

Participatory Management of Community-based Ecotourism at Jiuzhaigou National Nature Reserve, China

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Master of Arts

Xueyan Yang

aus Wuhan, Hubei, China

Gutachter: Professor Dr. rer. nat. Klaus Birkhofer

Gutachter: PD Dr. rer. nat. habil. Udo Bröring

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II. Abstract

Community-based ecotourism (CBET) is promoted in protected areas of developing countries as a strategy for biodiversity conservation and poverty alleviation. The success of CBET initiatives relies on effective participatory management programs that can build up collaborative relationships between key stakeholders – protected area administrative staff and local communities – and foster community empowerment. The performance of CBET participatory management programs, relationships between administrative staff and local community, and the level of community empowerment were previously assessed from the perspective of local communities. This study addresses both the perspectives of local community members and administrative staff, through an interview survey in Jiuzhaigou National Nature Reserve, China. This reserve is a key protected area for the conservation of giant panda and other endangered species in China, and is therefore of high priority for the national biodiversity strategy. Both qualitative and quantitative approaches were used to survey 200 local Tibetan villagers and 80 administrative staff members. The results indicate that both staff members and locals support the existing participatory management program - ecotourism development plan (EDP), but locals criticized the sustainable management policy (SMP). Younger, better educated and higher income interviewees were generally most supportive of the EDP and SMP. The relationship between staff members and locals was expressed as problematic with a lack of trust being mentioned as a key issue. The local community is empowered to some extent in economic and environmental dimensions, but not in social, psychological and political dimensions. The CBET generates economic income, but creates problems like inequality of benefit distribution, insufficient social infrastructure, loss of cultural identity, ecological degradation and participation as tokenism. Key factors that hinder the success of CBET from protected area governance and management aspects are a prevalent top-down approach, a mixture of property and operation rights, single sources of funding creating dependencies, a lack of efficient administrative structure and management capacity, and a lack of capacity building programs for the local community. This thesis provides empirical evidence for issues and limitations of policy implications under CBET participatory management programs in a protected area and offers recommendations on how to improve programs in the future.

Keywords: protected areas, participatory management, Tibet, administrative staff, community empowerment

III. Abstract (deutsch)

Das Community-based Ecotourism Konzept (CBET) wird in Naturschutzgebieten von Entwicklungsländern als Strategie zur Erhaltung der Artenvielfalt und zur Armutsbekämpfung gefördert. Der Erfolg von CBET-Initiativen beruht auf effektiven partizipativen Managementprogrammen, die den Aufbau von kooperativen Beziehungen zwischen wichtigen Interessengruppen - Verwaltungspersonal von Schutzgebieten und der lokalen Bevölkerung - ermöglichen und die Stärkung der Bevölkerung fördern. Die Leistung von partizipativen CBET-Managementprogrammen, die Beziehungen zwischen Verwaltungspersonal und lokaler Bevölkerung und die Ebene der kommunalen Selbstbestimmung wurden zuvor aus der Sicht der lokalen Bevölkerung bewertet. Diese Studie befasst sich in einer Interviewumfrage sowohl mit den Perspektiven der lokalen Bevölkerung als auch mit den Perspektiven des Verwaltungspersonals im Jiuzhaigou National Nature Reserve, China. Der Nationalpark ist eines der wichtigsten Schutzgebiete für Riesenpandas und andere gefährdete Tierarten in China und hat daher für die nationale Strategie zur Erhaltung der Artenvielfalt eine hohe Priorität. Bei der Befragung von 200 lokalen tibetischen Dorfbewohnern und 80 Verwaltungsmitarbeitern wurden sowohl qualitative als auch quantitative Ansätze angewendet. Die Ergebnisse zeigen, dass sowohl die Mitarbeiter der Verwaltung als auch die lokale Bevölkerung das bestehende partizipative Managementprogramm – Ecotourism Development Plan (EDP) – unterstützen, die Einheimischen jedoch gleichzeitig die Sustainable Management Policy (SMP) kritisieren. Jüngere, besser ausgebildete und einkommensstärkere Befragte unterstützten das EDP- und SMP-System grundsätzlich am stärksten. Das Verhältnis zwischen Mitarbeitern und Einheimischen wurde als problematisch eingestuft, wobei der Mangel an Vertrauen als Kernproblem benannt wurde. Die lokale Bevölkerung ist bis zu einem gewissen Grad in wirtschaftlicher und ökologischer Hinsicht befähigt, nicht aber in sozialer, psychologischer und politischer Hinsicht. Das CBET-Konzept generiert wirtschaftliches Einkommen, schafft allerdings gleichzeitig Probleme wie ungleiche Leistungsverteilung, unzureichende soziale Infrastruktur, Verlust der kulturellen Identität. Zudem werden Teilhabe und Partizipation oft als Alibipolitik wahrgenommen. Schlüsselfaktoren, die die erfolgreiche CBET-Umsetzung verhindern, sind der vorherrschende Top-Down-Ansatz, eine Mischung aus Armut und ungleichen Unternehmensrechten, einseitige Finanzierungsquellen, die Abhängigkeiten schaffen, ineffiziente Verwaltungs- und Managementstrukturen und das Fehlen von Programmen zum Kapazitätsaufbau für die lokale Bevölkerung.

Schlüsselwörter: Naturschutzgebiete, Partizipationsmanagement, Naturschutzgebietsverwaltung, Tibet, Stärkung der Eigenständigkeit der lokalen Bevölkerung

IV. List of Abbreviations

CAP – Canonical analysis of principal coordinates
CBET – Community-based Ecotourism
CE – Community Empowerment
CP – Community Participation
DRD – Department of Research and Development
EDP – Ecotourism Development Plan
JAB – Jiuzhaigou Administration Bureau
JNNR – Jiuzhaigou National Nature Reserve
nMDS – non-metric Multi-Dimensional Scaling
NSFC – Natural Science Foundation of China
PA – Protected Area
PERMANOVA – Permutational analysis of variance
PES – Payment for Ecological Services
RC – Resident Committee
RFTF – Return Farmland to Forest
RGTG – Return Grazing-land to Grassland
SARS – Severe Acute Respiratory Syndrome
SMP – Sustainable Management Policy

V.	Table of Contents	
I.	Acknowledgements	i
II.	Abstract	ii
III.	Abstract (deutsch)	iii
IV.	List of Abbreviations	iv
V.	Table of Contents	v
VI.	List of Figures	viii
VII.	List of Tables	x
1.	Introduction	1
1.1	Background and problem statement	1
1.2	Objective and approach of the thesis	4
1.3	Significance and major findings of the study	8
1.4	Structure of the thesis	10
2.	Study area and methods	11
2.1	Study area	11
2.1.1	Location	11
2.1.2	Climate	12
2.1.3	Biodiversity	13
2.1.4	Local community and administration	17
2.1.5	Tourism development	19
2.2	Methods	20
2.2.1	Research context	20
2.2.2	Sampling and data collection	21
2.2.3	Data analyses	22
2.2.4	Ethical considerations	23
3.	Results	24
3.1	Site observations	24
3.1.1	Observations of local communities and socio-economic system	24
3.1.2	Observations of administrative staff	26
3.2	Socio-demographics	27
3.2.1	Socio-demographics of group one – all the respondents	27

3.2.2 Socio-demographics of group two – local respondents.....	28
3.2.3 Socio-demographics of group three – administrative respondents	29
3.3 Respondents’ overall perceptions of sustainable management policy (SMP) and ecotourism development plan (EDP)	30
3.3.1 Group one – all respondents	30
3.3.2 Group two – local respondents	31
3.3.3 Group three – administrative respondents.....	33
3.4 Local respondents perception of sustainable management policy (SMP) and ecotourism development plan (EDP)	34
3.4.1 Environmental awareness of local respondents	34
3.4.2 Local satisfaction with sustainable management policy (SMP)	37
3.4.3 Local satisfaction with ecotourism development plan (EDP).....	43
3.4.4 Local perception of administrative performance.....	46
3.4.5 Expectation of future participation in ecotourism.....	50
3.5 Group three – administrative respondents’ perceptions of sustainable management policy (SMP) and ecotourism development plan (EDP)	52
3.5.1 Administrative satisfaction with sustainable management policy (SMP).....	52
3.5.2 Administrative satisfaction with ecotourism development plan (EDP)	55
3.5.3 Administrative perceptions of communication with local community.....	58
3.6 Results from in-depth face-to-face interviews	60
3.6.1 Results from interviews with local community respondents.....	60
3.6.2 Results from interviews with administrative respondents	65
4. Discussion.....	69
4.1 Overall perceptions of sustainable management policy (SMP) and ecotourism development plan (EDP)	69
4.2 Perception of local residents related to socio-demographic factors.....	71
4.2.1 Environmental awareness	71
4.2.2 Satisfactions with sustainable management policy (SMP).....	72
4.2.3 Satisfactions with ecotourism development plan (EDP)	72
4.2.4 Perception of socio-cultural changes due to tourism impact	73
4.2.5 Perception of administrative performance	74
4.2.6 Expectation of future participation in ecotourism.....	74
4.3 Perception of administrative staff related to socio-demographic factors	75

4.3.1 Satisfaction with sustainable management policy (SMP)	75
4.3.2 Satisfaction with ecotourism development plan (EDP).....	75
4.3.3 Perception of communication with local community	75
4.4 Administrative staff – community relationships.....	76
4.5 Community empowerment.....	79
4.6 Key factors that hinder community-based ecotourism (CBET) success from protected area governance and management aspects	84
5. Conclusions and recommendations	91
6. References.....	93
7. Appendices.....	108
Appendix 1: Sample questionnaire used for local communities	108
Appendix 2: Sample questionnaire used for local administration.....	112
Appendix 3: Additional results from questionnaires survey with local respondents.....	115

VI. List of Figures

Figure 1 Location of Jiuzhaigou National Nature Reserve	12
Figure 2 Distribution of major vegetation types in Jiuzhaigou National Nature Reserve	14
Figure 3 Distribution of major vertebrate fauna in Jiuzhaigou National Nature Reserve	16
Figure 4 Location of the four Tibetan villages in Jiuzhaigou National Nature Reserve	18
Figure 5 Administrative structure in Jiuzhaigou National Nature Reserve	19
Figure 6 Number of tourists in Jiuzhaigou National Nature Reserve from 1984 to 2016	20
Figure 7 Annual average per capita incomes from ecotourism for local residents at Jiuzhaigou National Nature Reserve	26
Figure 8 Educational levels of JAB employees	27
Figure 9 Ethnic groups of JAB employees	27
Figure 10 Educational levels of all the respondents	28
Figure 11 Educational levels of local respondents	29
Figure 12 Average perception towards EDP and SMP of all the respondent's subgroups	31
Figure 13 Average perception towards EDP and SMP of the local respondent's subgroups..	32
Figure 14 Average perception towards EDP and SMP of the administrative respondent's subgroups.....	33
Figure 15 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 1-3	36
Figure 16 The percentage of local respondents in different response categories for questions 1-3	37
Figure 17 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 4-9	39
Figure 18 Average scores \pm 95 % confidence intervals by gender for questions 4-9 in section 2	40
Figure 19 Local respondents' perceptions to Questions 4-9	42
Figure 20 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 10-15	44
Figure 21 Local respondents' perceptions to questions 10-15	46
Figure 22 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 16-20	48
Figure 23 Local respondents' perceptions to questions 16-20	49
Figure 24 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 21-22	51
Figure 25 Local respondents' perceptions to questions 21-22	52
Figure 26 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 1-4	53
Figure 27 Average scores \pm 95 % confidence intervals by education for questions 1-4 in section 1	54
Figure 28 Administrative respondents' perceptions to questions 1-4	55

Figure 29 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 5-6	57
Figure 30 Administrative respondents' perceptions to questions 5-6	58
Figure 31 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 7-10	59
Figure 32 Administrative respondents' perceptions to questions 7-10	60
Figure 33 Level of community participation in tourism	86

VII. List of Tables

Table 1 Numbers of local residents at Jiuzhaigou National Nature Reserve.....	24
Table 2 Working conditions for local residents in Jiuzhaigou National Nature Reserve.....	25
Table 3 Factors influencing relationships between administrative staff and community members as perceived by community and staff members in this study.....	78
Table 4 Proposed extended framework for community empowerment in CBET	81
Table 5 Perception by local community members regarding different dimensions of empowerment	82
Table 6 Perception by administrative staff members regarding local community empowerment	83

1. Introduction

1.1 Background and problem statement

Tourism continues to be a key driver of economic growth throughout the world. The latest data from United Nations World Tourism Organization (UNWTO) indicated that, in 2017, there was US\$ 1.6 trillion spent on tourism and over 1.32 billion people traveled abroad (UNWTO 2017 Tourism Highlights: 2018 Edition). International tourism represents 30 % of all service exports and 7 % of total world exports and it outgrew international business for the fourth consecutive year (UNWTO 2017 Tourism Highlights: 2018 Edition). The latest statistics of UNWTO show that tourism is now 10 % of world gross domestic product (GDP) and that one of ten jobs globally are now in tourism. In 2030, 1.8 billion international tourist arrivals are projected worldwide (UNWTO 2017 Tourism Highlights: 2018 Edition). Income from international tourism in China increased to US\$ 258 billion (UNWTO, PR No. 18035. April 23, 2018).

However, the growth of mass tourism in protected areas is also problematic (Wilson & Tisdell, 2015; Su et al., 2016; Tarpey, 2018). Often the most attractive landscapes exist in association to endangered wildlife and vulnerable ethnic communities. While generating greater economic benefits for local inhabitants, the influx of tourists to these areas has caused environmental degradation, the depletion of natural resources and biodiversity, and loss of cultural identity (Job et al., 2017; Lew & Cheer, 2017). Protected areas are facing a survival and environmental crisis in many regions of the world (Bergstrom & Randall, 2016; Melnykovich et al., 2018). To combat this global phenomenon, the concept of ecotourism has evolved. Ecotourism has three fundamental standards: 1) the scale of development must be adapted to natural, cultural and ecological settings; 2) the purpose must be to protect the natural and cultural environment; and 3) it must economically benefit the local communities (Ceballos–Luscurain, 1996; Pawar & Bhakti, 2015; Huy & Khin, 2016; Ashok et al., 2017).

As a result, local community participation in ecotourism development becomes essential for achieving the conservation and development goals of ecotourism (Cheng et al., 2017; de Lima & King, 2017; Zorpas & Pedreño, 2018). Accordingly, institutions like the World Bank, the US Agency for International Development and the United Nations increasingly have recognized the role of local community participation (Mtapuri & Giampiccoli, 2016). Particularly in nature reserves, the relation between the local community and natural resources or biodiversity can be described as symbiotic (Boley & Green, 2016; Ndivo & Cantoni, 2016; Aguiñaga et al., 2018). On the one hand, local communities usually function as stewardship to the park resources. On the other hand, they benefit physically and psychologically from it. In addition, the outcome of this symbiosis can feed back positively to

eco-tourists who desire to experience the local culture and nature, to better understand the ecology principles (Sebele, 2010; Sangpikul, 2017).

Based on these insights, the concept of community-based ecotourism (CBET) has been developed to improve the local economy in a sustainable way by encouraging local communities to participate in tourism management (Pawar & Bhakti, 2015; de Lima & King, 2017). In contrast to conventional ecotourism concept, CBET emphasizes that the ecotourism is planned and owned by the local community, through actively protecting natural resources (Stone, 2015). CBET, if successfully implemented, meets the principles of sustainable development: economic efficiency, social equity, and ecological sustainability (Mbaiwa & Stronza, 2010). Economic efficiency means that CBET ensures high living standards and equally shared benefits for community members. Social equity refers to providing local communities fair and equal access to resources and the possibility to participate in decision-making. Ecological sustainability means that CBET must not pose any pressure on ecosystems from tourism and preserve ecosystem functioning (Mbaiwa & Stronza, 2010). In recent years, ecological sustainability has extended from ecological conservation to cultural preservation to improve the welfare of local communities (Jones, 2005; Ruiz-Ballesteros & Cáceres-Feria, 2016). From a conservation perspective, CBET is a form of community-based natural resource management (CBNRM). As such, it is a popular choice in community-based strategies for biodiversity conservation (Kiss, 2004). Within this conceptual framework, CBET is promoted in developing countries as a win-win strategy to achieve sustainable ecological, economic, and social goals especially where many protected areas are noted for rich biodiversity and poor rural communities (Dodds & Galaski, 2018). At present, CBET programs are implemented in developing countries across Asia, Latin America and Africa (Baktygulov & Raeva, 2010). In the governance of protected areas in developing countries, CBET is embedded in participatory management or co-management strategies to secure community support of conservation and development programs, and to seek for protected area administrative staff – community cooperation programs (Bennett & Dearden, 2014; Stone, 2015).

In terms of outputs, some authors highlight that CBET is important in poverty alleviation (Tasci et al., 2014), diversifying livelihoods, empowering community members (Shikida et al., 2010), conserving ecosystems, improving collaborative relationships, and assisting struggling economies (López-Guzmán et al., 2011; Su et al., 2014), while others claim that many CBET programs fail to reach these goals (Calfucura, 2018; Bauch et al., 2014; Mckercher & Prideaux, 2014; Kontogeorgopoulos et al., 2014). For example, CBET programs may only make a limited contribution to biodiversity conservation and poverty alleviation (Lonn et al., 2018; Silva, 2015; Coria & Calfucura, 2012), provide very limited short-term income and have conflicting goals (Garcia-Amado et al., 2013; Sunderland et al., 2012; Blom et al., 2010; Schuett et al., 2016). Kiss (2004) highlights the need for assessing CBET impacts on economic growth and biodiversity conservation with better data and more systematic analysis. Goodwin & Santilli (2009) argue that CBET outcomes have not been well monitored, and

there is a lack of quantified data to indicate the actual benefits generated to local communities.

Dodds & Galaski (2018) review all existing literature on CBET initiatives in developing countries, and conclude that CBET failures are largely due to a lack of efficient governance and management that fail to create collaborative relationships and to empower community. Other authors indicate that despite efforts to solicit local support, management in protected areas is still suffering from a very high level of conflict between community members and administrative staff (De Pourcq et al., 2017; Nakakaawa et al., 2015; Himmelfarb, 2012; Chen et al., 2017). To overcome or mitigate these issues it has been highlighted that effective participatory management should put emphasis on building collaborative relationships between protected area staff and community, and ensuring community empowerment through capacity building (Bennett, 2016; Oldekop et al., 2016; Hiwasaki, 2006; Bennett & Dearden, 2014; Stone, 2015).

From a conservation perspective, collaboration is a key for a community-based approach in most developing countries (Stone, 2015). In the CBET participatory management programs in protected areas, collaborative relationships between protected area staff and communities appear to be of vital importance to wildlife conservation (Hausser et al., 2009; Tessema et al., 2010; Puntischer et al., 2017). Positive relationships between protected area staff and local communities built on trust can enhance support for protected areas and wildlife conservation (Mutugang, 2016; Holmes, 2013). In addition, the empowerment of local communities in management and decision-making of conservation projects is indispensable for the successful implementation of conservation strategies as local communities are often directly linked to natural resources. This link enables them to put crucial momentum to protection efforts by governmental authorities (Boley et al., 2015).

Furthermore, collaborative relationships are important from a development perspective to provide local communities with access to social capital, resources, opportunities to manage and market ecotourism and receive benefits, which foster the level of community participation and empowerment (Andrade & Rhodes, 2012; Hiwasaki, 2006). Buzinde, Kalavar, and Melubo (2014) observed a strong relationship between community well-being and empowerment. Tolkach & King (2015) indicated that community empowerment would enhance the capacity of community members by providing resources, opportunities, communication, knowledge and skills to determine their own future and to participate in initiatives that influence their own lives. Accordingly, the successful implementation of CBET implies community empowerment (Goodwin & Santilli, 2009; Lapeyre, 2010; Ruiz-Ballesteros & Cáceres-Feria, 2016) in the form of active community participation in tourism planning, implementing, managing and performing processes (Murphy, 2013; Idziak et al., 2015). Ensuring community support in CBET initiatives in protected areas is increasingly viewed as an important element of biodiversity conservation and local livelihood improvement (Buta et al., 2014; Constant et al., 2017).

To date, impact evaluation of CBET participatory management programs in protected areas is still limited (Qian et al., 2016; Dodds & Glasiki, 2018). Little is known about: 1) What are the perceptions from key stakeholders towards CBET participatory management programs, and which socio-demographic factors influence their attitudes; 2) what are the perceptions from key stakeholders of collaborative relationships and community empowerment, and what aspects are to be considered in participatory management programs? 3) What are the key factors that hinder CBET success from protected area governance and management aspects? To measure the management performance, quality of relationship and level of empowerment, empirical analyses usually rely on the perception of local communities regarding the effectiveness of management and governance policies, institutions, and processes that are involved in the implementation of CBET (Ko & Stewart, 2002, Hind et al., 2010; Lockwood, 2010, Tomićević et al., 2010). Although local communities may not be able to evaluate the impacts scientifically, they usually show a high level of understanding of their natural, social, and cultural environments, and are able to evaluate management performance based on common sense (Becken et al., 2013). However, a major knowledge gap is that previous assessment primarily considered the perspectives of local communities, e.g, their attitudes or willingness to participate in CBET, their perceived social, economic and ecological impacts, and relationship with local administrative staff. Additional important stakeholders in management processes, i.e., the administrative staff of a protected area, were ignored. An effective management should, however, be based on a good relationship between managers and the managed (Carroll & Buchholtz, 2014). A good relationship is reciprocal (Hinde, 1996) and involves both parties (Blumstein & Kollock, 1998). When one party takes action, another party needs to react and cooperate to maintain the relationship (Hinde, 1996). A better understanding of the attitudes and opinions from administrative staff on community participation and empowerment in conservation and development projects, and their perceived relationships with community members will provide insights into the effectiveness of CBET participatory management programs, and will indicate suitable policy changes towards improved conservation and development goals.

1.2 Objective and approach of the thesis

The present study aims to address the effectiveness of CBET participatory management programs for community empowerment and their impacts on relationships between administrative staff and local communities. For this purpose, the socio-demographic factors that influence individual perception and key factors that hinder CBET success are identified based on a case-study approach.

Like other developing countries, China has also adopted community-based ecotourism (CBET) as a national strategy for biodiversity conservation and poverty alleviation in national nature reserves. National nature reserves belong to the primary category of protected areas,

where the strictest environmental regulations are applied, with a dominant focus on preserving nature and related ecosystem services (Zhang et al., 2017). However, in many national nature reserves, the local indigenous people are ethnic minority groups who live in remote and widely scattered villages, which often create an uneven and unfair distribution of the economic benefits (Xu et al., 2017). Since 2000, the Chinese government has extended the purpose of national nature reserves from biodiversity conservation to the provision of ecosystem services (Xu et al., 2017). In general, CBET is endorsed by the central government as an effective tool that can harmonize nature and people (Fang et al., 2006) and as a key strategy for national nature reserves where economic alternatives are limited (Le et al., 2012).

Jiuzhaigou National Nature Reserve (JNNR), located in western China in the Sichuan Province, is one of the earliest protected areas in China. It was established in 1978 and became a National Protected Forest Park in 1994 (Cheng et al., 2017), being declared the “most biological diverse temperate forest in the world” (UNEP, 2005). Internationally it was added to the World Natural Heritage list in 1992, and rated as “Man and Biosphere Reserve” by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1997. In 2001, the certificate granted by Green Global 21 in Australia, made it one of the most attractive ecotourism destinations in Asia. Historically, it is a rural area and vulnerable ecosystem with frequent natural disasters, limited economic development, and a low living standard compared to urban areas in terms of education, employment, housing, health care and income (Feng & Wen, 2009; Zhang et al., 2012). The region, rich in biodiversity and beautiful landscapes, presents an ideal location for nature-based tourism development. The Tibetan inhabitants in the area were the first rural ethnic group in China that abandoned traditional agriculture and engaged in tourism.

Mass tourism developed very fast in the park since 1984. Local Tibetan inhabitants started to renovate their houses as tourist hostels, restaurants or shops. External investors built five-star hotels in the protected park area. The park quickly showed severe signs of pollution due to mass tourism (Zhang et al., 2012). To reduce the increasing mass tourism burden on the ecosystem and to improve poverty alleviation for the local community, two community-based ecotourism (CBET) participatory management programs were implemented since 1999. One is the sustainable management policy (SMP) for conservation purpose focusing on biodiversity and ecosystem conservation and empowerment of local communities. The SMP also established a community-based ecotourism joint-venture and introduced a Payment for Ecological Services (PES) program to compensate the local residents for the economic losses suffered from conservation policies.

Under the SMP, community-based nature conservation projects include:

- 1) Community participation at national initiatives - Return Farmland to Forest (RFTF), and Return Grazing-land to Grassland (RGTG); legal ban on farming, animal husbandry, and illegal logging.

- 2) Community compliance with a new environmental management policy: “tour in the park and stay overnight outside”. Under this policy, tourists were no longer allowed to stay overnight in local community houses inside the park. Communities were required to demolish all existing hostels and restaurants inside the park that were built by local residents since 1984, and to report any new construction project including renovation of old residential houses inside the park to Jiuzhaigou Administration Bureau (JAB) for approval.
- 3) Community support to biodiversity conservation projects especially for the Giant Panda and Sichuan Takin population in the park, by relocation and resettlement from ancient Tibetan villages that are located in the key wildlife habitats to alternative locations in the buffer zones.
- 4) Community support to environmental protection measures such as replacing firewood and coal in the village by electricity and gas, installation of drinking water diversion pipelines, and an adoption of tourism carrying capacity that restricts the daily number of visitors to 12,000.

A community-based ecotourism joint-venture was established. It was a collectively-owned and shared-capital business, in which local communities own 49 % of the stock, while JAB owns 51 %. This structure implies that JAB has the absolute power for decision-making of the joint-venture. In order to benefit local communities, JAB distributes 77 % of the profits to local communities, while JAB receives 23 % (JAB annual report, 2000).

The joint-venture operates two businesses. The first one is the Green Bus Sightseeing Company, functioning as the only mechanized way of transportation for tourists through the park since private vehicles were not allowed to drive into the reserve in 1999. It was operated by local communities. Until 2003, 350 buses were put into operation, which generated more than US\$ 12 million, and the annual income per capita for the local residents was US\$ 11,000 (Li et al., 2008). With foreseeable future profits generated by the Green Bus Company, in 2004 Aba Prefecture Government took over the business, and reduced the shares of local communities to 20 % (JAB, personal communication). The second business is Luorilang Service Center, which has a dining hall, and is the only restaurant inside the park for tourists. The restaurant is mainly managed by local communities and serves Tibetan food. The local residents who bought the stocks of the Joint-venture were allowed to rent an individual booth at Luorilang Service Center to sell souvenirs.

The PES has several features, including direct and indirect programs. Direct PES includes the above-mentioned joint-venture, a basic living subsidy from the forest restoration programs and a share from entrance fees. Indirect PES includes the permission to rent individual booths at Luorilang Service Center, to run small businesses inside the reserve, preferential

employment to work at JAB, community development programs and capacity building activities such as training and educational programs.

Since SMP was implemented, JNNR experienced a substantial reduction in waste, reaching the goal of "zero growth" of pollutants. Until 2015, over 480 million Yuan (approx. US\$ 68 million) were spent on infrastructure (JAB annual report, 2015).

The second community-based ecotourism participatory management program is the ecotourism development plan (EDP). It aims to develop more community-based ecotourism products that will benefit the local community, and to enhance marketing campaigns to attract more international and domestic eco-tourists. New community-based ecotourism projects include opening Zharu Valley and the four villages located there for tourists and developing ecotourism products for nature exploration such as biodiversity tours, hiking, cycling, kayaking, mountain climbing, panda watching, bird watching, and cultural experiences such as Tibetan cultural performance. Community members are encouraged to participate in eco-tour guide training programs. JAB also involved community participation in tourism market promotion activities such as webpage and brochures design to provide tourists with information on the outstanding biodiversity, ecology, and socio-cultural value of the reserve.

After 18 years of implementation, both CBET participatory management programs have gradually changed social, cultural, ecological and economic settings of JNNR. In 2012 JNNR was proposed by China as a '*best practice*' of managing World Natural Heritage for the following reasons: introducing eco-friendly tour buses, setting up community-based ecotourism joint-ventures, participatory management with benefits sharing, establishing a tourist interpretation system, tourist management regulations, and international academic cooperation (UNESCO world heritage best practice examples, 2012).

This thesis focuses on JNNR as case study area for the following reasons:

First, in the Chinese government reports, the criteria to evaluate the success of CBET are vague, and there is a lack of baseline data to support major conclusions. For example, the report listed 'sharing benefits' as one of the key accomplishments but did not provide data to show whether benefits were shared equally among community members. It listed 'participatory management' without providing any details on the level of community empowerment. There is therefore a strong need to re-evaluate the 'successes' based on perception data and a comparative approach.

Second, successful tourism management requires extensive interactive dynamics with different stakeholders (Feng & Wen, 2009). If it is a best practice, it usually generates favorable outcomes, which can be helpful in analyzing the implicit relationships between local communities and administrative staff.

Third, it is a key protected area for the conservation of the giant panda (*Ailuropoda melanoleuca* David, 1869) in China, and therefore CBET success is crucial in this area for developing national strategy on giant panda conservation. Since 2006, the management team of JNNR has been providing consultancy on CBET participatory management programs in other nature reserves (He et al., 2008).

Fourth, the local inhabitants living in the reserve are mainly Tibetans. Their traditional knowledge on nature and culture is part of the tourist attraction. Therefore, conservation of Tibetan culture and knowledge is a key challenge for CBET management.

Fifth, CBET management practices in JNNR serve as a role model for other national nature reserves in China (Rong-lin et al., 2012; Wang et al., 2012). Evaluating the effectiveness of CBET management practice in JNNR will provide information for policy-makers to further develop national strategies for community development and biodiversity conservation in national nature reserves.

This thesis used a joint qualitative and quantitative approach to survey communities based on 200 local Tibetan villagers inhabiting the reserve and 80 administrative staff members who manage the reserve. The research focused on analyzing the perceptions from the two key stakeholder groups regarding the two CBET management programs (SMP & EDP).

The research questions in this thesis address three major issues:

- 1) What are the perceptions from community and staff members towards SMP and EDP, and which socio-demographic factors influence their attitudes?
- 2) What are the perceptions from community and staff members regarding intergroup relationships and community empowerment, and what aspects are to be considered in SMP and EDP?
- 3) What are the key factors that hinder CBET success regarding protected area governance and management?

The core hypothesis is that success of CBET participatory management programs depends on positive perceptions from both local communities and administrative staff regarding socio-economic and ecological outcomes, a collaborative relationship between stakeholder groups, and an empowered community that proactively protects nature.

1.3 Significance and major findings of the study

This study provides significant policy implications for CBET management strategies in protected areas by:

- 1) addressing the impacts of CBET participatory management programs on social, economic, and ecological settings of local communities from the perspectives of two key stakeholders - local Tibetan inhabitants and the administrative staff.
- 2) using a key protected area for the conservation of the giant panda in China as a flagship region of outmost importance for the national biodiversity strategy.
- 3) providing results based on empirical data for policy-makers on CBET management in protected areas to understand different views from local communities and administrative staff members.
- 4) proposing an extended framework to measure community empowerment in CBET from five dimensions, based on an existing framework that measures community empowerment in ecotourism from four dimensions.

The major findings of the study are:

- 1) Both administrative staff and local communities supported the existing ecotourism development plan (EDP), but local communities criticized the sustainable management policy (SMP).
- 2) Younger, better-educated and higher income interviewees were generally most supportive of the EDP and SMP.
- 3) The relationships between local communities and administrative staff were perceived as uncoordinated with a lack of trust being mentioned as a major issue. Factors that affect the relationships were identified from perspectives of both groups.
- 4) The local community is to some extent empowered in economic and environmental dimensions, but not in social, psychological and political dimensions. Social justice, psychological satisfaction and political equality are missing in the current participatory management programs.
- 5) The CBET generated economic income, but created problems like inequality of benefit distribution, insufficient social infrastructure, loss of cultural identity, ecological degradation and participation as tokenism.
- 6) Key factors hindering the success of CBET from protected area governance and management were a prevalent top-down approach, a mixture of property and operation rights, single sources of funding creating dependencies, a lack of inefficient administrative setting and management capacity and a lack of capacity building programs for local communities.

1.4 Structure of the thesis

The thesis is structured as follows: Chapter 2 gives an overview of features of the study area, and describes the research context and combined qualitative and quantitative approaches used for this survey. Chapter 3 documents results from the data acquired by site observations, semi-structured questionnaires and in-depth face-to-face interviews. Chapter 4 discusses these results, compares them to previous studies, and analyzes key factors hindering CBET success. Chapter 5 summarizes the empirical findings to answer the research questions and to provide feasible policy recommendations for sustainable management of CBET in protected areas in developing and emerging countries.

2. Study area and methods

2.1 Study area

2.1.1 Location

Jiuzhaigou National Nature Reserve (JNNR) is located upstream in the Jialing River, west to Baishui River Basin, which is a big branch of the Baishui River, in northern Sichuan Province, China (Figure 1), where it forms the southeastern rim of the Qinghai-Tibetan Plateau. It is 438 km north from Chengdu. JNNR is surrounded by mountains, within which the nature reserve covers over 72,000 hectares as well as a 60,000-hectare buffer zone. The average altitude is around 3,300 m. It belongs to the Jiuzhaigou watershed (728.3 km) surrounded by steep alpine valleys. The waters are drained to the Jiuzhaigou river which gives mouth to the Baishui and Jialing rivers. Its catchment area covers 641.3 km², with vegetation coverage of 85.5 % and a forest coverage rate of 63.5 %. It has seven main valleys – Zharu, Heye, Shuzheng, Heijiao, Danzhu, Rize and Zechawa, among which Zechawa valley is the longest at 31 km in length and a river basin of 219.69 km²; the next is Rize valley of 30 km length and river basin of 166 km². The two valleys together with Shuzheng valley of 14 km length form a 'Y' shape. According to the characteristics of the ladder-like landform and rock formation, JNNR has three types of landforms – Tibetan glacial mountain, Zechawa water-eroded karst rock, and Heye piled mountain (Li et al., 2008).

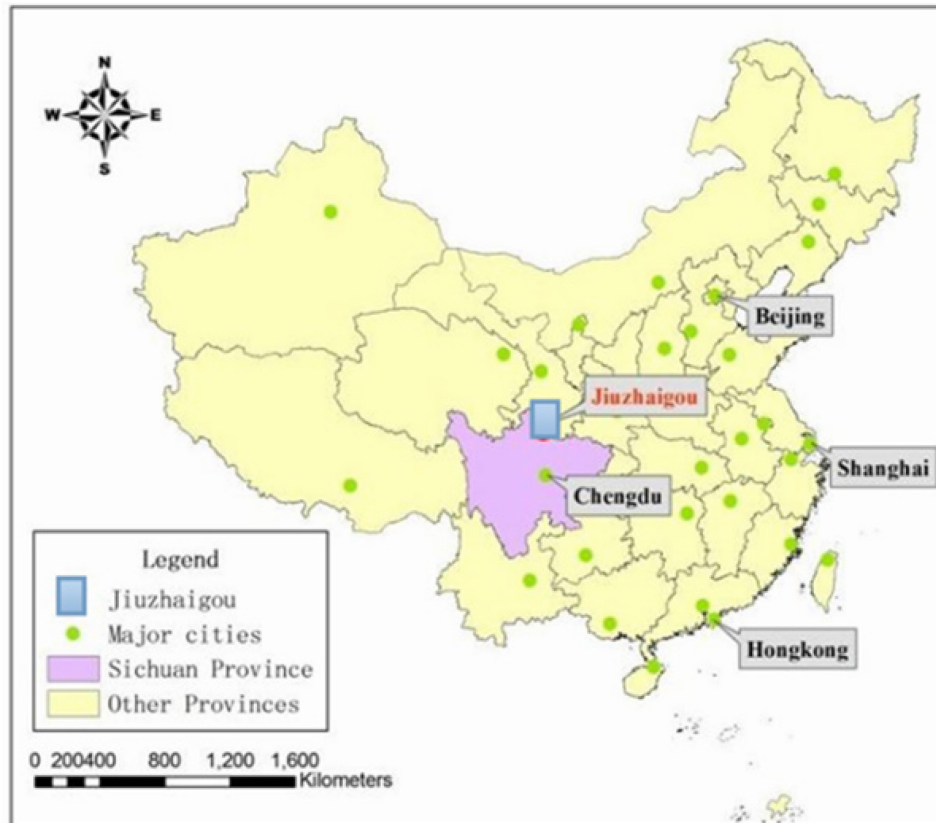


Figure 1 Location of Jiuzhaigou National Nature Reserve (source: map from Jiuzhaigou Tourism Bureau)

2.1.2 Climate

JNNR is located at the transition zone between the northern subtropical humid areas to the Tibetan plateau, the western Sichuan wet areas. Less precipitation forms a cold and dry monsoon climate. Winter is cool and dry. Average temperature in January is 2.5 °C and precipitation is 43 mm. Summer is mild and wet. Average temperature in July is 10 °C and precipitation is 104 mm (IUCN, 2006). Due to the foehn effect, a warm, dry wind blowing down the side of a mountain, the local climate has dry warm, cool wet and dry cold types (Sichuan Meteorological Science Institute, 2015).

For example, Luorilang Water Fall, located in the center of the park, has an annual average temperature of 7.3 °C, with the highest 16.8 °C in July and lowest -8.7 °C in January. Extremes can reach a maximum of 32.6 °C, and a minimum of -20.2 °C. Daily mean temperature is ≥ 10 °C. Annual precipitation is 550-780 mm, mainly from April to October, often in the form of heavy rain. The snow accumulates from November to April, with maximum depth of 150 mm. For the whole year, there are 100 no-frost days, with an average annual humidity of 60-70 %. Annual average wind speed is 1.5-1.2 m/s, with higher

wind speed through February - April, lower speed through July - November, in the direction of northwest and southeast (Sichuan Meteorological Science Institute, 2015).

2.1.3 Biodiversity

The pristine forests surrounding JNNR belong to some of the most endangered and diverse alpine ecosystems worldwide (Wang et al., 2018). The forest coverage is 63.5 % and the vegetation coverage is 85.5 % (JAB annual report, 2014). Due to the alpine valleys, abundance of water resources and soil types, and a mountain vertical height difference of 2,768 m, JNNR forms a rich variety of vegetation types and various habitats. Based on Liu et al. (2007) studying the distribution of major vegetation types, JNNR can be divided into the subtropical, tropical and temperate distribution zones, among which the tropical and temperate zones dominate area wise (Figure 2).

(1) Terrestrial plants

The vegetation types, and the species composition of vegetation show a vertical variation. Three distribution zones are described from the bottom up, respectively (Zhang et al., 2017): needle broadleaf mixed forest zone (distributed below 2800 m), subalpine coniferous forest zone (2800-3800 m) and alpine shrub meadow zone (3800-4200 m).

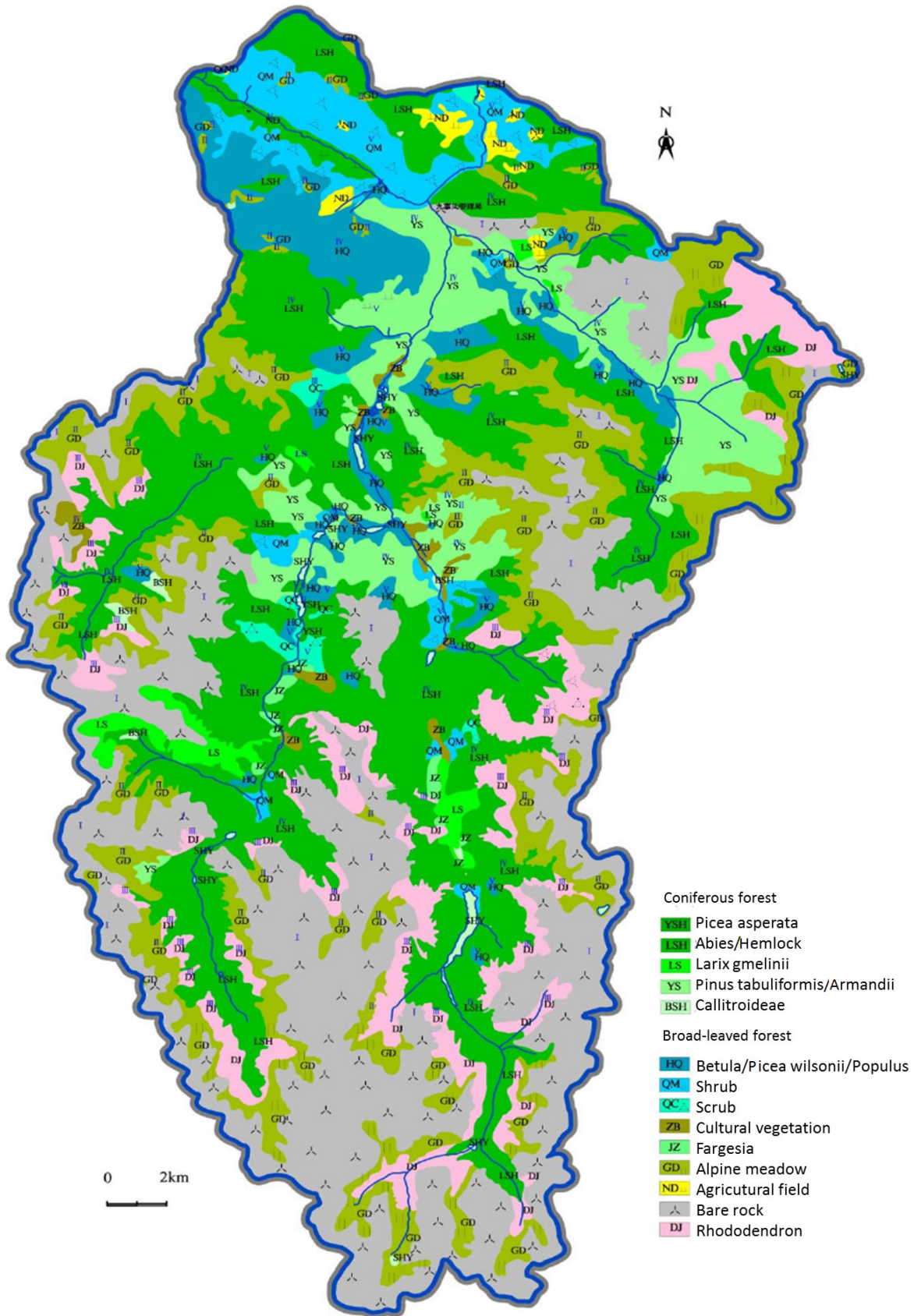


Figure 2 Distribution of major vegetation types in Jiuzhaigou National Nature Reserve (source: JAB annual report 2014, modified)

(2) Aquatic plants

JNNR is home to endangered and protected aquatic plants of 24 families, 50 genera and 74 species, among which there are three national protected species Class I (JAB annual report, 2014).

(3) Animals

JNNR has diverse ecological communities and a favorable natural environment, which provides unique living and breeding conditions for many wild animals (Zhang et al., 2017; Figure 3). Among the bird species, there are four Class I nationally protected birds, spot-tail rod chicken, green-tail chicken, taper, and golden eagles, and 23 national protected birds. Worldwide redheaded robins were discovered to breed only in JNNR (IUCN, 2006). There are 76 species of mammals, including 21 palearctic species, and 55 oriental species and JNNR is a breeding corridor for *Ailuropoda melanoleuca* (IUCN, 2006). There are 693 recorded species of invertebrates in JNNR (JAB annual report, 2014).

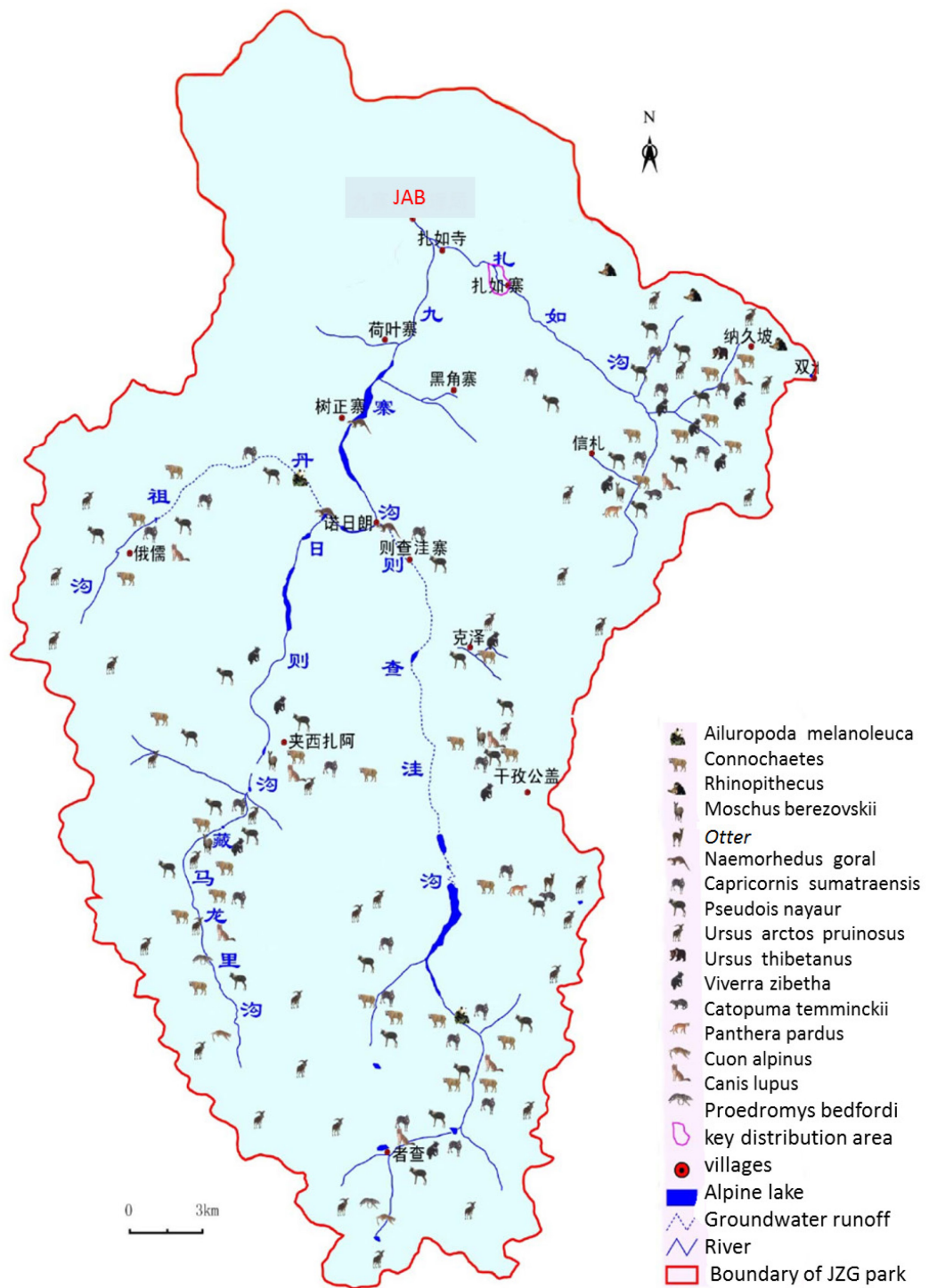


Figure 3 Distribution of major vertebrate fauna in Jiuzhaigou National Nature Reserve (source: JAB annual report 2014, modified)

2.1.4 Local community and administration

The name Jiuzhaigou refers to nine old Tibetan villages located in this area in history: Peibu, Panya, Jianpan, Heye, Zharu, Heijiao, Shuzheng, Guwa, and Zechawa. After relocation and resettlement in 1999, now the majority of local Tibetan residents live in four of these villages - Heye, Shuzheng, Zechawa, and Zharu (Figure 4). Roads were built from the park entrance to Shuzheng, Heye and Zechawa valleys for tour buses. Zharu Valley has no bus access. There are 334 Tibetan families and about 1,192 residents living in the park (Jiuzhaigou Annual Report 2015). Since the indigenous Tibetan residents lived in the park area for more than 1000 years, their cultural identity is very strongly linked to the area. Traditional Tibetan architecture, costumes, temples, sacred monuments and ceremonies are distributed in the park.

The local management authority of the park is the Jiuzhaigou Administration Bureau (JAB). It is governed by the Aba Tibet and Qiang Autonomous Prefecture. JAB has 14 departments (Figure 5), and is responsible for general management of JNNR including environmental protection, biodiversity conservation, ecotourism development, community development, infrastructure, and public security. As part of the management infrastructure, a Resident Management Office is responsible for regular communication with the local communities and for resolving conflicts between local villagers and administrative staff.

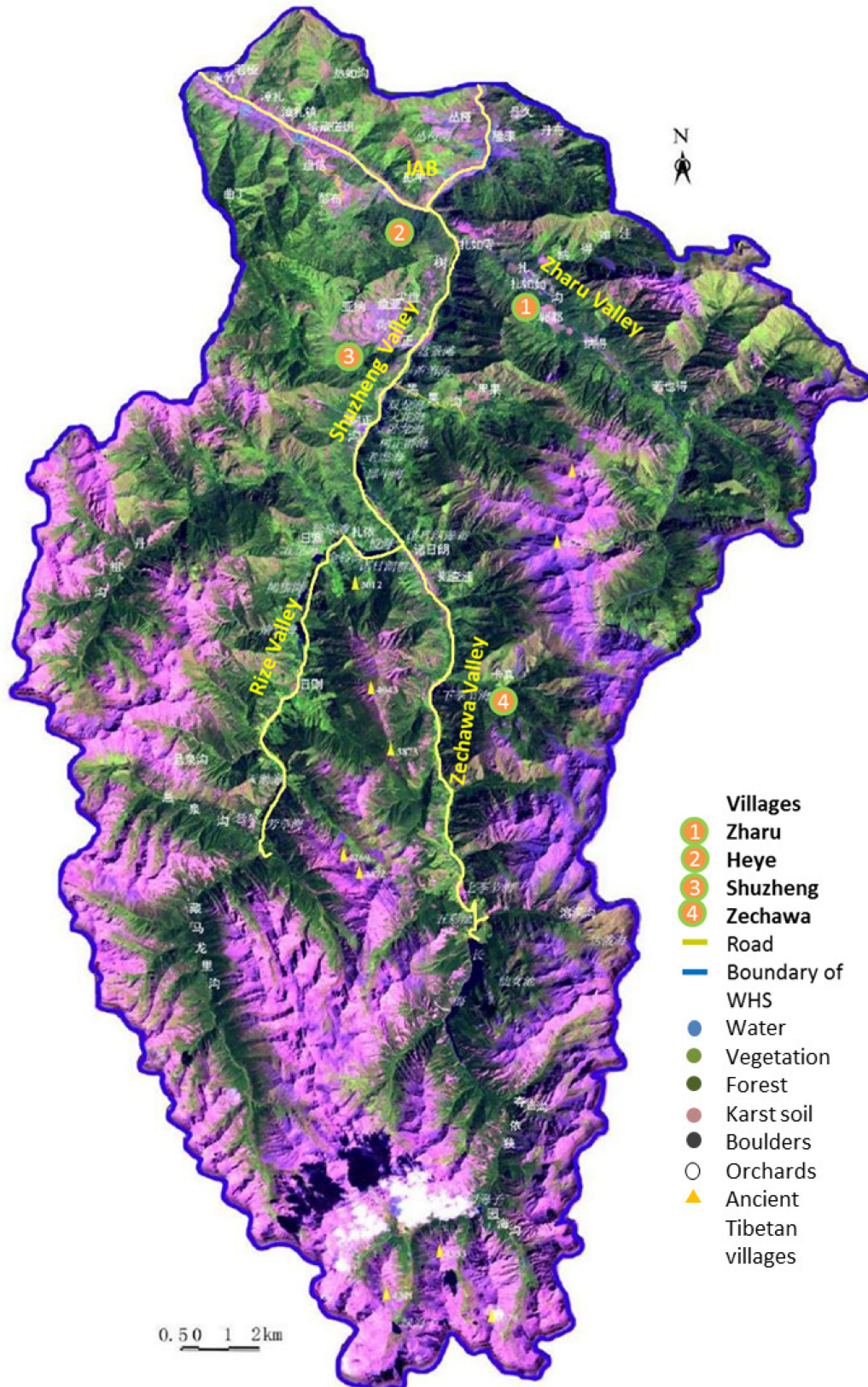


Figure 4 Location of the four Tibetan villages in Jiuzhaigou National Nature Reserve (source: JAB annual report 2014, modified)

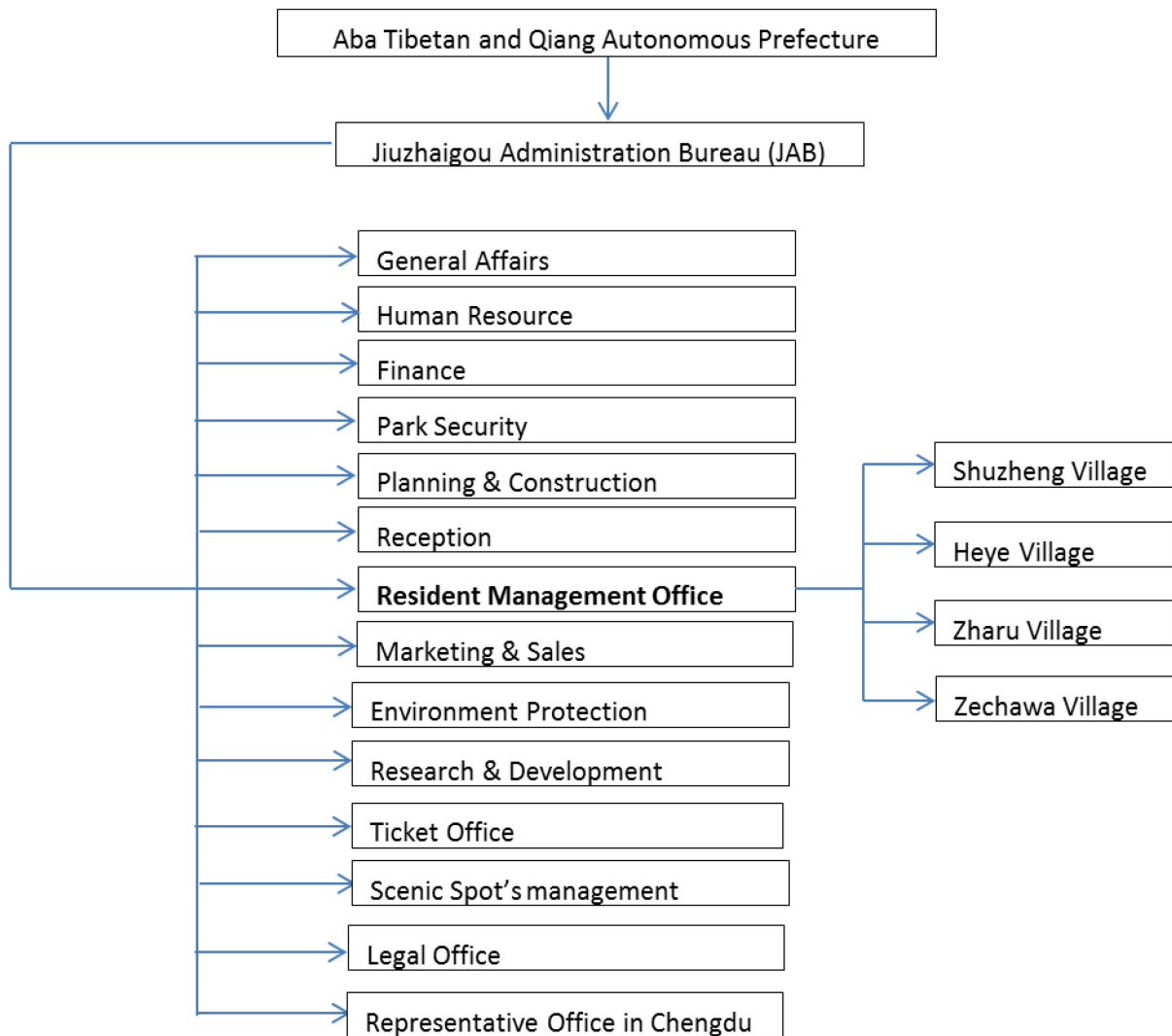


Figure 5 Administrative structure in Jiuzhaigou National Nature Reserve

2.1.5 Tourism development

In 1984 when the park opened to tourists, only 5,000 domestic tourists visited the park (Zhang & Zhu, 2007). The park started to receive international tourists in 1992 after being inscribed on the UNESCO World Natural Heritage list. In 2001 it received more than one million tourists mainly from Asia after being certified by Green Global 21. The average daily number of visitors in 2001 reached 30000 (Xu et al., 2014). In 2003 due to the Severe Acute Respiratory Syndrome (SARS) epidemic, the tourist number declined. After the construction of a local airport, the number of total tourists visiting the park reached 2.52 million in 2007 (JAB annual report, 2007). The number of tourists kept growing until May 2008, when the Wenchuan Earthquake occurred. The total number of tourists decreased by 74.5 % compared to 2007 (JAB annual report, 2008). JAB tried many measures to restore and recover tourism in the park, making JNNR one of the most attractive tourism destinations in

China. In 2013, the number of tourists declined again due to flooding, the Ya'an earthquake, and the outbreak of bird flu in Sichuan Province. In 2016, the number of tourists increased sharply again to more than 5.7 million (Figure 6).

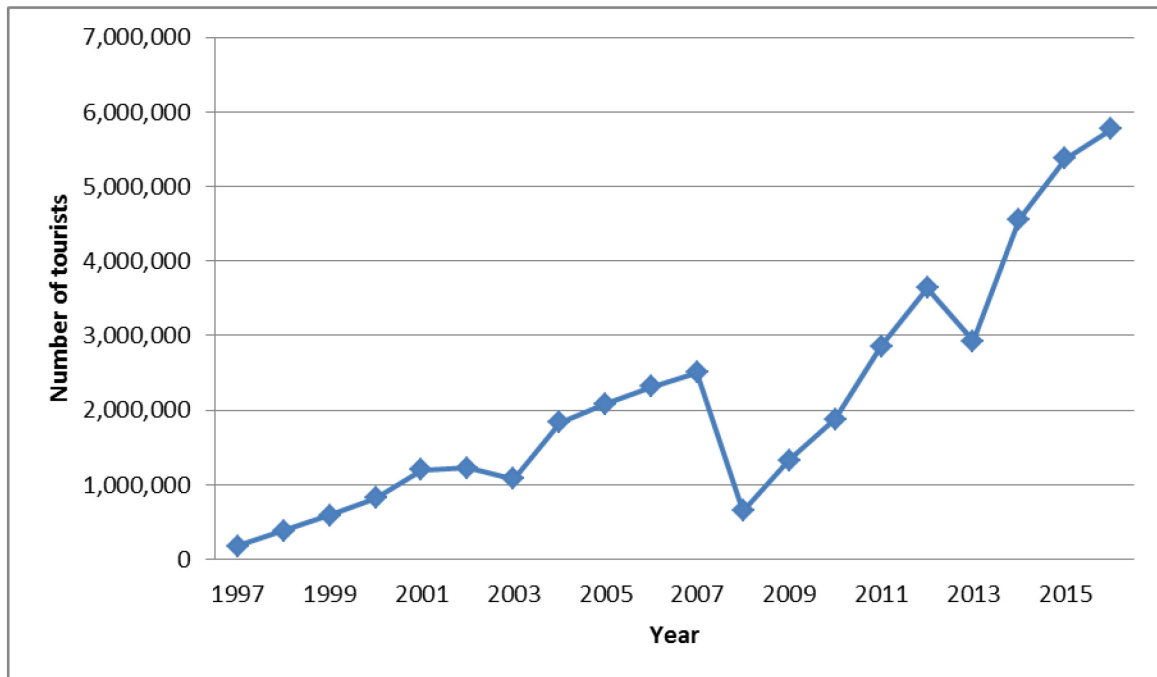


Figure 6 Number of tourists in Jiuzhaigou National Nature Reserve from 1984 to 2016 (source: Data from JAB, March 2017)

2.2 Methods

2.2.1 Research context

In this research, the focus population is the indigenous people, mostly Tibetan, living in the four villages inside JNNR and the administrative staff excluding individuals who are part of the local residents. The research used both qualitative and quantitative approaches to describe different perceptions by the local community and the park administration in regards to the Sustainable Management Policy and the Ecotourism Development Plan.

For local communities, a random sampling survey was designed to involve villagers of a wide range from the four villages. For the JAB staff, a purposive sample survey was designed to exclude those employees who are originally local inhabitants. Recruiting more participants in the survey helped to get diverse perceptions of SMP and EDP and their impacts that local community and administrative staff have experienced for 18 years.

Based on the results from questionnaires and follow-up in-depth interviews, theories of sustainable development, environmental economics, community-based ecotourism, social exchange, public choice, community participation and community empowerment were applied to discuss the perceptions by the local community and the park managers regarding the SMP and EDP. This approach helped to analyze their view on the relationships between local community and reserve managers, level of community empowerment and social, economic, and ecological impacts of CBET initiatives. The key factors that hinder CBET success regarding protected area governance and management were identified.

2.2.2 Sampling and data collection

In order to avoid possible conflicts of interests between different villages in the park, 200 local residents were selected randomly for interviews with 178 valid questionnaires collected (89 % response rate). In total, 80 JAB staff members at different professional levels were selected for interviews with 78 valid questionnaires collected (98 % response rate). Additional necessary information was acquired mainly from a literature review and official documentation such as annual reports from JAB between 1990 and 2016. Data used in this survey were collected from on-site observation, face-to-face questionnaire survey, in-depth face-to-face interviews from May to July 2015.

Literature survey: Literature in Chinese and English about relevant research on this subject was first collected and reviewed. Peer-reviewed journal publications, university research projects, official documents, and JAB annual reports provided the first-hand source of literature.

Ecotourism: Tourists are not allowed to enter the park individually without a professional tour guide. Thus, assisted by a tour guide from JAB, the researcher spent three days in May 2015 observing the current state of biodiversity conservation, visiting the ecological monitoring stations, experiencing ecotourism products, and observing tourist behavior. This approach was helpful in understanding the negative impacts caused by tourists and tourism development.

Villages: Besides Zhuru Village, there are four villages located at Zharu Valley. None of the villages is open to the public because green tour buses do not stop there. To get access and to interview local residents in the Zharu Valley, JAB had arranged a tour bus to take the researcher to visit the villages and talk with residents. Shuzheng, Heye and Zechawa villages are accessed by tour bus. The researcher spent three days visiting each village and talking with the locals in May 2015.

Semi-structured face-to-face questionnaire survey: A semi-structured face-to-face questionnaire survey was carried out with JAB managers and local residents. For JAB

managers, questionnaires were designed for interviews with different levels of officials from JAB and affiliated companies (including park administration, tourism management, community relations, environmental protection, cultural preservation, and finance). In total, 78 respondents include senior management (10), middle management (19), junior management (21), and ordinary employees (28). For the local residents, each household was seen as one sample unit, and received one questionnaire, to recruit as many local households in the four villages as possible, and to acquire a wide range of information and opinions from local villagers. The questionnaires to the local participants were organized into five major sections to ask for their perceptions of SMP, EDP and their impact. Participants chose 'yes' or 'no' when being asked whether they supported SMP or EDP. For the majority of follow-up questions they were given normally five options regarding their perception to the statement: "strongly disagree", "disagree", "neutral", "agree" and "strongly agree". Questionnaires to JAB managers were organized into four sections with different questions.

In-depth face-to-face interviews: After basic statistical analysis of the questionnaires, in-depth face-to-face interviews were organized with 80 selected participants (60 residents and 20 JAB managers). The 60 selected residents were equally distributed across the four villages. The 20 selected JAB staff members included senior management (2), middle management (5), junior management (6), and ordinary employees (7). It took between half an hour to two hours to complete an in-depth interview and it highly depended on the willingness of the individual interviewee to contribute. The researcher was involved in all interviews and tried to encourage all interviewees to talk freely about their feelings, opinions, experiences, and comments. The elder interviewees, normally over 40, could not speak Mandarin, while the younger people (between 20-39) could not speak Tibetan, but spoke Mandarin fluently. Hence, interviews were conducted in both Mandarin and Tibetan, with a translator provided by JAB. All in-depth interviews were recorded if interviewees agreed.

2.2.3 Data analyses

After the survey, statistical analyses on the completed questionnaires were carried out according to the following order:

- 1) Comparative analyses were applied for the overall perceptions of SMP and EDP by the local community and park administration. Analyses started addressing all the respondents and then moved to similar separate analyses for local or administrative respondents. Within local and administrative respondents, different subgroups were used according to socio-demographic variables like gender, age, education level and annual family income. Scatter plots showing the proportion of individuals from each subgroup for the two programs on

two axes were used to demonstrate the support by each subgroup for SMP and EDP (the closer the value to 1, the stronger the support). Canonical analysis of principal coordinates (CAP, Anderson and Willis, 2003) was then applied to identify how reliable respondents could be correctly re-assigned to their respective subgroup based on their support for SMP and EDP. For this purpose, individual respondents were removed from the analyses and were then re-assigned. The size of the circle for each subgroup in the scatterplot indicates the percentage of individual respondent that was correctly reassigned to their respective subgroup according to their support for SMP and EDP.

2) Effects of socio-demographic factors gender, age, education level and annual family income related to perceptions of SMP and EDP were analyzed for each section of the questionnaires. Permutational analysis of variance (PERMANOVA, Anderson, 2001) was used to identify which levels of gender, age, education, and annual family income factors differed significantly in terms of the respondents' scores to questions in the section. Afterwards, non-metric multi-dimensional scaling (nMDS) was applied to illustrate significant results from the PERMANOVA test, and to identify which factor levels differed in terms of responses to the questions. The resemblance measure used for the PERMANOVA models and nMDS ordinations was Euclidean distance.

3) For the in-depth face-to-face interview, content analysis was applied to help identify information from the conversations and perception of interviewees. Notes taken from face-to-face communication were transcribed to text. Key messages from the recordings and notes were summarized for the local and administrative interviewees, respectively.

All figures were produced in Microsoft Word or Excel, and statistical analyses and ordination plots were created with Primer-E 7 (Clarke and Gorley, 2006).

2.2.4 Ethical considerations

Since most of the respondents from local communities were indigenous Tibetan, political and cultural issues had to be taken into consideration before the questionnaires and interviews started. First, the aims of the survey were explained to all the participants to make them understand that the research targets the benefit to the local communities. Second, each respondent's background and culture were respected. Third, individual perception and personal information were kept confidential and the interviews were done anonymously. Certain agreements were made with respondents and the translator from JAB before the interviews started.

3. Results

3.1 Site observations

3.1.1 Observations of local communities and socio-economic system

There were three Resident Committees (RC: Heye, Shuzheng, and Zharu) which administer four villages (Heye, Shuzheng, Zharu, and Zhezawa) that include 334 families and 1192 local residents living in the park (602 males and 590 females). In addition, there were around 80 people coming from outside who mainly work as housekeepers (Table 1). In total, 94.3 % of the inhabitants (1124) were Tibetans; the others were Qiang and Han.

Table 1 Numbers of local residents at Jiuzhaigou National Nature Reserve (source from personal communication with Resident Committees, 2015)

Villages	Heye	Shuzheng	Zharu	Zachewa	Total
Number of families	112	111	46	65	334
Number of people	423	431	145	193	1192
People from outside	23	19	26	12	80

Local inhabitants usually worked in tourism inside the park as JAB employees, tour guides, shop clerks, photographers, or in costume rental. In total, 3.3 % (40) of the local residents were running the Luorilang Joint-Venture, 8.1 % (97) worked at the JAB (25.59 % of all JAB employees) and 16.6 % (198) were running the shops at the Luorilang Service Center (Table 2). Others ran small businesses in the park including stalls selling souvenirs, photography, or costume rentals: 45 at Changhai scenic spot, 54 at panda view scenic spot, 61 at Five-Flower Sea, and 74 at primitive forest scenic spots. In addition, about 206 people were employed seasonally in park management, forest conservation, fire safety, sanitation, road maintenance or as mountain rangers. The remaining inhabitants either worked in private tourism services or were unemployed (mainly seniors).

Table 2 Working conditions for local residents in Jiuzhaigou National Nature Reserve (source from site investigation and personal communication, 2015)

Villages	Working in the park	Tour guide	Stalls	Luorilang Joint-Venture	JAB	Others
Shuzheng	74	30	85	8	28	206
Zharu	23	8	27	12	20	55
Heye	69	38	58	9	30	219
Zachewa	40	7	64	11	19	52
Total	206	83	234	40	97	532
% of total locals	17.3 %	7 %	19.6 %	3.4 %	8.1 %	44.6 %

When the local residents were engaged mainly in agricultural farming before tourism started, the annual income per capita for the local residents was only 200 yuan (US\$ 31) in 1983 (Guo, 1997). Since 1984 when tourism began to develop in the park, the traditional source of income was restricted to local residents, and the main source of income then came from tourism services. The income of local residents increased significantly, after community-based joint ventures were established in 1999. In 2015, the annual income for local residents increased to 45201 yuan per capita (US\$ 6900) (JAB annual report, 2015). In 2016, the annual income for local residents increased to 51050 yuan per capita (US\$ 7794, JAB annual report, 2016; Figure 7), which makes the local Tibetan inhabitants one of the richest ethnic groups in China (JAB annual report 2015, 2016).

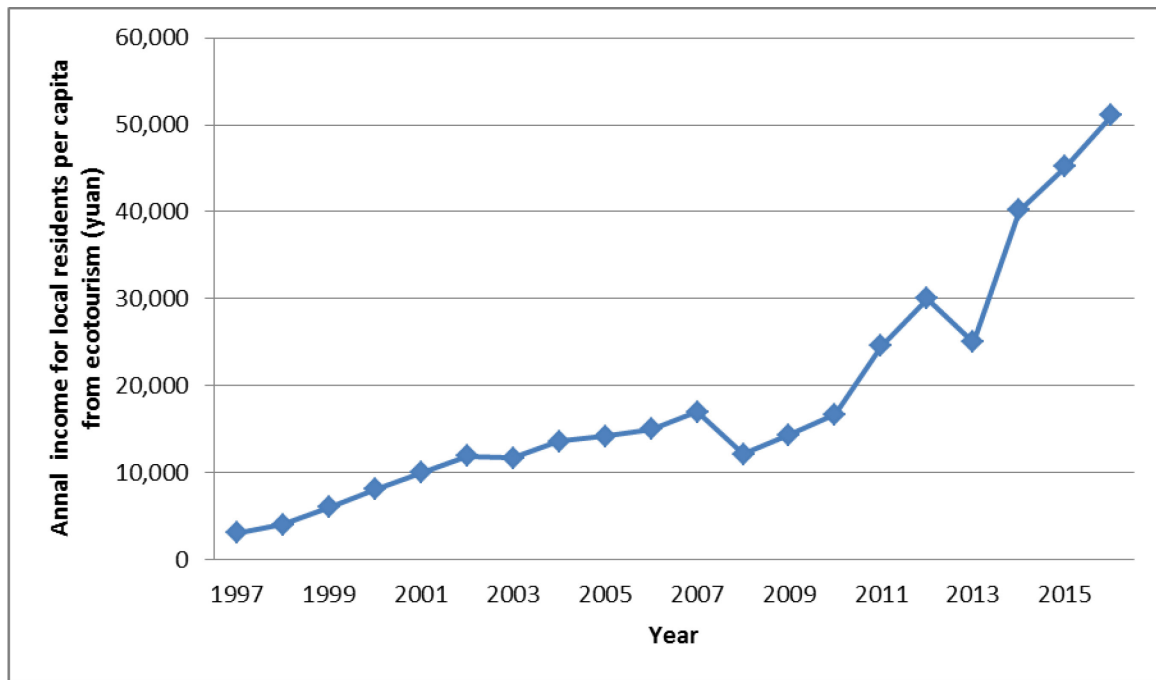


Figure 7 Annual average per capita incomes from ecotourism for local residents at Jiuzhaigou National Nature Reserve (Source: data from JAB annual reports, 1997-2016)

3.1.2 Observations of administrative staff

By May 2015, 379 people were officially employed by JAB, 157 females and 222 males. 35.9 % of them (136) had a bachelor degree and 0.5 % (2) had a master degree (Figure 8). In terms of ethnic groups, most of them were Han, which is the majority group in the Chinese population (Figure 9). The age of employed inhabitants ranged from 25 to 59 years. In total, 94 were below 30, 149 between 30-39, 130 between 40-49, and 24 over 50. There were 97 local residents and 282 non-locals (personal communication at Human Resource Office of JAB). All non-local staff had a university or high school education. Among the 97 local residents, there were seven senior management and nine middle management staff members. The remaining individuals were basic employees. Except permanent staff, there were also seasonal contracted employees (around 385). They worked as cleaners, security guards, and fire fighters in the park, among which the local inhabitants were 53.5 % (206 employees) (personal communication with Human Resource Office, JAB).

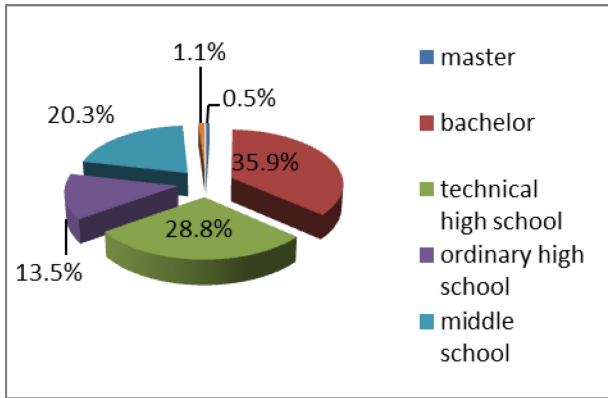


Figure 8 Educational levels of JAB employees

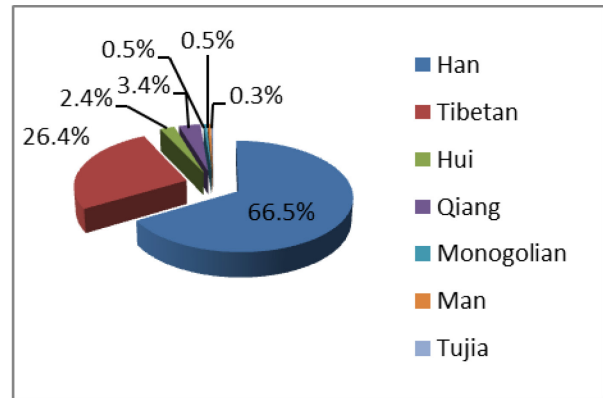


Figure 9 Ethnic groups of JAB employees

3.2 Socio-demographics

3.2.1 Socio-demographics of group one – all the respondents

The age of all the respondents was classified into six categories: 5.9 % below 20 (15), 26.6 % of 20-29 years (68); 28.5 % of 30-39 years (73); 24.6 % of 40-49 years (63); 10.6 % of 50-59 years (27); and 3.9 % over 60 (10). Respondents between 20-49 years were the main participants in the ecotourism operation or management at JNNR. The number of respondents in this age class was 204 individuals, which was 79.7 % of the total respondents. Of all the participants, 37.2 % (142) were male and 62.8 % (114) were female. Respondents who have completed high school or university are 50 % (138; Figure 10). Those without school education were mainly above 60 years of age. Those with elementary school were mainly 40-59 years. Those with middle school were mainly 30-39 years, while those with high school and university degrees were mainly 20-39 years.

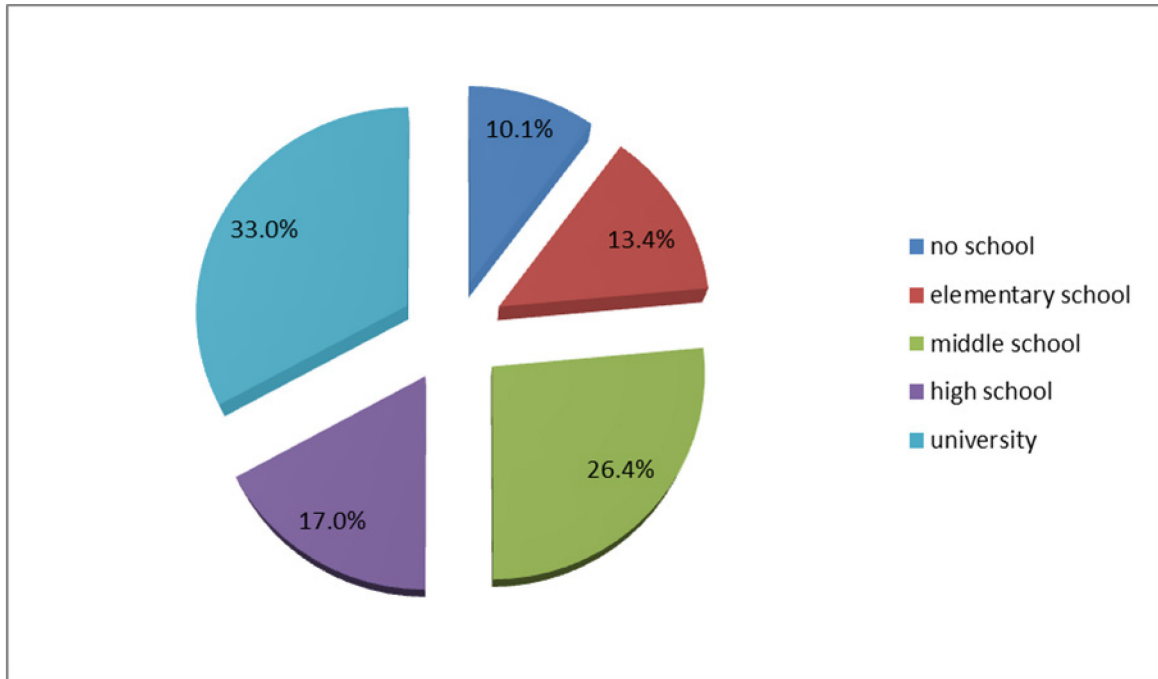


Figure 10 Educational levels of all the respondents

In total, 80.9 % of respondents (207) were working inside JNNR, including 34.0 % (87) working at JAB, 7.0 % (18) being employed by JAB-affiliated companies, 2.7 % (7) working for the Green Bus Sightseeing Tour Agency, 21.9 % (56) in park conservation such as mountain ranger, fire safety, sanitation, and road maintenance, and 15.2 % (39) running individual shops, either as photographers, or renting costumes. 19.1 % (49) of respondents were unemployed adults. Most of the respondents' families were benefiting from ecotourism activities. Respondents with an annual family income of 30,001-40,000 yuan were 42.2 % (108), while 34.8 % (89) received 40,001-50,000 yuan, and 12.1 % (31) received more than 50,000 yuan.

3.2.2 Socio-demographics of group two – local respondents

The age of respondents was classified into six groups: 8.4 % below 20 (15); 29.8 % of 20-29 years (53); 27.0 % of 30-39 years (48); 21.3 % of 40-49 (38); 7.9 % of 50-59 years (14); 5.6 % over 60 (10). It was obvious that the respondents of 20-49 years were the main participants in the ecotourism activities. The number of respondents in this age class was 139, or 78.1 % of the total respondents. Of the participants, 94 were male and 84 were female. The education level of the respondents is shown in Figure 11. Those without school education were mainly over 60. Those with elementary school were mainly 50-59 years. Those with middle school were mainly 40-49 years, while those with high school and university degree

were 20-39 years. In total, 22.5 % of the respondents had completed high school or university education (40; Figure 11).

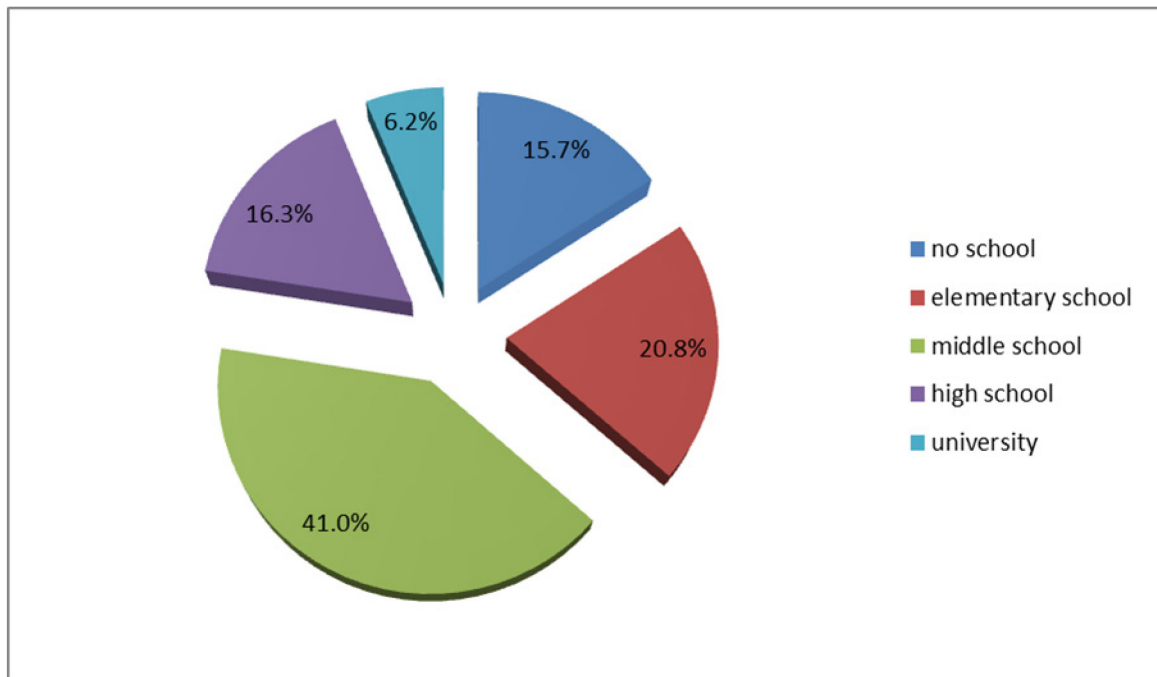


Figure 11 Educational levels of local respondents

In total, 72.5 % of respondents (129) were working inside JNNR, including 5.1 % (9) working at JAB, 10.1 % (18) employed by JAB- affiliated companies, 4.0 % (7) for the Green Bus Sightseeing Tour Agency, 31.5 % (56) in park conservation such as mountain ranger, fire safety, sanitation, and road maintenance. In total 21.9 % (39) ran individual shops, either being photographers, or renting out costumes. In total, 27.5 % (49) of respondents were unemployed, staying home to take care of children, or managing small agricultural plots in their gardens. In total, 47.2 % (84) of the respondents received annual family income of 30,001-40,000 yuan, while 29.2 % (52) received 40,001-50,000 yuan. A minority of 7.87 % (14) received more than 50,000 yuan.

3.2.3 Socio-demographics of group three – administrative respondents

The age of respondents was classified into four classes: 19.2 % of 20-29 years (15); 32.1 % of 30-39 years (25); 32.1 % of 40-49 (25); 16.7 % of 50-59 years (13). The majority of respondents were between 30-49 years. In China, the official retirement age is 55 for women and 60 for men. Of the participants, 48 were male and 30 were female. The education level of the respondents was 23.1 % with high school education and 76.9 % with university education. In general, the non-local JAB staffs had a higher education compared

to the local staff. For the JAB respondents, 18 had a high school education, and 60 had a university degree. Most of the respondents with a university degree were below 49. In total, 78 respondents included managerial staff of different levels at JAB. There were 12.8 % senior management (10), 24.4 % middle management (19), 26.9 % junior management (21), and 35.9 % ordinary employees (28). Because JAB is a state-owned agency, the annual family incomes of respondents are all above 30,000 Yuan. 30.8 % (24) received annual family income of 30,001-40,000 Yuan, while 47.4 % (37) received 40,001-50,000 Yuan. 21.8 % (17) received more than 50,000 Yuan.

3.3 Respondents' overall perceptions of sustainable management policy (SMP) and ecotourism development plan (EDP)

The mean proportional agreement value of each subgroup of respondents is displayed for EDP and SMP in figures 12-14. An axis score of 1 stands for 100 % of all respondents from that subgroup supporting the respective program. The size of the circle for each subgroup indicates the percentage of individual respondent that was correctly reassigned to their respective subgroup according to the overall support pattern for EDP and SMP in this group. A large circle stands for a very consistent response pattern among all members of a subgroup. Group one – all respondents, Group two – local community respondents and Group three – administrative respondents were analyzed sequentially.

3.3.1 Group one – all respondents

In some subgroups, more than 50 % of the respondents supported EDP, but less than 50 % supported SMP (Figure 12, sector ①). In other subgroups, more than 50 % of the respondents supported both EDP and SMP (Figure 12, sector ②). There is no subgroup located in sectors ③ and ④, which means that the majority (> 50 %) of all respondents in each subgroup had a positive attitude towards EDP. The subgroups located in sector ①, which are mainly senior, lower education, and lower annual income subgroups, showed relatively negative attitudes towards SMP. The subgroups with university education and a family annual income above 50,000 Yuan had positive attitudes towards both EDP and SMP. It is also obvious in Figure 12 that the administration subgroup supported both programs while the local subgroup only showed a positive attitude towards EDP. Subgroups of higher education and higher family annual income levels had a higher proportion of supporting respondents while subgroups in the senior, lower education and lower family annual income classes had a lower supporting degree.

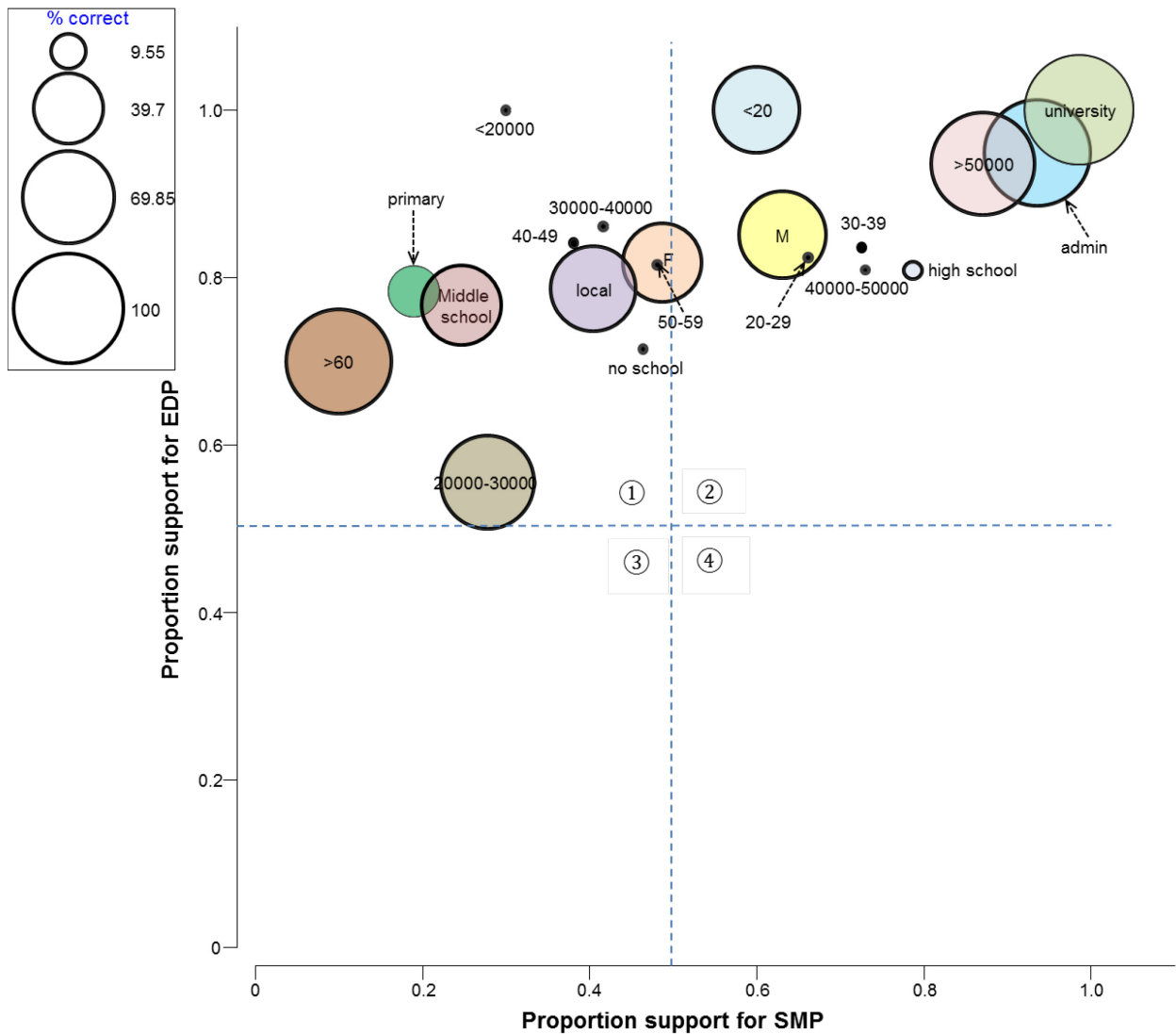


Figure 12 Average perception towards EDP and SMP of all the respondent’s subgroups. An axis score of 0.5 indicates that 50 % of the respondents from a subgroup support the respective program. The bigger the circle around a subgroup label, the higher the percentage of correctly re-assigned respondents to the respective subgroups.

3.3.2 Group two – local respondents

All subgroups among the local communities are located in sectors ① and ② of Figure 13, which means that all the respondents showed positive attitudes toward EDP. In contrast, their attitude to SMP, was less supportive. In sector ② respondents with a university degree strongly supported both programs. Respondents with a family annual income above 50,000 Yuan, or below the age 20 years supported EDP and to a lower extent SMP. Subgroups of high school education or age between 20-39, family annual income 40,000-

50,000 Yuan are located in sector ② as well, which means that these subgroups tended to support both programs relatively highly.

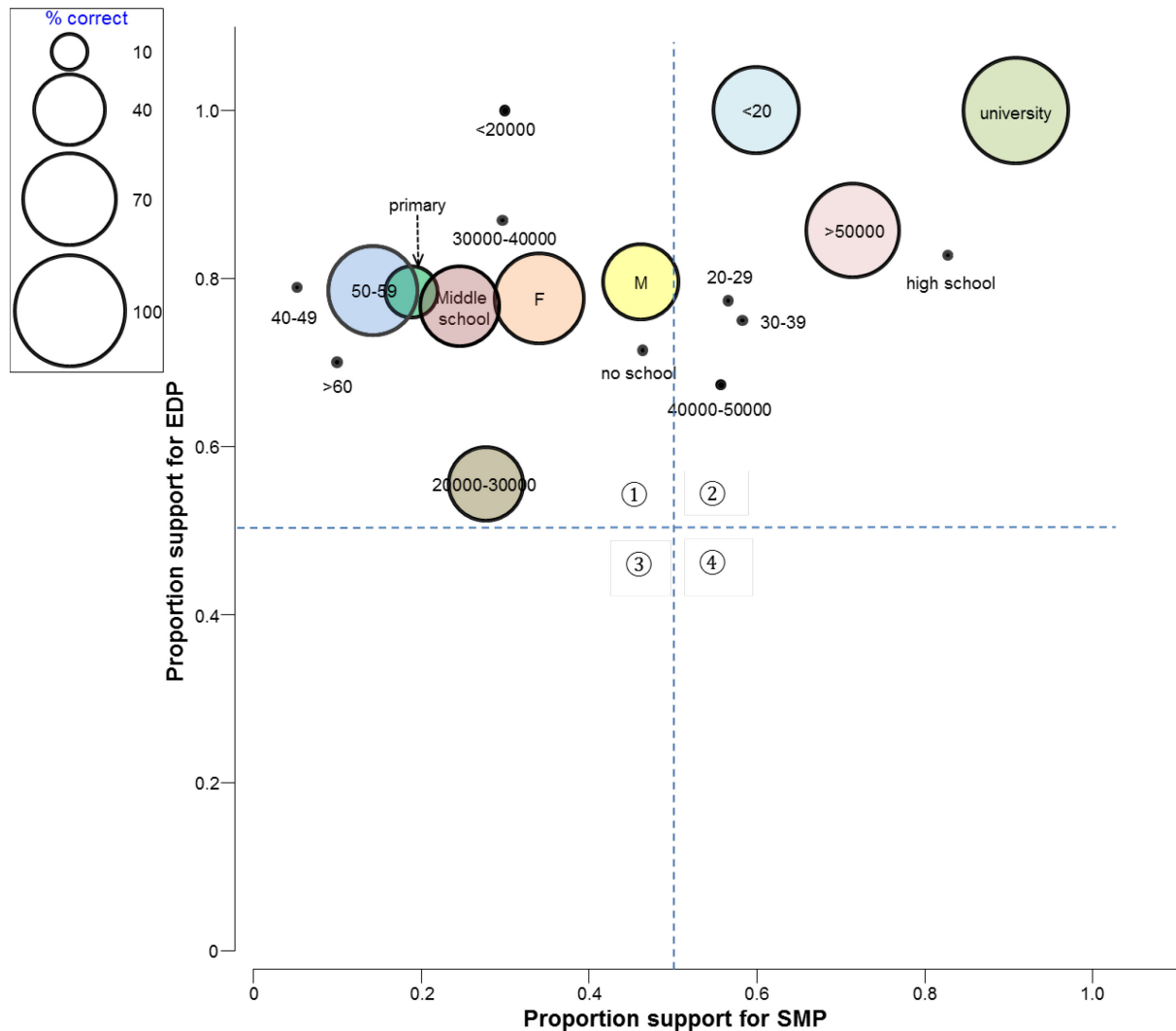


Figure 13 Average perception towards EDP and SMP of the local respondent’s subgroups. An axis score of 0.5 indicates that 50 % of the respondents from a subgroup support the respective program. The bigger the circle around a subgroup label, the higher the percentage of correctly re-assigned respondents to the respective subgroups.

In sector ① respondents over 40 supported EDP but not SMP. Subgroups of lower family annual income and lower education levels are located in this sector. Respondents with income less than 20,000 yuan were strongly supportive towards EDP. Males supported SMP relatively higher than females. Respondents with primary school, middle school and no school tent to support EDP more than SMP.

The re-assignment of female, university and middle school educated, age 50-59 years, or below 20, and income subgroups of 20,000-30,000 Yuan or above 50,000 Yuan respondents was relatively error-free based on their attitudes towards both programs.

3.3.3 Group three – administrative respondents

Figure 14 shows the average attitude of the respondents of JAB towards both EDP and SMP. It is obvious that all the subgroups of respondents are located in sector ②, which means that all the JAB respondents were relatively supportive of both programs.

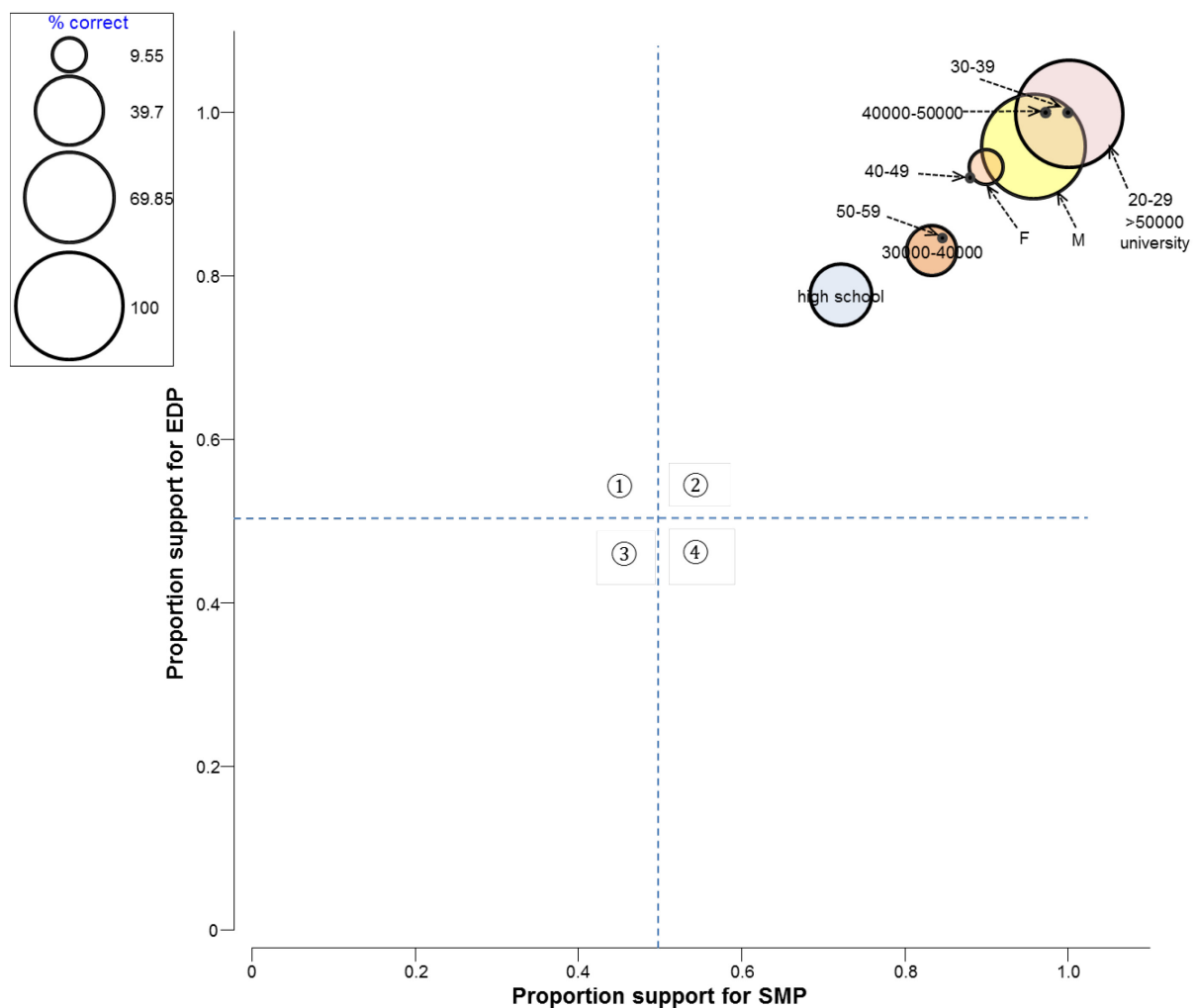


Figure 14 Average perception towards EDP and SMP of the administrative respondent's subgroups. An axis score of 0.5 indicates that 50 % of the respondents from a subgroup support the respective program. The bigger the circle around a subgroup label, the higher the percentage of correctly re-assigned respondents to the respective subgroups.

Respondents of age 20-39, with university education, and family annual income above 40,000 Yuan, strongly supported both programs. Males tend to support SMP more consistently than females. Respondents between 50-59 years, with high school degree, and family annual income between 30,000-40,000 Yuan supported both programs relatively less.

The re-assignment of males, university education, income above 50,000 Yuan and age 20-29 years subgroups was most successful based on their attitudes towards both programs.

3.4 Local respondents perception of sustainable management policy (SMP) and ecotourism development plan (EDP)

The perception of SMP and EDP by local respondents is presented by five major sections of the questionnaire.

3.4.1 Environmental awareness of local respondents

Three questions in section one are:

Q1: Do you understand environment law and policy at a Nature Reserve? (5: fully comprehend, 4: mostly, 3: about half, 2: very little, 1: nothing)

Q2: How important do you think it is to protect the environment and biodiversity in Jiuzhaigou National Nature Reserve (JNNR)? (4: very important, 3: important, 2: slightly important, 1: not important)

Q3: What is your reaction when seeing tourists' bad behavior against ecological protection? (4: stop immediately, 3: think before stop, 2: observe, 1: ignore)

Age ($F_{5,172} = 61.83$; $P < 0.001$), Education ($F_{4,173} = 177.91$; $P < 0.001$), and family annual income ($F_{4,173} = 107.53$; $P < 0.001$) all significantly affected the responses to questions in section 1. Gender did not affect responses significantly ($F_{1,176} = 0.91$; $P = 0.327$).

Panels a)-c) in Figure 15 all indicate a split between different subgroups according to age, education, and family income levels regarding questions 1-3. Respondents of senior age, lower income, and lower education are located in the left part of the ordination, and respondents of younger age, higher income and education are located to the right. Respondents of middle age, middle income and middle education are located in the center. The perceived understanding of environment law and policy increased with education and family income and decreased with age. The perception of the importance of environment and biodiversity protection in JNNR is positively related to higher education and family

annual income, but is negatively related to age. Respondents with higher levels of education and family annual income, and lower age were more willing to take action against incorrect behavior by tourists in protected areas. Environmental awareness of local respondents increased with the level of education and family annual income and decreased with age.

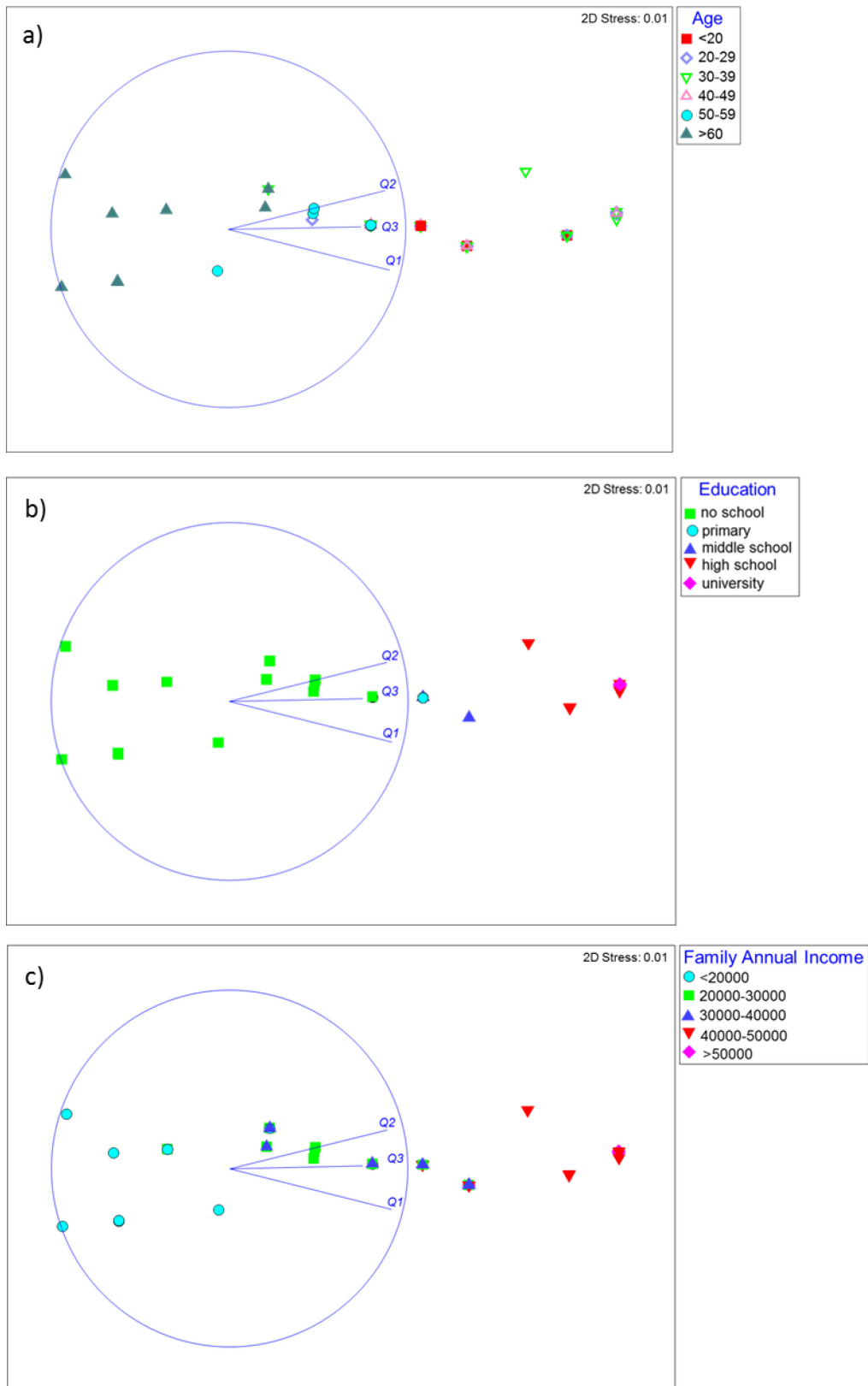


Figure 15 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 1-3. Note that vectors for individual questions point towards subgroups that scored higher for the respective questions (see questions above for scores). Stress value represents the difference between distances in the reduced dimension compared to the complete multidimensional space.

Panels a)-c) in Figure 16 show the percentage of the answers that local respondents chose for questions 1-3. Panel a) indicates that 47.7 % of the respondents understood the environment law and policy mostly. Panel b) indicates that 95.0 % of the respondents thought that it is ‘very important’ or ‘important’ to protect the environment and biodiversity in Jiuzhaigou National Nature Reserve (JNNR). Panel c) indicates that 89.9 % of respondents chose would intervene and stop tourists’ bad behavior immediately. In general, environmental awareness by the local community seemed to be high.

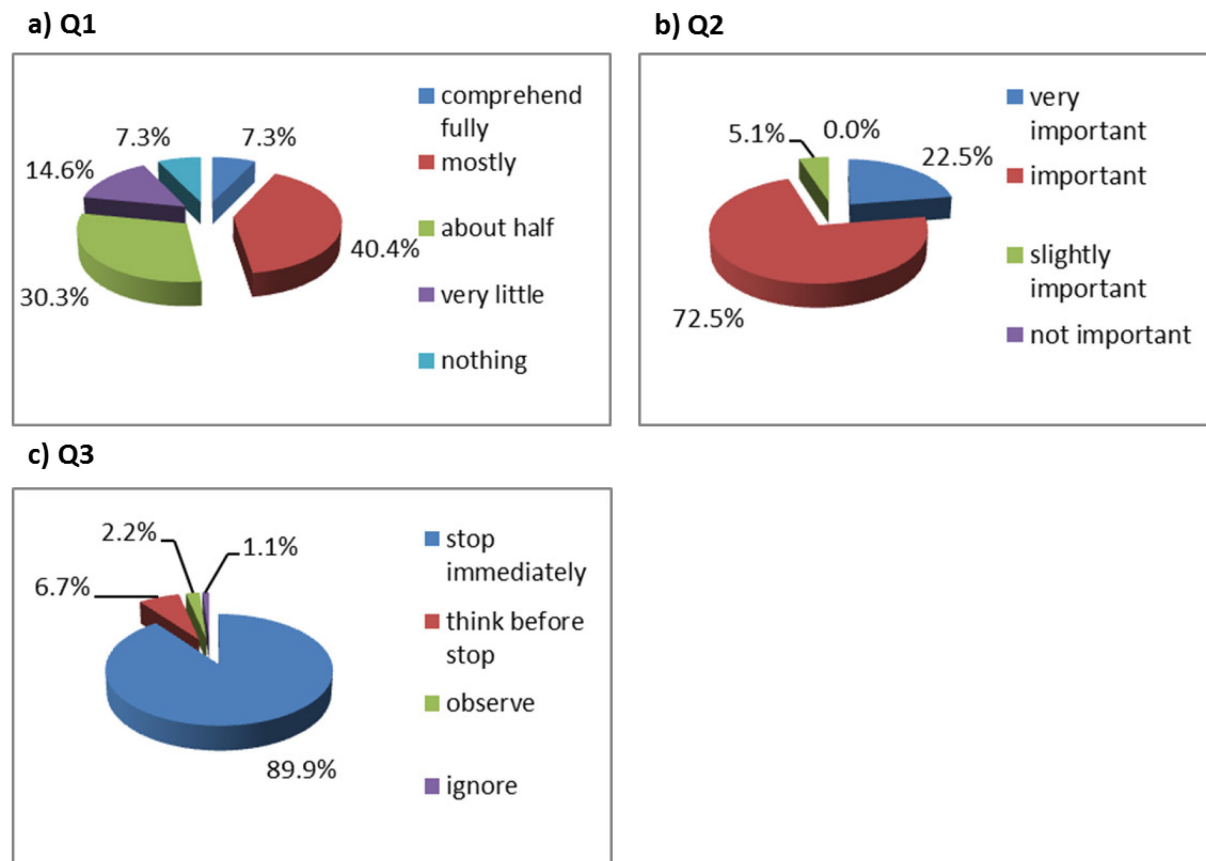


Figure 16 The percentage of local respondents in different response categories for questions 1-3

3.4.2 Local satisfaction with sustainable management policy (SMP)

Six questions were in section two- satisfaction with SMP, listed as Q4 – Q9.

Q4: How much do you understand the SMP? (5: fully comprehend, 4: mostly, 3: about half, 2: very little, 1: nothing)

Q5: Do you agree that the SMP has helped greatly to protect the environment and biodiversity in Jiuzhaigou National Nature Reserve (JNNR)? (2: strongly agree, 1: agree, 0 neutral, -1: disagree, -2: strongly disagree)

Q6: Are you satisfied with the current participation model? (2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied)

Q7: Are you satisfied with current distribution of benefits? (2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied)

Q8: How is income gap between different villages in the park? (2: very big, 1: big, 0: neutral, -1: small, -2: very small)

Q9: Are you satisfied with the jobs created by JAB? (2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied)

Gender ($F_{1,176} = 5.60$; $P = 0.024$), age ($F_{5,172} = 52.32$; $P < 0.001$), education ($F_{4,173} = 147.43$; $P < 0.001$) and family annual income ($F_{4,173} = 149.75$; $P < 0.001$) all significantly affected the responses in this section.

Panels b)-d) income in Figure 17 indicate splits between age, education, and family annual income levels regarding questions 4-9. Respondents of younger age, higher income and education are located in the left part of the ordination and respondents of female, senior age, lower income, and lower education are located to the right. Respondents of middle age, middle income and middle education are located in the middle. The perceived understanding of SMP, perception of environmental performance of SMP, satisfaction with the current participation model, distribution of benefits and job opportunities created by JAB increased with education and family annual income, and decreased with age. Regarding Q8, perception of the income gap between different villages in the park increased with age, and decreased with education and family annual income. Panel a) gender in Figure 17 does not reflect the significant differences between males and females regarding questions 4-9. Therefore, mean plots are shown to illustrate differences between genders. Panel Q8 in Figure 18 shows that females perceived a bigger income gap between different villages. Panel Q9 in Figure 18 shows that males were more satisfied with the jobs created by JAB.

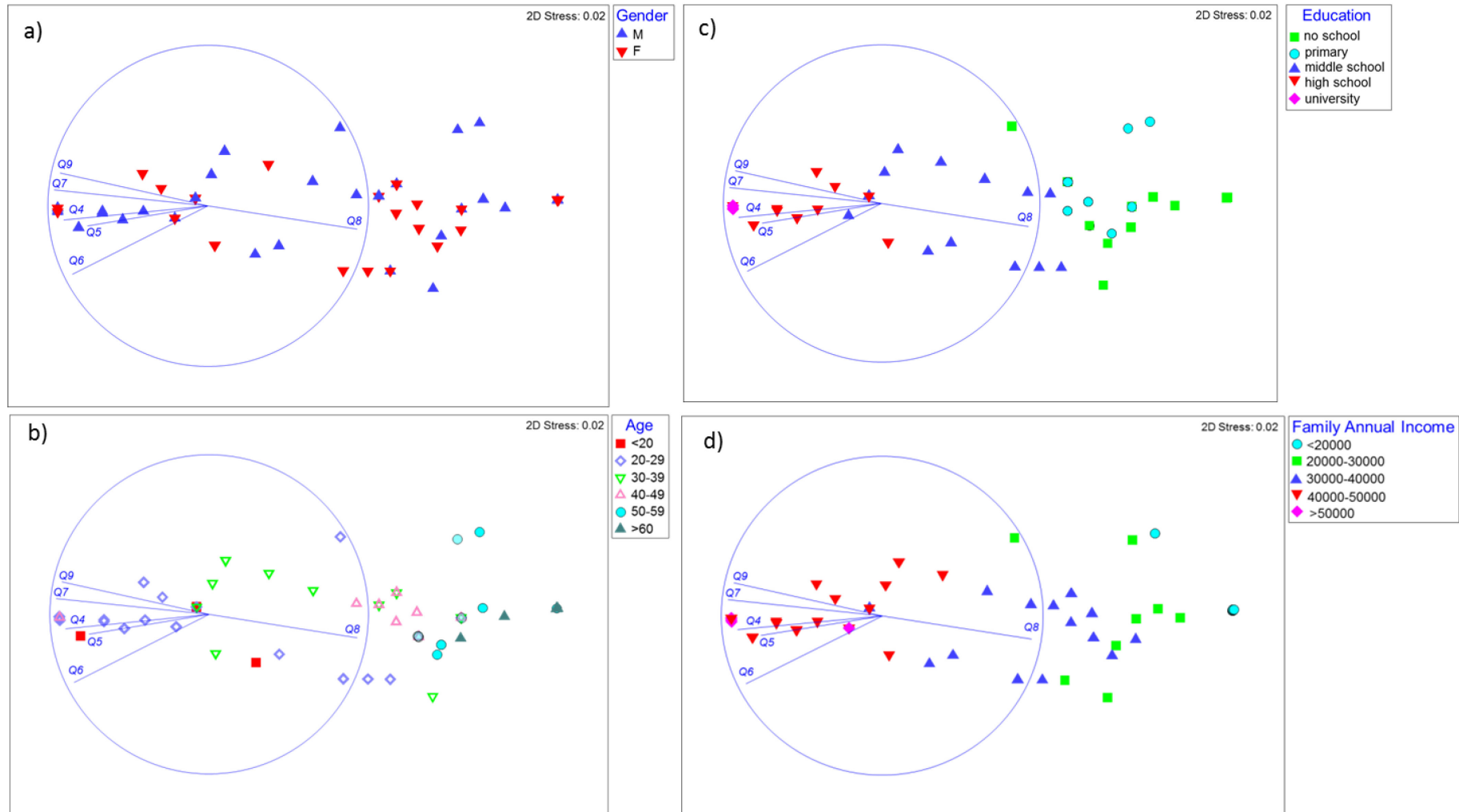


Figure 17 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 4-9. Note that vectors for individual questions point towards subgroups that scored higher for the respective questions (see questions above for scores). Stress value represents the difference between distances in the reduced dimension compared to the complete multidimensional space.

Participatory management of community-based ecotourism at Jiuzhaigou National Nature Reserve, China

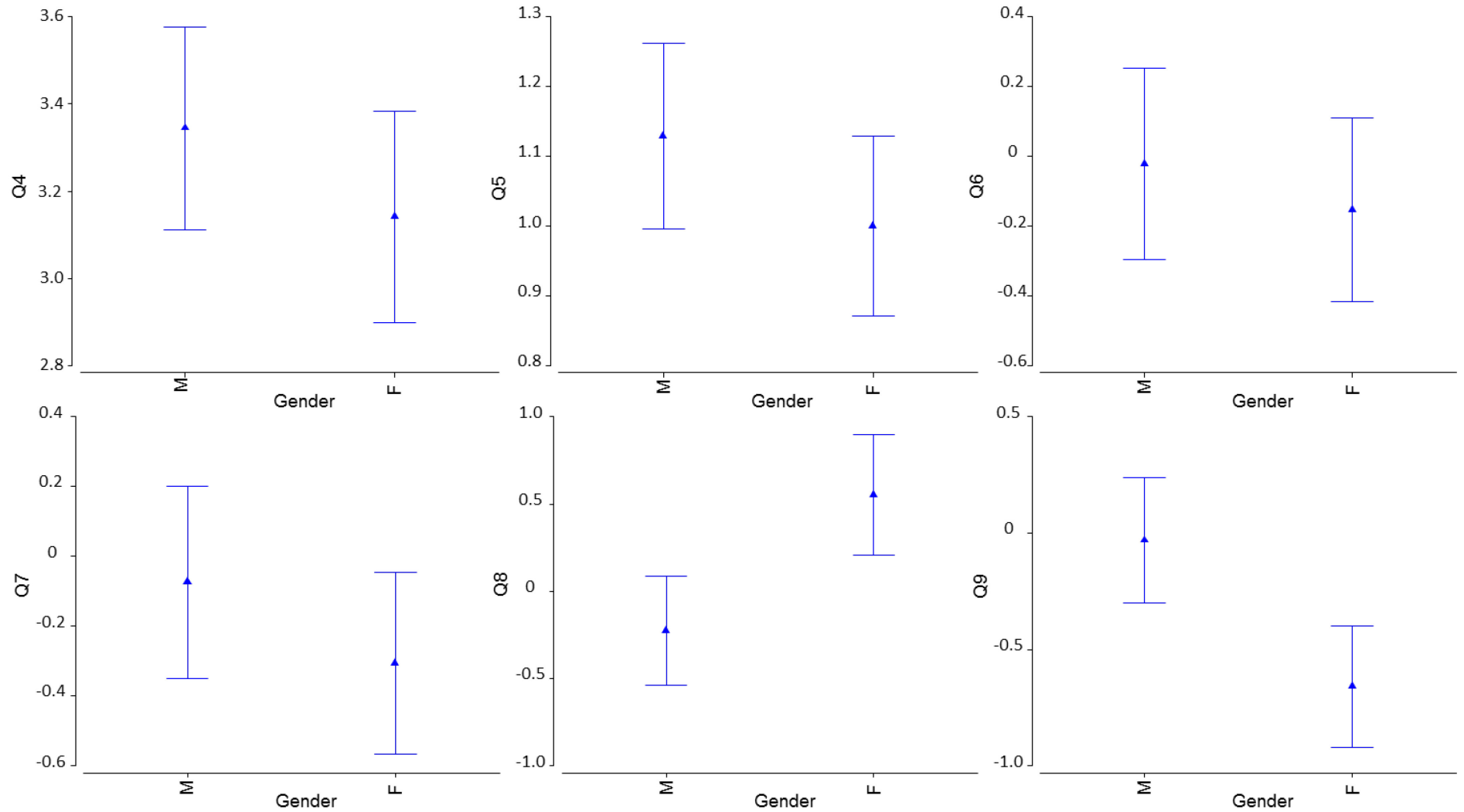


Figure 18 Average scores \pm 95 % confidence intervals by gender for questions 4-9 in section 2: question 4 ranging from 5 (fully comprehend) to 1 (nothing); questions 5-9 ranging from 2 (supportive) to -2 (not supportive).

Figure 19 shows the results of local respondents' perception to questions 4-9. Figure 19 a) shows that 52.3 % of the respondents stated they understand the SMP 'fully' or 'mostly', while 29.8 % stated that they understand the SMP 'very little' or 'not at all'. Figure 19 b) indicates that 93.8 % of respondents strongly agreed or agreed that the SMP helped to protect the environment and biodiversity in JNNR. Figure 19 c) indicates that only 41.5 % of respondents were very satisfied or satisfied with the current participation model, while 49.4 % of respondents were dissatisfied and 7.3 % strongly dissatisfied. Figure 19 d) shows that only 8.4 % of respondents were very satisfied with the current distribution of benefits, while 34.3 % were basic satisfied, 41.6 % were dissatisfied while 14.0 % were strongly dissatisfied. Figure 19 e) shows that 52.2 % of respondents perceived that the income gap between different villages was 'very big' or 'big. Figure 19 f) shows that 41.6 % of respondents were dissatisfied with the jobs created by JAB while 18.5 % were strongly dissatisfied. In general, more than half of the local respondents, male and female, were dissatisfied with the SMP impacts.

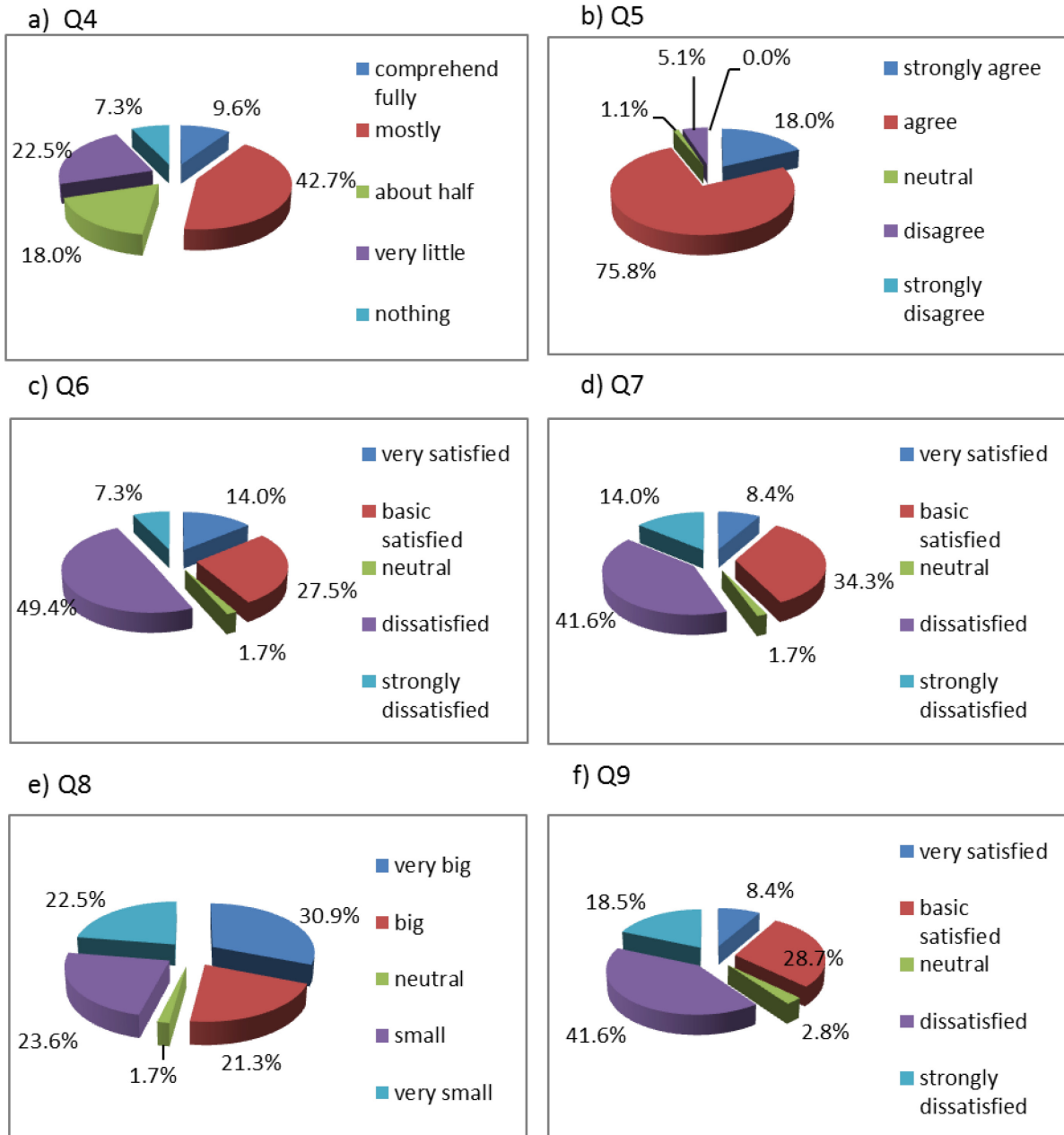


Figure 19 Local respondents' perceptions to Questions 4-9

3.4.3 Local satisfaction with ecotourism development plan (EDP)

Six questions are in the section three-satisfaction with EDP, listed as Q10 – Q15.

Q10: Has EDP improved your living standard? (2: much better, 1: better, 0: neutral, -1: the same, -2: worse)

Q11: Do you agree that EDP has improved the park infrastructure? (2: strongly agree, 1: agree, 0: neutral, -1: disagree, -2: strongly disagree)

Q12: Do you agree that EDP has changed the way of living and traditional culture including food, clothes, and house style? (2: strongly agree, 1: agree, 0: neutral, -1: disagree, -2: strongly disagree)

Q13: Would you like you or your children to marry across different religions? (2: strongly willing, 1: willing, 0: neutral, -1: unwilling, -2: strongly unwilling)

Q14: Are you willing to participate in ecotourism activities? (2: strongly willing, 1: willing, 0: neutral, -1: unwilling, -2: strongly unwilling)

Q15: Would you like your children to work at the Jiuzhaigou National Nature Reserve (JNNR)? (2: strongly willing, 1: willing, 0: neutral, -1: unwilling, -2: strongly unwilling)

Age ($F_{5,172} = 150.57$; $P < 0.001$), education ($F_{4,173} = 67.38$; $P < 0.001$) and family annual income ($F_{4,173} = 64.02$; $P < 0.001$) all significantly affected the responses in this section. Gender did not affect responses significantly ($F_{1,176} = 1.56$; $P = 0.204$).

Panels a)-c) of Figure 20 indicate splits between age, education, and family income levels regarding questions 10-15. Respondents of younger age, higher education and family annual income are located in the left part of the ordination and respondents of senior age, with lower education and lower family annual income are located to the right. Perceptions of living standard and infrastructure improvement by EDP, the acceptance of inter-religious marriage, the willingness to participate in ecotourism and the willingness to have children work at the park increases with education and family annual income, and decreases with age. Regarding Q12, the perceived satisfaction of local respondents with EDP's impact on the way of living and traditional culture increases with age, and decreases with education and family annual income.

The perceived satisfaction of local respondents with EDP was positively related to higher education and family annual income but negatively related to age.

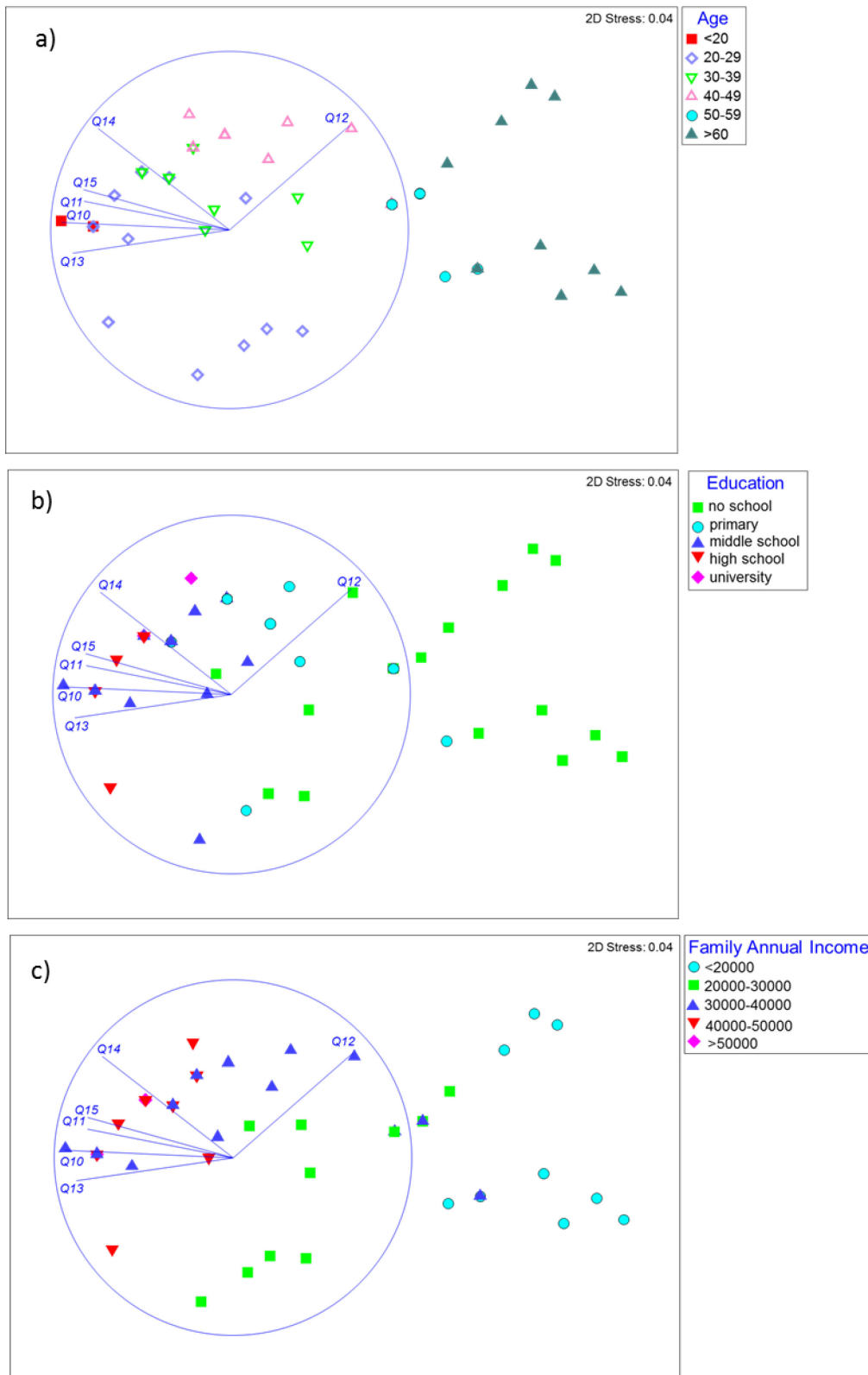


Figure 20 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 10-15. Note that vectors for individual questions point towards subgroups that scored higher for the respective questions (see questions above for scores). Stress value represents the difference between distances in the reduced dimension compared to the complete multidimensional space.

Figure 21 a) shows that 81.4 % of the respondents thought that the EDP had improved their living standard. Figure 21 b) shows that 98.3 % of respondents thought that the EDP had improved the park infrastructure. Figure 21 c) shows that 73.0 % of respondents strongly agreed or agreed that the EDP had changed the way of living and traditional culture. Figure 21 d) shows that 88.8 % of respondents were strongly willing or willing to marry across different religions for themselves or their children. Figure 21 e) shows that 92.7 % of respondents were strongly willing or willing to participate in ecotourism activities. Figure 21 f) shows that 97.7 % of respondents were strongly willing or willing to have their children work at JNNR. In general, the local respondents showed strong supportive attitude to EDP's impact.

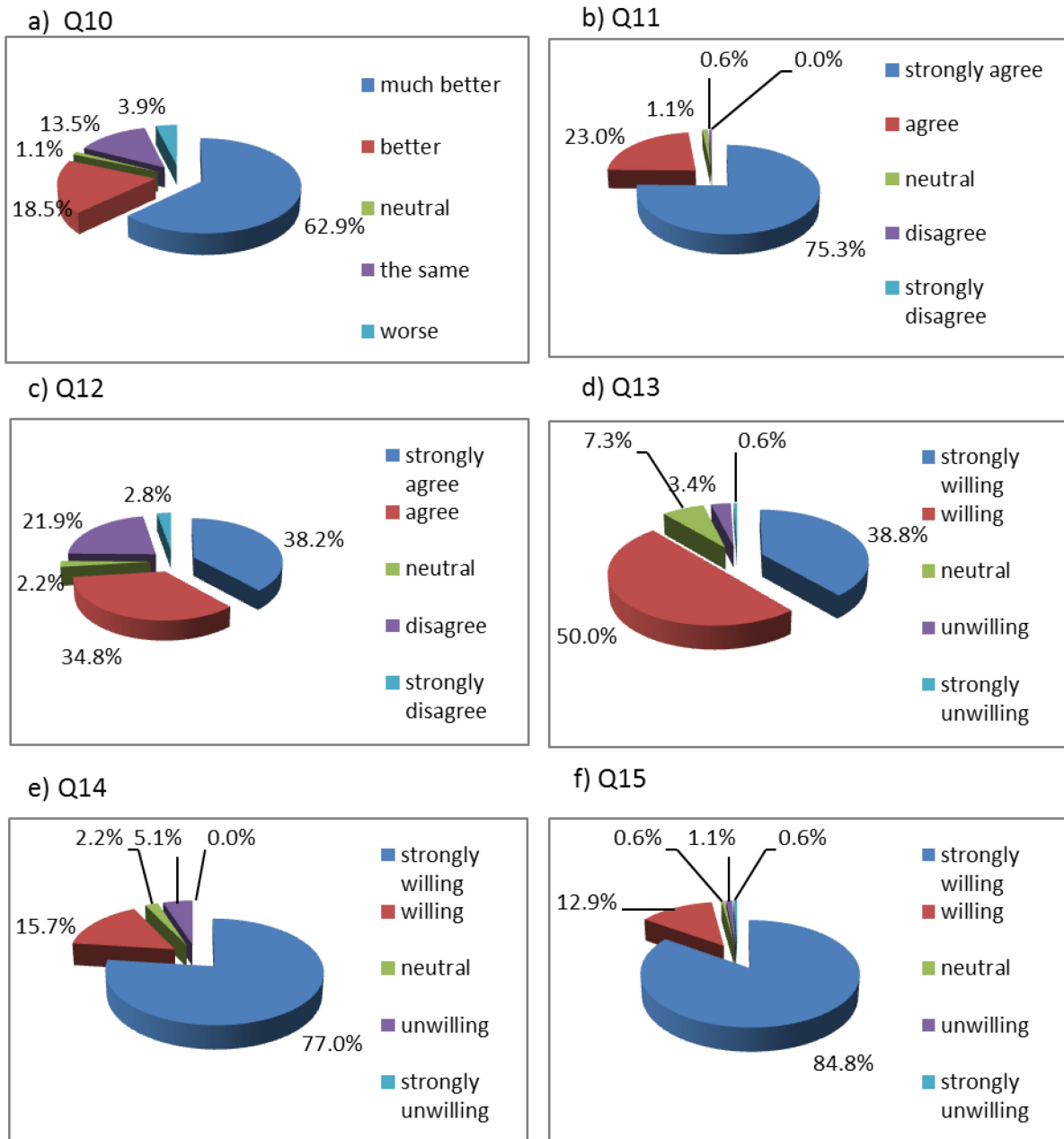


Figure 21 Local respondents' perceptions to questions 10-15

3.4.4 Local perception of administrative performance

Five questions were in section four – administrative performance, listed as Q16 – Q20.

Q16: Are you satisfied with JAB's management performance? (2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied)

Q17: Did JAB ask for your opinion when they developed SMP and EDP and explained to you the proposals and details? (1: yes, -1: no)

Q18: Are you satisfied with JAB's consultation on SMP and EDP? (2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied)

Q19: How did you participate in the ecotourism training programs arranged by JAB? (4: actively, 3: random, 2: not informed, 1: never)

Q20: What do you think of your communication with JAB? (2: very good, 1: good, 0: neutral, -1: not very good, -2: poor)

Age ($F_{5,172} = 126.25$; $P < 0.001$), education ($F_{4,173} = 76.73$; $P < 0.001$) and family annual income ($F_{4,173} = 55.81$; $P < 0.001$) all significantly affected the responses in this section. Gender did not affect responses significantly ($F_{1,176} = 0.64$; $P = 0.473$).

Panels a)-c) in Figure 22 indicate splits between age, education, and family income levels regarding questions 16-20. Respondents of senior age, lower income, and lower education are located in the left part of ordination and respondents of younger age, higher income and education are located to the right. Respondents of younger age, higher education, and higher income participated at ecotourism training more actively than respondents of senior age, lower education and lower income. Respondents of younger age, higher education, and higher income were more satisfied with JAB's consultation, communication and management performance than respondents of senior age, lower education and lower income. Most respondents chose 'yes' on question 17, which means JAB asked about their comments regarding SMP and EDP. Respondents with senior age, lower education and lower income were dissatisfied with JAB's consultation and perceive that their communication with JAB was not good or poor.

Respondents of younger age, higher education, and higher income had a more positive attitude towards JAB's management than respondents of senior age, lower education and lower income.

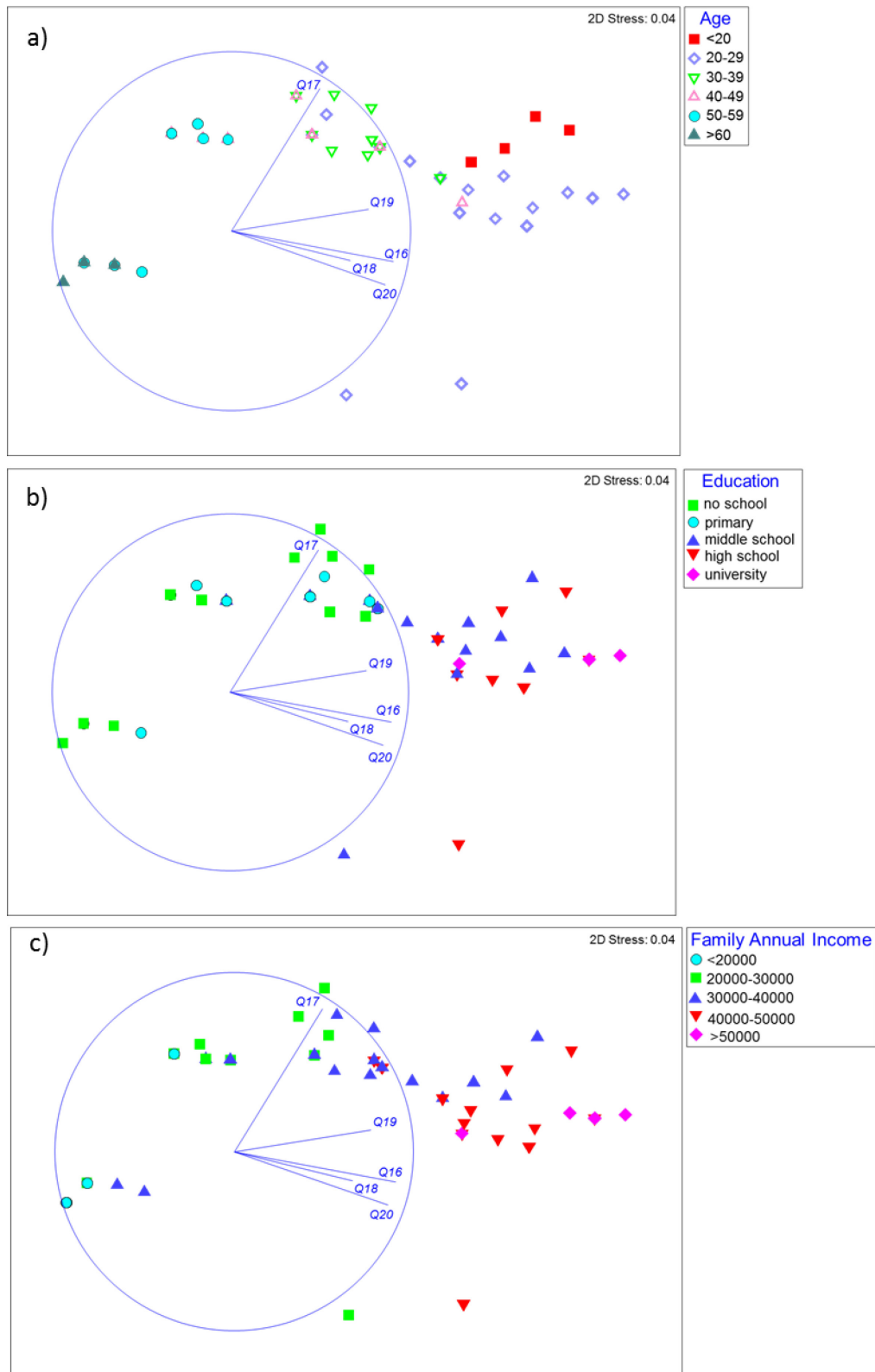


Figure 22 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 16-20. Note that vectors for individual questions point towards subgroups that scored higher for the respective questions (see questions above for scores). Stress value represents the difference between distances in the reduced dimension compared to the complete multidimensional space.

Panel a) in Figure 23 indicates that 61.8 % of respondents were satisfied with JAB's management performance, while 27.5 % were dissatisfied and 9.6 % were strongly dissatisfied. Panel b) indicates that 88.8 % of respondents chose 'yes' when they were asked if the JAB asked for their opinion when SMP and EDP were developed. Panel c) indicates that 16.3 % of respondents were dissatisfied with JAB consultations about SMP and EDP and 72.5 % were strongly dissatisfied. Panel d) indicates that 64.0 % of respondents participated actively in ecotourism training programs while 19.7 % were not informed. Panel e) indicates that 43.3 % of respondents perceived that the communication with JAB was not good and 16.9 % perceived that it was poor.

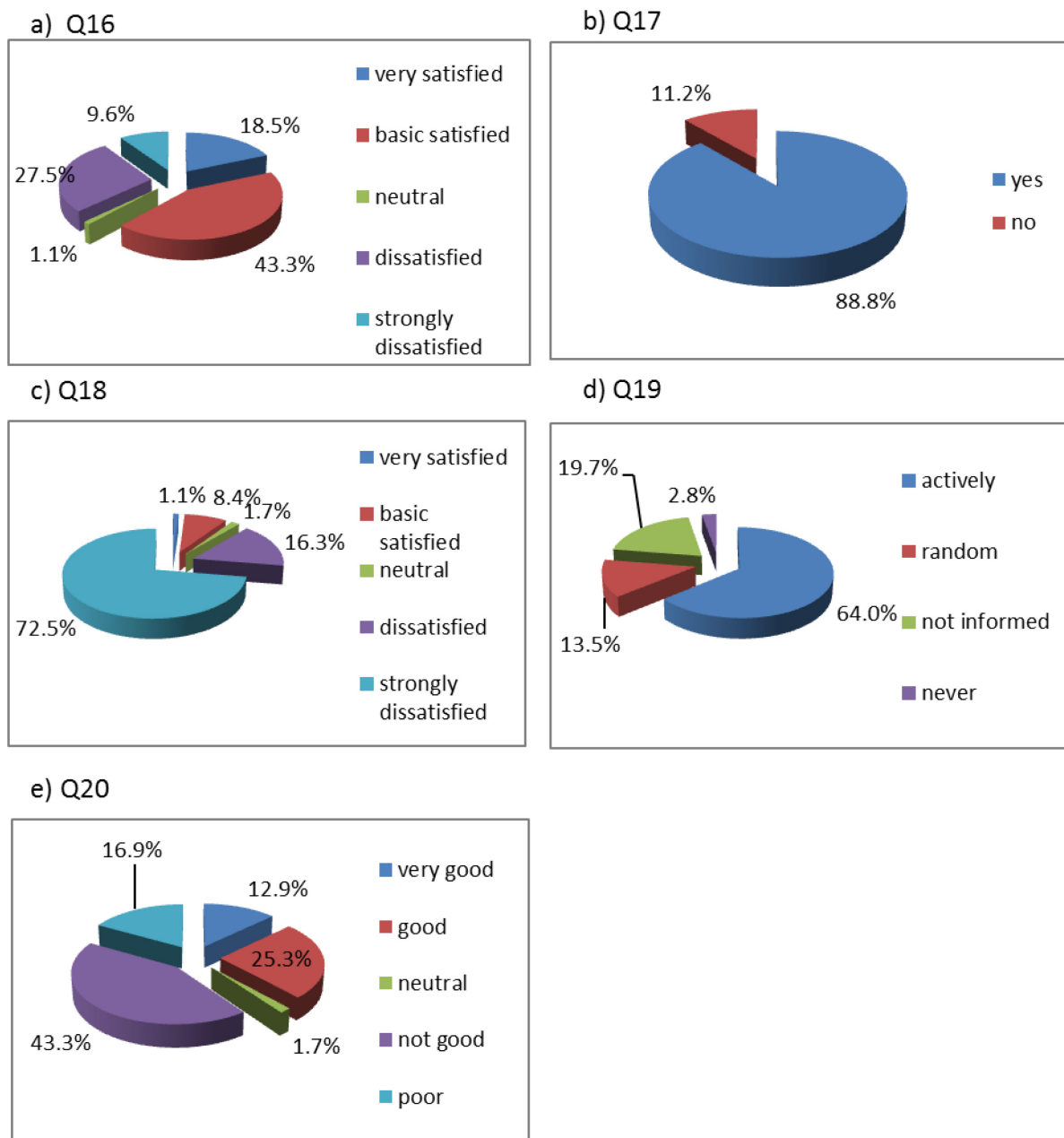


Figure 23 Local respondents' perceptions to questions 16-20

3.4.5 Expectation of future participation in ecotourism

Two questions are in section five – future expectation, listed as Q21 – Q22.

Q21: Have you adapted to sharply increased numbers of tourists? (2: very adapted, 1: somewhat, 0: neutral, -1: not adapted, -2: resisting adaption)

Q22: Will you continue to support and participate in future ecotourism development? (2: very supportive, 1: selective supportive, 0: neutral, -1: not very supportive, -2: resisting support)

Age ($F_{5,172} = 155.38$; $P < 0.001$), education ($F_{4,173} = 68.77$; $P < 0.001$) and family annual income ($F_{4,173} = 71.28$; $P < 0.001$) all significantly affected the responses in this section. Gender did not affect responses significantly ($F_{1,176} = 0.43$; $P = 0.558$).

Figure 24 a)-c) indicate splits from age, education, and family income levels towards responses to questions 21-22. Respondents of younger age, higher income and education are located in the left part of ordination and respondents of senior age, lower income, and lower education are located to the right. Respondents of younger age, higher education, and higher income had adapted more to sharply increased number of tourists than respondents of senior age, lower education and lower income. Respondents of younger age, higher education, and higher income showed stronger supportive attitude towards future ecotourism development than respondents of senior age, lower education and lower income.

Respondents' supportive attitude to future ecotourism development increased with education and family income and decreased with age.

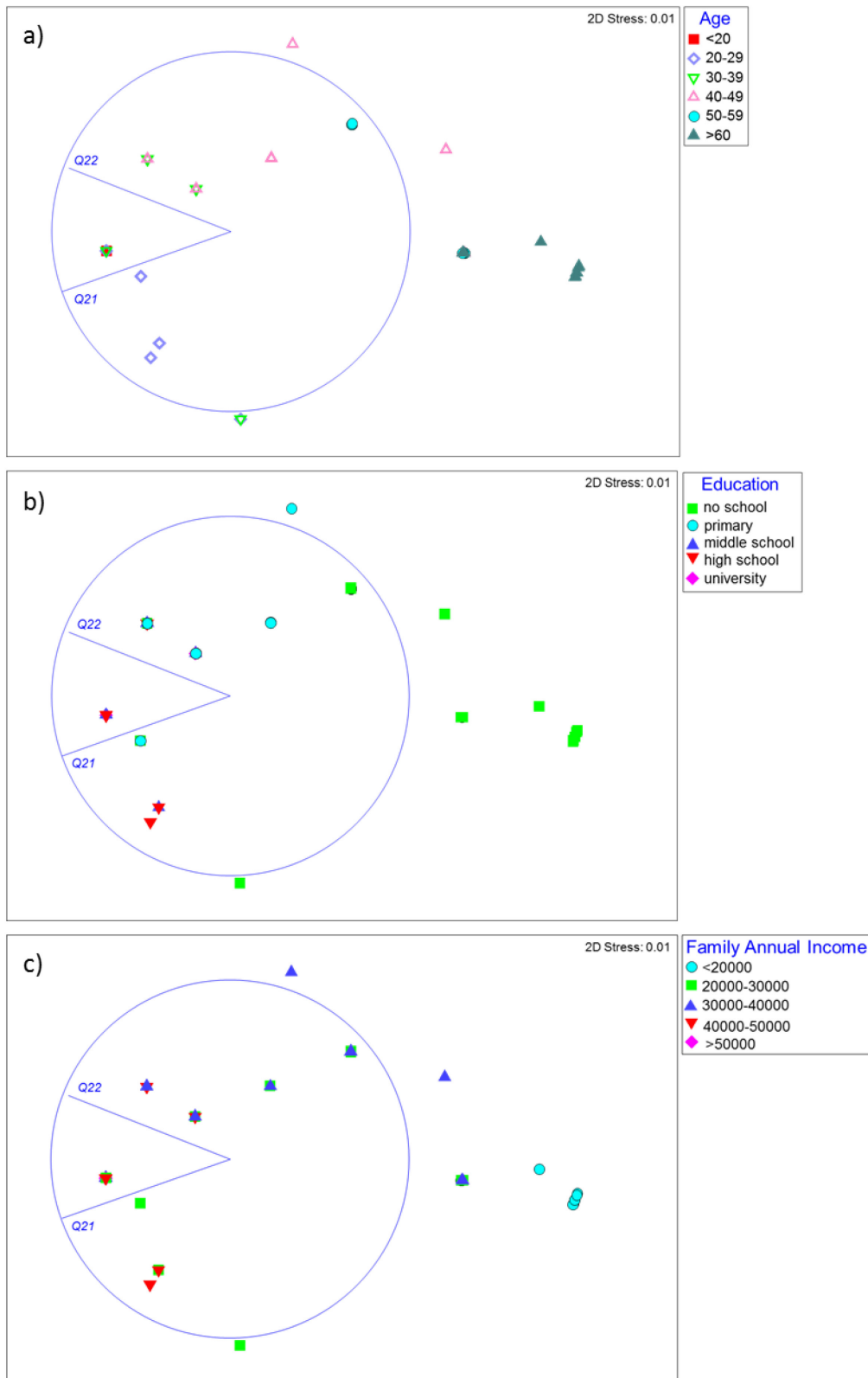


Figure 24 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 21-22. Note that vectors for individual questions point towards subgroups that scored higher for the respective questions (see questions above for scores). Stress value represents the difference between distances in the reduced dimension compared to the complete multidimensional space.

Figure 25 a) indicates that 82.6 % of respondents were adapted to the sharp increase of the tourists and Figure 25 b) indicates that 86.0 % of respondents would continue to support the future tourism development in JNNR.

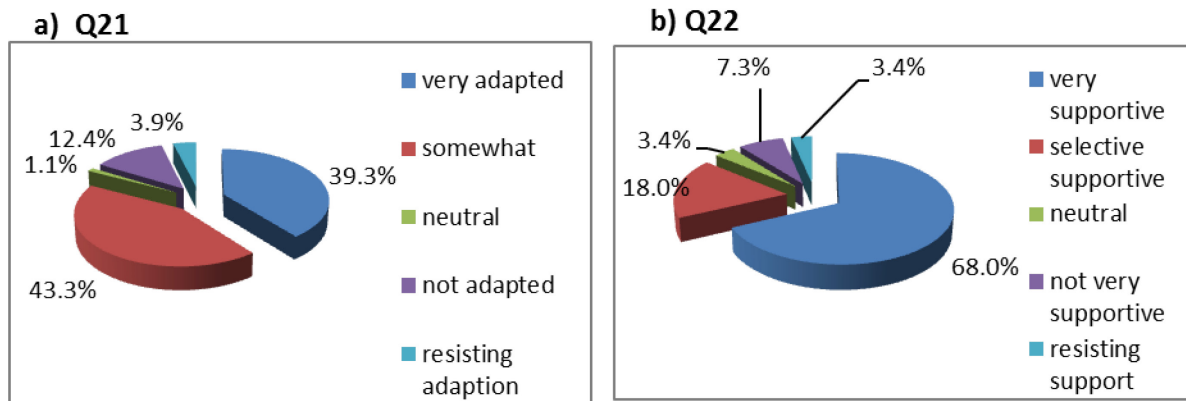


Figure 25 Local respondents' perceptions to questions 21-22

3.5 Group three – administrative respondents' perceptions of sustainable management policy (SMP) and ecotourism development plan (EDP)

The perception of SMP and EDP by administrative respondents is presented by four major sections.

3.5.1 Administrative satisfaction with sustainable management policy (SMP)

Four questions are in section one, listed Q1 – Q4.

Q1: Are you satisfied with the current local participation model? (2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied)

Q2: Do you think the benefits distribution is fair to the locals? (2: very much, 1: basic, 0: neutral, -1: unfair, -2: totally unfair)

Q3: What do you think of the jobs created for the locals? (2: very good, 1: good, 0: neutral, -1: not good, -2: deeply not)

Q4: Do you think that the SMP is well developed for the locals? (2: very much, 1: basic, 0: neutral, -1: not, -2: deeply not)

Education ($F_{1,76} = 7.33$; $P < 0.011$) significantly affected the responses in this section. Gender ($F_{1,76} = 2.26$; $P = 0.15$), age ($F_{3,74} = 0.93$; $P = 0.436$) and family annual income ($F_{2,75} = 0.76$; $P = 0.459$) did not affect responses significantly.

Figure 26 does not indicate a split between education levels regarding questions 1-4. Therefore, mean plots are shown (Figure 27). Figure 27 Q1 shows that respondents with university education were more satisfied with the current participation model than respondents with high school education. Figure 27 Q2 shows that respondents with university education more frequently perceived the benefits as fair to the locals compared to respondents with a high school education. Figure 27 Q3 shows that respondents with university education perceived that the jobs created for the locals were relatively fair compared to respondents with a high school education.

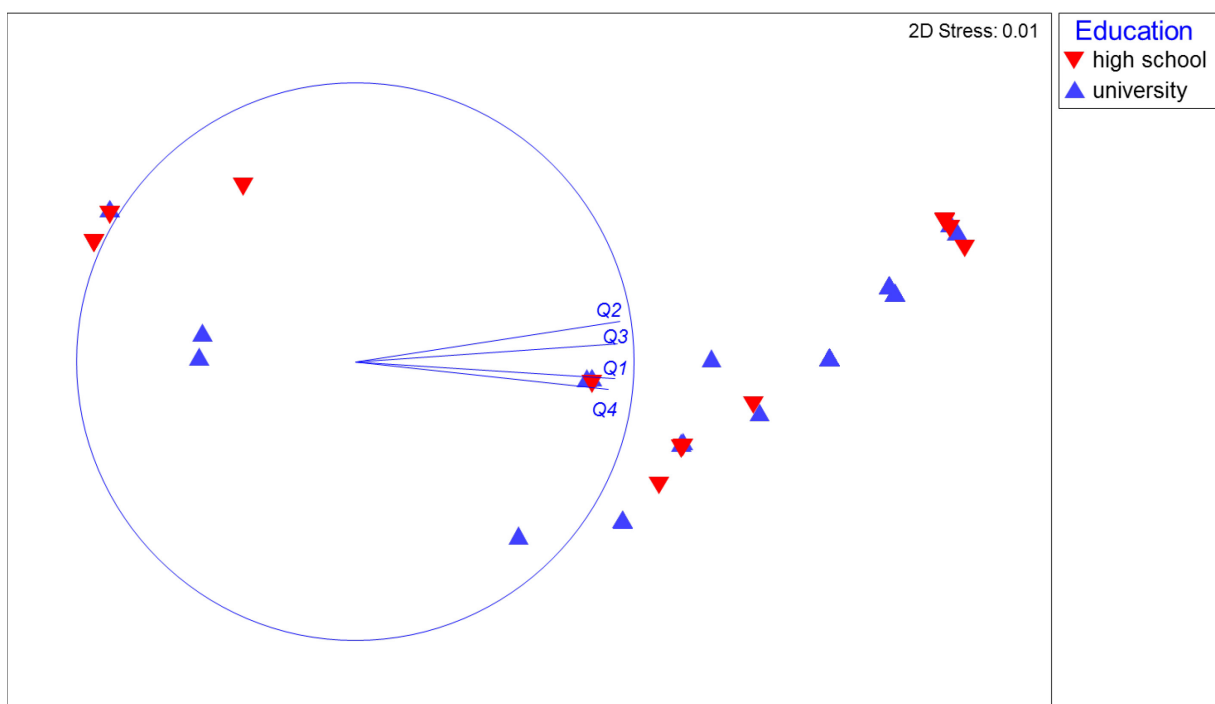


Figure 26 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 1-4. Note that vectors for individual questions point towards subgroups that scored higher for the respective questions (see questions above for scores). Stress value represents the difference between distances in the reduced dimension compared to the complete multidimensional space.

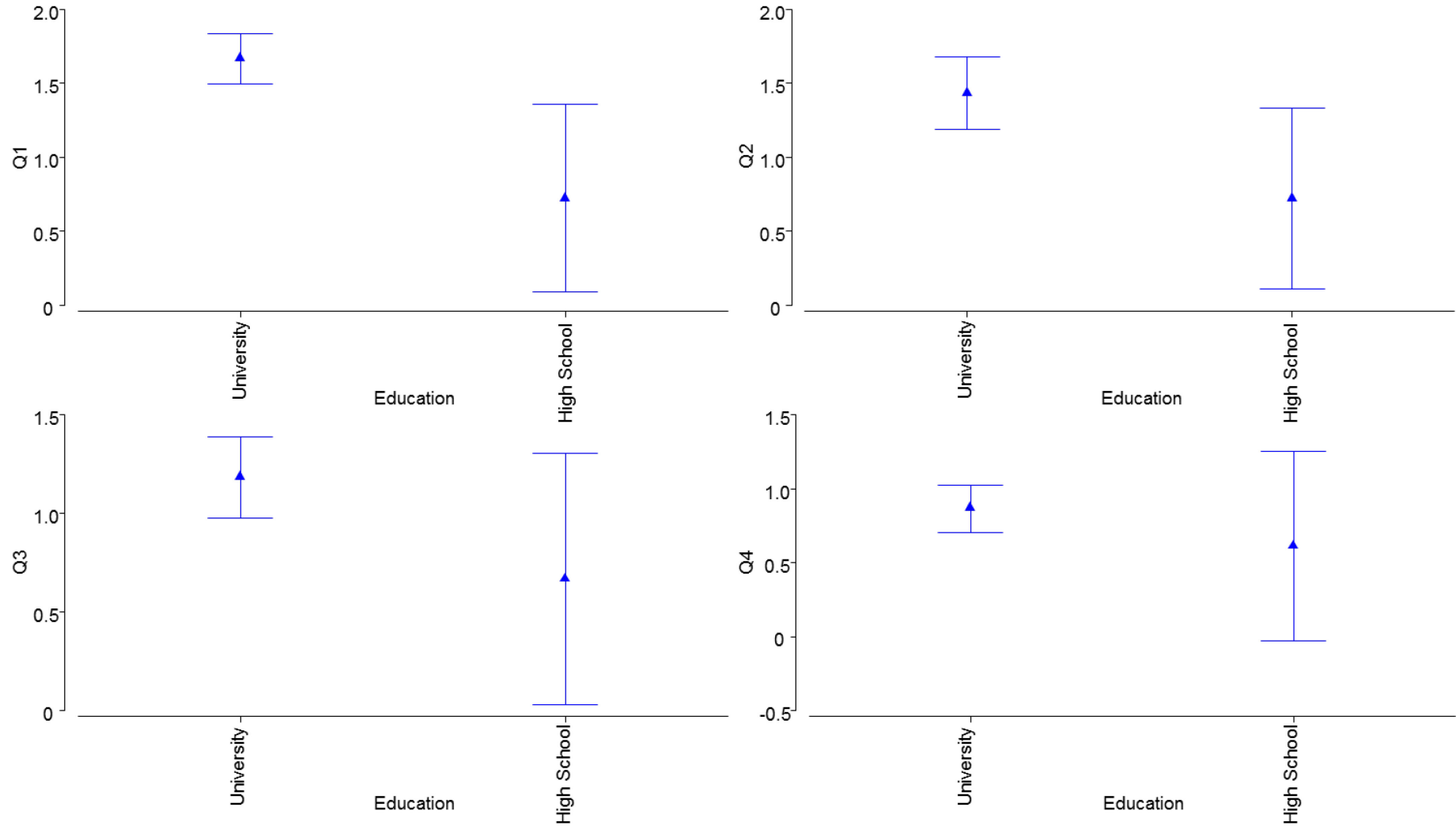


Figure 27 Average scores \pm 95 % confidence intervals by education for questions 1-4 in section 1: ranging from 2 (supportive) to -2 (not supportive).

Figure 28 a) indicates that 88.5 % of respondents from JAB were satisfied with the current local participation model. Figure 28 b) indicates that 78.2 % of the JAB's respondents thought that the benefits distribution was fair to the locals. Figure 28 c) indicates that 84.6 % of the JAB's respondents thought the jobs created in the local community were 'very good' or 'good'. Figure 28 d) indicates that the 80.7 % of the JAB's respondents perceived that the SMP was well developed to the locals.

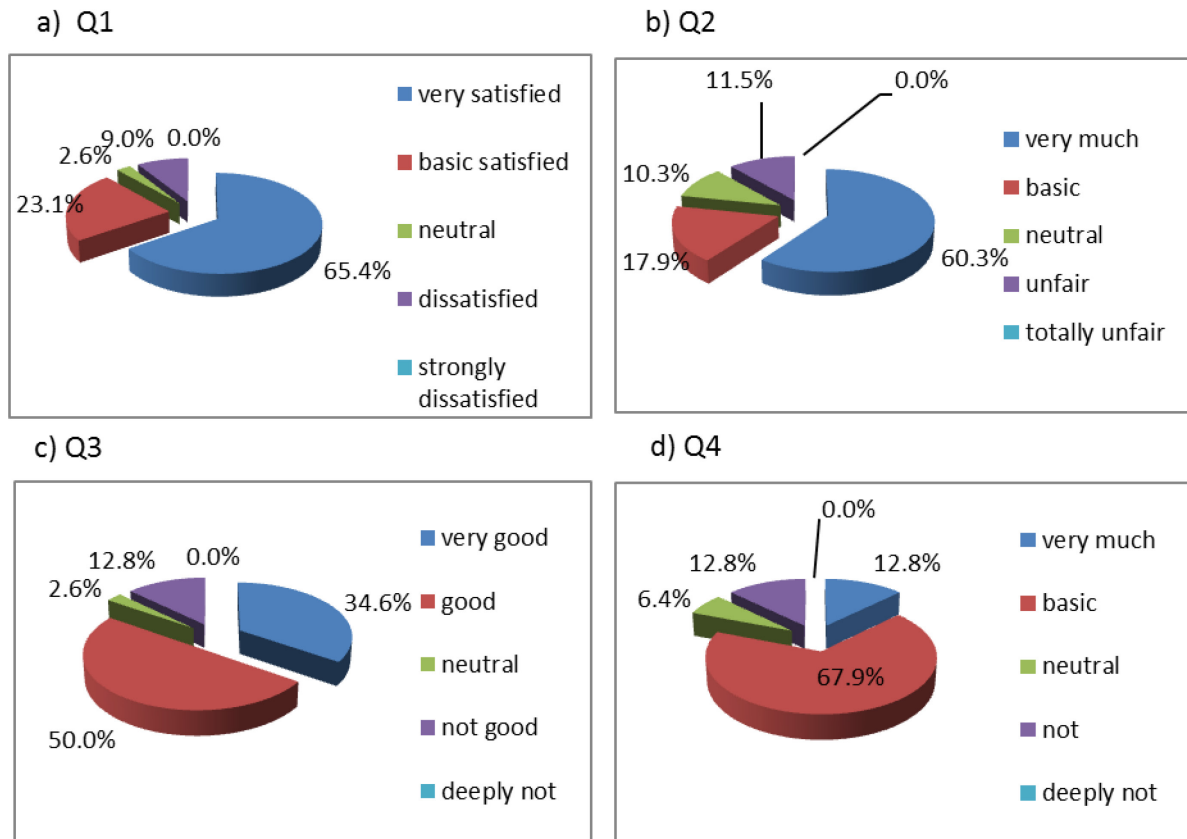


Figure 28 Administrative respondents' perceptions to questions 1-4

3.5.2 Administrative satisfaction with ecotourism development plan (EDP)

Two questions are in section two – satisfaction with EDP, listed as Q5 – Q6.

Q5: Do you think the current EDP is well developed for the locals?

2: very much, 1: basic, 0: neutral, -1: not, -2: deeply not

Q6: Do you think that EDP has changed local minority culture?

2: very much, 1: basic, 0: neutral, -1: not, -2: deeply not

Gender ($F_{1,76} = 4.49$; $P = 0.02$), age ($F_{3,74} = 9.75$; $P < 0.001$), education ($F_{1,76} = 11.78$; $P = 0.011$), and family annual income ($F_{2,75} = 9.95$; $P < 0.001$) all significantly affected the responses in this section.

Figure 29 shows the split between gender, age, education, and family income levels regarding question 6. Males, respondents below 49 years, with university education, higher income agreed that EDP had changed local minority culture while females, respondents above 50 years, with lower education, and with lower income disagreed.

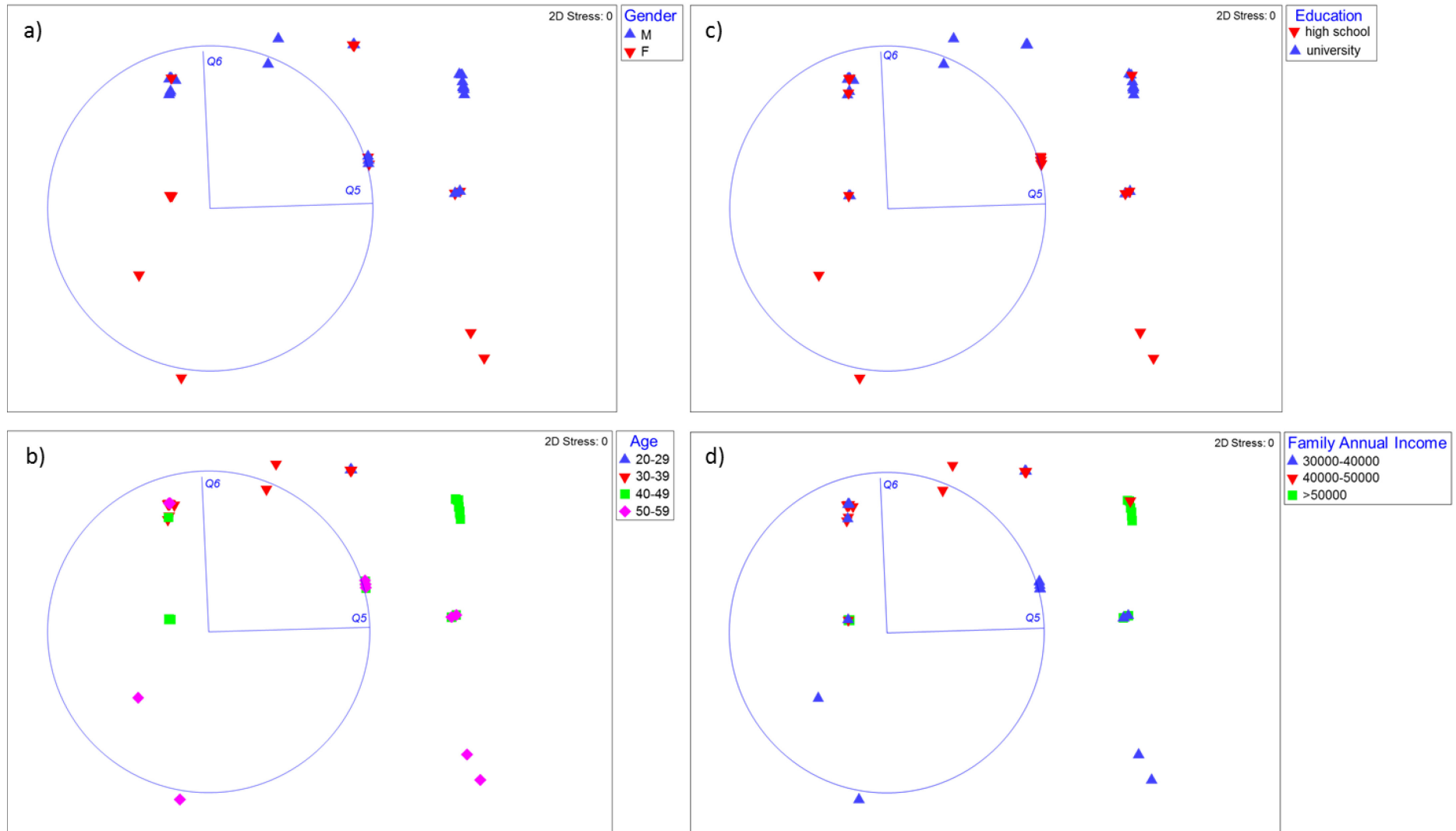


Figure 29 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 5-6. Note that vectors for individual questions point towards subgroups that scored higher for the respective questions (see questions above for scores). Stress value represents the difference between distances in the reduced dimension compared to the complete multidimensional space.

Panel a) in Figure 30 indicates that 70.5 % of the JAB respondents perceived that the current EDP was well developed for the locals. Panel b) indicates that 94.9 % of the JAB respondents perceived that EDP had changed local minority culture.

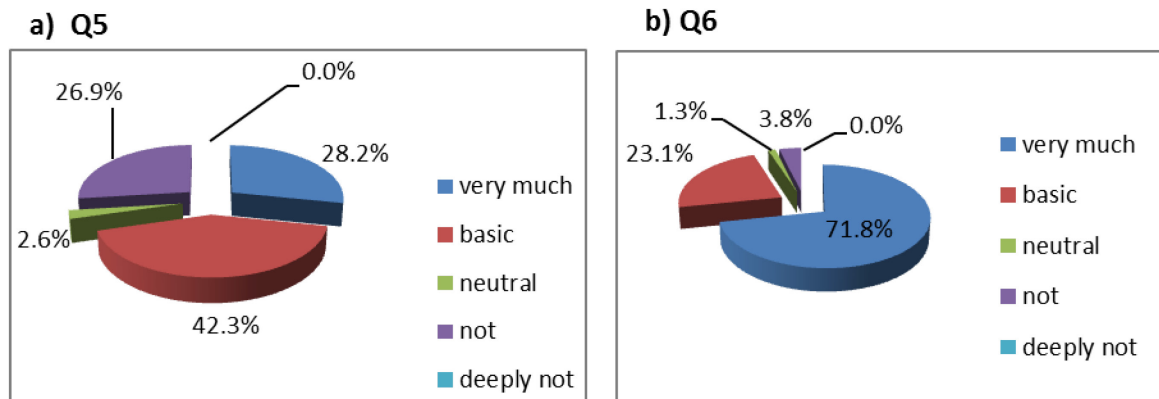


Figure 30 Administrative respondents' perceptions to questions 5-6

3.5.3 Administrative perceptions of communication with local community

Four questions are in section three, listed as Q7 – Q10.

Q7: Do you think locals play an important role in the JAB's practices of SMP and EDP? (2: very much, 1: a little, 0: neutral, -1: not, -2: deeply not)

Q8: Do you think that the local community has actively participated in educational programs? (2: very much, 1: a little, 0: neutral, -1: not, -2: deeply not)

Q9: What do you think of the communication with local communities? (2: very good, 1: good, 0: neutral, -1: not very good, -2: poor)

Q10: Do you agree that the locals should be actively involved in the decision-making? (2: strongly agree, 1: agree, 0: neutral, -1: disagree, -2: strongly disagree)

Age ($F_{3,74} = 9.75$; $P < 0.001$) and family annual income ($F_{2,75} = 12.28$; $P < 0.001$) affected significantly the responses in this section, while gender ($F_{1,76} = 0.16$; $P = 0.785$) and education ($F_{1,76} = 0.96$; $P = 0.392$) did not significantly affect the responses.

Figure 31 a)-b) show splits between age and income levels regarding question 8. Respondents of 40-49 years or with family income above 50,000 Yuan perceived that the local community had not actively participated in ecotourism. Figure 31 a) shows that respondents above 50 years and below 29 years perceived that the locals did not play an important role in SMP and EDP, and that the communication with the locals was not good or poor.

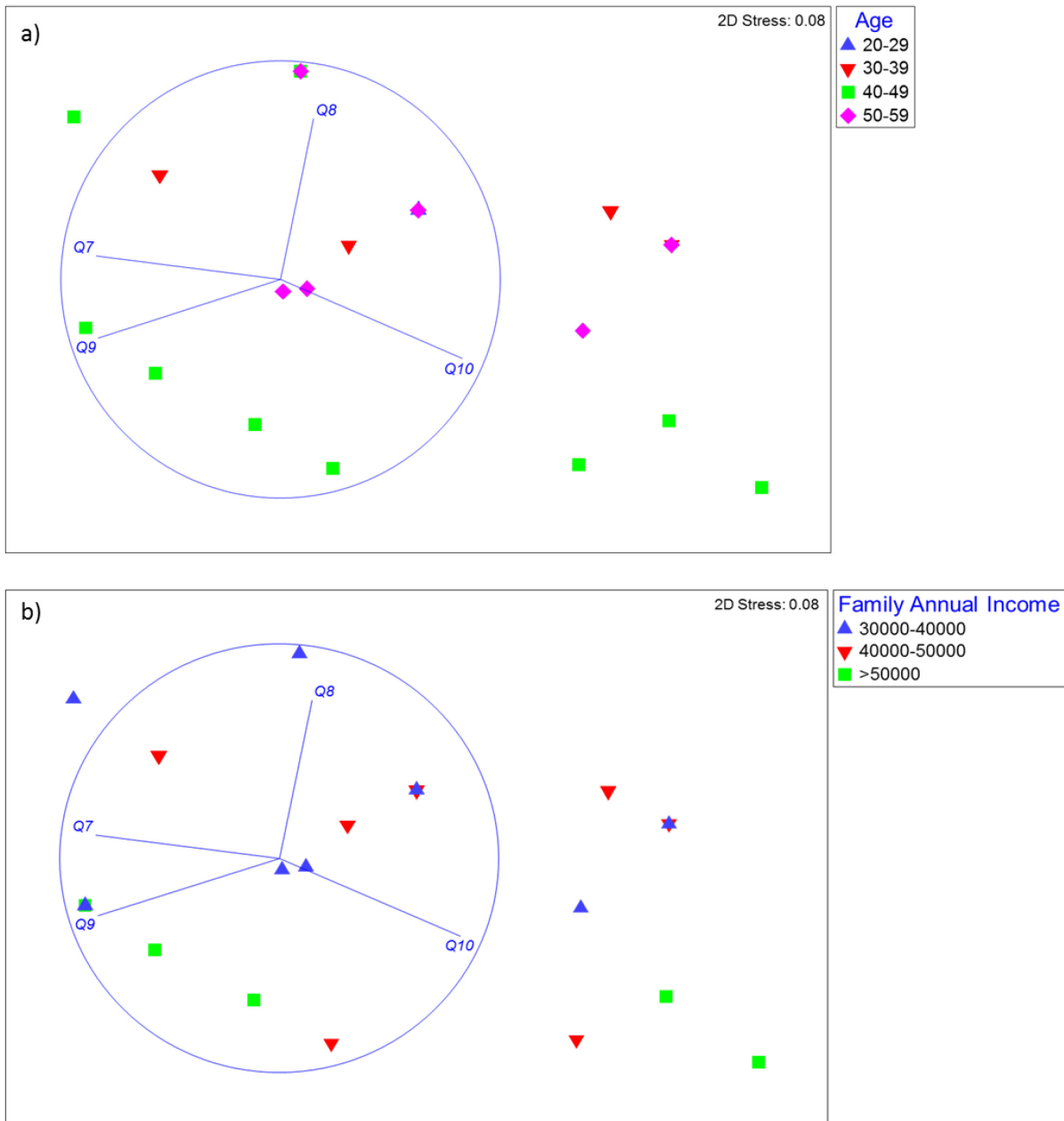


Figure 31 Non-metric multidimensional scaling ordination showing the differences between individual respondents from different subgroups regarding questions 7-10. Note that vectors for individual questions point towards subgroups that scored higher for the respective questions (see questions above for scores). Stress value represents the difference between distances in the reduced dimension compared to the complete multidimensional space.

Figure 32 a)–d) indicates the percentage of respondents in response to each question in this section.

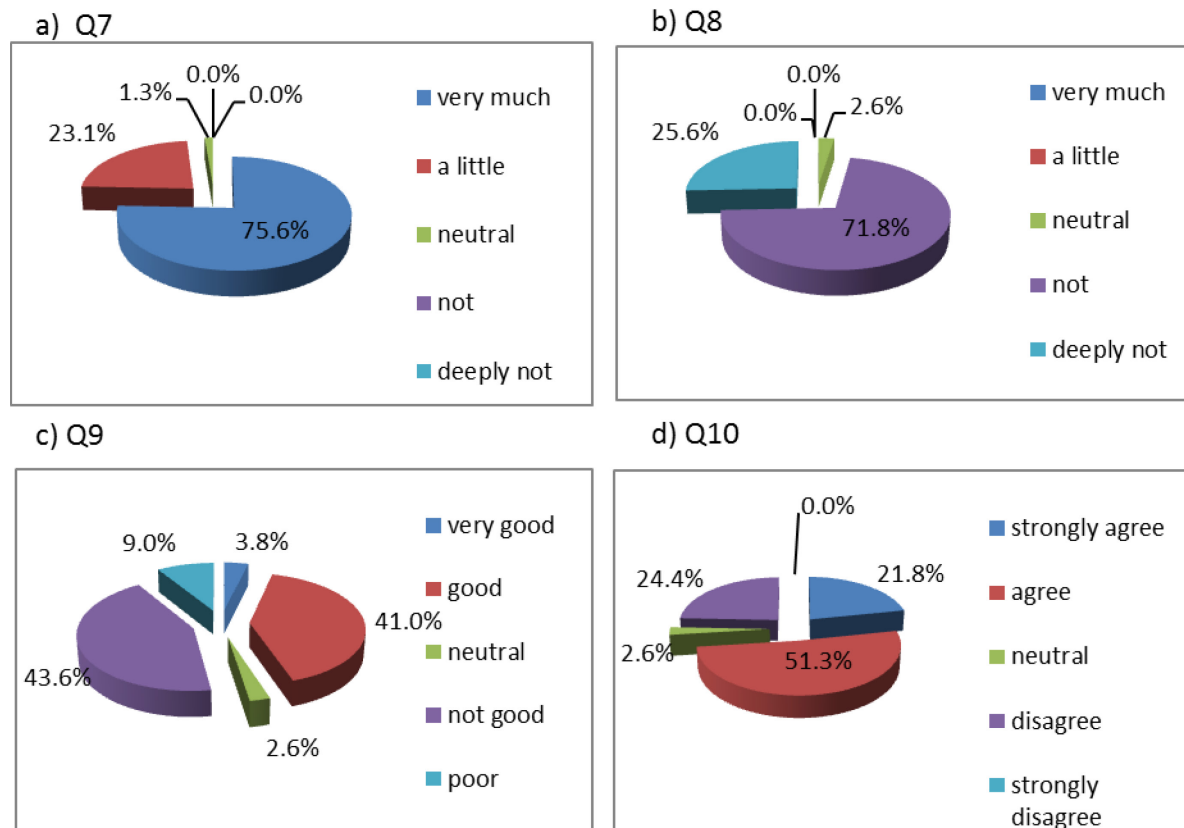


Figure 32 Administrative respondents' perceptions to questions 7-10

3.6 Results from in-depth face-to-face interviews

3.6.1 Results from interviews with local community respondents

There were 60 local community respondents selected for in-depth face-to-face interviews. Out of these, 40 were above 40 years old, with a middle school education or lower education level, with a family income below 40,000 Yuan, who had a negative attitude to SMP, and showed relatively weaker support towards EDP than other subgroups. The rest of the respondents were young people with a university degree and higher income, who strongly supported both the SMP and EDP. During the face-to-face interviews, almost all respondents acknowledged the significant achievements of SMP and EDP for nature conservation and economic growth. However, they also addressed critical issues that disappointed them from economic, social, cultural, environmental and managerial perspectives.

1) Economic aspect

More than half of the respondents referred to an unequal distribution of economic benefits resulting from the development of SMP. Expressions such as 'unfair' and 'mistreated' commonly appeared in their statements.

Income gap between villagers living in the nature reserve and outside

Most of the respondents over age 40, with lower income and education level, strongly opposed SMP. They all had the experiences of running hotels and restaurants in the park before the SMP was implemented. They were angry about the policy 'tour in the park, stay overnight outside'. Some respondents mentioned that the villagers who live outside the park and run the hotels and restaurants at the entrance of the park, which is less than 10 km from their own homes inside the park, had made 'ten times' more money due to this policy. They felt that they were treated unfairly because they were forced to give up their family hostel and restaurant business in the park in order to protect the ecosystem. However, those villagers at the park entrance ran the business as usual and dumped their garbage everywhere without caring about the park. Many of them perceived that the JAB was promoting ecotourism at the expense of the local community inside the park.

Income gap between villages in the nature reserve

The respondents living in Zechawa and Zharu, at the time of the interviews, perceived a rather big income gap between villages inside the reserve. Both of these two valleys are far from main roads but close to wildlife habitats. Zechawa is located to the northeast of Rize Valley, far from any scenic spot but close to one of the panda habitats. Zharu is located in the Zharu Valley, and close to wild takin and snub-nosed monkey habitats. It was not opened to tourists until 2009, far later than the other valleys. There was no road, and the tour bus had no access to the valley. Tourism in Zharu Valley was only available to small groups of tourists, for hiking and camping, guided by a JAB tour guide. This kind of activity was not attractive to domestic tourists, so the main customers were westerners. Only 330 tourists chose the eco-tour in Zharu valley in 2015 and 450 in 2016 (data from JAB, 2016). The residents of four villages in Zharu Valley including Zharu village, due to the limited number of tourists visiting their valley, had to make a living by walking a long distance every day to the main scenic spots in other valleys, to be able to sell souvenirs, take snapshots or rent Tibetan clothes to tourists. Contrastingly, Shuzheng is the nearest village to the entrance of the park and the first one that received tourists. Since 1999 when SMP was implemented, most of the households in Shuzheng village converted the first floor of their homes to small shops to sell local commodities or to rent Tibetan costumes. This remained a major source of income for the residents in Shuzheng. Since tourists had easier access to Shuzheng village, the business opportunities of villagers in Shuzheng improved. Respondents living in Zharu and Zechawa mentioned that they expected that tourism in their villages could develop more to benefit them to the same extent as in other villages.

Shared stocks of CBET joint-venture

Respondent complained that the shared stocks structure of CBET joint-venture was based on an oral agreement without legal protection. They showed concerns that the government could change the structure without legal constraint. For example, in 2004 Aba Prefecture Government took over the business of the Green Bus Company and reduced shared stocks for community members from 49 % to 20 %. They worried that their benefits were not secured. Another issue related to the CBET Joint-venture was that some local residents were excluded from the structure and unable to share the benefits. About seven respondents over 40 years' age, with a lower income and lower education, were strongly opposed to the current CBET joint-venture. They did not have enough money to purchase shares in 1999 when the joint-venture was established, and therefore, they were not allowed to rent individual booths at Luorilang Service Center, and were unable to share profits at the end of the year from the Luorilang Restaurant. Even though they were frustrated, they expressed a strong willingness to be part of CBET joint-venture in the future and expect JAB to find a solution for them.

Payment for Ecological Services (PES)

Respondents complained about the PES compensation especially the subsidy from entrance fees, which became the biggest portion of their annual income with tourism development. JAB took 7 Yuan out of each entrance fee as a subsidy to local community since 1999. With the rapid growth of tourists, in 2005 JAB raised the entrance fee from 140 Yuan to 220 Yuan, but the subsidy remained the same (seven Yuan per entrance fee) for local residents. Respondents argued with JAB to ask for an increase of the subsidy; however JAB 'pretended not to hear'.

Lower-level jobs created by JAB for the local residents and their children

Many respondents complained about the injustice in the job opportunities created by JAB to them and their children. They mentioned that JAB promised to offer good jobs to them and their children who received good education, in return for closing the family hotel and restaurant businesses in the park in 1999. However, the jobs offered by JAB to them and their children who graduated from colleges or universities were mainly 'park cleaners and security guards'. Many respondents criticized that JAB managers gave 'good office jobs' to their 'friends' or 'relatives', but left 'the bad jobs' to the local residents and their children. Some of them complained that JAB has 'never listened' to their complaints, or 'pretended not to hear'.

2) Social aspect

Almost all respondents showed a high-level of 'disappointment' and 'frustration' with the social development in the community, and perceived life quality as lower after SMP was implemented.

Inconvenient community infrastructure

Many respondents complained that the infrastructure developed in the reserve by JAB only focused on tourist needs, not on community needs. With the implementation of SMP, there was an obvious separation of the community villages from the scenic spots. The infrastructure was built only in scenic areas such as eco-toilets and recreation centers. However, the community infrastructure was not well developed. The villages lacked many of the basic conveniences such as kindergarten, school, hospital, cinema, or grocery store. The local residents who gave up traditional farming had to walk outside the park every day to buy food. Senior respondents criticized that when they got sick, they had to report to JAB to arrange transportation to take them to hospitals outside the park. Respondents above 30 years' age criticized that there was no kindergarten and school in the park, and that they had to spend more money to send their children to school outside the park for education, which greatly increased their living costs.

Restriction of renovating Tibetan houses

Almost all respondents criticized that under current SMP, the local residents were restricted in terms of renovating their houses despite many houses in the villages getting old. The owners of the houses must apply to JAB to get permission to buy cement or other construction materials. Respondents mentioned that in most cases JAB had declined their applications and ignored their needs. As an example, one villager was quite angry when his application to build a toilet in his house was rejected by JAB staff as unnecessary. JAB claimed that they had built a shared public toilet at the entrance of the village. The respondent complained that the shared toilet was far from his house and he did not want to use it at night. Other respondents also criticized that they wanted to add heating systems on the old houses for the winter, but their proposals were also rejected by JAB who stated that the SMP required local architects to retain the traditional Tibetan style and the traditional Tibetan style does not have modern heating.

Unemployment during the off-peak season

Many respondents showed a strong concern that the tourism off-peak season, which is normally from November to March, leaves most residents with very little to do. Some villages leaders mentioned that in Heye village, crowds of unemployed young people often gathered and illegal behaviors such as gambling, drugs, and prostitution frequently occurred. Some residents lost all their peak-season income gambling in the off-peak season. The Senior respondents said that they expected JAB do something to enrich the social spiritual life or provide alternatives of employment for the young residents during the off-peak season.

3) Cultural aspect

Respondents above 59 years showed strong concerns that they were losing their cultural identity with tourism development in the nature reserve, while the respondents below 29 years showed much less concern.

Loss of cultural sustainability

Many respondents especially those above 59 years were very concerned about the loss of the Tibetan language among the young generation. Some respondents mentioned that their children, who were in their 30's, could only speak Tibetan but not read or write it. They worried more about their grandchildren who were sent to schools outside of the park, and could not speak Tibetan at all. The senior respondents still had good memories of a primary school in the park where the teachers were all Tibetan. When the nature reserve was established, this school lost funding support and shut down. After JAB encouraged local residents to send their children outside for schools, the children lost opportunities to learn the Tibetan language, traditional food, clothes, architecture, and religious ceremonies in school. When respondents below 29 years were asked about their knowledge of Tibetan culture in interviews, many of them admitted that they knew very little; instead, they had good knowledge about Mandarin and Han culture.

Loss of cultural authenticity

Many respondents over age 49 showed concerns that authentic Tibetan culture was disappearing with tourism development. Pursuing economic growth, many local residents modified their traditional folk activities to get more benefits. Some important traditional religious activities such as common chanting and hill wandering gradually decreased. On the other hand, due to high competition in the tourism souvenirs market, external investors who wanted to attract tourists, collected lots of external souvenirs from other minority groups, and claimed these to be 'Tibetan original products' in the market. Respondents questioned that, if tourists realize they being cheated by the fake Tibetan products, they may stop buying authentic Tibetan souvenirs from the local people.

4) Environmental aspect

Almost all respondents appreciated the great achievements of SMP in nature protection and biodiversity conservation in the reserve, but they also listed a number of environmental issues of concern.

The young respondents with a university degree and higher income expressed their concerns that tourism-carrying capacity was established but not strictly enforced. During tourism peak season, they observed masses of tourists entering the reserve and fighting for spaces in green buses. Some respondents were worried that some tourism projects in the nature reserve were not going through an Environment Impact Assessment (EIA). The

artificial facilities and structures in the park were not harmonized with the natural landscape, and may cause severe damage to the affected ecosystems. Some of the respondents cited a lack of environmental monitoring of tourist behavior in the park. They observed that some tourists walked on the grass, picked flowers, and threw garbage everywhere. Whenever they saw it, they would stop tourists immediately. They expected that JAB should systematically monitor and enforce tourist behavior in the reserve to reduce the negative impact on ecosystems.

Almost all respondents were quite concerned about the environmental pollution caused by the five-star hotels developed by external private investors and family hostels developed by villagers in Zhangzha at the park entrance. Since tourists were not allowed to stay overnight in the park, Zhangzha had developed fast and served as the main tourism reception zone. Trees and grasslands were replaced by construction of hotels and restaurants. Garbage and trash dumped at the back of the hotels and restaurants contributed to the decline of the pristine beauty. Respondents commented that environmental control should be extended to the surrounding areas of the park. They complained that JAB did not do anything to control environmental pollution from these businesses.

5) Managerial aspect

Most of the respondents showed a low level of satisfaction to JAB in terms of managerial capacity in environmental protection, tourist and community management, finance, and communication skills. Some mentioned that they were never informed of or invited to participate in any educational program or a quarterly-based shareholders' committee meeting of the joint-venture. Others mentioned that there was no information given about the expenditure of entrance fees, profits from Luorilang restaurant and the Green bus businesses. Some of them suspected that there was possible corruption by JAB staff in the operation of Luorilang restaurant and the Green Bus businesses, and expected transparency in tourism revenue expenditure in the future. While feeling 'ignored' or 'isolated', young respondents expressed a high expectation to be included in decision-making processes from planning to management.

3.6.2 Results from interviews with administrative respondents

Among the respondents from JAB, 10 were between 30-49 years old, with university degree, income above 50,000 Yuan, who perceived the local community to inadequately participate in ecotourism. Another 10 were either below 29 or above 50, from lower- management level, who perceived that the communication with the local community was poor. Interviews with staff members were focused on their detailed perception of SMP and EDP impact on the local community, and their interactions with local community in the day-to-

day life. Compared with the local respondents, the staff member respondents showed quite opposite views on the impacts of SMP and EDP on local residents.

1) Mistrust with local community

Many JAB staff members commented that the local residents were 'greedy' and 'vain'. The respondents stated that the local residents had gained many economic benefits from the tourism development and become the 'richest Tibetans' in China, and the benefits from tourism development were 'equally distributed' and 'in the best way'. However, the local residents had never been satisfied with the money they made, and always blamed JAB for preventing them from making more money. Some respondents commented that they would not trust the local residents because the local residents always wanted more benefits. Several respondents said that they had tried their best to consider the benefits for the locals. Compared to management authorities of other national nature reserves, they had applied a rather good Payment for Ecological Services (PES) system to compensate local residents from economic loss. When the reserve closed for tourism after being hit by severe acute respiratory syndrome (SARS) in 2003 and the 'Wenchuan earthquake' in 2007, they had offered the local residents a basic living subsidy to help them survive. They criticized the local residents being the most 'greedy' Tibetans in China.

2) Jobs created to the local residents

The respondents commented that the jobs offered to the local residents were fair though most jobs offered were cleaners and security guards in the park. They complained that the local residents did not want to take those jobs, but wanted to sit in an office equipped with computer, internet, and air-conditioning. However, those office jobs were limited. Some respondents between 30-49 years old, usually above middle management level, admitted that JAB was unable to keep the promise to hire all the local children who graduated from university for management jobs in JAB, but they said that there were several reasons for this:

a) The promise was an oral agreement made by the previous leader of JAB, Mr. Ge, who was originally a local Tibetan inhabitant. After he retired, the new leader of JAB was not a local, was appointed by the Aba Government, who had no strong ties with the local villagers and did not want to take the oral agreement made by the previous leader seriously;

b) The Department of Research and Development of JAB required specialists on biodiversity and ecological conservation. However, most of the local children did not study these subjects in university. Therefore, they hired people from outside;

c) JAB financially depended on tourism revenue such as entrance ticket, or shared profits from the joint-venture. Due to a limited budget, it was difficult to create more jobs;

d) During tourism peak season, normally April – October, the tourism revenue was higher. Hence, they offered more jobs such as seasonal contractors for cleaners, security guards, or

firefighters to the local residents. However, the local residents refused and did not take the jobs. The administration staff members had to hire people outside of the park to do these jobs. They criticized the local residents as being very 'lazy and greedy'.

3) Poor communication with the local residents

Respondents between 30-49 years old, with university degree and higher income, showed concerns that there was no educational program being conducted in the past six years. There were no training courses, workshops and surveys organized by JAB for the local community. The respondents gave four reasons: first, the local residents were busy making money, and had no time to participate in the educational programs. Second, there were no instructions from the higher administrative government, e.g., the Aba Government, to ask them to do so. Third, there was no budget for education and training for the local community. Fourth, there was a lack of expertise in human resources in JAB or no assistance from NGO's to teach the relevant skills.

Regarding day-to-day communication in management processes, there was a common understanding among administrative respondents especially those above 50 years or below 29 years that communication was 'not important' or 'not necessary' because the government would make decisions for the local community. Quite a number of respondents mentioned that 'we will think for them automatically and they should not worry'. Some commented that 'they (the local residents) know nothing about conservation and management, and it is useless to involve them in planning and managing the park'. Some respondents mentioned there is a cultural barrier to understanding local Tibetan's way of thinking and their related behaviors. Language was also an issue for non-Tibetan young staff to talk with local senior residents. Some respondents mentioned that they had been trying to communicate with the local communities though sometimes the results were not good. When they were asked about how to address local community concerns, they said that they adopted an 'open-door' policy to allow local residents to address their issues.

4) Shortcomings of SMP and EDP

Some respondents shared the opinions that the current SMP and EDP were not very well developed for the local community, such as household registration procedures in the park. Under the current administrative regulation of SMP, only an external woman who married a local man could apply for household registration and would start sharing profits from the entrance ticket subsidies. This did not apply to an external man who married a local woman and could not apply for household registration. This constraint meant that no external man wanted to marry a local woman and the local woman could only choose a local man, often a close relative, to get married.

The senior management staff of JAB, usually 30-49 years, with a university education, mentioned and referred to some scientific reports that the SMP lacked an effective program for ecological protection, which had posed negative impacts on the natural landscape. Some

of them were also concerned that EDP had gradually caused local culture such as Tibetan language, food, clothes and house styles to disappear.

5) Frustration regarding inefficient administrative hierarchy

Several respondents explained that JAB was cross-administered by the Sichuan Provincial Government and the Aba Prefecture Government. Establishment of a new management policy or amendment of the current one requires approval from the upper-level administrations. Furthermore, since the park is a world heritage site and a biosphere reserve, it was also joint-managed by the Ministry of Environment Protection, Ministry of Education, Ministry of Water Resources and Ministry of Soil and Land Use. A lack of coordination among the different governmental levels and agencies resulted in common agreements taking years to be decided.

More than half of the respondents mentioned that they had no time to communicate with local people, because there were too many unnecessary administrative meetings or events that consumed their energy and time in their daily jobs. They were obligated to participate in all meetings and events because of instructions from the upper-level administration.

4. Discussion

4.1 Overall perceptions of sustainable management policy (SMP) and ecotourism development plan (EDP)

The administrative staffs supported both programs more than the local community. This is expected since Jiuzhaigou Administration Bureau (JAB) is a local government agency and one of the collaborative policy-makers for the two community-based ecotourism (CBET) participatory management programs. On the other hand, CBET has become the biggest contributor to the local economy (Gu et al., 2013). Tourism revenue in JNNR was 275,000 Yuan in 1984, increased to 605.7 million Yuan in 2004, and reached 1.5 billion Yuan in 2015, accounting for 6%, 81% and 92% of GDP of Jiuzhaigou City, respectively (Gu et al., 2013; JAB annual report 2004, 2015). With the considerably increasing number of tourists and the raising of the entrance fee, entrance fees have contributed the largest share to the total tourism revenue. From 55,000 Yuan in 1984, to 4.23 million Yuan in 1993 (Gu et al., 2013), to 254.37 million Yuan in 2004, and to 956.28 million Yuan in 2015 (JAB annual report 2004, 2015).

The local community showed rather strong support towards ecotourism development in JNNR. Almost all local residents between 25-59 years worked for tourist services in the reserve. The rest were either students or senior residents that stayed at home or had private businesses. The survey showed that 82.6 % of all local respondents accepted the increase in tourist numbers, and 86.0 % would continue to support future tourism development. This result differs from a common tourism perception paradoxical hypothesis: with tourism development, the more local residents depend on it, the more they oppose it (Murphy, 2013; Eusébio et al., 2018). The 'Angry index' developed by Doxey (1975) demonstrates that normally at tourist destinations, the attitude of local communities towards tourists changes over time, from positive to angry resentment later. This study found that, although tourism had developed for almost three decades in JNNR, and became the only livelihood for the local community, the local community still strongly supported it. This was because tourism development has brought considerable economic benefits to the local community. With an annual inflation rate in the period 1984-2015 of 5.52% (National Bureau of Statistics, 2017), the annual average income per capita for local community increased from 1984 – 2015 from 1,116 to 45,201 Yuan measured in 2015 prices (Gu et al., 2013; JAB annual report, 2015). This was a fortyfold increase. Compared to 1998 a year before CBET started, annual income per capita was eight times higher in 2015 (Gu et al., 2013; JAB annual report, 2015; National Bureau of Statistics, 2017). The finding supports aspects of the social exchange theory (Homans, 1974), which has been widely applied to explain community attitudes towards tourism (Sharpley, 2014; Rasoolimanesh et al., 2015).

The more the communities perceive net benefits, the more they support tourism (Eusébio et al., 2018).

The local community showed less supportive attitudes towards sustainable management policy, which aims for biodiversity conservation and ecological protection. A number of reasons were given by local community members to explain their negative attitudes, among which the main argument was a perceived inequality in benefits between the local community and other stakeholders. First, the local residents perceived themselves as the primary bearers of the cost of conservation. Contrary, they perceived the main socio-economic benefits (infrastructure construction, tourist accommodation services, green-bus transportation profits, and employment) went to other stakeholders such as tourists, Aba Prefecture Government, JAB, villagers outside of the reserve, and external investors such as the owners of the five-star hotels at the park entrance. Second, perceived distribution of economic benefits was unequal among the communities in the park. Households far from tourism facilities but close to wildlife habitats were perceived to gain much less income than households far from wildlife habitats but close to tourism facilities. Households in remote villages added to their subsistence by collecting wood or by growing vegetables in their garden (personal communication, 2015), which may pose potential threats to panda, takin, and snub-nosed monkey habitats.

In China, similar findings were observed in other National Nature Reserves. For example, a study in Wolong National Nature Reserve (He et al., 2008) indicated that benefit inequality is the main barrier to achieve local support for a giant panda conservation program in the reserve. A recent study (Xu et al., 2016) found benefit inequality the main challenge to empower local participation in a biodiversity conservation program in Huangshan National Nature Reserve. The study suggested that more care should be given to the poorer rural residents. Similar issues with CBET programs are reported from Kenya (Gadd, 2005) and Ghana (Appiah-Opoku, 2011), where local traditional communities perceived discrepancies in benefits distribution that caused conflicts with conservation initiatives led by protected area managers.

To avoid conflicts in community-based conservation programs, it is critical for protected area authorities to understand community attitudes towards protected area management programs in community-based conservation projects (Larson et al., 2016). Given that the community in this study on average perceived more negative impacts of SMP, there is a need for protected area authorities in JNNR to reconsider the adopted management program.

4.2 Perception of local residents related to socio-demographic factors

4.2.1 Environmental awareness

This study found that the perceived environmental awareness of the local residents in general was relatively high. Firstly, harmonization between humans and nature is an important element embedded in traditional Tibetan culture. Second, when sustainable management policy was implemented, educational programs were carried out during 1999 – 2009 (personal communication with JAB staff) that helped to improve local environmental awareness.

In relation to socio-demographic factors, perceived environmental awareness of local residents increased with education level and annual family income, and decreased with age. These results were expected because the younger residents usually receive higher education compared to their parents, who have a better understanding of environment protection and gain more profits through actively participating in community-based ecotourism.

Regarding age, this study does not support the findings from several previous studies that indicate age has a positive relationship with environmental attitudes, and that older people have more environmental concerns than younger people (Shen & Saijo, 2008; Abdul-Wahab & Abdo, 2010). On the contrary, the younger generation in JNNR was more aware of environmental concerns than their parents. This finding resembles results in a recent study in a protected area in Malaysia (Masud & Kari, 2015). Masud & Kari (2015) indicate that the younger generation today has a higher environmental awareness, because social networks and mass media provide them easier access to more information.

Gender was not a significant factor influencing environment awareness by local residents, a result that differ from the Malaysian study (Masud & Kari, 2015). Women and men show a relatively high degree of environmental awareness in JNNR. Probably due to the fact that women today have the same opportunities as men to receive higher education, and to participate in training programs in China.

Regarding education and income levels, results of this study are persistent with previous research. More education and income positively influence the attitudes of local community members towards environmental conservation (Sesabo et al., 2006; Masud & Kari, 2015). According to Imran et al. (2014) and Tomićević et al. (2010), the awareness and positive perception of the local community towards environmental conservation are enhanced by education and knowledge. Community members with higher education were more supportive for pro-environmental behavior (Solechi, 1998; Metha & Heinen, 2001, Sesabo et al., 2006; Abdul-Wahab & Abdo, 2010). Shen & Saijo (2008) and Ogunbode & Arnold (2012)

found that income significantly correlated with environmental knowledge and positive attitudes.

4.2.2 Satisfactions with sustainable management policy (SMP)

Local satisfaction with SMP increased with education level and annual family income, but decreased with age. This result indicates a positive correlation between environmental awareness and conservation policies. The younger residents, usually with a higher education, and a higher family annual income had higher environmental awareness, and therefore, supported SMP more frequently. Males were found to support SMP more than females because males were provided more jobs such as forest firefighters or rangers under the SMP framework.

A case study in Serbia (Tomićević et al., 2010) found that gender, age, education and employment all significantly influenced the attitudes towards ecological conservation. Tomićević et al. (2010) found that younger people and males with higher education and employment had a more positive attitude towards environmental conservation than older people and women with less education and without employment. Therefore, the author argued that a community-based management program should outreach to the younger males to enhance participation in conservation of a protected area. The present study supports this argument and suggests that the management authority should encourage young males with higher education and income to take the lead in the planning and management of community-based conservation initiatives, as a first step to improve community participation.

4.2.3 Satisfactions with ecotourism development plan (EDP)

Local satisfaction with EDP increased with educational level and annual family income, and decreased with age. This result indicates a positive correlation between environmental awareness, conservation policies and ecotourism development. Younger people, usually with higher education, having gained more economic benefits from community-based ecotourism, with a higher degree of environmental awareness, tend to support both nature conservation and tourism development.

These findings are consistent with a recent study on local attitudes towards tourism and conservation in rural Botswana and Rwanda (Black & Cobbinah, 2018). These authors argue that there is a significant positive correlation between a positive community attitude towards conservation of protected areas and tourism development. Black & Cobbinah (2018)

suggested that increased community participation in tourism and benefits to community would enhance community support to nature conservation programs. The results of the present study support this argument.

4.2.4 Perception of socio-cultural changes due to tourism impact

The local residents perceived a negative impact of tourism on traditional ways of living and Tibetan languages increased with age, and decreased with education level and annual family income. Senior residents, usually with lower education, and lower income showed more concern about the loss of Tibetan cultural identity with ongoing tourism development. First, senior community members worked as farmers before JNNR was established and got used to the traditional lifestyle of “sleep at sunset and work at sunrise”. They felt unhappy when this lifestyle was interrupted by mass tourism. Second, older people have a stronger tie with Tibetan culture compared to younger generations. They grew up in a traditional Tibetan environment without strong external influences. They were worried about the fact that younger community members did not understand Tibetan culture any more. Third, they were concerned that due to vicious competition and counterfeiting of artifacts, Tibetan souvenirs gradually lost their cultural authenticity.

Previous studies indicated a negative perception of socio-cultural threats (Naidoo & Sharpley, 2016; Bennett & Dearden, 2014), but also positive perceptions of opportunities for benefits (Sinclair-Maragh & Gursoy 2015; Andereck & Nyaupane, 2011) through tourism. Some studies report a direct relationship between positive perception of socio-cultural impacts and supportive attitudes towards tourism (Stylidis et al., 2014; Khoshkam et al., 2016; Eusébio et al., 2018). The present study supports this observation of joint perceptions. Tourism generates benefits, but often also has associated social costs (Tosun, 2002; Sinclair-Maragh et al, 2015; Gursoy et al., 2009). Until today, there is no consensus on a general socio-cultural impact of tourism (García et al., 2015).

Tibetan culture has a tendency to get lost in young Tibetan residents, who today receive education outside of local Tibetan communities. The threats to Tibetan culture identified in this study argue for adding cultural sustainability as a major goal for sustainable community development in community-based ecotourism. Tibetan culture is an important part of the tourism attraction in JNNR (Cao et al., 2016) and it should not be lost.

4.2.5 Perception of administrative performance

Age, education level and annual family income all significantly influenced local perception of administrative performance. Younger residents, with higher education and more income were more satisfied with administrative performance. Gender was not a significant factor influencing the community attitude.

Allendorf et al. (2012) and Snyman (2012) indicate a positive correlation between positive attitudes towards protected area management and education level. Shibia (2010) also found that younger residents were more positive towards protected area management. Kideghesho et al. (2007) and Mutanga et al. (2017) indicate that income was an important predictor of community perception in protected area management. Local residents with more income were more supportive of protected area management.

On the effect of gender, this study is consistent with what Kideghesho et al. (2007) indicated. Gender had no influence on community perception of protected area management in the previously mentioned study. However, other studies by King & Peralvo (2010) and Kaltborn et al. (2008) show that males support protected area management more than females because of different livelihood patterns. In JNNR, tourism is the only income source for both males and females, therefore there is no major difference in livelihood patterns.

4.2.6 Expectation of future participation in ecotourism

Age, education level and annual family income all significantly influenced the expectation of future participation in ecotourism. The expectations for future ecotourism development increased with education and annual family income, and decreased with age. Gender was not a significant factor.

Based on Social exchange theory, community members are expecting to participate in future tourism development as long as they perceive that future benefits will be higher than costs (Rasoolimanesh et al., 2015; Nunkoo & Gursay, 2012; Lee, 2013; Zapata et al., 2011). Swemmer et al. (2015) argued that sustainable tourism management should seek to offer the stakeholders the highest cost-benefit outcomes.

In JNNR, senior residents with lower education level and lower income perceived higher costs than benefits, and therefore had less supportive attitudes towards future tourism development.

4.3 Perception of administrative staff related to socio-demographic factors

4.3.1 Satisfaction with sustainable management policy (SMP)

In general, approx. 81 % of all administrative staff respondents perceived that the SMP was well developed for the local community. Education was a significant factor influencing their perception. Those with university education perceived more positive impacts of SMP in general. Administrative staff members with university degree education normally were employed above middle-management level and were collaborative policy-makers for SMP. On the other hand, due to their higher position in management, they did not have direct communication with local community members, thus, were not aware of local community issues. In the current JAB management structure, complaints and critical views from local community remain at the level of Resident Management offices, and cannot reach the policy-making level of JAB.

4.3.2 Satisfaction with ecotourism development plan (EDP)

In general, 70.5 % of JAB respondents perceived that EDP was well developed for local community. Gender, age, education and family annual income all significantly influenced their perceptions. Males, below 49 years, with university education and higher family annual income perceived more negative impacts of tourism on local Tibetan culture. These people were included in a training program on Tibetan culture when sustainable management policy was implemented in 1999. In the beginning, continuous training programs were planned to reach all levels of the administrative staff. Due to lack of funds, the training program stopped in 2001 (personal communication with JAB). It is highly recommended to re-establish training programs with a similar focus.

4.3.3 Perception of communication with local community

In general, 52.6 % of JAB respondents perceived that communication with local community was 'not good' or 'poor'. Age and family annual income were significant factors influencing their perception. Administrative staff members of 40-49 years of age with higher income perceived that the local community did not participate actively in educational programs. These people had experiences in organizing the training programs for the local community when SMP and EDP were initiated. They perceived the training programs as very important in building local knowledge capacity. They complained during in-depth interviews that the local community was driven only by economic interests and ignored the educational needs.

Administrative staff above 50 years and below 29 years perceived that the local residents did not play an important role in conservation and development programs, and that the communication with local residents was not good or poor. The staff members above 50 years usually had lower education levels due to closure of schools in cultural revolution periods in China during 1960s-1970s. They were low-level employees and less engaged in planning and managing of JNNR. The staff members below 29 years usually lacking knowledge about Tibetan culture were less tolerant and lost patience to communicate with community members. Therefore, they perceived that local participation was less important in the management of the reserve.

The perceptions from administrative staff about the impact from participatory management programs on local communities indicated significant policy implications that management authority should pay attention to. Too high levels of bureaucracy, a lack of coordination between agencies, a lack of efficiency at work, limited capacity building (for both administrative staff and local community) and low democratic participation in CBET management were all mentioned.

4.4 Administrative staff – community relationships

Previous research to evaluate relationships between administrative staff and local communities in protected areas only focused on the impact of protected area management on local communities (De Pourcq et al., 2017; Almeida-García et al., 2016; Allendorf et al., 2012; Niedziałkowski et al., 2014). For instance, some studies evaluated collaborative planning and management in protected areas from perspectives of communities (Bennett & Dearden, 2014; Gurney et al., 2016), the social impact of protected area establishment from community perspectives (Bennett & Dearden, 2014; Mason, 2015), community attitudes towards tourism impact (Naidoo & Sharpley, 2016; Uysal et al., 2016; Muresan et al., 2016), community perception of benefit-sharing (Hicks et al., 2018; Luintel et al., 2017; Tessema et al., 2010), and community perspective of communication with protected area administrative staff (Gross-Camp, 2017; Buta et al., 2014; Gadd, 2005). Only very few studies analyzed perceptions of relationships between administrative staff and community members from the perspective of both groups (Allendorf et al., 2012 and Mutanga et al., 2015). These previous studies did not address community-based ecotourism and protected area management aspects. Understanding the attitudes of both administrative staff and local community members in protected areas will help to explore the factors that determine their relationship and enable protected area authorities to address relevant factors to minimize conflicts between both groups.

This study attempts to fill this knowledge gap by analyzing perceptions from both administrative staff and local community in a protected area, and by identifying relevant factors that influence the perceived relationships (Table 3 below).

Table 3 Factors influencing relationships between administrative staff and community members as perceived by community and staff members in this study

Factor	Community perception	Staff perception
Sustainable management policy	Loss of benefits , inconvenient life	Well-developed for the community
CBET Joint-venture	Not legally protected, unfair benefit-sharing, increased income gap	fair benefit sharing, remarkable income growth
Payment for Ecological Services	No increase of shared-amount of entrance fee	Community well-benefited, richest Tibetans in China
Employment	Low-level jobs, lack of reliability by admin. to keep commitment	Priority given to community
Infrastructure development	Only tourist-oriented, lack of basic infrastructure in communities	Airport, highway, road, bus, drinking water pipeline, and electricity all benefit communities
Cultural sustainability	Loss of Tibetan language and knowledge; lack of cultural awareness at management level	School closed due to a lack of professional Tibetan teachers; community is rich and prefers to send children outside for better education
Environmental management	Lack of control over environmental pollution at park entrance; no monitoring of tourist behavior in the park	Pollution control at park entrance is out of duty; a lack of funding support on educational programs for tourists and guides
Participation in training	Not well informed or invited	No time to participate, only busy making money
Participation in planning and decision-making	Expected, but being excluded and ignored	lack of capacity, therefore unnecessary to involve community
Communication	Poor, complaints not being taken serious	Open-door policy; lack of Tibetan language skills
Attitudes towards partner	Arrogant, incapable and unreliable	Self-righteous, greedy and incomprehensible
Socio-demographic factors	Age, education, income	Age, income

Previous research identified major factors influencing relationships between administrative staff and community members in protected areas that were mostly mentioned in the literature from a community perspective: 1) establishment of protected areas, often banning traditional farming, hunting and logging activities for community members; 2) costs

and benefits related to communities living in or near protected areas; 3) demographic and socio-economic characteristics of community members; and 4) community participation in development and conservation initiatives (Mutanga et al., 2015). In addition to these previous results, this study provides empirical evidence on factors influencing the relationships from the perspective of both groups, such as factors listed in Table 3. On the other hand, since a relationship is dynamic, the relevant factors are also dynamic and linked, hence, timely monitoring of the factors to evaluate relationships is necessary. In addition to that, this study suggests conducting more empirical research on the factors that influence relationships in other protected areas where CBET has also been implemented, since protected areas differ from cultural and ecological contextual settings.

This study shows that insufficient communication between administrative staff and local community members in JNNR resulted in misunderstandings and mistrust, which poses a big challenge for CBET to reach the joint goals of biodiversity conservation and community development. On the other hand, perceptions from administrative staff members indicate imbalanced power and bureaucracy limits in managing this relationship.

4.5 Community empowerment

The concept of empowerment has been developed to give voice and power to marginal people at the local level. Empowerment is an effort to provide grassroots access to resources, to build self-esteem and confidence (Li & Hunter, 2015), to gain power and control their own lives (Pratto, 2016). The World Bank (2002) identified four elements in community empowerment: 1) access to information, to allow community take opportunities, get service, and use their rights; 2) inclusion in planning and decision-making, to ensure all decisions were made based on local knowledge, wisdom and aspirations; 3) accountability, to build community trust and to develop their roles in management; and 4) organization capacity, to develop team-work capability and strengthen local organization.

Research on empowerment in tourism usually focuses on economic empowerment (Kundu, 2017), women's empowerment (UN Women, 2011; Peeters & Ateljevic, 2017) or empowerment in planning (Lin & Simmons, 2017). The most significant theoretical contribution to empowerment in tourism is the empowerment framework introduced by Scheyvens (1999, 2000, and 2002) based on the premise that empowerment should go beyond economic aspects. The framework indicates four levels of empowerment: economic (income), psychological (self-esteem and confidence), social (community well-being and cohesion) and political (power distribution) (Scheyvens, 1999). It also provides indicators for empowerment and disempowerment (Scheyvens, 2000; Table 4). Scheyvens' framework is an outcome from a social development perspective (Scheyvens, 1999), therefore environmental empowerment is excluded in the original framework.

This study argues that when measuring community empowerment in community-based ecotourism (CBET), environmental empowerment is a crucial additional element. This has two reasons, firstly, CBET is integrated with both development and conservation perspectives; secondly, CBET emphasizes tourism development and nature conservation initiatives to be managed by local communities. Therefore, nature conservation knowledge and skills for local community are crucial among other capacities. This can be only achieved through environmental empowerment since empowerment relies on transferring knowledge and skills to the communities (Hepworth, et al., 2016). Through participating in nature conservation and educational programs, local community members will improve their environmental awareness and enhance their capability for environment management. This will eventually benefit ecosystem conservation. Environmental empowerment is also an important tool to determine if a community engages in CBET in a way that will ultimately benefit them and their environment. Therefore, this study proposes an extended framework for community empowerment in CBET (Table 4), based on Scheyvens' framework in ecotourism (2002), by adding an environmental dimension with proposed indicators of empowerment and disempowerment adapted from previous studies on environmental indicators in sustainable tourism (Tsaour et al., 2006; Ramos & Prideaux , 2014).




Table 4 Proposed extended framework for community empowerment in CBET (Source: adapted from Scheyvens, 1999, 2000, 2002, Tsaur et al., 2006, and Ramos & Prideaux, 2014)

	Signs of empowerment	Signs of disempowerment
Economic dimension	<p>Lasting economic benefits from CBET</p> <p>Shared profits in local community</p> <p>Visible improvements in local community</p>	<p>Small gains from CBET with high temporal variation</p> <p>Most profits go to other stakeholders</p> <p>Financial benefits only among a few households</p>
Psychological dimension	<p>Increased self-esteem because of tourist appreciation of culture, traditional knowledge and nature</p> <p>Increased confidence leads to active participation in educational programs</p> <p>Access to employment and cash for marginalized groups</p>	<p>Feeling of being excluded from benefits-sharing</p> <p>Feeling of hardships due to reduced access to resources</p> <p>Confusion, frustration, disinterest or disillusion regarding CBET initiatives</p>
Social dimension	<p>Cohesion and equilibrium is maintained or enhanced through CBET</p> <p>Team work to build a successful CBET venture</p> <p>Improved community development from part of CBET gains (e.g. build schools, improve roads)</p>	<p>Disharmony between community members</p> <p>Loss of respect for culture due to influence from outside (e.g. values)</p> <p>Inequity in benefit-sharing for marginalized groups</p> <p>Competition between community members, resentment and jealousy</p>
Political dimension	<p>Interests and needs of all community members are represented in political structure</p> <p>Forum provided to deal with issues and concerns of community in CBET ventures</p>	<p>Autocratic and self-interested leadership in the community</p> <p>Being treated as passive beneficiary at CBET ventures</p> <p>Being excluded from decision-making</p>

	Opinions for all groups to be involved and represented in decision-making	Feeling of no control over CBET operations
Environmental dimension	<p>High environmental awareness</p> <p>Environment-friendly behavior</p> <p>Sustainable use of natural resources</p> <p>Positive attitude towards ecosystem conservation</p> <p>Having control of ecotourism towards ecosystem conservation</p> <p>Strong awareness of environmental impacts from CBET and know-how in mitigating them</p>	<p>Low environmental awareness</p> <p>Environment harmful behavior</p> <p>Unsustainable use of natural resources</p> <p>Negative attitude towards ecosystem conservation</p> <p>Limited control of ecotourism towards ecosystem conservation</p> <p>A lack of awareness of environmental impacts from CBET and limited know-how in mitigating them</p>





Applying this novel framework to assess community empowerment in JNNR, outcomes are presented in Table 5.

Table 5 Perception by local community members regarding different dimensions of empowerment

	Perception from community members	Results
Economic dimension	A eightfold income increase compared with 1998; participation of all households; high expectation to participate in future	
Psychological dimension	Feel frustrated by SMP; perceived inequality in benefits sharing; perceived low-level jobs offered; self-esteem and confidence not built	
Social dimension	Cohesion and equilibrium within community not developed; frustrated from insufficient basic infrastructure (e.g. build schools, shops etc.,) and restriction of renovating old houses	
Political dimension	No community representative in political structure; issues and concerns of community not well received; opinions of community being collected but not represented in decision-making	
Environmental dimension	High environmental awareness; support sustainable use of resources; awareness of environmental impacts from tourism	

The results matched the perceptions from JAB administrative staff regarding community participation in CBET (Table 6) who perceived that community participation in planning, managing and decision-making processes was unnecessary, and that the community should not complain because they received economic benefits. This implies that empowerment is implemented in the CBET development strategy in national nature reserves in China. In practice, however, it is limited to the economic and environmental level. Social justice, psychological satisfaction and political equality were often neglected. This brings a critical question for CBET policy makers, whether economic growth and environmental protection are the only goals for community empowerment in CBET. Das & Chatterjee (2015) indicate that ecotourism may cause cultural and social damage to communities and eventually may undermine community life quality, even though it may bring economic benefits. Scheyvens (1999) argues that community-based ecotourism should appreciate the significances of the social, psychological and political dimensions rather than primarily focusing on economic or environmental goals.

Table 6 Perception by administrative staff members regarding local community empowerment

	Perception from staff members	Results
Economic dimension	<i>"We have done our best to maximize their income."</i>	
Psychological dimension	<i>"Why do they always complain? They are the richest Tibetans in China!"</i>	
Social dimension	<i>"Community should not worry because we (JAB) will automatically make decisions in favor to them."</i>	
Political dimension	<i>"Community participation in planning, managing and decision-making process was useless." "they do not know anything."</i>	
Environmental dimension	<i>"We have organized environmental training for them since 1999-2009."</i>	

Worldwide, CBET practices indicate a common failure to transform and empower local community members, largely due to power controlling by government or private tourism industries (Zapata et al., 2011; Van Der Duim & Caalders, 2008; Gascón, 2013; Johnson, 2010; Butcher, 2010; Zapata et al., 2011). In Laos, Cambodia and Vietnam, due to centralized power from government, the local communities found themselves difficult to manage CBET from the bottom up, though these countries all include CBET in their master tourism plan (Khanal & Babar, 2007). In Thailand, communities find CBET initiatives hard to compete with private tourism industries due to a lack of government regulatory enforcement (Boonratana, 2010). Dodds & Glasiki (2018) point out that a lack of community empowerment in some areas caused resentment among community members and a distance between community members and tourists. Theerapappisit (2012) and Fiorello &

Bo (2012) argue that higher levels of power, control and resources for community empowerment distinguish CBET from traditional ecotourism.

To enhance community empowerment, Rest (2003), Gutierrez (2005), and Mason (2015) proposed to establish a tourism association or committee to manage ecotourism at the community level, and ensure communities be included in tourism planning, designing, managing, owning and monitoring processes. Local community participation in planning and development of CBET projects empowers local residents by increasing their capability, improving their well-being and increasing pride for their culture (Dodds & Galaski, 2018). Worldwide there are only a few successful CBET examples. In Guatemala, Mayan villagers perceived improved quality of life through participating in small-scale ecotourism and were proud to exchange cultural experiences with tourists (Martain-Haverbeck, 2006). A successful CBET joint-venture in South Africa provides equity shares to local community (Nielsen & Spenceley, 2011). Two very successful CBET practices are found in Namibia and Botswana, where community-based tourism committees, who receive continuous capacity building from government and NGOs (World Resources Institute, 2005; Mbaiwa & Stronza, 2010), manage wildlife conservancies.

4.6 Key factors that hinder community-based ecotourism (CBET) success from protected area governance and management aspects

Tasci, Croes, & Villanueva (2014) argue that if CBET is planned well, it can become a useful tool for poverty alleviation, economic growth and community empowerment. However, Moscardo (2008) and de Groot (2015) argue that CBET is very complex; very often, the reality in practice does not match the principles. The present study assessed CBET outcomes from protected area governance and management, and suggested that key factors hindering CBET success in Jiuzhaigou national nature reserves (JNNR) are: a prevalent top-down approach, mixed property and operation rights, single sources of funding resulting in dependencies, a lack of efficient administrative structure and management capacity, and a lack of capacity building for community.

A prevalent top-down approach

China has its particular socio-political settings and manages CBET through a prevalent top-down institutional structure, applying strict control programs over nature reserves and local communities (Xu et al., 2016). Although there are a few examples to show that China is improving in involving community participation in planning and managing nature reserves (Su et al., 2016; Liu et al., 2016; Liu et al., 2013), citizen participation is not a strong aspect in

the tradition and culture of Chinese governance (Zhou et al., 2014). Therefore, conflicts between biodiversity conservation and socio-economic development in nature reserve management in China remain a big challenge (Zhang et al., 2017).

All national nature reserves are state-owned (Xu et al., 2016). If there is disagreement by local communities, the reserve authority often uses law enforcement to force community members' compliance. Similar issues are reported in protected areas in other developing countries like Malaysia, Serbia, Indonesia, Laos, Cambodia, Thailand and Vietnam (Laudati, 2010; Milgroom & Spierenburg, 2008; Khanal & Babar, 2007), as well as protected areas in a developed country like Japan (Hiwasaki, 2006).

Previous studies (Xu et al., 2014; Cheng et al., 2010, Sofield & Li, 2011) compared institutional differences for tourism management in protected areas in China and in the United Kingdom. The results indicate that the Chinese government applies a centralized top-down approach to control the tourism industries and leaves very little room for other stakeholders such as local communities and NGOs to participate. In the United Kingdom, there is a strong preference to involve public, community and private sectors in decision-making since the restructure of political and economic settings in 1980s (Bahaire & Elliott-White, 1999). Accordingly, management of protected area tourism in China only focuses on the role of government, as it has full control of all tourism revenue as well as decision making. Bao et al. (2006) compared community participation levels in tourism between China and western countries, and indicated that due to the centralized top-down approach, all communities in China participate rather passively. This makes community participation superficial or non-existent or participation is only present at the economic level. Tosun (2000) and Scheyvens (2002) argue that active participation means that the community has some degree of control over tourism and shares benefits equally, which is more likely to lead to sustainable development of protected areas than passive participation.

Previous research on community participation only focuses on theoretical importance with a lack of empirical analysis (Thapa & Moswete, 2017). Identifying the current level of community participation will provide insights into the success of the existing programs (Masud et al., 2017; Mayaka et al., 2016). Arnstein (1969) introduces 'a ladder of citizen participation' to explain the necessary steps of participation (Figure 33), and classifies the steps to three evolutionary levels: 'non-participation', 'degrees of tokenism' and 'degrees of citizen power'. He also indicates the importance of power redistribution to reach the level of citizen participation. This approach created the first theoretical basis for citizen participation research. Integrating this theory with tourism development, Tosun (1999) developed a framework of community participation in tourism showing three levels of participation: coercive, induced and spontaneous participation, and the defining characteristic of each level (Figure 33).

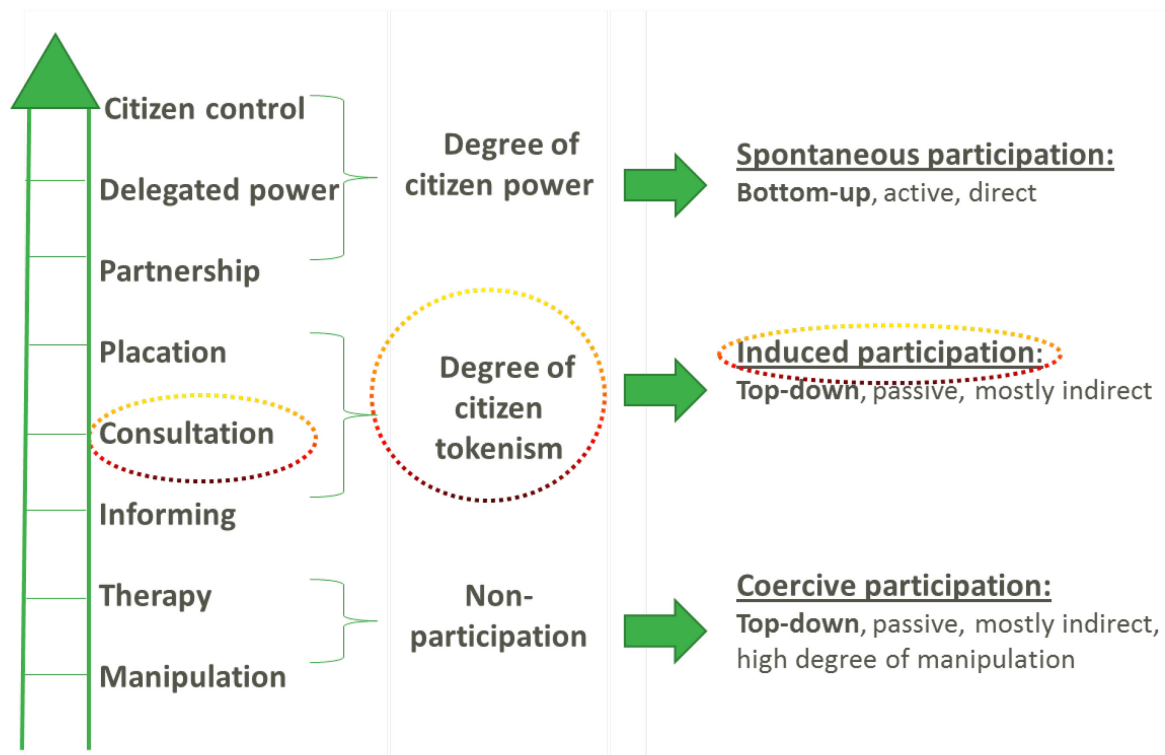


Figure 33 Level of community participation in tourism (Source: Adapted from Tosun, 1999; Arnstein, 1969)

Applying the topology in Figure 33 to this case study, community participation is located at the ‘consultation’ state at the level of ‘degrees of citizen tokenism’ in Arnstein’s ladder, and at the ‘induced’ level regarding Tosun’s categories. The community members were consulted for their opinions of SMP and EDP before the fundamental management programs were implemented. However, due to the prevalent top-down approach, community participation remained passive and without impact on the decision-making. This indicates tokenism in participation, with a lack of balance in power distribution between the local community of Tibetans and the reserve administration that represents the government. One of the consequences of the top-down approach was that administrative staff took it for granted that they could make decisions for the local community. This perception put the local Tibetan minority in a disadvantage and powerless position, from which they had no influence regarding future decisions. Tosun (1999, 2006) indicates that ‘induced participation’ is mostly seen in developing countries, where power is in the hands of governments institutionalizing community participatory initiatives.

Although the Chinese government has included ‘public participation’ as an important theme in national and regional development strategies, there is no existing legal framework to guarantee impact for all stakeholders; especially grass-root classes and NGO’s are often not incorporated in the decision-making process.

For the development of community-based ecotourism, Gans (2016) and Mak et al. (2017) argue that power should be redistributed from top to bottom level, in order to give local

grassroots opportunities to design their own goals and decide for their future, with support and assistance from government, NGOs and external advisors.

Mixed property and operational rights

In the national nature reserves in China, the reserve authority is a branch of the local government, which is the owner of land tenure, with the dominant commitment of biodiversity conservation and ecological services provision. At the same time, it is the operator of tourism enterprises, with the need for tourism to generate economic profits. Based on the 'public choice theory' (Olson, 1971), conflict of interest can drive political decisions to suboptimal outcomes which do not correspond with the outcomes the general public would favor or are best from a holistic social perspective. The conflicting mix of property and operational rights in the Chinese national nature reserves led to the fact that economic interests dominated in the short term in JNNR to the disadvantage of environmental protection. Similar issues are reported in Snake Island National Nature Reserve (Zhou et al., 2014) where reserve management promotes mass tourism and ignores nature and species conservation.

This conflict results in a lack of long-term plans for biodiversity and ecosystem conservation. When sustainable management policy was implemented, JAB performed some research to collect baseline data for selected species groups. However, there was no further research performed in terms of monitoring biodiversity and ecosystem changes over time. This lack of data made it difficult to evaluate impacts of CBET on wildlife conservation. For example, when JAB staff was asked regarding the contribution of CBET to wild panda conservation, staff members assumed that the number of wild pandas had increased over time without any support from data (personal communication with JAB). The Ministry of Forestry (MoF, 2015) of China announced that the number of wild pandas in China had increased to 1864 individuals by 2015; however, the increase is mainly from the establishment of successful panda captive breeding centers (Chen et al., 2018). The contribution from natural nature reserves such as JNNR remains unknown.

The mixed property and operational rights also result in a lack of enforcement of current environmental policies. For example, a number of tourism projects were launched hastily without going through an Environmental Impact Assessment (EIA). EIA is mandatory for all new projects as stated clearly in the current sustainable management policy. Therefore, some artificial facilities and structures in the park are not harmonized with the natural landscape. Another related issue is a lack of enforcement on environmental carrying capacity. According to sustainable management policy, the daily maximum number of tourists is restricted to 12,000 based on an estimated environmental carrying capacity in JNNR (Zhang & Zhu, 2007). However, in peak season, the daily number of tourists reaches

more than 22,000. During the tourism golden weeks (the public holidays in the first week of May and October), this number is even exceeded (Gu et al., 2013). The existing tourism service capacity in JNNR has surpassed the environmental carrying capacity. With the influx of tourists during peak season, catering services, garbage, and waste overwhelm the disposal treatment facilities. Zhang et al. (2017) found that the daily average discharge per person at JNNR is 95.5 kg of sewage, 1.5 kg of feces, and 1.1 kg of garbage, resulting in the eutrophication of lakes in the area. Mass tourism has caused severe damage in JNNR such as water contamination (Pan et al., 2017, Ouyang et al., 2016), travertine degradation (Wang et al., 2017; Qiao, 2012), threats for biodiversity (Schmidt et al., 2017; Zhang et al., 2017; Bing & Gao, 2015) and increasing amounts of sediment in lakes (Pan et al., 2017; Deng et al., 2011; Chen et al., 2011).

Another consequence of mixed property and operational rights is a lack of environmental monitoring regarding tourist behavior. Local community members often witnessed tourists behaving harmfully to the environment in the reserve. Movie and television companies chose to film at JNNR due to its outstanding natural landscape. One of the most famous Chinese directors, Jizhong Zhang, took his team there to film the movie 'The Condor Heroes'. The cast and crew threw garbage everywhere and destroyed the vegetation along the Pearl Beach Lake, contaminating the park and raising criticism among the Chinese public against irresponsible management by JAB. Similar issues are reported in the Namib-Naukluft National Park in the Namib desert, Namibia (Director George Miller produced the film Mad Max: Fury Road) (Bliss, 2018).

Single source of funding increase dependencies

In almost all Chinese nature reserves, tourism revenue is the only source of funding without alternatives (Xu et al., 2014). When a local economy depends on tourism, it will put more tourism pressure on ecosystems. On the other hand, tourism income is vulnerable since many factors can affect it (Cheng et al., 2010). In this study, after the Wenchuan earthquake hit JNNR in 2007, the number of tourists dropped dramatically. On August 8, 2017 JNNR was hit again by a 7.0 degree earthquake, which caused more serious damage in the natural landscape than the earthquake in 2007. It was reported that 29 tourists died and 525 tourists were injured (Phonix News, Aug 9, 2017). JNNR had to close for six months to evaluate the damage and reconstruct the tourist facilities and houses. Part of the park re-opened for tourism on March 8, 2018 (JNNR website), but few tourists have visited since then.

Case studies in Thailand (Boonratana, 2010) and in China (Xu et al., 2014) argue that CBET should not become the only option for community livelihood, especially when another goal of CBET is to conserve biodiversity and the ecosystem by restricting tourist numbers to

minimize ecological impacts. Dodds & Galaski (2018) indicates the possibility of identifying alternatives for community livelihood by describing a successful CBET agricultural tour in Costa Rica. Communities there generate supplemental income from agricultural tourism using activities such as butterfly watching or visits to coffee farms, animal-raising areas and banana plantations. These activities help local communities to maintain traditional agricultural activities and, at the same time, gain profit from tourism.

For the future development of CBET JNNR, Tibetan culture could become one of the major tourist attractions. JAB could support the local community with a focus on elder residents to develop Tibetan handicrafts, food, costumes and performances as an alternative livelihood for community sustainability.

Lack of efficient administrative structure and management capacity

In the current institutional setting in China, the national nature reserve authority is cross-administered by higher-level government offices. Bureaucracy with a lack of coordination among different levels of administration is a common failure in achieving agreement on management policies for national nature reserves. The same issues are reported for CBET management in protected areas in Japan (Hiwasaki, 2006) and Malaysia (Masud & Kari, 2015).

On the other hand, the reserve authority is committed to manage and protect the nature reserve, with full responsibility for protecting natural and cultural resources, developing tourism business activities, and improving community well-being (Management Act of National Nature Reserve, 2000). This requires complex sets of professional skills from ecological, economic, cultural, marketing and management sectors such as biodiversity conservation, forest protection, tourism facilitation, marketing, financing, education and outreach, intercultural communication, crisis management, and conflict resolution. In this study, the administrative staff in JNNR showed a lack of management capacities and poor communication skills to lead the local community towards a collaborative relationship. A main cause for this issue may be the lack of training programs established for different levels of management staff to enhance their capacity building. This limitation results in low awareness of long-term ecological and cultural conservation planning, and a shortage of human resources in conducting educational programs to local communities and tourists. The lack of human resources and capacity in the management sector is a major challenge for CBET projects in protected areas in Japan (Hiwasaki, 2006), Thailand (Bennett & Dearden, 2014), Malaysia (Masud & BintiKari, 2015), and Colombia (De Pourcq et al., 2017).

Lack of capacity building for local community

According to the interviews performed in this study, there was no educational program for local communities since 2009. Bennett & Dearden (2014) indicated that, to achieve community empowerment and ownership, capacity building is a key to enhancing tourism management and conservation skills for local communities. Tasci et al. (2014) highlighted that successful capacity building to enhance community members in terms of language skills, communication, guiding tourist, security awareness, and environmental management is crucial to successfully develop CBET projects.

Capacity building relies on training and education (Dodds & Galaski, 2018). Programs should include a variety of topics such as tourism management, ecosystem and biodiversity conservation, environmental protection, marketing, language, communication, safety, finance, and governance. CBET planners should be aware that education is a long-term on-going process, and that it is very important to provide community members useful resources and tools that enable them to participate in CBET actively (Bittar Rodrigues & Prideaux, 2018; Hennink et al., 2012). International collaborations would help to ensure the success for capacity building projects. Support from government, NGOs, international institutions and international expertise on education and training programs is crucial.

Henry (2009) reported that educational programs have enhanced capacity of a local community in St. Lucia to accomplish a community-based initiative successfully. Sebele (2010) reported that capacity building programs have benefited a community in South Africa to receive more job opportunities.

5. Conclusions and recommendations

This study aimed to answer three research questions through a case study in Jiuzhaigou National Nature Reserve (JNNR) in China:

- 1) What are the perceptions from community and staff members towards SMP and EDP, and which socio-demographic factors influence their attitudes?
- 2) What are the perceptions from community and staff members regarding intergroup relationships and community empowerment, and what aspects are to be considered in SMP and EDP?
- 3) What are the key factors that hinder CBET success regarding protected area governance and management?

Based on surveys and interviews, the study shows that both local community and reserve administrative staff members had supportive attitudes towards the existing participatory management program (EDP) due to remarkable economic gains. However, community members criticized the sustainable management policy (SMP). The socio-demographic factors of age, educational level and family annual income were identified as significant factors explaining the level of satisfaction among the local inhabitants and reserve administrative staff. Relationships between administrative staff and community members appeared to be uncoordinated and suffering from a general lack of trust. A refined framework for community empowered in CBET was developed and applied to this study based on perceptions from staff and community members. Results showed that community members were empowered economically and environmentally to some extent, but not socially, psychologically and politically. Social justice, psychological satisfaction and political equality were missing under the current management programs. Key factors that hindered CBET towards success from protected area governance and management included the prevalent top-down approach, a mixture of property and operation rights, the emphasis on a single source of funding, a lack of inefficient administrative setting and management capacity and a lack of capacity building programs for local communities.

In China, CBET is at an experimental stage, mainly based on learning-by-doing, without a clear path for future development (Xu et al., 2016). Worldwide CBET continues to be promoted and tested in protected areas where other economic alternatives are restricted. For the effective management of CBET practice in JNNR, recommendations based on the results of this study are:

1. Establish a CBET committee managed by local residents, supported by government and consultation with NGOs.
2. Diversify sources of income for the community by e.g. developing Tibetan products to promote cultural tourism and encourage local elder residents to a lead role in advising.

3. Train local young residents to take care of the panda populations and other important species, and employ them as staff members of biodiversity conservation programs with an emphasis on population size monitoring.
4. Re-structure CBET joint-venture regulations to include all local communities in the benefits sharing and reallocating of the PES subsidy and Green Bus Company shares.
5. Encourage community participation in decision-making processes.
6. Build basic community infrastructure independent of its importance for tourism.
7. Develop and evaluate long-term strategic plans and testable goals for ecological and cultural conservation.
8. Improve the management capacities of administrative staff through educational programs.
9. Establish continuous environmental educational programs for community members, administrative staff and tourists.
10. Strengthen international collaborations with NGOs and research institutions for biodiversity conservation and community development.

Given the significant contribution of the tourism sector to economic growth in protected areas in China and worldwide, it is foreseeable that Jiuzhaigou National Nature Reserve will continue to be an important case study region for CBET participatory management in protected areas in China and worldwide.

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7. Appendices

Appendix 1: Sample questionnaire used for local communities

Section A: Background information

Respondent number.....

Date.....

Village: Heye Shuzheng Zharu Zechawa

Age: ≤ 20 20-29 30-39 40-49 50-59 ≥ 60

Gender: male female

Marital status: single married widowed divorced separated

What is your religion: Tibetan Qiang Muslim Man Tujia Han other

Number of dependents: 1-2 3-4 5-6 7-8 8+

Occupation: JAB JAB affiliated companies tour agency individual shop
park conservation unemployed other

Annual income (in yuan) per family: ≤ 20000 20001-30000 30001-40000
40001-50000 >50000

Education: no school elementary middle school high school university

Section B: Analysis of environmental awareness of local community

1. Do you understand environment law and policy at a Nature Reserve?

5: fully comprehend, 4: mostly, 3: about half, 2: very little, 1: nothing

2. How important do you think it is to protect environment and biodiversity in Jiuzhaigou National Nature Reserve (JNNR)?

4: very important, 3: important, 2: slightly important, 1: not at all

3. What is your reaction when seeing tourists' bad behavior against ecological protection?

4: stop it immediately, 3: think before stop, 2: observe 1: ignore

Section C: Analysis of local satisfaction with SMP at Jiuzhaigou National Nature Reserve (JNNR)

Do you support the SMP? 1: yes, -1: no

4. How much do you understand the SMP?

5: fully comprehend, 4: mostly, 3: about half, 2: very little, 1: nothing

5. Do you agree that the SMP has helped greatly to protect the environment and biodiversity in Jiuzhaigou National Nature Reserve (JNNR)?

2: strongly agree, 1: agree, 0: neutral, -1: disagree, -2: strongly disagree

6. Are you satisfied with the current participation model?

2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied

7. Are you satisfied with current distribution of benefits?

2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied

8. How big is income gap between different villages in the park?

2: very big, 1: big, 0: neutral, -1: small, -2: very small

9. Are you satisfied with the jobs created by JAB?

2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied

10. What is the portion of annual expenditure for your family?

a. tourism investment%

b. children's education%

c. basic living%

d. gifts%

e. support parents%

f. travel%

a. others% (please specify)

Section D: Analysis of community satisfaction with EDP at Jiuzhaigou National Nature Reserve (JNNR)

Do you support the EDP? 1: yes, -1: no

11. Has EDP improved your living standard?

2: much better, 1: better, 0: neutral, -1: the same, -2: worse

12. Do you agree that EDP has improved the park infrastructure?

2: strongly agree, 1: agree, 0: neutral, -1: disagree, -2: strongly disagree

13. Do you agree that EDP has changed the way of living and traditional culture including food, clothes, and house style?

2: strongly agree, 1: agree, 0: neutral, -1: disagree, -2: strongly disagree

Please specify the reason_____

14. Would you like you or your children to marry across different religions?

2: strongly willing, 1: willing, 0: neutral, -1: unwilling, -2: strongly unwilling

15. Are you willing to participate in ecotourism activities?

2: strongly willing, 1: willing, 0: neutral, -1: unwilling, -2: strongly unwilling

16. Would you like your children to work at the Jiuzhaigou National Nature Reserve (JNNR)?

2: strongly willing, 1: willing, 0: neutral, -1: unwilling, -2: strongly unwilling

Section E: Analysis of local communities' perception of JAB's management performance

17. Are you satisfied with JAB's management performance?

2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied

18. Did JAB ask for your opinion when they developed SMP and EDP and explained to you the proposals and details?

1: yes, -1: no

19. Are you satisfied with JAB's consultation on SMP and EDP?

2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied

20. How did you participate in the ecotourism training programs arranged by JAB?

4: actively participate, 3: random participation, 2: not informed, 1: never

21. What do you think of your communication with JAB?

2: very good, 1: good, 0: neutral, -1: not very good, -2: poor

Section E: Expectation of future participation in ecotourism

22. Have you adapted to sharply increased numbers of tourists?

2: very adapted, 1: somewhat, 0: neutral, -1: not adapted, -2: resisting adaption

23. Will you continue to support and participate in future ecotourism development?

2: very supportive, 1: selective supportive, 0: neutral, -1: not very supportive, -2: resisting support

24. Do you have any suggestion to improve the current SMP and EDP?

25. What kind of help do you need to improve your living standard in the park?

Thanks for your kind assistance and good wishes for the future!

Appendix 2: Sample questionnaire used for local administration

Section A: Background information

Respondent number.....

Date.....

Name of the JAB department.....

Age: 20-29 30-39 40-49 50-59

Gender: male female

Marital status: single married widowed divorced separated

Are you a local inhabitant: yes no

What is your religion: Tibetan Qiang Muslim Man Tujia Han other

Number of dependents: 1-2 3-4 5-6 7-8 8+

Occupation: senior management middle management

junior management ordinary employee

Employment duration with JAB (years) : <1 1-2 3-4 5-6 7-8

8-10 11-15 15+

Annual income (in yuan) per family: ≤ 20000 20001-30000 30001-40000

40001-50000 >50000

Education: middle school high school university

Section B: Analysis of JAB's satisfaction with SMP at Jiuzhaigou National Nature Reserve (JNNR)

Do you support the SMP? 1: yes, -1: no

1. Are you satisfied with the current local participation model?
2: very satisfied, 1: basic satisfied, 0: neutral, -1: dissatisfied, -2: strongly dissatisfied
2. Do you think the current distribution of benefits is fair to the locals?
2: very much, 1: basic, 0: neutral, -1: unfair, -2: totally unfair
3. What do you think of the jobs created for locals?
2: very good, 1: good, 0: neutral, -1: not, -2: deeply not
4. Do you think that the SMP is well developed for the locals?
2: very good, 1: good, 0: neutral, -1: not, -2: deeply not

Section C: Analysis of JAB's satisfaction with EDP at Jiuzhaigou National Nature Reserve (JNNR)

Do you support the EDP? 1: yes, -1: no

5. Do you think the current EDP is well developed for the locals?
2: very much, 1: basic, 0: neutral, -1: not, -2: deeply not
6. Do you think that EDP has changed local minority culture?
2: very much, 1: basic, 0: neutral, -1: not, -2: deeply not

Section D: Analysis of JAB's perceptions of communication with local community

7. Do you think local communities play an important role in the JAB's practices of SMP and EDP?
2: very much, 1: a little, 0: neutral, -1: not, -2: deeply not
8. Do you think that local community has actively participated in educational programs?
2: very much, 1: a little, 0: neutral, -1: not, -2: deeply not
9. What do you think of the communication with local communities?
2: very good, 1: good, 0: neutral, -1: not very good, -2: poor

10. Do you agree that local communities should be actively involved in the JAB decision-making process?

2: strongly agree, 1: agree, 0: neutral, -1: disagree, -2: strongly disagree

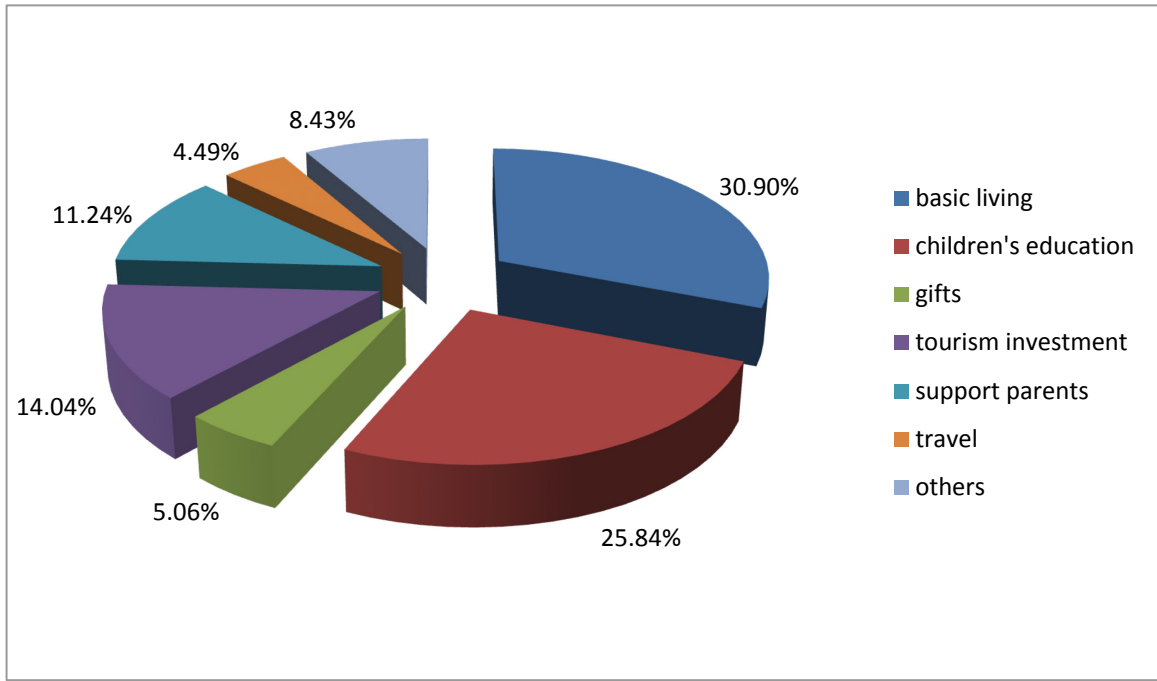
11. Do you have any suggestion to improve the current SMP and EDP?

12. Do you have any suggestion to improve local participation in ecotourism?

Thanks for your kind assistance and good wishes for the future!

Appendix 3: Additional results from questionnaires survey with local respondents

Section C: Q12 What is the portion of annual expenditure for your family?



Results showed that in the average annual expenditure of local respondents, 30.90 % was spent on basic living—food, clothes, housing, transportation, 25.84 % on children’s education, 14.04 % on tourism investment, 11.24 % supporting parents respectively, 5.06 % on gifts, 4.49 % on travel, 8.43 % on others mainly social entertainment and self-improvements.