

Article

# The Transition of Soundscapes in Tourist Destinations from the Perspective of Residents' Perceptions: A Case Study of the Lugu Lake Scenic Spot, Southwestern China

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**Abstract:** As an important part of regional synthesis, the local landscape is a crucial source of attractiveness for tourist destinations, in which soundscapes play a notable and special role. Many studies have investigated changes in the economic, cultural, and environmental aspects of tourist destinations under development, while little attention has been paid to how soundscapes change after tourism development. To this end, we chose the Lugu Lake Scenic Spot as a study area and explored the characteristics of soundscape changes by conducting a survey of residents in six villages at different stages of tourism development. The following conclusions were drawn: (1) Geophony did not obviously change under the influence of tourism. Biophony increasingly lost its influence, while anthrophony increased significantly, causing wide concern among residents. (2) The phenomenon of soundscape commercialization could be attributed to the impact of tourism maturation. Further, the representation of folk songs has undergone a great change. (3) In terms of spatial patterns, residents whose villages were in different states of tourism development had significantly different perceptions of soundscape transition. For example, the one village not undergoing tourism development was in its original soundscape phase. In the other villages, which were in the consolidation stage or the involvement stage, the sound environment had changed significantly, entering a tourism soundscape phase once there were tourism elements involved. Finally, we propose suggestions for enhancing the conservation of local soundscapes, with a focus on both building the tourism industry and enhancing the sustainable development of tourist destinations.

**Keywords:** soundscape; tourism influence; perception; changes; Lugu Lake; life cycle theory

## 1. Introduction

Mike Crang once said, “The landscape is a piece of palimpsest that is constantly being scrapped and rewritten” [1]. The local landscape is a comprehensive reflection of a specific region, a perceptible object formed by interactions between many interrelated elements within an area. It is also a core element of local tourism attraction. Researchers currently stress the importance of addressing and understanding the sensory dimensions of tourist experiences in destinations study [2,3]. Indeed, places and individuals' surroundings are described as multi-sensory, consisting not only of visual impressions,

but also by relevant sounds, smells, tastes, and touch [4–6]. Against this background, the soundscape is not only an inseparable part of the landscape, but also a crucial support in improving tourists' travel satisfaction and cultivating residents' local identity [7,8]. The concept of a soundscape was first proposed by Finnish geographer Granö in 1929 [9]. This idea came into public view during the World Soundscape Project in 1969, which was initiated by Schafer and which prompted people to reflect on and recognize traditional "auditory" behavior [10]. Unlike traditional acoustic concepts, a soundscape emphasizes the perception and understanding of the sound environment among individuals or in a society [11]. It is the result of overlapping sounds that are produced by abiotic or biotic agents, first perceived and then successively interpreted by organisms: this means that a cognitive component must be added or at least considered in the soundscape process. Thus, in this paper, soundscape is defined as "an acoustic environment, but also a cultural domain as perceived or experienced by a person or people" [12].

Since soundscapes are an important part of landscape composition, soundscape researchers have focused on the auditory characteristics of landscapes, which include three elements: sounds, listeners, and the environment [13]. Among these elements, the listener is the main object of soundscape research and the direct perceiver of the soundscape. Opinions about a soundscape will be affected by personal experience, cultural background, the environment, and other factors, resulting in perceptual differences [14]. The soundscape is both a temporal and a spatial phenomenon produced in a specific spatiotemporal environment that has a "spatial-temporal two-dimensional property" [15]. It is a special component of tourist destination landscapes. Therefore, more and more researchers have paid attention to soundscapes in recent years. The sound environment in tourism includes different aspects of natural background sounds [16], the language environment of residents [17], and sound marks [18]. Waitt and Duffy found that the auditory experience is an important part of the tourism experience. Moreover, the way tourists listen to sounds is an important factor influencing their emotional experience with recreational space [19]. Su X took ethnic music as a starting point to explore the relationship between tourism and the commercialization of culture. It was found that displaying ethnic music to tourists can enhance the uniqueness of the tourist destination, increase the competitiveness of the local tourism market, and have a positive effect on constructing tourist destination images [20]. An evaluation of soundscapes needs to combine subjective and objective indicators. On the one hand, a subjective evaluation of the soundscape can be conducted through questionnaires and interviews. For example, Ge used questionnaires that were based on a semantic differential method to investigate tourists' preferences and the consistency of the soundscape in Japanese urban streets [21]. After analyzing and evaluating the soundscape of public parks in Brazil, Bani found that tourists can perceive rich sound information, including the volume, tone, and timbre of sound: other conditions in the parks' environments that interfered with the soundscape and its perception were also identified, such as the spatial factors of each park, the urban setting of its surroundings, and the sounds originating from inside the parks. This sound information had different effects on tourists' satisfaction [22]. On the other hand, quantitative evaluation methods such as constructing a soundscape map of the research area [23], spatial analysis methods [24], and acoustic index measurements have also been applied [25]. Existing research on the soundscape of tourist destinations has mainly focused on tourists' experiences and their perceptions of soundscapes: there have been few studies that have paid attention to soundscapes from the perspective of residents.

Moreover, due to tourism development, the economic level, social environment, and landscape of tourist destinations are gradually changing. Residents of tourist destinations can intuitively feel the changes brought on by tourism development [26]. Research on residents' perceptions and attitudes toward the impacts of tourism arose in the 1970s: the contents and research methods of this field have constantly been enriched due to the construction and application of different theories, including "Doxey's irritation index" [27], the life cycle theory of tourist destinations [28], social exchange theory, quantitative measurements, and objective analyses [29]. Tourism development can create positive impacts, such as raising residents' income [30,31], improving living environments [32,33],

and promoting cultural exchange [34]. At the same time, residents are also increasingly aware of the negative social and environmental impacts. For instance, Yi has pointed out that tourism development increases noise pollution in a destination, which has reduced the hospitality of locals [35]. The kinds of sounds generated and diffused in a geographic space are important sources for understanding, experiencing, and obtaining local information on daily life [36]. From this point of view, residents are the real witnesses of soundscape transitions. Compared to the brief impressions of tourists, residents have a clearer perception of soundscape changes. Therefore, we can reveal and analyze the processes at work in changing soundscapes by exploring residents' perceptions of changing soundscapes in tourist destinations.

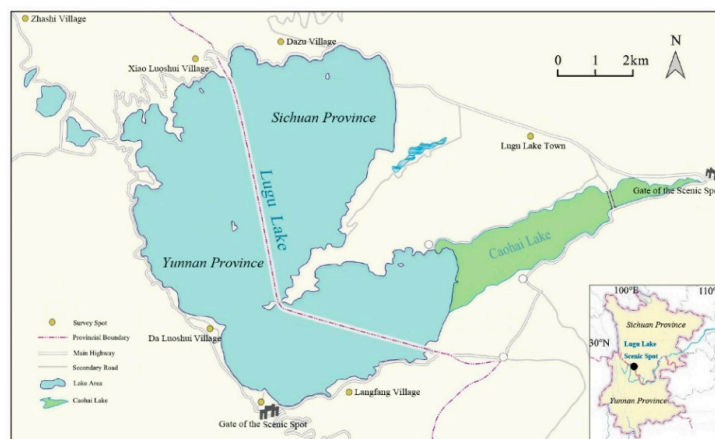
The purpose of this study was to explore how soundscapes change under the influence of tourism development. To achieve this, we used residents' perceptions and perspectives on the changing characteristics of soundscapes in six villages at different levels of tourism development in the Lugu Lake Scenic Spot. Here, we discussed in detail how interventions in tourism activities affect changes in the soundscape. This study supplements and expands the research on soundscape ecology and provides constructive suggestions for the improvement of the sound environment and for the sustainable development of tourist destinations.

## 2. Methodology

### 2.1. Study Area

The area of interest was Lugu Lake in southwestern China, a famous tourist attraction in China under the joint jurisdiction of Sichuan Province and Yunnan Province. It is located in a mountainous area and has a remote geographic location, inconvenient traffic, and poor accessibility, so it remains relatively isolated from the outside world. Because of this, it is far away from pollution and has less industrial development, which helps it maintain a good ecological environment. The Lugu Lake Scenic Spot has beautiful scenery and also allows for exploring the ancient and mysterious Mosuo culture, which has an interesting social organization. For instance, it is known as "the last pure land of human matrilineal culture" and attracts a large number of domestic tour groups. The tourism industry in Lugu Lake has been developing since the end of the 1980s. It was approved by the State Council as an open tourism destination in 1992. Since then, it has been included in the commercial development process of mass tourism in China [37].

There were several reasons we chose the Lugu Lake Scenic Spot as the study area. First, the natural landscape as well as the unique cultural landscape are rich and diverse, with various soundscapes full of aesthetic value. Secondly, with the continuous development of tourism, the soundscape of the Lugu Lake Scenic Spot has been changing constantly: differences between the villages in this area are based on the level, duration, and impacts of tourism development. In this situation, differences may exist among the residents of different villages in terms of perceived soundscapes. Therefore, for field research, six villages at different stages of tourism development in the Lugu Lake Scenic Spot were selected for resident interviews to explore changes in the soundscape (see Figure 1). Butler has divided the development and evolution of tourist destinations into six stages: exploration, involvement, development, consolidation, stagnation, decline, and rejuvenation [38]. By combining previous studies on the life cycle theory of tourist destinations [39–41] and the actual situation of the Lugu Lake, and by considering the start date and history of tourism development and the capacity of tourist facilities in each village, we determined the development stages of tourism in the six villages (Table 1).



**Figure 1.** The location of the Lugu Lake Scenic Spot.

**Table 1.** Comparison of basic characteristics of different villages in the Lugu Lake Scenic Spot.

Name of the Village	Main Course of Tourism Development	Tourist Reception Facilities	Tourism Development Stage
Zhashi village	This village is 18 kilometers away from the core scenic spot. It has not participated in tourism development and is undergoing planning. At present, only adventure tourists come to visit.	No tourist reception facilities for now.	Exploration
Langfang Village	This village started to participate in tourism development in 2012.	There are docks and boats, but only a few houses and inns are built in the lakeside area.	Involvement
Xiao Luoshui Village	This village started to participate in tourism development in 2005, when there was only one inn with four rooms. In 2008, tour groups began to enter the village, and an average of 300 tourists were received every day. At present, 18 of the 24 households in the village are engaged in tourism catering, and only 2–3 households are not involved in tourism.	The village has several homestays, hotels, and restaurants, with docks, boats, Mosuo household visits, and other supporting facilities.	Development
Dazu Village	This village started to participate in tourism development in 2005.	This village has the longest shoreline on the lake. There are bars, docks, restaurants, tourist shops, and other supporting facilities.	Development
Da Luoshui Village	The first family hotel opened in 1989. In 1997, tourism was developed on a large scale, with about 400 tourists being received every day. In 2013, tourism became the main industry of Da Luoshui Village, and the income of farmers was mainly from tourism.	This village has entertainment projects (such as tourist business streets), resorts, hotels, and guest houses of different sizes, with about 5230 beds. There is a tourist parking lot, tourist service centers, star-rated public toilets, tourist guide signs, etc.	Consolidation
Lugu Lake Town	In 1998, this town began to participate in tourism development. In 2001, it received 50,000 tourists, with a tourism income of more than 6 million yuan. In 2002, the number of tourist reception households increased to more than 20. In 2003, a village tourism association was established.	This village is the seat of local government. It is the first stop after entering the Lugu Lake Scenic Area at the Xichang entrance and has convenient transportation. It is equipped with a tourist guide system, shops, and other supporting facilities, as well as resorts, hotels, and homestays.	Consolidation

Source: Lijiang Lugu Lake Provincial Tourist Area Management Committee and The People's Government of Liangshan Yi Autonomous Prefecture.

## 2.2. Research Methods and Research Process

The purpose of this study was to conduct some exploratory research on changes in the soundscape and its characteristics due to impacts from tourism development from the perspective of residents. Therefore, we decided on a qualitative research method. Qualitative analysis is a multidimensional method that uses both “interpretive” and “naturalistic” approaches to the subject [42]. In designing

qualitative research, experiential observations and interviews are mainly used. The former was conducive to understanding the basic situation of tourism development in the study area, while the latter allowed us to obtain the opinions of residents through field interviews to obtain firsthand empirical data.

*Interviewees:* From July to August 2018, a field survey was carried out in different villages in the Lugu Lake Scenic Spot, and 36 residents were interviewed in-depth using purposeful sampling. The logic and power of purposeful sampling lies in selecting cases with rich information for in-depth research, from which researchers can obtain many events that are crucial to the purpose of the research [43]. The Lugu Lake Scenic Spot covers a large area, and the development level of villages in the Scenic Spot is different. In order to better investigate the residents' perceptions of soundscapes in their living villages, we selected the interviewees who are indigenous without village mobility. The main villages in the Lugu Lake Scenic Spot entered an orderly tourism development period 10 years ago. Those residents who have lived here for more than 10 years would have a clearer perception of changes in the soundscape under the influence of tourism. Thus, we screened 29 interviewees, including local managers, tourism operators, farmers, teachers, and various practitioners (Table 2), based on the three conditions of "no village mobility", "being a local aborigine", and "having lived there for more than 10 years".

**Table 2.** Basic information on the interviewees.

The Village	Number	Gender	Age	Education	Occupation
Da Luoshui Village	1	Male	42	Primary school	Administrator
	2	Male	33	Technical secondary school	Restaurateur
	3	Male	45	University	Administrator in Nature Protection Department
	4	Male	24	Middle school	Homestay operator
	5	Male	41	Middle school	Administrator
Lugu Lake Town	6	Male	68	Middle school	Farmer
	7	Male	41	Technical secondary school	Village cadre
	8	Male	41	Technical secondary school	Project manager
	9	Male	34	Primary school	Staff of scenic administration
Xiao Luoshui Village	10	Female	25	Junior college	Primary school teacher
	11	Male	23	University	Student
	12	Male	40	Middle school	Skipper
	13	Female	55	No school experience	Rowing worker
Dazu Village	14	Male	56	Middle school	Retailer
	15	Male	72	Primary school	Homestay operator
	16	Male	36	University	Primary school teacher
	17	Male	45	Junior college	Primary school teacher
Langfang Village	18	Female	19	Middle school	Restaurant waiter
	19	Male	42	Technical secondary school	Homestay operator
	20	Male	44	Primary school	Driver
	21	Male	23	University	Photographer
Zhashi Village	22	Male	36	Primary school	Driver
	23	Male	50	No school experience	Farmer
	24	Male	27	University	Cadre of village committee
	25	Female	71	No school experience	Farmer
	26	Male	34	Graduate school	Monk
	27	Female	46	No school experience	Farmer
	28	Female	38	Middle school	Farmer
	29	Male	40	Junior college	Monk

*Interview outline:* The questions addressed aspects that were developed from the perspectives of perception, cognition, and attitude, such as the following: What sounds were often heard before tourism development? What sounds are often heard now? What impact has tourism development had on the soundscape environment? What is your attitude toward these sound changes? What is your favorite and most desired sound? The interviews were conducted in a semi-structured way to ensure that the content of the conversation was relevant to this research [44].

*Text coding:* With the consent of the interviewees, the interviews were recorded onsite, and the interview process was written down in detail to ensure the reliability and validity of the data. Each interview lasted about 20–45 minutes. The recordings were transcribed afterward. Because the interviewees mentioned some soundscape element words at a high frequency (extracted by a ROST CM6), three encoders used the QSR NVivo to classify and encode the interview materials, and a seven-point scale was used according to an evaluation index system to score the residents' perceived soundscape changes [45]. A score of "0" indicated that the respondent thought the soundscape elements in the village had not changed after tourism development. A score of "1", "2", or "3" indicated that soundscape elements had, respectively, somewhat, obviously, or significantly increased. Further, a score of "−1", "−2", or "−3" indicated that soundscape elements had, respectively, somewhat, obviously, or significantly reduced. Then, the average score was calculated to obtain trends in soundscape changes in each village.

### 3. Results

#### 3.1. Perceived Soundscape's Composition and Classification in the Lugu Lake Scenic Spot

In order to have a better understanding about the specific situation of residents' perceived soundscape changes, firstly, all sounds mentioned by the interviewees were extracted and classified as a basis for exploring the changes in the soundscape. ROST CM6 was used to extract high-frequency words related to sounds according to the number of times the words were mentioned by the interviewees (Table 3). Then, the three general components of the soundscape were characterized: biophony [46], geophony [16], and anthrophony [47,48]. The sounds perceived by the residents are indicated in Table 4.

**Table 3.** High-frequency words describing sounds perceived by the interviewees.

No.	High-Frequency Words	Frequency (%)	No.	High-Frequency Words	Frequency (%)
1	Tourists' noise	1.85	11	Sounds from bars	0.28
2	Mosuo language	1.38	12	Sounds of the bonfire party	0.25
3	Minorities' language	0.78	13	Sounds of dancing	0.23
4	Animal sounds	0.70	14	Dialect	0.21
5	Mandarin	0.51	15	Sounds of muntjac	0.20
6	Sounds of vehicles	0.42	16	Noise	0.18
7	Natural sounds	0.41	17	Sounds of leopards	0.18
8	Music	0.41	18	Sounds of wild ducks	0.17
9	Sounds of talking	0.29	19	Sounds of migrant birds	0.15
10	Singing	0.28	20	Sounds of machines	0.12

**Table 4.** Soundscape classifications perceived by the interviewees.

Soundscape Classification	Sound Sources	Sound Elements
Geophony	Natural sounds	Rain, wind, water, thunder, fallen leaves
	Birdsong	Wild ducks, cuckoos, seagulls, crows, magpies, swallows, sparrows, geese, white cranes, swans, sparrows, hawks, thrushes
Biophony	Wild animals	Muntjacs, river deer, leopards, wolves, wild boar, bears
	Bug buzzing	Cicadas, crickets
	Croaking of frogs	Frogs
	Domestic animals	Pigs, cattle, horses, sheep, dogs, chickens, ducks
	Tourists' noise	Bustling, footsteps, chatting
Anthrophony	Vehicles	Cars, motorbikes, trumpets
	Commercial activities	Karaoke, higglers, bars
	Machines	Tractors, pavers, loaders
	Folk songs	Mosuo folk songs, Tibetan songs, Naxi folk songs
	Dialects	Mosuo language, Naxi language, Tibetan
	Mandarin	Chatting in mandarin
	Other artificial sounds	Bells, chants, mobile phones, television, Lusheng, flutes

### 3.2. Characteristics of Soundscape Changes in the Lugu Lake Scenic Spot

Since commercial tourism development in Lugu Lake started in 1992, the components of the soundscape in this area, as perceived by residents, have changed significantly. Geophony has changed the least, biophony has been significantly reduced in general, and anthrophony has significantly increased.

#### 3.2.1. Perceived Geophony Had no Obvious Changes

All sounds made by geophysical phenomena such as rain, wind, and flowing water make up geophony, which is mainly affected by the terrain, weather conditions, and climate change of an area [49]. Among the geophony sounds perceived by the residents, the most mentioned was the sound of running water. The Lugu Lake Scenic Spot is famous around the world for its lake. Local production and daily life are closely tied to the lake, so the sound of running water was the most perceptible element of geophony. In general, the impact of tourism development on geophony was very slight. Geophony is usually a background sound that can overlap, mix with, or be covered by other sounds [50]: under such circumstances, residents did not perceive obvious changes.

#### 3.2.2. Perceived Biophony Reduced Markedly

Biophony usually includes animals communicating between themselves or within groups, such as birds, frogs, insects, and mammals. In terms of bio-sounds, the sound elements perceived by residents were mainly birds, wild animals, livestock, insects, and frogs. After the Lugu Lake Scenic Spot entered the tourism development process, except for bird sounds and wild animal sounds in particular areas, there was a reduction in the other bio-sounds to a certain extent (Table 5).

**Table 5.** Averages for the biophony changes perceived by the interviewees.

Perceived Biophony	Villages	Da Luoshui	Lugu Lake Town	Xiao Luoshui	Dazu Village	Langfang Village	Zhashi Village	Overall Change
Birdsong	Areas near mountains and the lake	2.17	0.20	0.25	0.50	0.25	0.14	Increase
	Areas near the village	−1.67	−2.20	−0.25	−1.25	−0.75	−0.57	Reduction
Sounds of domestic animals		−0.33	−0.80	−0.25	−0.25	−0.25	−0.57	Reduction
Sounds of wild animals		0.33	0.40	0.25	0.25	0.25	0	Increase
Bug buzzing		−1.67	−1.60	−0.50	−1	−1	−0.29	Reduction
Croaking of frogs		−0.67	−1	−0.50	−0.75	−1	−0.14	Reduction

With the development of tourism, the local government has strengthened the protection of forests and animals in the lake area, deepened the implementation of an afforestation policy, and strictly forbidden cutting down trees and hunting birds or wild animals. As a result, wildlife in the forests and birds in the lake area have been protected, so residents hear more of their sounds. However, the habitat of birds has been affected by the construction and improvement of infrastructure in the village area and the expansion of human activities caused by tourism. The influx of tourists and the noise of human activities have also covered up the sounds of birdsong, which explains why there are now fewer bird sounds in the villages even through government policies have been protective.

*“When the tourism was not developed, there were fewer houses and people here, and the birdsongs were more than now, which refers to the place in the village; but now the birdsongs in mountains are more than before because the environmental protection was executed very well. We could go up to the mountain to shoot birds with slingshot and cut down trees for building houses before, but now we don’t. So, more birds are chirping in the mountains than before.”—Resident of Da Luoshui Village (No. 5)*

*“After the development of tourism, due to the protection measures, wild ducks are not allowed to be killed, so the sound of wild ducks and seagulls is similar to or even more than that heard before.”—Resident from Langfang Village (No. 19)*

While tourism has become a part of the livelihood of residents in the Lugu Lake, domestic animal sounds were also strongly perceived by residents, but with a gradual reduction. Residents who used to make a living on animal husbandry, farming, and fishing are now engaged in tourism business activities, so the number of domestic animals has decreased. Tourism has promoted local economic development, so instead of traveling with horses or plowing with cattle, nowadays most residents travel by vehicle and work using machines. One of the interviewees said, *“Now we use machines for production, and we don’t need livestock for labor, so we don’t raise them anymore. In short, the sound of cattle and horses is replaced by the sound of machines.”* —Resident from Zhashi village (No. 34)

### 3.2.3. Perceived Anthrophony Increased Significantly

Almost all respondents pointed out that the noise of tourists, cars, and business activities increased significantly after tourism development (see Table 6). Tourism has changed the sound environment of the Lugu Lake Scenic Spot, which used to be dominated by biological sounds and natural sounds. With the arrival of a large number of tourists, in order to satisfy their diverse needs, many bars and Karaoke were opened near the lake. The noise generated by these entertainment venues was of widespread concern to residents, with the majority of them stating that it was too loud. In addition to the noise from entertainment venues, hawking and other commercial activities have significantly increased, especially in Da Luoshui Village and Lugu Lake Town, where tourism development started the earliest.

*“It is very obvious that the sound of cars is more than before. I feel annoyed when I heard it. There used to be few cars here. Because tourism development has to meet the needs of tourists, some bars have been opened here. I think the noise of the bar is too loud. Opening a bar in this area is to pollute the sound environment “*—Resident from Lugu Lake Town (No. 7)

**Table 6.** Averages for anthrophony changes perceived by the interviewees.

Perceived Biophony	Villages	Da	Lugu Lake	Xiao	Dazu	Langfang	Zhashi	Overall Change
		Luoshui	Town	Luoshui	Village	Village	Village	
Tourists’ noise		2.67	2.40	2.25	1.75	1.75	0.14	Increase
Commercial activity sounds		2.50	2	1.50	2	1.75	0.14	Increase
Traffic noise		2.50	2.80	1.50	1.25	1.75	1.29	Increase
Mechanical sounds		0.33	0.60	0.25	0.75	1	1.57	Increase
Folk songs (for labor)		−1.17	−1.80	−0.50	−0.25	−0.50	−0.14	Reduction
Folk songs (for bonfire performances)		2.67	1.60	2.25	2	1.75	0	Increase
Mandarin		2.83	2.40	2.25	2.25	2.25	0.86	Increase
Dialects		−0.17	0	−0.25	0	−0.25	0	No change

The soundscape of folk songs presented a reverse trend after the development of tourism. The Lugu Lake Scenic Spot is inhabited by a large number of Mosuo, who created the “Rushing horse song”, the “Weaving song”, and other folk songs for use while doing labor. Singing these songs to each other was a way to entertain and amuse themselves while farming. After the development of tourism, most residents shifted from planting and animal husbandry to the tourism service industry, and the number of people working in the fields greatly decreased. The phenomenon of “singing in the fields and singing in the mountains” is now rare. Now, only older people can sing Mosuo folk songs, and young people seem to have forgotten this part of their cultural history. In contrast, folk songs during bonfire parties appeared more frequently in residents’ perceptions of tourism development. A bonfire party, which in the past was only held during a specific festival or ceremony, may now be performed every day. The increase in the singing and dancing sounds during the bonfire parties also means an increase in economic income for residents:



*“In the evening, people will sing and dance. Although it’s a little noisy, this is the sound of ‘making money’. In the past, we could only hear the barking of pigs, cows and dogs. Now we can hear the singing from the hotel, the music from bonfire parties in villages and the flute in performances. These sounds mean making money for me. I explained to everybody that this is the sound of tourists and also the sound of economic development. Think about what was your life when you only heard dogs and cows barking? Hasn’t your life changed for the better now?”—Resident from Da Luoshui Village (No. 1)*

After tourism development, the phenomenon of language conversion was very obvious and has manifested in an increase in the frequency of using Mandarin and the improvement of communication skills in Mandarin. Local languages and Mandarin have formed a symbiotic union. Local ethnic languages (such as the Mosuo language and Naxi language) complement and coexist with Mandarin: residents use ethnic languages when communicating with their families but switch to Mandarin when receiving tourists.

Although the frequency of using local languages did not change after tourism development, nonetheless, there have been arresting intergenerational differences in language usage. To be specific, the communication ability of the elderly (over 70 years old) has improved, and they now use Mandarin to carry out simple conversations with tourists. Young people aged 20–50 years old are the main group providing tourism services in the Lugu Lake Scenic Spot. They have the most frequent contact with tourists, and most of them can communicate fluently in Mandarin. Children learn Mandarin in school, but in order to maintain the foundations of their ethnic language, they are still required to communicate in ethnic languages after class and at home. On the whole, the complementary coexistence of local languages and Mandarin has become a peculiarity of the language soundscape.

### 3.3. Spatial Variations in the Soundscape in the Lugu Lake Scenic Spot

Soundscapes may vary temporally and spatially [51]. Since the stages of tourism development in each village are separated by time and different processes, forming an uneven spatial distribution of tourists in these villages, soundscape components and the extent of soundscape changes perceived by the residents also showed spatial differences. Zhashi Village is located far away from the core area of the Lugu Lake. There, tourism development has not been carried out systematically, and thus it is the least affected by its impacts. The residents’ perceptions of the soundscape, especially changes in anthrophony, were much lower here than in other villages. As a consequence, residents in Zhashi Village did not perceive noise from tourists and tourism business activities at all. In other words, Zhashi Village displayed an authentic sound environment dominated by natural and living soundscapes. As one respondent conveyed: *“The sound I hear now is similar to what I heard before. Tourism development of the Lugu Lake has no impact on us and tourists will not come to this village.”—Resident from Zhashi Village (No. 27)*

On the contrary, the other investigated villages are all located around the lakeside of the Lugu Lake Scenic Spot, and they have all felt the impacts of tourism. Therefore, although they were in different stages of the tourist destination life cycle, the residents of these villages could evidently perceive changes in the local soundscape. The development of tourism has significantly increased the anthrophony (e.g., tourist noise in these villages) and has changed the original sound environment, which was once full of natural sounds and dialects. The authentic soundscape has been replaced by a new tourism soundscape, which has resulted in natural sounds and living sounds being mingled with noises from tourist activities.

## 4. Discussion

### 4.1. Discussion of the Results

From the study results, it can be claimed that the Lugu Lake Scenic Spot has been undergoing tourism development since the late 1980s, and the regional soundscape has changed significantly

under the influence of tourism. Almo Farina has mentioned that along the gradient of increased human intrusion, geophony seems to not be affected, biophony shows a clear decrease, and finally, anthrophony increases [48]. This study verifies the theory of Almo Farina from the perspective of residents' perceptions. In terms of the components of the local soundscape, geophony has not shown obvious changes from the impact of tourism. Geophony does not follow any specific daily pattern [52] and is more closely related to weather conditions. It usually exists as a background sound that can overlap, mix with, or be covered by other sounds. Therefore, tourism intervention barely affects the geographic soundscape. After the development of tourism, the perception of biophony decreased significantly, mainly due to the noise permeating the area from tourist activities, vehicles, and commercial activities, which to some extent has covered up the sounds of insects, animals, and birds in the Lugu Lake Scenic Spot. Tourism development thus has had an impact on the local acoustic environment. While tourists should experience a normal reception, it is extremely important to maintain a quiet and comfortable acoustic environment surrounded by natural sounds.

The intervention of tourism has brought about significant changes in anthrophony. Singing traditional folk songs was an important way for Mosuo people in the Lugu Lake Scenic Spot to express emotions and communicate with each other in their daily life. Songs were improvised for the occasion, and they were also an integral part of ethnic culture. Hosts mainly present the essence of Mosuo culture to tourists in the form of singing and dancing. Nevertheless, with the development of tourism, traditional folk songs have been artificially modified for economic benefit. The psychological needs of tourists are catered to, as tourists seek unique destinations. Except for one or two old folk songs, most are newly fabricated.

On the one hand, the soundscape of folk songs has been embedded within processes of representation and reconstruction. Folk songs have departed from their real-life origins, transformed from a symbol of labor and recreation into a way to pursue private interests and attract tourists, gradually developing into stylized performances and staged authenticity. Once the commercialization of folk songs happened, this made their original cultural connotations cease to exist. On the other hand, as an important expression of local culture, this soundscape is an integral part of this tourist destination. Incorporating regional sounds into the construction of a tourist destination image and making soundscapes an important attraction of tourist destinations can not only shape tourists' sense of place but also increase their satisfaction [53]. The commercialization of soundscapes is the embodiment of tourism development and a window into ethnic culture. The "live presentation" and stage performances of this soundscape have made residents appreciate the cultural connotation and economic value of their local folk songs, triggering their desire to protect their cultural soundscapes. Compared to a fleeting visual experience, an auditory soundscape can remain for a long time [54], which is conducive to the formation of collective memory and the inheritance of a national culture.

The changes in the soundscape in the Lugu Lake Scenic Spot were reflected not only in the time differences before and after tourism development, but also in the spatial differences between villages with different levels of current development. In terms of spatial patterns, the villages not affected by tourism development and others in the Lugu Lake Scenic Area had different characteristics in terms of soundscape changes in the regional space. Meanwhile, no matter whether the tourism development of the destination was in the consolidation period or in the involvement period, as long as there were tourism elements involved, the composition of the soundscape and the local acoustic environment changed significantly, quickly impacting the living and production space (as perceived by residents). Under the influence of tourism, the visual landscape of a destination will undergo changes, which are sometimes instantaneous and abrupt, but which more often proceed in an orderly way and might be perceived gradually [55]. However, soundscapes present with rapid and significant changes after tourism development, marking a difference between soundscapes and visual landscapes. This question has been poorly conceptualized and has not been tackled within the extant literature.

In addition, soundscape changes brought about by tourism have caused residents to establish self-identity to a higher degree in terms of their national language and culture. When the traditional

languages and songs of this area have been faced with modern tourism, the voice of these ethnic groups has not been eroded and replaced. Instead, this has given birth to a further awakening of the cultural consciousness of the local people, causing them to recognize their own cultural value and strive to explore and display this value in the national soundscape. At the same time, most residents hold a positive attitude toward tourism development in the Lugu Lake. They expected to hear more tourist voices, even though it is noisy. They indicated that disturbances by tourists and the traffic noise brought by tourism are the sound of “making money”, representing local economic development and profitability. Due to the prosperity brought about by tourism, communication between the Lugu Lake Scenic Spot and the outside world is continually rising. Driven by these benefits, residents have begun to use Mandarin to communicate with tourists. Consequently, ethnic languages and regional dialects have gradually been diluted. The sounds that residents deeply want to preserve are national languages and songs, but the sounds they want to hear the most are the voices of tourists. Obviously, there is a certain internal conflict here. Therefore, our attention can be drawn to two different approaches in seeking a solution. First, in what way can we ensure the protection of the soundscape ecology in the region while advancing tourism development is worth consideration. Second, how to balance the change and invariability of tourist sounds and national sounds is also an essential issue. The soundscape should be given full attention as an integral part of a tourist destination. Only by effectively protecting the local sounds of nature and culture, and by avoiding serious damage to the soundscape and disturbances to the normal life of residents can we promote the sustainable development of tourist destinations.

Based on the theoretical analysis and empirical research, this study explored the mode and mechanism of changes in the soundscape under the influence of tourism, which not only expands the paradigm of multi-sensory research in tourism, but also provides a new theoretical perspective for tourism impact research. In this study, the method of qualitative research was adopted and we coded the interview materials by three encoders. However, in qualitative research, the reliability and validity of coding will be biased due to the subjective thoughts of the coder, which might become a weakness of the selected methodology. We compared the coding results of three coders to ensure that the final results were more objective. Tourism increases wealth and opportunities for cultural assimilation, both of which are potentially important drivers of social change and changes in the landscape [56]. The development of tourism has changed the soundscape of the Lugu Lake Scenic Spot, but it is noteworthy that tourism is encompassed within a larger social system. As a result, the impact of tourism is only one of the forces triggering a change in the soundscape of a destination, and it is difficult to completely separate this from other factors [57].

#### *4.2. Managerial Implications*

The findings of this research also signal the need for destinations to improve their management and marketing practices. An important practical implication is that the administration of the Lugu Lake Scenic Spot and other similar tourist destinations should attempt to attach importance to the protection and inheritance of local diverse soundscapes. Tourism development is resource-oriented and depends on specific attractions, including both cultural attractions and natural resources [58,59]. Therefore, we should pay equal attention to the natural soundscapes and the cultural soundscapes of tourist destinations. Proper planning should take into account the need to preserve and promote unique soundscapes such as typical geographical sounds, animal sounds, traditional folk music, and national languages. The administration should control the number of visitors and take space diversion in tourist activities during the peak periods of tourism, monitoring and adjusting the volume, frequency and time duration of various sound elements, so as to protect the conditions of this natural scenic spot as much as possible. Besides, the competitiveness of tourist destinations should include distinctive activities, such as interactive activities of residents and tourists [60]. It is necessary to select representative folk soundscapes for in-depth development. Through holding unique bonfire parties, singing and dancing performances, and other interactive activities, residents can actively participate

in the construction of tourism. It is more important to realize that the authenticity of the cultural soundscapes is dynamic under the influence of tourism, which requires us to fully consider residents' needs for the development of soundscapes and create tourism products that promote sustainable marketing for the tourist destination.

#### 4.3. Limitations and Suggestions for Future Research

Some limitations may be present in this research. For instance, we have not discussed whether soundscape changes vary depending on different types of tourist destinations, which will be the focus of follow-up research. Taking into account the gender bias of respondents, more attention must be paid to the relationship between gender differences and soundscape perceptions. Moreover, how to uncover the characteristics of the spatial–temporal changes of a destination's soundscape, combining tourists' perceptions and residents' perceptions, needs to be further discussed in future research.

### 5. Conclusions

In this paper, the Lugu Lake Scenic Area was selected as a study area. This study demonstrates the changes and characteristics of the area's soundscape under the influence of tourism from the perspective of residents, and the following conclusions were obtained: (1) Since the development of tourism, the components of the soundscape in the Lugu Lake Scenic Area have changed significantly. There were no obvious changes in the perception of geophony, but perceptions of biophony have decreased significantly. Meanwhile, perceptions of anthrophony have increased significantly since the development of tourism, which is of wide concern to residents. (2) Impacts from tourism have caused a commercialization of the soundscape in the Lugu Lake Scenic Area, and the representation of folk songs has changed, which has also stimulated local residents to protect and preserve the national soundscape. (3) In terms of spatial patterns, residents' perceptions of the characteristics of soundscape changes were different between Zhashi Village, which has not been affected by tourism development, and the villages that have been affected by tourism development, including Da Luoshui Village, Lugu Lake Town, Dazu Village, Xiao Luoshui Village, and Langfang Village. While acknowledging that more efforts in conceptualization and empirical evidence are needed, this paper argues that the transition of soundscapes is set on the tourism research agenda, posited as being vital for protecting and designing overall destination sound environments. This research also provided a new perspective for the development practices of tourist destinations, with significant guidance for soundscapes conservation and management.

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