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Natural Resource Management Incentive for the inhabitants in Guangxi Dayaoshan Natural Reserve

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Abstract

There is an abundance of natural resources on Mt. Dayao. The politics around these resources has always been complicated until now. This paper discusses the life change of inhabitants to conserve of Mt. Dayao as established by the government. Particularly, this paper considers the local people's incentive to the conservation of nature policy. The compensation of ecological benefit is an important ecological project that was implemented at the beginning of this century in different regions in China. Yet, various problems emerged during its implementation. All of the local people could not get enough subsidies because of the incomplete compensation system. The objective of this study is to investigate the ecological compensation of the nature reserves project and draw up criteria for the life-style of the farmers in the areas covered by this project. Questionnaire surveys and follow up interviews were conducted there.

Keywords: Natural Resource Management, Guangxi Dayaoshan Natural Reserve

1. Issues confronting nature conservation policies in modern China

1-1. Land rights in nature reserves

When the government wishes to newly establish a nature reserve, a number of problems arise regarding the land and resource rights of local residents who previously owned or were making use of that land. Regarding this, the Administrator for Wild Fauna and Flora at the China State Forestry Administration said, “The majority of countries have implemented a system for private land ownership, and thus nature reserves can generally only be established on public lands. But in cases where the state possesses a large amount of public land, establishing a nature reserve is not difficult.”¹ Furthermore, “China is a socialist nation, in which all land is publicly held. Since land ownership is by collective ownership or the state, when establishing a nature reserve the emphasis is placed on factors such as the necessity for preservation, the bounds within which protection should occur, effective means of retaining resources and scenery within the reserve, considerations of the ecological systems within the reserve, land area required, and securing the

¹ The State Forestry Administration Department of wildlife conservation, *Study on Chinas Nature Reserves Policies*, China Forestry Publishing House, 2003, p.8.

borders.²

As described here, the system of land ownership peculiar to China makes it easier for the government to create nature reserve policies, and to exert force toward the implementation of such policies. Contrasting with this, however, is growing dissatisfaction in many regions within China regarding the influence such policies can have on the lives of local residents. To address this, Section 7 of the Nature Reserve Management Law (1985 edition, Forestry Ministry) states that, “when establishing nature reserves, a clear determination of the target for preservation and most appropriate scope must be made, and demands regarding the economy of the area and the productivity and lifestyle of its inhabitants must be considered.” Also, “The state will make efforts to reasonably solve problems related to the productivity and lifestyle of residents, in accordance with related laws.” Realizing this ideal is difficult, however, and in various regions throughout China there have been cases where the government and the people have clashed over issues regarding natural resource management.

1-2. Clashes between the government and the people regarding resource management

Chinese policy has been heavily weighted toward promoting economic development, and it is well known that increasingly serious environmental problems, differences in resource management methods among various ethnicities, and forcible government enactment of environmental policies have posed significant social problems. With such clashes between the people and the government as a background, Gao Fukang states, “Legislation is formed through enactment or approval of the state, and is forcibly implemented in an external, top-down fashion with the backing of the force of the state. Ethnic customs, in contrast, are formed over long periods of time in an internal, bottom-up fashion with the backing of public opinion and moral judgment. These differences make clashes inevitable.”³

There have been numerous instances of conflict between citizens and the government due to the establishment of nature reserves and implementation of forest preservation policies. One such case is the clash that occurred in the Gusheng village in the Guizhou province that occurred with the start of the Grain for Green project. Yoshimoto Seki notes three problems that occurred: 1) while the state was attempting to expand forested acreage, farmers had lost all incentive for planting forests due to no longer being able to plant or graze the area; 2) it was a top-down plan, with no consideration of local ecological or market conditions; and 3) farming and grazing were simply prohibited, with no alternative proposals offered.⁴

Another example occurred in Yunnan province, when lands used by local residents for growing *amomum tsaoko* (an ingredient used in Eastern medicine) were designated as a nature reserve. With respect to the closure of these lands for environmental protection, local residents refused to

² According to the Nature Reserve Management Law, “the land used for nature reserves must be land that by law is owned by the state or collective ownership. Persons utilizing nationally owned land and the owners of land subject to collective ownership within nature reserves shall, in accordance with the rules and regulations concerning state land management, register said land at a regional People’s Government Land Management Administrative Department at the state level or above and thereby receive a land use certificate.”

³ Gao Fukang, He Zhen, *A collision of custom and the legislation and adjustment*, Law Press China, 2010, p.59.

⁴ Yoshiki Seki, Hu Xiang, *Opposition of the government and the farmer, Political Ecology of Tuigenhuanlin, Reforestation in China*, Ochanomizu-shobo, 2009, pp.152-192.

halt their harvest without being offered some form of compensation or alternative measure.⁵ Regarding shared forest management in China, Tomoya Akimichi states, “Maintenance of shared forests had been attempted for purposes related to regional religious beliefs or disaster management, but what’s happening now is the state establishing shared forests to serve as watershed forests, bird sanctuaries, and national parks. The future of shared forests will likely depend on the ability of the region and the central government to cast aside their strife and find common ground.”⁶ Regarding the division between government policy and local resident lifestyle, Mao Caiju states that, “In modern China there is a phenomena in which every policy from above is met with a countermeasure from below, and this most commonly arises due to a lack of government authority. So long as the people have not acquiesced to policy implementation, and so long as they are not truly convinced of the necessity of the policy, they will always form feelings of resentment toward its implementation, and will find no end of ad hoc ‘measures’ for blocking it.”⁷

From the current state of affairs in several Chinese provinces, Gao finds that clashes between government policy and local custom are inevitable, and that “building a harmonious society is already one of China’s social development goals, and taking an attitude of tolerance toward varied rulemaking at the expense of a unified legal system is the logical choice towards such ends.”⁸

2. Changes in natural resource management in Dayaoshan

2-1. Establishment of a nature reserve in Dayaoshan

The Dayaoshan Mountains are near Jinxiu in central Guangxi province, and cross seven provinces and cities. The Dayaoshan Nature Preserve stretches over three provinces, and has a total area of 25,594.7 ha.

Dayaoshan has long been considered a treasure trove of natural resources. According to an ecological survey conducted in 2008, Dayaoshan is home to 2,232 species of plants, of which 2,135 are wild. Within the nature reserve is 24,647.7 ha of government-protected shrub forest, accounting for a forested area of 96.3%.⁹ Protecting these forest resources is one of the most important goals behind establishing the nature reserve in 1982. When actual protection activities began in earnest in 1987, forest coverage was only 52.62%. Because Dayaoshan sits at the fountainhead of the Pearl River basin, it strongly affects the water used by approximately 2.5 million people, and the irrigation water used for approximately 54,000 ha of farmland. Because it affects the lives of people over such a wide area, of the 96.3% forested area in the reserve, 99.3% is nationally owned forest, and the remaining 0.7% is collectively owned forest. The majority of the area is scrub forest.¹⁰

⁵ Li Jianqin, Study of Vegetation and habits culture of the Makuzhai-Hanizu-Caoguo, *History of Anthropology Ecology*, China Social Sciences Press, 2006, p.222.

⁶ Tomoya Akimichi, *Earth History of Commons*, Iwanami Press, 2010, p.27.

⁷ Mao Caiju, Li Pi, Authority and the basics that enforce a public policy effectively, *The Journal of Yunnan Administration College*, No.4, Yunnan Administration College, 2006, P.90.

⁸ Gao Fukang, He Zhen, *A collision of custom and the legislation and adjustment*, Law Press China, 2010, p.4

⁹ Tan Weifu, Luo Baoting, *Research and Conservation of Biodiversity in Guangxi Dayaoshan Natural Reserve*, China Environment Science Press, 2010, p.xi, P.35.

¹⁰ From an interview with the director of the Dayaoshan Nature Reserve.

Dayaoshan was first established as a nature reserve in 1982, and protection activities have continued until today, despite unceasing changes to its legislation and jurisdictional organization. Currently, the main regulations related to natural resource protection in nature reserves is determined by the People's Republic of China Nature Reserve Regulations (enacted and implemented in 1994).

There are currently three types of zones in nature reserves, reflecting the priority placed on environmental protection: core zones, buffer zones, and experimental zones. Core zones have the strictest regulations for protecting natural resources. People are generally forbidden from entering these areas, and even ecological surveys and other forms of academic research cannot be performed there without special permission. Buffer zones separate the core zones from the outside world, and while these areas allow scientific research activities without special permission, admittance by the public is generally forbidden. Buffer zones are in turn surrounded by an experimental zone, which has the loosest regulations and can even be entered by visitors.

In Dayaoshan there were no villages in those areas designated as core and experimental zones, but there is one village, Lunantun, in the specified buffer zone. Below, we summarize the changes that occurred in this village after establishment of the nature reserve, and the results of an investigation regarding incentives for protecting natural resources.

3. Problems in Dayaoshan resulting from establishing the nature reserve

3-1. Lifestyle changes among local residents and poverty-related problems

Lunantun is a Yao village of 16 homes and 54 residents, and is the only village within the Dayaoshan Nature Preserve. There are currently seven other townships and 57 villages existing in the area around the nature preserve. As it was before establishment of the nature reserve, Lunantun's primary industries are related to forestry.

The author visited Lunantun in February 2012 and August 2013 to meet with the Lunantun town council and each of the sixteen households. During these discussions I investigated changes in income following establishment of the nature reserve, as well as topics related to current living conditions, income, received subsidies, and incentives for natural resource conservation.

In 1980, before establishment of the nature reserve, average income in the village was around 1000 yuan, income derived predominantly from natural resources such as lumber and herbs. At the time, this represented a quite high average income for Guangxi province. Following establishment of the Dayaoshan Nature Preserve, however, the 1990 average income was around 350 yuan, making it a region of poverty. Residents in the nature reserve received a stipend, under the title "food compensation for forested area inhabitants," but from the 1980s the amount was only 216 yuan per person per year, which from the figures above can clearly be seen as a miniscule amount, and a far cry from full compensation for lost income.

Average village income in 2007 was 830 yuan, and that had risen to 950 by 2012. The average income for farmers in all independent districts is approximately 2000 yuan per year, so while that level has not quite yet been reached, at least some progress has been made towards recovering the income loss caused by establishment of the nature reserve.

There are many villages besides Lunantun that lie in nature reserves, and like Lunantun before establishment of the reserve the livelihood of each was based on utilization of natural resources. Approximately 318,000 people live in the seven towns closest to the nature reserve, and as of 1998 the population of those in poverty, defined by an annual income of less than 900 yuan, was 1240,000. By 2005, that number had increased to 260,000. As described previously, in 1987 approximately 52.62% of the Dayaoshan area was forested, while currently coverage is 96.3%. This seems to indicate that before establishment of the nature reserve, income and regional lifestyles in Lunantun and the surrounding areas were highly dependent on the natural resources of Dayaoshan.

3-2. Lifestyle changes and awareness under the reserve policy

It has been around thirty years since Dayaoshan was declared a nature reserve and strict protection of nature called for, so I wished to investigate the thoughts and ideas of the local residents regarding the nature reserve. Below are the results of interviews with the heads-of-household of the 16 homes in the village.

First, regarding item (1) “Do you support the natural reserve policy?”, 9 persons supported it, 5 partially supported it, and 2 were against it. A detailed description of the background of these responses follow (Tables 1 and 2), but regarding the supporting responses for reasons related to natural resource preservation, there were opinions that this would prevent contention related to resource usage. Some other supporting responses showed a desire for permission for partial resource utilization, despite the ban on entrance to the reserve area. There were two dissenting opinions, due to the desire for utilization of natural resources. From this, I investigated the pros and cons of the nature reserve system, protection policies, and resources in Dayaoshan.

Following enactment of the reserve policy, access to the mountain was forbidden, causing a significant decline in the average income in Lunantun and other villages in the area. From that, the results of an investigation into non-income lifestyle changes following the reserve area enactment are as listed in Tables 3 and 4.

The top two items in Table 3 shows that the decline of forestry, which was previously the principle industry of the area, has resulted in many residents—particularly the young—leaving the area to find work. The four persons stating that they needed to devise ways of making ends meet each did so by processing and selling star anise or ginger. This is due to the success story of nearby Liuxiangcun, in which these herbs were previously sold in an unprocessed form, but now are sold as value-added products through essential oil processing of star anise plants and the processing of ginger into Chinese medicines and candies.

As indicated in the previous section, the average village income has remained at poverty levels from 1990 through the present day, but is showing some level of recovery. The responses from villagers listed in Tables 3 and 4 indicate that the primary factor behind the increased average income is income from family members who have gone to work in other places, and the processing and selling of agricultural products.

Forbidding entrance to the mountain after establishment of the reserve makes it is necessary to compensate local residents to make up for the limitations imposed on their traditional source of income. The following is the results of an investigation into the thoughts of villagers regarding

the subsidies paid until now and changes to their lives following establishment of the reserve.

As stated above, residents of Lunantun are currently paid a compensation of approximately 216 yuan per person per year, and this amount is far below what the village residents would consider fair. In Lunantun, residents petitioned for increases in the amount of received compensation payments in 1987 and 1996. Compensation payments were also paid from the reserve management office, but as compared to the previous levels of income earned through utilization of Dayaoshan's resources this is only a partial compensation, and there remains to this day a large gap.

Previous sections have described the inadequacies and dissatisfaction related to the amount of compensation payments, as well as dissatisfaction related to lifestyle changes, but nonetheless area residents have continued to adhere to the restrictions on collecting any and all resources, and are actively working to protect these natural resources. I therefore investigated incentives related to conservation behavior.

As shown in Tables 6 and 7, the most common response as to why reserve policies are obeyed is because residents feel that they can't go against government policies. Regarding the current complete ban on any and all use of natural resources in the area, many residents hope that in the future at least partial utilization will be permitted.

Table 1. Benefits of the nature reserve system.

Natural ecosystems are protected	16
I can receive a subsidy	3
Persons from other places no longer come here	2
No more battles over access to resources	2
None	5

Table 2. Drawbacks of the nature reserve system.

Can't use any mountain resources	16
My life has been made more difficult	10
Can't provide needed care of plant life	5
The period of protection has no limit	1

Table 3. Non-income lifestyle changes following enactment

Fewer young people	6
Family torn apart due to need to work elsewhere	6
Have had to devise ways of making ends meet	4
Increased psychological distance from the mountain	2
Lowered desire to live	1

Table 4. Current main income

Forestry related	13
Sale of medicinal herbs and of spices	4
Money from family working elsewhere	7
Pension	2
Self sufficient	2

Table 6. Why do you follow the policy

Can't fight government policies	15
To protect the environment	6
Don't want to pay fines	3
Don't know	1

Table 7. The role of conservation in the future

Want partial use of resources to be permitted	12
Want resource use permitted for area residents	3
Conservation has gone on this long, so should be continued	1

4. Measures taken by residents regarding the policy

Up to this point we have considered lifestyle changes and effects of reserve policies on residents, and have seen that even over a long period of extreme poverty residents have strictly obeyed the rules related to resource conservation.

The success of the Dayaoshan Nature Reserve in terms of increasing forested area and recovery of biological diversity has been numerically established. Much of such results have come at the expense of sacrifice by local residents, however, and one of the important issues for consideration when establishing future reserve policies will be finding ways to maintain natural systems while also lending aid to solving problems of poverty of local residents.

Disincentives regarding the inadequacies of compensation systems in China have long been pointed out. Due to the diversity of geographical conditions in a country as large as China, previous forest conservation policies have already experienced failure regarding establishing unified standards for compensation. The result is that there are no standards for determining which organization will pay what persons how much and for what length of time. Due to this, in 2013 a project conducted with the cooperation of the U.S. NGO The Nature Conservancy began. Its title is the “Guangxi Integrated Forestry Development and Conservation Project,” and will be conducted in the area of the Dayaoshan Nature Reserve covering six villages, including Lunantun. This will be China’s first experience in obtaining the assistance of an overseas organization to solve problems related to poverty of local residents living near nature reserves. While domestic policy determination can be difficult, this can be evaluated as an ad hoc response to problems of nature reserve-related poverty limited to a specific area, and there are high expectations for such attempts in the future.

It is possible that in the area of this study there have been petitions to the government for increased compensation in the past, but there is likely a need for village residents to demand stabilization and an increased amount of payments in such compensation schemes. The author has in the past investigated areas in which residents have been forcibly evicted due to forest reserve policies, but areas with more frequent petitions for government compensation often likely see payments increased more often.

It has now been over thirty years since establishment of the nature reserve area, and today a certain level of ecosystem recovery has been observed. It is likely now necessary for the residents of Lunantun and the surrounding area to negotiate for both improved compensation payments, and government permission for conditional use of resources. In turn the government should establish rules regarding partial resource limitation.

Finally, it is admirable that the residents of Lunantun have begun value-added production and sale of agricultural goods, and the continuation and expansion of such self-help efforts will likely prove to be effective means of escaping from poverty.

5. Conclusion

To protect the water vital to the lives of 2.5 million persons, and to preserve the forestry resources and biodiversity of China and the world, thorough conservation of the resources in Dayaoshan is a vital part of creating and preserving public goods. At the same time, if the resources of

Dayaoshan are to be positioned as public goods, then the residents of the surrounding area too must be acknowledged as benefactors of those goods. The residents making their livelihood in closest proximity to these resources are central subjects for conservation of these resources. It therefore follows that relieving the poverty of those residents has similar importance to the protection of resources in the nature reserve.

Over a long period of poverty, the incentive for area residents to preserve natural resources has been an inability to stand against government policy, a situation which is likely untenable given current conditions. This paper has raised three specific measures: 1) making requests for the improvement of the stability of the compensation system and larger payments; 2) improved understanding of the nature reserve system and negotiations for the use of resources; and 3) the development of value-added products. Item 3) in particular is an effective method for escaping poverty, because it promotes self-help efforts and does not rely on external factors. Also desirable is gradually increased international cooperation leading to furthered solutions to problems of poverty in the reserve areas. Escape from poverty and the resulting increased incentives for protecting the primary resources of the residents of the area is likely an important key for maintaining the nature reserve in Dayaoshan.