

Survey and Analysis of the Current Situation of "Human-tiger conflict" in the Neighbouring Areas of the Northeast Tiger and Leopard National Park

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Abstract. In recent years, global climate change has had a great impact on the habitat of the Northeast tiger and leopard, and as a flagship species, the country has strengthened its protection by establishing the Northeast Tiger and Leopard National Park. The establishment of the Northeast Tiger and Leopard National Park will certainly provide a better living environment for wildlife such as the Northeast tiger and leopard, but at the same time, it will also bring a certain degree of impact on the production and life of the residents around the Northeast Tiger and Leopard National Park. This paper uses a questionnaire survey, comparative analysis and other methods, according to the concept of sustainable development, combined with field survey data to understand the impact of the construction of the tiger and leopard national park on the surrounding residents, and analyses the possibility of coexistence between humans and tigers. At the same time, it compares various factors to provide a scientific basis for the formulation of relevant policies to promote the coordinated and sustainable development of the Tiger and Leopard National Park and the neighboring residents.

Keywords: Human-tiger conflict, questionnaire survey, comparative analysis, sustainable development.

1. Introduction

The construction of ecological civilisation is a key topic in every era. In recent years, global climate change has had a great impact on the habitat of the Northeast tiger and leopard, and as a flagship species, the country has strengthened its protection means to establish the Northeast Tiger and Leopard National Park. The establishment of the Northeast Tiger and Leopard National Park will certainly provide a better living environment for wildlife such as the Northeast tiger and leopard, but at the same time, it will also bring a certain degree of impact on the production and life of the residents around the Northeast Tiger and Leopard National Park.[1]

It is generally believed that human-animal conflict occurs when the needs and behaviours of wild animals negatively affect human goals or when human goals negatively affect the needs of wild animals. [2, 3] Tian Ye and other scholars investigated the Dongning area of Heilongjiang Dongning National Park of the Northeast Tiger and Leopard National Park through household interviews, questionnaires, etc. They concluded that human-animal conflicts take the form of food production reduction, livestock predation and personal injury and that most of the damages caused by wildlife have failed to be compensated. [4] Cheng Yifan, Xue Yadong Dai Yunchuan and other scholars of the Qilian Mountains National Park, Qinghai area of human-animal conflict research, also through the field visit questionnaire data collection and integration of analysis methods, concluded that the frequency of human-animal conflict and the degree of destruction and the residents of the habits of life, cultural cognition, and the gestation period of the wild animals and the abundance of food in the wild has a direct relationship [5].

Based on the above research, it can be found that the human-animal conflict is an urgent matter to be solved in the construction of a human-nature symbiosis society. There are fewer studies on human-tiger conflict in the Northeast Tiger and Leopard National Park in the Yanbian area. Therefore, the purpose of this paper is to explore through household interviews, questionnaires and other ways to explore the tiger and leopard park near the area residents in the park before the construction and after

the construction of the livelihood situation, based on the will of the residents with the development of the tiger and leopard national park, based on the statistical data and analysis of the people and tigers in a harmonious coexistence of human and tiger conflict to make an evaluation of the problem and make recommendations, to a certain extent, to make up for the blank of this research.

2. Research methodology and study area

2.1. Overview of the study area

The Northeast Tiger and Leopard National Park is located in the southern part of Laoyao Mountain, which is on the border of Jilin and Heilongjiang Provinces in China, with the geographic coordinates of $42^{\circ}31'06''\text{N}\sim 44^{\circ}14'49''\text{N}$, $129^{\circ}5'0''\text{E}\sim 131^{\circ}18'48''\text{E}$, and the total area of the park is 1,492,600 hectares. The area where Tiger and Leopard Park are located in the connecting zone of the border between China, Russia, and North Korea. It is rich in ecological resources and is one of the important distribution areas of the Northeast Tiger and the Northeast Leopard. The park's topography is diverse, including forests, grasslands, mountain ranges, lakes and rivers, and other natural landscapes. The most famous of these are the Changbai Mountains and the Songhua River basin, which are one of the main habitats of the Northeast tiger and the Northeast leopard.

The region is rich in wildlife species, including black bears, deer, bison, wild boars and foxes, and the northeastern tiger and the northeastern leopard. Among them, the number of wild northeastern tigers and leopards is the rarest in the world. The park has a special conservation organisation responsible for animal protection and research. To protect and restore the ecological environment and wildlife populations in the park, the Chinese government has invested a great deal of human, material and financial resources. They have implemented a series of measures, such as monitoring and law enforcement, wildlife rescue and breeding, ecological restoration and eco-tourism, which have positively impacted the conservation of rare species such as the Northeast tiger and leopard.

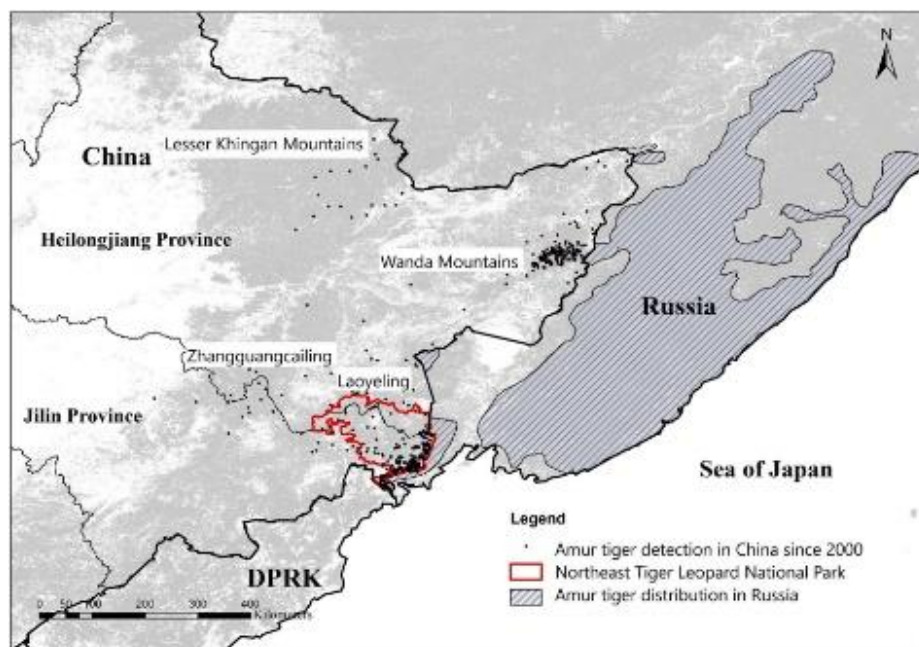


Figure 1. Geographic location of the Northeast Tiger and Leopard National Park [12]

2.2. Research Methods

This paper uses four methods: questionnaire survey, comparative analysis, household interviews, and data analysis. The questionnaire survey method can make the problems in the region clearer and is suitable for research in larger areas. At the same time, by comparing and analysing the policies of other national parks to solve the problem of human-animal conflict to understand the differences

between the study area and other regions, and propose solutions according to local conditions. Data analysis is currently the most commonly used research method, making data processing more convenient and faster.

(1) Questionnaire survey method

This study is based on a field survey with the residents in the neighbourhood of Tiger Park in the Hunchun area as the research object. The main survey objectives include the residents' lives, production style, and income. The survey subjects covered growers, farmers, businessmen, and forest employees of all age groups. An anonymous questionnaire was used to conduct the survey and in-depth interviews were conducted to ensure the accuracy of the research data.

(2) Comparative Analysis Method

This paper adopts the comparative analysis method to analyse the impact of Tiger Balm Park on the local area through the changes in the livelihoods of the residents before and after the completion of Tiger Balm Park. At the same time, based on the survey data, this paper provides a scientific basis for the policy recommendations. This paper also analyses the reasons for human-animal harmony in the Panda Park by comparing the will of the residents around the Giant Panda National Park with the will of the residents around the Tiger and Leopard Park to apply its reasonable aspects to the concept of human-tiger harmony and providing scientific advice on the construction of the Tiger and Leopard Park.

(3) Household Survey Method

We went into the residents' homes in the neighbouring areas of Tiger and Leopard Park and used communication and recording methods to record the current impacts on the residents and their hopes for the future.

(4) Data Analysis

SPSS 16.0 software and Excel software were used to analyse the data, including regression data analysis and descriptive analysis. The descriptive statistical analysis used in this paper is mainly for the descriptive statistics of the data obtained from the survey samples, and the regression analysis is mainly applied to the life satisfaction and influencing factors of the residents in the vicinity of Tiger Balm Park.

3. Research results

3.1. Results of survey data analysis

3.1.1. Analysis of survey data on the residents around Tiger Balm Park

The data of this study comes from the questionnaire survey of different occupations in the neighbouring areas of Huichun Tiger and Leopard Park, and most of the residents living in the adjoining areas of the Tiger and Leopard Park are local older adults, government officials in the establishment, and migrant workers. In Yangbao Manchu Township, for example, most residents know that the tiger and leopard are national-level protected animals. The data in Figure 2 shows that the state's publicity and protection of tigers and leopards has a substantial effect. However, when asked whether they were willing to leave their current townships and enter the urban areas for the expansion of the park, most residents chose no, except for government employees, and therefore believed that the state should pay more attention to the harmony between humans and tigers in the process of expanding the park.

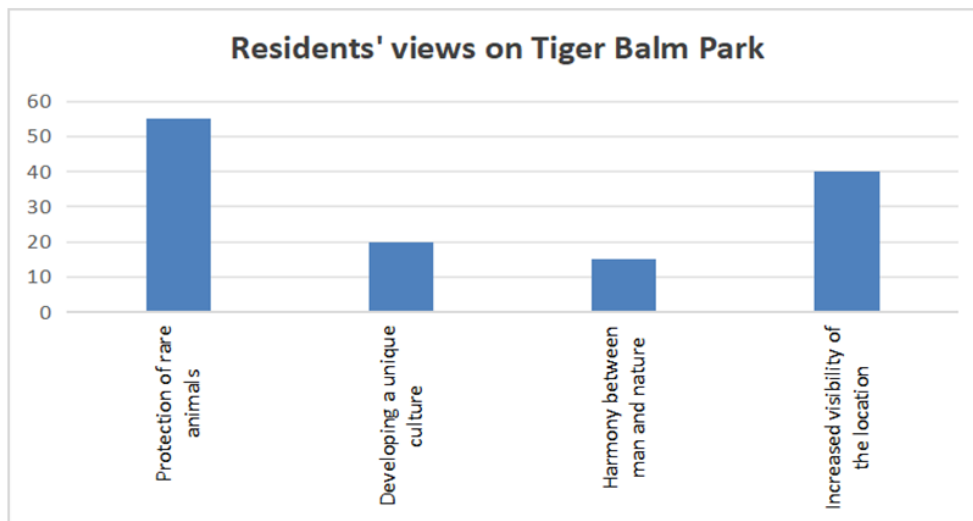


Figure 2. Residents' perceptions of the Northeast Tiger and Leopard National Park

When investigating the question of what impact the construction of Tiger Balm Park has had, most residents did not choose to live in harmony with nature, so it can be seen that there is an urgent need for Tiger Balm Park to live in harmony with its residents. In the process of interviewing local residents, it was learnt that tiger paw prints are often found in areas closer to the park, such as Hadamen. Due to the presence of tigers and leopards, local residents are afraid of grazing, fishing and other outings and restrict themselves from going out. At the same time, during the spot survey in Yangbao Manchu Township, it was found that there was a serious loss of young and middle-aged labourers in the area, and the fields of each family were basically outsourced. In addition to the government employees, other self-employed households suffered economic losses due to the establishment of the Tiger Balm Park. Among them, the shops operated by the three elderly people can only barely solve the problem of subsistence as a typical example. Although most of the residents' incomes were affected by the survey, most of them were satisfied with their current living conditions. In the survey of local residents' education, it was found that the township is poor in education resources, with only one primary school, of which the number of kindergarten and primary school students is only 30 or so, and there is no junior or senior high school in the township, which makes young people have to go to the townships in order to get the opportunity to get an education. Due to the low level of education of the local residents, most of them, except the government staff, need the researcher to read out the questions for them before they can answer the questionnaires. Therefore, we went on to study in depth the reasons for the lack of educational resources. The main reasons include: insufficient teachers, one teacher teaches students for more than one school year; serious population loss, most young people do not want to work in the area; due to the establishment of the Tiger and Leopard Park, there are tigers in the neighbourhood, so they are worried about the safety of their children and choose to go out to school.

Meanwhile, during the survey, it was found that most of the residents thought that tigers and leopards should be protected, but it has nothing to do with them, a few of them chose to help the country as much as possible, and most of them are government employees. Therefore, this paper suggests how to coordinate the interests of the two parties in the relationship between the protection of the tiger and the interests of the people has become the focus of this study to solve the problem.

3.1.2. Analysing the data of the people living in the area around the Giant Panda National Park

According to Zhou Ting's research in the article "A Game Study of Conservation and Community Development in the Edge Zone of Giant Panda Habitat in the Jiefangshan Mountains," the people in the area around the Giant Panda National Park in the past faced the same problems as the residents around the Tiger and Leopard Park today. Most people understand that the giant panda is a nationally protected animal but feel that pandas and humans cannot coexist peacefully and that such

conservation measures do not concern them, however, through the efforts of the State and the active cooperation of the local people, the most prominent and major problems have been solved in the neighbourhood of the Giant Panda National Park. Nowadays, the Giant Panda National Park and the local people present us with more scenes of harmony between human beings and pandas, and the giant panda has become a national treasure in the true sense of the word. The local people are proud of the existence of the pandas, and the people of other parts of the country have also shown their concern and love for the pandas on various platforms and in the international arena, which has made international friends love the pandas and want to participate in conservation activities.

In order to study the real internal causes of human-animal harmony, this paper combines several literatures on human-animal harmony to find effective ways to regulate the harmony between the Northeast Tiger and Leopard National Park and local residents. Through collation and integration, we found that animal protection in every region inevitably touches human interests, and how to truly achieve the concept of human-animal harmony is the subject of countless researchers, through the study of the literature on human-animal harmony in the Giant Panda National Park, we also extracted some of the useful data and collected them to compare with the data around the Tiger and Leopard Park.

Taking the survey of residential communities around the giant panda habitat in the Jiefangshan Mountains as an example, Figure 3 shows the summary of the survey.

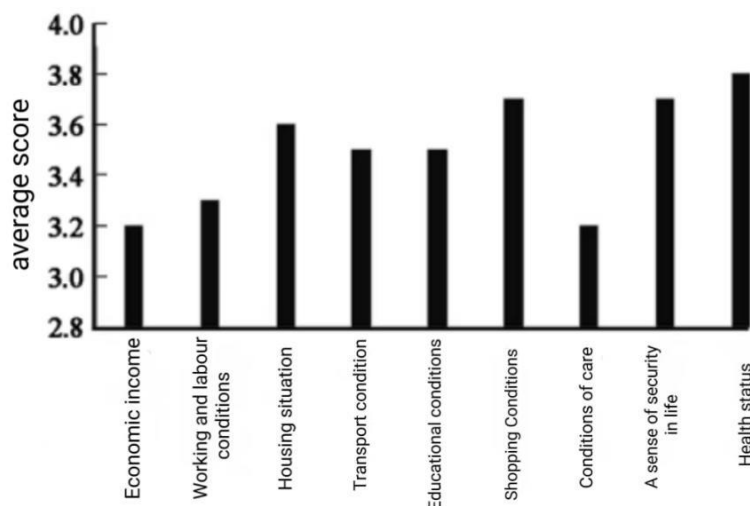


Figure 3. Basic situation of the residents around the giant panda habitat in the Jiefangshan Mountains [11]

The survey found that most of the residents did not know that their local area was in a heritage conservation area, and believed that the protection of wild animals had affected their production and life to a certain extent. Therefore, the State analyses the unfavourable factors for development in the master plan of the Giant Panda National Park and proposes modifications to it, which coincides with the content of the master plan of the Northeast Tiger and Leopard National Park. At present, the harmony between humans and animals in the Giant Panda National Park has made progress, and its success will serve as an example for the construction of the Northeast Tiger and Leopard National Park.

3.2. Suggestions and Countermeasures

By comparing the views of residents near the giant panda habitat with those around the Tiger and Leopard Park, this paper summarises the following views:

In the preliminary interviews with residents around the giant panda habitat, it was found that giant panda conservation has a greater impact on local residents, so the People's Government of Sichuan Province has formulated relevant policies to solve the human-animal conflict and promote local sustainable development. The current views of the neighbouring areas of the Northeast Tiger and Leopard National Park are generally consistent with those of the residents of the giant panda habitat.

Therefore, the government should learn from the experience of the panda habitat and formulate policies suitable for the neighbourhood of the Tiger and Leopard National Park according to local conditions.[6]

At present, the giant panda habitat has already achieved the goal of human-animal harmony to a certain extent. Through interviews with the local residents, it is found that most of the residents have a fondness for giant pandas. It is believed that the current activities of giant pandas have reduced the impact on individuals.[7]

The starting point for the construction of the Northeast Tiger and Leopard National Park is the protection of the Northeast Tiger and the Northeast Leopard and the construction of a regional environment in which human beings and nature coexist harmoniously. Through appropriate policy mechanisms, the establishment of the park will maximise the benefits of the tiger and leopard park for the residents in the surrounding area and increase the enthusiasm of those who have a vested interest in the construction of the park, to realise the sustainable development of human and animal interests in the area around the tiger and leopard park. [5] This paper proposes the following countermeasures through field research and visits to the Northeast Tiger and Leopard National Park, as well as analyses of the collected data:

In comparing the management methods of national parks in the United States and China, it is found that in the development of national parks in the United States, the dilemmas of China's national parks have also been encountered: the contradiction between long-term protection and development; and the solution to the contradiction between animals and human beings in the management area. Therefore, we can learn from the policies that have been implemented during the development of the U.S. national parks and modify and promulgate them in combination with the existing national conditions of China. In the construction of the tiger and leopard park project, it is possible to add experienced local residents to participate in the community co-management so that the residents deeply realise that protecting tigers and leopards is a matter of their interests. On the one hand, community co-management can make the residents realise the importance of the tiger and leopard. On the other hand, it can make some residents rely on the tiger and leopard park to obtain economic benefits and provide new career choices for the residents.

In the establishment of the Tiger and Leopard National Park, the existing various types of protected area management positions will be unified and consolidated into ecological management public welfare positions, giving priority to the recruitment of resident's familiar with the local area, and reasonably setting the size of the positions to provide residents with new options. At the same time, the Tiger and Leopard Museum can be set up in the park to provide systematic guidance to local residents, to lead the popularisation of local culture, and to increase employment training services so that they can act as museum guides. The establishment of the museum can also promote the publicity of the park so that more people can recognise the importance of protecting tigers and leopards, and make up for the lack of familiarity of the public with tigers and leopards due to the short time of the establishment of the park.[8] Eco-tourism has emerged in recent years, and it is possible to conduct eco-tourism without damaging the local environment of the park by hiring residents as tour guides to introduce the park to tourists. This will not only promote the economic development of the area around the park but also make more people aware of the importance of protecting tigers and leopards.

After investigation, it is found that most of the people living in the neighbouring areas of the Tiger and Leopard National Park are old people, so it is necessary to establish a pension security system for the park community, and to include eligible residents in the local minimum living security scope, so as to protect the rights and interests of the neighbouring residents. At the same time, the government should improve the construction of local medical care, pension, shopping, transport and other aspects to protect the basic rights of residents. Especially for health care and education, the government should actively promote the quality of education for the residents near the Tiger and Leopard Park by introducing teachers and improving the educational infrastructure. At the same time, medical construction should be established in the township to ensure the safety of residents' life and property, and at the same time, facilitate residents' daily life and contribute to the retention of young

labour force in the township. [9] Under the circumstance of guaranteeing the normal life of the residents, the government departments actively adjust the economic structure and promote the employment of local residents.[10]

People should strengthen the real-time monitoring of the living environment of the Northeast tiger and leopard, and reasonably protect the basic facilities for the survival of the tiger and leopard. Currently, the monitoring of the tiger and leopard itself is more comprehensive, and there is less research on the impact of environmental changes on the tiger and leopard habitat changes, the government should set up a special instrument to monitor the real-time changes in the living environment of the tiger and leopard, to point out the direction for the use, improvement and protection of biodiversity within the Tiger and Leopard Park, and also pay attention to the protection of local cultural heritage while protecting the tiger and leopard, so as to achieve the protection of culture and nature without losing sight of the two.

(5) Strengthen the publicity and education on tiger and leopard protection, and raise the ecological awareness of residents on tiger and leopard protection.

Publicity is an important way to make residents correctly understand the value of the tiger and leopard, through posters, speeches and lectures on wildlife protection and tiger and leopard protection education for residents near the park, to enhance the awareness of the residents of animal protection, especially in the process of their production and life will be the tiger and leopard caused by the impact of the understanding, and how to control the protection of personal life in the case of the living environment without harming the tiger and leopard, which is important for the sustainable development of the local community. This is of great significance to the sustainable development of the area. Through the survey of residents, more than 90% of the residents were clear that the Northeast tiger and leopard is a national-level protected animal, while only 25.6% of the residents were willing to contribute to the protection of the tiger and leopard, and most of the residents thought that the protection has nothing to do with individuals.

Therefore, to facilitate the smooth progress of the tiger and leopard protection work, the publicity and education of the residents are indispensable, and it is urgent to improve the residents' awareness of tiger and leopard protection and the enthusiasm and initiative of the tiger and leopard protection, to avoid the occurrence of the vicious cycle of resource utilisation.

4. Conclusion

Data analysis through SPSS16.0, Excel and other software concluded that the interests of the residents in the surrounding areas were not effectively protected in the process of building the Tiger and Leopard Park. This paper takes the area around the Tiger and Leopard Park in Hunchun City-Yangbao Manchu Township as the research area, takes the residents in the surrounding areas of the Tiger and Leopard Park as the main body, and uses a variety of survey methods to construct a data model, and then analyses the current human-tiger conflict problems in the Northeast Tiger and Leopard National Park, so as to realize the residents' demands, and ultimately to achieve the goal of human-tiger harmony in the surrounding areas of the Tiger and Leopard. The research results derived from this paper are as follows:

(1) Through the region's field research and literature survey, the main manifestations and impacts of the conflicts between the Northeast Tiger and Leopard National Park and local residents are summarised. With the promotion of ecological civilisation construction, China's research on national parks is gradually increasing, but due to the short construction time of the Northeast Tiger and Leopard National Park, there are fewer studies on the conflicts between the park and local residents, and this study can provide a certain reference significance for the subsequent research.

(2) Propose countermeasures to promote the harmonious coexistence between the Northeast Tiger and Leopard National Park and the local residents. Combine with the research on the local area, clarify the needs of the local residents, and put forward suggestions with a scientific basis. Specifically, it includes: how the construction of the tiger and leopard park can help the employment of the residents,

how eco-tourism can promote the development of the local economy; and how to improve the residents' awareness of the protection of tigers and leopards.

However, there are shortcomings in the research of this paper. This paper only selects one of the areas around the tiger and leopard park for research, although Yangbao Manchu Township is representative of the region, but there are regional differences or spatial differences and humanistic differences between different areas. Therefore, there may be some limitations in the scope of the survey. The factor of few growers and farmers in Yangfu Manchu Township has not been investigated in relation to the factors affecting growers, so the scope of the data is not comprehensive enough, and further investigation is needed to improve the data.

Therefore, for future research, it is still necessary to explore in depth in theory, dig deeper into the data, and comprehensively consider all the influencing factors, including education level, gender and age, and nature of the work in order to find the optimal solution to the problem of human-tiger conflict, and try to diversify the research methodology, diversify the objects of the study, and deepen the content of the study.

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