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Tourism-Related Facility Development in Sagarmatha (Mount Everest) National Park and Buffer Zone, Nepal Himalaya

Yujie Sun [1,*] and Teiji Watanabe [2]

[1] Graduate School of Environmental Science, Hokkaido University, Sapporo 060-0810, Japan
[2] Faculty of Environmental Earth Science, Hokkaido University, Sapporo 060-0810, Japan; twata@ees.hokudai.ac.jp
* Correspondence: cherrysunyujie@eis.hokudai.ac.jp

Abstract: The increase in the number of tourists to mountain regions poses both opportunities and challenges for sustainable mountain development. In order to achieve sustainable development, it is essential to examine societal, landscape, and population transformation in mountain regions. This study explores transformation in the context of the tourism-related facility in Sagarmatha National Park and Buffer Zone (SNPBZ) of Nepal as an example of the Himalayan region. Questionnaire surveys targeting the owners and managers of tourism-related facilities and interview surveys with various community leaders, officials, and school principals were conducted in the park in 2017–2019. Both surveys show that the types, ownership, distribution, and capacity of facilities in the park have been transformed. Growth of tourist numbers, improvement of porters' accommodation conditions, and migrant labor are the main factors driving the transformation. Tourism has also induced imbalanced development and unequal benefits among the villages in the park. The findings suggest that diversification of trekking routes and facility and service quality improvement could help to mitigate imbalanced development and unequal benefits. The in-depth examination of the transformation of tourism-related facilities augments the knowledge of the dynamic changes of facilities in mountain regions, which is vital for sustainable mountain development.

Keywords: mountain region; facility status transformation; imbalanced tourism development; unequal benefits; sustainable tourism; Sagarmatha National Park and Buffer Zone (SNPBZ)

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1. Introduction

Rural areas have long been regarded as suitable locations for tourism, which has been an economic contributor to the areas [1]. The rapid development of tourism has brought extraordinary changes in rural areas' economic, social, cultural, and environmental conditions [2]. Many rural areas are experiencing landscape changes generated by rural tourism [3]. Over the past four decades, rural economic development, rural settlement patterns and communities, population, migration, and social structure have been identified as the traditional concerns of rural geographers [4]. Recent studies have shifted from the physical form of rural settlements to the social dimensions of the rural community [4]. However, little analytical and exhaustive research has been conducted on the relationship between the imbalanced social composition of rural areas, the spatially uneven development of tourism, and the problematic relationship between the two [5]. Further, the review of previous works has shown considerably less research relating to developing countries [1].

Mountains, characterized by fragile and dynamic environments, are home to rural indigenous communities [6] and have long been widely indispensable as places of important cultural significance [7]. Thus, nature and culture-based tourism have prevailed as economic pathways for rural communities in mountain areas [8,9]. Many mountain regions have fostered tourism development to boost their economies through

the provision of direct income and employment opportunities to local residents [10]. Thriving mountain tourism has also accelerated built-up expansion to accommodate many tourists, leading to the modification of the rural landscape [5]. Studies have explored tourism-induced changes in the features and functions of rural settlements [5,10–13]. However, these studies offer limited investigation and analyses about the underlying processes and challenges of the resultant growth of different types of tourism-related facilities and distribution patterns. Mountain tourism is unevenly distributed globally, and its benefits are unequally scattered from the local to the national level [7]. This often results in limited community engagement in tourism development [14–16]. In Turkey, although tourism has accelerated economic growth, it has also resulted in imbalanced development between coastal and remote regions [17]. In the tourism service-dependent states of the USA, patterns and trends of income disparity have been observed [18]. In central Botswana, residents of the Serowe village have greater decision-making power due to the village's advantage in population size and gain more than those in other villages surrounding Khama Rhino Sanctuary Trust [19]. In Huang Shan Scenic Park of China, tourism has widened the income gap within buffer communities, although it has also stimulated regional development [20]. Such imbalanced development and unequal benefits matter, as they affect poverty reduction, social cohesion [21,22], political stability, and other aspects of social development [23], which might subsequently affect future tourism sustainability. Moreover, [24] pointed out that research in sustainable mountain development is insufficient, with limited knowledge provided on the different drivers of mountain ecosystems or human migration to and from mountain regions. Tourism is the primary source of foreign exchange and revenue in Nepal [25]. The magnificently disparate natural landscape and rich cultural heritage have promoted the rapid development of tourism in the country. Since foreigners were first allowed to visit Nepal in 1951, the number of tourists has increased significantly, from 9526 in 1964 to 1,197,191 in 2019 [25]. Trekking and mountaineering are the leading tourist activities in Nepal; the total number of trekkers and mountaineers to the country was 197,786 in 2019 [25]. Sagarmatha National Park and Buffer Zone (SNPBZ) (Figure 1), one of the top trekking destinations in Nepal, had the third-largest number of tourists in 2019 [25].

Since the first arranged commercial trek started in the Everest region (current SNPBZ area) in 1966, mountaineering and trekking activities have flourished, bringing far-reaching social and environmental changes to SNPBZ [26–31]. Local people residing in the region are mainly Sherpas, and their participation in tourism has led to remarkable changes in their lifestyles [32]. Furthermore, [32–36] discussed the impact of tourism on mountain residents' cultural values and lifestyles.

Wealth derived from tourism is retained mainly by a small number of Sherpa families in SNPBZ [10]. The distribution of tourism benefits is unequal among local Sherpas and between local Sherpas and other ethnic groups [32,36,37]. Uneven power structures and income differences at the village level are obstacles to executing rural development plans in the park [10]. Moreover, [20] noted that sustainability on different scales is important in forming sustainable development in a certain area. However, no detailed suggestions have been provided to date for mitigating imbalanced development and unequal benefits in the park.

Tourism-related facilities have flourished with an increasing number of tourists in SNPBZ. There has been a proliferation of shops and teashops serving snacks and lunch for tourists and porterhouses serving meals for trekking guides and porters along the trekking routes [30]. Although some previous studies have discussed changes and growth of settlements in SNPBZ [10,38], there is little comprehensive knowledge on the diversification, management, and ownership of tourism-related facilities. Furthermore, there is insufficient explanation of the factors that drive facility development changes and the challenges pertaining to the unequal distribution of tourism income.

Thus, this study aims to (1) examine the current status of tourism-related facilities in terms of their types, management, distribution, growth, capacity, and plans for future expansion in SNPBZ; (2) analyze the impact of the development of tourism-related

facilities on local communities; and (3) investigate the factors contributing to the diversification of tourism-related facilities. Moreover, it intends to yield a more up-to-date understanding of the evolution and present status of tourism-related facilities and the imbalanced development and unequal benefit distribution in SNPBZ through answering the following research questions: (1) what are the tourism-related facilities in SNPBZ and who manages them?; (2) how are tourism-related facilities distributed in the park and what factors influence their distribution?; and (3) what types of problems have been induced by tourism-related facilities and what measures could be taken to mitigate these challenges?

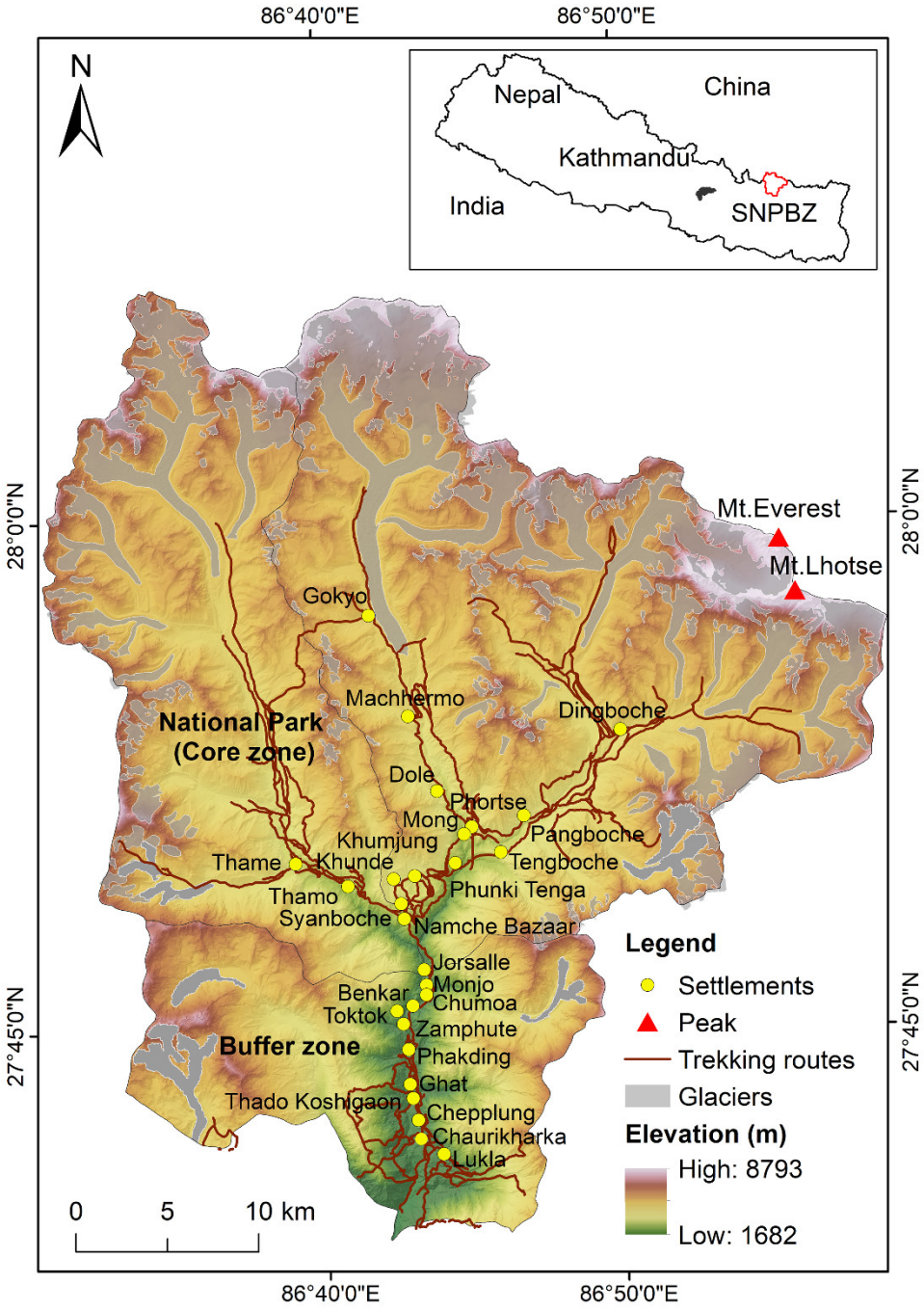

Figure 1. Study area.

By investigating the three analytical points and answering the three research questions, this study enhances the literature of the case studies of international tourism-

induced rural landscape changes in developing countries. In addition, the results deliver an efficient basis for creating sustainability in remote and isolated areas.

2. Study Area

Established in 1976, the park (Figure 1) was declared a World Heritage Site in 1979 for its prominent natural and cultural resources [32]. Located in the world's highest ecological system, the core zone of the national park area covers about 1148 km². The southern area of the park is adjoined by a 275 km² buffer zone created in 2002. The landscape incorporates mountains, glaciers, and rivers, ranging from 2800 to 8848 m. In 1953, the first successful summit of Mount Everest (Qomolangma) made the area famous among international mountaineers and explorers [39]. However, it was difficult to visit the park in the 1950s. When the Lukla airstrip was built in 1964, conditions changed remarkably [40]. Trekking and mountaineering activities are usually conducted in spring and fall. The number of tourists to SNPBZ increased from 5836 in 1980 to 52,424 in 2019 (Figure 2). Tourists visiting SNPBZ are principally international tourists from UK, USA, Japan, Germany, and Australia [40,41]. These tourists cover all generations varying from 20 to 60 years old [40]. They travel primarily in organized groups. Due to the limited transportation facility, porters and livestock usually carry group tourists' luggage (Figure 3). Almost all tourists stay in lodges. They visit SNPBZ primarily for trekking, enjoying the scenery, and viewing Mount Everest [41].

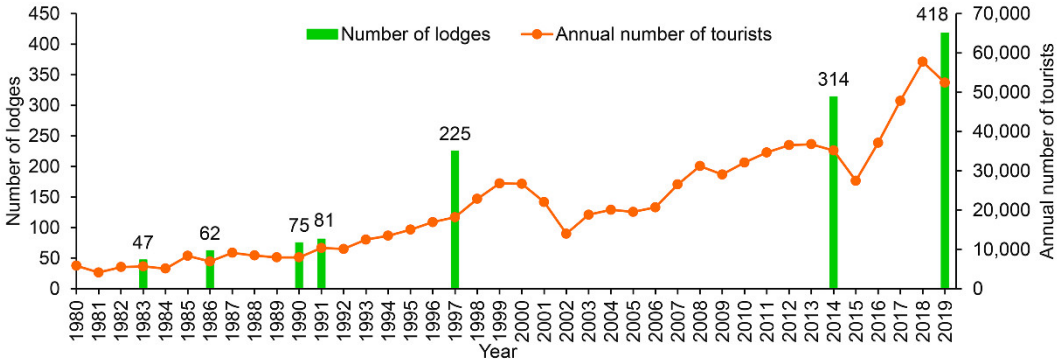

Figure 2. Number of lodges in SNPBZ and the annual number of tourists to SNPBZ. Sources: Developed by the authors based on [25,30,42,43]; SNP Jorsalle Entry Point, November 2017 and May 2019; and field survey.

Figure 3. Porters and livestock carrying tourists' luggage in the park (Photograph was taken by Y.S. on October 19, 2018). SNPBZ is administratively part of the Solukhumbu District. The human population in the park increased from 3465 in 1991 to 7161 in 2011 [44,45]. Sherpas dominate the population, followed by Rai, Tamang, and other ethnic groups. The main settlements are Namche Bazaar, Khumjung, Khunde, Phortse, Pangboche, Thame, and Dingboche. Lukla is the entrance village to the park, and Namche Bazaar is the park's administrative, commercial, and tourist center.

Sherpas began to set up tourism enterprises in the late 1960s, and 15% of the families ran family lodges or shops in the mid-1980s [36]. The first shop was opened in Namche Bazaar in 1967 [10], and by the spring of 1991, 21 shops were operating there [43]. The first Sherpa lodge was constructed near Namche Bazaar in 1971 [36]. A boom in lodge development was observed in the 1980s [43]. Many Sherpas have rebuilt their houses into lodges and shops to accommodate the increasing number of tourists, which has brought notable changes in the expansion of the built-up areas [10]. Lodges have become an increasingly important part of the local economy [30]. There were 418 lodges in the park in 2019, when the field survey was conducted.

3. Methods

This research implements a case study approach to examine rural landscape changes induced by tourism and the implied transformation's contributing factors and challenges [11]. Case studies are vital in exploring one or more bounded systems over time through multiple sources of information to obtain a thorough understanding of individuals and communities in their natural settings [46]. SNPBZ was selected because of the authors' familiarity, the importance of tourism in the region, the rapid increase in the number of tourists visiting the park, and its topography that allows people to enter into the national park area through one route, which enabled us to understand the accurate picture of peoples' mobility. These criteria are helpful to select an area characterized by a sufficiently important tourism activity so as to examine the manifold transformation of tourism-related facilities and their resultant challenges.

This study employed a mixed method to incorporate face-to-face questionnaire and semi-structured interview surveys to collect data in the field. As a quantitative method, the questionnaire has been largely used to investigate tourism-induced rural settlement changes [5,10–13]. A semi-structured interview is an extensive method to collect rich and detailed data which can provide a holistic understanding of the phenomena under investigation [11], and has been effectively practiced by previous studies about rural landscape changes and rural tourism [11,47]. Questions of the questionnaire and semi-structured surveys were adapted from [5,10,28], and further expanded to deepen the understanding of the evolution of tourism-related facilities in SNPBZ (see Supplementary Materials Tables S1–S3).

3.1. Questionnaire Surveys

This study prepared two forms of questionnaire surveys: one for lodges and another for other tourism-related facilities. The reasons lie that tourists mainly stay in lodges [40], and lodging facilities are the most important tourism-related facilities in SNPBZ [30].

Since there is no exact total number of tourism-related facilities in the park, this study referred to the most recent information on population size from the 2011 national census. In 2011, the total human population in the park was 7,161 [44]. Therefore, according to [48], when the confidence level is 95% and p=0.5, the supposed sample size for 7,000 people should be 378, while this study collected 536 sets of answers between November 2017 and June 2019 and tried to finish surveying all the facilities in each village to make sure the data completeness.

Questionnaire surveys were conducted face-to-face through purposive sampling from the buffer zone to the core zone. On the basis of an extensive literature review, questions were prepared in English. The questionnaire was reviewed by three researchers who had conducted research activities in the park for a long time. A pilot survey was carried out after the questionnaire was translated into Nepali with the help of two Nepalese researchers during the first fieldwork in March 2017. After the pilot survey, a final improved version of the questionnaire was prepared. Most of the target respondents were able to understand English; however, a well-trained research assistant who was familiar with the area and fluent in English was employed as an interpreter whenever the questionnaire survey was conducted. When respondents did not understand English, the research assistant interpreted the questions from English to Nepali and the answers from Nepali to English.

The targets of the questionnaire surveys were owners and managers of tourism-related facilities. The number of investigated lodges was 318, corresponding to 76.1% of the total number of lodges in the park in 2019. The questions contained in the two questionnaire surveys were almost the same, except that there was an additional part for lodge information in the questionnaire for lodges. The questionnaire for lodges consisted of 48 questions and was divided into four parts: lodge, household, personal, and tourism-related information. The questionnaire for other facilities included 29 questions and was divided into three parts: household, personal, and tourism-related information. Answers were collected on the types of facilities, ownership, capacity (lodge), and plans for future expansion (lodge). In the tourism-related information section, questions based on a five-point Likert scale were used to evaluate respondents' satisfaction with tourism in the park, and two multiple-choice questions about the perceived benefits and costs in the park were asked.

The gender ratio of the respondents was 55% men and 45% women (Table 1). Most of the respondents were aged 31–40 years (31.9%). Local Sherpas accounted for 48.7% of the sample. Most migrants (92.8%) had come to the park for job opportunities, while 6.8% had come for marriage and 0.4% had fled natural disasters.

Table 1. Demographic information of respondents (n = 536).

Variable	Category	Number of Respondents	Percentage
Gender	Male	295	55.0
	Female	241	45.0
	Total	536	100.0
Age (years)	Under 30	153	28.5
	31–40	171	31.9
	41–50	119	22.2
	Over 50	93	17.4
	Total	536	100.0
Ethnicity	Local Sherpa	261	48.7
	Local non-Sherpa	10	1.9
	Migrant Sherpa	51	9.5
	Migrant non-Sherpa	214	39.9
	Total	536	100.0

Source: Developed by the authors based on the questionnaire surveys.

3.2. Interview Surveys

Semi-structured interviews were conducted either in Nepali or English with 12 local community leaders, 5 national-park officials, and 2 school principals between 2017 and 2019. The obtained information concerned the history of tourism development, national-park management policies and plans, attitudes toward current tourism development, perceived benefits, and costs in the park.

3.3. Data Analysis

This study distinguished respondents' origin based on two categories: locals and migrants. Locals are those originally resident in SNPBZ, while migrants are from outside the park. Moreover, this study classified tourism-related facilities into four categories: lodges, shops, teashops, and porterhouses. Lodges are accommodations where tourists can stay overnight, sleep, and eat food; shops sell various goods; teashops serve drinks and food to tourists and residents (e.g., restaurants, cafés, and pubs); and porterhouses (Figure 4) generally offer food and accommodation to porters and trekking guides. Table 2 shows the number of respondents from each type of tourism-related facility.

Table 2. Surveyed facilities (n = 536).

Category	Buffer zone	Core zone	Total
Lodge	136	182	318
Shop	36	65	101
Teashop	36	28	64
Porterhouse	25	28	53
Total	233	303	536

Source: Developed by the authors based on the questionnaire surveys.

Figure 4. One porterhouse in Phakding (2640 m) (Photograph was taken by Y.S. on November 14, 2018).

This study classified these types of facilities into three categories: owned, bought, and rented. "Owned" refers to facilities built by the respondents themselves and managed either by themselves or by employees; "bought" refers to facilities purchased by respondents and managed either by themselves or by employees; and "rented" refers to rented facilities. This study analyzed data from the buffer zone and core zone separately when necessary. Data were analyzed using SPSS, version 25. A Chi-square test was performed to analyze the relationship between altitude and distribution of facilities. Results are mainly descriptive, intending to analyze key processes of tourism-induced changes in management, ownership, growth, and distribution of facilities.

4. Results

4.1. Types of Tourism-Related Facility Ownership

The results of the survey showed that shops, teashops, and porterhouses were mainly rented in both zones (Table 3). Lodges were mostly owned in both zones, with a higher percentage in the core zone (80.2%). In total, 14 facilities were bought, among which 12 (85.7%) were in the buffer zone.

Table 3. Types of facilities (n = 536).

Variable	Category	Type of Facility		
		Owned (%) (n = 275)	**Bought (%) (n = 14)**	**Rented (%) (n = 247)**
Buffer zone	Lodge (n = 136)	66.2	7.4	26.5
	Shop (n = 36)	19.4	2.8	77.8
	Teashop (n = 36)	33.3	0.0	66.7
	Porterhouse (n = 25)	4.0	4.0	92.0
	Subtotal (n = 233)	47.2	5.2	47.6
Core zone	Lodge (n = 182)	80.2	0.5	19.2
	Shop (n = 65)	7.7	0.0	92.3
	Teashop (n = 28)	35.7	3.6	60.7
	Porterhouse (n = 28)	14.3	0.0	85.7
	Subtotal (n = 303)	54.5	0.7	44.9
Total (n = 536)		51.3	2.6	46.1

Source: Developed by the authors based on the questionnaire surveys.

The survey results also showed that owned facilities were the highest in number, at 275 (51.3%), followed by rented facilities at 247 (46.1%) and bought facilities at 14 (2.6%) (Table 3; Table 4).

Table 4. Ethnicity of surveyed facilities' owners and managers (n = 536).

Variable	Category	Ethnicity			
		Local Sherpa (%) (n = 268)	**Local Non-Sherpa (%) (n = 12)**	**Migrant Sherpa (%) (n = 47)**	**Migrant Non-Sherpa (%) (n = 209)**
Owned facilities	Lodge (n = 236)	89.0	1.3	3.8	5.9
	Shop (n = 12)	16.7	8.3	16.7	58.3
	Teashop (n = 22)	54.5	18.2	0.0	27.3
	Porterhouse (n = 5)	100.0	0.0	0.0	0.0
	Subtotal (n = 275)	83.3	2.9	4.0	9.8
Bought facilities	Lodge (n = 11)	45.5	0.0	18.2	36.4
	Shop (n = 1)	0.0	0.0	0.0	100.0
	Teashop (n = 1)	100.0	0.0	0.0	0.0
	Porterhouse (n = 1)	0.0	0.0	0.0	100.0
	Subtotal (n = 14)	42.9	0.0	14.3	42.9
Rented facilities	Lodge (n = 71)	31.0	0.0	16.9	52.1
	Shop (n = 88)	5.7	1.1	12.5	80.7
	Teashop (n = 41)	9.8	0.0	19.5	70.7
	Porterhouse (n = 47)	4.3	2.1	10.6	83.0
	Subtotal (n = 247)	13.4	0.8	14.6	71.3
Total (n = 536)		50.0	1.9	9.1	39.0

Source: Developed by the authors based on the questionnaire surveys.

Regarding the ethnicity of the facilities' owners and managers, local Sherpas accounted for most of the owned facilities (83.3%), especially lodges (89%) (Table 4). The

14 bought facilities were purchased and managed mainly by local Sherpas (42.9%) and migrant non-Sherpas (42.9%). In terms of rented facilities, 71.3% were occupied by migrant non-Sherpas. Migrant non-Sherpas constituted most of the shop renters (Table 4). Overall, local Sherpas accounted for precisely half of the facilities' owners and managers (50%), followed by migrant non-Sherpas (39%). In total, the proportions of locals and migrants managing the surveyed facilities were 51.9% and 48.1%, respectively.

4.2. Distribution of Tourism-Related Facilities

The spatial distribution of the tourism-related facilities in SNPBZ is shown in Figure 5. Among the 536 surveyed facilities, 233 (43.5%) were located in the buffer zone and 303 (56.5%) in the core zone (Table 3). The results showed that there were more lodges in the core zone (Table 2). Furthermore, investigated facilities were mainly located between 2,600 m and 3,000 m ($X^2 = 60.473$, $p = 0.000$). Lodges were the dominant type of facility at all elevations (Figure 6). Among the surveyed 318 lodges, 42.8% were located in the buffer zone and 57.2% in the core zone (Table 2).

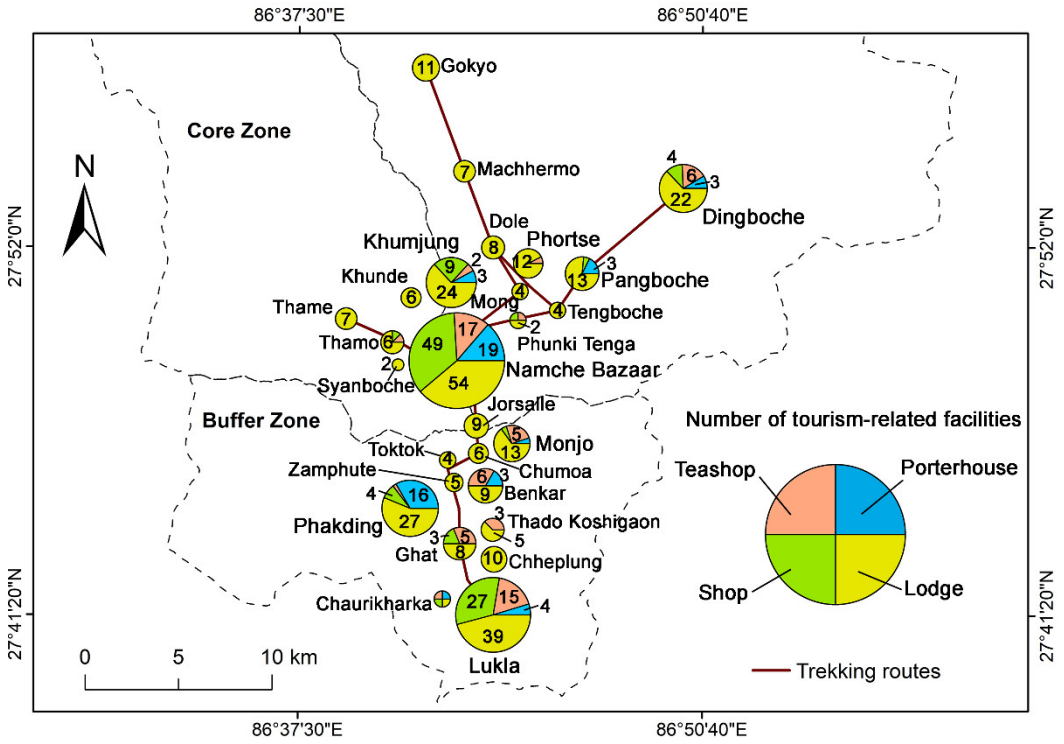

Figure 5. Spatial distribution of surveyed tourism-related facilities in villages in SNPBZ in 2019 (n = 536). Source: Developed by the authors based on the questionnaire surveys.

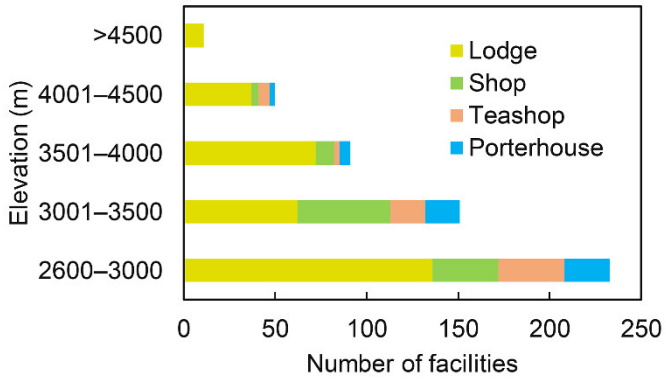

Figure 6. Elevational distribution of tourism-related facilities in 2019 (n = 536). Source: Developed by the authors based on the questionnaire surveys.

Namche Bazaar (Figure 7) had the largest number of facilities (139), followed by Lukla (85) and Phakding (48). Namche Bazaar also had the highest number of lodges (54), shops (49), teashops (17), and porterhouses (19). Villages in which tourists do not stay overnight had a smaller number of facilities, such as Zamphute (5) and Toktok (4), in the buffer zone.

Figure 7. Locations of lodges, shops, teashops, and porterhouses in Namche Bazaar (3450 m) in 2019. Note: L = lodge, S = shop, T = teashop, and P = porterhouse. Source: Developed by the authors based on the questionnaire and field surveys. Base image: Google Earth.

4.3. Development of Lodge Facilities

4.3.1. Increase in Lodge Numbers

The total number of lodges increased from 47 in 1983 [43] to 418 in 2019. Table 5 summarizes the growth of lodges in the major villages from 1997 to 2019. In the buffer zone, the total number of lodges in the studied villages doubled from 1997 to 2019. Lukla, at the entrance to the park, had the largest number of lodges in the buffer zone. The main

reason for this is that tourists usually stay at least one night in Lukla before flying back to Kathmandu. Villages that are not the main stops for tourists, such as Toktok, Thado Koshigaon, and Jorsalle, also experienced substantial increases in the number of lodges.

In the core zone, the total number of lodges increased by 81.8% (Table 5). There was no increase in Tengboche, because most of the land there is managed by the Tengboche monastery. Another exception is Thame (Figure 8), where the number of lodges decreased. The interview surveys suggested that two reasons led to this reduction. First, fewer tourists visited Thame than they did the Namche Bazaar–Dingboche and the Namche Bazaar–Gokyo routes. Second, some Sherpa families moved from Thame to seek either better living conditions or education for their children.

Figure 8. The largest lodge in Thame (3800 m) (Photography was taken by Y.S. on October 31, 2018).

Table 5. Growth of lodges in the major villages.

Village	Elevation (m)	Number		Growth Rate/ 12 Years (%)
		1997	2019	
Buffer zone (total)		69	141	104.3
Thado Koshigaon	2600	2	6	200.0
Ghat	2630	6	9	50.0
Phakding	2640	13	27	107.7
Chheplung	2660	5	10	100.0
Zamphute	2680	2	5	150.0
Toktok	2710	1	5	400.0
Benkar	2720	5	9	80.0
Chumoa	2790	4	6	50.0
Jorsalle	2810	3	9	200.0
Monjo	2820	5	13	160.0
Lukla	2850	23	42	82.6
Core zone (total)		99	180	81.8
Namche Bazaar	3450	32	54	68.8
Khumjung	3780	7	27	285.7
Thame	3800	9	8	−11.1
Phortse	3810	6	13	116.7
Khunde	3840	2	6	200.0

Tengboche	3860	5	5	0.0
Mong	3950	2	4	100.0
Pangboche	3985	10	15	50.0
Dole	4040	3	8	166.7
Dingboche	4310	10	22	120.0
Machhermo	4410	5	7	40.0
Gokyo	4750	8	11	37.5

Sources: 1997: [42]; 2019: by field survey.

4.3.2. Lodge Capacity

Lodge capacity data were collected for 302 lodges: 124 lodges in the buffer zone and 178 in the core zone. In total, there were 4569 rooms and 9029 beds (Table 6). There are two types of rooms: one with no bathroom, which is locally called a "common room," and the other with a private bathroom, which is called an "attached room." An attached room has either only a toilet or both a toilet and a shower. In both the buffer zone and the core zone, there were more common rooms than attached rooms. The average number of beds for a lodge in the buffer zone was 26.9, while that for the core zone was 32.

In the buffer zone, lodges in six villages did not have attached rooms while lodges in Lukla had the highest proportion of attached rooms (Table 6). Based on the fieldwork observation and interview surveys, those six villages with no attached rooms in the lodges were mostly used as lunch venues for tourists.

In the core zone, only three villages did not have attached rooms. Syanboche had the largest percentage of attached rooms because of the presence of a luxurious hotel (Hotel Everest View), which offers only such rooms. Namche Bazaar had the greatest number of rooms (1026) and beds (2036), followed by Dingboche and Gokyo. Although Khumjung had the second highest number of lodges, it had fewer rooms and beds. The largest lodge was situated in Gokyo, with 58 rooms and 116 beds.

Table 6. Data on lodge capacity (n = 302).

Village	Elevation (m)	Lodge Number	Total Rooms	Attached Rooms (%)	Common Rooms (%)	Bed Number
Buffer zone (total)		124	1717	24.1	75.9	3340
Thado Koshigaon	2600	5	28	0.0	100.0	56
Ghat	2630	8	63	6.3	93.7	126
Phakding	2640	27	523	31.7	68.3	1024
Chaurikharka	2650	1	4	0.0	100.0	8
Chheplung	2660	10	69	1.4	98.6	141
Zamphute	2680	5	68	17.6	82.4	90
Toktok	2710	4	31	0.0	100.0	57
Benkar	2720	8	72	0.0	100.0	139
Chumoa	2790	6	68	0.0	100.0	135
Jorsalle	2810	8	62	0.0	100.0	121
Monjo	2,820	13	243	28.8	71.2	483
Lukla	2,850	29	486	33.1	66.9	960
Core zone (total)		178	2852	19.7	80.3	5689
Phunki Tenga	3250	2	18	0.0	100.0	35
Thamo	3440	6	43	11.6	88.4	82
Namche Bazaar	3450	54	1026	28.5	71.5	2036
Khumjung	3780	24	214	10.3	89.7	423
Thame	3800	7	77	20.8	79.2	145
Phortse	3810	8	92	5.4	94.6	176
Syanboche	3830	2	24	75.0	25.0	48

Khunde	3840	6	51	13.7	86.3	101
Tengboche	3860	4	112	0.0	100.0	234
Mong	3950	4	31	0.0	100.0	62
Pangboche	3985	13	164	11.0	89.0	330
Dole	4040	8	140	2.9	97.1	280
Dingboche	4310	22	495	24.8	75.2	1004
Machhermo	4410	7	97	9.3	90.7	194
Gokyo	4750	11	268	15.7	84.3	539
Total		302	4569	21.3	78.7	9029

Source: Developed by the authors based on the questionnaire surveys.

4.3.3. Future Plans for Lodge Expansion

Among the 318 surveyed lodges, 62.3% (198) did not want to expand their lodges in the future, 19.8% (63) had plans to expand, and 17.9% (57) were uncertain (Figure 9). The main reason the respondents did not want to expand their lodges was the high cost of construction. Nowadays, the national park office allows one household to cut down only three trees when constructing new buildings. Thus, local people have to bring in timber and other construction materials from outside the park, such as the lower part of the Solukhumbu district and Kathmandu.

Lodges with expansion plans mainly wanted to increase the number of rooms, attached rooms, and dining space. Among them, 49.2% were in the buffer zone, with Lukla accounting for the most (29%). The rest (50.8%) were in the core zone, of which Namche Bazaar had the most (46.9%).

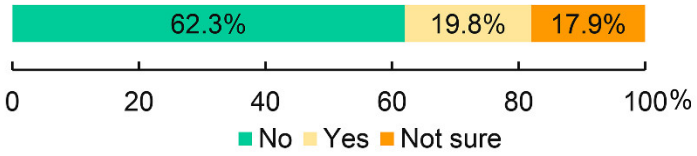

Figure 9. Plans for lodge expansion in the future (n = 318). Note: The survey was conducted between 2017 and 2019, before the start of the COVID-19 pandemic. Source: Developed by the authors based on the questionnaire surveys.

The results showed that 57 lodges were uncertain about expansion plans because they wanted to check whether the number of tourists would steadily increase. The survey results also indicated that some lodge owners were worried about the risk of losing money to increase the number of rooms if tourist numbers did not increase.

5. Discussion

This study proved the legacy of the past that tourism continues to shape further development in the lodge and other tourism-related facilities in SNPBZ. Previous studies only showed the changes of lodges in their features and functions [10]. In contrast, this study advances the understanding of different types of facilities in terms of their diversification in their ownership, management, regional and village level distribution. Furthermore, though previous studies have already revealed the leadership of Sherpa in commanding the lodging industry in SNPBZ [10,43], detailed percentage data were not provided. This study contributes to this data gap and reveals that the number of migrants accounts significantly in managing the facilities. The following part will thoroughly examine economic, environmental, and social factors contributing to the transformation of the facilities, imbalanced development, and unequal benefits, and will provide detailed recommendations to mitigate the challenges. These are important in understanding the social dimension of the region, broader comprehension of the implications of tourism development for rural settlements, and realizing sustainable mountain development.

5.1. Transformation of the Status of Tourism-Related Facilities

The results of the questionnaire surveys clearly showed that the types, quality, and management of tourism-related facilities in the study area have diversified. Migrants from outside the park searching for job opportunities have provided labor for managing facilities.

5.1.1. Diversification of Tourism-Related Facilities

Tourism fosters economic growth. Tourism-related facilities are diversified in their types, quality, and management in the park. Some of the factors contributing to the diversification of the facilities in SNPBZ include the increase in the number of tourists, improvements in conditions for accommodating trekking guides and porters, and social and cultural transformations among local Sherpas.

First, diversification was the result of an increase in the number of tourists (Figure 2). This finding is consistent with previous studies [10,30]. As stated previously, the number of SNPBZ tourists increased from 5836 in 1980 to 52,424 in 2019 (Figure 2). From 1997 to 2019, the number of tourists increased by 150%, while the total number of lodges increased by 85.8% (Figure 2). A 2007 tourist survey showed that tourists entering SNPBZ comprised 80 different nationalities in the fall and 74 in the spring [40]. Tourists were distributed across a wide age range, which indicates the need for diverse services and extensive quality standards [40]. Various types of facilities (Table 2, Figure 5), such as lodges with attached rooms (Table 6), restaurants with varied menus, cafés, pubs, and mountain equipment shops with superior quality products, have been developed to meet tourists' increasing service demands.

Second, the need to improve the accommodation conditions for trekking guides and porters in the park has contributed to facility diversification. The increase in tourists has created employment opportunities for thousands of trekking guides and porters [30]. Trekking porters usually carry tourists' luggage; however, another type of porter, the commercial porters who carry supplies for tourism-related facilities, has also increased significantly in number [49]. Previous studies have pointed out that porters and trekking guides have led to an increased demand for firewood and waste disposal, which might have posed an environmental threat [50,51]. This was because, in the past, trekking guides and porters usually stayed in tents and used firewood for cooking and heating. However, repeated field observations by the authors showed that porters no longer collect firewood. According to the interview surveys, porters began to be provided shelters in the park in the early 2000s. Nowadays, trekking guides usually eat and sleep in lodges with their customers, while porters and some local trekking guides tend to eat and sleep at teashops and porterhouses. Therefore, they do not need to prepare food or have their own heating sources, which has reduced firewood use and improved waste management. The development of numerous teashops and porterhouses (Table 2, Figure 5) meets the different requirements of tourists and contributes to environmental conservation in the park, although new types of garbage, such as pet bottles, are now left in hidden places [31].

Third, social and cultural transformations among local Sherpas are reflected as a factor contributing to diversification. This factor has been discussed by [52]. Recently, Sherpas have traveled overseas and imported new ideas and customs to meet tourists' desires and preferences, successfully blending tradition and modernity. Tourists to SNPBZ encounter western, Japanese, Chinese, and local menus. Various types of bakeries and pubs are scattered in different villages in the park. In the lodges, modern decorations are intermingled with traditional Sherpa objects.

5.1.2. Migrants' Involvement in Managing Facilities

The increasing number of tourists to SNPBZ has generated various employment opportunities for the locals. Previous studies [30] revealed that local Sherpas in the park had moved on from trekking staff positions and were performing more lucrative jobs, such as lodge owners and outside employment (e.g., owning a trekking company). A similar situation was also recognized in Australia by [53]: local labor was unwilling to be employed in low-paying and seasonal jobs. SNPBZ's tourism-related facilities have experienced significant transformation due to the involvement of migrants (Table 4). In the area, labor shortage in the tourism industry has been filled by immigrants. The significance of migrant labor in the hospitality industry has also been highlighted by [54].

5.2. Imbalanced Development and Unequal Benefits among Villages

The direct impact of tourism benefits among villages in SNPBZ is complex. Some villages, such as Lukla, Phakding, and Namche Bazaar, are more developed than others, such as Chaurikharka, Toktok, and Thame, owing to their location, pre-determined main stops along trekking routes, and well-developed facilities. Therefore, these developed villages accommodate more tourists, which translates to more economic benefits than that of the less developed villages in the park. The seasonality of tourism in the park and the intensity of tourist flow in time and space further deepen the imbalanced development and uneven benefits. Additionally, [36,43] showed the imbalanced development and unequal benefits induced by tourism among different villages and within the same village from as early as the 1990s. The interview surveys in this study indicated that facility location influenced benefits within the same village. Perceived development imbalances among villages (Table 7) could weaken social cohesion and become a severe impediment to future tourism growth [22]. For instance, in Huascaran National Park of Peru, the imbalanced involvement of local communities in tourism projects was shown to cause tensions among villagers [21].

Another factor responsible for the imbalanced development and resultant unequal benefits among villages may be the leading role of local Sherpas in the tourism industry of SNPBZ. The dominance of local Sherpas [10,32] in the field has resulted in power disparities and unjust social relations among the local Sherpas and between Sherpas and other ethnic groups [43]. This study demonstrated that local Sherpas dominate the ownership and management of tourism-related facilities (50%) (Table 4). A similar case has also been observed in the Annapurna region, where lodge ownership mainly belongs to a small number of powerful Gurung, Thakali, and Managi families who have dominated the tourism business and had an overwhelming advantage over decision-making in the region [5].

Table 7. Respondents' perceived tourism-led benefits and costs in the park (n = 536).

Category	Item	Number of Respondents	Frequency
Perceived benefits	Increased income from tourism	522	97.4
	Improved living conditions	472	88.1
	Park conservation	110	20.5
	None	7	1.3
Perceived costs	Imbalanced development among villages	365	68.1
	Restrictions of resource use in national park	110	20.5
	Crop losses caused by wildlife	100	18.7
	None	126	23.5

Source: Developed by the authors based on the questionnaire surveys.

5.3. Recommendations and Their Exportability

Tourism product diversification is crucial for the competitiveness and sustainable development of a particular destination [55]. Some potential tourism products in SNPBZ are cultural viewing, wildlife watching, and bird watching. Moreover, [26,40] found that tourists were often interested in other activities in addition to trekking in SNPBZ. Therefore, incorporating cultural activities and wildlife-related trekking routes may provide alternative attractions and maximize tourist experiences. First, the 19 public monasteries in SNPBZ might be used as cultural attractions. Second, traditional Sherpa festivals during the year can be considered to diversify tourism activities. For example, the Dumje Festival and the Losar Festival could provide good opportunities to attract tourists.

To promote cultural tourism, social media can be beneficial for spreading awareness of Sherpa culture and tourist attractions. The recent "Ding Zhen" effect in China is a successful case of using social media to raise cultural awareness [56]. Further, information about tourist attractions should be made readily accessible to tourists, contrary to the current practice where such information is mostly obtained from books or friends [26,40].

The less developed villages should improve facility and service quality to attract more overnight tourists. Furthermore, [26,40,57] indicated that diarrhea was a common problem that tourists encountered during trekking in SNPBZ. Clean drinking water, well-maintained toilets, and good hygiene in the park are top priorities that tourists want improved. Moreover, as shown in Table 6, some villages do not have lodges with attached rooms. Thus, to attract tourists, these villages should consider increasing the number of attached rooms to facilitate comfortability.

Mountain regions have their specific characteristics, including the difficulty of access and marginality [58]. For example, the topographic barrier of SNPBZ (Figure 10) does not allow people to access essentially except the only route through Lukla. This access route has an analogy with a port on a small island. Therefore, the proposed recommendations above can also be applied not only to other Himalayan regions (including Nepal, India, and Bhutan) with limited access routes, but also to isolated islands with a single port. For instance, Khaptad National Park in the far-western region of Nepal, with its excellent bird-watching resources and rich cultural and religious activities, has a limited number of tourists and popularity [25]. Thus, diversifying tourism products and promoting tourism by using social media can be the strategies for attracting tourists there.

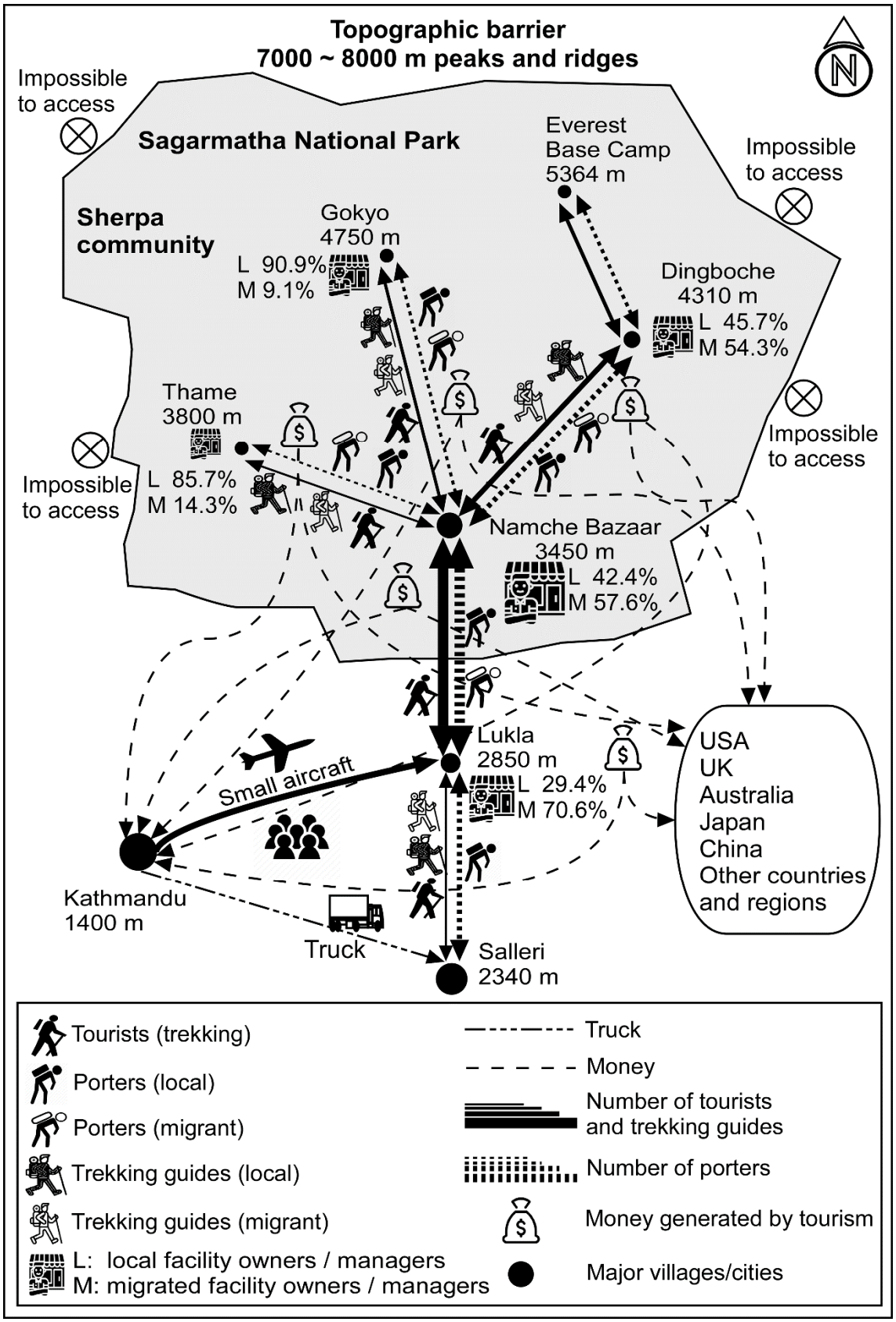

Figure 10. Mobility of people and money in Sagarmatha National Park. Note: The amount of money is unknown. Source: Developed by authors based on social survey.

6. Conclusions

Tourism has brought rapid development to the facilities in SNPBZ. Results of the social survey in this study indicate that the types of tourism-related facilities have been diversified in ownership and management. Migrant non-Sherpas (39%) have been greatly involved in managing the facilities, although local Sherpas (50%) dominate the tourism business in the area.

Tourism-related mobility in SNPBZ is largely constrained by the topographic barrier in the park. The movement of tourists, local people, and cash brought by tourism has produced far-reaching impacts on the transformation of the status of tourism-related facilities and imbalanced development and unequal benefits among villages in the park. The increase in the number of tourists, improved porter accommodation conditions, and higher levels of migrant labor have contributed to the transformation. To balance the development and benefits induced by tourism in SNPBZ, stakeholders, such as park managers, trekking agencies, and local organizations, should consider diversification of trekking routes to incorporate less developed villages. The diversified routes should consider residents' preferences, tourists' travel interests, and tourists' prior trekking experience. Although the diversification of the trekking routes may increase human imprint on the local landscapes and waste accumulation in the region, the increase in human imprint is beyond the focus of this study. Nevertheless, national park authorities and policymakers may consider the potential environmental issues to be brought by the increase in human imprint when the route diversification is developed. Such environmental issues can also be one of the directions of future research. Moreover, diversification of tourism products coupled with improved facility and service quality could help to mitigate further uneven development and unequal benefits in the park.

This study proceeds a step further from previous studies that explored the impact of tourism on changes in settlements by extending the research to the transformation of social dimension in rural communities. Understanding these processes of change is an essential issue for rural development and tourism planning. Moreover, it enriches the literature of rural settlements and rural tourism studies in the developing context. It also contributes to practical and detailed recommendations on how development endeavors could mitigate uneven development and unequal benefits in mountain regions and isolated islands.

Given the impact of the COVID-19 pandemic on international tourism, tourism activities in SNPBZ are likely to have been disrupted. The questionnaire surveys revealed that 63 lodges had plans for future expansion (Figure 9). However, this study is limited by not addressing the impact of COVID-19 on park tourism. The surveys were conducted before the COVID-19 pandemic; therefore, issues related to the expansion of tourism-related facilities in the park need to be re-examined. Further research on how to restore tourism activities in the park is also necessary.

Supplementary Materials: The following are available online at www.mdpi.com/article/10.3390/land10090925/s1, Table S1: Questionnaire for lodge owners/managers, Table S2: Questionnaire for other tourism-related facilities, and Table S3: Interview sheet with community leaders, national-park officials and school principals.

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