

Visitors' Opinion Regarding Animal Welfare at Zoo National d'Abidjan

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Abstract: This study aimed to assess the opinion of visitors regarding animal welfare at Zoo National d'Abidjan. To reach this goal, a survey was conducted by interview with 220 visitors randomly selected among those who realized a full tour of the Zoo. Respondents were predominantly (59.1%) men and 59.1% were aged between 21 and 40 years. A large part (48.2%) had a high school level. Nearly 31% (30.9%) have animals and 64.6% love animals. More than half (60%) believe that the animals are in a situation of well being and 24.1% believe that elephant, lions and monkeys are lean. On the hygiene of habitat, 49.5% of visitors think that the pen of chimpanzees is the least clean. More three quarters (79.1%) believe that the animals are well fed, 89.1% that they are safe and 29.9% believe that animals are sad. Finally, visitors have various opinions but many believe that the welfare of lions, elephant, chimpanzees and patas monkeys must be improved.

Key words: Animal welfare, interviews opinion, visitors, Zoo National d'Abidjan.

1. Introduction

Nowadays we assist the biodiversity crisis and the situation is more important in Africa [1]. This crisis is especially important when we consider wild animal species. According to International Union for Nature Conservation [2] about 38% of wild animals in the world are threatened and the situation is more worrying for emblematic species like lions (*Panthera leo*) [3], elephants (*Loxodonta africana*) [4], chimpanzees (*Pan troglodytes*) [5]. Furthermore, between 1970 and 2005, we noticed on average 59% decline in large mammal population abundance [6]. Many factors explain this loss of biodiversity and the main importances are fragmentation and loss of habitat, poaching, etc. [7]. These factors affect African biodiversity and its

management strategies stay less effective in protected areas. In this situation, zoos could be an essential alternative for wild species conservation. Defined as a parklike area in which live animals, especially wild animals, are kept in cages or large enclosures for public exhibition, zoos have main objectives that are divertissement, education, research and conservation. But some zoos because of its adjusting, animal behavior in captivity or the management of species could fail in their conservation role. In fact, captivity is known to affect animal welfare [8] and some species adapt poorly to captivity and it affects its welfare and reduces its lifespan [8-10]. Zoo National d'Abidjan is a public zoo located in Abidjan town in Ivory Coast. It harbors 294 individuals of 30 species (Vamara, personal communication, 2016) in which 30.5% are threatened (Oyetola, personal communication, 2015). But many of zoo visitors complain about animal welfare according to a satisfactory survey of zoo visit

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we made in 2015. To better understand their opinion, we made this study to assess their opinion regarding animal welfare in general in this zoo.

2. Material and Methods

2.1 Study Area

This study was carried out in Zoo National d'Abidjan (national zoo of Côte d'Ivoire) located at latitude 5°22'52.12" North and longitude 4°0'17.08" West in the Cocody township. The zoo has been found in 1955 by Mr. Ivan Cholley as a menagerie. It covers 18 ha. The zoo harbors 294 individuals of 30 animal species. Among these species, we have 15 chimpanzees, one elephant (*Loxodonta cyclotis*), one dwarf hippopotamus (*Hippopotamus minor*), three Zebra (*Equus quagga burchellii*), three lions, four dwarf crocodiles (*Osteolaemus tetraspis*), three African rock pythons (*Python sebae*) and six species of birds with two common ostriches (*Struthio camelus*). About facilities, we have three open areas, two aquariums, five pools, 36 cages, 12 enclosures, three pits and four aviaries (Oyetola, personal communication, 2015). Fruits, vegetables, leaves, yams, plants, herbs, meat and offal, fish, eggs and seeds are the essential feed of animal in the zoo.

2.2 Visitors Sampling and Methodology

Our study population was persons who visited the zoo between 9:00 am and 5:00 pm during August and September 2015. Among them, we randomly selected 220 each at the end of their visit. To know their opinion on animal welfare, we interviewed them using a questionnaire. The questionnaire had 30 questions, organized in 3 sections: visitor identification,

knowledge on animal welfare and opinion on zoo animal welfare. In the first section questions were about age, sex, occupation, study level. For the second section, the main questions were about animal owning, degree of affection for animals and knowledge on animal welfare. For the last section, we asked visitors' opinion about animal body condition, the size of animals' habitat, animal and habitat hygiene, animal feeding, its safety and emotional condition. At the end of the interviews we asked them to give some recommendation to improve zoo animal welfare.

2.3 Data Analysis

After the interviews, the data were saved using Sphinx 5.0 software and exported in Excel. Excel tables were used to calculate the frequency of each opinion and also to build graphics and tables.

3. Results

3.1 Visitors' Socio-Demographic Data

Our study was focused on 220 visitors with 59.1% men. As for the age of the respondents, 59.1% were between 21 and 40 years old, 30% were under 20 years old, 10.5% were between 41 and 60 years old and 0.5% were over 60 years old. As for the academic level, respectively 48.2%, 41.8% and 7.3% had a high school, college and elementary school level and 2.7% had no formal education level. The majority of visitors were pupils (Table 1).

3.2 Relationship with Animals and Knowledge of Animal Welfare

Near 31% of the respondents had a domestic animal and cats were the most owned animals (Table 2).

Table 1 Occupation of visitors interviewed during the study.

Occupation	Occurrence	Frequency (%)
Pupils	78	35.4
Students	57	25.9
Private workers	48	21.8
Civil servants	31	14.1
Housewife	6	2.8

More than the half (64.6%) like animals a lot, 30% like animals moderately, 1.8% tolerate animals and only 3.6% hate animals. About the half of respondents (52.7%) have already heard of animal welfare and 90.5% know at least one of the fundamental animal welfare criterions.

3.3 Visitors' Opinion on Animal Welfare at the National Zoo of Abidjan

In a general way, 60% of respondents thought that zoo animals were healthy and 75.9% considered that the animals seem fit but 24.1% believed that some animals were lean and lions were the most indexed (Table 3). Furthermore, 69.1% were satisfied about the size of animals' habitats but 30.9% found that

habitats of crocodiles, chimpanzees, lions, buffaloes, patas monkey, bushbucks, leopards and elephant were smalls. Regarding habitat hygiene, 60% thought that it was not acceptable and they considered that chimpanzees enclosure was the least hygienic (Fig. 1). Regarding animal feedings, 79.1% of respondents found that animals were well-fed but 15% found that elephant, patas monkeys, chimpanzees, leopards and lions were malnourished. About 6% (5.9%) of respondents did not give their opinions on animal feedings. Regarding animal safety, 89.1% of visitors found animals safe, 7.3% thought that some were not safe, and 3.6% did not express an opinion. Among those who felt that some animals were not safe, 76.9% responded that all were not safe, 7.7% found that only

Table 2 Frequency of animals held by respondents.

Animal held	Occurrence	Frequency (%)
Cat	42	54.5
Dog	23	29.9
Turtle	3	3.9
Deer	2	2.6
Rabbit	2	2.6
Cattle	1	1.3
Duck	1	1.3
Mongoose	1	1.3
Dove	1	1.3
Monkey	1	1.3

Table 3 Species considered as lean by the visitors.

Species	Occurrence	Frequency (%)
Lion (<i>Panthera leo</i>)	16	22.9
Elephant (<i>Loxodonta cyclotis</i>)	14	20.0
Patas monkey (<i>Erythrocebus patas</i>)	12	17.1
Chimpanzee (<i>Pan troglodytes</i>)	6	8.6
African civet (<i>Civettictis civetta</i>)	4	5.7
Dwarf crocodile (<i>Osteolaemus tetraspis</i>)	4	5.7
Pygmy hippopotamus (<i>Hexaprotodon liberiensis</i>)	3	4.3
Bushbuck (<i>Tragelaphus scriptus</i>)	2	2.9
Spotted hyena (<i>Crocuta crocuta</i>)	3	4.3
Warthog (<i>Phacochoerus africanus</i>)	3	4.3
Common ostrich (<i>Struthio camelus</i>)	1	1.4
Buffalo (<i>Syncerus caffer nanus</i>)	1	1.4
Leopard (<i>Panthera pardus</i>)	1	1.4

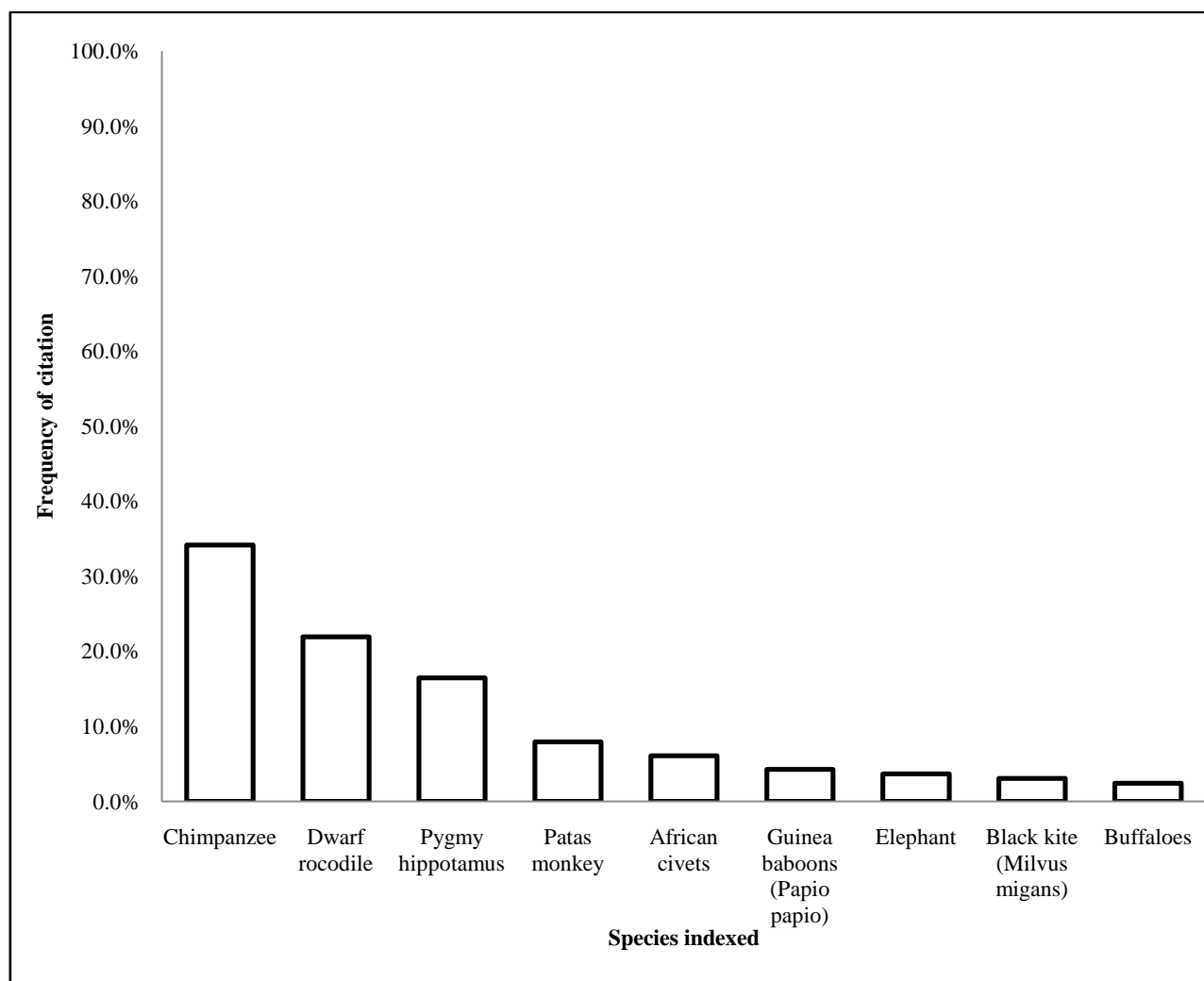


Fig. 1 Species whose habitats are considered less hygienic.

Table 4 Number of occurrences of visitors' opinion about each emotional state of zoo animal.

Emotional states	Sad	Aggressive	Scared	Happy
Species				
Patas monkeys	19	4	1	14
Chimpanzees	15	2	0	6
Elephant	4	0	0	11
Lions	8	1	0	2
Golden jackal (<i>Canis aureus</i>)	3	0	0	0
Pygmy hippotamus	1	0	0	0
Buffaloes	2	1	0	0
All animals	12	1	1	114

elephant, lions and patas were not safe. Regarding the emotional condition of the animals, 29.9% of visitors thought the animals seem sad, 3.6% that they seem aggressive, 0.9% that they seem scared, 67.3% felt they looked happy. Details of the emotional state of

the animals are summarized in Table 4. Visitors made many suggestions to improve animal welfare but increasing of zoo's animals was the most cited (Table 5) and 52.3 % of zoo visitors were ready to pay more for entrance if animal welfare is improved.

Table 5 Visitors' suggestions to improve animal welfare.

Suggestions	Occurrence	Frequency (%)
Increase zoo animals number	99	45
Improve habitat hygiene	51	23.2
Put a companion with solitary animals	21	9.5
Redevelop habitat	26	11.8
Extend the zoo	12	5.5
Well feed animals	16	7.3
No suggestions	63	28.6

4. Discussion

4.1 Visitors' Socio-Demographic Data

In our study, we found that women would visit almost as much the National Zoo of Abidjan as men. This seems to be slightly different in the United States where 54.6% of visitors were women [11] but very different in Malaysia where 88.3% of visitors were men [12]. The high proportion of men in our study may be related to their higher purchasing power. This could also be explained by the fact that in our societies, men at a certain age have more freedom than women, who are often accompanied by men when they go out. This assertion is supported by the fact that the majority of our visitors are between 21 and 40 years of age. This age group would be most affected by this phenomenon. In addition, the Zoo National d'Abidjan is visited mainly by young people under 40 years old (89.1% of the respondents). This situation is close to the observations made in Malaysia [12] and in Croatia [13] where more than 70% of visitors are less than 40 years of age. Moreover, more than half of the visitors (61.4%) were pupils and students. This can be explained by the fact that the study was conducted during the Summer (August-September), which correlates to the school holidays during which this category of visitors takes part in important distractive activities and most of adults claimed to have accompanied with their children. This observation was also made by various authors, which means that the children play a major role in encouraging visitors to go to the zoo [13-15].

4.2 Visitors' Opinions on Zoo Animals Welfare

In this study, more than half of respondents said they have heard about animal welfare. This is explained by the fact that animal welfare is often brought up in the Medias through various national and international press [16]. Among the animals perceived as lean, the most designated are lions, elephant and the patas monkey. Visitors feel that if the food intake is insufficient this could explain the bad state of the animals. Moreover, an elephant eats approximately 1 to 1.5% of its weight [17] while the ration that is distributed to them is below this norm. In addition, elephants in the wild spend 60 to 80% of their time feeding [18] whereas in the National Zoo of Abidjan, the feeding time of the elephants in the day is too short and it could have an effect on their well-being and hence on their physique. Moreover, its age could also reflect on its physique because the elephant is more than 24 years old. In the case of the monkeys, lean animals are noted in chimpanzees where there are aggressive animals that prevent the weaker ones from accessing to food. In the case of lions, lean animals are those who realize stereotypes. These stereotypes, often associated with other signs, are recognized as the symptoms of animals which have difficulties adapting to life in captivity [19] and could be explained by the restriction of their natural habitat [20] as well as the proximity of the zebras and antelopes, the natural prey of lions. Regarding the size of the habitats, the majority of visitors found their satisfaction unlike some who consider that the habitats of the crocodiles, lions, buffalo, patas monkey

and leopards are too small. These habitats have not been sufficiently enlarged since the establishment of the zoo, while new individuals have been acquired. More than half of the visitors (49.5%) feel that the hygiene of the habitats of some animals is unsatisfactory. The cleaning frequencies of these habitats are not adequate to keep these spaces clean and the animals affected are dangerous animals for which the cleaning of pens is possible but not carried out by the zoo workers. This situation was also observed in Greece, where 53.8% of visitors felt that the animal habitat hygiene was unsatisfactory and safety of animal was weak [21]. Some respondents (15%) believe that the elephant, lions, panther and monkeys are malnourished; this seems to be related to the fact that among these species some individuals are lean.

5. Conclusion

Animal welfare is today a major concern of any establishment that holds domestic or wild animals. Indeed, the sensitivity of people to the treatment of animals is increasingly strong in our societies. Our study aimed to know the opinion of visitors of the Zoo National d'Abidjan on the well-being of wild animals held there. It was found that, in general, visitors believe that animals are in a state of well-being even if some people consider that the welfare of certain animals such as the lions, elephant and monkeys should be improved. Many visitors felt that they could accept an increase in entrance fees to the zoo if the welfare of these animals is improved.

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References

[1] Mooney, H. A., 2010. "The Ecosystem-Service Chain

- and the Biological Diversity Crisis." *Philos. Trans. R. Soc. Lond., B, Biol. Sci.* 365 (1537): 31-9.
- [2] Union Internationale POUR LA CONSERVATION De La Nature. 2008. LA LISTE ROUGE DE L'UICN DES ESPÈCES MENACÉES: Un Outil Fondamental Pour La Conservation. UICN: Gland, 2p.
- [3] Henschel, P., Coad, L., Burton, C., Chataigner, B., Dunn, A., MacDonald, D., Saidu, Y., and Hunter, L. T. B. 2014. "The lion in West Africa Is Critically Endangered." *PLoS One* 9 (1): e83500.
- [4] IUCN/SSC African Elephant Specialist Group. 2008. The Status of Africa's Elephants: Emerging Challenges and Opportunities for Their Conservation and Management. IUCN/SSC African Elephant Specialist Group, Mombasa, Kenya: 25p.
- [5] Kormos, R., Boesch, C., Bakarr, M. I., and Butynski, T. 2003. *West African Chimpanzees: Status Survey and Conservation Action Plan*. IUCN/SSC Primate Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK. ix + 219 pp.
- [6] Craigie, I. D., Baillie, J. E., Balmford, A., Carbone, C., Collen, B., Green, R. E., and Hutton, J. M. 2010. "Large Mammal Population Declines in Africa's Protected Areas." *Biol. Conserv.* 143 (9): 2221-8.
- [7] Singh, J. S. 2002. "The Biodiversity Crisis: A Multifaceted Review." *Curr. Sci.* 82 (6): 638-47.
- [8] Mason, G. J. 2010. "Species Differences in Responses to Captivity: Stress, Welfare and the Comparative Method." *Trends Ecol. Evol.* 25: 713-21.
- [9] Clauss, M., Franz-Odenaal, T. A., Brasch, J., Castell, J. C., and Kaiser, T. 2007. "Tooth Wear in Captive Giraffes (*Giraffa camelopardalis*): Mesowear Analysis Classifies Free-Ranging Specimens as Browsers But Captive Ones as Grazers." *J. Zoo Wildl. Med.* 38 (3): 433-45.
- [10] Clubb, R., Rowcliffe, M., Lee, P., Mar, K. U., Moss, C., and Mason, G. J. 2008. Compromised Survivorship in Zoo Elephants. *Science* 322 (5908): 1649.
- [11] Lukas, K. E., and Ross, S. R. 2005. "Zoo Visitor Knowledge and Attitudes toward Gorillas and Chimpanzees." *J. Environ. Educ.* 36 (4): 33-48.
- [12] Hassan, K. H. 2015. "Measuring Visitors' Observation and Perception on Animal Welfare in National Zoo. Mediterr." *J. Soc. Sci.* 6 (6): 33-9.
- [13] Knežević, M., Žučko, I., and Ljuština, M., 2016. "Who Is Visiting the Zagreb Zoo: Visitors' Characteristics and Motivation?" *Sociologija i prostor* 54: 169-84.
- [14] Puan, C. L., and Zakaria, M. 2007. "Perception of Visitors towards the Role of Zoos: A Malaysian Perspective." *Int. Zoo Yearb* 41 (1): 226-32.
- [15] Jordan, Y., and Du Plessis, G. M. 2014. "Motivators to Visit the National Zoological Gardens of South Africa." *Afr. J. Hosp. Tour Leis.* 3 (1): 1-5.

- [16] Lamine, C. 2006. Mettre en parole les relations entre hommes et animaux d'élevage. Introduction Circulation des récits et mise en débat, ethnographiques.org, Numéro 9 [en ligne]. Available at <http://www.ethnographiques.org/2006/Lamine.html>. Cited the 18th April 2017.
- [17] Ullrey, D. E., Crissey, S. D., and Hintz, H. F. 1997. Elephants: Nutrition and Dietary Husbandry. Nutrition Advisory Group, 20.
- [18] Veasey, J. 2006. "Concepts in the Care and Welfare of Captive Elephants." *Int. Zoo Yearb.* 40 (1): 63-79.
- [19] Clubb, R., and Vickery, S. 2006. "Locomotory Stereotypes in Carnivores: Does Pacing Stem from Hunting, Ranging or Frustrated Escape?" In *Stereotypic Animal Behavior: Fundamentals and Applications to Welfare*. Edited by Mason, G., and Rushen, J. pp.58-85 2nd edition. Wallingford: CAB International.
- [20] Clubb, R., and Mason, G. 2003. "Captivity Effects on Wide-Ranging Carnivores." *Nature* 425: 473-4.
- [21] Karanikola, P., Tampakis, S., Tsantopoulos, G., and Digbasani, C. 2014. "The Public Zoo as Recreation and Environmental Education Area: Visitor's Perceptions and Management Implications." *WSEAS Trans. Environ. Dev.* 10: 81-91.