

# ECOTOURISM IMPACTS ON LOCAL SOCIAL-ECOLOGICAL SYSTEM IN JIUZHAI VALLEY NATIONAL PARK, CHINA

YUAN TIAN

NORWEGIAN UNIVERSITY OF LIFE SCIENCES  
DEPARTMENT OF NORAGRIC  
MASTER THESIS 60 CREDITS 2012





**Ecotourism impacts on local social-ecological system  
in Jiuzhai Valley National Park, China**

**A Thesis submitted in Partial Fulfillment of the Requirement  
for the Degree of Master of Science  
(International Environmental Studies)**

**Norwegian University of Life Sciences  
Department for International Environment and Development Studies  
(NORAGRIC)**

The Department of International Environment and Development Studies, Noragric, is the international gateway for the Norwegian University of Life Sciences (UMB). The university comprises eight departments, associated research institutions and the Norwegian College of Veterinary Medicine in Oslo. Established in 1986, Noragric's contribution to international development lies in the interface between research, education (Bachelor, Master and PhD programmes) and assignments.

The Noragric Master theses are the final theses submitted by students in order to fulfill the requirements under the Noragric Master programme "International Environmental Studies", "Development Studies" and other Master programmes.

The findings in this thesis do not necessarily reflect the views of Noragric. Extracts from this publication may only be reproduced after prior consultation with the author and on condition that the source is indicated. For rights of reproduction or translation contact Noragric.

© Yuan Tian, May 2012

Peggyxiaoxiao@hotmail.com

Noragric

Department of International Environment and Development Studies

P.O. Box 5003

N-1432 Ås

Norway

Tel.: +47 64 96 52 00

Fax: +47 64 96 52 01

Internet: <http://www.umb.no/noragric>

## DECLARATION

I, Yuan Tian, declare that this thesis is a result of my research investigations and findings. Sources of information other than my own have been acknowledged and a reference list has been appended. This work has not been previously submitted to any other university for award of any type of academic degree.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **DEDICATION**

This work is dedicated to my husband and my parents for their endless love, understand and support, and to all the indigenous people in Jiuzhai Valley National Park for their great help and contributions to my research and thesis.

## ACKNOWLEDGEMENTS

I've already finished my master thesis, which means that my two-year master study in UMB is about to end. Although two years is not a long time in one's research life, my progress in each step during this time was inseparable with your concern, encourage and help. Thank you all from the bottom of my heart.

Thanks to Noragric and UMB, I can be provided this precious opportunity to learn knowledge in environmental science and to exchange opinions with students from many other countries all over the world.

My sincere thanks and great appreciation go to my supervisor Dr. Ian Bryceson. I'm deeply impressed by your extensive knowledge and rigorous attitude since the first time I listened to your presentation. The systematic theories and interesting stories in your lectures provided me with theoretical fundamentals and research inspiration. You led me into a vast field of environmental science, told me how to be a qualified researcher, encouraged me to overcome countless difficulties no matter in language or study, and guided me in research design and thesis writing step by step. For me, you are a kind person, an honorable teacher, a talented researcher and a nice friend. All the knowledge and research attitudes that I've learned from you will benefit me for my whole life. Thank you for all your invaluable help.

I would like to show my gratitude to Padina, Wei yuet and Yee yee. It is an honor for me to exchange opinions with you on many topics, and discussing with you was a great help for me to get a thorough understanding of different issues. All the information and suggestions from you was useful for me to adjust to life in Norway. Besides, thank Paulito and Tania for your help in learning Norwegian language, and thank all my friends in China and abroad for your warm caring and endless encouragement.

My special thanks goes to all the people who provided great help during my fieldwork in Jiuzhai Valley National Park. Thank Jinhai Ren for introducing me to the Science Department of Jiuzhaigou Administration Bureau and helping me get research permit. Thank Zeziman for introducing me to the indigenous people in Zha Ru Village and treating me like your own child. You are such a pious and kind person. Thank Zeluzuo, the lovely Tibetan girl who

guided me to the old He Ye Village, invited me to have dinner with your family and let me try on your own traditional Tibetan costume. Thank all indigenous people and employees who participated in my interviews, all tourists who spent time on answering questions in the questionnaire.

I'm forever indebted to my parents for everything that you have done for me. It is you who teach me to be a good student, a polite, upright, honest, optimistic, hard-working and responsible person. Time flies, ten years has passed since 2002 when I left you to study in university far away from home. Every time I go back home and stay for a short time, I feel guilty because I'm not able to accompany you for a longer time. Mom and dad, thank you for your endless love, deepest understanding and strongest support. I hope I will become a useful person for the family and the country as you expected.

Last but not least, I owe my deepest gratitude to my husband Jinchang Sun. You are always and will forever be my sunshine, giving me warm feelings. There is no need to say too much, but thank you for your love, encouragement and patience.



## **ABSTRACT**

Ecotourism, which is widely and rapidly developed all over the world, is nowadays regarded as an alternative to mass tourism. Jiuzhai Valley National Park is the native place for more than 1,000 Tibetan people, and has a long history of ecotourism development in China. Although it has been considered as a successful case, there was no status report of ecotourism impacts on local social-ecological system. This study investigated how the ecosystems were protected and affected by ecotourism development in this area, especially the impacts on biodiversity conservation and the freshwater aquatic ecosystem. The research also sought to present an impact assessment on the local community, including life style, religion, and degree of community participation. Qualitative methods were adopted as the main research approach, and quantitative method of questionnaire was used as assistance.

After ecotourism developed in the park, projects of reforestation and landslides control were observed to be helpful to minimize impacts caused by natural disasters on the ecosystem. However, the large number of tourists and lack of monitoring program have also caused negative impacts on biodiversity conservation and freshwater aquatic ecosystem, despite Jiuzhaigou Administrative Bureau (JAB) taking many other conservation measures. To indigenous Tibetan people, ecotourism development is a double-edged sword which has influenced their life profoundly. On the one hand, income growth and modernization of life style have improved the quality of local residents' life considerably, and Tibetan people are able to spend more money on participating in religious activities to strengthen their beliefs. On the other hand, cultural assimilation has occurred spontaneously, and loss of traditions in local community has become more and more obvious. Scarce local educational infrastructure is also a critical problem which has restricted young people's self-development. According to ecotourism principles, this study also explored the degree of indigenous people's participation in ecotourism, and the findings indicate that the degree of community participation in the park was still at primary level. Apart from sharing economic benefits through subsidies and employment, conservation of indigenous culture and knowledge, promoting social harmony and political involvement need to be strengthened. Community participation cannot be accomplished unless indigenous residents are involved in decision-making process. By assessing ecotourism impacts on ecological and social systems inside the park, the study applied resilience theories to provide further understanding that building resilience is the key factor for achieving sustainability of the local social-ecological system and ecotourism.

## **ABBREVIATIONS**

CNTA	China National Tourism Administration
CP	Community Participation
EIA	Environmental Impact Assessment
EU	European Union
IUCN	International Union for Conservation of Nature
JAB	Jiuzhaigou Administrative Bureau
LAC	Limits of Acceptable Change
RMB	Renminbi (Chinese currency)
SCTA	Sichuan Province Travel Authority
SES	Social-ecological Systems
TIES	The International Ecotourism Society
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNWTO	World Tourism Organization
WWF	World Wildlife Fund



# TABLE OF CONTENTS

DECLARATION.....	iii
DEDICATION.....	iv
ACKNOWLEDGEMENTS.....	v
ABSTRACT.....	vii
ABBREVIATIONS.....	viii
TABLE OF CONTENTS.....	x
LIST OF FIGURES.....	xii
LIST OF TABLES.....	xiii
1. INTRODUCTION.....	1
1.1 Research purpose.....	1
1.2 Objectives and research questions.....	2
2. LITERATURE REVIEW.....	3
2.1 Evolution of ecotourism.....	3
2.2 Tourism and protected areas.....	4
2.3 Ecotourism development in China.....	5
3. METHODS.....	7
3.1 Epistemological and ontological considerations.....	7
3.2 Research design and research methods.....	7
3.3 Sampling and data collection.....	7
3.4 Data analysis.....	9
3.5 Ethical considerations and reflection on research criteria.....	9
3.6 Research limitations.....	10
4. RESULTS.....	11
4.1 Research location.....	11
4.2 Background.....	14
4.3 Impacts on ecological system.....	18
4.3.1 Biodiversity conservation.....	20
4.3.2 Freshwater aquatic ecosystem.....	23
4.3.3 Questionnaire survey on tourists' perspectives.....	25
4.4 Impacts on social system.....	28
4.4.1 Life style.....	28

4.4.2 Architecture.....	34
4.4.3 Food.....	39
4.4.4 Costume.....	42
4.4.5 Religion.....	45
4.4.6 Education.....	49
4.4.7 Traditional knowledge.....	52
4.4.8 Income distribution.....	53
4.4.9 Degree of indigenous people’s participation in ecotourism development.....	56
5. DISCUSSION.....	58
5.1 Relationship between ecosystem conservation, tourists and JAB.....	58
5.2 Relationship between JAB and indigenous residents.....	61
5.2.1 Sharing economic benefits.....	61
5.2.2 Conservation of indigenous culture and knowledge.....	62
5.2.3 Promoting social harmony.....	63
5.2.4 Political involvement.....	64
5.3 Build resilience for local social-ecological system.....	64
6. CONCLUSION.....	67
7. REFERENCES.....	68
8. APPENDICES.....	75
Appendix 1 Interview guide.....	75
Appendix 2 Questionnaire 1.....	76
Appendix 3 Questionnaire 2.....	78

## LIST OF PICTURES

Figure 1 Framework of the study.....	1
Figure 2 Locations of Sichuan Province and Aba Tibetan Qiang Autonomous Prefecture.....	11
Figure 3 Location of Jiuzhai Valley National Park.....	11
Figure 4 The administrative hierarchy governing the four villages in Jiuzhai Valley National Park.....	12
Figure 5 Sites within Jiuzhai Valley National Park.....	13
Figure 6 Annual numbers of tourists from 1981 to 2011.....	16
Figure 7 Locations of trees after construction of wooden track inside the Park.....	20
Figure 8 Lichens in Jiuzhai Valley National Park.....	22
Figure 9 Footprints in the areas where Lichens were previously growing.....	22
Figure 10 Algae at the bottom of the lake.....	23
Figure 11 Plants growing on Tufa deposits.....	23
Figure 12 The Jade-colored Lake.....	24
Figure 13 <i>Schizopygopsis kialingensis Tsao et Tun</i> in the Panda Lake.....	24
Figure 14 Forms of transportation that tourists chose to reach the park.....	26
Figure 15 Tourists' perspectives on impacts caused by ecotourism.....	27
Figure 16 Chimneys behind restaurants.....	28
Figure 17 Garbage at the foot of the hill.....	28
Figure 18 Family private plot .....	31
Figure 19 Shopping center in Nuorilang Dining Hall.....	31
Figure 20 Airing hullless barley.....	32
Figure 21 Feeding chickens.....	32
Figure 22 The old He Ye Village.....	35
Figure 23 Traditional Tibetan building.....	35
Figure 24 The first floor for livestock.....	35
Figure 25 The second floor.....	35
Figure 26 Farming tools on the third floor.....	36
Figure 27 The ground for farming.....	36
Figure 28 Houses in Ze Cha Wa Village.....	37
Figure 29 Paintings on the periphery wall.....	37
Figure 30 Previous window.....	37
Figure 31 Current window.....	37

Figure 32 Two different Tibetan styles of living room.....	38
Figure 33 Living room of Han style.....	38
Figure 34 Houses of Tibetan people living outside the Park.....	39
Figure 35 Buttered tea.....	40
Figure 36 Butter.....	40
Figure 37 Hulless barley flour.....	40
Figure 38 Brick tea.....	40
Figure 39 Watermill house in Shu Zheng Village.....	42
Figure 40 Rice, vegetables and meat.....	42
Figure 41 Tibetan child with ordinary clothes.....	43
Figure 42 Current costumes of Tibetan young women and married women in the park.....	45
Figure 43 Long Da which is made of paper and cloth.....	46
Figure 44 Jing Fan in the old He Ye Village.....	47
Figure 45 Zhuan Jing.....	48
Figure 46 Prayer wheels in Shu Zheng Village.....	48
Figure 47 Stupas in Ze Cha Wa Village.....	48
Figure 48 Buddha in the stupa.....	48
Figure 49 Closed primary school in the park.....	49
Figure 50 Making an ox horn comb.....	53
Figure 51 Traditional Tibetan spinning.....	53
Figure 52 One household income distributions in Shu Zheng Village.....	55
Figure 53 One household income distributions in Zha Ru Village.....	56
Figure 54 Degree of indigenous people's participation in ecotourism development in the park.....	57

## LIST OF TABLES

Table 1 Important events for ecosystem conservation in Jiuzhai Valley National Park.....	19
Table 2 Basic information of tourists who participated in the questionnaire survey.....	25
Table 3 Advantages and disadvantages of previous and current life style.....	33
Table 4 Preference of different style of clothes in different occasions (%).....	44
Table 5 Income sources of households in Shu Zheng and Zha Ru Village.....	54

# 1. INTRODUCTION

## 1.1 Research purpose

Jiuzhai Valley National Park is at southeastern end of Minshan mountain range which is on the periphery of Himalayan Plateau. It is regarded as the “most biologically diverse temperate forest in the world” (UNEP, 2005), and it is also attractive for magic colors of water and traditional Tibetan cultures. It is one of the most famous tourist attractions in China and has always been considered as a successful case of tourism which depends on nature resources (Hendrickson, 2009). After it became the World Nature Heritage and Man and Biosphere Reserve, the number of tourists has increased incredibly fast since the beginning of 21<sup>st</sup> century. Although many measures have been taken either to limit the daily number of tourists or to reduce negative impacts caused by ecotourism, there has been almost no systematic research to evaluate positive and negative impacts on local social and ecological systems. Several researchers have pointed out the potential negative impacts caused by ecotourism, but these were difficult to assess. The purpose of this study was to evaluate ecotourism impacts on local social and ecological systems in Jiuzhai Valley National Park, because these impacts are pivotal for sustainable development of both ecotourism and local Tibetan society. Conclusions of this research may be helpful to decision-makers and to better future of nature and human in this area. A framework is established to help identify the interactions among different factors (Figure 1).

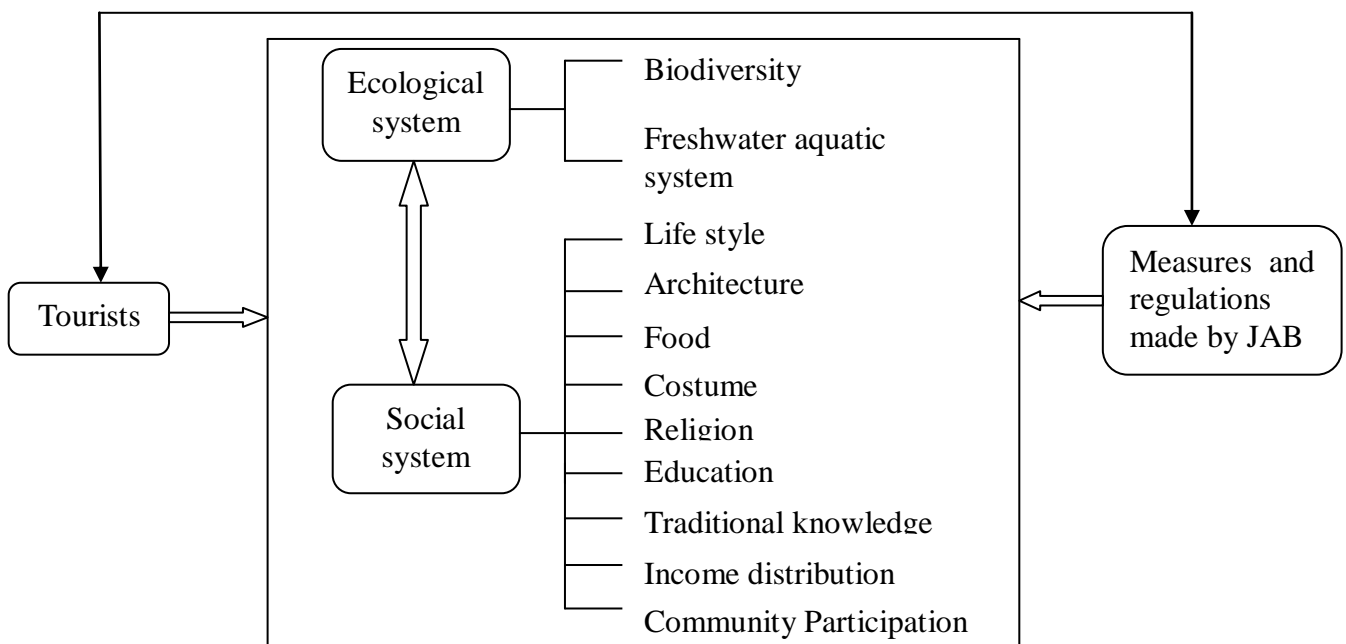


Figure 1 Framework of the study



## 1.2 Objectives and research questions

Objective 1: To evaluate impacts of ecotourism on ecological system in this area

- What are the impacts on biodiversity conservation?
- What are the impacts on freshwater aquatic ecosystem?

Objective 2: To evaluate social impacts of ecotourism in this area

- What is the degree of participation of indigenous people?
- How far they have been involved in ecotourism?
- What are the impacts on culture diversity?
- What are the impacts on people's traditional and indigenous knowledge?
- What are the main differences of households' income distributions in different villages?

## 2. LITERATURE REVIEW

### 2.1 Evolution of ecotourism

Tourism is a social product, and the definition of “tourism” was first seen in the Oxford English Dictionary which was published in 1811 in England (Ceballos-Lascuráin, 1996). According to World Tourism Organization (UNWTO), the general definition of tourism is that “tourism comprises the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited.” Over the decades, tourism has been developing rapidly; as a result, it becomes one of world’s largest industries (Neto, 2003). Economic benefits produced by tourism account for 4.4% of the world’s GDP (Eagles, et al, 2002). Nature-based tourism, which relies on the use of nature resources, has become an important sector of tourism economy even though it only accounts for 15% of all tourism (WWF, 1995). Due to negative impacts on environment and local communities caused by uncontrolled exploitation of nature resources in traditional mass tourism, a “sustainable tourism” which is environmentally responsible is considered to be needed (Ceballos-Lascuráin, 1996).

Ecotourism, which is a specific category of nature-based tourism, has developed in recent years with the aim of contribution to sustainable development (Ceballos-Lascuráin, 1996). The term “ecotourism” was coined by Héctor Ceballos-Lascuráin in 1983 (Butler, 1992), afterwards defined by IUCN, ecotourism is “environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features-both past and present) that promotes conservation, has low visitor negative impact and provides for beneficially active socio-economic involvement of local populations” (Ceballos-Lascuráin, 1993). The difference between traditional natural tourism and ecotourism was pointed out by Farrell and Runyan (1991), and the latter is considered to be “more exclusively purposeful and focused on the enhancement or maintenance of nature systems”. According to the Global Ecotourism Conference 2007 (TIES, 2007), principles of ecotourism include:

- Minimize impact
- Build an environmental and cultural awareness and respect

- Provide positive experiences for both visitors and hosts
- Provide direct benefits for conservation
- Provide financial benefits and empowerment for local people
- Raise sensitivity for host countries' political, environmental and social climate

Thus, ecotourism is considered to be a solution to reduce negative impacts caused by previous tourism (Diedrich, 2007). Besides, it also seems to be an alternative to mass tourism although there are some other marketing terms like green tourism used to take the place of mass tourism (Goodwin, 1996).

## 2.2 Tourism and protected areas

The International Union for Conservation of Nature (IUCN, 1994) defines protected areas as “land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means”. The areal coverage of protected areas has increased to more than 12,200,000 km<sup>2</sup> at the end of 20<sup>th</sup> century, which is more than ten times than that in 1970 (Zimmerer, et al., 2004). Among the 6 management categories of protected areas defined by IUCN, national parks have been more well-known than other 5 types. Since the first national park-Yellowstone National Park (USA) was established in the world more than a century ago, provision of recreational opportunities and inspiration has become the main purpose for creating protected areas (Ceballos-Lascuráin, 1996). Nevertheless, since IUCN indicated biodiversity conservation as an objective of protected areas in 1994, the thinking behind establishment of protected areas has expanded to biodiversity conservation and it is believed that this will effectively slow down the rate of biodiversity loss (Naughton-Treves, 2005). More recently, there has been a shift in the mission of protected areas to community development-“building active and sustainable communities based on social justice and mutual respect” (Gilchrist, 2003). Protected areas are expected for both biodiversity conservation and poverty alleviation to achieve sustainable development nowadays.

Since most protected areas have unique biological and culture diversity, they are definitely to be prime tourism destinations worldwide. Even though tourism has already produced some benefits, tourism has also caused negative impacts on nature and culture environment in protected areas. We have already encountered negative impacts on geological exposures, soils,

water resources, vegetation, animal life, sanitation, culture environment and landscape in some protected areas. There will be no big difference between tourism and ecotourism if it is not strictly managed and seriously controlled in the latter one (Cater, 1993; King & Stewart, 1996). Furthermore, since community development has been included in ecotourism, there will be more negative impacts on indigenous people and their cultures if there is a lack of correct and effective management strategies in protected areas (McLaren, 1998).

According to Buckley (1998), there will be easier options for management when the negative impacts have already been obvious. In reality, neither question will be asked nor do management strategies seem to be necessary until severe negative impacts have become apparent (Abigail, 1999). Although problems in protected areas concerning improper management actions and interrelated policies have been published (Schaller, 1994; Dompka, 1996), there is deficient quantitative information about both degradation and community development (Kramer, 1997; Stone & Wall, 2004). We haven't known much about whether or not protected areas achieve their goals progressively due to little research having been done on ecological degradation comparison before and after the establishment of protected areas (Liu, 2001). Besides, some researchers also criticize that there has been little research aiming to assess ecotourism impacts in protected areas (Ross, 1999; Stone & Wall, 2004).

### 2.3 Ecotourism development in China

China has been characterized as a “mega-diversity country” in the world (Mittermeier & Werner, 1990), however, tourism movements were opposed by the central government during the first decades after establishment of People's Republic of China (Yan & Bramwell, 2008). According to Deng Xiaoping's “Open Door” policy reforms in 1978, tourism was appointed the first “door” to be opened to the world (Xu, et al, 2008). Afterwards, tourism industry has been rapidly developing in China since Xiaoping emphasized the potential benefits generated by tourism for national economic growth (CNTA, 2000). Government considered it to be a good way “to achieve national and local economic development” (Yan & Bramwell, 2008).

Comparing to 34 protected areas in China in 1978, there are more and more protected areas established nowadays especially since the early 1990s when market economy system started to replace centrally planned economy system (Cheng & Wang, 2010), and the number of protected areas increased to be 1276 in 2000 (Li & Han, 2001; Li, et al, 2005). With number

of protected areas increasing sharply in the late 20<sup>th</sup> century, ecotourism has been introduced to China from the West (Ye & Xue, 2008). Unlike the general definition of ecotourism, Chinese have their own traditional way to interpret this new concept. Nevertheless, the main resources on which ecotourism depends are also natural resources and culture diversity in China, but Ye and Xue (2008) pointed out that “Chinese ecotourism resources are neither independent natural resources nor cultural resources absolutely, but organic combinations of both, which comply with the view of ‘the unity of man and Heaven’ in ancient China.”

China is one of the countries which have the largest system of protected areas with fastest growth rate in the world nowadays (Liu & Diamond, 2005). As a result, the number of visitors to protected areas has risen quickly, and 15.9% of protected areas in China have an annual number of more than 100,000 visitors (Li, 2005). However, few protected areas have a limitation to daily or annual number of tourists because they want to increase financial support for management and conservation. Most protected areas in China have financial problems due to insufficient funding from government (Li, 2004). Li and other researchers have also pointed out some other problems that protected areas are faced with in ecotourism development in China:

- (1) Monitoring of ecological systems is poor. Ecotourism is different from mass tourism because it is more environmentally friendly. However, nearly half of protected areas in China had completely no monitoring in 1997, and only a few had formal monitoring.
- (2) Local communities have many obstacles in participating in ecotourism. Besides, economic benefits from ecotourism are distributed unequally to households.
- (3) Some protected areas have already encountered unexpected negative impacts not only on ecological systems but also on local social systems.
- (4) Environmental impact assessment (EIA) is below the level that protected areas actually need for making management decisions.

### **3. METHODS**

#### **3.1 Epistemological and ontological considerations**

This study focused on understanding the multiple and complex relationships between nature and human in a specific social and culture context in which people are living and working, and the meanings of participants' experiences. "The goal of the research is to rely as much as possible on the participants' views of the situation being studied. The questions became broad and general so that participants could construct the meaning of a situation, typically forged in discussions or interactions with other people." (Creswell, 2009)

I used social constructivist view to do my research by going to visit this context and collecting data individually. The primary purpose of this study was to understand ecotourism impacts on local social and ecological systems and how participants perceive the changes in their lives. However, I also interpreted that all the findings and interpretation were "shaped by the researcher's own experiences and background" (Crotty, 1998).

#### **3.2 Research design and research methods**

It was a case study of ecotourism impacts in Jiuzhai Valley National Park. The target population was people who live and work in this area, including official workers and indigenous residents. The main methods that I used were qualitative methods; however, quantitative methods were necessary to assist me in indicating the unequal distribution in households' income between different villages in the park. Thus, a comparative research design with questionnaires was adopted to explore the differences.

#### **3.3 Sampling and data collection**

Due to specific culture context and official regulations in this area, convenience sampling was reasonable to help gather information. Participants were chosen on the basis of convenience and availability (Babbie, 1990). Then I used following methods for collecting data:

(1) Literature review: A literature review was conducted on previous research which has been

done in this area. The main sources of literature were journal papers, official reports and theses. Information about (potential) environmental impacts caused by ecotourism was the main secondary data that I've collected for this research.

(2) Observations: Ecotourism was opened in Zha Ru Valley in 2009 and the main appeal for ecotourists is rich biodiversity and immemorial Tibetan culture. However, tourists are not allowed to go into this valley individually without a professional guide. Thus, with an American family, I spent one day as an ecotourist following a guide from JAB to observe the current state of biodiversity conservation in this place, which was helpful to find out the negative impacts caused by ecotourists and ecotourism development.

(3) Participant observation: Zha Ru Village is one of the villages in Zha Ru Valley; however, none of these villages is opened for public. It is impossible for tourists except those with a professional guide to see those villages in Zha Ru Valley because there is no public tour bus go in that way. In order to find out the unequal distribution of households' income between villages opened for tourism (e.g., Shu Zheng Village) and not opened for tourism (e.g., Zha Ru Village), I spent almost two hours walking to the first village I saw from the entrance of Zha Ru Valley which is surrounded by six mountains, and average elevation of the mountains is higher than 4,000 meters. I went to ask a Tibetan woman to make sure whether that village was Zha Ru Village, and she was surprised to know that I walked to this village individually without a professional guide. Besides, she shed tears when she saw the hot sun made me sweat profusely. What a kind person! Then she invited me to have a rest and a cup of traditional Tibetan tea at her home and we had a nice talk with each other that day. She became the "gatekeeper" who helped me get access to other households in this village afterwards. In the end I realized that it was dangerous to walk alone to Zha Ru Village because there are wild boars in Zha Ru Valley.

(4) Semi-structured interviews: For the first research problem, two tour guides (because there are only two professional guides in JAB) who help ecotourists hiking through Zha Ru Valley and another five non-staff indigenous residents were interviewed, which was based on their willingness to participate. For the second research problem, six residents from each village were included for face-to-face interviews. Among the six residents in each village, half were employees in JAB and half were non-staff residents. Besides, another six local people from different households which are outside of the park were also chosen for interviews on this

topic. All the participants are older than 30 years because they have actually experienced the differences in livelihoods since the establishment of this park. In order to get the honest self-representation perspectives from the participants, interviews were open-ended with a semi-structured interview guide (see Appendix 1). For the comparative study, although focus group seemed to be a good way to understand participants' perspectives, it was difficult to do in that specific context because of language barrier. Therefore, quantitative methods were used as assistant. 15 questionnaires (see Appendix 2) were distributed in Shu Zheng Village and Zha Ru Village separately. However, I found that it was difficult for indigenous people to read in Chinese although some of them could speak fluent Mandarin. Then I changed questionnaire with structured interview, and each participant could answer just the same questions in sequence.

### 3.4 Data analysis

Data analysis of qualitative methods in this study was inductive. However, Marshall and Rossman (2006) indicated that the process of data analysis should be going on simultaneously with gathering data in qualitative research. Therefore, notes taken from interviews were transcript in Excel and Word every day. Diagrams were generated by Excel based on questionnaires after comparative study to illustrate the unequal income distribution in Shu Zheng and Zha Ru Village.

### 3.5 Ethical considerations and reflection on research criteria

Since I collected data from indigenous people and their perspectives were the main sources for my research to generalize social impacts caused by ecotourism in this area, ethical issues needed to be considered carefully before I went to the field. First of all, the research problem I chose to do is to benefit target population who was studied, rather than "further marginalize or disempower the study participants" (Creswell, 2009). Secondly, I respected every participant and her/his background and culture, and I never put anyone at risk during data collection. Thirdly, all their responses will be kept confidential and I guarantee that their names will never be identified to the public at any time and all their personal information will not be given to anyone else.



### 3.6 Research limitations

This study was based on observations and interviews with officials, tourists and indigenous people during my fieldwork. Since the main research methods used in this study are qualitative methods, most results are to be exploratory and tentative. Then the external validity, ecological validity and reliability of this study may not be strong. However, I've tried to present clear procedures used in my research for it to be replicated. The size of sample was difficult to be large because trust with participants was not easy to build and honest self-representation was hard to get in a short time especially, when the participants and I have quite different cultural origins.

Language barrier was another difficulty during my work. Almost all young Tibetan residents and those who are younger than 60 years could speak not only Tibetan language but also fluent Sichuan Dialect. However, residents who are older than 60 years could speak only Tibetan language. Since the perspectives of this group of people were quite important for my study, a translator was needed during interviews with those old Tibetan residents. This probably influenced the accuracy of my comprehension of the participants' perspectives to some extent.

Due to the specific cultural context, it was difficult to tape recordings during interviews with a part of ethnic indigenous people. Therefore, information that I obtained from taking notes was incomplete. Besides, subjectivity was inevitable not only in understanding participants' conceptions but also in my own observations, especially in the initial period of my research because it took time for me to get used to this specific cultural context.

Altitude sickness was the biggest obstacle that I've experienced during my fieldwork and it was also the most difficult one for me to overcome. It happened when I was climbing up Zha Yi Zha Ga which is the "King of all Mountains" in Tibetan language. I wanted to know more about this holy mountain and get more information about biodiversity conservation; however, I had to give up in the end although I had tried to overcome many times. This was unfortunate because I wanted to know more about vertical distribution of biodiversity in this mountain, and I wanted to know the current situation of biodiversity conservation after ecotourism developed in Zha Ru Valley.

## 4. RESULTS

### 4.1 Research location

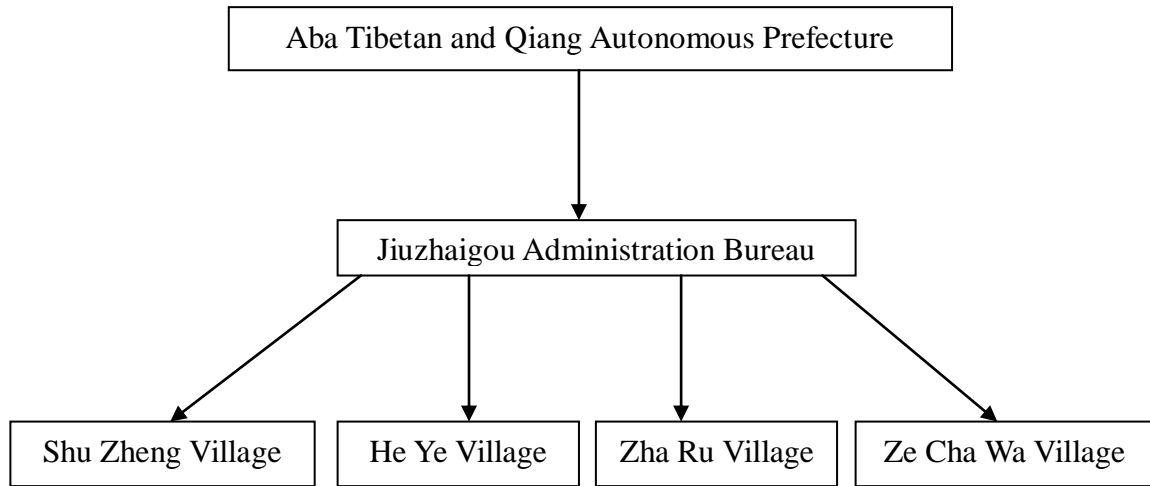


**Figure 2 Locations of Sichuan Province and Aba Tibetan Qiang Autonomous Prefecture (From Wikipedia)**



**Figure 3 Location of Jiuzhai Valley National Park**

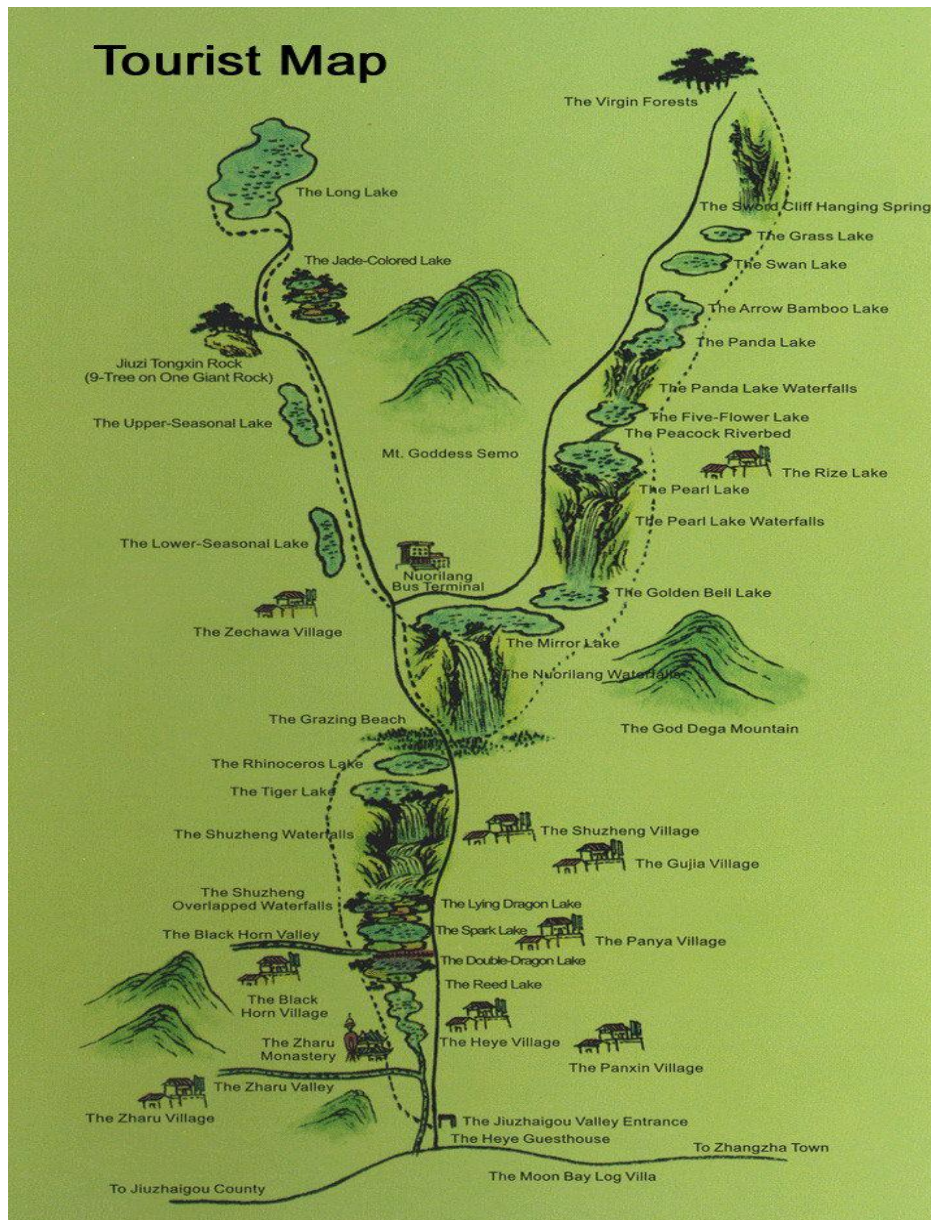
Jiuzhai Valley National Park, also known as Jiuzhaigou National Park is located in Aba Tibetan and Qiang Autonomous Prefecture, northwest Sichuan Province, southwestern part of China (Figure 2). It is also at the southeastern end of Minshan mountain range, which is on the periphery of Himalayan Plateau. Aba Tibetan and Qiang Autonomous Prefecture include Jiuzhaigou County (previous Nanping County and other 12 counties, and Jiuzhai Valley National Park is in Zhangzha Town of Jiuzhaigou County. The park is governed neither by the government of Zhangzha Town or Jiuzhaigou County, but it is governed by Jiuzhaigou Administration Bureau which is directly under the government of Aba Tibetan and Qiang Autonomous Prefecture (Figure 4).



**Figure 4 The Administrative Hierarchy governing the four villages in Jiuzhai Valley National Park**

The park covers over 72,000 hectares as well as 60,000 hectares buffer zone, which extends from East Longitude 103°46'-104°4' and North Latitude 32°51'-33°19'. The elevation varies from 1,996 m at the entrance to 4,764 m at the peak of Ga Er Na Feng Mountain in the park. Jiuzhai Valley belongs to geographical and climatic temperate zone of the Earth, so it has warm wet summer and cold dry winter with an average annual temperature of 7.3°C, humidity of 60% and a total rainfall of 761mm (Jiuzhai Valley National Park Website).

“Jiuzhai” means nine villages in Chinese language. The park was named after nine old Tibetan villages in this area: He Ye, Jian Pan, Ya Na, Pan Ya, Guo Du, Ze Cha Wa, Hei Jiao, Shu Zheng and Re Xi (Zha Ru). Nowadays the majority of indigenous Tibetan people inhabit the four villages of He Ye, Shu Zheng, Ze Cha Wa and Zha Ru, and there are approximately 1,000 permanent indigenous Tibetan people constituting about 110 families in all villages ( Jiuzhai Valley National Park Website).



**Figure 5 Sites within Jiuzhai Valley National Park**

(From <http://www.intowestchina.com/NewsRead.asp?ArticleID=283>)

There are three main valleys along the route of the tour buses (Figure 5). Shu Zheng Valley where He Ye Village and Shu Zheng Village are located is the first valley that tourists encounter from the entrance. Nuorilang Waterfall is the center of the park and the Y-shaped junction of the three valleys. Northwestern route from Nuorilang is Ze Cha Wa Valley where Ze Cha Wa Village is located while northeastern is Ri Ze Valley without indigenous residents. Besides, there is another valley where Zha Ru Village is located in this park, but there are no tour buses in that part. Zha Ru Valley has been open for ecotourism since 2009, but most tourists cannot get access to Zha Ru Valley except a small number of ecotourists who are guided by professional guides from JAB.

## 4.2 Background

In order to answer the call of Chairman Mao (Pan, 2005), many people went to mountain areas contributing to livelihood improvement and economic development of rural places in the 1960s in China. In Sichuan Province people started to exploit forests and other nature resources to stimulate economic growth in Aba area where indigenous people had completely relying on nature resources and traditional agriculture to survive, and Jiuzhai Valley was one of the woodlands for lumbering at that time. However, the Great Proletarian Cultural Revolution took place all over China in 1966 when Jiuzhai Valley had been logged for six years. There were no more lumbering activities in the following ten years in this area due to that great political movement.

An investigation team which belonged to the Conservation Division of Ministry of Agriculture, Forestry and Fishery started to do a survey in Jiuzhai Valley area in 1975. Then Wu Zhonglun who was the deputy president of China Academy of Forestry made an overall analysis of nature resources status in Jiuzhai Valley in the same year. Then he submitted a written statement to the Government of Sichuan Province and Sichuan Forestry Department, in which he made a strong request that this area should be well protected because it was a miracle of nature landscape on the earth. Therefore, any kind of logging activities was prohibited within an extent of 200 meters of Ze Cha Wa Valley and Ri Ze Valley, which was the first conservation measure made by former Nanping Forestry Bureau for this area (Zhang & Lan, 2003).

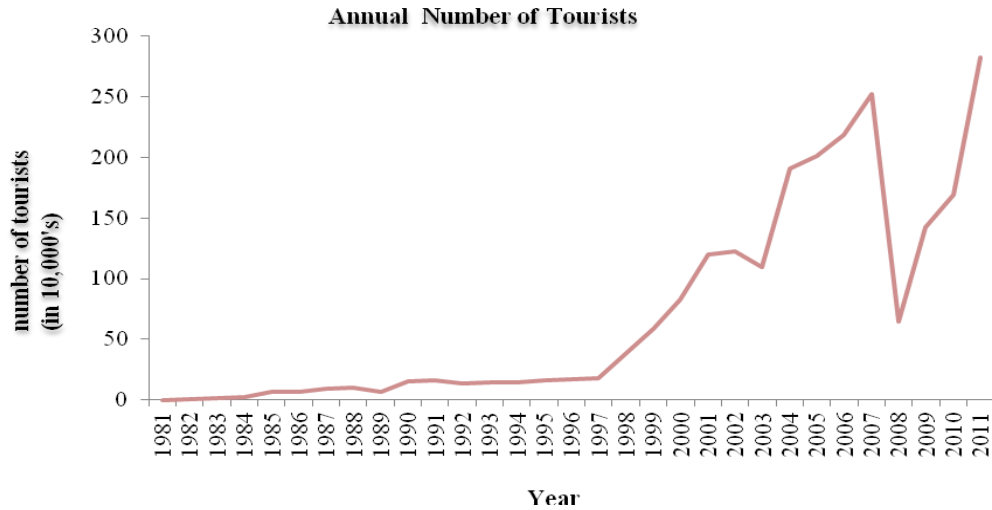
Establishment of Nanping Jiuzhai Valley Nature Reserve was first announced by State Council of China on December 15<sup>th</sup> of 1978, and all logging activities were banned in Jiuzhai Valley from then on (Zhang, 2003). Afterwards Jiuzhai Valley became a national park in 1982, which was confirmed by Chinese State Council. Then Jiuzhaigou Administration Bureau was established by Sichuan Forestry Department and Nanping Forestry Bureau in 1984, and the park with unique landscape started to open for tourists in the same year.

The number of tourists in the first year after establishment was only 5,000 and Jiuzhai Valley National Park was not well known to tourists from China and abroad in the first decade until 1992 when it was announced World Nature Heritage by UNESCO. Besides, travel time from Chengdu, capital of Sichuan Province to Jiuzhai Valley was reduced from 48 hours to 12

hours by bus owing to improvement of highway in 1989. A few more people got to know this place and it was the initial and exploring stage of tourism development in this park.

In 1997 the park was designated as Man and Biosphere Reserve by UNESCO. Meanwhile more local people and investors from other places of China participated in the operation of restaurants and hotels or hostels outside the park at the end of 20<sup>th</sup> century, which lead to a sharp increase of tourists' number from 1997 to 2001. The total number of tourists was 1,197,540 in 2001, and the largest daily number even reached 30,000 in peak season (Ren, 2004). A new provision was made to limit daily number of tourists within 12,000 as soon as possible although it was the first time that the annual tourist number was more than one million.

Certificated by Green Global 21 in 2001, Jiuzhai Valley National Park became the first tourist district which has been approved by Green Global 21 in Asia and became one of the most popular tourist destinations in China. However, there were no more choices to travel to this park except a 10 hours' journey by bus from Chengdu and it had high risk to drive on hilly roads into mountain area during rainy season, which was the main obstacle to attract more tourists. Thus, construction of Jiuzhai Huanglong Airport was of great importance for tourism development in Jiuzhai Valley National Park as well as in Aba Prefecture. It was the first airport in Aba area and the sixth highest airport in China with an elevation of 3,447 meters (Sichuan Jiuzhai Huanglong Airport Website). The airport is 88 kilometers away from entrance of the park and put into service on September 28<sup>th</sup> 2003. Then it was much more convenient for tourists to travel by direct flights from Chengdu, Chongqing, Xi'an and other four cities to the park. With the fast increasing number of tourists after the new airport constructed, number of tourists reached 2.52 million 2007 (SCTA, 2011). Unfortunately the Great Wenchuan Earthquake occurred in May 2008 in Aba Tibetan and Qiang Autonomous Prefecture, which gave a deathblow to tourism in this area and Jiuzhai Valley National Park was no exception. Although the park was not heavily affected, there were only 700 tourists in the following month after the earthquake and the total annual number of tourists decreased 74.5% than the previous year. However, with ecotourism opened in Zha Ru Valley in 2009 and many other measures taken to stimulate tourism recovery in the park, it is still one of the most favorite tourist resorts in China nowadays.



**Figure 6 Annual numbers of tourists from 1981 to 2011**  
**(Data from Ren, 2004 and SCTA, 2011)**

Ecotourism has not developed in Zha Ru Valley until 2009 when indigenous residents in other valleys have got economic benefits from tourism development for decades. In order to earn more money and improve living conditions as people in other valleys, villagers in Zha Ru Valley started to make business by taking snapshots or lending Tibetan clothes to tourists in other valleys. I did not understand why not to develop tourism in this valley until an employee who is working in the Department of Science and Research and now in charge of ecotourism in Zha Ru Valley told me the reasons:

The main reason that Jiuzhai Valley became a famous national park is because there are so many beautiful lakes and waterfalls inside. However, all of these are in other three valleys except Zha Ru Valley. Zha Ru Valley only has high mountains, thick forests, high biodiversity and old villages, which are not attractive to tourists especially domestic tourists at all (unlike tourists from abroad, the majority of Chinese people do not regard the landscape in Zha Ru Valley as beautiful landscape). Thus, no one was confident in developing tourism in this valley until 2002 when the deputy chief of JAB proposed to develop ecotourism in Zha Ru Valley for the first time. He was an indigenous resident in Zha Ru Village and he believed it was an excellent place for original ecotourism because tourists could go hiking and camping there while it was impossible to do in other valleys. Unfortunately, he was appointed official worker in other place before he could conclude an agreement with all villagers on ecotourism development in Zha

Ru Valley. There were no more people who were willing to take charge of it although it was proved to be feasible by specialists retained from famous universities and research institutions. A volunteer who came from Australia submitted a proposal about developing ecotourism in Zha Ru Valley again in 2009. The chief of JAB approved this suggestion quite unexpectedly, thus, ecotourism has started in Zha Ru Valley since July 2009. However, it was not as popular as expected in the following half year and the total number of ecotourists from July to December in 2009 was 88. There were several reasons for it. More than 90% of tourists were from Europe or America since few domestic tourists are interested in such original ecotourism, such that good English language skills are the basic requirement for tour guides. Besides, it is a hard work to guide tourists hiking and camping in this valley, which requires good physical fitness of a tour guide. Thus, there were limited people who were able to be tour guides in Zha Ru Valley, and some of them gave it up after several months because they said that the work tired them out. There are only two professional tour guides including me in JAB now so camping activity has to be cancelled temporarily. We usually arrange one day's activities for each group of tourists instead of the previous arrangement of two days' and four days' activities, since there are not enough tour guides. Each group should have at least three people and it costs each tourist 380 RMB. The contents of one-day ecotourism in Zha Ru Valley include: (1) brief introduction of history and administration of this park before entering the park; (2) brief introduction of traditional Tibetan culture on the way to Zha Ru Village; (3) we show them around Zha Ru Village and sometimes we also show them traditional Tibetan spinning in a household; (4) introduction of some invaluable or endangered plants during hiking in Zha Yi Zha Ga Mountain, which includes the origins of those plants' names, the habits and uses of plants, why they are invaluable; (5) take a break and have lunch in a settled rest area before turning back.

Although there were 315 tourists who came to Zha Ru Valley in 2010 and it is estimated that there will be more than 500 tourists in 2011, there is still a gigantic gap of ecotourism development between Zha Ru Valley and other three valleys. Besides, there is another gap of economic income between people in Zha Ru Valley and other valleys.



### 4.3 Impacts on ecological system

From the first conservation measure with the aim of anti-logging in the area in 1978, many efforts have been made to protect ecosystem within the park especially after establishment of JAB (Table 1). The first one after it became a national park was a project for controlling landslides since the park is in mountain area and such landslides occur frequently in summer. Moreover, it would be difficult to develop tourism if tourists' personal safety could not be guaranteed in the park. This big important project has lasted for 15 years since 1984, which was commanded by Sichuan Province People's Government directly. There were 50 small slit dams, sand dams, horizontal grided dams, drainage dams and check dams constructed in 30 valleys in the project, as well as a 500 meters' groove for flood drainage and two small bridges (Zhang, 2004). The project was not only a great help for maintenance of ecosystem, but also played an important role in reducing damage by landslides to tourists, indigenous people and villages in the park.

Reforestation is a crucial way of reducing soil erosion, and it is also an effective way to control landslides. The park was likely to suffer soil erosion after 6 years' heavy logging. Thus, reforestation activities were greatly encouraged by JAB and local people were prohibited to cut trees for cooking, lighting and heating at the same time. Thousands of hectares' farmlands have been converted into forests, which was of great significance to stability of water bodies and maintenance of ecosystem inside the park. Nevertheless, the number of tourists has increased inconceivably fast with rapid development of so-called ecotourism since the end of 20<sup>th</sup> century, and it turned out that it was more and more difficult to regulate tourists' behavior. Although some measures have been taken to restrict tourists' behavior (Table 1), tourists' behaviors and sometimes the measures themselves still put pressure on ecosystem conservation, especially on protection of biodiversity and freshwater aquatic ecosystem.

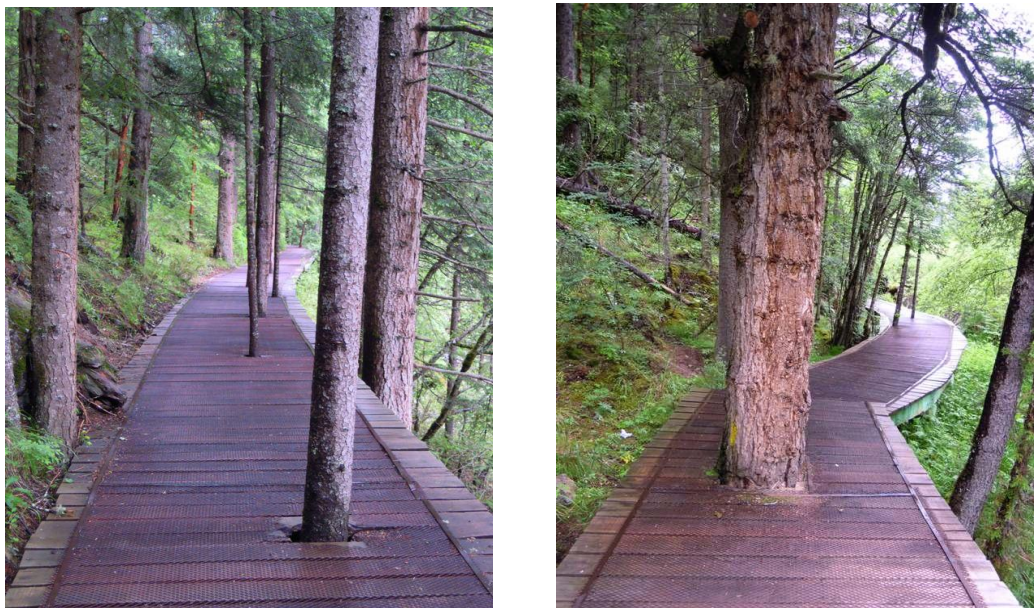
**Table 1 Important events for ecosystem conservation in Jiuzhai Valley National Park**

<b>Purpose</b>	<b>Corresponding regulations</b>
<b>Maintenance of ecosystem</b>	Landslides mitigation project in 14 areas where was susceptible to geological hazards in the park, including Shu Zheng Valley, Za Cha Wa Valley, Ri Ze Valley and Zha Ru Valley
	Conversion of farmland to forest or pasture inside the park
	Set up monitoring stations for insect pest and plant disease in forest, meteorology and water pollution
	Organization of full-time safeguarding teams for fire and landslide in each valley
<b>Controlling carrying capacity of tourism</b>	Largest daily number of tourists was limited to 12,000
	Introducing 307 green tour buses which have met EU III emission standards
<b>Transformation of production structure</b>	Adjust agrarian-based economy to tourism-based economy
<b>Infrastructure</b>	Construction of wooden track for tourists walking along the lakes and waterfalls
	Construction of communication infrastructures, including IC telephone booths at entrance and optical cables
	Rebuild roads along tour bus route
	Introduce 32 eco-toilets and 8 car toilets which are automatic flushing-free
	Construction of 17 lounge halls for tourists to have a rest in the main tour sites
	Construction of Nuorilang dining hall which is the only place for tourists having lunch inside the park
	Construction of wastewater treatment stations beside Nuorilang Waterfall and The Spark Lake, which is able to process wastewater from Shu Zheng Village, Ze Cha Wa Village and Nuorilang Dining Hall to meet domestic discharge standards
<b>Restriction of human behavior</b>	Tourists are not allowed to do the following things inside the park: <ul style="list-style-type: none"> <li>- Smoke</li> <li>- Feed or catch fish, birds, insects or other wildlife</li> <li>- Walk off the wooden track, trample down the grass, climb trees, or pick flowers</li> <li>- Touch tufa rocks or enter water bodies</li> </ul>
	Indigenous residents are not allowed to cut trees, or operate restaurants or hostels in the park
	Repeal of horse rental and cow rental activities in The Virgin Forests and The Five-flower Lake

(Adapted from Fang, et al., 2005 and Zhang, 2003)

#### 4.3.1 Biodiversity conservation

Jiuzhai Valley National Park lies on the transition belt between Qinghai-Tibet Plateau and Sichuan Basin, where is at the intersection of subtropical and temperate zones. The wide range of altitude provides various habitats for flora and fauna. Thus, Jiuzhai Valley area is rich in biodiversity. Professor Portman once said that “Jiuzhai Valley National Park is a museum with rich and varied collections, and it is also a tremendous gene bank” (Zhang, 2003). JAB has tried its best to protect biodiversity in many different ways since tourism started in this area, for example, no trees were cut down and all trees were remain in the same place after construction of wooden track inside the park (Figure 7). However, biodiversity conservation is inevitably affected by increasing human activities. When more tourists come to visit this park, more infrastructures are constructed by JAB, causing greater impact.



**Figure 7** Locations of trees after construction of wooden track inside the park

In the previous report of biodiversity statistics in 1984, there were 2,576 species of higher plants, in which 24 species are nationally protected plants such as "Gingko", and more than 400 species of lower plants in which 212 species are algae. Besides, the park is also a habitat for more than 300 species of animals, which include some endangered species such as Giant Panda and Golden Monkey (Zhang, 2003). Moreover, there were some new species discovered in the latest biodiversity study in 2004. It turned out to be a surprising result because it was believed that tourism should definitely have negative impacts on biodiversity

conservation. There are two reasonable explanations to the result and one of them would infer that tourism does have negative impacts on biodiversity in this park.

- (1) The park is in mountain area with high altitude, and the average annual hours of sunshine are 1,900. In addition to long time's sunshine, strong ultraviolet radiation is likely to cause gene mutations which are "sudden and spontaneous changes in the cell" (Wikipedia). As a result of gene mutations, there could be new species created spontaneously.
- (2) Exotic species brought to this area by human beings are likely to inhabit forests, grasslands and places where are interfered with human activities to a great extent. There are exotic plants of 16 families, 27 genera and 37 species found within the park area (Liu, 2007). According to "the tens rule" proposed by Williamson and Fitter (1996), "1 in 10 of those imported appear in the wild (introduced or casual), 1 in 10 of those introduced become established, and 1 in 10 of those established become a pest", invasion of these exotic plants is a big threat to biodiversity conservation inside the park.

Beside the threat from invasion of exotic plants, there is another negative impact on biodiversity during tourism development. Construction of infrastructure in the park, especially roads and wooden tracks, can destroy the original habitat and divide it into smaller units. There is a 68 kilometer-long road in the park, and the affected areas of biodiversity are approximately 108 hectares (Liu, 2007). On the basis of Liu's research (Liu, 2005) about tourism's impacts on landscape in the park, shrub vegetation has been affected more heavily than other types of vegetation. In addition to impacts caused by construction of roads, 2-meter wide and 52 kilometer-long wooden tracks, which look environmentally friendly, have also caused negative impacts on biodiversity. For example, it interrupts daily activities of wild animals, changes their normal orbits of activities, which may block gene flow between distinct species and reduce genetic diversity to an extent. Besides, preservative chemicals on the track are toxic to amphibians and reptiles.

Moreover, biodiversity conservation has already been affected by tourists' behaviors. It is difficult to control tourists' behavior inside the park although there are some restrictions made by JAB. It is not rare to see that tourists smoking, walking off the wooden track and trampling

down the grass especially when it is crowded on the track, which can inhibit the growth and reproduction of Lichens (Figure 8). Jiuzhai Valley is an excellent habitat for lichens; meanwhile lichens play an important role in recovering ecosystem of degraded grassland (Heber, et al, 2000). However, lichens grow slowly and most of them are quite vulnerable to environmental disturbance. For example, lichens are so susceptible to air pollutants that they will disappear when the accumulated concentration of sulfur dioxide reaches 0.06 ppm in the air (Zhang, 2003). Besides, lichens are among those species which are most sensitive to trampling (Grabherr, 1982). Thus, there are two big threats to conservation of lichens inside the park. Firstly, increasing number of tourists and tour buses can lead to increasing concentration of air pollutants as well as concentration of heavy metals in the soil. Secondly, trampling by tourists may reduce the diversity of lichens due to their high environmental susceptibility and slow growth. Figure 9 shows that there are apparently less or no lichens growing in the areas trampled by tourists.



**Figure 8 Lichens in Jiuzhai Valley National Park**



**Figure 9 Footprints in the areas where Lichens were previously growing**

### 4.3.2 Freshwater aquatic ecosystem

There are 114 lakes, 17 waterfall groups and 47 springs in this park, which is unusual in mountain areas in China. Indigenous Tibetan people call the lakes “hai zi” which means “the son of the sea” because of its sparkling green blue color. There is a popular saying that any other waterscape is not worth seeing in China as long as you’ve already been to Jiuzhai Valley National Park, so water is considered to be the soul of the park. The waterscape in this area has been formed by complex and long-term crustal movements, glacial activities, karst processes as well as seismic activities (Zhang, 2003). It is amazing that the color of deep lakes is dark blue while shallow lakes look colorful, due to thickness of tufa deposits and kinds of algae growing in the lakes (Figure 11). Tufa is a kind of chemical deposits consisting of calcium carbonate and there are many tufa lakes and tufa waterfalls in the park. Tufa deposits are also nutritive matrix, which can provide wet habitat for various floras (Figure 10).



**Figure 10** Algae at the bottom of the Lake



**Figure 11** Plants growing on Tufa deposits

However, water quality and waterscape have been changing little by little in the park. Water quality has deteriorated since 1986 and became the worst in 1996. The measured concentration of CODMn (permanganate index, mainly used in Chinese papers), BOD<sub>5</sub>, NH<sub>3</sub>, N (t) were far from standards (Zhang, 2004). Although the situation became better in 1999, there was another serious problem for water bodies: there were more than one million tourists visiting this park every year since the beginning of 21<sup>st</sup> century. When few tourists touched and entered water bodies to take photos, more tourists would do the same thing, no matter how many restrictions made on tourists’ behavior inside the park. As a result, some tufa waterfalls are beginning to recede at a rate of 0.22-0.6 mm per year (Zhang, 2004). Besides,

The Jade-colored Lake, which is the smallest “hai zi” in the park, has been shrinking, and some rocks which were on the lower bottom of the lake are exposed (Figure 12).



**Figure 12 The Jade-colored Lake**

There are only two species of fish found in Jiuzhai Valley National Park in the latest survey. One of them is *Triplophysa leptosome* and the other one is *Schizopygopsis kialingensis* (Figure 13). Both species are only found in China and the latter one is mainly found in Jialing River Valley. *Triplophysa leptosome* was found in this park in 2004 for the first time, however, another species of fish has not been found anymore since 2004. Songpan Naked Carp, which is regarded as aquatic eidolon by Tibetan people in the park, was the only species that can survive in this area in the 1970s. After 30 years’ tourism development inside the park, the lakes are no longer suitable for Songpan Naked Carp to survive while the other two species became dominant in place of it.



**Figure 13 *Schizopygopsis kialingensis* Tsao et Tun in the Panda Lake**

### 4.3.3 Questionnaire survey on tourists' perspectives

A questionnaire survey was carried out in the middle of July when it was the peak time of tourism in Jiuzhai Valley National Park. 30 questionnaires were sent to tourists who were randomly selected in the rest area beside the entrance of the park and all questionnaires were collected. Table 2 shows the basic information of participants in the questionnaire survey. There were 16 women and 14 men among the 30 participants. 70% of participants were young people who are between the age of 20 to 40, and there were only 2 participants older than 50. The main reasons for this may be that it takes nearly 10 hours by tour bus from Chengdu to this park and old people are likely to have car sickness especially on hilly roads; or they are likely to have altitude sickness at Jiuzhai Huanglong Airport if they choose to take airplane. We can also know from Table 2 that there were 8 businessmen, accounting for more than one fourth of all participants. It is partly because businessmen are likely to have higher income than people with other occupations. Besides, the percentage of teachers and students is relatively high since it was in summer holiday and quite a few teachers and students choose to visit cool scenic spots for vacation. Moreover, 23% of participants were from Sichuan Province, in which 71% were from Chengdu. There were fewer tourists from western part of China than those from other parts of China, which is due to less developed economy and lower income of people in western areas. Three of five foreign tourists had been to Zha Ru Valley for hiking in the mountains.

**Table 2 Basic information of tourists who participated in the questionnaire survey**

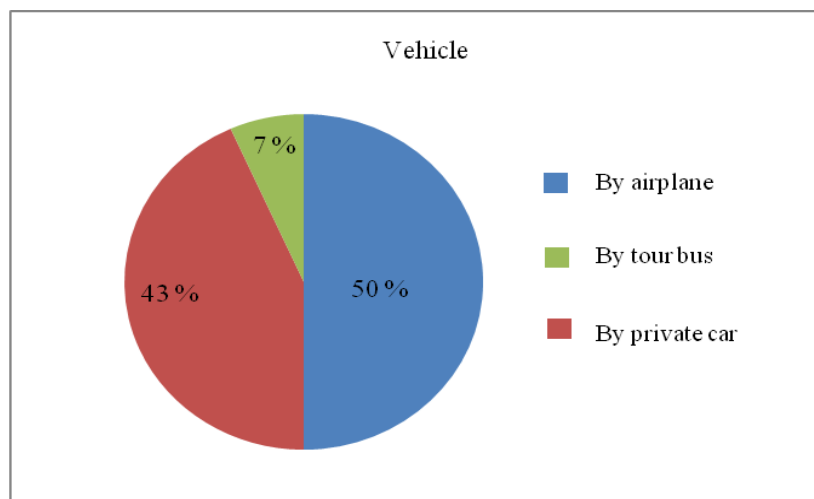
Gender		Age		Occupation		Native place	
Male	16	20-30	9	Clerk	6	Sichuan Province	7
Female	14	30-40	12	Official worker	3	Northern China	10
		40-50	7	Teacher	4	Southern China	3
		> 50	2	Student	3	Eastern China	3
				Businessman	8	Western China	2
				Tour guide	3	Abroad	5
		Others	3				



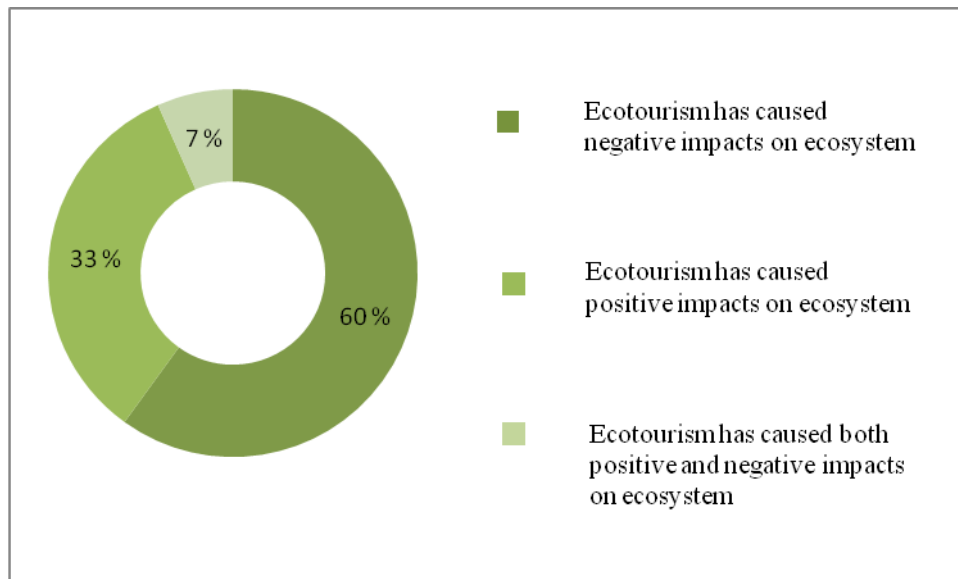
Since the survey was done in July when it was the peak time of tourism in this park, 70% of participants thought the number of tourists in the park was large and 30% thought it was large. Figure 14 shows that there were 50% of tourists came to the park by airplane while 43% took tour bus and 7% used private car. 85% of participants believed that construction of Jiuzhai Huanglong Airport could definitely increase the number of tourists to Jiuzhai Valley National Park. However, there were a couple who came from Germany had different point of view.

You cannot imagine how we came here. We left home in April and our private car is the only vehicle for us. It was a fantastic and exciting journey from Europe to Asia. We've been to many countries where people are nice and friendly. The most important thing is that we could see beautiful landscape that we've never seen on airplanes. The altitude of Jiuzhai Huanglong Airport is more than 3,000 meters so I believe that its carrying capacity is limited. Besides, landscape is amazing on the way from Chengdu to Jiuzhai although it is dangerous to drive on hilly roads sometimes. More Chinese people now have their own private cars so maybe more tourists will do the same as we did in the near future.

They also said that the blue green lakes were quite impressive; however, there were so many tourists in the park that JAB should reduce the daily number of tourists, or else ecosystem would be heavily affected.



**Figure 14** Forms of transportation that tourists chose to reach the Park



**Figure 15 Tourists' perspectives on impacts caused by ecotourism**

Beside the German couple, 60% of participants believed that ecotourism development in the park had caused negative impacts on ecosystem (Figure 15). Some of them doubted that there were more than 12,000 tourists each day in peak times such as summer vacation or national day holiday. Quite a few tourists have seen other tourists touching and entering water bodies, trampling on grass and smoking in the park, which were the main reasons that they believed ecotourism had caused negative impacts on ecosystem. There were three tour guides among the participants, and they had visited the park for six, three and two times respectively. All of them considered that the number of tourists was increasing incredibly fast and the landscape was not as beautiful as before. Besides, they also found that it was more difficult to regulate tourists' behavior although they had tried their best. There were two participants who thought that ecotourism had caused both positive and negative impacts on ecotourism. On one hand, construction of infrastructure could protect ecosystem from damage caused by natural disasters. On the other hand, large number of tourists as well as human activities must cause negative impacts on ecosystem inside the park. Due to huge number of tourists in the period from July to October, an undergraduate who majored in ecology and geology suggested that the park should be closed for several months after November in order to help self-recovery of ecosystem inside the park.

Moreover, the majority of tourists who have been to the park for at least two times also mentioned that the ecological environment of Zhangzha Town had deteriorated in recent years. More and more private houses have been converted into hostels and restaurants, and more star

hotels have been built in this small town. Nevertheless, there are less trees and grasslands left, and sanitary conditions are much worse than before. There are many chimneys at the back of hostels and restaurants (Figure 16). Besides, it is full of garbage at the foot of the hill behind those hostels and restaurants (Figure 17), which is a total contrast to the landscape inside the park.



**Figure 16** Chimneys behind restaurants



**Figure 17** Garbage at the foot of the hill

#### 4.4 Impacts on social system

##### 4.4.1 Life style

Before Jiuzhai valley became a national park, indigenous Tibetan people made a living from farming, animal husbandry and collecting natural resources. Owing to fertile soil and suitable climate in this area, people used to grow different kinds of food grains such as wheat, barley, buckwheat, hulless barley, maize, broad bean, pea, and potato. Annual yields of those crops in Jiuzhai valley were much higher than that in the surrounding area and people lived a life of peace. Even in the three years from 1958 to 1961 when The Great Chinese Famine occurred, harvest was enough for people who were living in this area.

Collective ownership of livestock was adopted in animal husbandry in this area after establishment of People's Republic of China. Collective ownership is short for "socialist collective ownership of working people", which is one form of socialist public ownership. Under collective ownership, the means of production and labor achievements belong to partial

groups of working people and all people in the group are in joint ownership for both means of production and labor achievements. Each village in Jiuzhai Valley was an independent group and villagers in each group were divided into several teams which were in charge of raising pigs, sheep and cattle respectively. Pigs, sheep, goats and cattle belonged to the whole group of villagers while horses and cattle for plowing were personal assets. Villagers could raise chickens independently but there was a limitation of number of chickens for each household. People in each village butchered some pigs and cattle when spring festival was coming and everyone in the group could get same amounts of pork and beef.

Each group also constituted teams of villagers for cutting firewood, hunting and digging for medicinal materials in forests in slack farming seasons. Strong young men were selected to be team members because labor intensity was high in these works. All the firewood was fired into charcoal before villagers sold it to people who were living in Zhangzha Town and other towns in Jiuzhaigou County. The main animals that people could hunt in Jiuzhai valley were wild boars, foxes, wolves and argali. However, there were abundant precious medicinal materials in this area, for example, Rhubarb, Sichuan Fritillary Bulb, Angelica, Rhizoma Gastrodiae, Radix Bupleuri, Radix Codonopsis, and Caterpillar Fungus. Wild animal meat and medicinal materials were exchanged for money afterwards in the national purchasing center in Zhangzha Town. Money from selling charcoal, animal meat and medicinal materials would be equally divided and then given to each villager in the group, which was the main economic income for indigenous people in this area. Owing to rich nature resources in Jiuzhai valley, each villager in He Ye Village could get 0.8 RMB per day in the early 1970s, which was much higher than the income of people who were living in the surrounding area. Besides, each household could get approximately 800 RMB in 1979, which was highly commended by the country government.

In the beginning stage of tourism development in this area, some educated indigenous people were employed to work in JAB. 30% to 40% of employees were indigenous Tibetan people when JAB established. However, local villagers' livelihoods did not change a lot in the first decade and the previous life style of farming, animal husbandry and collecting natural resources continued. Although being paid by JAB, the Tibetan villagers who worked in the bureau still did farming and bred poultry after work.

Life was getting better from the beginning of 1990s when the number of tourists began to

increase. At that time there were farmlands everywhere outside the park in Zhangzha Town and no hotels or hostels were available to tourists. Thus, JAB encouraged indigenous people to rebuild their houses into family-hostels, and tourists would be asked to stay over in designated households inside the park. Each household could serve at most 45 tourists per night according to the regulation made by JAB, and economic income of each household has grown explosively since then on. However, indigenous people did not abandon their traditional agrarian way of life and they continued to engage in it during daytime. Due to environmental pollution caused by waste water and domestic garbage from hostels in the park, such livelihood lasted for four years until 1998 when all hostels in the park had to be closed and tourists were no longer allowed to stay overnight inside the park. Zhu Rongji who was the Prime Minister of State Council inspected Jiuzhai Valley National Park in 1998 when the Chinese Government called on all citizens to return farmland to forests and animal breeding grounds to pastures. JAB prohibited residents from cutting trees and farming in public area after Prime Minister Zhu Rongji left. Moreover, all pigs, cattle, sheep and goats were butchered at the same time and animal husbandry has been absolutely banned inside the park since then on. Therefore, industrial structure has shifted from agrarian-tourism-based economy to complete tourism-based economy.

Although farming is prohibited in public areas, local people still grow some food grains like maize and potato because each household has a small family private plot behind their house (Figure 18). However, annual yields of these grains are not enough for the whole family so people have to buy vegetables, meat, fruits as well as other food from the outside shops. A small proportion of people became sanitary workers in the park, working for JAB to have stable revenue. Except those who have jobs in JAB or other companies, the economic income of indigenous people relies heavily on tourism in the park. Indigenous people who live in He Ye and Zha Ru Village usually go to the main sight spots (The Panda Lake, Long Lake, The Five-flower Lake) and make money from renting out tourists their traditional Tibetan clothes and taking photos for them. People in Shu Zheng and Ze Cha Wa Village usually operate their own shops at home instead of renting out clothes and taking photos for tourists since Shu Zheng Village and Ze Cha Wa Village have already been open for business. Besides, there is another shopping center in Nuorilang Dining Hall, which is for a particular group of local people to sell tourism souvenirs. Nuorilang Dining Hall was rebuilt on the funds collected from indigenous people in 2000 and a single share of stock cost 100,000 RMB. Those who purchased at least one share of stock could have a right to do business at appointed stalls in

the hall (Figure 19). Since Nuorilang Restaurant is a limited company which is the subordinate enterprise of JAB, all stockholders are offered a generous bonus at the end of the year.



**Figure 18 Family private plot**



**Figure 19 Shopping center in Nuorilang Dining Hall**

In order to make more local Tibetan people benefit from ecotourism development, Ge Lin who was the former director of JAB, drew up a new rule of subsidy for all indigenous people living inside the park in 2000. JAB takes out 7 RMB from the sale of each ticket as people's living subsidy fund, and every indigenous villager can get approximately 5,000 to 12,000 RMB from JAB at the end of the year, which depends on the annual number of tourists. However, those who are employees in JAB or other government agencies cannot receive such welfare as well as their children. The majority of people are satisfied with the fair measure and subsidization and they really appreciate that tourism has brought a drastic change to their livelihood. A Tibetan woman in He Ye Village told me her story:

I can still remember that my brothers and I had to carry water from the hill behind our village for the whole family and the poultry everyday when I was a little girl. We also had to look for pine stump for lighting because electricity was not available in Jiuzhai valley before The Great Proletarian Cultural Revolution. Pine stump has high oil content and there were plenty of it in the forests. We had food but no money at that time, and all people were poor except the landlords. In order to improve our livelihood, my father has been to Tibetan for three times in his life, walking alone, taking a basket of backup straw sandals and another bag of muskiness and angelica with him. Those medicinal materials could be exchanged with horses and money in Tibetan and we always got some small gifts when he came back home. He is a great father. After Jiuzhai valley became a national park,

people in each village built their own hydroelectric generating stations. There was no limitation to capital household electricity consumption and it was free for villagers. Life has changed a lot since the beginning of 1990s when much more tourists came to visit the park, especially after 1998 when we must return farmland to forests and animal breeding grounds to pastures. In the last few years I made money from renting out tourists the traditional Tibetan clothes at The Panda Lake and Long Lake in summer and autumn and got living subsidy from JAB at the end of the year. Now my two daughters have grown up, one of them is an official worker in Jiuzhaigou County and the other one is working in a bank in Chengdu. Thus, I prefer to do farming (Figure 20) and raise chickens (Figure 21) at home and live a peaceful life.

Although life is getting much better in this area, there are also some problems emerged as a result of tourism development. Economic income has increased year by year; however, living expenditures of each household have risen exponentially. For example, meat, vegetables and fruits are expensive now while people did not have to buy food when they were famers; they have to buy firewood for heating in winter and sometimes for cooking as well while it was free before tourism developed in the park; electricity was free when there was a small hydroelectric generating station in each village, but all the stations stopped working afterwards because the generating system was not stable enough, so people have to buy electricity which is transmitted from Wenchuan and Yingxiu and it costs 0.22 RMB per kilowatt-hour. Besides, the gap between the rich and the poor is getting larger in all villages due to tourism development.



**Figure 20** Airing hullless barley



**Figure 21** Feeding chickens

It is quite difficult for indigenous people to decide whether they prefer current livelihood or the previous one since either has its advantages and disadvantages (Table 3). Besides, young generation and old people also have different opinions. Ecotourism development, is like a double-edged sword, has influenced the life style of indigenous Tibetan people profoundly.

**Table 3 Advantages and disadvantages of previous and current life style**

	<b>Previous</b>	<b>Current</b>
<b>Advantages</b>	Enough food grains	High economic income
	No limitation to capital household electricity consumption and electricity was free	Modern life style as people living in big cities
	Each household had almost equivalent annual income	Various products on the market
	High frequency of family reunion	Convenient transportation
	Life was peaceful without interruption	
<b>Disadvantages</b>	Life was hard	Gap between the rich and the poor
	No stable economic income	Economic benefits have changed the harmonious relationship between family members

Beside people who live inside the park, those who live in Zhangzha Town outside the park have also witnessed a drastic change in their livelihood. Here is the story from a Tibetan woman who is a sanitation worker in Zhangzha Town:

My family was poor before tourism developed in this area. We lived on the top of mountain when my sisters and I was young. My parents planted wheat, potato and broad bean on a few small pieces of land. The soil was not suitable for planting maize due to the high latitude, so there was not enough food for the whole family. My parents always ate little in order to provide enough food for me and my sisters. We did not have money to buy a horse, thus it took us more than one hour to walk to the mountain foot and another two and half hours back home. Besides, there were not enough clothes for us and my extremities were frozen every winter as well as my sisters'. I'll never forget how hard life was at that time. Fortunately, life started to change with ecotourism development in our town. Since all farmlands have to be returned to forests and animal breeding grounds have to be returned to pastures, we had to move to the foot of mountain at the end of 20<sup>th</sup> century. Afterwards each family member could get some food and money from the government as subsidy every month although we do not have farmlands. Besides, I become a sanitation worker and I'm able to support my children even



though I'm completely uneducated. We live in a much bigger house in the town and I do not have to worry about whether we have enough food or clothes for my daughters, which is all I expected for livelihood. Thanks to ecotourism development in Jiuzhai Valley National park, this has changed my life thoroughly.

In fact, many indigenous people who lived outside the park have bought new houses in big cities like Chengdu in recent years. The whole family has already moved to the new city and started their new life there, and their previous house in Zhangzha Town has been rented to other people who are doing business there. Most previous houses have been rebuilt to restaurants, hostels and hotels, and the owner of the house can get an annual rental of 200,000 to 1,000,000 RMB depending on the location and area of the house.

#### 4.4.2 Architecture

Although people in all villages are living by mountain foot, they still retain their houses in their old villages. The former head of He Ye Village drove his car and took me to his old house in the old He Ye Village. There is a long but narrow winding road which was built in 2006 from the current He Ye Village to the old one and it took us about 20 minutes to arrive at the old village because he had to drive slowly and carefully on the narrow hilly road. The road can also lead to the old Pan Ya and Jian Pan Village which consolidated with the old He Ye Village to form the current He Ye Village. The old He Ye Village is surrounded by mountains which are covered with luxuriant forests (Figure 22) and the traditional buildings (Figure 23) are quite different from those I've seen in current He Ye Village. Traditional Tibetan buildings in Jiuzhai Valley were mainly built on mountainside where was close to headwater regions. A part of indigenous people used to adopt earth and timber for construction of their houses while the majority of Tibetan people used timber only. Besides, the roofs were usually in a form of triangle, which were covered by window-sills.



**Figure 22 The old He Ye Village**



**Figure 23 Traditional Tibetan building**

Generally there were three floors in an old house. The first one was used as livestock shed and there were neither doors nor windows on this floor (Figure 24). People used to raise pigs and cattle there and few households might also have horses. Living room, kitchen and bedrooms were on the second floor (Figure 25). Besides, there were usually two toilets on this floor, and the feces that were collected from people as well as from livestock would be used as fertilizer for farming. The third floor in the old house was usually used for stacking farming tools and sundries (Figure 26). However, some other people also vacated a small room for chanting scriptures on the third floor. Beside the three floors in the house, each household had an own piece of ground for planting food grains and vegetables (Figure 27). In fact, almost all villagers in He Ye Village still plant maize and hulless barley on the land which is at the side of their old houses even though they have been living in current He Ye Village for more than 10 years. The architectural structure of traditional buildings was appropriate to indigenous people's previous life style in which farming and animal husbandry played a dominating role.



**Figure 24 The first floor for livestock**



**Figure 25 The second floor**



**Figure 26 Farming tools on the third floor**



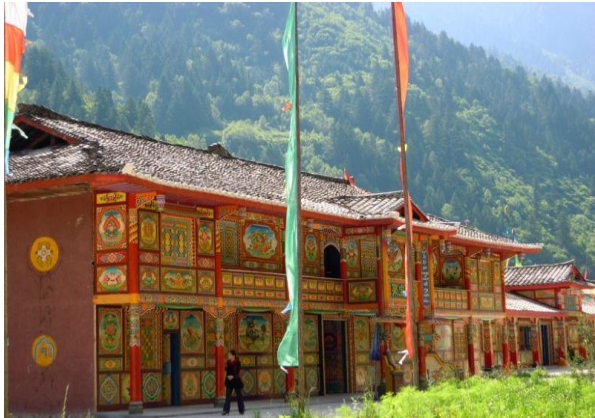
**Figure 27 The ground for farming**

With implementation of the rule which requires to return farmland to forests and animal breeding grounds to pastures, indigenous people in the old He Ye, Jian Pan and Pan Ya Village moved into the current He Ye Village which is at the foot of the mountain and much more convenient for them to do business inside the park. Each household built their new house in the village. Besides, they redecorated the house when they've got enough money from tourism development in the park. Indigenous people in Shu Zheng, Ze Cha Wa and Zha Ru Village have also redecorated their houses for better living conditions although these villages remain in their original places.

The structure of architecture has changed a lot and houses in each village have their own features. Nowadays most houses adopt reinforced concrete structure and there are usually two or three floors in the houses. In He Ye and Zha Ru Village, a majority of families have two floors in their houses since they cannot do business in their own villages. Thus, living room, dining room, kitchen and bathroom are on the first floor while bedrooms and the room for chanting scriptures are on the second floor. However, people in Shu Zheng and Ze Cha Wa Village prefer to have three floors in their houses because the first floor has to be used for doing business. Then arrangement of the other two floors is almost the same as that in He Ye and Zha Ru Village. It is not difficult to find that almost all houses do not have spaces for stock and farming tools since mode of production in agriculture and animal husbandry has already converted into tourism-based production. Current architectural style is much more adapted to modern life style of indigenous people.

Beside changes in architectural structure, decoration of local houses is so gorgeous that architecture becomes another new splendid spectacle in Jiuzhai Valley. The periphery wall of

the house is quite bright and multicolored (Figure 28) and there are usually some big paintings on one side (Figure 29). Indigenous Tibetan people prefer to have the paintings of yak or an old man who exists in an old legend on the periphery wall, which is a kind of prayer for good harvest, health and safety. Style of windows is almost the same as the previous one (Figure 30), and both of them are meticulously engraved into different patterns. However, the only difference is that current windows are much more colorful than before (Figure 31).



**Figure 28 Houses in Ze Cha Wa Village**



**Figure 29 Paintings on the periphery wall**



**Figure 30 Previous window**



**Figure 31 Current window**

Owing to tourism development in this park, indigenous people have more time and money to design and decorate their houses. Living room plays an important role in a house because that is the main place where Tibetan people receive their guests, and then decoration of living room needs to be elegant. Although there was not any decoration in living room or other rooms, decoration of living room stands for the economic strength of a family in the park nowadays. The living room in some families has many paintings over the walls and ornate carvings on the ceiling (Figure 32). All the paintings and carvings in the room are handmade

by Tibetan painters and sculptors, and the patterns are different from each other. A painter has to spend about three months on painting all walls and staining the carvings on the ceiling, but he will be well paid after finishing the decoration of living room. There is also another Tibetan style living room in some other families. Indigenous people usually fix a stove which has a stove-pipe to the roof of the house in the middle of the living room, and it is used for heating during winter. Instead of many paintings on the wall, there are many small cabinets and drawers with totally different styles and patterns (Figure 32). Families which have such Tibetan style living room usually have another Han style living room (Figure 33). Unlike the one which has a stove for heating, there is a sofa, tea table and a television in the Han style living room and this one is mainly used for receiving guests.



**Figure 32 Two different Tibetan styles of living room**



**Figure 33 Living room of Han style**

Nevertheless, not all Tibetan people living in Zhangzha Town have such style of houses as those in Jiuzhai Valley National Park. Ecotourism development in the park has also promoted economic development in the surrounding area and most families rebuilt their houses at the

end of 20<sup>th</sup> century. The structure of their houses is more or less the same as that in the park, for example, there are two or three floors in the house, and reinforced concrete structure was adopted under construction. However, exterior decoration of houses is much more succinct (Figure 34) since safety and maximum comfort of living are what indigenous people really care about. Besides, houses of indigenous Tibetan people have another feature. There is a bright Five-Star Red Flag fluttering in the wind on the roof of the house everywhere, which is a profound demonstration of Tibetan people's deep love for their country. Some families also hang a portrait of Chairman Mao on the periphery wall of their houses since Chairman Mao is their great benefactor who has completely changed their lives from serfdom.



**Figure 34 Houses of Tibetan people living outside the park**

#### 4.4.3 Food

Maize, potato and some other grains which were produced by indigenous people were the main food source for them before ecotourism developed in this area. They did not eat meat often when they were poor farmers, but bacon and roast were indispensable for significant traditional festivals. Although Tibetan people did not have a wide variety of food, there are three kinds of food which play an essential role in their previous life and were also the representative of traditional Tibetan food in China.

Buttered tea is one of the most well-known Tibetan foods in China and it has a long history of more than 1,000 years. Indigenous Tibetan people used to regard it as a vital necessity in daily life, and even today most of them have to drink it every day in winter. Buttered tea is also considered as the one of the best beverage to serve guests. It is not difficult to make a bowl of buttered tea (Figure 35); however, it takes much time to prepare the butter (Figure 36), hullless

barley flour (Figure 37) and tea (Figure 38) for making the buttered tea. Butter is extracted from yak's and goat's milk, which is different from the normal butter in market. Generally speaking, five to six catties of butter can be separated from 100 catties of milk. Tibetan people usually use brick tea for making buttered tea. Brick tea is kind of fermented tea, which is rare to see in the market in big cities. After simmering for several hours, brick tea can be served for buttered tea with butter, hulless barley flour and sugar or salt. Buttered tea is probably the most favorite food of Tibetan people in this area and it has rich nutrients. Since it is not suitable for planting vegetables on the land of such high altitude, brick tea turns out to be a proper substitute which can provide essential vitamins and trace elements for human body. Besides, butter is the main fat source that can help people keep warm in winter.



**Figure 35 Buttered tea**



**Figure 36 Butter**



**Figure 37 Hulless barley flour**



**Figure 38 Brick tea**

Tsamba, which means noodles in Tibetan language, used to be the traditional staple food of Tibetan people in this area. It should be necessary for each meal but indigenous people will never be satiated with it. There are three typical kinds of tsamba, which is made of hulless

barley, pea and oat respectively. However, hulless barley tsamba is eaten more frequently than the other two types by local people. It is almost like the solid state of buttered tea because butter and brick tea are used as bond in kneading the hulless barley flour into a ball and the ball is what Tibetan people call “tsamba”. Tsamba is the best portable food for Tibetan people to adapt their previous life style and it can also provide enough energy. Indigenous Tibetan people used to eat it every day in winter because they did not have to chop logs and make a fire for cooking.

Beside buttered tea, there is another typical beverage in Tibetan food in this area. Considered as Tibetan beer, hulless barley wine is the only beverage for celebrating the traditional festivals of indigenous Tibetan people. Besides, it is only used for receiving important guests as the warmest welcome of the host. Hulless barley wine is brewed only from hulless barley and it has a special mixing flavor of sour and sweet. It is rich in dietary fiber, vitamin E and some trace elements like calcium, zinc and selenium so it is quite good for human health.

It is not difficult to find out that hulless barley plays a predominant role in all the three traditional foods. There is a famous watermill house in Shu Zheng Village (Figure 39) which was used to grind hulless barley to make flour. It was free for all villagers living in the park and people could use it whenever they wanted. However, local people no longer use it nowadays. With tourism development in the park, more and more indigenous people are involved in business activities no matter the old or young. Especially from the end of 20<sup>th</sup> century, all indigenous people had to stop farming and animal husbandry in this area. The watermill house has gradually fallen into a state of neglect. Thus, they have to buy food from street peddlers and shops outside the park. Owing to improvement in transportation system, indigenous people prefer to buy food which is transported from other regions. Unlike the old generation, indigenous Tibetan people eat rice, noodles, vegetables and vegetable oil most of time nowadays (Figure 40), which is almost the same as what the Han people eat. However, buttered tea, tsamba and hulless barley wine are still the main food for traditional festivals. The only difference is that people do not make the traditional food themselves but prefer to buy them instead because they are busy doing business and do not have enough time to prepare these foods. So there is a group of people who live in Zhangzha Town outside the park have started to make money by making traditional Tibetan food and selling them to people living inside the park since the beginning of 21<sup>st</sup> century. Although expensive during traditional Tibetan festivals, tsamba, butter and hulless barley wine demand in this area



exceeds supply. Old people still consider these traditional foods as their favorite while the young are not used to eating them due to the special flavor of butter in tsamba and buttered tea. Comparing to the traditional food habit in this area, young people prefer to have dinner with friends in the restaurants outside the park because there are countless big and small restaurants which can serve a variety of hot and cold dishes.



**Figure 39 Watermill house in Shu Zheng Village**



**Figure 40 Rice, vegetables and meat**

#### 4.4.4 Costumes

Indigenous Tibetan people used to wear their traditional Tibetan costumes every day in the past. Even some poor people had only one costume, and they never changed their clothes. There are several characteristics of traditional Tibetan costume. First of all, one costume usually has a gown and a shirt. The gown is quite loose so that local people used to put tsamba in the chest pocket of inner gown, which is a unique design for Tibetan people to adapt the previous way of life. Besides, it is long enough to reach the ground when people put it on. There is no button on the gown, people are used to buckling up a belt tightly instead. The Tibetan shirt is also special. Left shoulder of the shirt is usually bigger than the right one. Instead of having buttons in line in the middle, there is one button under the right axilla or sometimes there is a ribbon which is made of colored cloth. The color of shirts for Tibetan men is usually white and the shirt is high necked, while most blouses of Tibetan women have print and lapels. The sleeves of both gown and shirt are longer than the arm, which can keep the body warm in cold seasons. However, Tibetans usually wear one sleeve of gown and put the other one around the waist or sometimes they take off both sleeves of gown in summer, which is an adaptive way to regulate body temperature. The second characteristic is that Tibetans like wearing jewelry, no matter whether women or men, including necklaces, silver

bracelets with gems, and rings. Tibetan men also get used to having broadsword and snuff bottle strapped to the waist while Tibetan women prefer to have a string of metal coins and gems hanging on the back for celebrating traditional and religious holidays. The third one is that Tibetans wear furs and hats as a decoration in winter. The common style of hats for men is the thin woolen hat, which was introduced to this area from the west in the middle of last century. Women usually wear red woolen hats.

Ecotourism development has brought hundreds of thousands of tourists to this area and most of them are the Han people. The style of clothes that tourists wear, which is completely different from the traditional style of Tibetan costumes, has already affected their traditional style. Nowadays, traditional Tibetan costumes are no longer the first choice to local people in daily life except in those important days. Although a few Tibetans who are older than 60 years old still wear traditional clothes every day, most of indigenous people prefer to wear clothes similar to the ones Han people use. Parents also choose the Han-style clothes for their children because they are more convenient for children to wear and maintain (Figure 41). However, traditional Tibetan costumes still play an important role in some special events and occasions (Table 4). From Table 4 we can see that the majority of indigenous people choose to wear their traditional costumes at the weddings, funerals, traditional festivals and all people who participated in interviews would wear Tibetan costumes for religious activities. Although there are few who people prefer to wear Han-style clothes in the first two occasions, the main reason for this is that the spouse or the hosts are the Han people.

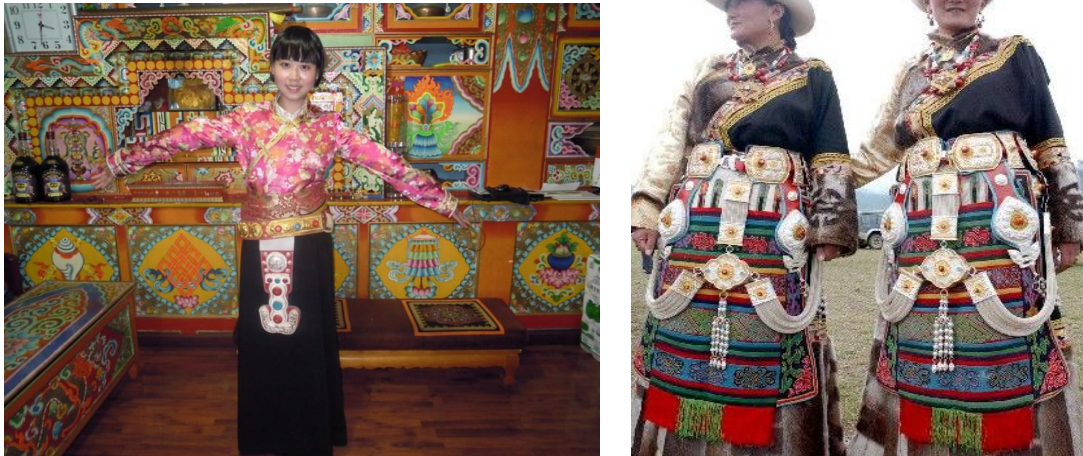


**Figure 41** Tibetan child with ordinary clothes

**Table 4 Preference of different style of clothes in different occasions (%)**

	Tibetan costumes	Han-style clothes	Combination of Tibetan and Han-style clothes
<b>Weddings</b>	<b>94.6</b>	<b>5.4</b>	<b>0</b>
<b>Funerals</b>	<b>92.5</b>	<b>7.5</b>	<b>0</b>
<b>Traditional festivals</b>	<b>98.7</b>	<b>1.3</b>	<b>0</b>
<b>Religious activities</b>	<b>100</b>	<b>0</b>	<b>0</b>
<b>Daily life</b>	<b>9.8</b>	<b>77.9</b>	<b>12.3</b>

Ecotourism development in this area has also brought a remarkable increase in economic income to indigenous people, so traditional costumes emphasize not only applicability in different seasons but also luxuriance in different occasions since indigenous people have enough money to do so. Costumes have already become the symbol of both beauty and wealth, and sometimes the value of decorations and jewelry for one costume can be more than 100,000 RMB. Take the costumes of young women and married women for example (Figure 42). The material for making clothes was mostly cloth in the past. Nowadays, the blouses for young women in most families are usually made of silk and the gowns are made of colorful brocade fabrics, which feel smoother than cloth and looks much more elaborate. The main decoration for young women is the waistband that is made of gold or silver, which depends on the economic strength of the family. Since the waistband is approximately more than 10 cm, it is heavy when wearing it around the waist. Besides, there are several different types of gems embedded in the waistband like turquoise, emerald, corallite and crystal. Comparing to the vivid style of the young women's costumes, the costumes for married women are much more complicated and expensive. The first and most important difference between them is that Tibetan women have to wear another apron which is called "Bang dian" in Tibetan language. This apron is made of velvet or wool and usually has colorful horizontal stripe on it, which is a traditional symbol of a married Tibetan woman. Beside the apron, married women have more decorations and expensive jewelry on them like hats, earrings, and necklaces, which represents wealth and good luck. Some married Tibetan women also have a string of turquoise in their hair, which is a kind of prayer for long life of their husbands.



**Figure 42 Current costumes of Tibetan young women and married women in the park**  
 (The right photo is from <http://www.jiuzhaigoulyou.org/renwen/shownews1235.htm>)

#### 4.4.5 Religion

Bon Religion was the only indigenous religion in Tibet before Songtsen Gampo introduced Buddhism to that area. Bon Religion was introduced to Aba area in the 2nd century before Christ and it became prevalent among the population in this area in the 6th century. Even after the 7th century when Buddhism was introduced to Tibet and became the only religion of Tibetans in that area, Bon Religion was still handed down from generation to generation in the Aba area. However, it was affected by Buddhism to some extent and it became one sect of Buddhism. Almost all indigenous Tibetan people in Jiuzhai Valley National Park believe in Bon Religion, and there are still 60 temples of Bon Religion in Aba Prefecture because it remains the main religion for Tibetans in Aba area (Zhang, 2003).

Bonpos have an animistic view of world, and they worship heaven, earth, sun, moon, star, thunder, mountain, stone as well as soul and ghost. Besides, Bon Religion has already had many systematic precepts and scriptures with rich philosophical meanings nowadays. Although ecotourism development in this area has completely changed the livelihood of indigenous Tibetan people, it has never shaken their faith in Bon Religion because it has a long history and numerous believers there. On the contrary, ecotourism development has gradually made a positive contribution to the increase of people's economic income, which is a crucial factor to promote the further permeation of Bon Religion in people's spirits and livelihood. Beside continuation of all previous religious customs, Tibetan people have

devoted much more money to religious activities and ceremonies than ever before in recent years.

Long Da is the main material in Bon Religion for nature worship and offering sacrifices to spirits. Long Da has two types which are made of paper or cloth respectively (Figure 43), and it usually has a shape of square or rectangle. Long Da which is made of paper has four colors: white, yellow, red and green. However, those which are made of cloth usually have one more color that is blue. There are many scriptures and patterns printed on the Long Da and it is said that such Long Da has boundless supernatural power. Indigenous Tibetan people are used to casting the paper Long Da and letting it go with the wind while stringing the cloth ones with lines and hanging them on the top of mountains, bridges, roofs and some other special places, which is a way of prayer for everything going well in their lives. The right photo in Figure 43 is a sacrificial alters in Zha Ru Valley and it is called “Yan Zi Zha Wu” in Tibetan language. It is an extraordinary place for local people to offer sacrifices to water spirit every spring when people in each village and even from far outside villages come here to burn incense and cast Long Da.



**Figure 43 Long Da which is made of paper and cloth**

Jing Fan, which is called “Ge Da” by Tibetan people in Jiuzhai valley, is another common way of prayer. It is usually made of cloth, linen and silk, and has a shape of rectangle. Indigenous people used to use a branch to fix Jing Fan and stick them at the entrance of the villages (Figure 44). However, almost each household has their own Jing Fan nowadays. It has five colors, blue, white, red, green and yellow, which represents sky, cloud, fire, water and earth separately. There are also many different patterns and scriptures on it, which is a usual way to offer sacrifices to mountain spirit. In addition, it also represents people’s wishes

for harmony between heaven and earth, human and animal. Beside its religious meanings, Jing Fan is also a great artwork in Tibetan areas.



**Figure 44 Jing Fan in the old He Ye Village**

Zhuan Jing is a traditional religious activity in Bon Religion, in which Bonpos revolve around a fixed route which should be an anticlockwise loop, walking and praying. It is regarded as a practice for boundless beneficence, and it is the most widespread etiquette in Tibetan society. In Jiuzhai valley, indigenous Tibetan people usually walk around the prayer wheels rotating them with one hand for praying every day. Especially the old who are devout, they often spent the whole morning on Zhuan Jing because religion means a great responsibility for them (Figure 45). There are lots of scriptures in the prayer wheels, so it is believed that Bonpos can chant scriptures in each wheel for 100 times when rotate it for one time, which is a way to increase their beneficence exponentially. There are many different prayer wheels in each village, but the most famous one inside the park is at the entrance of Shu Zheng Village (Figure 46). There are nine stupas behind the prayer wheels, which has special meanings to local Tibetans. Every morning each family in Shu Zheng Village walks around the prayer wheels and stupas, chanting and praying, which is a religious custom no matter it rains or snows and has not changed even with ecotourism development in this area. Nevertheless, ecotourism has brought other changes. Almost each household in Ze Cha Wa Village has built their own stupa in the yard because of increasing economic income in recent years (Figure 47). All the stupas should be in white but people can put different things into the stupa for praying, like scriptures, Buddha. People in Ze Cha Wa Village often put a golden Buddha inside the stupa (Figure 48). Beside the prayer wheels rotated by people, there is another kind of prayer wheel which is rotated by water flow in the park. It is called Shui Zhuan Jing (“Shui” means water in Chinese language) and usually built on rapid flowing rivers so the power generated

by the running water can be a strong driving force to rotate the prayer wheels. Each village has one or several these wheels, which is a way for praying a prosperous village.



**Figure 45 Zhuan Jing**



**Figure 46 Prayer wheels in Shu Zheng Village**



**Figure 47 Stupas in Ze Cha Wa Village**

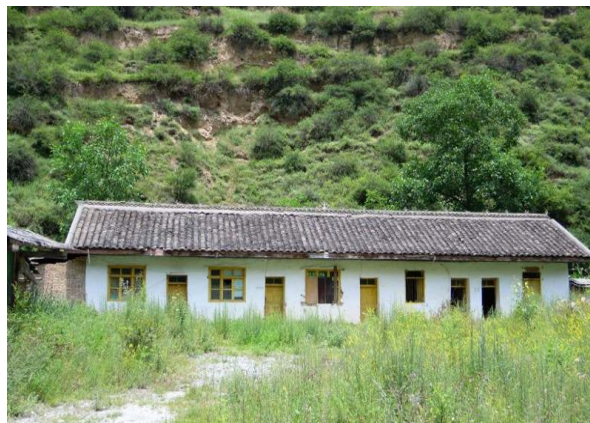


**Figure 48 Buddha in the stupa**

Zha Ru Temple, which is the most important sacred place for Bonpos in Jiuzhai Valley National Park, has a long history of more than 1,000 years in this area. It was built in 1573 in Ming Dynasty and now it is under reconstruction owing to development of ecotourism and society in the park. Many religious activities and the annual temple fair used to be held in this place. Besides, Indigenous people from each village as well as those from Zhang Zha Town come here for praying on the lunar 15<sup>th</sup> in every month. Especially on 15<sup>th</sup> of the first month in the lunar New Year, they also wear their traditional Tibetan costumes, take some tsamba and hulless barley wine, and walk around Zha Yi Zha Ga Mountain for praying that everything will go well in the New Year, which usually takes three to five days.

#### 4.4.6 Education

There was a school in the Jiuzhai valley area before the national park was established (Figure 49). All teachers were indigenous villagers and students there could learn basic knowledge from grade one to grade five in primary school. Besides, The Tibetan language was what teachers and students speak at school. However, the majority of students had to give up studies after they finished fifth grade in the primary school for several reasons. First of all, there were no junior and senior high schools in this area, and then parents had to spend much money sending their children away to bigger towns or cities where higher levels are available. But most families did not have enough money at that time so they were not able to support their children's studies and livings in those places. Secondly, the young were encouraged to do farming and animal husbandry in each village because villagers were short of strong labor. In order to restrict young people for further study at that time, it was defined that anyone who would continue further studies after fifth grade in the valley could not get the basic grain ration from the village. Thirdly, language barrier was another problem. Student in bigger towns and cities spoke Sichuan Dialect which is totally different from Tibetan language, so it was difficult for Tibetan students to study and communicate because they had never learned such language before. Therefore, indigenous Tibetan people who are older than 60 can speak only Tibetan language nowadays, neither Sichuan Dialect nor Mandarin.



**Figure 49 Closed primary school in the park**

After the National Park was established, many teachers left school and went to big cities to seek new jobs from which they could earn higher salaries. Although some new teachers came to the school afterwards, they were not as good as those who had much teaching experience. A lot of parents began to be unsatisfied with the way that the new teachers taught and



worsening educational quality. With growth of economic income in each family especially from the beginning of 1990s, a few parents sent their children away to study in big cities like Chengdu and Mianyang. Parents had to spend more much money than local citizens because there was a regional based regulation on education in China. School age children must go to public schools including primary and junior high schools in the place where they applied for household registration to get the nine-year compulsory education for free. Otherwise, students have to pay if they go to schools outside their household registration area, which is normally expensive. High school education and education in private schools are not included in compulsory education system in China, which means that students have to pay tuition fee to go to private schools or high schools even in their original places. After getting more and more positive feedback from those children who studied in big cities, increasing number of parents decided to send their children away for school education. As a consequence, the local school in Jiuzhai valley did not have enough students and had to be closed afterwards. Beside the low educational quality in local school, there was another reason that pushed parents to send their children to study in big cities. JAB started to realize that they needed more qualified professional persons to deal with the various problems caused by ecotourism development in the 1990s. In order to solve this problem, Ge Lin who was the former director of JAB wanted to promote participation of indigenous people in ecotourism development because he claimed that indigenous Tibetan people were the specialists who deeply understood the relationship between human and nature in this area. However, indigenous knowledge was not enough to resolve the deteriorating conditions in the park and systematical scientific theory is also of great importance. Therefore, he often went to different villages in the park to have conversations with local people, encouraging them to send their children to big cities for better education. He said that only in this way these indigenous Tibetan children could become the future well-qualified JAB workers who were able to cope with different kinds of problems in this park. As a result, almost all children who were born after 1980 have got education of high school in big cities and those who were born after 1990 have been educated in big cities from primary school.

However, there is a new problem caused by sending children to study in big cities. Public schools in big cities can provide better educational quality, which does not mean that students study harder and learn more in those schools. In fact, indigenous children who study in big cities do not work as hard as many other students do at school. The main reason for this is also due to ecotourism development in the park. Although living in big cities for the most

time of year, indigenous Tibetan students go back to their homes in the park during summer and winter vacations. Owing to ecotourism, they can make pocket money during vacations especially in summer when it is the peak time for tourism. Generally speaking, a local student can earn 100 to 300 RMB in one day during summer by renting out tourists the traditional Tibetan clothes and taking photos for tourists just as other indigenous people do. Then they can earn at least 3,000 RMB in one month, which is more than the monthly salary of many young people working in big cities. Thus, many indigenous young people who study in big cities have lost their motivation of self-development for future career because ecotourism in the park as well as subsidy from JAB will provide them enough money for living a good life. Nowadays, about 70 local young people who have graduated from high schools or colleges in big cities come back to the park without being employed to any companies or organizations. They just do the same things as those uneducated old people do every day, which makes their parents disappointed. A father in He Ye Village told me his story:

My parents did not have money to send me to better schools in big cities when I was young. I had no choice but do farming and animal husbandry at home to make a living although I was eager to get higher education to change the fate of my family. Owing to ecotourism development in the park, I had enough money to send my three daughters away to study in Mianyang and Chengdu from primary school. I always expected that their lives would completely change since then on. Now all of them have graduated from either high schools or colleges, and it costs me more than 1 million RMB in total during their schooldays. However, none of them has a stable job and this is the result which is hard for me to accept. Although I understand that they are not qualified for the jobs in JAB due to lack of competence, I still hope that JAB can help us to find more opportunities for so many graduated students in the park. I've spent too much on children's education and had a high expectation. I hope that the condition will be improved one day.

There is another problem coming out of sending children to study in big cities. Parents usually do not send small children to kindergartens because there is no specific kindergarten where small children can speak Tibetan language for communication. Instead, parents teach their children both Sichuan Dialect and Tibetan language at home before their children are sent to primary schools in big cities. However, 70% of the indigenous children cannot speak Tibetan language after they come back home from big cities especially those who were born after 2000. They only understand when other people speaking Tibetan language, but they use

Sichuan Dialect to communicate with people inside the park as they do at school. Some parents are worried about the future condition of Tibetan language in the park area although they only speak Tibetan language with their children after they come back. They believe that more practice will be helpful to improve their children's Tibetan language.

#### 4.4.7 Traditional knowledge

Due to the policy of returning farmland to forests and animal breeding grounds to pastures in China at the end of 20<sup>th</sup> century, farming and animal husbandry were no longer the main living basis for indigenous people. Besides, digging for medicinal materials was also made illegal in the park area since then. Almost all indigenous people started doing business inside the park afterwards, except the old people in each family. They still prefer to live a life in the traditional way, for example, they usually plant maize, potato, hulless barley and broad bean on the small piece of family private plot; they like making traditional Tibetan clothes for the whole family. However, the young generation, who is either busy studying in big cities or busy doing business in the park, has no idea about the traditional knowledge in farming, animal husbandry, digging for medicinal materials, traditional spinning and embroidering. Instead of learning traditional knowledge from the old generation, young people prefer to surf the web, watch TV or play games at home. Nowadays few young people know how to make traditional foods like tsamba and most of them do not eat these traditional foods often or even dislike the taste. Besides, except the few blacksmiths and carpenters who are older than 60 in each village, there will not be anyone who is proficient in these crafts in the near future. The majority of interviewees considered that it was impossible for young generation to inherit all traditional knowledge in this park so extinction of most indigenous knowledge was inevitable.

Fortunately, some young people have started to learn traditional knowledge due to the increasing number of tourists to the park, because quite a few tourists are interested in traditional Tibetan culture and Tibetan goods. In Figure 50 there was a young Tibetan man making an ox horn comb which is good for scalp and hair. Nowadays lots of tourists would like to buy ox horn combs or ox horn chopsticks as tourism souvenirs or as gifts given to relatives and friends after they go back home. In Figure 51 an indigenous young lady was making a cape in the traditional Tibetan way of spinning. There are many indigenous people selling capes to tourists in the shopping center in Nuorilang Dining Hall. However, only in this lady's shop in Ze Cha Wa Village we can know that how the capes are made and what

kind of materials are used. Besides, all the capes in this small shop are made by the young lady so many tourists prefer to buy the capes in her shop.



**Figure 50 Making an ox horn comb**



**Figure 51 Traditional Tibetan spinning**

#### 4.4.8 Income distribution

Surveys of income distribution were carried out in Shu Zheng and Zha Ru Villages. These two villages were selected to illustrate the unequal income distribution in different villages because almost all indigenous people consider that Shu Zheng Village is the richest village in the park and Zha Ru Village is the poorest. The main source of income for each household is quite different between the two villages and there is also a big gap in economic income between households in the two villages.

Shu Zheng Village is the first village that was opened for tourism development in the park. Since the beginning of 21<sup>st</sup> century when operating family hostels were not allowed inside the park, many families in this village have changed the first floor of their houses into a small shop for selling tourism souvenirs to tourists. Nowadays, selling tourism souvenirs at home becomes an important income source to households in Shu Zheng Village, however, it is the only thing that people cannot do in Zha Ru Village because the majority of tourists will not go there, except a small number of ecotourists. From Table 5 we can see that besides the six common income sources in the two villages, some people in Zha Ru Village also sell agricultural products like walnuts to tourists as an extra income source because they have more time to do some farming at home than people who are busy selling tourism souvenirs at home in other villages. But money from selling agricultural products is far lower than selling tourism souvenirs to tourists because Jiuzhai valley is a famous resort for tourism. As a result,

more and more indigenous people in Zha Ru Village hope that their village can be open for ecotourism as the other opened ones in the park and they will be offered increased income from ecotourism development in this area.

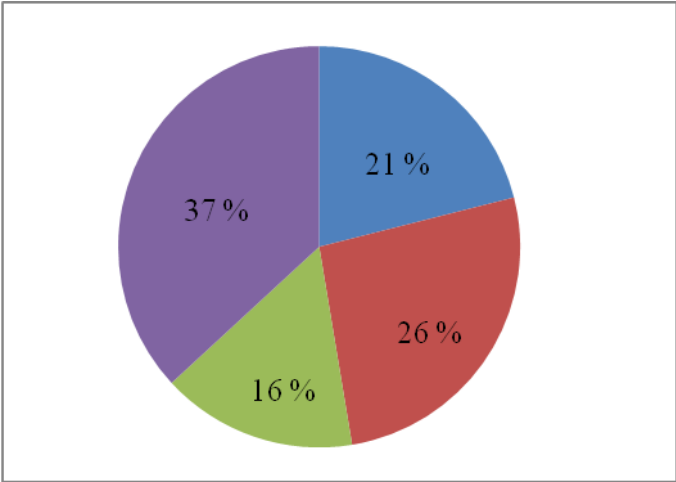
**Table 5 Income sources of households in Shu Zheng and Zha Ru Village**

Shu Zheng Village	Zha Ru Village
Selling tourism souvenirs at home	Selling agricultural products to tourists at sight spots or outside the park
Selling tourism souvenirs at Nuorilang Dining Hall and get bonus	
Renting out traditional Tibetan clothes to tourists and taking photos for tourists at the main sight spots	
Subsidy from JAB	
Salary from JAB	
Salary from other companies and organizations outside the park	
Doing business outside the park	

The following figures stand for the income sources and their percentages to the whole income from two households which are in Shu Zheng and Zha Ru Village respectively. Annual subsidy from government is the common income source, which is calculated by the number of family members whose household registrations are in the park area. However, those who work in JAB or other governmental agencies cannot get the subsidy from JAB as well as their children, even they have their household registrations in the park. Thus, an ordinary family with three children can get approximately 40,000 to 50,000 RMB subsidy from JAB at the end of year. Beside subsidy from JAB, renting out traditional Tibetan costumes to tourists and taking photos for them is another common source. There are three family members in the household in Zha Ru Village, a single mother, a daughter and a son. This household is one of the poorer households in the park. The daughter is employed by a company outside the park so she gets salary from her job. The mother goes to the main sight spots almost every day in peak seasons with her son, renting out Tibetan costumes to tourists and taking photos for them, and the money from it accounts for more than half of the annual household income. Besides, the mother also sells her walnuts to tourists in autumn when she has a good harvest. However, she can get no more than 3,000 RMB every year from selling walnuts.

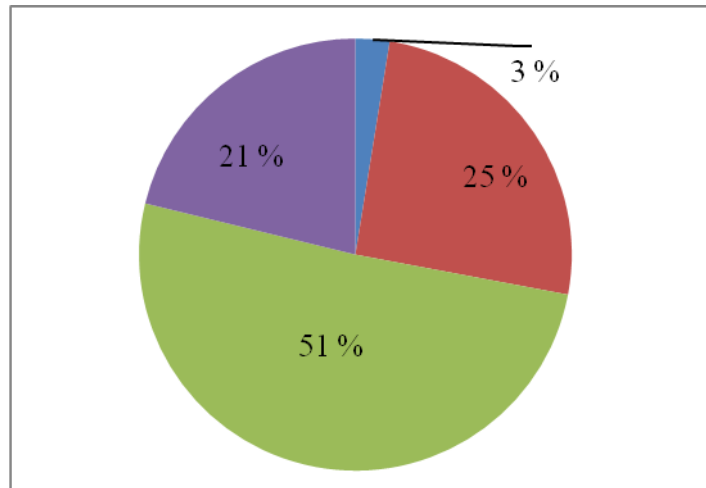
The household in Shu Zheng Village represents the richer ones in the park. There are 6 family members in this household, parents and four children, so the whole household receives more subsidy than the one in Zha Ru Village from JAB every year. However, the percentage of

subsidy accounts for less of the total household income. The main income source for this household is from selling tourism souvenirs at Nuorilang Dining Hall and receiving bonus. Since people had to purchase shares of stock to acquire the right to sell tourism souvenirs there at the beginning, the poorer households were not able to do this. There are some other households which put money into other business outside the park or in big cities instead of buying shares of stock in Nuorilang Dining Hall become the richest ones in the park. As a result, the rich ones have become richer. Beside the unequal income distribution between villages inside the park, most people living in Zhangzha Town also consider that not only the people living inside the park but also more indigenous people living outside the park area should benefit from ecotourism.



**Figure 52 One household income distributions in Shu Zheng Village**

- Subsidy from JAB
- Selling tourism souvenirs at home
- Renting out traditional Tibetan clothes to tourists at the main sight spots
- Selling tourism souvenirs at Nuorilang Dining Hall and bonus



**Figure 53 One household income distributions in Zha Ru Village**

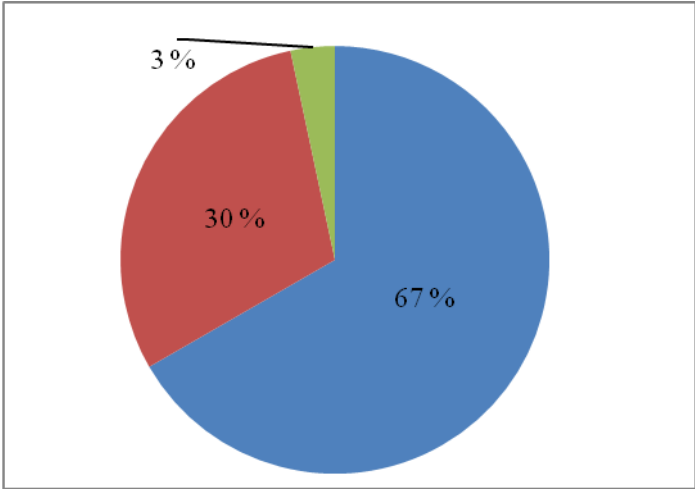
- Selling agricultural products to tourists at sight spots or outside the park
- Subsidy from JAB
- Renting out traditional Tibetan clothes to tourists and taking photos for them at the main sight
- Salary from other companies and organizations outside the park

#### 4.4.9 Degree of indigenous people's participation in ecotourism development

Stimulating community participation (CP) has been one of the most important objectives in ecotourism development since the initial stage of ecotourism all over the world. Although JAB has made great efforts to help indigenous people benefit from ecotourism development in the park, most of benefits to indigenous people are economic benefits. The level of CP in this park is lower than the expected level in ecotourism development.

Figure 54 shows that the dominant degree of participation for indigenous people is doing private business inside the park. Following the rules and restrictions made by JAB, no longer operating family hostels inside the park ten years ago, and now selling tourism souvenirs at home and Nuorilang Dining Hall, or renting out traditional Tibetan costumes to tourists and taking photos for them at the main sight spots nowadays, indigenous people have gained substantial economic income in these ways. However, almost all indigenous people, including those working in JAB, have not been involved in decision-making process during ecotourism development in the park. Only a few committee members in each village have the right to participate in decision-making processes, whilst other indigenous people are only informed after a new decision is made. Although employing indigenous people working in JAB is a

good way to promote CP, it is not sufficient to achieve the aim of CP in ecotourism development. Nevertheless, most indigenous people are satisfied with the work that JAB has done because they say they are more interested in increasing economic income rather than participating in decision-making. But a few young people who have got higher education in big cities or abroad consider that more indigenous people should be involved in the process of decision-making especially when the decision is relevant to ecosystem conservation in the park, because their traditional knowledge will be a great help to conserve natural resources and promote harmonious development between ecological and social systems.



**Figure 54 Degree of indigenous people’s participation in ecotourism development in the park**

- Doing private business inside the park
- Working as an employee in JAB
- Participating in decision-making



## 5. DISCUSSION

In order to achieve the aim of ecotourism, JAB has taken many measures to conserve the ecosystem and improve Tibetan livelihoods in the park area. Although considered to be a successful case in China, ecotourism in Jiuzhai valley has also caused negative impacts on local social and ecological systems. Lack of timely monitoring and impact-assessment are an important reason for this. Inadequate research is conducted after each new JAB's policy or regulation. Thus, it is hard to decide whether the new measure is helpful or not towards achieve the aim of ecotourism. Besides, according to the principles of ecotourism, coordinating the relationships between JAB, tourists, indigenous residents and the ecosystem is of great significance in relation to sustainable development of ecotourism. Here I will compare my findings to those in previous research, and relate the ecological and social impacts to the conservation objective and community participation objective of establishing national parks.

### 5.1 The relationship between ecosystem conservation, tourists and JAB

Tourist, is like a double-edged sword, has influenced the conservation objective of the park to a certain extent. On the one hand, millions of tourists' visiting the park have generated considerable tourism revenue, which provides a fundamental way of fund raising to fulfill the conservation objective in the park. Reforestation, construction of infrastructure such as dams and wastewater treatment stations as well as improvement of local livelihood owe much to economic contributions of tourists. On the other hand, tourists' behaviors have also caused negative impacts on ecosystem conservation, for example, trampling by tourists can influence the diversity of lichens in the park; Zhang and He (2007) claimed that vegetation cover rate has been going down around the entrance area of the park due to large quantities of tourists; Liu (2005) also considered that broad-leaved forest has been affected more seriously than other types of vegetation. Then increasing financial support and reducing negative environmental impacts are both key factors to achieve conservation objective, which depends largely on the relationship between JAB and tourists.

JAB plays two different roles for tourists. The most important one is that JAB is the organization which provides services when tourists come to visit the park. With tourists' self-

consciousness strengthened nowadays, the demand for high quality services is becoming an inevitable trend. Many tourists consider higher price of tickets to be equal to fewer visitors and higher quality of services, however, it is not the reality in this park. The ticket price of Jiuzhai Valley National Park is one of the most expensive in China, but the number of tourists is also one of the largest. Some tourists complained that the park was too crowded to provide unique experiences and JAB was not able to provide high quality services to each tourist in peak seasons. For example, Nuorilang Dining Hall is the only place for tourists to have lunch inside the park, such that in the peak seasons, tourists have to wait for a long time for a table to be available at lunch time. Beside tourists' complaints, several tourists doubted whether JAB had implemented the regulation to limit daily number of tourists within 12,000, and they also felt that 12,000 are beyond the carrying capacity of this park. According to official statistical data in SCTA (SCTA, 2011), the number of tourists visited Jiuzhai Valley National Park in October of 2011 was 496,900. Then the average daily number of tourists in this month was 16,029, and it is believed that the peak daily number is even larger in the seven-day National Day Holiday. Similar situations happened in August and September of 2011 and October of 2007, and average daily number of tourists in these months was larger than 12,000. Unlimited number of tourists seems to be helpful to increase financial support for ecological conservation at the very beginning, but it is not the sustainable way either for developing tourism industry or for achieving conservation objective in this area. Since JAB is the sole service agency in the park, most tourists said that they would be willing to accept a higher price ticket if JAB would regard providing each tourist with pleasant experiences and high quality services as its primary task. Therefore, increasing ticket price, improving service quality and strictly controlling tourist number will be helpful to increase financial support and reduce negative environmental impacts, or else it will be difficult to achieve fund raising and conservation objective simultaneously in the long run.

Secondly, JAB is an administrative organization which is able to influence tourists to build environmental and cultural awareness, and respect for local ecological and social systems. However, ecotourism education for tourists is a weak link in JAB's administration. Introduction handbooks are only available in the tourist center outside the entrance, and handbooks in other languages including English, German, Japanese, and Korean are also available there. Information about what tourists cannot do inside the park is only found in the handbooks in foreign languages, but not in the Chinese ones. In fact, compared to foreign visitors, Chinese tourists actually need to be provided with more ecotourism education,

because Chinese people have just started to build environmental and cultural awareness a few years ago. For example, most of tourists who take a handbook on their own initiative before entering the park are visitors from abroad, while Chinese tourists only catch a glimpse of the handbook at the tourist center without taking it into the park. Beside the problem of introduction handbook, tour guides on the green buses mainly introduce information about landscape and Tibetan culture, and the only emphasis on environmental protection is that tourists cannot smoke in the park. Therefore, negative impacts caused by tourists can be charged to their lack of information and education to a large extent. Even though education for tourists plays a crucial role in environmental protection, sometimes it is not effective enough. For example, although being explicitly reminded that this park is a non-smoking park, some tourists cannot stop smoking after they enter the park. It is just the problem of poor monitoring that Li (2004) has pointed out. He considered that many protected areas in China have very poor monitoring program, and now it turns out that Jiuzhai Valley National Park is no exception. Although JAB has done much work on monitoring water quality, insect pest, plant disease and natural disasters such as forest fire or landslides, monitoring on tourist's behaviors together with auxiliary aid and punitive provisions will also be helpful to reduce negative impacts caused by tourists. However, not only the inside ecosystem conservation but also the outside environmental protection need to be paid close attention to. Very few researchers care about outside environmental situation when evaluating ecotourism impacts in protected areas such as national parks in China. It seems that a national park is a separate and closed space which is the only area that can be influenced by tourism industry. In fact, ecotourism development in a national park is able to cause tremendous changes to the district where the park is located. From the results in Chapter 4 we can see that sanitation condition in the park's neighboring areas has been deteriorating in recent years. There are three reasons for this: firstly, according to JAB's policy, all family hostels should be closed and tourists were no longer allowed to stay overnight inside the park at the end of 20<sup>th</sup> century in order to reduce environmental pollution, so it is natural that the outside neighboring area started to be responsible for tourist accommodation; secondly, with the number of tourists increased a lot, the owners of restaurants, family hostels and hotels in Zhangzha Town have been busying increasing economic income without being provided any guidance for environmental protection; thirdly, most of tourists ignore environmental protection in Zhangzha Town because it is "beyond" the area of the national park. As a result, Zhangzha Town is becoming a place which is "used" to assimilate wastes and pollution caused by ecotourism, and this definitely violates the primary intention and commitment of establishing Jiuzhai Valley

National Park. It is believed that the situation cannot be improved unless governmental agencies such as Zhangzha Town Government or JAB can provide essential guidance and supervision.

## 5.2 Relationship between JAB and indigenous residents

Indigenous Tibetan people were the hosts and protectors of the park before ecotourism developed, and they still are despite the great changes in this area. This is a critical principle in ecotourism development. Furthermore, community development should be promoted simultaneously in the process of developing ecotourism. Then JAB is not so much an administrative organization as a service agency which encourages community's participating in ecotourism. According to Scheyvens (1999) and Weaver (2010), CP cannot be achieved in ecotourism unless local community is empowered economically, psychologically, socially and politically, which can "lead indigenous people to greater economic achievements, self-confidence, social cohesion, and political influence" (Coria & Calfucura, 2012).

"Empowerment" is a popular term which is usually recognized as a key factor in evaluating social impacts of ecotourism. There are quite a few academic papers in which the authors have analyzed the different dimensions of empowerment (Alkire & Deneulin, 2009), not only theoretical psychological studies (Bandura, 2002) but also participatory observations from fieldwork (Kim, et al, 2007). In my opinion, such kind of "empowerment" is a passive situation in which local authority is still in control of indigenous people. Some local authorities prefer to use the term of "empowerment" in interviews or official reports in order to show their concern about indigenous people's rights and benefits, however, empowerment does not mean that power has shifted from local authority to indigenous people. Indeed I would rather interpret empowerment as a way to enable local community to be involved in sharing ecotourism benefits, which includes sharing economic benefits, conservation of indigenous culture and knowledge, promoting social harmony and political involvement.

### 5.2.1 Sharing economic benefits

Sharing economic benefits should be regarded as the first step, because indigenous people will not have interests and motivation in participating in ecotourism unless they can be provided economic benefits. Especially in the areas where local people have no longer had

access to agriculture and hunting lands and their production patterns have dramatically transformed since ecotourism developed, and Jiuzhai valley is an area like this. JAB's offering subsidy to indigenous people is a good economic incentive to help their participation in ecotourism, and some indigenous people become employees working in JAB. However, these still are rudimental economic stimulating measures (Wunder, 2000). In order to lead indigenous people to further economic achievement, joint-stock system is adopted by JAB. Nuorilang Dining Hall was rebuilt on the funds collected from indigenous people, so stockholders can not only make money from selling tourism souvenirs in the hall but also be awarded bonus at the end of year. It is a recommendable attempt to achieve CP, but the only drawback in this system is that number of indigenous people who have been involved in the stock is limited. It would be a better condition if JAB can find out a solution to help more people benefit from ecotourism development, and the solution is also helpful for JAB to set an impartial income distribution mechanism in local communities.

### 5.2.2 Conservation of indigenous culture and knowledge

According to Scheyvens (1999), psychological empowerment can be interpreted as strengthening indigenous people's self-esteem, helping them build self-confidence on their unique ethnic culture, traditional knowledge and nature resources that they possess. However, self-esteem and self-confidence cannot be built or strengthened by external encouragement or pressure without indigenous people's own desire. Then I would refer to psychological empowerment as conservation of indigenous culture and knowledge because these are two key factors which local people are proud of. In Jiuzhai valley indigenous residents have experienced transformation of production pattern, modernization of life style in recent 20 years. Consequently, limited access to nature resources, lost traditional knowledge in agriculture and spontaneous cultural assimilation are what indigenous Tibetan people face now. From the result of ecotourism's impacts on social system in Chapter 4 we can see that local ethnic culture including food, costume, architecture, language and traditional knowledge has been profoundly affected by ecotourism development except religion. Although many people concentrate on increasing economic income nowadays, they show great fears for the future of their culture. Due to transformation of production pattern, traditional knowledge in agriculture is difficult to be preserved in the park area. Therefore, conservation of traditional knowledge in making food, Tibetan costume, environmental conservation and other aspects in local culture need to be paid close attention to. Besides, how to help young generation inherit

and carry forward their unique traditions is also of great significance.

### 5.2.3 Promoting social harmony

Social empowerment mainly refers to two aspects: existence of various infrastructures for social development and strengthened community's awareness of cohesion and integrity (Moslem & Amran, 2011). And I would prefer to consider social empowerment as promoting social harmony. With economic growth increased significantly, a variety of infrastructures have been constructed in the park area, for example, road, electric power network, water supply system. However, lack of educational infrastructures is becoming a serious problem in Jiuzhai valley. As a result, not only is sending children to study in big cities expensive, but those children having difficulties finding jobs after graduation. More than 10 years' education in big cities is still not able to make indigenous young people more competitive, which make their parents suffer economic losses and psychological pain. Although there are some problems from the young people themselves, for example, they do not study hard and they lose motivation of self-development for future career, external factors should also be blamed. Instead of pushing indigenous parents to send their children to study in big cities, JAB would better raise funds or use part of existing funds to develop local educational infrastructures, because increasing young generation's education level plays a significant role in community development as well as in social harmony. For example, a kindergarten needs to be built inside the park, and all teachers in the kindergarten are required to speak Tibetan language with children. This measure will be helpful to strengthen children's mother language and avoid their forgetting it at an early age. Although there is no school in the park, there are some primary and middle schools in Jiuzhai County. It would be a great help if JAB takes steps to introduce and retain talented teachers who have much experience in the nearest schools in order to improve education quality. In this way, parents do not have to spend much money sending their children to study far way. Besides, children's mother language will be further strengthened during daily communications with schoolmates and family members. Beside educational infrastructures needed to be improved, community's awareness of cohesion and integrity also needs to be strengthened. Since indigenous people are busy doing business and making money nowadays, they have much less time to participate in family parties than before. Then several residents especially the old are disappointed with the aloof relationship between family members. Therefore, improving current relationships in the family and helping them establish a harmonious and united relationship between family members,

neighbors and communities are important aspects in promoting social harmony.

#### 5.2.4 Political involvement

Political involvement has the closest relationship with power in the four aspects, so it is the most difficult one to achieve in ecotourism. Voices and concerns of indigenous people are usually neglected by the government or management authority. From the results it is recognized that the degree of indigenous people's involvement in political issues is low. Although most indigenous people in Jiuzhai valley are full of concern about income growth and livelihood improvement and they are satisfied with the efforts that JAB has made, their involvement in decision-making process should not be replaced with economic benefits. Akama (1996) claimed that decentralized power is required from national level to the community level in ecotourism. Democratically elected representatives of each interest group like olds, youths and women should express the views and perceptions in the decision-making procedures, and propositions from each level need to be coordinated by JAB to reach a consensus ultimately.

#### 5.3 Build resilience for local social-ecological system

According to the definition given by Stockholm Resilience Center, social-ecological systems (SES) are linked systems of people and nature. When regarded as a whole system, SES emphasizes that "humans must be seen as a part of, not apart from, nature—that the delineation between social and ecological systems is artificial and arbitrary" (Stockholm Resilience Center). SES behaves according to three key principles: "(1) order is emergent as opposed to predetermined; (2) the system's history is irreversible; (3) the system's future is unpredictable" (Jennifer, et al, 2010). SES theory is helpful to make people understand how to promote sustainable development of the linked social and ecological systems, and management of protected areas where both of ecosystem and community are involved in tourism should follow this whole system thinking. Besides, resilience thinking also plays an important role in understanding the interlinkages of SES. In the report for The Swedish Environmental Advisory Council, it was indicated that resilience in SES included (Berkes, et al, 2003):

- the amount of change a system can undergo and still retain the same controls on function and structure, or still be in the same state, within the same dome of attraction

- the degree to which the system is capable of self-organization
- the degree to which the system can build capacity for learning and adaptation

In Jiuzhai Valley National Park, ecosystem and local community are inherently interacting, continually adapting and consistently independent. However, sustainability of local SES is closely related to ecotourism development in this area. Due to vulnerability of ecotourism to many external disturbances, local SES is also susceptible. For example, there was a great earthquake occurred in Aba Tibetan and Qiang Autonomous Prefecture in 2008. Although the park was not heavily affected by the disaster, the number of tourists had decreased sharply in the following half year since then on. Ecotourism in the park suffered heavy losses from interrupted traffic, continued aftershocks, so did the economic income of indigenous people. Beside extreme weather and geological conditions, there are some other political, economic, social and legal uncertainties which can cause considerable impacts on ecotourism, as well as ecosystem and local community. For example, after the policy of returning farmland to forests and animal breeding grounds to pastures in China, residents in the park have had limited access to natural resources. Although it is helpful to conserve ecosystem, it has changed people's life style completely. Fortunately, there were some other measures like subsidy taken afterwards, and JAB has made great efforts to help local people adapt to the new tourism-based production pattern. From the two examples we can see that annual number of tourists is uncertain, and the future of local SES is also unpredictable. Therefore, building resilience and adaptive capacity for local SES is vital to its sustainable development.

Berkes et al. (2003) have pointed out that four strategies are required to build resilience and adaptive capacity in SES.

- (1) "Learning to live with change and uncertainty". It mainly refers to helping local people recognize potential disturbances and envision alternative futures in order to avoid particular consequences to a certain extent. Relevant measures need to be taken by JAB after changes happen, which will be helpful for people to adapt.
- (2) "Nurturing diversity for reorganization and renewal". Biodiversity and cultural diversity are both key factors in resilience-building. It will be of great help if JAB can make efforts on implementing conservation of biodiversity and cultural diversity simultaneously, as well as minimizing ecotourism impacts on diversity conservation.
- (3) "Combining different types of knowledge for learning". Traditional knowledge should not be replaced with modern scientific knowledge. Experiential knowledge from the



old generation is precious, which can help build adaptive capacity of nature and human. Therefore, relevant educational infrastructures are crucial for the young generation to inherit and carry forward the traditional knowledge. Besides, combining the “old” and “new” knowledge will be useful in ecotourism management.

- (4) “Creating opportunity for self-organization”. Be different from an equilibrium system, self-organization is able to provide potential multiple pathways for management (Folke, et al, 2002). It will be difficult to achieve sustainable development unless JAB’s future policies focus on fostering capacity of self-organization in local SES.

Only in this way ecotourism will be further developed in a sustainable way, and the objectives of establishing Jiuzhai Valley National Park will be further fulfilled as well.

## 6. CONCLUSION

Ecotourism has attracted large numbers of tourists and brought considerable changes to Jiuzhai Valley National Park. As the local administrative agency, JAB has made great efforts and taken many effective measures to protect ecosystem inside the park. However, due to lack of monitoring program on tourists' behaviors and evaluation system on ecotourism impacts, negative impacts on biodiversity and freshwater aquatic ecosystem have become evident. As ecotourism developed rapidly in the last ten years, sanitary conditions in the park's neighboring areas have been deteriorating. Extended collaboration and cooperation with other relevant government agencies would be helpful to solve this problem.

Ecotourism development has also changed indigenous Tibetan people's life completely. Being promoted to participate in ecotourism by JAB, indigenous people have gained substantial economic benefits from private business inside the park. Although income distribution is not equal among households and villages, nowadays local Tibetan people have much higher quality of life than ever before. Income growth has also strengthened their religious beliefs. However, modernization of life style has stimulated decline of traditions in Tibetan culture, such as language, traditional knowledge and techniques. Lack of local educational infrastructures is also a critical problem. There are both internal and external reasons for young people's less competitive to find a job after graduation, and then JAB is responsible to help the young generation get good education and find a corresponding job locally. Degree of community participation in ecotourism is still at primary level, because measures have been taken only on increasing indigenous people's economic income. Conservation of indigenous culture and knowledge, promoting social harmony and political involvement are challenging tasks left for JAB. Furthermore, resilience-building that can provide adaptive management of local SES is the crucial factor for sustainability.

## 7. REFERENCES

- Akama, J.S. (1996) Western Environmental Values and Nature-based Tourism in Kenya. *Tourism Management*, 17 (8): 567-574.
- Alkire, S. & Deneulin, S. (2009) *The human development and capability approach*. Sterling, VA: Earthscan.
- Babbie, E. (1990) *Survey Research Methods* (2<sup>nd</sup> ed.). Belmont, CA: Wadsworth.
- Bandura, A. (2002) Social Cognitive Theory in Cultural Context. *Applied Psychology: An International Review*, 51 (2): 269-290.
- Berkes, F., Colding, J. & Folke, C. (2003) *Navigating Social-ecological Systems: Building Resilience for Complexity and Change*. Cambridge: UK, Cambridge University Press.
- Buckley, R.C. (1998) Tools and Indicators for Managing Tourism in Parks. *Annals of Tourism Research*, 26 (1): 207-210.
- Butler, J.R. (1992) *Ecotourism: Its Changing Face and Evolving Philosophy*. Paper presented to the 4th World Congress on National Parks and Protected Areas, Caracas, Venezuela.
- Cater, E. (1993) Ecotourism in the Third World: Problems for Sustainable Development. *Tourism Management*, 14 (2): 85-90.
- Ceballos-Lascuráin, H. (1993) *The IUCN Ecotourism Consultancy Programme*. México, DF
- Ceballos-Lascuráin, H. (1996) *Tourism, Ecotourism, and Protected Areas*. Cambridge: UK, Cambridge University Press.
- Cheng, L. & Wang, T. (2010) Analysis on the Future Policy Tendency of Ecotourism Management Based on the Appropriation of Benefits in Western China. *Society and Natural Resources*, 23(2): 128-145.

- CNTA. (2000) *Deng Xiaoping's Talks on Tourism, 6 January 1979*. Beijing: China Communist Party, Central Literature Publishing House.
- Coria, J. & Calfucura, E. (2012) Ecotourism and the Development of Indigenous Communities: the Good, the Bad and the Ugly. *Ecological Economics*, 73: 47-55.
- Creswell, J.W. (2009) *Research Design* (3rd ed). Thousand Oaks, CA: SAGE Publications, Inc.
- Crotty, M. (1998) *The Foundations of Social Research: Meaning and perspective in the Research Process*. London: SAGE Publications Ltd.
- Diedrich, A. (2007) The Impacts of Tourism on Coral Reef Conservation Awareness and Support in Coastal Communities in Belize. *Coral Reefs*, 26: 985-996.
- Dompka, V. (1996) *Human Population, Biodiversity and Protected Areas: Science and Policy Issues*. American Association for the Advancement of Science, Washington, DC.
- Duraiappah, A. K. (1998). Poverty and Environmental Degradation: A Review and Analysis of the Nexus. *World Development*, 26: 2169-2179.
- Fang, Y., Zeng, Y. & Li, S. (2005) Management Philosophy and Practices of Habitat Conservation for Jiuzhaigou Nature Reserve, Sichuan, China. *Wuhan University Journal of Nature Sciences*, 10 (4): 730-738.
- Farrell, B.H. & Runyan, D. (1991) Ecology and Tourism. *Annals of Tourism Research*, 18 (1): 26-40.
- Folke, C., Carpenter, S., Elmqvist, T., Gunderson, L., Holling, C.S., Walker, B., Bengtsson, J., Berkes, F., Colding, J., Danell, K., Falkenmark, M., Gordon, L., Kasperson, R., Kautsky, N., Kinzig, A., Levin, S., Mäler, K., Moberg, F., Ohlsson, L., Olsson, P., Ostrom, E., Reid, W., Rockström, J., Savenije, H. & Svedin, U. (2002) *Resilience and Sustainable Development: Building Adaptive Capacity in a World of Transformations*. From: <http://www.sou.gov.se/mvb/pdf/resiliens.pdf>

- Gilchrist, A. (2003) Community Development in the UK - Possibilities and Paradoxes. *Community Development Journal*, 38 (1): 16-25.
- Goodwin, H. (1996) In Pursuit of Ecotourism. *Biodiversity and Conservation*, 5: 277-291.
- Grabherr, G. (1982) The Impact of Trampling by Tourists on a High Altitudinal Grassland in the Tyrolean Alps, Australia. *Vegetation*, 48: 209-217.
- Heber, U., Bilger, W., Bligny, R., Lange & O.L. (2000) Phototolerance of Lichens, Mosses and Higher Plants in an Alpine Environment: Analysis of Photoreactions. *Planta*, 211: 770-780.
- Hendrickson, C.Y. (2009) *To Develop or Conserve? A Case Study on Biodiversity Protection and Local Sustainable Development in Jiuzhaigou, China*. M. Sc. Thesis. Lund University, Lund.
- IUCN. (1994) *Guidelines for protected area management categories. International Union for the Conservation of Nature (IUCN) Commission on National Parks and Protected Areas with the assistance of the World Conservation Monitoring Centre*. Gland, Switzerland.
- Kim, J.C., Watts, C.H., Hargreaves, J.R., Ndhlovu, L.X., Phetla, G., Morison, L.A., Busza, J., Porter, J.D. & Pronyk, P. (2007) Understanding the Impact of a Microfinance-Based Intervention on Women's Empowerment and the Reduction of Intimate Partner Violence in South Africa. *American Journal of Public Health*, 97 (10): 1794-1802.
- King, D.A. & Stewart, W.P. (1996) Ecotourism and Commodification: Protecting People and Places. *Biodiversity and Conservation*, 5 (3): 293-305.
- Kramer, R., Schaik, C.V. & Johnson, J. (1997) *Last Stand: Protected Areas and the Defense of Tropical Biodiversity*. New York: Oxford University Press.
- Li, W. & Han, N. (2001) Ecotourism Management in China's Nature Reserves. *A Journal of the Human Environment*, 30 (1): 62-63.

- Li, W. (2004) Environmental Management Indicators for Ecotourism in China's Nature Reserves: A Case Study in Tianmushan Nature Reserve. *Tourism Management*, 25 (5): 559-564.
- Li, W., Ge, X. & Liu, C. (2005) Hiking Trails and Tourism Impact Assessment in Protected Area: Jiuzhaigou Biosphere Reserve, China. *Environmental Monitoring and Assessment*, 108: 279-293.
- Liu, J., Linderman, M., Quyang, Z., An, L., Yang, J. & Zhang, H. (2001) Ecological Degradation in Protected Areas: The Case of Wolong Nature Reserve for Giant Pandas. *Science*, 292: 98-101.
- Liu, J. (2005) *A Study of Impacts of Tourism Development on Landscape and Anduo Tibetan Culture at the Jiuzhaigou Nature reserve*. M. Sc. Thesis. Sichuan University, Chengdu.
- Liu, J. & Diamond, J. (2005) China's Environment in A Globalizing World. *Nature*, 435: 1179-1186.
- Liu, S., Zhang, X. & Zeng, Z. (2007) *Biodiversity of The Jiuzhaigou National Nature Reserve*. Chengdu: Sichuan Science and Technology Press.
- Lu, X., Wu, C. & Xiao, G. (2006) Fuzzy Synthetic Evaluation on Resident's Perceptions of Tourism Impacts – Case of Jiuzhaigou National Park, Sichuan Province, China. *Chinese Geographical Science*, 16 (1): 87-94.
- Marshall, C. & Rossman, G.B. (2006) *Designing Qualitative Research* (4th ed.). Thousand Oaks, CA: SAGE Publications, Inc.
- McLaren, D. (1998) *Rethinking Tourism and Ecotravel: The Paving of Paradise and What You Can Do to Stop It*. West Hartford, CT: Kumarian Press.
- Mittermeier, R.A. & Werner, T.B. (1990) Wealth of Plants and Animals Unites 'Megadiversity' Countries. *Tropicus*, 4 (1): 4-5.

- Moslem, G. & Amran, H. (2011) An Evaluation of the Role and Performance of NGOs in Community-Based Ecotourism at Ulu Geroh, Gopeng, Malaysia. CIPD MONOGRAPH No. 9. From <http://www.sustainability.utm.my/cipd/files/2011/10/An-Evaluation-of-the-Role-and-Performance-of-NGOs-In-Community-Based-Ecotourism-at-Ulu-Geroh-Gopeng-Malaysia1.pdf>
- Naughton-Treves, L., Holland, M.B. & Brandon, K. (2005) The Role of Protected Areas in Conserving Biodiversity and Sustaining Local Livelihoods. *Annual Review of Environment and Resources*, 30: 219-252.
- Neto, F. (2003) A New Approach to Sustainable Tourism Development: Moving beyond Environmental Protection. *Nature Resources Forum*, 27 (3): 212-222.
- Pan, M. (2005) Reevaluation of Movement of Educated Youth Went to and Worked in Countryside and Mountain Areas (in Chinese). *Sociological Studies*, 5: 154-181.
- Ren, X. (2004) Analysis of Tourism Development and Sustainable Development in Jiuzhaigou. From <http://wenku.baidu.com/view/a23e26232f60ddccda38a06a.html>
- Ren, X. (2005) A Probe into Community Participation Managerial Mode of Natural Protection Zones : A Case Study of Jiuzhaigou Natural Reserve Zone. *Tourism Science*, 19 (3): 16-25.
- Ross, S. & Wall, G. (1999) Ecotourism: Towards Congruence between Theory and Practice. *Tourism Management*, 20 (1): 123-132.
- Schaller, G.B. (1994) *The Last Panda*. Chicago: University of Chicago Press.
- Scheyvens, R. (1999) Ecotourism and the Empowerment of Local Communities. *Tourism Management*, 20 (2): 245-249.
- SCTA. (2011) From Sichuan Province Travel Authority Website:

<http://www.scta.gov.cn/web/main.jsp?go=newsList&pid=7&cid=101>

Stockholm Resilience Center. From:

<http://www.stockholmresilience.org/research/whatisresilience/resiliencedictionary.4.aeea46911a3127427980004355.html>

Stone, M. & Wall, G. (2004) Ecotourism and Community Development: Case Studies from Hainan, China. *Environmental Management*, 33 (1): 12-24.

Strickland-Munro, J.K. (2010) Using Resilience Concepts to Investigate the Impacts of Protected Area Tourism on Communities. *Annals of Tourism Research*, 37 (2): 499-519.

TIES. (2007) Oslo Statement on Ecotourism. From

<http://www.iipt.org/pdf/OsloStatementEcotourism0807.pdf>

UNEP . (2005) Jiuzhaigou Valley Scenic & Historic Interest Area, Sichuan, China. From

<http://www.unep-wcmc.org/medialibrary/2011/06/24/68205af0/Jiuzhaigou%20Valley.pdf>

Untamed Path Website. Defining Ecotourism. From

<http://www.untamedpath.com/Ecotourism/defining.html>

Weaver, D. (2010) Indigenous Tourism Stages and Their Implications for Sustainability. *Journal of Sustainable Tourism*, 18 (1): 43-60.

Williamson, M. & Fitter, A. (1996) The Varying Success of Invaders. *Ecology*, 77 (6): 1661-1666.

Wunder, S. (2000) Ecotourism and Economic Incentives-An Empirical Approach. *Ecological Economics*, 32 (3): 465-479.

WWF. (1995) Ecotourism: Conservation Tool or Threat? *Conservation Issues*, 2 (3): 1-10.

Yan, H. & Bramwell, B. (2008) Culture Tourism, Ceremony and the State in China. *Annals of Tourism Research*, 35 (4): 969-989.



- Ye, W. & Xue, X. (2008) The Differences in Ecotourism between China and the West. *Current Issues in Tourism*, 11 (6): 567 -586.
- Zhang, J. & Lan, K. (2003) *Jiuzhaigou-The Heritage for All Mankind*. Chengdu: Sichuan Fine Arts Publishing House.
- Zhang, R. & He, Z. (2007) Evaluation about Environment Quality and Analysis of Vegetation Sensitive Factor of Jiuzhaigou Scenic Spot. *Resources Survey & Environment*, 28 (1): 74-78.
- Zhang, X. (2003) *Tourist Handbook in Jiuzhai Valley National Park*. Chengdu: Sichuan People's Publishing House.
- Zhang, X. (2004) *Collection of Academic Papers on Jiuzhaigou Geological Studies* (unpublished).
- Zimmerer, K.S., Galt, R.E. & Buck, M.V. (2004) Globalization and Multi-spatial Trends in the Coverage of Protected-Area Conservation (1980–2000). *Ambio*, 33 (8): 520-529.

## 8. APPENDICES

### Appendix 1 Interview Guide

#### Social impacts of ecotourism in Jiuzhai Valley National Park

The purpose of this study is to evaluate social impacts caused by ecotourism in Jiuzhai Valley National Park. Since it has been regarded as a successful case in China by many researchers, it is important to understand what indigenous people think about changes after ecotourism development in this area. The following questions will lead a guide to interview and provide subjects for discussion.

Basic information (gender, age, worker/resident)

What kind of changes have you been experiencing in your livelihood since the establishment of this park?

When do you think is the turning point of your livelihood here? Why do you think so?

Was life getting much better or worse after the turning point? Why is it better or not?

What kind of way for livelihood in this area do you prefer, the previous one or the current one? Why do you think so?

What do you think is the degree of your participation in ecotourism development?

What are the changes in your traditional culture? (vehicle, trappings, religion, food, daily necessities, architecture, custom)

Have you lost any previous knowledge in current life style, for example, in agriculture, medical treatment?

What do you think about the future of the knowledge? Do you think your descendants will know and use it? Why?

*Note: The interviewers have to lead to other questions by using the answers of these questions from the participants, which may help us to get more details for this research.*

## Appendix 2 Questionnaire1

My sincere thanks to you for spending time to answer my questions today. My name is Tian Yuan and I'm a master student in International Environmental Studies in Norwegian University of Life Sciences. The questionnaire will be used to analyze unequal income distribution between Zha Ru and Shu Zheng valleys in Jiuzhai Valley National Park for my master thesis. Thus, your answers will be great helpful for this research. All the responses that I gather from you will be kept confidential and they will never be given to anyone else.

1. Where do you live?
  - A. Shu Zheng valley
  - B. Zha Ru valley
  
2. What is your religion?
  - A. Pre-Buddhism Bon
  - B. Benbo-Sec
  - C. Qiang
  - D. Others
  
3. Are you an employee working in Jiuzhaigou Administration Bureau?
  - A. Yes
  - B. No
  
4. How many family members do you have?
  - A. Less than 3
  - B. 3-5
  - C. 5-7
  - D. More than 7
  
5. What is the main source of economy income for your family?
  - A. Self-employment inside the park
  - B. Employed by JAB
  - C. Employed by private business
  - D. Compensation from government
  - E. Others ----- (please write it down)
  
6. How much money do you get from government as compensation every year?  
----- CNY
  
7. What is the criterion for compensation?
  - A. Calculated by number of family members who are living inside the park
  - B. Calculated by household

- C. Calculated by which village do you live in
- D. You have no idea how it is calculated
- E. Others ----- (please write it down)

8. What is the degree of your satisfaction with the compensation?

- A. satisfied            B. Satisfied
- C. Not satisfied       D. Completely unsatisfied

9. How far have you been included in ecotourism?

- A. Private business inside the park
- B. Working as an employee in JAB
- C. Participating in decision-making
- D. None of them

10. Are there any restrictions on private business in your village?

- A. Yes            B. No

If you choose "A", please write them down:

-----

11. How is your livelihood after tourism development in this park?

- A. Much better   B. Almost the same   C. Even worse

Please explain this a little bit:

-----

12. What kind of help do you need to improve your livelihood inside the park?

-----

## Appendix 3 Questionnaire 2

My sincere thanks to you for spending time to answer my questions today. My name is Tian Yuan and I'm a master student in International Environmental Studies in Norwegian University of Life Sciences. My research is going to analyze ecotourism's impact on local social and ecological systems in Jiuzhai Valley National Park so that tourist's point of view is quite important and your answers will be helpful for me. All the responses that I gather from you will be kept confidential and they will never be given to anyone else.

1. Gender

- A. Male                      B. Female

2. Where are you from?

\_\_\_\_\_

3. Is this the first time that you come to this park?

- A. Yes                      B. No (How many times have you been here?\_\_\_\_\_)

4. What is your occupation?

- A. Clerk                      B. Official worker                      C. Teacher  
D. Student      E. Businessman      F. Tour guide      G. Others

5. How old are you?

- A. 20-30                      B. 30-40                      C. 40-50                      D. Older than 50

6. What is the most attractive in this park do you think before you come here?

- A. Landscape                      B. Tibetan culture  
C. Both                      D. Others (Please write it down)

7. What is the most impressive after you visit this park?

- A. Landscape                      B. Tibetan culture  
C. Both                      D. Others (Please write it down)

8. What kind of vehicle did you choose to come here?

A. Airplane

B. Coach bus

C. Private car

D. Others (Please write it down)

9. Do you think the construction of Jiuzhai Airport will attract more tourists?

A. Yes

B. No

10. How do you think the number of tourists to this park?

A. large

B. Large

C. Small

D. small

11. What kind of impact does ecotourism have on ecosystem and indigenous people in this park?

A. Positive impacts on both

B. Negative impacts on both

C. Positive impacts on ecosystem, negative impacts on indigenous people

D. Negative impacts on ecosystem, positive impacts on indigenous people

12. In order to conserve ecosystem and make livelihoods of indigenous people much better, do you have any suggestions?

---