

Final Research Paper: Legal Protections for Jiuzhaigou Valley in the Context of Climate Change

Yuezhou Yang

Introduction

China is a major actor in the global climate change debate. Since 2007, China has surpassed the United States as the world's largest emitter of carbon dioxide. In the early 2007, a report issued by six Chinese Government departments concluded that climate change could cause large drops in agricultural output by 37% in the coming century¹. China is also concerned about increasing climate instability. According to the IPCC 4th Assessment Report, there is wide range of climate change impacts in China: Northwest China 0.7°C increase in mean annual temperature from 1961 to 2000, between 22% and 33% increase in rainfall, increase in frequency of extreme rains and floods, decrease in the frost period in northern China, the entire Himalayan Hindu Kush ice mass has decreased in the last two decades and the ratio of melt accelerates, sea level rise affects large populations in costal areas, while delta regions of China have resulted in drying up of wetlands and severe degradation of ecosystems².

China ratified the Kyoto Protocol in 2002. Though as a developing country, China is not required to curb emissions, in 2005 Chinese President Xi Jinping committed in Washington to announce a nationwide cap-and-trade program to limit carbon emissions that would begin in 2017. The program will be the country's most significant climate policy to date, and it follows a landmark U.S.-China deal in November 2014 to roll back both countries' emissions³. China has also established a special project called "MDG Carbon: Carbon finance for achieving the Millennium Development Goals", which invests US\$1.7 million in 12 western parts of the country to help both the public and the private sector deal in carbon credits. It uses carbon trading as a tool to generate income and job opportunities by investing in green technologies in the region¹.

In terms of conservation policy and law, China has issued dozens of laws and regulations by departments at different levels. Separate laws cover wildlife protection, forestry, marine conservation, wetlands conservation and EIA. China has adopted the policy of establishing a national system of PAs to protect species, ecosystems and natural sites⁴. The national policy on PAs is set out in several key documents and regulations, as listed in table 1. Despite long list of exiting policy instruments, China has no comprehensive law for the establishment of PAs. Currently these are established under ministerial regulations only. Moreover, existing laws provide limited flexibility in terms of zoning and management options⁴. Most of China's nature reserves are managed by the State Forestry Administration. Others are established by the State Environment Protection Agency, Ministry of Conservation, Ministry of Water Conservation, Ministry of Agriculture or State Oceanic Administration. As only a few sites are managed by multiple agencies, there's more coordination between the different agencies needing to be improved⁴.

Table 1. Some key national policies, documents and regulations of China

Policy	Date	Instrument
First PA established in China	1956	Declaration of Dinghushan as PA
PAs recognised as important part of national planning	1979	Notice of Strengthening, Planning and Scientific Investigation in Nature Reserves
First three Man and Biosphere (MAB) reserves established	1980	National MAB Committee
PAs recognised as legal entities	1981	Forest Law
Regulations for PAs promulgated	1985	Management Approaches of Nature Reserves of Forest and Wildlife, Law of Grassland
China recognises heritage value of PAs and joins World Heritage Convention	1985	World Convention on Protection of Cultural and Natural Heritage
PA role in ecological conservation recognised	1987	Principles on China's Ecological Conservation
Need for species protection recognised	1988	Law of Wild Animal Protection
Recognition of important wetlands	1988	Ramsar Convention
China accepts global responsibilities and need to share benefits from uses of biodiversity	1992	Convention on Biological Diversity
Recognition of need to protect geological sites	1994	Rules for Conservation Management of Geological Relics
Rules for Nature Reserves endorsed by State Council	1994	Regulations for Nature Reserves
Regulations for Marine reserves established	1995	Management Approaches of Marine Nature Reserves
Wide range of policy issues restated and approved	1992	China Biodiversity Action Plan
Logging ban applied to large areas following disastrous floods.	1998	Prime Minister's Decision
Programme launched to reverse clearing of steep land for farms	1999	Programme for returning farmland to forest and grassland
Programme launched to narrow economic gap between rural interior and urban east/south of China	1999	Great Western Development Programme
Programme launched to improve rural livelihoods	2003	Decree Number One

Source: (IUCN, 2006-2010)

Recent efforts of the Chinese government to implement environmental laws and regulations has culminated in a comprehensive Environmental Protection Law which focus on implementation and enforcement, defines accountability and legal responsibility, and imposes sanctions for non-compliance. In addition, internationally, China is a signatory to all major environmental conventions and an active participant in the World Heritage Convention, CITES, Ramsar, the Convention on Biological Diversity, and the framework conventions on Climate Change and Desertification¹. This paper uses Jiuzhaigou Valley National Park as case study, analyzing China's legal protection on a protected natural area in the context of climate change. The paper is structured in five parts. Following the introduction, part one presents the location, values, and threats of Jiuzhaigou Valley. Part two elaborates the idea that laws are critical to the effective governance and management of natural areas by describing the types of legal protections used in Jiuzhaigou Valley, Part three discusses the governance that goes to stakeholders involved, and decision-making process. Part four presents the management plan that reflects actions to mitigate or adapt to climate change. Part five analyzes the challenges to protect Jiuzhaigou Valley for the future in light of changing climate.

Jiuzhaigou Valley Scenic and Historic Interest Area

Jiuzhaigou Valley lies in the southern part of the Minshan Mountain range at: 32°54' to 33°19' N and 103°46' to 104°04' E; approximately 270km north of the Provincial capital, Chengdu, on the margins of the Tibetan plateau. Elevations range between 1996-4764m. The highest peak in the Min Shan range is known in Tibetan as Xia Dong Ri (Chinese: Xue Bao Ding) and is an important sacred mountain. Both the Chinese term: Jiuzhaigou and the Tibetan: Rizadegu refer to 'nine villages' which were historically present in the area. Prior to the establishment of the park, nine Tibetan villages were located in the area, a total of 1185 people of Tibetan heritage. And most residents living within Jiuzhaigou Valley identify as ethnic Tibetans⁵.

Jiuzhaigou Valley is valued by its diversity of forest ecosystems and endangered species and outstanding natural landscape beauty (image 1). Stretching over 72,000 ha in the northern part of Sichuan Province, the jagged Jiuzhaigou valley reaches a height of more than 4,800 m, thus comprising a series of diverse forest ecosystems. It includes old-growth forests which provide important habitat for numerous threatened species of plants and animals. There are about 2,500 plant species including more than 200 aquatic species. Excellent habitat is available for the 140 bird species recorded, 13 of which are listed as endangered. Also protected are 170 vertebrate species and 10 mammals, including the endangered giant panda and golden snub-nosed monkey, and the vulnerable Sichuan takin⁶. Jiuzhaigou Valley is also a reserve of exceptional natural beauty with spectacular jagged alpine mountains soaring above coniferous forest around a fairyland landscape of crystal clear, strange-colored blue, green and purplish pools, some 100 lakes, about 20 large waterfalls, limestone terraces, caves and other beautiful features. These include a number of karst formations; indeed the area is a “natural museum” for alpine karst hydrology and research⁷.



Image 1. Jiuzhaigou Valley Natural Beauty

Currently, Jiuzhaigou Valley faces with treats of invasive species, changes in traditional ways of life and knowledge systems, impact of tourism, water pollution, landslides, erosion and siltation valued by IUCN⁶. The highest risks regarding environmental problems are first, illegal hunting and/or collecting herbs; second, impacts of blooming tourism. Residents within Jiuzhaigou Valley are only permitted to collect fungus and herbs for their own use and are prohibited from collecting and selling commercially, while hunting is entirely prohibited in the park. Poachers are mostly the people living around Jiuzhaigou Valley who generally have very poor incomes. They come to the park to hunt Blue Sheep and as well as collect lucrative Chinese Caterpillar Fungus⁵. There has been a dramatic increase in the annual number of tourist visitors from 170,000 in 1991 to 5 million in 2012, with growth accelerating from 1998. Expansion of hotels occurred in the property until 2001 when all were closed and removed outside. Now, more than 100 hotels plus other guest houses are clustered around the property entrances and are visually intrusive⁶. Problems raised by interviewees that they associated with high visitor numbers included: emissions and noise from the buses used to transport visitors within the park, trampling of vegetation by visitors, construction of visitor facilities, and the potential introduction of alien invasive species. In addition, visitors were having an impact on the local culture, changing the nature of the villages within the park⁵. These two threats remain the greatest on-going management challenges for this protected area.

Laws are Critical to the Effective Governance and Management of PAs: Types of Legal Protections

As a national park and a national nature reserve, Jiuzhaigou Valley is protected by national, provincial, and international laws and regulations, which secure the long-term management and conservation of the Property. In 1982, Jiuzhaigou was designated as an area of scenic beauty and historic interest by the State Council. The site overlaps, or completely includes, Jiuzhaigou Nature Reserve which was established in 1978. Legal protection measures are provided under the national constitution; the Forestry Act; the Environmental Law; and the

Provisional Regulations Concerning the Places of Scenic and Historical Interest⁸. In 1982, the site was proposed as an area of Scenic Beauty and Historic Interest by the State Council. An administration Bureau was established for the site in 1984⁵. Three years later, Sichuan Provincial Government approved measures for the legal protection of the site, and clearly defined its boundaries in 1987⁸. In 1994, Jiuzhaigou was approved as the National-level Nature Protection Area by the Ministry of Forestry⁹. The area was designated as a UNESCO Natural Heritage site in 1992 and a Biosphere Reserve in 1997⁵. In 2004, the Sichuan Provincial Regulation on World Heritage Protection in Sichuan and the Regulation on Implementing Sichuan Provincial Regulation on World Heritage Protection in Aba Autonomous Prefecture became law, which provided a stricter basis for protection of the property⁷.

As the time line described above, Jiuzhaigou has complex legal histories, frameworks, and challenges. There are complex overlapping, coordinated or uncoordinated interactions of government entities, stakeholders, legislations, management plans, public hearing which will explain in the next two parts. Following is a list of laws and regulations concerning cultural and natural properties protection and management (including extracts of relevant articles from the Constitution, Criminal Law, Law/Regulations on Land-use, Environment Law and Forestry Law, amongst others)⁹:

- *Forestry Law of PRC*
- *Implementation Rules on Forestry Law of PRC*
- *Wild Animals Protection Law of PRC*
- *Wild Plants Protection Law of PRC*
- *Preventive Law on Environmental Noise Pollution of PRC*
- *Preventive Law on Atmospheric Pollution of PRC*
- *Implementation Detail on Preventive Law of Water Pollution of PRC*
- *Environmental Protection Law of PRC*
- *Preventive Law on Solid Waste Pollution of PRC*
- *Implementation Rules on Protection of Terrestrial Wild Animals of PRC*
- *Implementation Rules on Protection of Aquatic Wild Animals of PRC*

- *Protection Rules on Wild Plants of PRC*
- *Administrative Rules on Seeds of PRC*
- *Protection Program for National Ecological Environment*
- *Preventive Rules on Forest Diseases and Insect Pests*
- *Forest Fireproofing Rules*
- *Administrative Methods on Protection of Woodlands*
- *Administrative Punishment Methods for Environment Protection*
- *Administrative Methods for Forest and Wild Animals in Natural Protection Zone*
- *Administrative Methods for Business License of Terrestrial Wild Animals and their Produces in Sichuan Province*
- *Notice on Further Strengthening Protection of Wild Animals by Office of Sichuan People's Government*
- *Notice on Strengthening Protection of Wild Animals Resources and Management on Hunting*
- *Implementation Methods of Forest Fire Prevention of Sichuan Province*
- *Temporary Methods of Forest Protection and Fire Prevention in Sichuan Province*
- *Administrative Measures on Environmental Protection*
- *Pact on Protection of International New Plant Species(Version 1978)*
- *Notice on Further Strengthening Administration on Natural Protection Zone*
- *Administrative Rules on Tour Guides of Scenic Areas and Scenic Spots in Sichuan Province*
- *Detail Application on Hearing Criminal Cases of Destroying Forest Resources by the Supreme People's Court*
- *Detail Application on Hearing Criminal Cases of Destroying Wild Animal Resources by the Supreme People's Court*
- *Regulations concerning the World Heritage Site in Sichuan Province*

Governance: Stakeholders and Decision-Making Process

Governance is one dimension of PA: 'The interactions among structures, process

and traditions that determine how power and responsibilities are exercised, how decisions are taken and how citizens or other stakeholders have their say in a protected area.' (IUCN, Governance Principles.) Natural areas, in this case Jiuzhaigou Valley require a legal framework as described in the last part in order to provide for stability and other goals with regard to sustainability for it and with the legal framework comes a structure for who makes decisions, how decisions are made, and how is accountable for the decisions, who is involved in participating, how information is available about that process. This part goes to discuss the governance structure of Jiuzhaigou Valley by answering these questions.

The governance type of Jiuzhaigou Valley is Governance by Government, where is in charged by National Ministry of Forestry; Sichuan Provincial Government, State Council, Aba Autonomous Prefecture government; and government-designated management to World Heritage Convention. Though the idea regarding the local community approach to decision-making is rarely found in China, there is some community participation via employment as workers or as small business operators found in Jiuzhaigou Valley. The administrations there were supposed to play an important role in organizing and managing community participation in the planning and decision-making process, but there was minimal involvement in truth¹⁰. In the study conducted by Li in 2006, she used two stories of local community involvement in tourism benefits as a tool to analyze the decision-making process in Jiuzhaigou Valley.

Prior to the late 1960s, this area was remote, inaccessible, and relatively undisturbed, though occupied by Tibetan farmers. Following intensive logging from the late 1960s to 1975, part of the area was protected as a Nature Reserve in 1978, since when Local communities with Jiuzhaigou Valley have adapted to various government policies. The local communities are original farming ones practiced largely subsistence agriculture, combining the raising of livestock with seasonal crop production and supplementing food supplies with wild plants and games. As a management goal in 1992 to progressively transfer local residents from employment in agriculture to scenic area protection has made it no longer

permitted to farm, now the local residents obtain their incomes either directly or indirectly from tourism⁵.

Then in Li's story, at the beginning of the development in the 1980s, every household in Jiuzhaigou wanted to develop a family hotel due to it was the main source of residents' income. And this generated to a chaos and negatively impact on local market competition. Conscious of this situation, the Jiuzhaigou administration took the cautionary step of requiring all family hotels to obtain a special permit from them. Each hotel could not have more than 45 beds, and the number was determined based on the actual number of tourists recorded. Also tourists were appointed to hotels by the administration and paid directly to the administration. At the end of each year, every family that operated a hotel would receive US\$ 6666 (for 45 beds) from the administration. According to her survey, most owners were satisfied with this arrangement. The other story is related to the Green Bus Company. In the 1980s, there were about 400 motor vehicles owned by local residents used for carrying tourists along the valley, which had negative environmental impacts in terms of noise, air pollution, and energy consumption. To reduce this impact, the administration introduced green buses powered by liquid gas instead of gasoline. Considering protect the benefits of the original vehicle owners, the company absorbed them as shareholders. As of 2000, around 90% of the shareholders were from the local communities.

As demonstrated by many successful case studies around the world, shared governance is recognized the importance of enabling legal and policy framework for conservation objectives and the most effective ways to mobilize conservation-relevant resources. One of its principle strengths is its flexibility to actively involve multiple stakeholders and decision-making relationships (IUCN, Governance Principles). So though in the context of China's historical heritage and political ecology it is difficult to develop such policies and to shift to practices that reflect shared governance of park resources together with local communities, it will be valuable to increase participation of local communities in terms of effective governance and management of PAs. As Wright's⁵ study in 2013 for example, she found out there would be huge potential for a much better

management of Jiuzhaigou Valley, if the government listened to the traditional ecological knowledge owned by local residents who had lived in the area for several generations and were thus very familiar with the landscape and its flora and fauna comparing to the administration staff. Older residents hold a great deal of knowledge about past and current distributions of plants and animals, as well as traditional and alternative land management approached, however, Wright found little evidence of local capacity building and power sharing based upon this knowledge.

Another benefit of local communities involvement lies on getting support from them. As analyzed in the China example: The politics of conservation in contemporary rural China (Lecture 5), lack of community support has adverse environmental effects: 'the local people would end up using wood resources from an area they'd been told was protected because they have no stake in the local area anymore or they're being displaced or really at odds with the national government.' Now in the case of Jiuzhaigou Valley, local residents explained in Wright's study that each village has a sacred mountain, where hunting, cutting and gathering herbs on the sacred mountain was (and is) not permitted. In the past, there would be more than ten people from the village acting as rangers to ensure that their mountain is protected, but now they no longer have time to protect the mountain because they have to take care of their business. And as analyzed in part one, illegal hunting and collecting herbs have become a great threat to Jiuzhaigou Valley. In general, local capacity building and power sharing was overwhelmingly absent in the governance of Jiuzhaigou Valley. While some of the residents described procedures and arrangements whereby they could contribute their idea regarding management of the park to the park administrators, they generally considered these arrangements to be ineffective⁵.

Management Plan

Due to the lack of scientific reports on the impacts of climate change on Jiuzhaigou Valley, there are only two identified issues: water loss¹¹ and forest growth reduction¹². Since 1980s, the water in the lakes of Jiuzhaigou Valley has

lost each year due to the reduction of precipitation which is caused by the abnormal change of summer monsoon and the decrease of cold air from North to South. Schwartz's study in 2013 conducted climate-growth analysis and found increased growth with cool temperatures in summer and fall. Warmer temperatures during the growing season could negatively impact conifer growth, indicating possible seasonal climate water deficit as a constraint on growth. Also slower growth with warmer growing season climates suggested reduced potential future forest growth. In addition, Jiuzhaigou Valley is being impacted significantly by human activities from tourism and some management plans are created to mitigate these impacts.

In 1986, the Management Plan for Jiuzhaigou Administration of Scenic and Historic Area was made. In 1995, the management plan for Jiuzhaigou National Nature Reserve was prepared by Sichuan Forestry Surveying Design Institute and Sichuan Inspection and Protection Station of Wild Animal Resources and was approved in April 1996⁹. A comprehensive list of 32 relevant laws is presented. 'Regulations concerning the World Heritage Sites in Sichuan Province' are planned. The responsibilities of the Administration Bureau, under the Aba Prefecture People's Government are to: (i) publicize laws & regulations; (ii) protect scenic area resources; (iii) coordinate in overall planning; (iv) control the construction of service facilities; and (v) work out rules for tourist security, environmental sanitation, and public security¹³. [SEP]

As for visitor management, in 1999, 227 low pollution "Green Buses" featuring trained World Heritage guides were initiated. The "Nurorlang Fast Food Restaurant" with a capacity of 3,000-4,000 persons completed in late 2002. An improved visitor and administrative center have also been built in 2001. An on-line ticket booking system for the site was put into operation in mid-2002. Since 2001, all sewerage from 32 refurbished toilets is "packed and moved to the sewerage farm outside the site every day¹³." According to IUCN mission's report¹⁴, the management authorities of this site has been effective in restricting hotel construction to areas outside of the property. Within the site, visitors have no option other than staying in small-scale tourist facilities established in the homes

of the Tibetan villagers resident. The management authorizes and the local residents have entered into an effective partnership, material and social conditions of the villagers have considerably improved, and economic benefits accrued through tourism has eliminated the need for natural resources exploitation. Despite these positive features, there's still need to improve its management plans to face the pressure of growing number of tourists and its associated negative environmental impacts. For example, the Bureau drew the attention of the Chinese authorities to the need to improve training of site staff so that they can better monitor and mitigate tourism impacts on the site. In last decade, the staff has changed to be more well educated and expertized, 3% of which have master or Ph.D. degrees, 2% of which have oversea employment experience, 74% of which have higher education background.. It attaches importance to exchanges and cooperation with renowned universities at home and abroad and carry out various forms of education and training activities regularly. Jiuzhaigou International Lab for Ecological Environment and Sustainable Development was established, which integrate domestic and foreign science resources to strengthen property conservation research building¹⁵. In the aspect of financial situation, founding is considered adequate which is mainly from Admission ticket sales. Separation of managers and fiancé, which means adherence to the two-line principle of revenues and expenditures, sustainable financial resources were ensured by the government¹⁵.

Overall, the management of the property was rated as largely effective by IUCN mission⁶. In the last decades since inscription of the property there have been major advances, particularly with respect to visitor and tourism management, and environmental monitoring and research. Some concerns remain regarding the capacity of the authorities to be fully effective in enforcing protection legislation and regulations. Of particular concern is the on-going pressure on the carrying capacity of the property and emergence of environmental and social impacts accompanying the growth of mass tourism. There is a need to extend the current training programs and enlist more well-qualified staff. More effort is also required to assess the biota and wildlife habitats of the property, and to implement policies and programs to mitigate detrimental effects of human

pressures while allowing greater recognition of the outstanding biodiversity values. Additionally, consideration should be given to ways of improving conservation management in the buffer zone and extending the boundaries, as well as regional landscape approach taken to conservation in the broader contiguous region⁶.

Challenges for the Future

With the conscious that environmental response to atmospheric warming is a major potential threat to the natural values of Jiuzhaigou Valley, there are several monitoring plans addressing this problem directly. Several scientific studies and research programmes have been conducted concerning the site in terms of global warming and forest pest and disease in recent years.

Jiuzhaigou Valley has been monitoring animal and plants populations since the late 1970's. Water monitoring of the surface lakes and streams began in the 1980's. However with the major increase in tourism since the 1990's aligned with a logging ban on the Yangtze river basin (of which Jiuzhaigou Valley belongs) and major changes in lifestyle for the rural Tibetans living in these areas, more focused and complex environmental monitoring was required. Thus in 2007, Jiuzhaigou Valley began the implementation of a new Integrated Monitoring System based on Geographic Information Systems mapping and database technology¹⁶, which provides a framework for the protection and management of the park, including a detailed monitoring plan for park resources. Water resources, biodiversity, forest pest and diseases, and weather and climate are all monitored under this plan. In addition, the plan provides for protection of biodiversity, traditional culture, and the environment under increased tourism development. As part of the monitoring and protection of Jiuzhaigou, the Science Department is intimately involved in collaborative research with both domestic and international universities and researchers. Important areas of research and monitoring include the evolution of Jiuzhaigou's tufa deposits; air and water quality; archaeology; meadow reforestation and biodiversity; and human-landscape interactions¹⁷. It's valuable to conduct these scientific research

and the results of these research projects will form the basis for new management policies. With the continuing growth in tourism, it's the urgent to make many remedial actions to control the effects of human activities based on the research and monitoring projects for the future.

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