

# We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

**4,800**

Open access books available

**122,000**

International authors and editors

**135M**

Downloads

Our authors are among the

**154**

Countries delivered to

**TOP 1%**

most cited scientists

**12.2%**

Contributors from top 500 universities



**WEB OF SCIENCE™**

Selection of our books indexed in the Book Citation Index  
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?  
Contact [book.department@intechopen.com](mailto:book.department@intechopen.com)

Numbers displayed above are based on latest data collected.

For more information visit [www.intechopen.com](http://www.intechopen.com)



---

# Creation of the New System of Management of Important Transition Zones in the Nature

---

Jing Tan, Tian Yan, Wang Shang-Wu  
and Jie Feng

Additional information is available at the end of the chapter

<http://dx.doi.org/10.577246057>

---

## 1. Introduction

The construction of ecology management system in natural ecological reserve (reserve) has been a long-term and complex project led by Chinese government. Its fundamental purpose is to protect natural biodiversity, save endangered species, maintain ecology balance, explore the means and approach of using rationally natural resources and ultimately to promote the harmonious development between natural ecosystems and human socio-economy. International management and protection of reserve is a multi-level ecosystem management and protection including the core zone · experimental zone · buffer transition zone · business district and living area. This idea has great significance to guide the management system construction of natural ecosystem in China.

Chinese western nature reserve system is well known for its characteristics such as large-scale, high-altitude, long-ecological transition zone and system vulnerability, which leading to the arduous task for government in natural ecological reserve protection and management, so the government usually attached more importance to the protection of the core and experimental zone, while relatively ignored the management and operation to transition zone. This situation doesn't meet the basic principles of natural ecological system protection and management of systematization, safety and integrity. Therefore, the most urgent priority is how to change the reserve excessive weak management present situation, save reserve biodiversity crisis, alleviate government management function pressure in future, which has important practical significance and long-term history meaning to ensure the natural ecological system security and integrity.

## 2. Section I The crisis and management system defects of the important transition zones of western nature ecology reserve

### 2.1. The crisis and pressure of the reserve transition zones

The transition zone is one of the important components of varieties of living organisms and the genetic variation patterns combination in the reserve biodiversity system. The 1997 statistics shows that the scale and amount of typical biology species transition zone in western region accounts for more than 80% of the nation totals <sup>[1]</sup>, which consists of hundreds of thousands of hectares of transition zones, such as Sichuan Wo Long Nature Reserve and its transition zone with more than 20 hectares; Thousands of hectares of transition zone, such as the crossing transition zone between Sichuan MiYaLuo Natural Ecological Reserve System and Sichuan Cao PO Provincial Nature Ecology Reserve System - ---- Mashan Village transition zone with 1110.2 hectares in Aba Prefecture. Sichuan Jin Fo Mashan reserve transition zone <sup>[2]</sup> with more than 900 hectares, etc.

However, these transition zones are facing double crisis in the long run, natural ecological security and system integrity crisis, the survival and development crisis from the transition zone community.

#### a. The Ecological Crisis Of The Reserve Transition Zone

The ecological crisis is mainly from three aspects which are as follows:

The first is the ecological crisis caused by Local residents' over-reliance on natural and ecological resources. Reserve transition zone residents are dependent on long-term eco-environmental resources for their livelihoods, thus the excessive deforestation and use leads to the fragmentation of biodiversity habitat, obvious reduction of biological species distribution, quick decreasing of herd numbers, species inbreeding and genetic heterozygosity falling; The excessive deforestation and use changed the forest composition and organic ecological relations among species, reduced the ability of resistance to diseases and pests for forest itself, increased the scale and frequency of forest diseases and pests occurrence, which made the transition zone natural forests appear many remnants, degradation even extinction. Such as recently decade, in China, 200 kinds of plants have extinct, 4,000 - 5,000 species of higher plants are facing threat, accounting for 15% -20% of total number of species. In China, the first batch rare and endangered plants published in the international convention have been up to 388 kinds of <sup>[3]</sup>;

The second is ecology crisis resulted from the traditional hunting customs of community residents and the increasing demand for wild animals and plants consumer market. For a long time, because the transition zone has been non-control zone, which resulted in its acquisition and poaching behavior is always rampant. In addition to, lots of treasure herbs and edible fungi are collected, and the 20 kinds of national first level protection animals (giant panda, golden monkey, tibetan antelope and so on) are being endangered. Only in a smuggling raid inspection of 1996 in Sichuan, 146 copies of giant panda skin were seized by them <sup>[4]</sup>.

The third is ecology crisis because of the community environment pollution in the transition zones. In this paper, the author's investigation indicates that the Sichuan Wang Lang national nature ecological reserve important transition zone ---- Ping Wu Guan Ba community and whose surrounding communities in Mian Yang City , and the Sichuan Miyaluo nature ecology reserve important transition zone----- Mashan in village in Aba Prefecture Li County and it's surrounding communities, face the waste and water pollution problems. And others data showed 44% of communities in the nature ecology reserve transition zones exist the garbage pollution diffusion phenomenon, 12% have the water pollution, 22% of the core area are suffering the direct threat<sup>[6] [7]</sup>.

#### b. The Community Survival And Development Pressure Of The Reserve Transition Zone

Most of Western Reserve transition zones not only belong to minority areas which are representative of Tibetan, Qiang, Yi and so on, but also locate the poor communities in which the socio-economic conditions are relatively backward. Statistics show there are nearly 300 national standard poor counties surrounding the 926 national reserves<sup>[5]</sup>. According to the 85 investigations into the reserves and their surrounding communities, the population size is 14000 averagely in protection zone, while the transition zone is about 59000. In terms of population density, the population density of 85 protection areas and transition zones is 5.75 persons / km<sup>2</sup>, which is 1.8 and 2.4 times compared with developed countries<sup>[8]</sup>. The survival and development pressure of transition zones is mainly from the following aspects:

The first is the pressure from cumulative increase of population. The long-term lenient family planning policy in these areas results in the obvious growth of population density and size for the three decades. Community residents have to live on subsidies relief and the original means of livelihood resulting from the inability to transfer and placement, when the government faces the pressure from community population cumulative increase.

The second is the dependence on ecological resources, excessive deforestation and hunting, which causes the area expansion of zoology forest, wasteland, mark place, and the frequent natural disasters such as regional climate, soil change and landslide. Therefore, some communities are facing the transfer pressure in the short run.

The third, Survival dilemma has resulted in the intensification of the contradictions between the conservation and community development. In some areas of the communities living in the alpine valley transition zone, farmers' own arable crop fails completely, due to water shortage, drought, soil fertility declination, decline in productivity as well as of human illegal logging and the destruction to wild animals; The lack of projects or technology, backwardness of transportation and educational and other factors make farmers be unable to save themselves; The difference of subsidies standard in different reserves transition zones cause the intensification of the contradictions among communities and governments.

## 2.2. The management system questions of the reserve transition zones

The geographical and scale characteristics of transition zones increase the protection difficulty of reserves. Statistics show that, by the end of 2008, China has established 2538 of

different levels of nature ecology reserves, and the scale of them amounts to about 148.943 million hectares, accounting for 15.5 percent of the land area <sup>[6]</sup>. Moreover the area of protection transition zone is larger, which has far exceeded the scale and level of developed countries.

The investigations into nature ecology reserve in 1997 and 1999 , as well as "sustainable management policy research report of Chinese natural ecological conservation area" held by the Man and the Biosphere National Committee in 2000, pointed out that the majority of our reserves exist universally some problems such as poor management, irrational use of resources<sup>[8]</sup> and so on, in the ecosystems protection, promotion the ecological all-round development, scientific research, popular science and other functions. This requires we have to review from the management system of nature ecology protection.

#### a. The Management System Defects Of The Nature Ecology Reserve

Facing of the ecological crisis and community survival development pressure in the reserve, government should make efforts mainly from three aspects: First, the government need take leading management system, taking "rescuing protection mode, first program after construction, perfection gradually"<sup>[9]</sup> management measures to carry out mainly compulsory management and protection on the core areas; Second, the government should take system and legislation to restrict economy development of the community surrounding transition zone; Third, it's important to take community relief and subsidies measures to relieve the conflict between protection area and its surrounding communities development. For example, the protection of rare animals such as giant panda and Chinese alligator core area is a kind of typical crisis rescuing protection.

Under the guidance of "rescuing principle" imposed by the Government, the management system adopted of reserve in China is the government-led and top-down arrangement. Namely, it is the management system combining the comprehensive management with departmental management based on the category management and classification management. The so-called category management is that the area was divided into two levels including core area management and the experimental area management in line with degree of importance to protected objects; The so-called hierarchical management means that the management institution is composed of nation, province, city and county according to the representativeness, importance and crisis degree of protected objects; The so-called management combining the comprehensive management with departmental management, is according to the regulations provisions 1 , paragraph 2 1 in the law of 《People's Republic Of China Ecological Reserves Ordinance》 and the regulations paragraph 8 in the law of 《Natural Ecological Reserve Ordinance 》 : "the state environment protection administration departments shall be responsible for the comprehensive management of nature ecology reserves. Nearly ten administrative departments: State Forestry Administration, State Oceanic Administration, Ministry of Agriculture, Ministry of Construction, Ministry of Land Resources, Ministry of Water Resources and Chinese Academy of Sciences is in charge of the relevant conservation area in their respective responsibility range."

In theory, this management system arrangement is nearly comprehensive and thoughtful. In fact, it will lead to some problems such as overlapping management, cross-management, bull management and poor management in practice. First of all, a reserve can be managed simultaneously by 4 levels management agencies and multiple departments, which will lead to duties fuzzy and duplication and making responsibilities move down. But the corresponding resources and right don't move down, which leading to the separation of powers and responsibilities, management responsibility dislocation, management dislocation or management absence. As a result, this system causes high management costs and poor management effect because of coordination difficulty.

Second, category management generally just takes care of the core and experimental areas, ignoring the management and conservation of the whole natural protection system. Thus transition zone of protection system appears lots of management vacuum.

Third, hierarchical management · bull management and cross-management increase system construction costs and ineffective implementation. Different departments are in charge of the same protected area, thus they will easily make regulations from their own management or interests due to the dislocation of system or management standards introduced by them. That's to say, legislation and regulation has become the way of sharing resources and the means of vested interests distribution among government departments.

#### b. The Contradictions Between Ecology Protection And Community Development Intensified By The Mandatory And Exclusive Management Mechanism

The so-called "mandatory and exclusive management mechanism", established under the government-led management mode, has unfavorable effects on the protection activities. On the one hand, it take the core area as the mandatory protection and the scope of subsidies, these compensation policies objectively broke the balance among communities, which will sharpen the conflict among communities as well as the government; On the other hand, the current management system considers government as the management subject, while rules out other social members especially community residents, which will make the government locate the helpless and passive situation in the long run. This likely leads to the opposition sentiment between the reserve and communities, thus many farmers don't care the illegal behavior even develop and utilize maliciously the natural ecological resources, so management and protection effectiveness isn't satisfactory.

#### c. The Lack Of Scientific Partition And Systematic Concepts In Reserves

The natural ecology reserve refers to the ecology systems composed of representative, typical and integrated biological communities and the abiotic environment. In line with the biodiversity and systematic features, the protection areas is identified as the ecology system consisting of the core zone, experimental zone, buffer zone, transition zone, business district, tourist area, living service areas and other functional areas.

However, China's reserve only contains core area and experimental zone. According to the policy, only core area is the focus of compulsory protection and resource allocation. While the important ecology transition zone likely become vacuum area, because it has not been



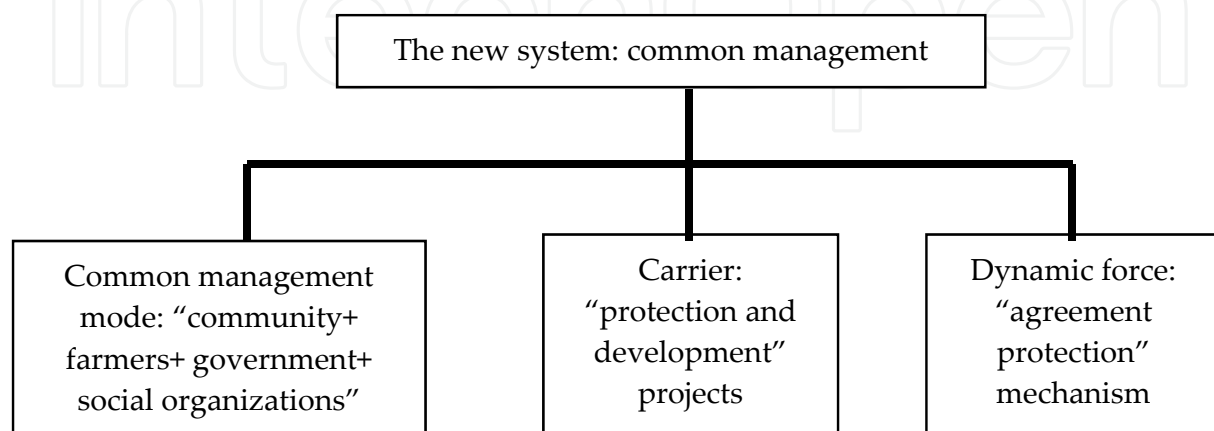
identified as the core area and the protected area. This kind of management thoughts isn't helpful for the development and balance of reserve ecology system, especially for the protection of important transition zone in the ecology system, which impacts directly on the integrity of the structure and function of ecology system.

Therefore, how to bring important transition zones into protection system? The author proposed the management system which introduces "Agreement Protection" mechanism based on project and brought farmers and social organizations into the legal management subjects, and they will participate in the protection with government together. This system can stimulate effectively the protection initiative and enthusiasm of community and social, ease the contradictions between the ecology protection and community development and functions pressure of government, ultimately, can resolve effectively the problem of subject vacancy of management system in western natural ecological reserve.

### 2.3. Creation the new management system of important transition zones in Chinese Western nature ecology reserves

#### a. The Basic Idea Of Creating Co-Management System Of The Reserve Transition Zone

Based on reserve transition zone crisis and the existing problems of reserve management system, firstly, the author believes that the reserve transition zone should be brought into the scope of protection and management to ensure the integrity of the ecology protection system; Secondly, community-based organizations and farmers in the transition zone also should be considered as the legal protection subject to make up for management system subject vacancy; Thirdly, on the condition of not changing ownership of state-owned ecological forest, let community-based organizations and farmers participate in the transition zone ecological forest management by the way of signing Agreement Protection based on projects. Simultaneously, in nature ecology Protection projections, entitle them some privileges such as information, participation, supervision and decision-making power to improve their host status and enhance responsibility consciousness in ecological protection; Create the new system (common management) of ecological protection in reserve transition zone (see Figure 1).



**Figure 1.** Common management system in natural protection reserve transition zone

b. Creation The New Mode Of Common Management: "Community+ Farmers+ Government+ Social Organizations"

The so-called common management mode: "community + farmers + government + social organizations" is that the government and community members consider the "Agreement Protection" mechanism as driving force to participate in jointly management such as the design, decision making, implementation, supervision and evaluation based on projects. The content of " Agreement Protection" agreed the common management rights, responsibilities and interests among "community and famers"(party a) · "government" (party b) and social organizations (third party), to form the interests joint through the resources integrity way, thus, the protection and construction tasks will be completed more easily. The focus of common management is target consistenc, interest-sharing, joint participation and risk-sharing. Compared with government-led mode, this mode has the following features:

1. Relying on community development projects

Common management mode regards a "Agreement Protection " projects as carrier, project target covers the transition zone protection target and community development goal, in details, including the international protection and development programs, the state development and poverty alleviation projects and new rural construction projects, especially GET (the global environment facility) aid projects (see Table 1).Projects aid agencies may be government and other social welfare organizations at home or abroad.

Projects type	Projects breakthrough point	Remarks
Economic development projects	Economic forest construction and its application; Ecological farming base construction; Ecological farm households tourism economic construction; Alpine ecological flowers construction; Special economic development projects	All kinds of fruit and vegetable planting base, medicinal plants base; Eco-bee breeding base; ecological poultry breeding base; Flower type ornamental and consumer base; Prickly ash and silkworm base, etc
Alternative Resource projects	Promotion and utilization of solar energy Digester construction and use Energy saving and environmental protection of life and production of construction Life and production construction of energy conservation and environmental protection	
Circulation resource industry construction projects	"Three links", human and livestock drinking water projects	"Three links" includes Water, electricity and road

**Table 1.** The coverage of community development projects



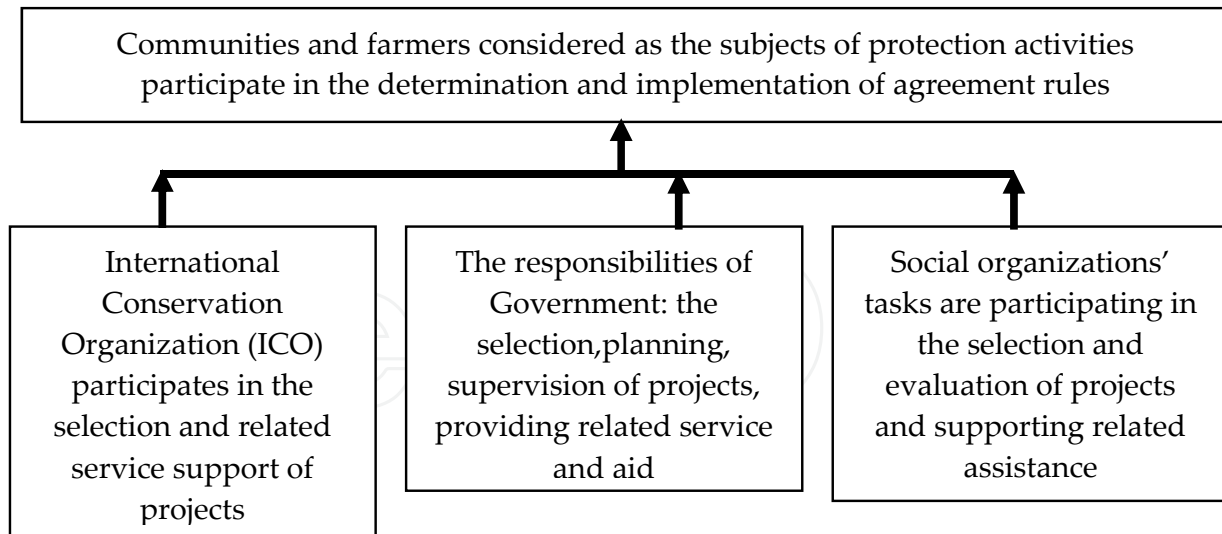
## 2. The main functions of “Agreement Protection” projects (see Table 2).

The functions of “Agreement Protection” projects	Specific tasks
The biodiversity management and protection of reserve transition zone	Eliminating of illegal logging and dredging; Eliminating illegal fishing; Eliminating foreign sabotage; Firewood cutting in accordance with provisions; Collecting the understory of grass and fruit, fungi, ferns and other non-wood products in accordance with regulations; Restrictive hunting wild boar and other destructive animals
Communities development	Infrastructure construction: human and livestock drinking project and new energy promotion, etc.; Rural economy construction: courtyard, fruit trees, rubber, walnut and other with local characteristics economic construction; Breeding and its processing; The new rural construction: electric light, TV ,phone, ecological toilet, rural cultural center construction, etc. The rural new practical technical training: planting and breeding industry, comprehensive prevention and control of disease, migrant workers’ skills training, women's ability construction, etc.

**Table 2.** The main functions of “Agreement Protection” projects

## 3. The subjects’ roles and responsibilities of co-management mode

The subjects of the common management mode include community-based organizations, farmers, government and social organizations. Government and social organizations are advocates and supporters of “Agreement Protection” projects. Community-based organizations and farmers are supporters and executors of “Agreement Protection” projects. First, the main responsibilities of the advocates and supporters: selection and determination of project, setting goals, drawing up jointly tasks with community organizations, providing project-related fund, materials and technical services; Second, community organizations and farmers considered as implementers participate in jointly the construction of project’s implementation plan, management mechanism and management system with the advocates and supporters. Third, the advocates and supporters provide services such as guidance, service, monitoring and evaluation on the progress and performance of project of “Agreement Protection” projects (see Figure 2).



**Figure 2.** Subjects' responsibilities of co-management mode

c. Establishment the Related Mechanism Of Co-Management "Agreement Protection"

1. Establishment the "Agreement Protection" Mechanism Of Co-Management

The so-called "Agreement Protection" mechanism of co-management doesn't change the structure of forest rights, it make ecology forest management rights and protection rights delegated or transferred to the communities and any other organizations or individuals who are willing to assume the protection responsibility to ensure community's development and security and integrity of reserve ecosystem. This kind of mechanism sets responsibilities, rights and benefits of interested parties in the process of management and protection by means of agreement, forms the co-management mechanism based on community organizations and farmers, supplemented by Government and other organizations.

2. Establishing various forms of incentive and restraint mechanisms based on local conditions

In accordance with economic development regulations, under the condition of avoiding greater risk, to meet effectively personal interests is the direct driving force of promoting economic development. Therefore, the effective compensation and incentive way has positive significance to encourage communities and farmers to participate in the protecting action actively.

Compensation mechanism is a kind of coordinating manner for government and social organizations to support and relieve community livelihoods and development. So how to transfer the compensation way into the incentive and constraint functions is critical to encourage community and farmers to complete initiatively the management and protection task.

d. Establishment Of Multi-Level Education And Technical Training Mechanism

Education and technical training plays a very important role for the "Agreement Protection" mode. The persistence of farmers' protection consciousness, awareness and conservation

actions on the transition zone usually can be reflected after education and training. For example, the provisions of contents and frequency of education publicity and the technical training in Mashan Village “Agreement Protection” project have achieved remarkable effect. Through education and technical training, farmers can really feel the importance of conservation actions on the ecology safety and community economic development, what’s more, they will truly feel a range of democratic rights and master consciousness in the community ecology protection activities. Therefore, the establishment of education and technical training mechanism provide objectively the most fundamental and powerful guarantee for the continuous process of protection action. In summary, the root of management and protection issues in reserve transition zone is existing defects of management system. Through the establishment of “Agreement Protection” mechanisms and co-management mode, the management and protection of reserve transition zone was transferred to communities and farmers. This kind of new system is not only helpful to transfer resources and role of communities and other social organization, but also useful to relieve the pressure from protection function of government. So it can effectively make up for the poor management and the absence of subjects in the management system of nature ecology reserve. Therefore, it is the new breakthroughs for further reformation of natural protection management system.

### **3. Section II The “Agreement Protection” mechanism and pattern of Western conservation transition zone**

#### **3.1. Background**

##### **a. Overview of the “agreement to protection”**

The "agreement to protect" research on Mashan Village of Li County, in Aba State, Sichuan Province (Hereinafter called as "agreement to protect" research) is raised by "Beijing Natural Landscape Protection Center" (Hereinafter referred to as "Landscape"). It advocates and encourages local governments to transfer collective woodland protection, and lets the community and the villagers participate in the protection action. The "agreement to protect" based on various incentives such as ecological compensation is aimed to expand the scope of protection, ease the contradiction between protection and economic development, and finally promote community socio-economic development.

Based on the “Mutual agreement protection” signed by the Forestry Bureau of Li County and the Landscape, the Mashan Village is chosen as the pilot village of “agreement to protect”. In December 2008, Forestry Bureau of Li County (Party A) and Mashan Village (Party B) signed the “agreement to protect” which continued from December 2008 to December 2010. According to the research requirements and conventions, we made mid-term evaluation in November 2009 and annual assessment in August 2010.

##### **b. The nature and purpose of the study**

Under the agreement, the implementations of the project are local government (Party A - Bureau of Forestry) and community residents (Party B - Horse Village community), and also

invite independent experts to Party A, Party B and the third party (the "landscape" donors) group involved in the assessment. The study includes the implementation of the matters specified, the agreement's impact on community social and economic development, and the agreement's effectiveness of community-based biodiversity protection etc..

There are three aspects of the study. Firstly, the study evaluated the effectiveness of the biodiversity conservation protection and socio-economic development; secondly, the study checked the process of the implementation, and provided an important reference for sustainable planning; thirdly, the study summarized the experiences and lessons of the protocol protected mode, timely detected problems and proposed recommendations for improvement, and finally provided technical support and enlightenment for the mode's demonstration and promotion.

### c. The purpose of the agreement to protection

Ecology, society and economy form a complete organic system, and there are close internal relations and interactions among them. Therefore, the eco-environmental protection and economic and social development of the Mashan Village should promote each other and complement each other. The research on "Agreement to protect" is based on interactions of ecology, society and economy, and the decisions are made for the following reasons.

1. To regulate and restrain the villagers' behavior we should strengthen the protection awareness of the villagers, and let them recognize the vital and long-term interests they can get from the protection of the ecology; Only the villagers agree with the purpose of protection, will they take the appropriate measures and actions.
2. To improve the quality of the villagers' living environment by the protection of the natural environment and the using of the new energy, we can improve the living and health conditions of Mashan Village, which will contribute to improving the quality of the living environment of villagers.
3. To provide financial compensation and maintain social stability. On the basis of the protection obligations and responsibilities on the villagers, we should provide financial compensation and spiritual encouragement to their protection behaviors. With a variety of compensation, we can resolve the contradiction between the protection and development, and fight for the win-win between community development and ecological protection.
4. 4) To protect and inherit Qiang culture. When it was designed, the agreement focused on the characteristics of the Qing culture and established cultural activity funds for purchasing necessary items, which provided important safeguard and support to the protection and promotion for national culture.

## 3.2. Natural and social status of Mashan Village

Observed from the perspective of the natural ecosystem's integrity and security, Mashan Village in Li County of Aba autonomous prefecture, Sichuan province, is a transition zone with great conservation value. Mashan Village is located in the arid valleys of the Hengduan

Mountainous and mountain forest Transitional Zone, the community is closed to the Wolong National Nature Ecological Reserve of Sichuan bordering on the Miyaluo Nature Ecological Reserve and Caopo Provincial Nature Ecological Reserve of Sichuan, which belongs to communities of Miyaluo Provincial Nature Ecological Reserve.

The topography in Mashan Village has created more abundant types of natural ecosystems, and gave birth to the rich resources of the species. Survey shows, there are 13 species of state emphatically protected plants and rare and endangered plants, 21 species of state-level protected wild animals and 18 species of state-level protected birds in nature reserve. The species of wild plants and animals under the first-grade state protection were *Fargesia spathacea* Franch, *Taxus chinensis*, *Rhinopithecus roxellanae*, *Ailuopoda melanolcuca*, *Panthera pardus*, *Panthera uncial*, *Moschus berezovskii*, *Moschus sifanicus*, *Budorcas taxicolor*, *Aqulia chrysaetos*, *Bonasa sewerzowi*, *Tetraophasis obscures*, *Lophophorus lhuysii* etc.

Mashan Village is a mixed village with Tibetan, Yi and Qiang where farmers rely on the natural environment, vegetation and animals, all of which are living resources of their lives. The nature ecological environment of community due to long-term deforestation, resulting in serious damage to vegetation, landslides, debris flows and other natural disasters, hillside planted almost reaped nothing. Over the past decade, local farmers mainly rely on government assistance. The farmers have not received ecological protection education and the technical training of the management and protection woodland, their unconscious awareness of participation in the protection of the ecological, turned a blind eye to community poaching, or even involved in illegal logging, all of which plunged the Miyaluo natural ecosystems security into a crisis.

How to change this situation, by whom or in what way to restore these damaged vegetation system? This section from the “agreement protection” mechanism and natural ecosystem co-management pattern of innovative practice, revealed that by optimizing the relations of production and a wider mobilization of social forces to participate in completion of the protection and management of natural ecosystems is the key to institutional innovation of the natural protection system.

### 3.3. “Agreement Protection” pattern and its characteristics

“Agreement protection” is a new mechanism for biodiversity conservation. The concept is proposed by the Conservation International (Conservation International CI). Agreement protection is the protection right that aimed at separating ownership from managerial authority of protective area on the premise of unchanged ownership of woodland. And then participation management and protection of subject whose responsibilities, powers and interest are consolidated in the form of “agreement”, and protection right and managerial authority are turned over to communities and farmers which promised to undertake management and the responsibility of protection, as well as any organization willing to undertake the responsibility of protection, and ultimately we achieve the goal of effective protection and development of natural ecosystems.



The author participated in the baseline survey and final research assessment of the project which called "Mashan Village in Xue town of Li County wild plants and animals agreement Protection projection" (hereinafter referred to "Protection projection") in Aba autonomous prefecture, Sichuan province in 2008 and 2010, considering that the "Protection projection" is a beneficial exploration of Nature Ecological Reserve transition zone joint management and protection system innovation, and very worthy of studying and summarizing.

a. "Agreement Protection" Pattern and Its Characteristics

Mashan Village's "Protection projection" operation pattern is based on the four subject containing community, farmers, government and society organizations which participate in operation pattern of joint management and protection (hereinafter referred to as "co-participatory pattern"). The pattern takes "Protection projection" as a support, the "agreement protection" as the ligament, agreed to communities with farmers (Party A) and Government (Party B) whose powers, responsibilities and interest in Protection projections. The basic features are as follows:

The first, the organization of the management of Protection projection is the common Management Committee including village committees and farmers representative of the Mashan Village, county-level Forestry Bureau and International Protection Organization; the second, the main role in the Protection projections: International Protection organizations are the sponsors and supporters of the project, county-level Forestry Bureau is the supporters and service providers of the project, communities and farmers are the specific actors of the protective action. The third, agreement protection content is developed by the members of the four parties and then was submitted to community farmers' general assembly for discussion to pass and practice. Fourth, "Protection" agreement clearly agreed responsibilities, rights and interest in order to make member's responsibilities and division clear. Under the framework of the agreement protection, county-level Forestry Bureau is responsible to assist the village committee of Mashan Village to build a conservation organizations and institutions including "patrolling management and protection group", "construction group of ecological forest and production forest", "oversight group of agreement Protection projection", "advocacy group of the national culture" and correlation protection institutions. International Protection Organizations and backbone of village committees are responsible for the coordination of Protection actions, and mobilize community residents' perceived protection and self-help management action and so on.

b. The Comparison of the "Agreement Protection" Pattern and the Government-led Pattern

1. Government-led pattern, in which government does as a dominant implementation of the protection and management of protected areas, and agreement protection pattern, in which the government, supporting and helping of social organizations, communities and farmers do as a dominant implementation of the protection and management of protected areas. Clearly defined communities and farmers are the main body of the natural ecological environment protection of community and the first responsible person status in the "agreement protection" pattern. The farmer should have right



relevant to the protection system to know, to speak, to participate, to make decision and management rights of democratic rights and civil rights, which completely changed the bystanders and saboteurs role of the community subject;

2. Agreement protection pattern changed the government-led functions. Government is no longer the only conservation managers in the reserve, but is important mentors, supporters and service providers of the ecological protection. Government provided adequate guidance, support and services to the protection action of communities and farmers, including construction of protection organizations, technical training, to guide management and provide appropriate compensation and activity funds. Moreover, through the guidance of the agreement Protection projection, the transition zone of protected areas is effectively integrated into the natural protection management system, which plays an important role to promote the integrity of the protected area system.
3. Agreement protection pattern introduce incentive and restraint mechanisms to encourage community farmers to join the protection action. Agreement Protection projection fully mobilize social resources ,establish various forms of incentives and constraints, assist Mashan Village community in establishing a stable monitoring and protection system, reward and punishment mechanisms implemented in the whole process of the protective action, not only have encouragement of material and spiritual dimensions but also incentives of technology, bonuses, and honors level. Moreover, it also provide with severe penalties to those who do not fulfill the agreement and not implement protection in accordance with the terms of the agreement. They can be used in the combination of incentive and restraint mechanisms, both simply and effectively.

In a word, "co-participatory protection pattern", on one hand, effectively gives the farmers a variety of democratic rights, increases their political status and enhances their sense of responsibility; on the other hand, objectively the effective means of rewards and punishments for the protective action which was smoothly carried out provide a mechanism guarantee and improve the farmers' enthusiasm, so this "agreement protection" pattern should receive good results.

### **3.4. "Agreement Protection "mechanism of Mashan Village**

The "agreement protection" mechanism through helping the government to transfer the protection rights of woodland to the community organizations and farmers and by means of ecological compensation or a variety of other incentives promotes biodiversity protection and management of the Contract Area.

- a. The Organizational Mechanisms and Decision-making Mechanism of Agreement Protection

Under the framework of agreement protection, Mashan Village firstly established organizational mechanisms and decision-making mechanism. In organization building, with the help of village committee, a organization carrier, it set up the "agreement protection" commission which is composed of governments, international protection organizations,

village committees and farmers representative and strengthened the management of community protection organization. In the decision-making on major events, the village committee organizes villagers to discuss and make collective decisions, put the provisions of the agreement protection into system regulations of pacts agreed and implementation. Such as farmers can gather the fallen leaves and withered woods freely and fell the trees moderately in their own lands; through resolutions and announcements of the general assembly of farmers, require the implementation of strict state-owned forests and collective forest protection and management is required, and prohibited the community and non-community farmers into the protected areas for illegal logging.

b. According to Local Conditions, Establishing Classified Management Mechanism

There are a total area of 1110.2 hectares in the protection zone of Mashan Village, involving 502.8 hectares collective forests land and 607.4 hectares state-owned woodland. In view of woodland species and current situation, the community takes in the charge of classified management and protection mechanism of forest land. First, the community regards the collective forests and state-owned woodlands destroyed or degraded as a "reforestation land", through hands out saplings technical aid replants and protects; second, regards the collective forests and state-owned woodlands in good condition as "protection woodlands" for strict patrol and monitoring; third, the community farmers have deserted its own forest land, through compensates walnut saplings and technical guidance to plant and develop economic forest.

The local Forestry Bureau provide technical training and guidance for the three types of woodland, and international protection organizations and government should give appropriate subsidies for protecting behavior to ensure that replanted forest saplings of the survival rate could be more than 90%.

The classification management and protection mechanisms not only can achieve the goals of protective project, but also help communities to build economic self-help system to solve the contradiction between ecological protection and economic development and inspire the communities to actively participate in the awareness and responsibility of the protective actions.

c. Incentive and Restraint Mechanisms Ensure the "Protection projection" Carried Out Smoothly

Mashan Village "agreement protection" pattern runs in accordance with the principle of the "who builds, who benefits, who protects, who benefits". The incentive and restraint mechanisms are the key to ensure the protective action continued orderly development.

1. Incentives mechanisms. " Agreement protection " lay down the incentives methods: First, incentives methods such as free distribute walnut saplings and provide cultivation technology training and guidance to help farmers to develop economic forest and injected "blood transfusion and hematopoietic" mechanism for forest property rights of farmers to stimulate recovery and development of eco-forest; second,

encourage community organizations to carry out publicity education activities of conservation actions by way of bonuses and honors; third, methods such as on-site technical training and passing on management experience are used to promote ecological forest protection and forest management; fourth, reward hard-working people and punish lazy people by way of labor subsidies to strengthen the organization and institutionalization of the patrol work to ensure that regulatory work is normal and orderly development; fifth, encourage the community to carry out national characteristics cultural heritage and conservation activities by way of presenting cultural and promotional materials. Sixth, timely periodic summary assessment in accordance with the requirements of the "Agreement", give a reward and honorary title to what are effective protective behaviors and encourage farmers to develop the initiative, consciousness, honor sense, pride of the community eco-protective behaviors.

2. Constraint mechanisms. Mashan Village has developed the appropriate discipline and penalties focusing on the work of supervision and patrol team: Firstly, lay down the rules of the patrol mission and the punishment method of deforestation behavior to restrain the lazy violations. Secondly, the behavior such as those who fail to complete the task on time and timely report and process when have problem, take measures of withholding and temporary withholding subsidies or bonuses, and formulate the stipulation of reorganizing the deadline. Thirdly, appraisal protection motion regularly according to the agreement, the condition such as woodland management and protection and fulfill the guardianship duty are not in place which temporarily have not reward, pending completion of the rectification and then reissue. At last, make strict rules for collective protection activities about the number of participants (higher than 51% of the village) and the number of participation times (more than 4 times / year), and collective rewards and punishments are linked.
3. The distribution of benefits mechanism. In order to defend the collective economic sustainable development and the sustainability of community conservation actions, protocol protection provisions, the expected return of 20% of walnut grove set-aside for collective provident fund which used to guarantee the healthy and sustainable development of community protection organization in the provision of agreement protection. The expected return distribution mechanism, fully affirmed the value of the existence of collective organization, embodies the concept which the organization led farmers to implement protection actions. Such an interest distribution mechanism, increase farmers' hope and enthusiasm for expected income.

### **3.5. The effect evaluation of Mashan Village "Agreement Protection " pattern**

5-7 August 2010, the authors carried out field research for Mashan Village "agreement protection" pattern. Before the survey they used a random number table, randomly selected 50 samples in the village 94 farmers of the General Assembly on the public, and at the same time took 30 samples as a standby; After three days of the household survey, observation, typical interviews and focusing discussion, we collected 54 valid questionnaires copies. Aiming at the discussion topics of research, the author selected 5 key indicators of data processing to form survey results.

- a. "Agreement protection" pattern promote the transformation of the socio-economic status of Mashan Village
1. "Agreement protection" pattern significantly increase the protection awareness of farmers

In the investigation, the author selected two indicators to study the change of protection awareness for the farmers, awareness and value of acceptance. The awareness is measured and assessed by the Protection projection, project scope, protected plants, village regulation and so on (see Figure3). The other is described through protective object, community organization, community culture and organizational activities and so on.

The survey results show that the farmers' protection awareness changes significantly. Implementation of the agreement Protection projection made communities and farmers show the master attitude to protecting responsibility and protective behaviors. Farmers have a clear understanding of the practical significance and long-term significance of the ecological protection behavior for themselves and the environment, farmers are willing to participate in patrol work, and they reached a consensus on the validity of agreement protection at 4 aspects.

The First, the natural disasters such as landslides, mudslides can be decreased by protecting forest land.

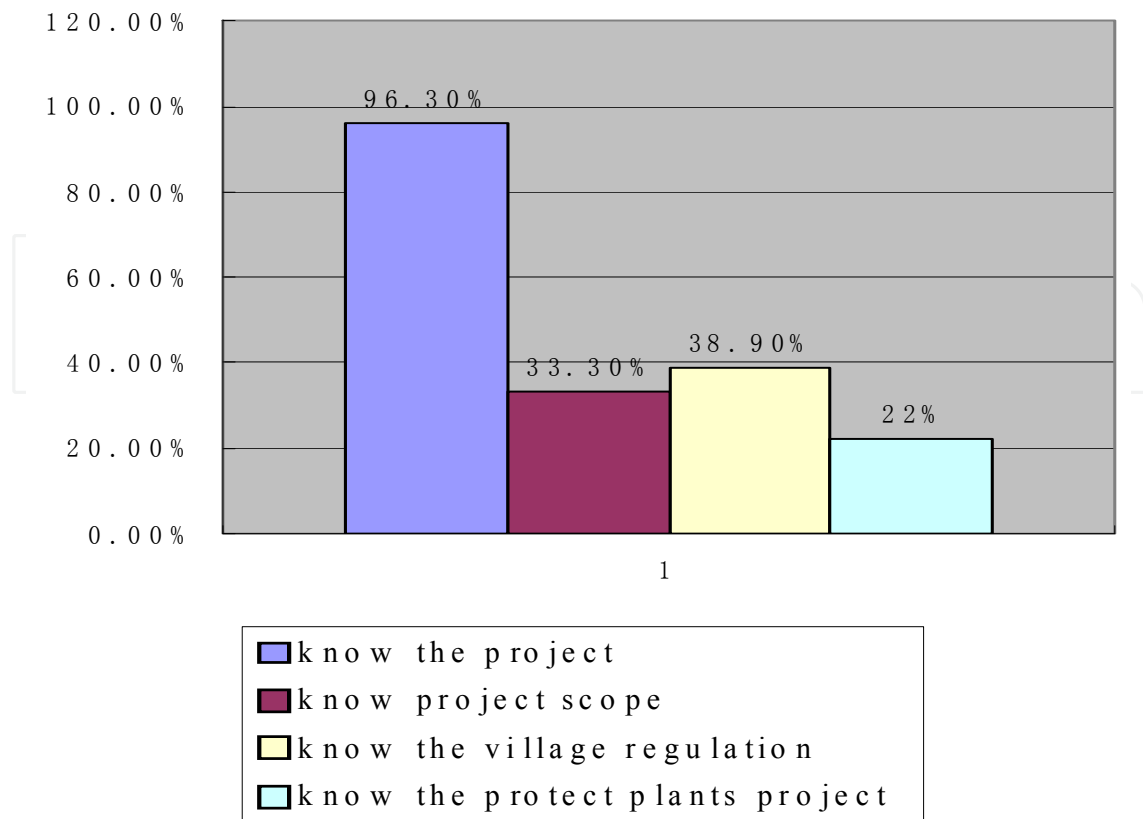
The Second, the forest land protection is our responsibility. We should do better on our own beneficial protection actions;

The third, the "agreement protection" pattern play a role in improving the natural ecological environment of the community. After two years of hard-working, community and ecological protection zone should be able to see more wild rare animals, and promote the economic development of tourism;

The fourth, the construction of Walnut economic forest is indeed a good project can benefit for the future generations.

2. The "agreement protection" pattern promoted the construction of community organizations system

Protection organizations is the most foundational and most important basic-level organization which mobilizes community farmers' positivity of protection action, organize publicity education, consolidate community the continuity of protection action, organizes publicity education, consolidates the sustainability of community protection action, and improve the protective effect. Because of the imperfect natural resource management system, as all rural communities throughout the country in the past, Mashan Village did not have protective organizations which allow community to participate. "Agreement protection" pattern promoted the system construction of community organization (see table 3).



Note: Combined with questionnaire and interview survey comprehensive data, ① 96.3% of the farmers know the “agreement protection” project and its content; ② 54.5% of the farmers think that the woodland should be protected by themselves, 34% of the farmers believe that the woodland should be protected by the government and farmers together, 11.5% is not clear. ③ 61.8% of the farmers think that once found the actions such as deforestation and poaching will resolutely put a stop; Data derived from the obtained first-hand information by the authors’ investigation

**Figure 3.** The awareness for studying protection consciousness

Method of data sources	Indicators: the construction of Organizations and institution
Interviews, Observations, Questionnaires,	The village regulation increased from 3 to 14, including the entire contents of community ecological protection and civilized behavior. Established 4 kinds of protective organizations: “the management and protection group of patrolling mountain”, “ecological forest and economic forest construction group”, “supervision groups of agreement Protection projection”, “advocacy group of national culture”. Put forward 4 systems and a require, that is “cultural propaganda system”, “management system of ecological forest and economic forest construction”, “supervision system”, "supervision groups rules and regulations", and “a claim to the management and protection group of patrolling mountain” .

Note: Data derived from the obtained first-hand information by the authors’ investigation

**Table 3.** Organizations and institutions building

The formulation of the organizations and systems effectively not only provide an important safeguard for participating, regulating and supervising protective actions, but also promise the way of making use of natural resources and management oversight, set up a woodland management and protection of technical training platform to improve the protection consciousness, awareness and capacity of farmers.

3. “Mashan Village” pattern improved the protection ability of farmers

The survey shows that the behaviors such as unauthorized felling bamboo, illegal hunting, forest destruction, digging herbs randomly, picking up mushrooms freely have not happened in experimental communities in 2 years; community farmers are able to moderate harvesting wood according to the provisions of the agreement protection and dependence on forest resources significantly reduced. The “agreement protection” pattern enhance the protection abilities of the community farmers (see table 4).

Method of data sources	Index: the change of the protection abilities
Interviews, Observations, Questionnaires, On-site assessments	The behaviors of random cutting scarcely appear during the term of agreement protection. 15% of the households use their own planting trees as part of live energy resources. More than 95% of the households use electricity to cook food and boil water, even a small number of villagers use solar power. Forest fires did not happen in the village during the term of agreement protection

Note: Data derived from the obtained first-hand information by the authors’ investigation

**Table 4.** The protecting abilities of farmers

4. The “agreement protection” pattern promoted economic conditions diversification of farmers

Under the joint efforts of governments and international protection organizations ,“agreement protection ” takes planting the economical trees as the breakthrough point to help the community farmers learned a variety of techniques such as woodland planting, management, disease prevention and patrolling to help farmers improve the value of knowledge of ecological forestry and the management level. In this paper, the author selected 4 indexes to research the changes of the economic development, that is the disposable income per household, living consumption expenditure per household, number of walnut trees per household and number of livestock per household(table 5).



Method of data sources	Index: the economic changes condition
Observations, Interviews, Questionnaires, On-site assessments	<p>100 walnut trees planted per family.</p> <p>Farmers attach great importance to the walnut forest expected return, after two years, and every single walnut tree can increase the income of ¥200 - ¥500. The average annual income of walnut tree per household can reach about ¥30 000 per household. After Walnut trees mature, the average annual income will also increase more than 10%.</p> <p>Approximately 85% of the rural households are no more engaged in livestock breeding, which caused the annual income will be reduced about ¥500- ¥1000 per household. Reduce farming income has little effect on livelihoods while plays a significant role in protecting ecology. The structure of households' income which changes from "Logging and hunting forest and products income + original planted income + the original aquaculture income" two years ago into "conversion of cropland to forest subsidies + post-disaster reconstruction subsidies + wage income + the original pepper and other forest income".</p> <p>The household disposable income reached ¥15,000- ¥35,000 per year right now.</p> <p>The average household expenditure is mainly education and living expenses, and other expenditure performance was not significant</p>

Note: Data derived from the obtained first-hand information by the authors' investigation

**Table 5.** The economic development changes of the farmers

The survey shows that the farmers' income structure has changed from aquaculture and migrant workers into the mainly farming gradually after the implementation of the "agreement protection" pattern.

- b. The "agreement protection" pattern promoted the protection and management of natural ecosystems
  1. Promoted the integrity of natural ecosystems. Transferred the transition zone of protected areas over to community to manage which can make up for the lack of traditional protected areas division and management system and also promote the returning to nature and integrity of protected areas ecosystems.
  2. Fill the subject vacancy in the law. Integrating the community farmers into the category of management' main body is the breakthrough point of the management system. This not only solved the problem of government's functions pressure and shortage of human resources, but also more important thing is that the transition zone transformed from the vacuum state to the protection state. Farmers effectively have the democratic status related to protection, which have far-reaching social and political significance.
  3. The management functions of government have changed. Government is no longer the protection functions that are monopolized, but is important advocates, supporters and service providers in the natural ecological protection. So they also look forward to the new mechanism to give a guarantee on the allocation of resources.

## 4. Conclusions

Mashan Village is a transition zone of protection areas which only have nearly 100 families and the transition zone area of 1, 000 hectares. The practical effect of the village in the implementation of the "agreement protection" pattern and mechanism is significant. First, it has expanded the area of the nature ecological reserves to alleviate the contradiction between the ecological protection, community production and economic development; second, it stimulated the protective awareness and consciousness of community organizations and farmers individuals, mobilized the ability of ecological protection and promoted the diversification of community protection organizations and personal relationships, enhanced the cohesion of the community farmers, responsibility and collective honor sense; Third, community and government are propelled to participate protection action together, objectively enhanced the positive interaction development of community ecology, economy, social; fourth, "agreement protection" pattern completely changed a single government-led management model. Similar to the major transition zone of topography and biodiversity of Mashan Village there are still have a lot in western china. Mashan Village "agreement protection" pattern provided creating the management system of nature ecological reserves major transition zone of western parts with strong evidence and basis.

## Author details

Tan Jing, Tian Yan, Wang Shang-Wu  
*Sichuan Agriculture University, Sichuan, China*

Feng Jie  
*Forestry Bureau Li County, Sichuan, China*

## 5. References

- [1] Wang Zhi, Jiang Ming-kang. Comparison of Chinese nature reserve classification with IUCN protected area categories. *Rural Eco-environment*,2004,(4)
- [2] Xue Qiao, Fan Hua. Try commenting on the relationship that Conservation Steward Program with Forestry Ecological and environmental protection of Li county. *Journal of Sichuan Forestry Science and Technology*.2009.Vo1.30, (3)
- [3] Liu Jian-Guo, M. Linderman. Ecological Degradation of nature reserves: The case of Wolong giant panda Nature Reserve. *Science*, 2001 (4)
- [4] Su Yang. The research and practice of harmonized development of the nature reserves and their ambient communities in West China. *Sustainable development in China*,2003(4)
- [5] Chen Hong-Mei, Research on the Legal System of Nature Reserve's Management in China[D]. HoHai university.2006.(2)
- [6] Li Yong-hua. Thoughts of Function and Intensive Management of Nature Protection Zone. *Ecological Economy*,2001,3,30~32

- [7] Zhao Jun. Defects and Improvements of Public Participation's Principle in Chinese Environment Law[J]. Environmental Science and Technology, 2005, 28(2).
- [8] Xia Shao-min, Yan Xian-wei. Management system of China's nature reserve. Journal of Zhejiang Forestry College, 2009, 26(1)
- [9] Han Nian-Yong. A policy study on sustainable management for China nature reserves. Journal of Natural Resources, 2000, 3, 32~37

IntechOpen

IntechOpen