Research Progress of National Park Community Management Based on Web of Science

A-li Yang[1], Wen-jie Zhang[1,*], Fen-jie Qi[2] and Meng-ran He[1]

[1] *School of Tourism, Northwest Normal University, Lanzhou, Gansu 730070, China*
[2]*School of Business, University of Queensland, Queensland, 4072, Australia*
* Corresponding author. Email: 568170925@qq.com

ABSTRACT

The universality of conflicts in national park communities is a critical issue in current national park management research. This paper uses the scientific knowledge graph analysis tool to visually analyse and systematically discuss 351 pieces of literature about national park community studies retrieved from the Web of Science database. This paper indicates that the research is mainly focused on community conflicts, community management influencing factors, and community governance aspects. It also reveals the current situation and examples regarding international experiences, hoping to provide references for future in-depth research, practical exploration and effective collaborations in community management in national park studies.

Keywords: National Park, Community management, Community conflict, Community governance

1. INTRODUCTION

National parks are large-scale natural areas that need special protection and administration to maintain the ecosystem's integrity and authenticity. In 1872, since Yellowstone Park was established in the United States, the national park movement upsurge has been set off in the US, UK, Canada and other countries. National parks have been continuously promoted in the world as a business card and national image, and the research on national parks has gradually deepened. To keep up with the trend of national park development worldwide, China has set up 10 pilot areas for the national park system since 2015, under the guidance of authorities, such as the General Plan for the Establishment of a National Park System and the Guiding Opinions on the Establishment of a Natural Protected Area System with National Parks as the Main Part, China has actively carried out major reform and practice in national park management. The main idea of China's national park pilot programme includes "ecological migration", "building a coordinated community development system" and "establishing a unified, standardized and efficient management system". It has been noticed that there are always residents living around the national park territories. Due to the lack of sufficient consideration of community well-being, the development of national parks is usually separated from the locals. It should be pointed out that the effectiveness of community management determines the development process of national parks. In this paper, the literature related to national park community management is selected, and relevant research hot topics are summarized and reviewed by using bibliometrics and content analysis method, to clarify the core issues of community management and draw on successful international experience to provide a theoretical basis and practical experience for the development of national parks in China.

2. METHODS OF LITERATURE COLLECTION AND ANALYSIS

2.1. Literature Sources

This paper takes the Web of Science (WOS) core collection as the data source with the time span of 1985-2020, using the advanced search to look for keywords "National Park", "Community Management" and "Community Administration". A total of 675 pieces of relevant literature were retrieved, and 351 records were obtained by excluding those that have less alignment with community management of national parks, such as genetics, entomology, limnology and litigation documents.

2.2. Analytical Methods

In this paper, BICOM2.01, UCINET, HISTCITE software are used to analyse the data of the retrieved core literature of national park community management. UCINET and HISTCITE are also used for visual analysis, while the centrality of high-frequency words is measured and the research area is summarized to visually display the research status and progress of international national parks.
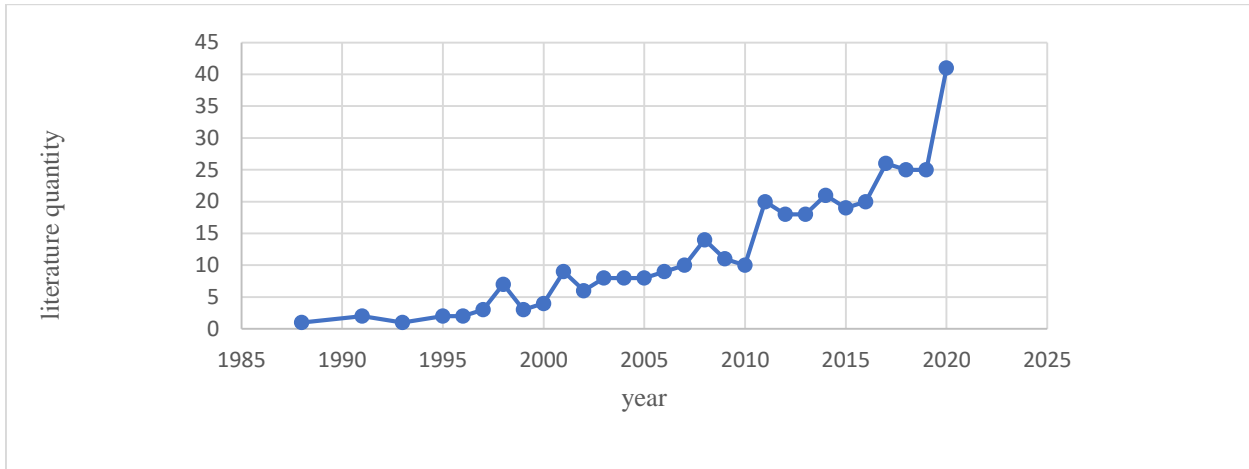
2.3. Research Situation

Figure 1. Published literature on community management in WOS national park
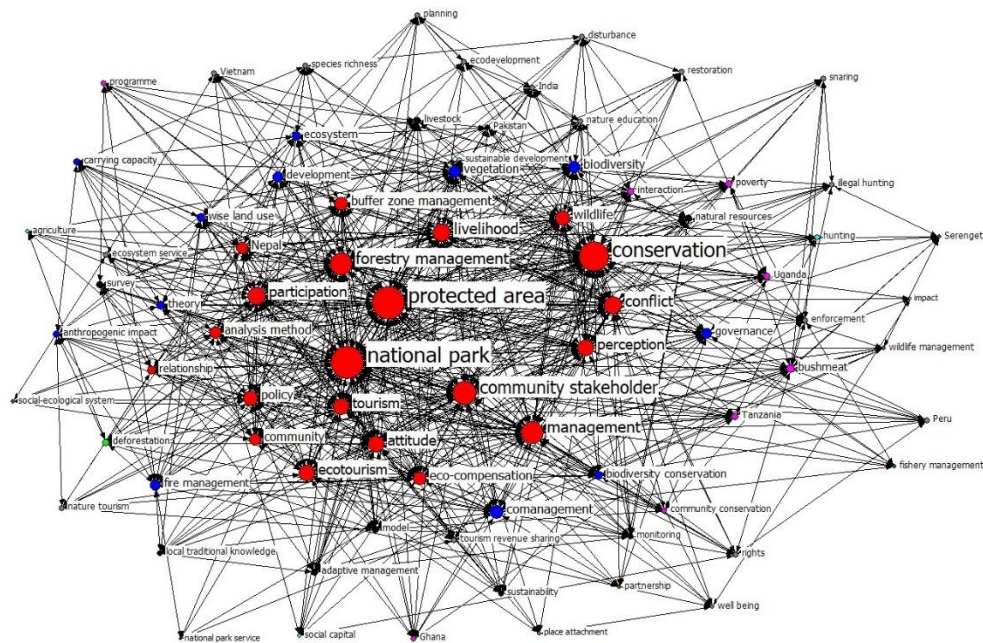

Figure 2. Key words network of international national park community Management

Table 1. Centrality measurement of high frequency keywords in national park community management researches

Number	Key word	Degree	Number	Key word	Degree
1	National park	67.000	8	Livelihood	37.000
2	Protected area	67.000	9	Participation	34.000
3	Conservation	62.000	10	Tourism	33.000
4	Community stakeholder	48.000	11	Perception	32.000
5	Forestry management	45.000	12	Attitude	32.000
6	Management	44.000	13	Ecotourism	31.000
7	Conflict	37.000	14	Police	30.000

High-frequency words can reflect the changes of community management research in multiple stages and reveal the research frontier. According to the annual literature publication volume (as shown in Figure 1), the research could be divided into three stages. The first stage (1985-2000) was the embryonic stage: there was little

research literature, and scholars mainly focused on the conservation of community biodiversity, ecological conservation and recreation opportunities. The second stage (2001-2010) was the development period. Academics started to discuss the conflict in community management from different perspectives. The discipline became diversified and the research theories were increased, and many scholars began to introduce social exchange theory, social representation theory and relative deprivation theory into this field. The third stage is the rising period (2011-present). Scholars mainly focus on the interactive behaviour and attitudes of community stakeholders, looking through the sustainable development of national parks and integrating public goods and environmental justice theories from multi-dimensional development perspectives.

The paper takes keyword frequency and centrality as the main criteria, both of which are directly proportional to the importance of keywords. Using UCINET software to measure the centrality of keywords (Figure 2) with a frequency of 3 and above (Table 1), and found that the current research on national park communities mostly adopts multiple regression analysis, factor analysis, variance analysis, correlation analysis and other research methods, discussing the leverage between community development and ecological conservation.

Regarding the distribution of research journals, 152 journals are containing relevant literature, while the distribution is uneven. The journals that included the most articles were environmental protection (20 articles), followed by environmental management (19 articles) and social and natural resources (13 articles), 33 journals included more than 3 articles, and 98 journals published 1 article each.

2.4. Regional Distribution of Research Situations

In general, the research area of national park community management is combined with specific national park construction research. As can be seen from Table 2, there are more publication quantities and focused destinations in the Americas. Among the 117 retrieved literature, 84 are published by the United States, accounting for the largest proportion, followed by 17 from Canada. There are many documents in Europe, but the regions involved are relatively scattered. 22 are published in the UK and other countries have fewer published papers, accounting for a small proportion. The regions involved in Africa and Asia are relatively limited. Oceania, though less documented, is more regionally concentrated, with Australia having the highest amount of 12 papers. The above countries established national parks earlier, and their similar development background and mature national park system provided rich research samples and data for the scholars. In addition, the number of non-Chinese researchers studying China's National Park accounts for 10.9 % in Asia, indicating that the pilot programme of China's National Park System has attracted wide attention from the international society since 2015.

Table 2. Regional distribution map of international national park community management researches

Regions	Main research areas	Number of articles	Proportion
America	USA, Canada, Brazil, Chile, Costa Rica, Argentina, Bolivia, Colombia	117	33.4%
Europe	UK, Germany, Poland, Greece, Netherlands, Norway, Spain, Italy, Switzerland, Turkey, Austria, Czech Republic, Romania	101	28.8%
Asia	Indonesia, Nepal, China, Japan, India, Belgium, Thailand	55	15.6%
Africa	South Africa, Tanzania, Zimbabwe, Cameroon, Kenya, Ghana, Botswana, Nigeria	51	14.5%
Oceania	Australia, New Zealand, Fiji	27	7.7%

3. MAIN RESEARCH CONTENTS AND GOVERNANCE MEASURES

3.1. Research on Community Conflict

3.1.1. Community conflicts caused by land issues

Large areas of national parks have been placed under strict protection for biodiversity conservation and ecosystem integrity, which deprives communities of access to land and natural resources, puts pressure on their livelihoods and leads to community conflict. For example, Poland's Bialowieza National Park has faced a backlash from residents over expanding the national park's boundaries. On the other hand, the encroachment of urbanization outside national parks squeezes community space, which is also an important reason for community conflicts. The Blue Mountain National Park in Australia is close to the urban residential area which spread to the interior of the national park. The rapid growth of the population causes huge pressure on the ecological security of the national park and leads to conflicts accordingly.

3.1.2. Community conflicts caused by ecological conservation policy

To fulfil the needs of ecological conservation, many countries have implemented restrictive policies on the access of various resources. For example, the access to resources and agricultural activities are strictly restricted, plus the banning of fishing, hunting and forced relocation of community residents. It is the basis for people to recognize and acknowledge the value of national parks' resources. If we blindly emphasise on natural forces to ignore the role of communities, natural evolution will be out of order, animal disaster cases will continue to occur, and community dissatisfaction and even revolt will be triggered. For instance, a fishing ban in South Africa's Chichikama National Park has caused great dissatisfaction in the community. Community clashes erupt after the forced relocation of ethnic Malay residents from Malaysia's Dahanshan National Park. The Yushan National Park in Taiwan Province bans hunting and severely restricts farming and resource use, depriving communities of the right to inherit traditional culture and survive.

3.1.3. Community conflicts caused by development and utilization

Past experiences have proved that the rational development and utilization of recreational resources in national parks is necessary and feasible. However, a series of conflicts have resulted from the failure to fully consider the impact of production and life of community residents in development and utilization. The San Rosario and San Bernardo Islands National Parks in Colombia have been observed a decline in community welfare due to increased tourism activity [1]; Improper development of Zion National Park in the United States has caused NIMBY (Not In My Back Yard) syndrome. Yushan National Park in Taiwan Province disturbed the living space of the ethnic group due to tourism development. In addition, Banff National Park in Canada takes tourism development as the main driving force for the development of the park, such as the development of hot springs and golf courses. Excessive tourism development has resulted in the continuous deterioration of the community and environment.

3.1.4. Interest distribution mechanism causes community conflicts

The unfair interest distribution mechanism, the limited of interest compensation mechanism and the failure of interest expression mechanism are the critical triggers for the community conflicts in national park management. To preserve the integrity and authenticity of the ecosystem in the national park, the local residents bear most of the protection efforts. However, it is difficult for the residents to receive corresponding compensation in the allocation of ecological benefits. South Africa's Kruger National Park isolates tourism from the local community, leaving community residents without equitable access to the national park's tourism benefits and employment benefits. The destruction of livestock and crops by wild animals and other losses suffered by residents are far greater than the corresponding compensation and income, thus causing conflicts of interest between the administrative entities and communities. William et al. (2013) advocated that part of the tourism revenue should be distributed to residents to make up for the losses they suffered related to national park programmes.[2] To understand and face these challenges, national parks need a more flexible management approach and local solutions.

3.2. Research on the Influencing Factors of Community Development

3.2.1. Perception and attitude factors

The attitude of the community residents as the owner of their traditional territory will directly affect the development of national parks. It is demonstrated that the community's perception and attitude toward national parks are mainly affected by four aspects: social influence, ecological benefits and influence, the legality of governance in the national park, and the community's acceptance of park management. [3] In general, the community's positive attitude leads to pro-conservation behaviour, which could reduce conflict and improve the effectiveness of national park management. The negative attitude causes conflict, misunderstanding and distrust between the community and the national park administration, which reduces management efficiency significantly. Meanwhile, the community's perception and attitude are usually affected by the availability of resources, employment opportunities and the interaction with the national park management processes, which can be indirectly affected by education level and protection awareness. [4]

3.2.2. Trust factors

Trust is the emotional bond connecting national parks authorities and communities, which increases both sides' confidence in the partnership. Effective and smooth information exchange is the key to establishing emotional trust between communities and the administration. A natural resource management project in Benin National Park in Africa aims to build trusted relationships with communities by engaging them in activities such as afforestation and wildlife monitoring. However, the abnormal use of trust and non-transparency could destroy the positive relationship. The Bialowieza National Park in Poland lost the local's trust due to a lack of detailed public information and transparent decision-making process, which caused the community to no longer care for or

support the construction of the national park. Researches show that special attention should be paid to whether the communication between the national park and the community is smooth and whether the community "gets what they wish".

3.2.3. Activity interference factors

The national park ecosystem is not only affected by the changes in the natural environment, but also by the production and livelihoods of the nearby communities, including agricultural activities, collection of non-forest products, poaching and logging, recreational development and management activities. Residents' unreasonable logging, farming, aquaculture and other activities lead to the ecological degradation of the surrounding area. [5] A large number of human disturbance activities such as the collection of non-forest products have caused vegetation amount to decline sharply or even become extinct. Besides, tourists' improper behaviour has serious impacts on the landscape, animals, air quality, soil quality and traditional cultural values. [6] Fortin, MJ (1999) took the community of Canada's Quebec as the object, using the social impact assessment method to identify several impacts of community activities on resource management, local economy, tourism development and the relationship with neighbouring communities. These community activities are part of the main causes of ecosystem destruction, bringing negative effects to communities such as destruction of wildlife habitat, damages to soil and vegetation, and reduction of biodiversity. Scholars have pointed out that it is necessary to clarify the types of human activities, define the type and scope of activities, land use patterns and intensity through zoning management, to leave space for community development and keep community activities and ecological conservation in a stable state.

3.3. Community Governance

3.3.1. Experience summary

As shown in table 3, according to the differentiated background of developed and developing countries, community management has produced two governance concepts: eco-conservation centric and community development centric. The application of the two concepts in developing and developed countries has different emphases. The former focuses on coordinating the relationship between protection and development of community stakeholders and promoting dual development. The latter pays more attention to the use of various management tools to maintain the authenticity and integrity of the environment so that the community can always maintain a healthy state with flexibility, adaptability, stability and sensitivity.

Table 3. Community management experience of national parks in some countries and regions

Regions	Management experience
Fiji	Community Participation in Ecotourism Development, democratic Governance
Mexico	Strict monitoring of park ecosystems, strengthening stakeholder exchanges, environmental publicity and education, and optimizing funding sources
Japan	Government boundaries and park management systems involving local communities, private land acquisitions, and preferential taxation systems
Canada	District management, community co-management, land agreement
United Kingdom	Management contract, protection and coordination mechanism, public participation mechanism
Australia	National parks commission, concessions, public-private partnerships
United States	Franchising, buffer zone management, land "mixed" ownership disposal model, adaptive management, "co-jurisdictional" mutual assistance agreement
South Africa	Community assets association, land reform, buffer management, park forum
Nepal	Implement forest projects to protect wild animals and plants, use part of tourism income to provide skills and training projects for communities
Cameroon	Sustainable community forest management plan, buffer management
Thailand	Using the community's traditional culture and religious beliefs for forest management activities
Brazil	"Green tax on commodity trade and service transactions", advisory committee, advisory committee system

3.3.2. Community participation mode

The model of community participation is based on the balance between the right of the community to use resources and the obligation of environmental protection. Community condominium contracts and condominium committees are the main modes of community participation. The co-management contract model breaks the old pattern in which national park protection agencies only rely on administrative and legal means to carry out management work. It changes the relationship between managers and being managed, and then establishes partnerships with community residents. Cameroon's national parks in Africa are managed in a "contract" way, in which each community promises to conserve some resources in exchange for limited, controlled consumer use

of selected plants. South Africa's "contractual" national parks try to combine conservation with the livelihoods of local people.[7] The community management model of Banff national park in Canada focus on community survival and development, recognizes the significant status of the residents and reaches a co-management contract with them. The co-committee model focuses on ensuring community participation, like the Australian national parks established management committees that engage multiple stakeholders, the joint management committee of Kluane National Park in Canada and Brazil's National Parks Commission.

3.3.3. Means of community development

3.3.3.1. *Community revenue sharing*

In order to stimulate community residents to actively participate in national park development, the administrative entities of national parks protect community interests by promulgating relevant policies and introducing special poverty alleviation projects. For example, Australian national parks and Miami National Park in Tanzania make fair sharing of benefits with local communities. National parks in Africa take "tourism revenue sharing" as an important policy in park development.[8] The Vietnam government's "Decision 24" introduced social support and improved the livelihoods of poor families.[9] Scholars noticed that most of the national parks in developing countries covered poor communities which lack the necessary livelihood resources and have low levels of education. With the support of external policies for the communities, there is an urgent need for them to carry out inclusive education and training to develop eco-friendly industries, such as the cultivation of economically valuable crops like medicinal materials, and environmentally friendly industries to improve the communities' well-beings.

3.3.3.2. *Community education*

To gain sufficient conservation support and provide cultural services and minimize tourism's negative impacts, various education opportunities have been carried out in national parks worldwide. For example, Lake Mburo National Park in Uganda provides wildlife conservation courses for local schools and community residents through a community conservation program to reduce poaching and illegal hunting. Russia's national parks have developed an education system for different public groups by providing a variety of educational methods to enhance public awareness of eco-conservation. Training and education should also strengthen the understanding of local culture and apply it to the management of national parks, which is conducive to the sustainable development of national parks. For example, Phromma et al. (2019)

studied Thai national parks and found that community management could be effectively actualized by applying traditional community culture and religious knowledge to regulate the residents' behaviours and actions.[10]

3.3.3.3. *Ecotourism*

Ecotourism provides a large number of employment opportunities for community residents through the development of alternative livelihood activities, which is regarded as a beneficial approach to eradicate poverty and maintain human activities within a healthy limit. The "community eco-hotel" developed in Bolivia's Madidi National Park has not only solved the problem of unemployment but also became the most profitable livelihood for the community. Abukari and Haruna (2018) conducted a comparative study about the pressures and threats faced by Ghanamore National Park and Tarangire National Park in Tanzania and found that creating alternative livelihood activities for communities could effectively reduce residents' dependence on animal and vegetation resources.[11] Studies have shown that ecotourism must ensure that certain activities are carried out in a specific space and in a limited way. Beyond this threshold, local communities face a loss of cultural rights, values, indigenous knowledge and skills.

3.3.3.4. *Community empowerment*

The essence of community empowerment in national parks is to improve community balance, strengthen the relationship between communities and national parks, and promote the community stakeholders to maintain the state of power balance. Community empowerment is a decisive factor for the construction of national parks to obtain community support.[12] It is manifested in a fairer distribution of wealth, decentralization, and is a management plan to achieve sustainable ecological resources. Andresduran and Carlos (2009) analysed the political and environmental empowerment of national park communities in Colombia and proposed different governance models for protected areas.[13] However, insufficient community empowerment can also pose threats and challenges to national park management. Meru Bettiri National Park failed to highlight the independence of the community as economic empowerment is insufficient with an under-developed society. Vimal and Ruppert (2018) surveyed six national parks in Africa and found that empowerment of different degrees is not only conducive to regulating the "people-national park" contradictions and conflicts but also conducive to improving the positive perception and attitude of community residents and improving community happiness.[14]

4. DISCUSSION

Based on the research process of national park community management globally, the research perspectives have gradually extended to the relationship between national parks and community stakeholders, interaction studies and environmental change, while developed from single problem-focused to multi-dimensional comprehensive research. Community study in national park management began to involve the concepts that relate to "stakeholder" and "social exchange theory" to study from multi-disciplinary perspectives. At present, most researches are based on case studies or comparative studies, focusing on forestry and coastal national parks. Data are collected through structured or semi-structured in-depth interviews and focus group interviews to conduct structural equation model analysis. However, the applications have special regional characteristics, which may lack universality and discussion on the path of community coordination is required. Researches also discuss from the legislative point of view to protect the stakeholders' benefit distribution and land ownership.

Future research should pay attention to distinguishing the peculiarities of diversified destinations, and reveal the mechanism of community participation based on the geopolitical and economic backgrounds. Meanwhile, the current community management studies mostly implement panel data and cross-sectional data to analyse the status of national parks at certain points in time. It is necessary to strengthen dynamic research, using long-term series data and follow-up investigations and give full play to the advantages of space-time analysis, apply cross-regional and cross-cultural synchronic comparative study, as well as longitudinal data analysis.

5. CONCLUSION

Through continuous trial and practice, the community management studies of national parks start to reach the structuralized and systemic status. However, there are many types of conflicts in the Chinese context that require more attention from both society and academics. The Chinese national parks must learn from international experience, encourage residents to participate in the managerial process to empower the local stakeholders and build ecological compensation mechanisms. Developing community-based tourism to improve community well-being is also critical, as well as establishing the eco-conservation mechanism for national parks to promote the sharing of benefits, which can explore the paradigm of national park community management in China and provide further constructive pathways for the national park programmes.

REFERENCES

[1] León C J, de León J, Ara A J E, et al. Tourists' preferences for congestion, residents' welfare and the ecosystems in a national park[J]. Ecological Economics, 2015, 118(7): 21-29. DOI:10.1016/j.ecolecon.2015.07.003

[2] Sun Kun, Zhong Linsheng. International related research and enlightenment on the public welfare management of national public parks[J]. Advances in Geographical Sciences, 2021,40(02):314-329.

[3] He Siyuan, Wei Yu, Su Yang, Min Qingwen. Research on the Mechanism of Community Participation in the Construction and Management of National Parks Based on Grounded Theory [J]. Acta Ecologica Sinica, 2021(08):1-12.

[4] Haruna Abukari, Raphael B. Mwalyosi. Comparing Conservation Attitudes of Park-Adjacent Communities: The Case of Mole National Park in Ghana and Tarangire National Park in Tanzania[J]. Tropical Conservation Science, 2018, 11: 1-14. DOI: 10.1177/1940082918802757

[5] Mohd Salleh Daim, Aidatul Fadzlin Bakri, Hikmah Kamarudin, et al. Being Neighbor to a National Park: Are We Ready for Community Participation? [J]. Procedia - Social and Behavioral Sciences, 2012, 36: 211-220. DOI: 10.1016/j.sbspro.2012.03.024

[6] Nur Belkayali, Merve Damla Kesimoğlu. The stakeholders' point of view about the impact of recreational and tourism activities on natural protected area: a case study from Kure Mountains National Park, Turkey[J]. Biotechnology & Biotechnological Equipment, 2015, 29(6):1092-1103. DOI: 10.1080/13102818.2015.1072054

[7] STUART J. C, TASRIF K, IRFAN Y, et al. Co-management approaches and incentives improve management effectiveness in the Karimunjawa National Park, Indonesia[J]. Marine Policy, 2013, 41: 72-79. DOI: 10.1016/j.marpol.2012.12.022

[8] Vedeld P, Jumane A, Wapalila G, et al. Protected areas, poverty and conflicts: A livelihood case study of Mikumi National Park, Tanzania[J]. Forest Policy and Economics, 2012, 21(none):20-31. DOI: 10.1016/j.forpol.2012.01.008

[9] Iwanaga et al. Policy effects for forest conservation and local livelihood improvements in Vietnam: a case study on Bach Ma National Park[J]. Journal of Forest

Research, 2019, 24(5): 267-274. DOI: 10.1080/13416979.2019.1655129

[10] Phromma I, Pagdee A,Popradit A, et al. Protected area co-management and land use conflicts adjacent to Phu Kao-Phu Phan Kham National Park, Thailand[J].Journal of sustainable forestry, 2019,38(5):486-507. DOI:10.1080/10549811.2019.1573689

[11] Haruna Abukari and Raphael Benedict Mwalyosi. Comparing pressures on national parks in Ghana and Tanzania: The case of Mole and Tarangire National Parks[J]. Global Ecology and Conservation, 2018, 15. DOI: 10.1016/j.gecco.2018.e00405

[12] Luo Yu chan. The power dilemma and empowerment path of communities in rural tourism[J]. Agricultural Economics, 2020(04): 63-64.

[13] Andres Duran, Carlos. Governance in Colombian National Parks: Reflections on the Case of the Orika Community and its Participation in Environmental Conservation in Parque Nacional Natural Corales del Rosario y San Bernardo[J].Revista de Estudios Sociales.2009, 32: 60-72. DOI: 10.7440/res32.2009.04

[14] Ruppert Vimal, Maude Khalil-lortie, Tsegaye Gatiso. What does community participation in nature protection mean? The case of tropical national parks in Africa[J]. 2018, 45(4):333-341. DOI: 10.1017/S0376892917000583