

動物園の構造・機能分析

—野生生物保全社会システム構築に向けて—

横浜国立大学大学院 環境情報学府

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The Structural and Functional
Analysis of Zoological Gardens
— For the Establishment of the
Social System for *in situ* and *ex
situ* Wildlife Conservation —

Kanako TOMISAWA
Graduate School of Environment and
Information Sciences, Yokohama
National University

ABSTRACT

The recent wildlife extinction and various environmental changes lead to the subject of how to foster the wildlife conservation effectively and efficiently. In present, the innovation of zoos has occurred, in the way that zoos need to act for wildlife conservation not only *ex situ* but also *in situ*. However it is possible that not all of the zoos around the world have this formation. Thus, this thesis discusses about the role of zoos for wildlife conservation and builds some models for further wildlife conservation.

Introduction

In recent decades, the extinction of wildlife and various changes of environmental elements have become a critical social problems¹. From the view of further conservation social system, increasing attention has been paid at how to promote wildlife conservation effectively and efficiently. In present, the conservation role of zoos is not only for *ex situ*, but also *in situ*². That means the innovation of zoos occurs along with their changes of conservation role^{3,4}. However, in fact, this conservation is performed in only some zoos, and nowadays there is still a limit for the present conservation social system. This thesis considers the necessity of the conservation activities in present time, and discusses about the role of ecotourism as a tool for conservation. The objects of this study are zoos, which have been engaged with the wildlife conservation activities, and have been taken the initial role for wildlife conservation. This dissertation focuses on the conservation role of zoos.

The purpose of this thesis is the structural and functional analyses of the roles of zoos for the construction of conservation social system for the *in situ* and *ex situ* wildlife conservation, from the views of conservation biology, veterinary medicine and tourism studies.

This thesis is contained with seven chapters and the summary is as follows.

Chapter one describes the overview of this dissertation, such as the research background, purpose, outline and structure. The review of previous research is carried out in chapter two. It is included the necessity of wildlife conservation, conservation biology and the positioning of this thesis in those field. This chapter also analyzes the

relationship between zoo and wildlife conservation.

Chapter three investigates and analyzes the conservation method of zoos as the core institution for *ex situ* wildlife conservation. Because the structure of zoos describes their purpose and role, and the structure itself can be shown by the zoos' exhibition, this study focuses on the zoos' exhibition as the research object.

Chapter four analyzes the zoos' functions by focusing on wildlife conservation and education, and classifies zoos by various types of conservation. Zoos contribute to the society through its education in the framework of conservation.

Chapter five analyzes the change of role of zoos by paying attention to the change of human lifestyle and nature. It also hypothesizes that ecotourism can be one of the tools for wildlife conservation and discusses the effectiveness of zoos for shortening the distance between human and nature as well as for ecotourism with wildlife conservation purpose.

Chapter six builds a new wildlife conservation model for *in situ* and *ex situ*. In the beginning of this chapter, *in situ* wildlife conservation is argued. Then, the chapter indicates the model, in which zoos are related to *in situ* conservation with cooperation with ecotourism which is one of the styles of tourism in nature life. Furthermore, in the condition that the collaboration between zoos and ecotourism is available, a new conservation model in zoos using virtual technology is proposed.

Chapter seven is the conclusion, the dissertation's originality and further research subjects.

The Structural Analysis of Zoos

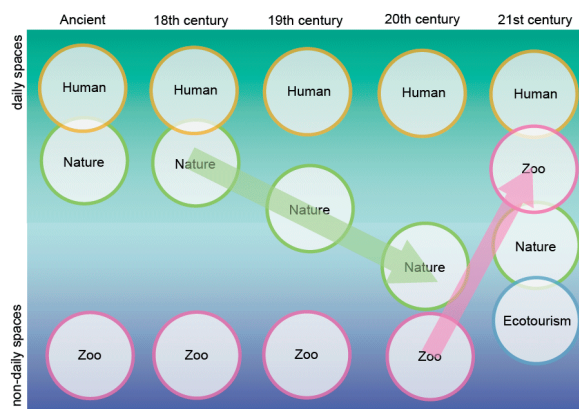
The analysis of exhibition was carried out by field and interview investigation. Exhibition's characteristics are classified into three groups. A zoo chooses the exhibition methods, which are suitable for their size and landform. Exhibition methods are different by the size of zoos. Moreover, the education areas are recently built close to the exhibition areas, that points out the rise of the further role as educational facility of zoos.

The Functional Analysis of Zoos

Zoos can be classified into three groups by environmental education activities and four groups by conservation activities. Using the classification in conservation activities, this thesis proposes a new conservation strategy that all of the zoos can join. It is important for the promotion of *in situ* conservation activities, in which zoos are related to build mutual relationship and trust with their located areas. Besides this, it is necessary that each of zoos performs a self-analysis well, realizes one's role in the wildlife conservation again and carries out education programs that is suitable for the zoo. Then, the effective and efficient conservation system of zoos will be possible.

The Changes of the Role of Zoos Accompanying Change of Ecosystem

Zoos have changed from institutions for exhibit rare animals to institutions that conserve endangered animals, as well as carry out education and research related to wildlife conservation and ecology⁵. In present, zoos are required not only enforcing *ex situ* conservation activities but also enforcing *in situ* conservation activities². However zoos don't have enough function to do *in situ* conservation work alone. Thus, this thesis discusses about the effectiveness of zoos and ecotourism for shortening of the distance between human and nature. Zoos need to correspond to demands of visitors and to do other attempts. Zoos can express their policy to visitors concretely by contributing to exhibiting animals using the information about *in situ* wildlife.



The Collaboration Model of Zoos and Ecotourism

This dissertation suggests a new collaboration model between zoos, which can contribute to *in situ* conservation activities, and ecotourism around wildlife habitats. By changing wildlife tourism to ecotourism, the maintenance of biodiversity and sustainable use of natural resources will become reality. As a result, *in situ* conservation will be promptly developed. Moreover, the collaboration between zoos and ecotourism will lead to the development of education programs and further improvement of *in situ* conservation.

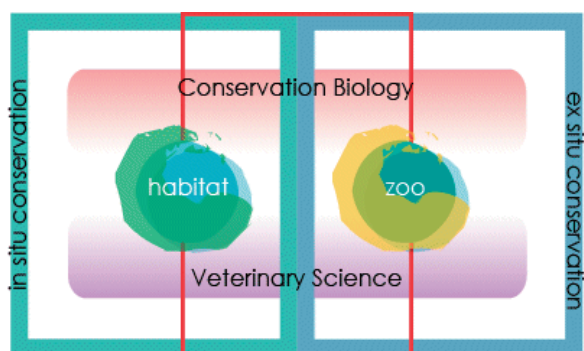
Building of a New Concept of Zoos

The new model of zoos using virtual technology is proposed under the condition in which the collaboration between zoos and ecotourism, which have been shown in the previous chapter, is available. In this model, zoos have new facilities that imitate the *in situ* environment by using the information of habitats such as temperature, humidity, smell, illumination and sound. Zoos have been so far regarded as museums to exhibit the living animals. But it is necessary to discuss about the exhibitions of zoos that do not use living animals in the future.

Conclusion

As a conclusion, the following five points are mentioned. First, the exhibitions of zoos have been classified into three groups. Zoos' exhibition characteristics clarify the structure of the zoos. Second, in their functional classification, zoos can be classified into three groups by environmental education activities and four groups by conservation

activities. Besides this, the dissertation suggests a new conservation strategy, in which all of the zoos can join, even though the zoos have small size that cannot carry out conservation activity by them. Third, zoos are effective for shortening of distance between people and nature. Fourth, a new model of collaboration of zoos and ecotourism has been developed in which zoos can concern with *in situ* conservation. Lastly, a new model of zoos using virtual technology has been proposed under the condition that collaboration of zoos and ecotourism shown above is available.



The Dissertation's Originality

This thesis discusses about wildlife conservation from plural academic views such as conservation biology, veterinary medicine and tourism studies. Thus, the approach is applied for the research topic of wildlife conservation at the first time. This thesis has also indicated a new method of wildlife conservation for zoos and tourism industry by an academic analysis. That means this thesis brought a new view for sustainable wildlife conservation.

Further Research Subjects

This thesis has pointed out the role of zoos for wildlife conservation and social contribution accurately by systematic classification of zoos. However, the classification was based on the limited examples. Thus, it is needed to show the case-by-case directivity. For the cooperation of zoos and ecotourism, the natural resources, the opinion of local communities, conservation policy of local governments and other factors are quite different between areas. It is needed to change the conservation strategy to be suitable to each area.

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