

# Impact of Covid-19 on Environment and Socioeconomic Aspects in a Rural Tourism Destination: A Case of Sikles, Nepal

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## Abstract

**Background:** Ecotourism focuses on the protection of flora and fauna, environmental management, poverty reduction, and economic enhancement. Many developing countries utilize it to integrate socioeconomic development with biodiversity conservation, promoting sustainable development. Due to lockdowns and travel restrictions brought on by the COVID-19 pandemic during 2020-2021, tourism was severely affected.

**Purpose:** This study examines the effects of the global pandemic on tourist visitation and socioeconomic at the community level in Sikles village of the Annapurna Conservation Area.

**Design/methodology/approach:** Eighty questionnaire surveys, two focus group discussions, and five key informants' interviews were conducted to collect primary data, along with secondary data on international tourist flow and revenue generated in Sikles. A 5-point Likert scale was used to assess the spillover impacts of the pandemic on different socioeconomic facets of the local community.

**Findings:** The result of the paired sample t-test shows no significant difference in the average annual income of the people involved in tourism before and during the pandemic in fiscal years 2075/76 and 2076/77 at  $p > 0.05$ , despite the pandemic. Unlike most cases, the income from tourism has not changed significantly, even during the pandemic in Sikles. This is because the locals took advantage of the lockdown to promote ecotourism destinations like Hugu, Kori, and Kaphuche on digital platforms, which in turn increased the domestic tourism flow in Sikles. However, there was a significant loss in the revenue collection by ACAP from international tourists.

**Conclusion:** The study concludes that, despite global tourism declines during the COVID-19 pandemic, Sikles maintained a stable tourism income due to strong local promotion of ecotourism sites, which boosted domestic visitation. However, ACAP faced significant revenue losses due to reduced international tourism, underscoring the need for diversified and resilient tourism and conservation strategies.

**Keywords:** Ecotourism, COVID-19 pandemic, rural destination, ACAP, crisis, livelihood, socioeconomic

# 1. Introduction

The tourism industry is considered to be one of the most dynamic economic sectors (Zenker & Kock, 2020). Many countries have managed to grow their economies through tourism activities, as it creates direct and indirect job opportunities, facilitates foreign currency exchange, and generates revenue (Gautam et al., 2022; Lamichhane et al., 2020). Among different sectors of tourism, ecotourism is one of the most important forms that prioritizes the environment, economy, and society (K C et al., 2025; Neupane et al., 2021). Globally, ecotourism has led to a more positive attitude among residents towards flora and fauna and protected areas (Acharya & Halpenny, 2013; Gautam et al., 2022). It has been utilized by many developing countries as a tool to integrate socioeconomic development with biodiversity conservation, thereby promoting sustainable development (Baral et al., 2012; Khanal, 2020).

Nepal is a land of wonders, despite its small geographical coverage. It boasts a great diversity in terms of landscape, nature, rich biodiversity, and a mystic indigenous culture and tradition (Lawaju et al., 2024; Shrestha et al., 2023). According to DNPWC (2025), 23.3% of the total country's land with these features is legally protected under the paradigm of parks, reserves, conservation areas, and buffer zones. Community-based homestays near protected areas offer a multitude of recreational opportunities, including hiking, nature walks, water-based activities, and wildlife viewing, in addition to exploring local culture (K C et al., 2025). According to the Government of Nepal, approximately 60% of international tourists visiting Nepal enjoy recreating near protected areas (DNPWC, 2025).

Ecotourism supports rural livelihoods by creating job opportunities and income-generating activities (Acharya & Halpenny, 2013; Baral et al., 2012). It supports the livelihoods of indigenous people living in rural areas and helps reduce poverty (Gautam et al., 2022; Lamichhane et al., 2020). On the other hand, it preserves the natural environment and local culture by providing economic benefits from these resources (Neupane et al., 2021; Shrestha et al., 2023). Therefore, ecotourism is a holistic approach that promotes the environment, economy, and social values. Due to the potential economic benefits of employment and income generation, many rural communities in Nepal are practicing ecotourism (Baral et al., 2012; K C et al., 2024). Among the various tourist destinations in Nepal, Sikles is a stunning destination within the Annapurna Conservation Area (ACA) located in Kaski, Nepal. It is predominantly inhabited by the ethnic Gurung community. This picturesque traditional village offers a stunning view of Lamjung village, Annapurna II, and is listed among the 100 most important tourist destinations in Nepal by the Government of Nepal (*The Kathmandu Post*, 2025).

Ecotourism destinations have been affected by various disasters throughout history. Among them, due to lockdowns and travel restrictions brought on by the COVID-19 pandemic from 2020 to 2022, tourism has been severely affected globally, regionally, and locally (K C et al., 2024). Due to this disastrous situation, the livelihood of indigenous people who depend on tourism revenue has been adversely affected in rural destinations (Nepal, 2020). Similarly, in Sikles, a significant number of local people who are directly and indirectly dependent on tourism activities were affected due to the cessation of almost all travel and tourism activities resulting from the lockdown. The Annapurna Conservation Area Project (ACAP) has been generating revenue from tourism, which is then used for conservation activities and community development. However, with closed borders and visa suspensions, it has incurred a significant loss in revenue collection from international tourists (Shrestha et al., 2023).

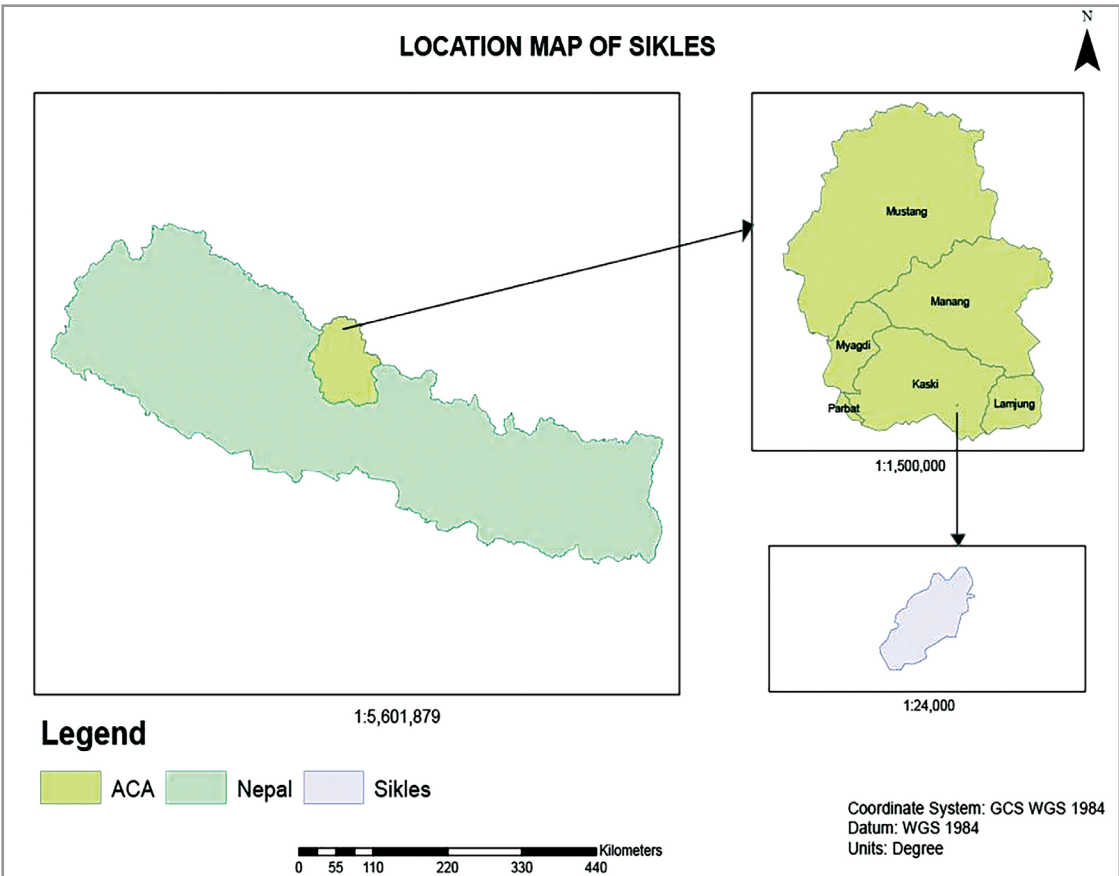
The global COVID-19 pandemic has not spared any sector with spillover effects (Lawaju et al., 2024). Nepal implemented a lockdown from March 2020 to July 2020 (the first phase, as a precautionary measure to control the rate of virus transmission). Closed borders and travel restrictions had caused a crisis in tourism throughout the country, which also had adverse economic impacts on tourism-dependent communities (K C et al., 2024; Poudel & Subedi, 2020). However, it has also given nature-based and adventure-based tourism destinations a chance to readjust (Nepal, 2020). The travel destinations had the opportunity to explore potential tourism products and activities, aiming to diversify tourism offerings beyond a single location and activity. In this context, this research assesses the ground reality of the

effects of the pandemic on the socioeconomy of one of the ecotourism-dependent communities inside the Annapurna Conservation Area. Furthermore, it examines the perceptions of tourism-dependent and non-tourism-dependent residents towards COVID-19, including its positive and negative aspects. This type of study is important for the sustainable development of rural tourism destinations, as it brings the ground reality of the pandemic's impact on different facets of the environment and socioeconomy.

## 2. Study Area and Methodology

The study was conducted in Sikles village, located in the Madi Rural Municipality of Kaski District (Figure 1). Among the various conservation units of the Annapurna Conservation Area Project (ACAP), Sikles is one of the seven conservation units. The ACAP, being one of the largest conservation areas in Nepal, spans an area of 7,629 square kilometers and supports a diverse range of flora and fauna (NTNC, 2025). It is managed through the direct involvement of local people in decision-making, conservation activities, and benefit sharing (NTNC, 2025). It follows the Integrated Conservation and Development Programme (ICDP) model, a pioneering conservation model in the developing world (Baral et al., 2012).

Figure 1: Location Map of Sikles



A descriptive approach is followed in this study, taking into account the views of stakeholders involved in the tourism development of Sikles. The primary data was collected in various sampling units. Slovin's formula was used to determine the sample size from the total number of households in the Sikles village. First of all, the number of total households in Sikles was taken from the ward office through a phone interview (which was 360). Then, the sample households for the research were selected from the formula given below, with a 10% margin of error.

According to Slovin's formula (1960)

$$n = N / (1 + Ne^2)$$

where n = number of samples to be taken

N = total households

e = margin of error

The total number of sample households calculated was 80. Among them, all the homestay operating households (20) and 13 hotel owners were purposively chosen, and 47 other households (58.75%) not involved in homestays and hotels were chosen randomly from the available list. The secondary data on international tourist flow was obtained from Nepal Tourism Statistics 2020 and UCO Sikles, along with the revenue generated from UCO Sikles and the Homestay Management Committee of Sikles.

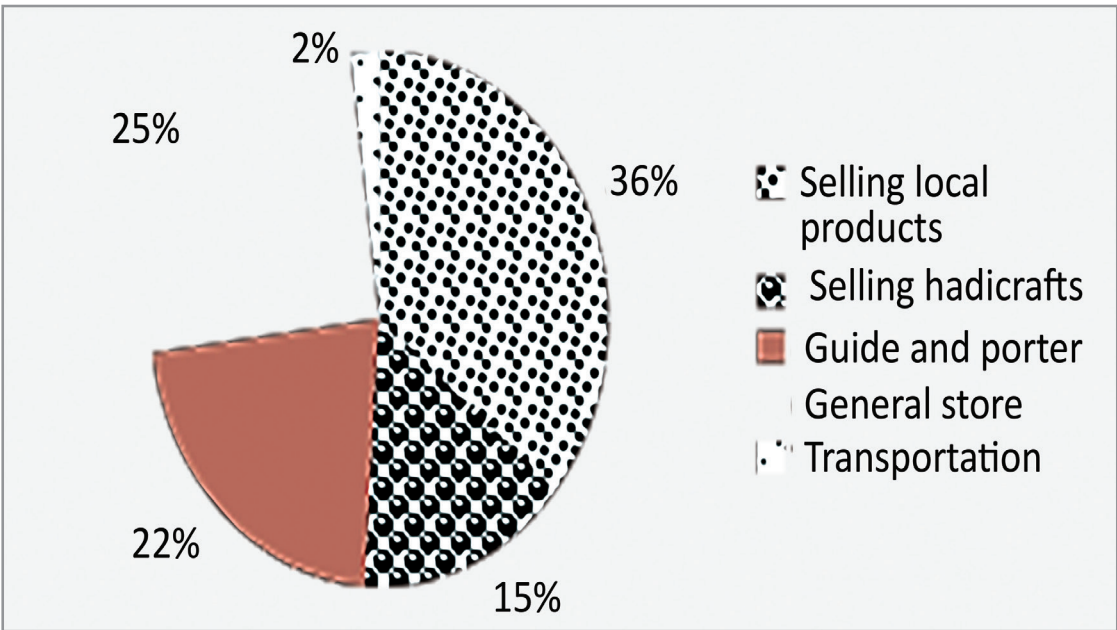
Both descriptive and analytical techniques were employed for data analysis. The qualitative data obtained through five key informant interviews (KII) and two focus group discussions (FGD) (with nine female hotel and homestay owners and five local leaders) were narrated and summarized through thematic areas to draw the conclusions on various effects of the COVID-19 pandemic on ecotourism and about ways to develop ecotourism in Sikles. KII respondents were homestay operators, hotel owners, and local leaders. The quantitative data obtained through the questionnaire survey were entered into a computer and analyzed using the Statistical Package for the Social Sciences (SPSS) and Microsoft Excel. The results were expressed using frequency, percentage, weighted mean graphs, etc.

### 3. Results and Discussion

#### Involvement of stakeholders in different tourism activities

The local people who own hotels and homestays in Sikles are involved in various tourism activities beyond accommodation services. A significant number of respondents (36%) are involved in selling local products, followed by 25% in running general stores, 22% as guides and porters, 15% in selling local products, and 2% in transportation services (Figure 2). It shows that ecotourism in Sikles has created various income-generating opportunities for local people (Acharya & Halpenny, 2013). Also, they are trying to diversify their income sources to sustain their income and livelihood (K C et al., 2021).

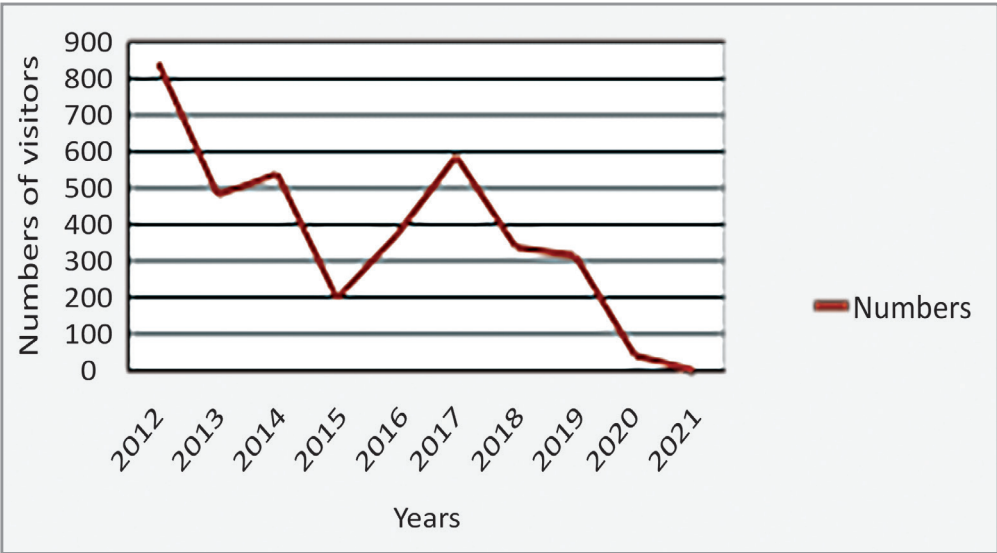
Figure 2: Involvement of local people in various tourism activities



### International Visitors Flow in Sikles

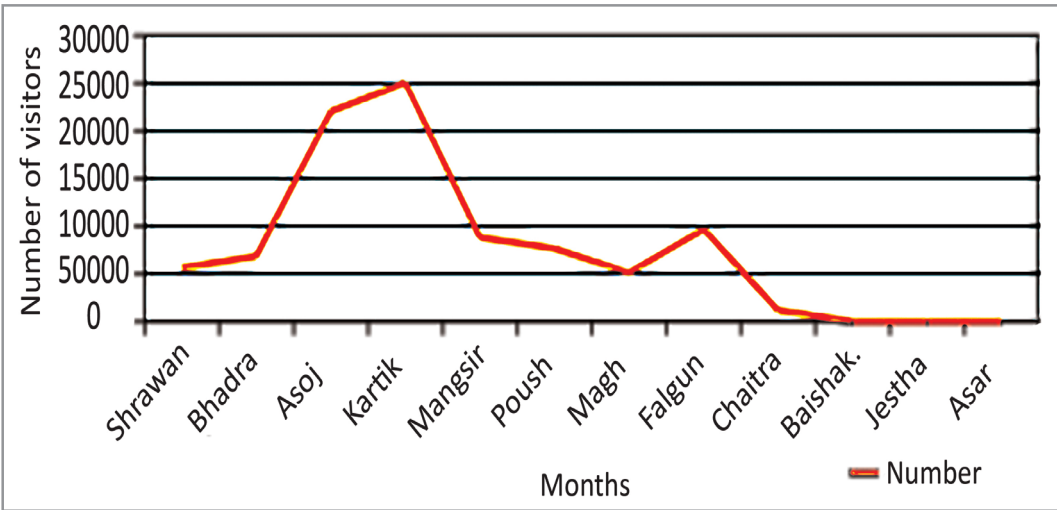
The line graphs show the flow of international visitors to Sikles over the last 10 years (Figures 3 and 4). It shows that the number of visitors in Sikles is in a declining trend, with a significant decline in 2015 (a 36.54% drop from the previous year) due to the earthquake. As of 2020, the number has drastically decreased by 87.27% compared to 2019, and there were no visitors in 2021 due to lockdowns and closed borders resulting from the COVID-19 pandemic. According to Nepal Tourism Statistics 2020, only the first three months of 2020 were open for arrivals. As a result, tourist arrivals in Nepal in 2020 were almost 80% (230,085) less than in the previous year, 2019 (MCTCA, 2021). The decrease in tourism numbers in different areas of Nepal during the COVID-19 pandemic was also mentioned by Khanal (2020) and Ulak (2020).

Figure 3: Flow of international tourists in Sikles in last 10 years



Source: UCO, Sikles ACAP

Figure 4 : Number of international visitors in ACA by months in Fiscal Year 2076/77

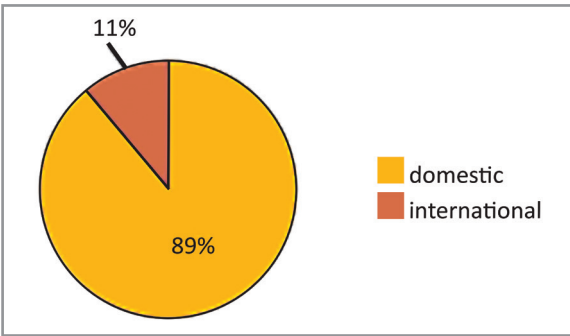


Source: Nepal Tourism Statistics 2020

Types of visitors in Sikles after the easing of lockdown in the country

The owners of the hotel and homestay were asked what percentages of their guests have been domestic and international during the pandemic. The results show that the percentage of domestic tourists received by hotels and homestays (i.e., 89%) is significantly higher than that of international tourists (i.e., 11%) (Figure 4). The result shows that the COVID-19 pandemic has a significant effect on the arrival of international tourists in Sikles due to travel restrictions and visa suspensions. The KII and FGD respondents have also expressed similar views towards domestic and international tourists arriving in Sikles. This tourism trend aligns with the findings of K C et al. (2024) and Khanal (2020).

Figure 4: Guest type received by hotels and homestays during pandemic



Socioeconomic impacts of the COVID-19 pandemic

Re spondents were asked to answer Yes or No to the following statements (Table 1). The results show that the majority of respondents from homestays (i.e., 80%) were afraid of COVID-19 when receiving guests; however, most hotels and homestays were open in Sikles after the easing of lockdown in the country. This is similar to what Poudel and Subedi (2020) mentioned. At the same time, the majority of the respondents from hotels (i.e., 76%) are concerned about safety and have been applying safety precautions before receiving guests. This is important to note, as the fear of disease transmission enhances hygiene and safety (Poudel & Subedi, 2020). About 45% of the respondents from homestays have been involved in other income-generating activities since the pandemic, while only 38.5% of the respondents from hotels are found to be involved in other sources of income generation. The KII and FGD respondents mentioned that it was easier for people involved in agriculture and animal keeping to get involved in these alternative income-generating activities than for homestay and hotel owners, as the former were mostly dependent on tourists for generating income. This supports the finding of Lamichhane et al. (2020) in Chitlang, Nepal.

Table 1: Perception of receiving guests during the pandemic

Statements		Hotel			Homestays		
		Yes	No	Total	Yes	No	Total
1.	Are you receiving guests after lockdown?	93.9%	6.1%	100%	95%	5%	100%
2.	Have fear of COVID-19 while receiving guests	69.2%	30.80%	100%	80%	20%	100%
3.	Have been applying safety measures before receiving guests.	76%	24.00%	100%	45%	55%	100%
4.	Have been engaged in other income-generating activities after the pandemic.	38.5%	61.50%	100%	45%	55%	100%

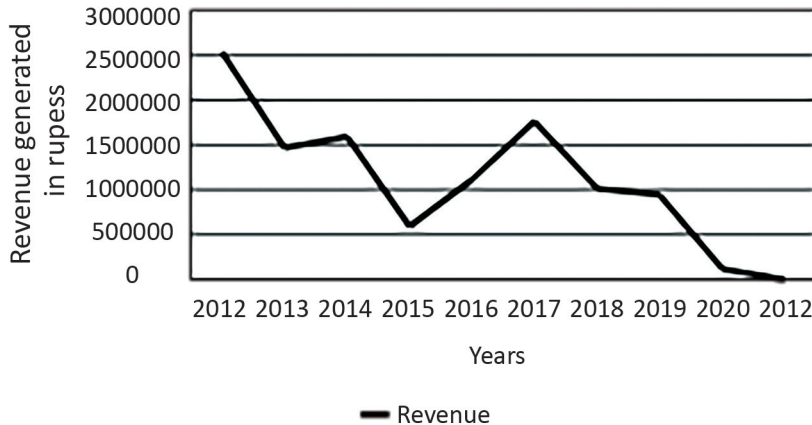


**Economic losses**

***Loss in revenue collection***

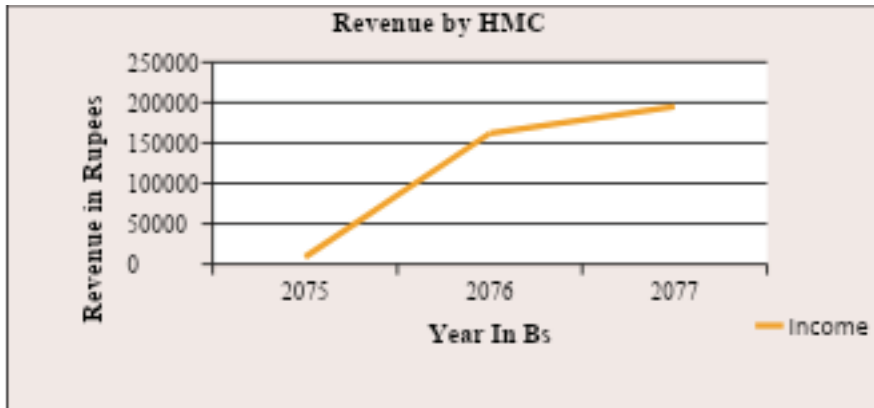
Figure 5 illustrates the revenue generated from international tourists in UCO Sikles, ACAP, over the past 10 years. It shows that the revenue generated in 2012 was the highest, while it was in a decreasing trend, with a significant fall in 2015 due to the earthquake. It then slowly escalated in the following years. However, after the COVID-19 pandemic hit the world, travel restrictions and lockdowns were imposed (Ulak, 2020). Due to this, the revenue collected by NTNC-ACAP in Sikles fell drastically by 87.37% compared to 2020. FGD and KII respondents also expressed similar views regarding revenue generated in Sikles. This finding is similar to that reported by Shrestha et al. (2023).

Figure 5: Revenue generated from international tourists in Sikles



Source: UCO, Sikles

Figure 6: Revenue collected by HMC, Sikles



Source: HMC, Sikles 2021

In contrast to the revenue collected by ACAP, the revenue collected by the Homestay Management Committee (HMC) in Sikles has continued to trend upward even after the pandemic hit the world (Figure 6). This is due to the increasing number of domestic visitors in 2076 and 2077. According to the views of key informant interview and focus group discussion respondents, the promotional campaign for potential ecotourism sites in Sikles, such as Kapuche Glacier Lake and Kori Hilltop, played a significant role in attracting domestic tourism to Sikles after the lockdown. This finding was aligned with that observed by K C et al., (2024). These days, social media and digital platforms are playing a significant role in promoting

a tourist destination and attracting domestic tourists (Dhungana, 2024).

**Loss in monthly income of the tourism operators**

A paired sample t-test was conducted to evaluate the effect of the pandemic on average annual income before and during the pandemic of the years 2076 and 2077, and it was observed that there was no significant difference in the average annual income before and during the pandemic at  $p>0.05$  with S.E ( $\pm 80070$ ) at 95% confidence interval (Table 2). It shows that the COVID-19 pandemic has had no significant effect on the income generated by ecotourism in Sikles. The main reason was the arrival of a higher number of domestic tourists than in previous years. As mentioned by Lamichanne et al. (2020), domestic tourists have been spending significantly more these days, thereby supporting the local income and livelihood of people involved in tourism. KII and FGD participants mentioned that during the 1st and 2nd phases of lockdown in the country, it was the off-season for tourism activities in Sikles, resulting in minimal loss. So, it is important to attract both domestic and international tourists for the sustainability of any tourism destination (K C et al., 2024).

Table 2: Paired Samples t-test of average annual income of the fiscal year 2075/2076 and 2077/78 before and after the pandemic

Std. Deviation	95% Confidence Interval of the Difference		t	Df	Sig. (2-tailed)
	Lower	Upper			
45997.382	-7977	318219.97	1.937	32	.062

**Perception of local people in the socioeconomic effects of the COVID-19 pandemic**

To understand people's perception of the effects of the pandemic on different socioeconomic facets of the community, questions based on a 5-point Likert Scale were used. Table 3 shows the weighted mean of the respondents for the given statements.

**Negative effects**

The pandemic has not spared any sector from its impact. FGD and KII respondents, along with survey respondents in Sikles, agreed with the statement that the rate of unemployment had increased in Sikles after the COVID-19 pandemic outbreak (Table 3). While they were moderate in the statement that loss in revenue collection retards community development. People perceived a moderate impact on the statement that the production of local goods in Sikles has decreased, as there was no market for them. The term "social distancing" has become common since the pandemic, which was hardly followed before it. There may be a change in the behavior of hosts when interacting with visitors (Zenker & Florian, 2020). In contrast to this statement, the tourism operators in Sikles disagree with the 2.60 weighted mean on a 5-point Likert scale. The loss of economic activity and halt in business due to the pandemic may discourage further investment in tourism (Khanal, 2020); however, the results show that people in Sikles are moderate in their agreement with this statement.

Table 3: Perception of negative effects of the pandemic

Statement	Weighted mean	Remarks
1. Increase the rate of unemployment in the village	3.64	Simply Agree
2. Loss in revenue collection retards community development	2.70	Moderate
3. Production of local goods decreased as there is no market	2.61	Moderate
4. Might change the host visitor relationship in the coming days	2.60	Disagree
5. Discourage further investment in tourism at Sikles	3.1	Moderate

**Positive effects**

Although the COVID-19 pandemic wreaked havoc in many sectors globally, there are still positive aspects



brought about by its impact. In Sikles, agriculture was a subsistence livelihood option for many people not involved in tourism (according to the view of KII and FGD respondents). This subsistence livelihood was similar to what K C et al. (2021) mentioned. The results show that respondents strongly agree with the statement that they found solace in traditional methods of income generation (Table 4). Since women play a significant role in running tourism businesses, they often remain busy (Acharya & Halpenny, 2013). However, the respondents agree with the statement that women involved in tourism have free time to learn new skills, as there is a lighter workload during lockdowns due to the reduced flow of tourists. There is a strong consensus among people that the pandemic has sensitized everyone to the importance of health and sanitation.

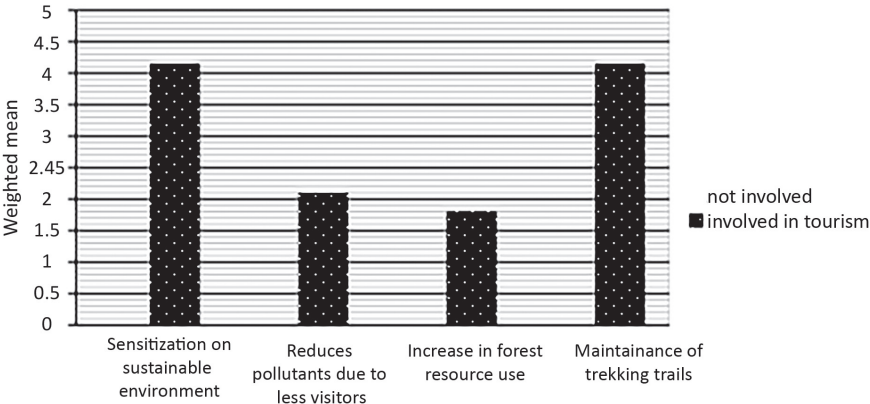
Table 4: Perception of positive effects of the pandemic

Statement	Weighted Mean	Remarks
1. Found solace in traditional methods of IGAs after the pandemic	3.82	Strongly agree
2. Women involved in tourism get free time to learn new skills, as there is less workload	3.52	Simply Agree
3. The COVID-19 pandemic sensitized people about health and sanitation	4.33	Strongly Agree

*Effect on Environment*

Several studies have shown that the pandemic had positive effects on the environment, as travel was restricted during lockdowns (Loh et al., 2022; Rutz et al., 2020). Even after the easing of lockdowns, there was a significant reduction in the number of people traveling during the pandemic, which in turn has reduced pollution caused by traffic. This has increased the frequency of encountering wild animals near settlement areas (Rutz et al., 2020). In the case of Sikles, there was strong agreement among people on the statement that the pandemic has sensitized locals to the importance of a sustainable environment (Figure 7). There was still disagreement among people about reducing pollution, even when tourism had ceased during the pandemic. FGD and KII respondents mentioned that local people were themselves contributing to solid waste pollution in the environment of Sikles. There was moderate agreement and disagreement in responses regarding the increase in use of forest resources after the pandemic among people involved and not involved in tourism, respectively. While respondents both involved and not involved in tourism agree that the trekking trails around Sikles are well-maintained during a pandemic. The pandemic has had some positive impacts on the environment (Loh et al., 2022).

Figure 7: Weighted mean on the environmental effect of the pandemic



The response of local people was moderate regarding the statement that ecotourism is the major source of

the local economy in Sikles (Table 5). They have a strong agreement on the statement that domestic tourism has to be promoted to minimize the economic losses from the pandemic in this region. The community people have a strong agreement that alternative income-generating activities should be ensured for the tourism-dependent community to minimize the crisis during a pandemic situation, as mentioned by K C et al. (2021). The views of KII and FGD participants also supported this. They solely rely on one source of income for their livelihood, which might be risky in a rural tourism destination.

Table 5: Community perception on ecotourism and the crisis due to the pandemic

Statements	Weighted Mean	Remarks
Ecotourism is the major contributor to the local economy of Sikles	3.4	Moderate
People in Sikles are willing to rebuild the hospitality business	3.91	Simply agree
Domestic tourism has to be promoted to minimize the economic losses from the pandemic	4.48	Strongly agree
Alternative income-generating activities and safeguard measures should be ensured for tourism entrepreneurs to decrease the rate of unemployment	4.33	Strongly Agree

#### 4. Conclusions And Implications

This research reveals the ground reality of the socioeconomic effects of COVID-19 in ecotourism destinations. There are both positive and negative effects. The positive effects were evident in the environmental sector, as it became cleaner with reduced pollution. The locals use the lockdown period to enhance the trails and digital promotion of the destinations around Sikles. The income generated by homestays and hotels was affected during the lockdown and travel restrictions, but it later improved once mobility was allowed. Later, it was found to have increased more than in previous years, as people were drawn to quiet and peaceful destinations. This demonstrates the significant impact of digital marketing on business growth (Dhungana, 2024). However, the revenue collected by ACAP from the entry fees of international tourists has decreased significantly (Shrestha et al., 2023). This might impact the budget allocation for the conservation activities.

Based on the findings, it is suggested that the revenue collection by ACAP should not entirely depend on international tourists. Government support should be enhanced during the period of international travel restrictions until alternative revenue collection from domestic tourists is implemented. A lack of preparedness for disasters and pandemics like COVID-19 was evident in the study area. Learning from the previous impacts of earthquakes and COVID-19, effective policy measures should be implemented to promote domestic tourism and diversify revenue sources and income-generating activities. It may also be important to assess the satisfaction and intentions of tourists before and after the pandemic and provide services according to the tourists' demand. The COVID-19 pandemic has sensitized people to the importance of health, hygiene, and safety measures, and these measures should be followed to minimize the risk of infection from infectious diseases. Finally, the government, local people, and private entrepreneurs should work together to prepare for future pandemics with effective strategies to mitigate losses and make the tourism sector more sustainable.

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