

بسم الله الرحمن الرحيم

Sudan University of Science and Technology

College of Graduate Studies

**A preliminary Study on Administrative Performance, animals Care
and Visitors interest Satisfaction in Kuku Zoo**

دراسة اولية عن الاداء الاداري وعناية الحيوان واشباع رغبات الزوار في حديقة حيوان

كوكو

By

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for the degree of Master of Science in Wildlife Management

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Declaration

I declare that this research project is my original work. It is being submitted in partial fulfillment of the degree of master of science in Wildlife Management to the Sudan University of Science and Technology

It has not been submitted for award of degree for any similar purpose any other University.

Nuha Kamal Khalid Saeed

Signature :

date

DIDECATION

To my Parents, my Husband,

my kids , my sisters and my brother , my Husband Family , my friends and colleagues, And for Everyone who helped me in my research .

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ABSTRACT

A preliminary study was carried out in Kuku Zoo on administrative performance, animal welfare, and visitor interest satisfaction towards the services rendered to them in the Zoo.

The study was conducted in the period (2-31 December, 2018).

The methods used are three questionnaire forms distributed randomly to the Zoo administration personnel's, Zoo worker and Zoo visitors (30 forms for each), in addition to daily direct observations of animals cages or enclosures and feeding quality and quantity and feeding. The results revealed insignificant differences, SPSS- Chi Square (χ^2) $P > 0.05$ for administrative performance. There is no significant variation (chi squares) $P > 0.05$ in training course for employees, administration personals, veterinary services for the animals, animals vaccination, Quarantine, food formulation, suitability of housing, animal behavior, feeding adequacy, suitability of visiting time, effect of recreation activities, safety of animals and visitors, regulation observation, animal distribution, research obstacles, and workers problems. The remaining variables showed significant variation (chi square $P < 0.05$) for services, cage safety and reasons for visiting the zoo for the workers in the Zoo. there is significance ($p < 0.000-0.05$), in the following variables, training

courses, work experience, working hours during the day, salary per month, contagious infection, and body hazard. No statistic inference was drawn for problems facing workers during their work in the Zoo and workers infection allowance. As for Kuku Zoo animals there is significance in cage safety and housing suitability($p < 0.05$). No significant results were obtained for captive animal behavior and food adequacy($p > 0.05$).

Key Words

Sherg elnil, Kuku zoo, Administrative Performance, Animal welcare, Visitor interest satisfaction.

المخالصة

اجريت دراسة اولية لدراسة الاداء الاداري ,ايواء وغذاء الحيوانات ,اقتناع الزوار باهمية حديقة حيوان كوكو. اجريت الدراسة خلال الفترة (2-31ديسمبر2018).

استخدمت في الدراسة توزيع فورمات استبيان عشوائيا , بواسطة الاستبيان علي شرائح موظفي الادارة, الزوار والعاملين بالحديقة من داخل حديقة حيوان كوكو والمختصين بقسم علوم الاسماك والحياة البرية. اما بالنسبة لايواء الحيوانات في الحديقة فقد اعتمدت علي المعاينة اليومية المباشرة.

لقد احتوت الدراسة علي طريقتين لجمع المعلومات :طريقة الاستبيان وطريقة الملاحظة اليومية المباشرة .

اظهرت الدراسات عدم وجود فرق معنوي اعتمادا علي القراءة اقل من $P < 0.05$ باستخدام مربع كاي من التحليل الاحصائي SPSS . لكل من :الدورات التدريبية ,المراقبة الادارية ,الاشراف البيطري ,سلوك الحيوانات,الغذاء الكافي ,زمن الزيارة المناسب ,تأثير الانشطة الترفيهية,سلامة الزوار والحيوان ,لوائح المراقبة ,توزيع الحيوانات ,الصعوبات التي تواجه الباحثين ,مشاكل العمل ,اما بقية المتغيرات فقد اظهرت انها يوجد فرق معنوي عند $(P > 0.05)$ في خدمات المقدمة للزوار, الارشاد,سلامة الاقفاص,مناسبة الاقفاص لايواء الحيوانات وجذب الزوار لزيارة الحديقة .

كلمات مفتاحية

شرق النيل, حديقة حيوان كوكو, الاداء الاداري, عناية الحيوان, اشباع رغبات الزوار.

Chapter One

1. Introduction

Kuku Zoo was establishment in 2008 in Sharq elnil –Khartoum State. It is one of the biggest Zoos in the Sudan.

The collection of wild animals has a long history according to the records dating back as far as 2500 BC (Egypt as depicted in ancient hieroglyphs). China and Greece also have a long history of keeping wild animals and many wild animals were also kept for sport in Roman gladiatorial contest.

Khartoum Zoological Garden which had been working since the beginning of the 19st Century till the last decade of the 20st Century had played good role as a true Zoo.

1.1. Justification

The justification for establishing Kuku Zoo is based on the ability to collect wild species is especially that endangered ones and keep them in captivity to be or as sites of wildlife conservation. For a long time and still a reality that Zoos have historically been defined as sites for entertainment of the general public and continued to be dependent on the revenue raised through visitor receipts. Consequently, today Zoos are primarily identified as sites of entertainment.

Today Zoos open to the public can be found virtually in every country in the world. The World Association of Zoos and Aquariums membership

now consists of more than 1200 institutions which together attract over 600 million visitors per annum (**Holtorf, 2008**).

In the Sudan has meager or no research had been conducted on Zoos, with regard to the present matters like the efficiency of administrative performance. Therefore, the study is also intended to evaluate the vision of the public towards the wild animal's welfare and visitor's interest satisfaction. When visiting the Zoos for entertainment.

1.2. The wild animals in Kuku Zoo

Porcupines (Hystrixaleata), Turtles (Centrochelyssucata), Nile crocodile (Corcodilus niloticus), Pythons (Python sebae), Red Necked Ostrich(Struthiocamelus), Peacock(Pavocristatus), Marbou stork(Leptoptilscrumeniferus), Toulouse goose (Anseranser), Muscovy ducks(Cairinamoschata), Tufted Guinea fowl(Numidamcleagris), Dmicle crane(Grusvirgo), Crowned(Balearicapovonina), Crane Bateleur (Terathopiusecaudatus), Lion(Pantheraleo), Striped hyaena (Hyaena hyaena), Black backed Jackal(Canismesomellas), Genets (Viverragenetta), White tailed Mongoose (Mungos spp), Baboons (Papio Anubis), Patas Monkeys (Erythrocebus patas), Grivet Monkeys (Chlorocebus aethiops), Drcas gazelle(Gazella dorcas), Red-fronted gazelle(Eudorcas rufifrons).

1.3.Objectives

The objectives of the study are

- 1-To evaluate the administrative performance of Kuku Zoo.
- 2-To evaluate the care, medical service and provision of food for the wild animals in captivity in Kuku Zoo.
- 3-To evaluate the satisfaction of visitors interest when visiting Kuku Zoo.
- 4- To enlighten the people about the importance of Kuku .

1.4. Hypothesis

Kuku Zoo is not satisfying the requirement of a successful zoo.

Chapter Two

2. Literature review

2.1. Establishment of Zoos

The justification for establishment of Kuku Zoo is based on the ability to collect especially the endangered wild species ones and keep them in captivity to be or act as sites of wildlife conservation .For a long time and still a reality that zoos have historically been defined as sites for entertainment of the general public and continue to be dependent on the revenue raised through visitor receipts. Consequently, today Zoos are primarily identified as sites of conservation, research, education and entertainment (**Reade and Waran, 1996**).

The collection of wild animals has a long history according to the early records dating back as far as **2500 BC** (Egypt as depicted in ancient hieroglyphs). China and Greece also have a long history of keeping animals and many animals were also kept for sport in roman gladiatorial contest (**Turley, 1998**) .

The tower of London menagerie was opened in **1125** by King Henry(**1**), and across Europe and America. Menageries existed right through the **17th** **18th** and **19th** century's .In the **18th** century wild animal collections

became more public rather than restricted to high societies and the concept of zoo began to emerge by the 19th century (**Lai, 1999**).

There were what we recognize as zoological gardens, including London zoo and the jardin des plantes in Paris .In the early 20th century saw a move towards exhibiting wild animals in a way which meant to train they could also exhibit their behaviors therefore providing more than just an empty enclosure. This move was temporarily abandoned in the 1920s and 30s with enclosures designed primarily for ease of cleaning and note the animal's needs. Since then particularly in the 1960s and 1970s the zoo concept has changed .This was in response to a growth in public awareness of environmental issues and growing interest in wild animal's welfare (**Carr and Cohen, 2011**).

In the 21st century well established Zoos. It is difficult to give a precise date to the origin of the Zoo due to that change in concept, nature and meaning throughout time. However, if a Zoo is taken to encompass the collecting and displaying of live wild animals as noted by (**Benbow, 2004**)then the earliest forms can be traced back over 4500 years to historic civilizations such as the ancient Egyptians, Chinese and Romans civilization .

This broad definition of a zoo incorporates entities such as menageries, wild life parks ,safaris and zoological gardens amongst others the common theme throughout the histories of zoo is of it as a place of human entertainment and leisure the forebears of the modern zoo tended to be status-symbols of the rich and powerful peoples though they were sometimes open to the public for entertainment purposes .the dual purpose of zoo as sites of entertainment and displays of power and wealth was prevalent in the medieval and early modern menageries of Europe **(Carr and Cohen, 2011)** .The late 18th and early 19th centuries witnessed an important milestone in the evolution of zoo with the creation of zoological societies such the zoological society of London that gave a scientific raison for zoos and opened the first truly public zoos **(Turley, 1998)**.whilst stressing the scientific importance of zoos it is thanks at least in part to the efforts of zoological societies that these places have become a mass tourism and leisure experience **(Mullen and Marvin, 1999)**.

2.2. Development of Zoos

Today zoos open to the public can be found virtually in every country in the world .The World Association of Zoos and Aquariums membership now consists of more than 1200 institutions which together attract over

600 million visitors per annum (**Holtorf, 2008**).The initial zoos of the modern era followed in the footsteps of their predecessors and were created with an emphasis on allowing the public to see the animals rather than on needs of the animals and with little or no concern given to animal rights or conservation (**Carr and Cohen, 2011**). Two issues which have not reached public agenda till relatively recently in comparison with the age of zoos .Consequently, the conceptualization of zoos in the modern era has built on their historic construction as places of human entertainment ;places to be visited during leisure time where the animals are presented for the amusement of visitor (**Turley, 1998 ; WAZA, 2005**) this view is mirrored in the UK zoo licensing act (**1981**) which defines zoos as establishments "which keeps wild animals (those which are not domesticated to the country)in captivity for the purposes of exhibition to the general public (**Dibb, 1995**). In contrast to the original image of zoos as primarily sites of entertainment according to contemporary socially \morally acceptable public opinion zoos exist to aid the conservation of species under threat of extinction. This is a view widely espoused by those involved with zoos such as the (**WAZA, 2005**) and supported by academics such as (**Reade and Waran, 1996**) who have stated that conservation is generally considered to be the main role of the zoo today as part of this focus (**Dibb, 1995**) has recognized that the role of at least

some zoos in conservation has increasingly been pushed to the fore in their publicity material. The shift to the presentation of zoos as sites of conservation and away from them as spaces of entertainment has been identified as a " structural and ideological transformation (**Beard-Sworth and Bryman, 2001**) that can be traced back to the 1960"s (**WAZA, 2005**) though the potential of Zoos were established to aid and provide conservation and research on animals was noted in the late 1800s (**Broad and Smith, 2004**). This transformation is arguably still an ongoing process that has been led by recognition of the rights of wild animals by the general public and an associated growing dislike of the capturing and presentation of animals in stark cages (**Turley, 1998**). In such a situation, the zoo as a location for the indulgence of an unashamedly recreational gaze upon its captive inmates becomes less and less appealing, and more difficult to justify" (**Beard, sworth and Bryman, 2001; Dibb, 1995**). Consequently and **Holtorf (2007)** has stated that Zoos, once doomed, are popular again because they present themselves as conservation centres. An integral component of conservation efforts in the modern Zoo is the conducting of research on wild animals (**Jamieson, 1985; WAZA, 2005**). Furthermore, conservation encompasses captive breeding programs of endangered species to ensure their survival and/or for release into natural habitats and protection / rejuvenation of such environments (**Puan and**

Zakaria, 2007). In addition to being defined as centres of conservation modern Zoos have been constructed as places where members of the public can learn about animals and how they can contribute to the survival of endangered species (**Serrell, 1981;Smith and Broad, 2008 ;Ballantyne, et al 2007).**

2.3. The role of Zoos

WAZA, (2005) has stated that Zoos and aquariums they are popular visitor attractions, have unique opportunities to introduce their visitors to a wider world and to explain the issues of international conservation. Consequently ,the world association of zoos and aquarium sees education as central component of the modern zoo support for this view is provided by(**Falk, et al 2007)** whose study showed that Zoos can enhance visitors understanding of wildlife and conservation .The potential of learning experiences in zoos is related according to educational theorists ,to the fact they are offered in an informal and unstructured manner rather than a structured traditional schoolroom setting (**Reade and Waran, 1996**).In particular it has been suggested that where active educational opportunities that facilitate interaction be it physical and \or emotional with wild animals are offered a successful transfer of conservation messages to visitors is more likely to occur than

where only passive educational experiences are offered via animal viewing and notice boards. Active learning opportunities may be facilitated by amongst other things ,the provision of animal demonstration ,volunteer or animal handler talks ,touch tables ,direct contact by visitors with animals and multimedia factual information (**Swanagan, 2000; Lindemann –Matthies and Kamer, 2006 ; Smith and Broad, 2008 ;WAZA, 2005 ;Ballantyne, et al 2007**) . It has also been suggested that the potential for learning in zoos is heightened if animals are housed and fed in as natural \realistic amanner as possible (**Ballantyne , et al 2007 ; Smith and Broad, 2008 ;Fernandez ,et al 2009**) .The key to the success of the transfer of conservation messages rests with the informal learning environment of the zoo that enables individuals to freely choose what and how to learn in a process that has been called free-choice learning (**Falk, 2005**) . The modern zoo is therefor, portrayed to the public as being a site of education ,research and conservation .One of the earliest proponents of this integrated vision of Zoos was (**Durrell, 1976**) who stated that the purpose of keeping any collection of wild animals in confinement should be threefold :first to conduct as complete as possible a biological study of every species .second to aid severely endangered species by setting up under ideal conditions, protected breeding groups and eventually a reintroduction program so helping to ensure their future survival .

Thirdly by the display and explanation of this work to the public to persuade people of the vital necessity and urgency for overall conservation of nature.

However **(Durrell, 1976)** clearly believed research, education and conservation should be the cornerstones of the ethos of all zoos. He stated that the reality in many zoos around the world fell far short of these ideals .In particular , he castigated zoos for a lack of scientific rigour where animal record systems were either not kept at all or only in a poor ,unscientific manner . This led **(Durrell, 1976)** to say let us be clear on this one would not expect science in the fairground ,circus or other zoological extravaganza ,but one does expect a modicum of it in any reputable zoological garden or other collection of wild animals that lays claim to be anything other than a sideshow. The views of **(Durrell, 1976)** have been reinforced by the **(WAZA, 2005)** which has stated that zoos must aim to integrate all aspects of their work with conservation activities. Whether zoos are really capable of aiding conservation in a meaningful manner has been contentious issue. , Furthermore where appropriate ,charitable status might be better promoted: Similarly **(WAZA, 2005)**has noted that zoos need to promote a clearer view of their unique role and the contribution they can make as part of a global conservation coalition.

(**Jamieson, 1985**) has also questioned the ability of zoos to make a significant contribution to the breeding of endangered species due to their limited size in proportion to the requirements of larger wild animals. In addition zoos have faced a barrage of criticism about animal welfare and animal rights in the last 30 years that have questioned to their ability to act productive agents of conservation (**Mason, 2000 ; Spedding, 2000 ; Davey, 2007**) . And had a negative impact on their public image (**Holtoraf, 2008**). This situation may not be helped when it is recognized that the majority of wild animals in most zoos are not endangered and therefore arguably not in need of conservation at the present time (**Benbow, 2004**) . A common call from the animal rights lobby who question the value of zoos has been that both humans and wild animals will be better off when they zoos are abolished (Jamieson, 1985). One of the most problematic issues that zoos have faced in recent years is that alongside the desire to see zoos as sites of conservation, research and education is the reality of the need to ensure they gain the financial income to allow them to keep operating (**Dibb, 1995**). The most common source of income has traditionally been the paying visitor (**Turley, 1998 ; Davey, 2007 ; Hosey, 2008**). The need to attract visitors is a concern for zoos and their conservation ,research and education efforts when set alongside the traditional image of zoos as sites of entertainment for

members of the public in manner more akin to traditional animal circuses than places of learning and science. While the vast majority of zoos may now deny the image of a zoo as a site simply of entertainment at the expense of animals they only have themselves to blame for the creation of these image (**Durrell, 1976 ; Fernandez et al 2009 ;Turley, 1998**)noted that zoos cannot perform their more socially acceptable functions without satisfying the needs and requirement of day visitors. Who by definition are on recreational excursion ? The historic images of zoos as sites of entertainment and the desirability of this amongst the public are not issues that are easily consigned to the past rather it is arguably still the case today that the predominant image of zoos in the eyes of the public is one of the places of entertainment (**Benbow, 2004**). This view is reinforced by (**Puan and Zakaria, 2007**) study of zoos in Malaysia which found that people are primarily motivated to visit zoos for recreation. Similarly (**Sickler and Fraser, 2009**) have noted how visits to the zoo are often described as fun ;furthermore ,although public opinion may appear more enlightened today concerning animal rights ,what most people are entertained by and how they view animals may not actually have changed that much .Consequently (**Beard, Sworth and Bryman, 2001**) have claimed that the shift in emphasis in zoos from entertainment to conservation may be as much for the benefit of human visitors

sensibilities as a response to animals needs a view expanded to encompass humanity in general (**Holtorf, 2008**). Despite The questionable morality of zoos as sources of entertainment it is vital today to engage the interest of potential visitors and ensure they have a good time during their visit to a zoo. This is necessary as visiting zoos , especially outside of formal school trips occurs during leisure time and utilizes discretionary income . Both time and money are keenly sought by a vast array of competing attraction of which zoos are only one (**Davey, 2007**) Consequently, zoos must recognize that visitors want to be entertained and failing to provide this will undermine **zoos** gate receipts as people decide to undertake their leisure experience elsewhere (**Tomas, Crompton and Scott, 2003**) the pressure to provide entertainment (**Dibb, 1995**). He noticed a number of zoos began to offer entertainment attractions in addition to the chance to see wild animals. These offerings are set against declining visitor numbers to zoos between the early 1970s and mid 1990s which arguably spurred zoos to reinvent themselves and invigorate their entertainment attraction (**Turely, 1998**). Those Zoos recognize the importance of the leisured visitor to their survival is demonstrated by the propensity of these establishments to advertise themselves as destinations for tourist (**Beard, Sworth and Bryman 2001**). Entertaining of visitors is arguably necessary to ensure effective

learning experience ,especially when these are aimed at children and people who feel they are visiting zoos as part of leisure ,(Puan and Zakaria, 2007) have stated that it is undeniable that effective education can only be gained if the desire of visitors for enjoyment is met. Consequently, (Jamieon, 1985) has noted that some zoo curators see baby elephant walks, for example as a necessary evil or defend such amusements because of their role in educating people, especially children about animals. However it may also be claimed that as leisure sites, at least in the eyes of the general public zoos are inappropriate places for learning as visitors do not come prepared to be educated but instead have an expectation to be entertained, (Tomas, Crompton and Scott, 2003; Reade and Waran, 1996) have claimed that zoo visitors are more socially or entertainment oriented than learning or goal –oriented. Furthermore ,it has been stated that there is little evidence of ability of zoos to educate general visitors about the need for conservation through informal learning mechanisms though more formal educational programs within the year 2008 have stated that "there is a distinct lack of evidence to support attitudinal or behavioral change through informal zoo education , consequently ,rather than providing a true learning experiences ,particularly informal ones may actually do little more than provide a socially acceptable veneer to the entertainment on offer. Based

on this suggestion it has been claimed that it is time for zoos to stop arguing that exciting children in New York or Tokyo about the plight of gorillas in Cameroon or the Democratic Republic of the Congo is responsive conservation. This process is too indirect too slow too far away and too unlikely to affect the real issues (**Conway 2003**). Alternatively it may be argued that there is a need to further distance zoos from their traditional image as sites primarily of entertainment for human visitors if they are to be able to educate visitors about the need for conservation (**Carr and Cohen, 2011**). Whichever view is correct the concern is that attempting education in an entertainment setting can lead to the message of the former being subsumed under the reality of the latter. The potentially mixed message of education and entertainment is exemplified (**Swanagan, 2000**) who in his work on zoos visitors conservation attitudes and behavior reported that most elephants exhibit and show in zoo offer abundant zoological information, yet the animal routines resemble a circus show. (**WAZA, 2005**) pointed out that mixing education and entertainment is not in itself problematic. (**Sickler and Fraser, 2009**) have suggested that the distinction between education and fun and enjoyment is blurred and that learning can be fun and therefore sought after as a form of entertainment. Similarly (**Packer, 2006**) has stated that what many visitors to zoos seek is not so much to learn

something as to engage in an experience of learning that what many visitors to zoos seek is not so much to learn something as to engage in an experience of learning that is inherently valuable or enjoyable in its own right. following on from this, (WAZA, 2005) has argued that fun and conservation within zoos face, according to (Sickler and Fraser, 2009) is how to balance their image as places of fun, recreation or entertainment with their mission of education. This means the emphasis within zoos needs to be on developing methods that provide learning opportunities to visitors at the same time as they have fun and portraying this hybrid entertainment \education image effectively to the public. It is clear that the modern zoo must perform four roles in order to be seen to be socially acceptable and to be economically viable these roles are conservation, education, research and entertainment (Jamieson, 1985 ;Reade and Waran 1996 ;Turley, 1998 ;Fernandez, et al 2009) . Based on this reality (Turley, 1998) has stated that zoos must balance carefully the demands of the paying visitors with those of maintaining credibility as conservation and education –oriented organizations, recognizing the multiple roles of zoos in contemporary society. The aim of this paper is to assess the image that zoos are currently portraying to the general public to see how the different roles are advertised and whether they sit comfortably alongside one another in particular the paper examines how

the socially \morally acceptable face of zoos as sites of conservation site alongside the less morally acceptable ,but economically necessary entertainment side of zoos .the need for this work is supported by **(Turley, 1998)**who has stated that zoos might do more to enhance "their credibility awareness among visitors and the public at large of their conservation and educational responsibilities could be improved, Furthermore where appropriate ,charitable status might be better promoted: Similarly **(WAZA, 2005)**has noted that zoos need to promote a clearer view of their unique role and the contribution they can make as part of a global conservation coalition .

Chapter Three

2. Materials and methods

3.1 The study area

The study was carried out in Kuku Zoo –Department of Fishery and Wildlife Science, College of Animal Production Science and Technology, Sudan University and of Science Technology during the period 2-31 of December 2018.

The area of the Zoo is 20 acres of which 10 acres were used for keeping wild animals .Kuku Zoo lies in sherq alnil locality –Khartoum state lies between longitudes (31,5-34,45)and latitude(15,8-16,45).

The zoo is used for keeping wild animal species in captivity (cages) as well as domestic livestock in enclosures like horses, camels, sheep and goats.

3.2 Methods used

(3.2.1) Questionnaire

Three questionnaire were designed for random collection of data from Zoo administrative personnel, labors and visitors

The first one form was distributed randomly among zoo personnel's and college staff (30 forms) – (see appendix, from 1).

The second form was distributed randomly among zoo laborers (30 forms) – (see appendix, form 2)

The third form was distributed randomly among zoo visitors and students (see appendix, form 3).

(3.2.2) **Observations** of animals and housing animal's facilities

Daily direct observation was made for animals housing in the zoo with special emphasis on wild species, as the Zoo is also contain some representatives of domestic animals like horses, camels, sheep and goats in enclosure's.

The wild animal species in the Zoo include carnivores like lion, hyaena, jackal, and reptiles like the python, tortoises, and crocodile. Primates like baboon, grivet monkey, red hussar and avian species including ostrich as the largest of all birds in the Zoo .The hygiene and provision of food and water was taken notes of about their levels.

Scientific names wild animals in Kuku Zoo and their numbers

Hystrix aleata(9), *Centrochelys sucata*(8),*Corcodilus niloticus*(3),
Python sebae(3), *Struthio camelus*(1), *Pavocristatus*(7), *Grusvirgo*(5),
Leptoptilscrumeniferus(1) , *Anser anser*(10), *Cairinamoschata*(10),
Numidamcleagris(2), *Balearicapovonina*(2), *Terathopiusecaudatus*(2)
,*Panthera leo* (11),*Hyaena hyaena*(2), *Canismesomellas*(4), *Mungos spp*(1), *Viverragenetta*(1), *Papio Anubis*(8), *Erythrocebus patas*(6),
Chlorocebus aethiops(18), *Gazella dorcas*(4), *Eudorcas rufifrons*(1).

3.3.3 **Analysis:**

Two methods were used:

- 1) Descriptive procedures (%) were used for analysis of the collected data according to the formula **Krippendorff, (2004)**.

2) Chi square test for significance (χ^2)

$P > 0.05$ = non significance

$P < 0.05$ = significance

Chi square formula = $(\text{expected} - \text{calculated} / \text{expected})^2$

The Formula for Chi Square Is

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

O is observed value.

E is the expected value.

Chapter Four

4. RESULTS

The following tables show the answers of the respondents according to the three questionnaires

Training course for employees (66.7%) of the employees was training course. While (33.3%) didn't, there for there is no

Significance record ($P=0.423$) according to Chi sq.

Sig (Significance), $P<0.05$.NS (non-significance) , $P>0.05$. Table (4-1).

Table (4-1) Training course for zoo staff with regard to administration of the Zoo

	Post graduate	Graduate	Secondary	total	Percent %	Asymp. Sig. (2-sided) NS
yes	6	11	3	20	66.7%	
No	5	3	2	10	33.3%	
total	11	14	5	30	100%	

Administrative follow up for all the zoo activities ;(86.7 %) said Yes while (13.3%) said No there for there is no significance as chi. sq. value (0.644). Table (4-2).

Table (4-2) Administrative follow up on the Zoo activities or works

Follow up	Post graduate	graduate	secondary	total	Percent%	Asymp. Sig. (2-sided) NS
Yes	9	13	4	26	86.7%	
No	2	1	1	4	13.3%	
Total	11	14	5	30	100%	

Medical services ;(86.7%) said Yes while (13.3%) said No there is no significance as chi. sq. value is (0.829). Table (4-3).

Table (4-3) Veterinary Services for the animals in the Zoo

Veterinary services	Post graduate	graduate	secondary	total	Percent%	Asymp. Sig. (2-sided) NS
Yes	10	12	4	26	86.7%	
No	1	2	1	4	13.3%	
Total	11	14	5	30	100%	

Vaccination of animals in the Zoo (63.3%) said yes while (37.7%) said no. There is no significance as the value is (0.457). Table (4-4).

Table (4-4) Vaccination of animal in the Zoo

Answers	Post graduate	graduate	secondary	total	Percent%	Asymp. Sig. (2-sided) NS
Yes	7	10	2	19	63.3%	
No	4	4	3	11	37.3%	
Total	11	14	5	30	100%	

(66.7%) said yes there is quarantine while (33.3%) said no.

There is no significance as the value is (0.100). Table (4-5).

Table (4-5) Animal quarantine in the Zoo

Answers	Post graduate	graduate	secondary	total	Percent%	Asymp. Sig. (2-sided) NS
Yes	5	12	3	20	66.7%	
No	6	2	2	10	33.3%	
Total	11	14	5	30	100%	

(76.7%) said yes while (23.3%) said no.

There is no significance as the value is (0.102). Table (4-6).

Table (4-6) Feeding of animals is done according to scientific bases in the Kuku Zoo

Answers	Post graduate	graduate	secondary	total	Percent%	Asymp. Sig. (2-sided) NS
Yes	9	12	2	23	76.7%	
No	2	2	3	7	23.3%	
Total	11	14	5	30	100%	

(76.7%) said yes while (23.3%) said no extension. There is a high significance as the value is (0.000). Table (4-7).

Table (4-7) Section of Extension and guidance for the visitors in Kuku Zoo

Answers	Post graduate	graduate	Secondary	total	Percent%	Asymp. Sig. (2-sided) **
yes	11	12	0	23	76.7%	
no	0	2	5	7	23.3%	
total	11	14	5	30	100%	

(80%) said yes while, (20%) said no. There is high significance because chi square value is (0.012). Table (4-8).

Table (4-8) Well designed animal cages to ensure safety of both animals and visitors in Kuku Zoo

Answers	Post graduate	graduate	secondary	total	Percent%	Asymp. Sig. (2-sided) *
Yes	8	14	2	24	80%	
No	3	0	3	6	20%	
Total	11	14	5	30	100%	

(70%) said yes while (30%) said no. There is high significance because chi square value is (0.028). Table (4-9).

(4-9) Suitability of housing for each animal species in Kuku Zoo

House suitable	Post graduate	Graduate	secondary	Total	Percent%	Asymp. Sig. (2-sided) *
Yes	9	11	1	21	70%	
No	2	3	4	9	30%	
Total	11	14	5	30	100%	

(73.3%) said has effects while (26.7%) said no effect. There is no significance as the value is (0.139). Table (4-10).

Table (4-10) The impact of continuous presence of visitors (one, two or in group) on animal behavior in Kuku Zoo

Animals behavior	Post graduate	graduate	Secondary	total	Percent%	Asymp. Sig. (2-sided) NS
Yes	8	12	2	22	73.3%	
No	3	2	3	8	26.7%	
Total	11	14	5	30	100%	

70%) said enough while (30%) said not enough. There is no significance as the value is (0.263). Table (4-11).

Table (11) Adequacy of food quality, quantity given to animals in Kuku Zoo

Adequate feed	Post graduate	graduate	secondary	Total	Percent%	Asymp. Sig. (2-sided) NS
Yes	8	11	2	21	70%	
No	3	3	3	9	30%	
Total	11	14	5	30	100%	

(69.7%) said the time is suitable while (30.3%) said not suitable.

There is no significance as the value is (0.866). Table (4-12).

Table (4-12) Rest of animals and suitability of Kuku Zoo visiting time for the public

Visit suitable	Post graduate	graduate	Secondary	total	Percent	Asymp Sig. (2-sided) NS
Yes	7	10	3	20	69.7%	
No	4	4	2	10	30.3%	
Total	11	14	5	30	100%	

The accessory have a positive impact for animal behavior ;(69.7%) while (30.3%) said not said have negative impact.

There is no significance as the value is (0.787). Table (4-13).

Table (4-13) The positive impact of recreational activities on animals in the kuku zoo

Effect of recreational active	Post graduate	graduate	secondary	total	Percent%	Asymp Sig. (2-sided) NS
Yes	7	9	4	20	69.7%	
No	4	5	1	10	30.3%	
Total	11	14	5	30	100%	

(83.3%) said there are regulations while, (16.7%) said no regulations.

There is no significance as the value is (0.235). Table (4-14).

Table (4-14) Selfing ad applying regulations for the visitors to observe while patrol inside the Zoo for the safety of both, the animals and the visitors

Answers	Post graduate	graduate	secondary	total	Percent%	Asymp. Sig. (2- sided(NS
Yes	9	13	3	25	83.3%	
No	2	1	2	5	16.7%	
Total	11	14	5	30	100%	

(96.7%) of visitors repeated visit to the Zoo, while (3.3%) of them didn't.

There is no significance as the value is (P=0.309). Table (4-15).

Table (4-15) Frequency of visits to Kuku Zoo

frequency	student	others	total	Percent%	Asymp. Sig. (2- sided NS
Yes	15	14	29	96.7%	
No	0	1	1	3.3%	
total	15	15	30	100%	

(50%) said for entertainment. (40%) said for education. (10%) said for research. High significance as the value is (P=0.000). Table (4-16).

Table (4-16) Reasons for visiting Kuku Zoo

Reason of visit	Student	other	total	Percent%	Asymp. Sig. (2- sided **
Entertainment	0	15	15	50%	
Education	12	0	12	40%	
Research	3	0	3	10%	
Total	15	15	30	100%	

No significance as the chi square value is ($P=0.143$)(93.4 %) said there is development while (6.6%) said no development. Table (4-17).

Table (4-17) Development of Kuku Zoo

Answers	student	family	total	Percent%	Asymp. Sig. (2- sided NS
Yes	15	13	28	93.4%	
No	0	2	2	6.6%	
total	15	15	30	100%	

(63.3%) said yes while (36.7%) said no. There is high significance as the value is ($P=0.000$). Table (4-18).

Table (4-18) Enough varieties of animal's species in Kuku Zoo

Enough spp.	student	others	total	Percent %	Asymp. Sig. (2-sided)**
Yes	4	15	19	63.3%	
No	11	0	11	36.7%	
Total	15	15	30	100%	

(69.7%) of visitors prefer to visit animals Zoo while (30%) not prefer visiting animals. Significance as the value is (P=0.020).Table (4-19).

Table (4-19) Visitor preference to visit Kuku Zoo

Visitor choice	student	family	total	Percent%	Asymp. Sig. (2-sided)*
Yes	13	7	20	69.7%	
No	2	8	10	30.3%	
total	15	15	30	100%	

(16.7%) said it is important to increase the number of wild animal.

(53.3%7) said introduction of more new wild species and (30%) said the area of the Zoo should be increased. High significance as the value is (P=0.001). Table (4-20).

Table (4-20) Increase of Zoo area and introduction of new and more wild animal species and numbers

Increase	Student	family	total	Percent %	Asymp. Sig. (2-sided)
Area	7	2	9	30%	**
Animal number	5	0	5	16.7%	
Animal species	3	13	16	53.3%	
Total	15	15	30	100%	

(86.7%) said yes while, (13.3%) said no label. Significance as the value is (P=0.032). Table (4-21).

Table (4-21) Animal information's in kuku zoo

Animal label and information	student	others	total	Percent%	Asymp. Sig. (2-sided)
Yes	15	11	26	86.7%	*
No	0	4	4	13.3%	
total	15	15	30	100%	

(59.7%) of the visitors faced obstacles and no extension while (40.3%) said no problems.

No significance as the value is (P=0.713). Table (4-22).

Table (4-22) Problems facing visitors in Kuku Zoo

problems	Student	family	total	Percent%	Asymp. Sig. (2-sided)
Yes	8	9	17	59.7%	Sig. (2-sided)
No	7	6	13	40.3%	
total	15	15	30	100%	NS

High significance as the value is (P=0.000).(80%) of the workers have previous has experience while (20%)said no. Table (4-23).

Table (4-23) Previous experience for worker in dealing with wildlife species in Kuku Zoo

Answers	Workers		Total	Percent%	Asymp. Sig. (2-sided) **
	Training course	No training			
Yes	18	0	18	60%	
No	6	6	12	40%	
Total	24	6	30	100%	

No statistic Table (4-24).

Table (4-24) Administrative technical working problems facing workers in kuku zoo

Answers	No. of worker					total	Percent %	Asymp. Sig. (2-sided) No statistic computed because it constant
	Administrative		total	Technical				
Yes	0	0	0	0	0	0	0%	
No	24	6	30	24	6	30	100%	
Total	24	6	30	24	6	30	100%	

Significance as the value is (P=0.003)

(93.3%) working to 12 hours. (6.7%) working 24 hours. Table (4-25).

Table (4-25) working hours for worker in Kuku Zoo

Answers	No. Worker of		Total	Percent%	Asymp. Sig. (2-sided) *
	Yes	No			
12h	24	4	28	93.3%	
24h	2	0	2	6.7%	
Total	24	6	30	100%	

(80%) said take medium, (20%) said take low. High significance as the value is (P=0.000). Table (4-26).

Table (4-26) monthly salary for worker in Kuku Zoo

Salary	No. of workers		Total	Percent%	Asymp. Sig. (2- sided **
	Yes	No			
Enough					
medium	24	0	24	80%	
low	6	0	6	20%	
total	30	0	30	100%	

-No statistic for table (4-28)

Table (4-27) Payment of workers Infection allowance in Kuku Zoo

Infection allowance	No. of workers	total	Percent%	Asymp. Sig. (2- sided No statistic
Yes	0	0	0%	
No	30	30	100%	
Total	30	30	100%	

(96.7%) said no while (3.3%) said yes. There is significance as the value is (P=0.042)

Table (4-28) Workers contagious infection in Kuku Zoo

	No. of workers	total	Percent%	Asymp. Sig. (2-sided)
Infection	1	1	3.3%	0.042
No Infection	29	29	96.7%	
Total	30	30	100%	

Chapter Five

5.1 Discussion

Usually zoo gardens have functions which are primarily concerned with visitor's interest satisfaction and animal welfare. These two tasks are the responsibilities of any zoo.

Zoos are also intended to ensure that they have financial income which comes from entering fees of the visitors to allow them to keep operation.

As far as Kuku Zoo administration there is a director and a supporting staff. Training of the staff is not satisfactory (The design of cage safety for animals (80%) satisfactory, with significance 66.7%) with no significant difference in value (0.423), table(4-1). However, I have noticed that there is no periodic or frequent veterinary care for the wild animals.

The design of cages for some animals (ostrich –gazelle) is not suitable because gazelle injured itself by the iron wall, and the ostrich eat the thrown stuff by the visitors. T showed significant difference in value (0.028), table (4-8).

The enclosures are designed for ease to cleaning and not the animal's needs (**Benbow, 2008; Turley1998**).

The time visit is suitable and satisfactory in Kuku Zoo (69.7%), with significant difference in value (0.866), table (4-11). Some visitors may stay late in the zoo. Prolonging lighting time is negatively changing the behavior of wild animal. The initial purpose of establishing zoos with an emphasis on allowing the public to see the animals and with little or no concern given to animal rights or animal welfare (**Turley, 1998**).

The administrative follow up in Kuku Zoo is not satisfactory (86.7%), with no significance difference in value ($p=0.644$), there is no development in the zoo garden infrastructures restaurants other service facilities; mosque and bathroom. The distribution of wild animal cages is not satisfactory. The proper way of provision of food to carnivorous, omnivorous and herbivorous groups is to have a section for each group.

The extension for visitors is satisfactory (70%) with significant difference in value (0.000), table(4-7). There is an effort to prepare relevant training courses for the zoo laborers. Furthermore wild animals are successful transfer of conservation messages to visitors is more likely to occur than where only passive educational experiences are offered via animal viewing, and notice boards. Active learning opportunities may be offered by, amongst other things, the provision of animal demonstration, volunteer or animal handler talks-touch tables, (**Swangan, 2000 ; WAZA, 2005 ; Lindeman.,**

Matthies and Kamer, 2007 ;Smith and Broad, 2008 ; Ballantyne,et al 2007).

Recreation actives had no effect in animal psychology and are not satisfactory,(69.7%), with no significance difference in value (0.787), except the plastic and rubber toys which are usually consumed by the animals, table(4-12).

The wild animal species in Kuku Zoo display a good diversity (63.3%), with significant difference in value (0.000), table(4-19).

The purpose of keeping wild animals in captivity should be practiced to show as complete as possible a biological study of every species **(Durrell, 1976).**

Kuku Zoo lacks scientific method as far as to animal record systems is concerned. Reality in many zoos around the world fell far short of this ideal, in particular zoo lack of scientific rigour method where animals record systems were either not kept at all or only in a poor, unscientific manner, **(Durrell, 1976 ;WAZA,2005).**

The regulations are not satisfactory (83.3%)with no significant difference as the value is (0.235),table(4-14). However, in Kuku Zoo visitors continue practicing negative behavior (feed animal-enter between wall

defense). A common call from the animal right lobby is better off when the Zoo are abolished (**Jamieson, 1985**).

According to Kuku Zoo: this is applicable due to the massive public misbehavior to animals.

People do not preferring visiting the Zoo (93%) with no significant difference as the value is ($P=0.143$), table (4-20).

A study of zoos in Malaysia showed that people visit zoo for recreation (**Sickler and Fraser, 2009**). Indeed they have a good time during their visit to a zoo. This is necessary when visiting Zoo, especially outside formal school trips that occur during leisure time and utilizes discretion income. Both this time and money keenly sought by vast array of competing attraction of which zoos are only one (**Davey, 2007**). The pressure to provide entertainment attraction in addition to the chance to see wild animals is a growing tendency (**Dibb, 1995**).

Some zoo curators see baby elephant walks, for example as necessary evil or defend such amusements because of their role in educating people, especially children about animals. However, it may be claimed that as leisure sites, at least in the eyes of the general public zoos are inappropriate places for learning as visitors do not come prepared to be

educated but instead have an expectation to be entertained (**Tomas and Scott, 2003 ;Reade and Waran, 1996**).

In Kuku Zoo visitors usually come for education,(50%),and for recreational purpose (50%),with significant difference in value (0.000),table(4-12). The Zoo is important source of assistance in educational and tourist process of wild animals it is the largest among Zoo in Sudan and the most diverse in wildlife species.

Zoo need to promote and a clear review of their unique role and the contribution they can make as part of a global conservation coalition (**WAZA, 2005**). In this respect, Kuku Zoo is playing a good role as entertainment and conservation institute. Usually the animals have inadequate food (70%), with no significant difference as the value is (P=0.263), table (4-10), animals are daily fed except the carnivorous are fed two times a week. Wild animals in Kuku Zoo receive the same regime as far as water and food are concerned. And nutrition formulation is unsatisfactory (76.7%), with no significance difference as the value is (P=0.102),table(4-6). The ability of learning in the Zoo is heightened if animals are housed and fed in natural realistic ammaner as possible (**Ballenyne, et al 2007 ;Smith and Broad, 2008 ;Fernandez,et al 2009**).

In Kuku Zoo the animal cages need to be ted to provide conditions close to natural.

5.2 Conclusion and Recommendations

The study revealed that Kuku Zoo has played a good administrative performance in some aspects and poor performance in others. Animals welfare is more or less satisfactory with deficiencies in animal housing and feeding.

5.3 Recommendations

1-Periodic research studies should be conducted on the status of Kuku Zoo with regard to administrative performance: animal welfare and visitors interest satisfaction.

2-The wild animal cages should be arranged in rows (species wise) on the basis of feeding or species.

3-Prohibit sale of plastic or rubber toys inside the Zoo.

4-Improvement of employees' salaries.

5-Reduction of weekly working hours and adopt the shifting regime for work during day and night.

6-Public enlightenment through the mass-media.

7-Provision of guidance to the visitors of the Zoo on how to deal with the wild animal and the regulation when patrolling inside the Zoo.

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APPINDICES

Appendix (1)

جامعة السودان للعلوم والتكنولوجيا

كلية الدراسات العليا

استبانة العاملين بالادارة والاختصاصيين

الاخ الكريم بين يدك مجموعة من الاسئلة تدور حول نشاطات ودور الادارة في ادارة حديقة حيوان كوكو نرجو شاكرين التكرم بالاجابة عليها بدقة ودون تحيز مع العلم ان هذه المعلومات سوف تستخدم لغرض البحث فقط0

..... الاسم

..... الوظيفة

..... المستوي التعليمي

الخبرات السابقة للعمل بالمجال

.....

.....

.....

1:هل تتلقي دورات تدريبية في المجال

نعم

لا

2:هل هناك مراقبة ادارية

نعم

لا

3: هل هناك اشراف طبي علي الحيوانات بصورة دورية

نعم

لا

4: هل يوجد تحصين للحيوانات او لقاحات معينة

نعم

لا

5: هل يوجد بالحديقة مساحة مخصصة للحيوانات المريضة

نعم

لا

6: هل تتم تغذية الحيوانات علي اسس علمية

نعم

لا

7: هل هناك جهة معينة مسئولة عن الارشاد وتوجيه الزوار بالحديقة

نعم

لا

8: هل يتم اسكان الحيوانات بصورة جيدة بحيث تضمن سلامة الحيوان

وسلامة الزوار

نعم

لا

9: هل مساكن الحيوانات مناسبة لكل نوع

الثدييات الكبيرة:

اسود

نعم

لا

غزلان

نعم

لا

ضباع

نعم

لا

القرود

نعم

لا

الثدييات الصغيرة:

الشيهم

نعم

لا

ارانب

نعم

لا

زواحف :

تماسيح

نعم

لا

الاصلة

نعم

لا

السلحفا

نعم

لا

الطيور:

الغرنوق

نعم

لا

الصقور

نعم

لا

الطاؤوس

نعم

لا

البط

نعم

لا

الرهو

نعم

لا

10: هل يؤثر الوضع الاجتماعي علي سلوكيات الحيوان

(منفرد0زوجي0جماعة)

نعم

لا

11: هل كمية الغذاء التي تقدم للحيوانات كافية

نعم

لا

12: هل يوجد زمن محدد للسماح بدخول الجمهور مع مراعاة راحة الحيوان

نعم

لا

13: هل يراعي للحيوان وحساسيته تجاه الاضاءة لذلك يتم اطفاء الاضاءة

بالوقت الذي يناسب راحة الحيوان

نعم

لا

14: هل الملحقات السياحية الاخرى (العاب اطفال ،مراجيح وغيرها)تأثير

علي الحيوان ايجابي

نعم

لا

15: هل لوجود الجمهور تأثير علي سلوك الحيوان

نعم

لا

16: هل هناك احتياطات وتدابير متخذة لسلامة الحيوانات

نعم

لا

17: هل هناك احتياطات وتدابير متخذة لسلامة الجمهور

نعم

لا

18: هل الغرض من الزيارة دوما مشاهدة الحيوانات او اغراض اخري

نعم

لا

19: هل يتم ترتيب اسكان الحيوانات علي حسب النوع

نعم

لا

20: هل طريقة الاسكان الحالي للحيوانات تأثير علي سلوكيات بعض

الحيوانات

نعم	<input type="checkbox"/>
لا	<input type="checkbox"/>

21: هل توجد بالحديقة وحدة علاجية للقيام بالاسعافات الالوية للحيوانات

نعم	<input type="checkbox"/>
لا	<input type="checkbox"/>

22: هل هنالك اية اصابات حدثت بالحديقة نتيجة لمهاجمته من قبل احدي

الحيوانات

نعم	<input type="checkbox"/>
لا	<input type="checkbox"/>

23: اذا كان الاجابة بنعم هل تم تقديم اسعافات اولية بالحديقة للشخص المصاب

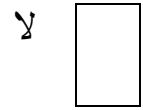
قبل وصوله الي المشفي

نعم	<input type="checkbox"/>
لا	<input type="checkbox"/>

24: هل تقوم ادارة الحديقة بفرض قوانين للزوار لاتباعها داخل الحديقة تاكيدا

لسلامة الزوار والحيوانات

نعم	<input type="checkbox"/>
-----	--------------------------



Appendix (2)

استبيانة العمال

.....الاسم

.....الوظيفة

.....المستتوي التعليمي

❖ هل تتلقي دورات تدريبية

نعم

لا

❖ هل هناك خبرات سابقة للتعامل مع الحيوان البري

نعم

لا

❖ هل تواجه مشاكل في العمل

■ ادارية

○ نعم

○ لا

■ فنية

○ نعم

○ لا

❖ هل ساعات الدوام

○ 12ساعة

○ 24 ساعة

❖ هل تتقاضى اجر

○ كثير

○ متوسط

○ قليل

❖ هل حدثت عدوي مرضية لاحد العمال

○ نعم

○ لا

Appendix (3)

استبيانة الزوار

الاسم.....

الوظيفة.....

المستتوي التعليمي

1: هل قمت سابقا بزيارة الحديقة

نعم

لا

2: هل تتكرر الزيارة

نعم

لا

3: هل سبب الزيارة علمي او بحثي

نعم

لا

4: هل سبب الزيارة ترفيهي

- نعم
- لا

5: هل تري ان الحديقة تساهم في تغيير مزاج الشخص للافضل عند الزيارة

- نعم
- لا

6: هل تساهم الحديقة في تقديم معلومات عن الحيوان البري الموجود بالحديقة

- نعم
- لا

7: هل يتم ارشادك وتوجيهك بصورة صحيحة حتي تحقق اهدافك او هدفك من زيارة

الحديقة

- نعم
- لا

8: هل توجد لوحات تعريفية عن الحيوان علي اقفاص الحيوانات تساعد في تقديم

معلومة

نعم

لا

9: هل واجهت أي صعوبات أو مشاكل حالت دون حصولك على المعلومة العلمية

نعم

لا

Appendix (4)

Wild animals feeding Kuku Zoo

Species	Feed quantity	Feed quality	Frequency	Water provision Frequency
carnivorous	Good	Good	2time in a weak	2time in a weak
herbivorous	v.good	v.good	Daily	Daily
Omnivorous	v.good	v.good	Daily	Daily
Birds general	good	Good	Daily	Daily

Appendix (5)

Wild animals in Kuku Zoo

English name	Scientific name	Number	Local name
<i>Porcupines</i>	<u><i>Hystrixaleata</i></u>	<u>9</u>	اب شوك
<i>Turtles</i>	<u><i>Centrochelyssucata</i></u>	<u>8</u>	السلحفا البرية
<i>Nile crocodile</i>	<u><i>Corcodilus niloticus</i></u>	<u>3</u>	التمساح النيلبي
<i>Pythons</i>	<u><i>Python sebea</i></u>	<u>3</u>	الاصلة
<i>Red Necked Ostrich</i>	<u><i>Struthiocamelus</i></u>	<u>1</u>	النعام احمر الرقبة
<i>Peacock</i>	<u><i>Pavocristatus</i></u>	<u>7</u>	الطاؤوس
<i>Marbou stork</i>	<u><i>Leptoptilscrumeniferus</i></u>	<u>1</u>	ابو السعن
<i>Toulouse goose</i>	<u><i>Anseranser</i></u>	<u>10</u>	الوز
<i>Muscovy ducks</i>	<u><i>Cairinamoschata</i></u>	<u>10</u>	البط المسكوفي
<i>Tufted Guinea fowl</i>	<u><i>Numidamcleagris</i></u>	<u>2</u>	دجاج الوادي
<i>Dmicile crane</i>	<u><i>Grusvirgo</i></u>	<u>5</u>	الرهو
<i>Crowned</i>	<u><i>Balearicapovonina</i></u>	<u>2</u>	الغرنوق
<i>Crane Bateleur</i>	<u><i>Terathopiusecaudatus</i></u>	<u>2</u>	العقاب
<i>Lion</i>	<u><i>Pantheraleo</i></u>	<u>11</u>	الاسد
<i>English_name</i>	<i>Scientific name</i>	<i>Number</i>	<i>Local name</i>

<i>Black backed Jackal</i>	<u><i>Canismesomellas</i></u>	<u>4</u>	الثعلب
<i>Genets</i>	<u><i>Viverragenetta</i></u>	<u>1</u>	قط الجانيت
<i>White tailed Mongoose</i>	<u><i>Mungos spp</i></u>	<u>1</u>	النمس ابيض الزيل
<i>Baboons</i>	<u><i>Papio Anubis</i></u>	<u>8</u>	قرد البابون
<i>Patas_Monkeys</i>	<u><i>Erythrocebus patas</i></u>	<u>6</u>	النسناس الاحمر
<i>Grivet Monkeys</i>	<u><i>Chlorocebus aethiops</i></u>	<u>18</u>	النسناس الاخضر
<i>Drcas gazelle</i>	<u><i>Gazella dorcas</i></u>	<u>4</u>	غزال العادة
<i>Red-fronted gazelle</i>	<u><i>Eudorcas rufifrons</i></u>	<u>1</u>	غزال ام سير
<i>Striped hyaena</i>	<u><i>Hyaena hyaena</i></u>	<u>2</u>	الضبع المخطط