaction						Mean	SD	χ^2
	Satisfied		Partly		Not satisfied				
	No.	%	No.	%	No.	%			
1. Visitors area:									
1.1. Softscape components	18	7.20	108	43.20	124	49.60	1.58	0.62	78.368*
Garden maintenance									
Lawns, shape and area	34	13.60	78	31.20	138	55.20	1.58	0.72	65.408*
Flowers and other ornamentals	63	25.20	76	30.40	111	44.40	1.81	0.81	14.792*
Shade trees	79	31.60	86	34.40	85	34.00	1.98	0.81	0.344*
Number and variety of garden plants	63	25.20	109	43.60	78	31.20	1.94	0.75	13.208*
Plant labels	13	5.20	28	11.20	209	83.60	1.22	0.52	285.608*

χ^2 p: p value for Chi-square test

*: Statistically significant at $p \leq 0.05$

5- Opinion of the studied sample about the general features of the animals area:

Results of the questionnaire shown in Table (5) indicated the following:

(1) Exhibit simulation:

It was necessary for the current research to explain the meaning of naturalistic enclosures as described by Patrick and Tunnicliffe (2013) which involves using some artificial rockworks of varying quality, sparse vegetations, and larger areas for the animal. It was necessary also to tell the visitors' sample something about the dilemma of exhibiting " wild" animals in an " artificial" and "protected" environment. Polakowski (1989) found that illusions can be created in animal exhibits to produce an atmosphere similar to the animals' environment, and

that was the point to be explained to the studied sample of visitors as "exhibit simulation". Accordingly, the majority of the visitors expressed their satisfaction about the success of Alex Zoo designer to create a considerable level of exhibit simulation (58.80% were satisfied in addition to 25.20% which were partly satisfied).

Alex Zoo was built as early as the beginning of the twentieth century, using the experiences gained from older collections in Alexandria and Egypt as well the experience gained from other European civilizations. The design of Alex Zoo is completely natural and exhibits, usually were built according to the habitat of the animals, exhibit simulation and illusion concept was carefully adopted : The lion house (about 3700 m²), for example, was naturally constructed on a huge protected open place making different slopes of hills and the lion enclosure located on top of them. Visitors can watch lion moving around the open area, they can also closely watch it face-to-face eating from the other side. This lion house has amazing acoustics, designed probably to be reflected through walls of the house to resonate every growl and roar into a natural fearful noise. Another example is the presence of a huge mock- rock mountain for monkeys of about 1200 m², completely built as a natural series of mountains where visitors can watch monkey jumping, climbing and eating in an amazing community as it appears in nature. There are many other examples which express the exhibit simulation concept in Alex Zoo. Nevertheless, there are 16.00% of the tested samples who were not happy about those animals which are still imprisoned or kept in iron-barred cages like some species of monkeys, chimpanzee, and birds which live in miserable conditions under captivity.

(2) Exhibit animal barriers:

The majority of the visitors were greatly satisfied about using good, safe and illusive animal barriers (65.60%). Visitors said they know that there are many kinds of barriers to be used to keep animals inside their enclosures and people out, which was a good point of safety awareness. According to the description of CLRdesign (2004), Alex Zoo has five main animal barriers:

- a** – Dry moats; in which animals are allowed to access, they have a gently sloping interior edge, in Alex Zoo one can find dry moats around lion enclosures and monkey mountain.
- b**- Water moats; they are ideal for foreground barriers, because they can easily be made to resemble a variety of water bodies. Such moats should be deep enough to prevent escape of animals, the edge nearest the animal area should be shallow, sloping gently to a deeper midstream and minimizing danger of drowning. In Alex Zoo one can find water moats around the hippo enclosures.
- c**- Iron fences; vertical iron-barred fences could be easily used for heavy weight and big size animals. In Alex Zoo, one can find such iron fences around the elephant, giraffe as well as the lion enclosures.

- d-** Concrete fences; it is a shorter barrier made up of concrete which is constructed around enclosures which contain some specific kinds of mammals which can not jump higher, nevertheless, the floor of enclosures is designed to be deep enough parallel to the barrier. In Alex Zoo, one can find such concrete fences around zebras, camels and goats.
- e-** Mesh or netting barrier; this complete enclosure is required for birds or some mammals, it has a ceiling in addition to walls to prevent access of unwanted local opportunistic species as well as to avoid flying birds out of enclosures. In Alex Zoo, one can find such mesh barrier in the enclosures of all types of birds as well as chimpanzee.

(3) Animal information labels:

Most of the studied sample of visitors was partly satisfied about the presence of animal labels (42.00%). But 29.20% of the visitors were not satisfied. It is well understood now that the animal information labels are a very important way to give information about animals and how they live in the wild (Churchman, 1985), it is a part of the educational role of zoos towards their visitors (Hirsch and Screven, 1988). As a matter of fact most of the animal labels in Alex Zoo are considered to be a kind of "public display labels". It includes: common name, scientific name, family name, nativity and sometimes the description of the animal and its habitat. When interviewed, the visitors of Alex Zoo who were not satisfied about the animal labels said that there are several enclosures or cages which have no labels at all, which made them upset since they were not able to have some basic information about such animals. But due to the death of many animals throughout the past years, many cages became empty so that the administrative people of Alex Zoo were obliged to move some other animals to occupy these cages, but unfortunately, they didn't make new labels for these enclosures.

(4) Number of animals in captivity:

The majority of the visitors (69.60%) said they are not satisfied about the number of species or the number of displayed animals in Alex Zoo. The survey which was carried out by the author of this study reports the presence of less than 50 species of animal species in Alex Zoo, while the total number of animals in captivity may be less than 500 animals. Unfortunately, the number of animals in Alex Zoo has been reduced to a great extent since several species and animals were died and not replaced due presumably to the limited governmental budget. Olney and Ellis (1989) reported that by 1912, Alex Zoo had a collection of 55 species and a total number of animals of 219, not including domestic animals. In 1989, Alex Zoo contained 2620 animals of 255 species.

(5) Cleaning level of animals and exhibits:

According to the funding constraints, the cleaning level of animals and exhibits looks bad in most of the animal enclosures. About 84% of the tested sample expressed their dissatisfaction accordingly. Badr (2014) reported the death of a lot of animals in Alex Zoo due to the reasons mentioned earlier.

(6) Availability of tour guides:

Alex Zoo has no tour guides as a service in the zoo, thus more than 69% of the visitors were dissatisfied for the non-availability of tour guides. About 11% were satisfied and 20 % were partly satisfied, after interviewing the tested sample, they said they believed that the student groups which appear from time to time visiting the zoo are leaded by a tour guide from the zoo, but they knew later that their teacher was their tour guide. Badr (2014) assured the absence of tour guides in Alex Zoo as well as the non-availability of a map or information book for the zoo.

Table (5). Opinion of the studied sample about the general features and components of Alex Zoo, with respect to the animal area.

	Degree of satisfaction						Mean	SD	χ^2
	Satisfied		Partly		Not satisfied				
	No.	%	No.	%	No.	%			
2. Animals area: Exhibit simulation	147	58.80	63	25.20	40	16.00	1.66	0.85	76.136*
Exhibit animal barriers	164	65.60	58	23.20	28	11.20	1.46	0.69	122.528*
Animal information labels	72	28.80	105	42.00	73	29.20	2.00	0.76	8.456*
Number of animals in captivity	27	10.80	49	19.60	174	69.60	1.41	0.68	150.872*
Cleaning level of animals and exhibits	28	11.20	13	5.20	209	83.60	1.22	0.52	285.608*
Availability of tour guides	28	11.20	50	20.00	172	68.80	1.42	0.69	144.416*

χ^2 p: p value for Chi-square test

*: Statistically significant at $p \leq 0.05$.

CONCLUSION

According to the above-mentioned, it was evidenced that Alex Zoo doesn't match exactly the international standards of the World Association of Zoological gardens and Aquarium. Although the main design of the Zoo looks good when we consider that Alex Zoo is one of the oldest zoos in the East.

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الملخص العربي

تقييم حديقة حيوان الاسكندرية

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بدأت حديقة الحيوان بالاسكندرية عام ١٩٠٧ كحديقة حيوان على نظام الاقفاص الحديدية القديم. وفي عام ١٩١٦ أعيد تصميم حدائق انطونيادس حتى تصبح قادرة على استيعاب وعرض بعض الحيوانات والطيور. تبلغ مساحة حديقة الحيوان بالاسكندرية حوالي ٢٥ فدان وتقع في منطقة سموحة بالاسكندرية بجمهورية مصر العربية. تم اجراء دراسة تقييمية لحالة حديقة الحيوان بالاسكندرية لمعرفة اذا كانت تضاوى المواصفات الدولية لحدائق الحيوان وهل تقوم حديقة حيوان الاسكندرية بتحقيق اهدافها والفوائد المتوقع الحصول عليها كسائر حدائق الحيوان. اشارت النتائج المبينة على الملاحظات والاستبيانات التي تم تحليلها احصائيا الى العديد من الحقائق: بخصوص اسباب قيام الزوار بزيارة الحديقة ذكر معظم افراد العينة المدروسة الى انهم يقومون بزيارة حديقة حيوان الاسكندرية اساسا من اجل الترفيه ثم الحصول على قدر من المعرفة والتعليم. معظم افراد العينة المدروسة اشاروا الى عدم رضائهم سواء عن مستوى المساحات الخضراء لحديقة حيوان الاسكندرية او عن الوضع العام لمكونات تلك الحديقة. معظم الزوار اعربوا عن عدم رضائهم

عن بوابات الدخول وطريقة الدخول حيث يستحيل على زوار الحديقة ارتياد الحديقة بسيارتهم حيث ان كل مداخل الحديقة ذات سلام لان مستوى انشاء حديقة حيوان الاسكندرية اعلى من مستوى الشوارع المحيطة. اما بالنسبة للطرق والمشايات بالحديقة فان تصميم الحديقة والذي تم منذ زمن طويل قد سمح بنوع من سهولة الحركة للزوار بين اماكن عرض الحيوانات حيث تستخدم الطرق والمشايات للمشاة فقط. ولهذا اعرب معظم الزوار عن استيائهم بسبب عدم وجود اى طريقة للزوار الذين يستخدمون كراسى متحركة يستطيعون بها الدخول للحديقة من اى بوابة الهام الا ان يقوم بحمل تلك الكراسى زوارا اخرين. ومن ناحية اخرى اعرب معظم افراد العينة المدروسة عن رضائهم عن وجود اسوار حماية الزوار والتي تقوم بحجز الزوار فى المساحة المخصصة لهم خارج حدود اسوار الحيوانات. وكذلك لا يوجد اى لافتات توضح الطريق الى المكونات المختلفة للحديقة . وكذلك لا توجد اى خرائط توضح اماكن المكونات والاقفاص ولا تحديد الاتجاهات وطريقة الوصول الى اى مكان تعرض فيه انواع الحيوانات. وجاء مستوى النظافة على قائمة عدم رضاء الزوار حيث اعرب معظم الزوار عن عدم رضائهم بسبب تراكم القمامة والقاذورات فى كل ارجاء الحديقة . كما ان معظم زوار الحديقة كانوا غير راضيين عن حديقة الاطفال سواء بالنسبة لمساحتها او بالنسبة للخدمات المخصصة للاطفال عليها. كذلك فان معظم الزوار غير راضون عن صيانة الحديقة والمساحات الخضراء وكذلك الزهور وباقى نباتات الزينة وكذلك عدد وتنوع نباتات الزينة المستخدمة فى زراعة الحدائق. وعلى الجانب الاخر كان معظم الزوار راضيين عن عدد وطريقة توزيع اشجار الظل فى الحديقة حيث تم زراعة تلك الاشجار على مدى يتعدى مائة عام . اما بخصوص المناطق المخصصة للحيوانات فى حديقة حيوانات الاسكندرية فقد اعرب معظم الزوار عن نجاح من قامو بتصميم حديقة حيوانات الاسكندرية فى خلق مستوى مقبول لما يسمى بالتصميم الطبيعى لاماكن معيشة الحيوان . وعلى نفس مستوى النجاح اعرب معظم الزوار عن رضائهم فى استخدام المصمم لحواجز جيدة وامنة وطبيعية لمناطق عرض الحيوانات . اعرب معظم الزوار ايضا عن رضائهم الجزئى عن وجود لافتات على اقفاص الحيوانات تحتوى القدر الكافى من المعلومات عن الحيوان وكيف يعيش فى اماكنه البريه. ولكن فوق ذلك كله اعرب معظم الزوار عن عدم رضائهم بسبب انخفاض عدد الحيوانات المعروضة بالحديقة وكذلك بسبب انخفاض مستوى النظافة للحيوانات واماكن معيشتهم وكذلك لعدم وجود اى مرشد بالحديقة.