

THE ENVIRONMENTAL AND SOCIAL IMPACTS OF TOURISM IN NEPAL

by
Christine Francois

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Abstract

Nepal is a country that is vastly diverse, from the lowlands (terai) to the mountains. Nepal's diversity doesn't end with its nature – the inhabitants are also diverse, with over 100 caste/ethnic groups. Such diversity can attract many tourists and visitors to the nation. However, climate change is affecting Nepal in a number of ways and with a large portion of Nepal's tourism being based on the nature, it is important to understand the relationship between the environment and tourism. Tourism can also impact the social dynamics and society as a whole. Chitwan National Park and Gaurishankar Conservation are used as the study sites in this paper as they are two emerging tourist hotspots. Through an intensive literature review analysis and interviews of key informants, this paper attempts to show the relationship between tourism, the environment, society and why it is important to develop a sustainable tourism infrastructure. This paper found that the current tourism infrastructure prolongs and worsens the environmental and social issues in Chitwan National Park and Gaurishankar Conservation Area. However, if the public and private sectors of Nepal use the following recommendations listed in this paper, then the tourism sector could be used to benefit the study sites from an environment and social standpoint.

Primary Reader: Amir Poudel

Secondary Reader: Dr. Daniel Zachary

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1. Introduction

Nepal is a landlocked nation between China and India. Being slightly bigger than the state of New York, with an area of over 140,000 km², it is a truly a diverse country. According to the 2011 census, there are over 126 caste/ethnic groups, 123 different languages spoken and 10 different religious groups, with Chhetri being the largest ethnic group (Government of Nepal, 2020). The diversity of Nepal doesn't end with its residents, the country is also diverse in its nature. Even though the country covers just 0.1% of the area of the planet, it contains 3.2% of known plants, and 1.1% of animals (Ollerton, 2020).

With such diversity comes an array of issues. From social issues like mass migration to environmental issues like flooding and air pollution, Nepal surely has it all. Throughout history and other case studies, we know that climate change can perpetuate issues like these. However, we don't entirely understand how tourism has impacted social and environmental issues in countries, especially countries that are known to attract thousands of tourists.

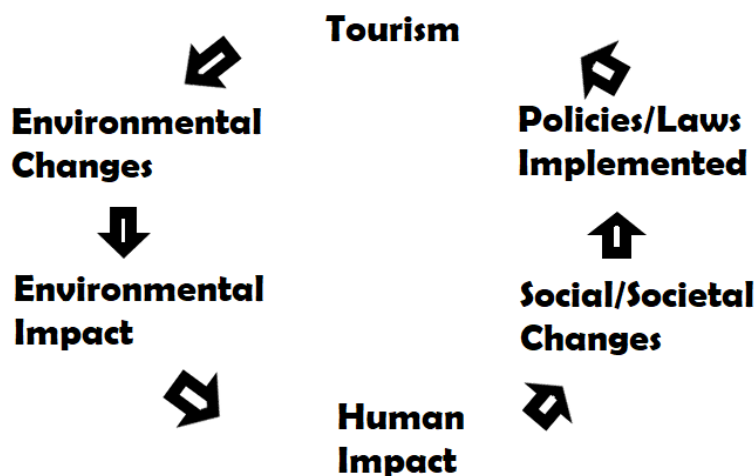
Prior to the 1960s, only 3 to 4 visitors from Britain could enter Nepal due to the established diplomatic relationship that Britain had with Nepal (Liechty, 2005). However, due to a revolt and the placement of a new King, Nepal began to open their borders to the international world (Liechty, 2005). From 1955 to 1965, the tourists going to Nepal were primarily from the United States and were in the retirement age (Liechty, 2005). By 1965 though, there was a sudden burst of younger tourists from the western world that were visiting the country (Liechty, 2005). A key difference between the younger tourists and the older ones was their length of stay. Younger tourists would stay in Nepal for weeks to months at a time, while older tourists would leave after a few days (Liechty, 2005). This rapid shift in the type of tourists coming and the length the tourists were staying did not allow for the country to create a sustainable tourism infrastructure that benefited the tourist, the locals, and the environment.

Based on research findings, there is a need to understand how the tourism industry in emerging tourist hotspots can be developed in a sustainable manner. With the COVID-19 crisis, now is the time to examine previously overpopulated tourist areas as well as new ones to create a harmonious infrastructure that allows residents, tourists and nature to thrive. This paper analyzes (1) the existing tourist infrastructure in Nepal in relation to environmental and social issues, (2) example the relationship between environmental and social issues in Nepal and (3) provide recommendations for emerging tourist sites in developing in a sustainable and responsible manner. This paper anticipated to find that tourism, when developed unsustainably, prolongs and worsens environment and social issues in emerging tourist hotspots.

Study Objectives

This paper's main objective is to see how tourism impacts the environment and social dynamics of Nepal. The secondary objective is to see the relationship between environmental conservation, social infrastructure and tourism in Chitwan National Park and Gaurishankar Conservation Area.

Conceptual Framework



For this study, two specific research questions were formulated and tested:

- How has society/social dynamics changed around touristy areas?
- How does a tourist location impact the environment neighboring cities/villages and vice versa?

2. Methodology

2.1 Study Limitation

Due to COVID-19 (travel restrictions, lockdown, etc.), data could not be collected from the field, all of the research had to be conducted virtually.

2.2 Study Sites

The two sites chosen for this study are Chitwan National Park and Gaurishankar Conservation Area.

Chitwan National Park is in Nepal's Terai region and Gaurishankar Conservation Area is in the Himalayas region. These locations were chosen as they both are emerging tourist hotspots in Nepal. As they have not reached their full tourist potential, there is still time to modify their tourism infrastructure.

Chitwan National Park

Chitwan National Park (CNP) was established in 1973 as the first national park in Nepal is approximately 952 sq. km and the buffer zone is about 729 sq. km (Chitwan National Park, 2015). The park is managed by the Department of National Parks and Wildlife Conservation (Nepal & Spiteri, 2011). The buffer zone was established in 1996 in an effort to build partnerships with border residents that faced implications from the park (Nepal & Spiteri, 2011). The main castes in CNP are the Brahmin, Chettri, and the indigenous Tharu and farming is the primary livelihood activity (Nepal & Spiteri, 2011). The most popular entry into the park is through the city of Sauraha, which receives more than 70 percent of visitors (Nepal, 2015). The park is a prime habitat for several species including the Greater One-horned Rhinoceros, the Royal Bengal Tiger and the Gharial Crocodile (Nepal, 2015).

Gaurishankar Conservation Area

Gaurishankar Conservation Area (GCA) covers an area of 2,179 sq.km which encompasses 22 Village Development Committees of 3 districts: Sindhupalchok, Dolakha, and Ramechhap (Paudyal et al. 2018). There is a total population of approximately 56,521 people with the major ethnic/caste groups being Tamang, Sherpa and Chhetri (Paudyal et al. 2018).

The Nepal Government entrusted the Gaurishankar Conservation Area's management to the National Trust for Nature Conservation for the next 20 years in July 2010 (NTNC, 2020). The third conservation area is to be entrusted to the NTNC for management (NTNC, 2020).

2.3 Study Methodology

Two key methods were used to conduct this study: literature review and interviews of key informants.

Literature Review

A literature review was used as the primary research instrument. For this study, 10 – 15 peer-reviewed articles were critical examined to obtain diverse information. The date of publication for these articles ranges from the year 2005 – 2018. The two databases that articles were primarily used to find articles were ResearchGate and the John Hopkins Sheridan Library database. From the Nepal Tourism Department, tourism statistical data is collected to analyze tourism trends in Chitwan National Park and Gaurishankar Conservation Area. A GIS data analysis was also conducted to support the information found through the literature review. The GIS data collected and analyzed showed the environmental changes that were occurring in Nepal and specifically the study sites. ArcGIS was used to analyze the vegetation and floods in Nepal. The GIS data was collected in the ArcGIS Hub website.

Key informant Interviews

Skype interviews were conducted with key experts to provide first-hand information about challenges with social infrastructure, tourism and environmental conservation in Nepal. Each interview was approximately 45 minutes long and was conducted via skype. Annex 3 provides all of the questions and answers for the interviews.

Key Informant	Position	Organization	Current Location
Amir Poudel	Professor	John Hopkins University	Nepal
Paras Pokhrel	Senior Program Officer – Water Security & Climate Resilience	WaterAid Nepal	Nepal
Ashok Sigdel	Conservation Officer	National Trust for Nature Conservation	Nepal

3. Results

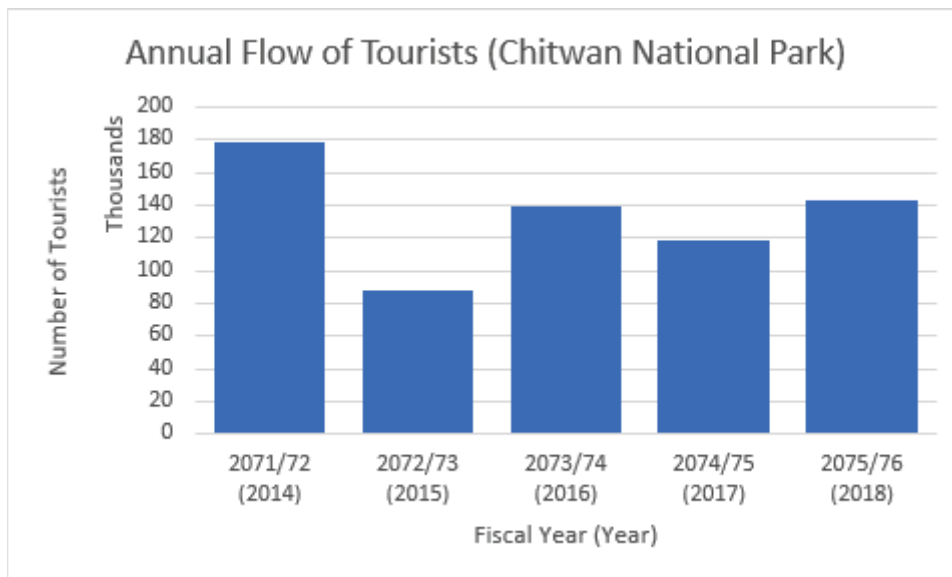
3.1 Chitwan National Park

Main Tourism Products

Wildlife is the main driver for tourism in Chitwan National Park. Some of the activities that you could do in the park include visiting the elephant breeding center, jeep safaris, jungle walks and bird watching (Jungle Safari Lodge, 2014).

Annual tourist flow trend

The graph below shows the annual tourist flow from 2014 to 2019 (Ministry of Culture, Tourism & Civil Aviation, 2020).



Current tourism infrastructure

The tourism infrastructure has not been planned adequately in the park. As the city of Sauraha receives most of the influx of tourists, there are more lodges and guest lodges in this city. There is a lack of tourism policies to deal with the concentrated tourist inflow in Sauraha (Nepal, 2015). There are fewer benefits for residents who live in villages farther away from the park's entry point than those who live closer to the entry point (Nepal & Spiteri, 2011). The current infrastructure also does not include a mitigation plan for human-wildlife conflicts. There is less interest to participate in wildlife conservation programs from the local people as wildlife causes the following issues: human casualty, crop-raiding, and livestock predation (Nepal, 2015).

3.2 Gaurishankar Conservation Area

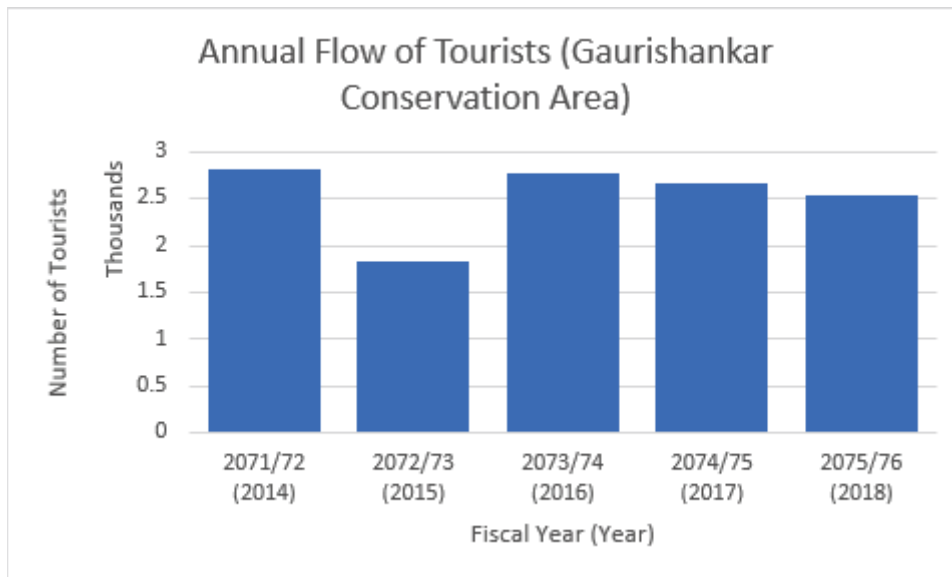
Main Tourism Products

The mountains in Nepal attract a majority of the tourists like trekkers and mountaineers (Upadhyay, 2020). In GCA, trekking is the primary tourist product. GCA has enhanced 2 trekking trails that will help boost tourism in the area. The first trail goes from Jiri to Shivalaya (this is an important trail for tourists

and trekkers going to the Numbur Cheese Circuit) and the Shivalaya to Deurali, which is a continuation of the Jiri to Everest trail (Shah, 2014). Homestays is another tourism product for GCA. 20 new homestays were added in high potential tourism destinations within the GCA (Shah, 2014).

Annual tourist flow trend

The graph below shows the annual tourist flow trend from 2014 to 2019 in GCA.



Current Tourism infrastructure

GCA's tourism infrastructure is still very lacking as it is in its infancy phase with the area being entrusted to the National Trust for Nature Conservation in 2010. GCA will require stakeholder participation along with management authority to create a thriving infrastructure that benefits the local communities and the park (Paudyal et al 2018). In addition to this, the remoteness of the GCA also contributes to a lower number of tourists.

For both study sites, you can see that the highest number of tourists that went to those sites was in 2014, followed by a sharp decline in 2015 and then rebounded the following year. This could be due to the earthquake that occurred in Nepal April 2015.

3.3 Tourism Statistical Data Information on Nepal

Statistical data was collected to show trends in different sectors of Nepal's tourism industry as a whole.

Some of data through this collection pertains specifically to the study sites CNP and GCA.

All the data used is coming from the Nepal government and Ministry of Culture, Tourism & Civil Aviation Planning & Evaluation Division.

Tourist Flow by Country

The table is listed under Appendix A in the appendices. The table shows the number of tourist arrivals by major nationalities from 2010 to 2019. The top 5 countries with the highest arrivals to Nepal from 2010 to 2019 are India, China, USA, United Kingdom and Sri Lanka.

Gross Income

The table showing the gross foreign exchange earnings is listed under Appendix B. The average total of foreign exchange earnings from tourism from 2000 to 2020 is 31,521.25 million Rupees.

Tour Industries and Guides

The table is listed under Appendix C. The table shows the number of tourism industries and guides in Nepal from the years of 2012 to 2018. You can also see that the number of industries has increased in every single section.

Hotels

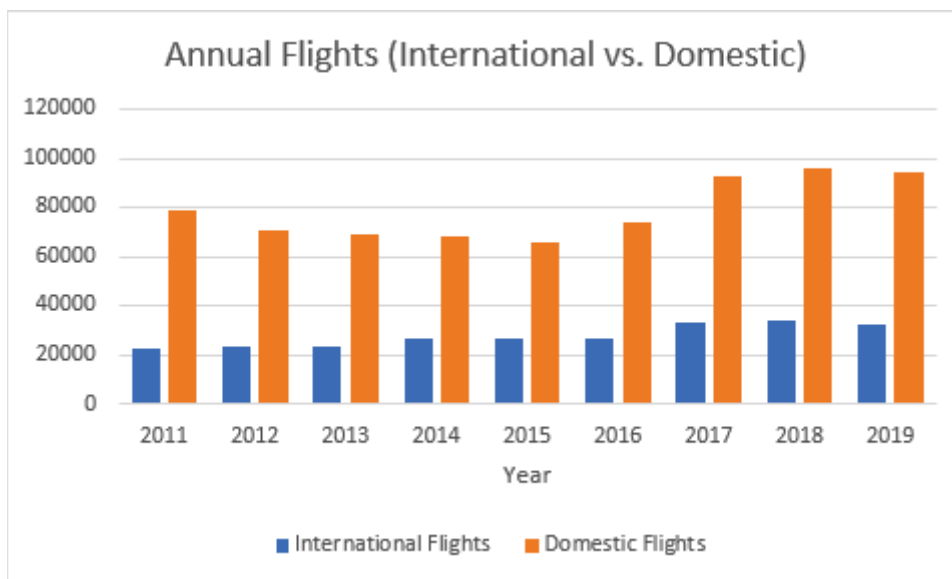
The table is listed under Appendix D. The table shows the number of star and tourist standard hotels from 2001 to 2019. An international standard hotel is a high-class hotel that includes services like catering, spa, gym, meeting rooms, etc (Mumicha, 2020). From 2001 to 2019, there is an increase of 28 star hotels and 265 tourist standard hotels. There is an overall difference of 4,892 beds, for both types of hotels combined, from 2001 to 2019.

Homestays

Appendix E is the table that shows the number of homestays from 2013 to 2019. A homestay is when a tourist/traveler lives with a family in their home to get more of an authentic experience. One of the districts listed on the table is, Ramechhap, which is located in the Gaurishankar Conservation Area. The district of Chitwan, where Chitwan National Park is located, is also on the table.

International and Domestic Flights

The graph below shows a comparison between the total numbers of international flights with domestic flights from 2011 to 2019. The average number of international flights is approximately 27,811. The average number of domestic flights is approximately 78,977. Over the course of 2011 to 2019, there is an increase of approximately 9,000 international flights and 15,000 domestic flights (Ministry of Culture Tourism & Civil Aviation, 2020).



Tourist - Purpose of Trip to Nepal

There are several different reasons for why a person would come to Nepal. In the table listed in Appendix F, the reasons listed are: holiday pleasure, trekking & mountaineering, business, pilgrimage,

official, conf, and other. From 2006 to 2019, the two main reasons people travel to Nepal are for holiday and trekking/mountaineering.

Number of people employed

The table, listed as Appendix G, shows the breakdown of the different ethnic groups that work in the tourism industry in 2014. The Brahmin/Chhetri and the Janjati make up the highest numbers across all the different industries (Sharma et al. 2014).

3.4 Social Issues in Nepal

One social issue within Nepal is mass migration. The civil war in Nepal lasted from 1996 to 2006 (Khan & Hyndman, 2015). Due to the Maoist insurgents wanting to recruit the children from rural Himalayan families, mass migration occurred (Khan & Hyndman, 2015). However, protection from recruitment was not the only factor when families were sending their children to Kathmandu for their education, a lack of educational opportunities and economic prosperity also played a role (Khan & Hyndman, 2015). The national capital attracted migrants due to business, commercial and social interests (Haack & Khatiwada, 2007).

Another social issue in Nepal is caste/ethnicity disparity. In 2014 Tourism Employment Survey, it is stated that the Government of Nepal has made ethnicity disparity in the economic sector a high priority (Sharma et al 2014). However, Janjati and Brahmin/Chhetris dominate the tourism sector and other ethnic groups like Dalits and Terai are less likely to be employed in the tourism industry (Sharma et al 2014).

Wildlife's role in the tourism industry is another social issue in Nepal. In Chitwan National Park, elephant safaris have been criticized due to the animal's treatment and wellbeing. Despite locals making money and financially supporting themselves, the topic of animal rights is highly debated.

3.5 Environmental Issues in Nepal

Air Pollution

Air pollution is a huge issue in Nepal. Nepal was ranked 177th out of 180 countries in the 2016 Environmental Performance Index for its air for its air quality (Saud & Paudal, 2018). There are various factors that contribute to the air quality in Nepal, including more people living in urban areas but the main contributor is the increase of vehicles (Saud & Paudal, 2018). The number of transportation services in the tourism sector more than doubled from 2012 to 2018 (Ministry of Culture Tourism & Civil Aviation, 2020).

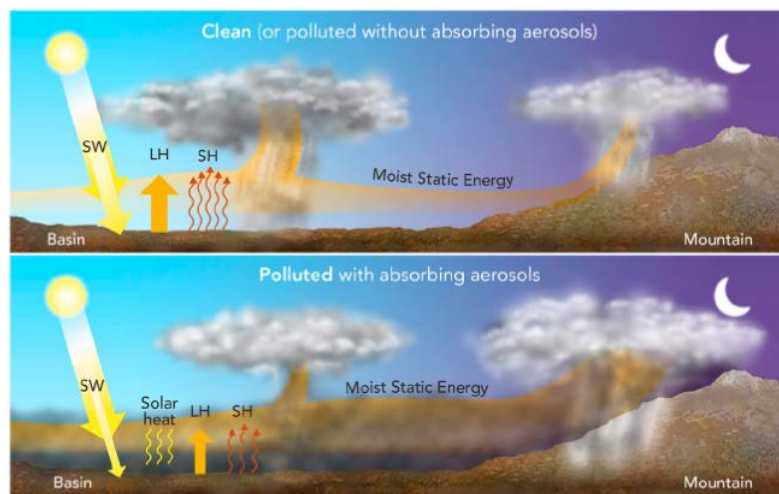
Despite vehicles being the number one source of air pollution, brush fires, cooking stoves and brick kilns also contribute to it (Grove, 2017). The brick production was a main driver in attracting more people to the Valley because as the population increased, there was a demand for building construction (Haack & Khatiwada, 2007). Despite the many environmental drawbacks with using bricks, they are the preferred material for construction for private and public buildings (Haack & Khatiwada, 2007). One of the main environmental impacts of using brick is the emission of fine particulate matter (Haack & Khatiwada, 2007). Smoke from fires and vehicle emissions produce soot containing black carbon making the air warming, thus changing rainfall patterns (Grove, 2017).

Flooding

Another environmental issue in Nepal is flooding. Since the 1970s, the duration and intensity of floods in Nepal has increased (Dewan, 2014). Due to climate change, there has been an accelerated retreat of the glaciers in the mountain which has caused more intense monsoon precipitation that contributes to the flooding in Nepal (Dewan, 2014). The terai region in Nepal is more prone to flooding (Dewan, 2014). Flooding can lead to more disease and pollution in the region which can cause decreases in tourism. As there is no long-term mitigation policy in place to deal with the flooding, the local people rely on

traditional or indigenous knowledge and adaptation strategies (Dewan, 2014). Floods can cause the grasslands in Chitwan National Park to constantly change, thus causing changes to the management plan for the park (Nepal, 2015).

China, one of Nepal's neighbors, has also dealt with catastrophic floods due to air pollution. In July 2013, a catastrophic flood occurred in the mountainous area northwest of the Sichuan Basin (Fan et al, 2015). Fan showed, in an atmospheric simulation, that heavy air pollution trapped in the basin would significantly enhance the rainfall intensity over the mountainous areas through "aerosol-enhance conditional instability" (2015). The image below shows how aerosols suppress convection which allows excess moist air to be transported to the mountainous areas.



Study Sites

In GCA, soil erosion and habitat fragmentation are the negative byproducts of road construction. Even though soil erosion is a natural process, road constructions is one of the human activities that can accelerate the process. In Chitwan National Park, elephant safaris have impacted wildlife movement within the park.

3.6 Environmental Policies/Laws and Government Involvement

With 8 of the 14 world's snow-topped mountains over 8000m, nature base tourism, especially mountain tourism, is very popular in Nepal (Upadhyay, 2020). However, despite having vast biodiversity and nature, sustainable tourism policies are not heavily defined. Up until the 1950s, there was no concrete plan and/or tourism policy in Nepal (Upadhyay, 2020).

Before 2008, tourism and environmental policies did not intertwine with one another. However, both types of policies were first created in the 1950s. The first tourism plan, "General Plan for Organization of Tourism", was prepared by George Lebrec in the late 1950s and suggested to showcase Nepal's flora on posters and stamps to promote tourism (Upadhyay, 2020). Coincidentally, King Mahendra passed the first wildlife law in 1957 which legally protected rhinos and their habitat (Heinen & Shrestha, 2006).

In the 1960s, the Nepal Tourism Development Committee was created to formulate tourism policies in Nepal (Upadhyay, 2020). While tourism policies were getting underway, the formal conservation movement and legislation did not start until 1973. The National Park and Wildlife Conservation Act was passed in 1973 and offered strong protection for the national parks and wildlife reserves but denied people in rural communities the rights to profit from these lands (Heinen & Shrestha, 2006). This law was very unpopular with the public as it presented many limitations to members of the rural community (Heinen & Shrestha, 2006).

On the tourism side, the government implemented the 1995 Tourism Policy which encouraged participation primarily from the private sector (Upadhyay, 2020). This act included different working policies that allowed for participation from the private sector and general people in the tourism infrastructure to be upgraded; to develop Nepal as a center for adventure tourism and promote popular religious tourism sites (Upadhyay, 2020). As general people and the private sector participated in

tourism, the government's role was limited to infrastructure development and coordination (Upadhyay, 2020).

However due to the importance of tourism in Nepal, the government decided to replace the 1995 policy and formulate an updated policy in 2007 named the Tourism Policy 2008. This is the first tourism policy in Nepal that includes a message about conserving the Nepali environment as well as improving the lives of the locals. The long-term goal of the policy was to make Nepal an attractive tourist destination through conservation and promotion of the natural, cultural, biological and human-made heritage (Johnson & Bahadar, 2016). The main mission of the policy was to improve inhabitant's living standards through tourism activities (Johnson & Bahadar, 2016).

Following 2008, the Ministry of Culture, Tourism and Civil Aviation along with industry partners, created the Tourism Vision 2020. The Vision is: "Tourism is valued as the major contributor to a sustainable Nepal economy, having developed as an attractive, safe, exciting and unique destination through conservation and promotion, leading to equitable distribution of tourism benefits and greater harmony in society," (Johnson & Bahadar, 2016). One of the goals for Vision 2020 was to increase tourist arrivals to two million and tourism related employment to one million (Upadhyay, 2020). The Vision 2020 document's biggest failure is the absence of a detailed action plan to support the implementation (Johnson & Bahadar, 2016).

This is why the National Tourism Strategic Plan 2016 – 2025 is so important. It provides the government with a guiding framework in developing the tourism industry in Nepal.

There are six objectives of this plan (Johnson & Bahadar, 2016):

1. Increase revenues and employment opportunities and contribute to GDP growth per capita through tourism.

2. Diversify the country's tourism attractions and services.
3. Increase tourist arrivals without compromising sustainability and environmental and cultural quality.
4. Market and brand Nepal in key generating markets.
5. Improve the quality of the product and tourism human resources.
6. Alleviate poverty and encourage community participation.

The government alone cannot develop the tourism sector; there is a need for partnership of the public, community and private sectors to create the tourism infrastructure (Upadhyay, 2020).

As the government is receiving assistance from different sectors, this could contribute to why decentralization and devolution of conservation programs have gained popularity (Paudyal et al 2018). Decentralization involves transferring decision making authority to lower levels of government whereas devolution involves transferring the rights and responsibilities to local user groups (Paudyal et al 2018).

Depending on where you are, tourism policies and implementation of these policies are perceived differently. One issue in GCA was the lack of government engagement with local communities when it came to the decentralized conservation policies (Paudyal et al 2018). However, in another study, both residents and tourists positively perceived nature-based mass tourism in Chitwan (Poudel et al. 2016).

When tourism policies were first implemented, nature was not on the forefront, however as time went on, nature was recognized for being an important aspect and policies were put into place to preserve it from a tourism perspective.

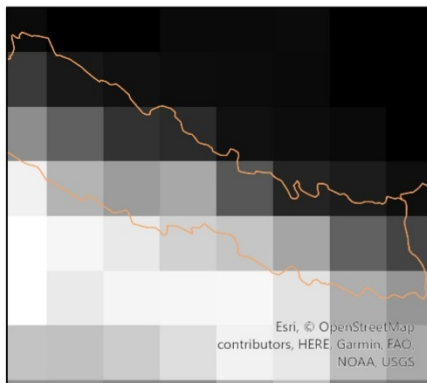
3.7 GIS Analysis

GIS air pollution data was downloaded from learn.arcgis.com. The analysis was conducted to show the relationship between air pollution in Nepal and flooding. From 1998 to 2016, Nepal's air pollution

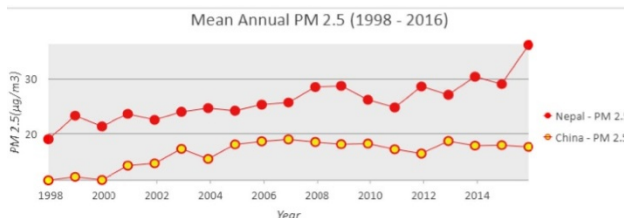
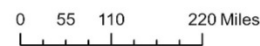
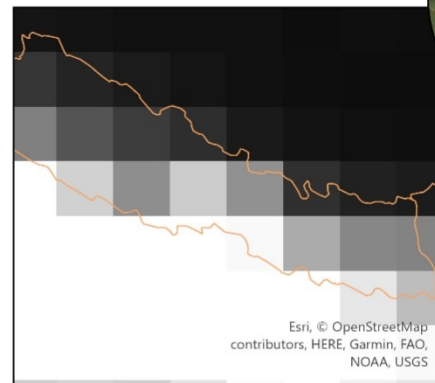
increases in certain areas, with the colors going lighter in the 2012 – 2016 image (indicating higher PM 2.5 levels). Based off of the data from ArcGIS.com, the amount of fine particulate matter pollution in Nepal is higher than China. The areas with higher air pollution align with the areas that are prone to flooding.

Nepal Annual PM 2.5 1998 - 2016

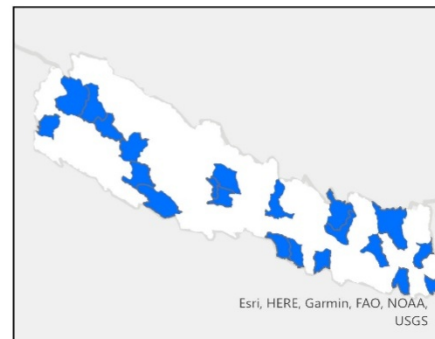
Nepal Annual PM 2.5 1998 - 2002



Nepal Annual PM 2.5 2012- 2016



This chart shows the change in PM 2.5 from 1998 to 2016 in Nepal. This chart also compares the PM levels of Nepal and China. This data was obtained from learn.arcgis.com website. This specific global raster data measures levels of fine particulate matter pollution. These are air pollution particles with a diameter less than 2.5 microns.



Flooding Areas 2016

3.8 Key Informant Interviews

Two key informants were interviewed to gather more information about tourism’s environmental and social impact in Nepal. The purpose of the interview was to get a first – hand knowledge about the effects of tourism from not only experts, but also Nepali locals. These interviews took place via Skype and were up to 45 minutes long. These interviews are being used to provide further knowledge on the

topic. The complete interview is listed in Appendix H. The questions that were asked in the interview are listed below.

1. In your opinion, how has tourism impacted the environment in Nepal?
2. How has tourism changed/impacted society in Nepal?
3. What are the biggest environmental threats in Nepal?
4. In your opinion, what is the first step that residents and tourists need to do to alleviate environmental threats?
5. Do you believe that Nepal has a strong tourism infrastructure that can deal and adapt to climate crisis?
6. How is it more beneficial to have nonprofits and locals heavily involved in conservation efforts?
7. Should the government get more involved?
8. What changes could the government make, if any, to protect the nature of Nepal?
9. Do you think that the tourists who come to Nepal are environmentally conscious/try not to add to the environmental problems in Nepal?
10. What changes should the tourism industry adopt to reduce their environmental impact?
11. How much has tourism played a role with the environmental issues in Nepal?
12. Which locals of Nepal are environmentally conscious? Which locals are more involved with conservation efforts?
13. Do you think the residents/locals of Nepal want to work more with nonprofits to help reduce environmental issues? Is there an interest from locals for more government involvement?

4. Discussion

Tourism is an important sector for the Nepali economy and yet, the research shows that there haven't been many studies regarding the relationship between tourism, society and the environment. In Paras Pokhrel's interview, the intrinsic nature between tourism and the environment was mentioned. However, there is also an intrinsic relationship between tourism and society. Most of the societal changes that can be seen in touristy areas, such as Gaurishankar Conservation Area and in Chitwan National Park, can result in a change in local people's livelihood.

4.1 Social Impact

The city of Sauraha receives more visitors than any of the surrounding cities near Chitwan National Park. Due to this, in addition to farming, tourism can be seen as one of the primary ways people support themselves financially. In other cities/villages, people are using the resources around them to market to tourists and financially support themselves. Even in the mountainous remote region of GCA, we see that there is an increase in homestays. One possible explanation for this could be that the inhabitants are seeing their homes as a resource.

However, we can see that in some ways, tourism doesn't change social dynamics. One main example of this is with caste/ethnic disparity. Paudyal stated that the household size and that certain caste/ethnicities in Gaurishankar Conservation area were found to participate determined who would participate more in conservation and tourism programs (2018). If a household had more people in it and they were of a higher caste/ethnic group, then people from these households were more likely to participate in conservation programs. Unfortunately, tourism and conservation programs can help perpetuate this disparity. In order to avoid these types of disparity, there needs to be cohesion between the government, the people and the nonprofit organizations there to help.

4.2 Environmental Impact

Tourism also impacts the environment of neighboring cities. As Nepal is ranked 6th out of 200 countries that will suffer from climate change impacts, climate change can play a significant role in the tourism industry (Bhandari, 2014). Climate change can impact the natural environment that attracts tourists (Bhandari, 2014). The tourism statistical data shows that there has been an increase in trekking; in 2006, 66,931 people came to Nepal to trek and in 2019, 197,786 people came to trek (Ministry of Culture Tourism & Civil Aviation, 2020). As discussed in my interviews, more people coming to trek will lead to more road construction. With more roads, more tourism transportation vehicles will be used to transport trekkers. However, when roads are not constructed with nature and environmental threats, such as landslides and floods in mind, this can negatively impact the environment. Additional vehicles will also add to the ongoing issue of air pollution in Nepal. Even though tourism doesn't have as much of an impact on air pollution, increasing the number of vehicles used in this sector does not help the problem.

Despite tourism having a negative impact on the environment, there are some benefits that tourism provides. One example is protection of biodiversity and wildlife. Having wildlife tours that allow tourists to see species in their natural habitat, like the Royal Bengal Tiger, benefit the tourist and the species. With species being in a protected touristy area, there is less poaching

5. Conclusion

Tourism can play an interesting yet promising role in Nepal as well as similar countries. However, with the ongoing climate crisis and the impact that it can have on Nepal, tourism has to be developed with the environment, the economy and society in mind. The government has already implemented different tourism and environmental policies throughout the years. However, tourists and especially locals would follow regulations/policies more if they saw economic value to them.

A study was conducted to show the African forest elephant's value, where it was showed that a living African elephant was worth \$1.75 million (Chami et al 2020). The African Forest elephant also helps to increase the amount of carbon stored by the rainforest. When the elephants forage for food, they step on some trees and leave others unbroken. The unbroken trees are able to grow taller in the forest but are also able to absorb more carbon in their tissue (Chami et al 2020).

If we used the framework designed to determine the African forest elephant's value for certain species in Nepal, like the Greater One-horned Rhinoceros, Royal Bengal Tiger and /or the Gharial Crocodile, then we would be able to solve many issues at once. People could stop poaching these animals if they see that they are more valuable alive then dead. More tourism jobs could be created to ensure the protection of these animals. These animals could have the potential to help with the climate crisis. The framework used to determine the African forest elephant's value is below (Chami et al 2020).

- Identify the services produced by the resource.
 - Verifiable estimates of the quantities of services produced must exist in the academic or professional literature.
 - If the quantity produced of a service is not measured in money, market prices must exist that can be sensibly assigned to the service.
- Project the market values of each service ($p_{j,t+i}$, $s_{j,t+i}$) into the future.
- Assign a discount rate appropriate to the natural resource and the service(s) produced.
- Using the values projected in Step 2, calculate the value of the resource using equation (2).

6. Recommendations

Based on the findings of this study, there are several recommendations for the Nepal Government and the private sector.

6.1 Public Sector

- Enforcing/implementing policies that help mitigate the effects of climate change
- Assess the environmental impact when making tourist sites more accessible, i.e roads
- As discussed in Paras Pokhrel's interview, parks and trekking routes will go beyond one city, which means that the local government's policies will only extend to the local jurisdiction. The national government needs to be more involved with enforcing policies for tourist attractions or they need to ensure that the policies for the tourist attraction are being implemented in each of the city the site is located.
- Provide educational programs/workshops throughout Nepal about the relationship between tourism and the environment

6.2 Private Sector

- Travel agencies and hotels provide greener options ,i.e electric cars when carrying tourists
- Penalize tourists that pollute areas
- Include educational portion on tours to teach tourists about environmental conservation and threats in Nepal
- Find ways to hire people from all different ethnic/caste backgrounds to workers from all

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Appendix A

Tourist Arrivals by Country (2010 – 2019)

Nationality	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	16,243	19,824	22,030	20469	24516	14816	25507	33371	38429	38972
%	2.7	2.7	2.7	3.5	3.1	2.7	3.39	3.55	3.28	3.3
Bangladesh				22410	21851	14831	23440	29060	26355	25849
%							3.11	3.09	2.25	2.2
Canada	9,322	11,404	13,507	12132	11610	6495	12491	15105	17317	17102
%	1.5	1.5	1.7	1.7	1.5	1.2	1.67	1.6	1.48	1.4
China	46,360	61,917	71,861	113173	123805	64675	104005	104664	153633	169543
%	7.7	8.4	8.9	12.4	15.7	12	13.81	11.1	13.1	14.2
France	24,550	26,720	28,805	21842	24097	10885	20863	26140	31810	30646
%	4.1	3.6	3.6	3.5	3	2	2.27	2.8	2.71	2.6
Germany	22,583	27,472	30,409	22263	18028	12216	23812	29918	36879	36641
%	3.7	3.7	3.8	3.5	2.3	2.3	3.16	3.2	3.17	3.1
India	120,898	149,504	165,815	180974	135343	75124	118249	160832	194323	254150
%	20.1	20.3	20.6	23.2	17.1	13.9	15.7	17.1	16.57	21.2
Italy	10,226	12,621	14,614	9974	10347	3972	9911	11840	15342	15676
%	1.7	1.7	1.8	1.2	1.3	0.7	1.32	1.3	1.31	1.3
Japan	23,332	26,283	28,642	26694	25829	14465	22979	27326	29817	30534
%	3.9	3.6	3.6	3.3	3.3	2.7	3.05	2.9	2.54	2.6

Nationality	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
South Korea				19714	23205	18112	25171	34301	37218	29680
%							3.34	3.6	3.17	2.5
Malaysia									22833	21329
%									1.95	1.8
Myanmar							25796	30852	41402	36274
%							3.42	3.3	3.53	3.0
Netherlands	13,471	16,836	15,445	10516	12320	4324	11453	13393	15353	15032
%	2.2	2.3	1.9	1.3	1.6	0.8	1.52	1.4	1.31	1.3
Spain	13,712	16,037	14,549	10412	13110	4307	12255	15953	20214	19057
%	2.3	2.2	1.8	1.3	1.7	0.8	1.63	1.7	1.72	1.6
Sri Lanka	45,531	59,884	69,476	32736	37546	43117	57521	45361	69640	55869
%	7.6	8.1	8.7	4.1	4.8	8	7.64	4.8	5.94	4.7
Thailand				40969	33422	32338	26722	39154	52429	41653
%				5.1	4.2	6	3.55	4.2	4.47	3.5
U.S.A.	36,425	42,875	48,985	47355	49830	53897	53645	79146	91895	93218
%	6	5.8	6.1	5.9	6.3	10	7.12	8.4	7.83	7.8
U.K.	35,091	39,091	41,294	35668	36759	204469	46295	51058	63466	61144
%	5.8	5.3	5.1	4.5	4.7	3.8	6.15	5.4	5.41	5.1
Others	168,590	179,158	214,638	78821	218639	171688	119245	174460		204822
%	28.4	26.9	27.2	23.5	27.7	31.9	15.84	18.6		17.1
Total	602,867	736,215	803,092	797,616	790,118	538,970	753,002	940,218	1173072	1197191

(Ministry of Culture Tourism & Civil Aviation, 2020)

Appendix B

Nepal's Gross Income for Tourism (2000 – 2020)

Year	Total Foreign Exchange Earning from Tourism (Rs. in millions)	As % of Total Value of Merchandise Exports	As % of Total Value of Exports of Goods & Non Factor Services	As % of Total Foreign Exchange Earnings	As % of GDP
2000/01	11,717.0	16.8	11.8	5.8	2.7
2001/02	8,654.3	14.9	10.6	4.8	1.9
2002/03	11,747.7	23.1	15.2	6.1	2.4
2003/04	18,147.4	32.9	20.3	8.2	3.4
2004/05	10,464.0	17.5	12.2	4.7	1.8
2005/06	9,556.0	15.5	10.9	3.6	1.5
2006/07	10,125.0	16.5	10.8	3.8	1.4
2007/08	18,653.0	30.1	17.9	5.6	2.3
2008/09	27,960.0	40	22.8	6.5	2.8
2009/10	28,139.0	44.5	24.6	6.0	2.4
2010/11	24,611.0	35.8	20.2	4.9	1.8
2011/12	30,703.8	37.7	20	4.5	1.8
2012/13	34,210.6	39.8	18.9	4.5	2
2013/14	46,374.9	45.9	20.5	4.7	2.4
2014/15	53,428.8	54.4	21.6	4.9	2.5
2015/16	41,765.4	55.8	19.6	3.7	1.9
2016/17	58,526.9	71.3	24.3	4.5	2.3
2017/18	67,094.6	71.9	24.8	9.9	2.2
2018/19	75,808.6			11.2	
2019/20*	42,736.9			6.3	

(Ministry of Culture Tourism & Civil Aviation, 2020)

Appendix C

Tour Agencies and Guides (2012 – 2018)

Year	Travel Agency	Trekking Agency	Rafting Agency	Tourist Transportation Service	Tour Guide	Trekking Guide	River Guide
2069/70	2239	1598	52	31	0	0	100
2070/71	2450	1761	60	50	3141	9741	131
2071/72	2611	1903	61	59	3335	10436	131
2072/73	2768	2019	66	67	3507	11358	187
2073/74	3444	2367	72	72	3717	13049	207
2074/75	3824	2637	73	72	3876	13831	230
2075/76	3508	2649	73	77	4126	16248	253
2076/77	3680	2764	81	82	4200	17625	266

Source: Department of Tourism

(Ministry of Culture Tourism & Civil Aviation, 2020)

Appendix D

Hotels (2001 – 2019)

Year	Star Hotel		Tourist Standard Hotel		Total	
	Hotel	Bed	Hotel	Bed	Hotel	Bed
2061	110	10715	886	28392	996	39107
2062	110	10715	896	28669	1006	39384
2063	105	9763	502	14497	607	24260
2064	105	9763	512	14897	617	24660
2065	96	9320	573	16743	669	26063
2066	97	9369	647	19124	744	28493
2067	103	9125	686	20517	789	29342
2068	106	9323	721	21457	827	30780
2069	107	9371	746	22286	853	31657
2070	117	9506	909	25017	1026	34523
2071	118	9554	957	26625	1075	36179
2072	116	9710	957	27240	1073	36950
2073	120	10071	985	28171	1062	38242
2074	125	10697	977	29136	1101	39833
2075	129	11146	1125	29710	1254	40856
2076	138	13200	1151	30799	1289	43999

(Ministry of Culture Tourism & Civil Aviation, 2020)

Appendix E

Homestays 2013 - 2019

The following two tables are from 2013 to 2016

District	Type	2013			2014			2015			2016		
		No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	WWNo. of Room	No. of Bed
Kathmandu	Community	47	70	138	52	80	148	52	80	148	63	99	214
	Private	19	57	103	31	102	176	34	114	198	42	126	176
	Total	66	127	241	83	182	324	86	194	346	105	225	390
Kavre	Community	31	-	-	43	17	32	43	17	32	49	83	107
	Private	2	5	10	2	5	10	2	5	10	2	5	10
	Total	33	5	10	45	22	42	45	22	42	51	88	117
Lalitpur	Community	7	13	25	7	13	25	7	13	25	12	24	47
	Private	2	6	12	3	8	16	4	10	20	6	15	30
	Total	9	19	37	10	21	41	11	23	45	18	39	77
Mugu	Community	5	5	10	5	5	10	5	5	10	5	5	10
	Private	-	-	-	-	-	-	0	0	0	0	0	0
	Total	5	5	10	5	5	10	5	5	10	5	5	10
Nuwakot	Community	25	33	66	25	33	66	25	33	66	25	33	66
	Private	-	-	-	-	-	-	0	0	0	0	0	0
	Total	25	33	66	25	33	66	25	33	66	25	33	66
Ramechhap	Community	6	15	30	6	15	30	6	15	30	29	54	96
	Private	1	3	6	1	3	6	1	3	6	1	3	6
	Total	7	18	36	7	18	36	7	15	36	30	57	102

District	Type	2013			2014			2015			2016		
		No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	WWNo. of Room	No. of Bed
Chitwan	Community	7	14	28	7	14	28	7	14	28	7	14	28
	Private	1	2	2	2	4	6	2	4	6	2	4	6
	Total	8	16	30	9	18	34	9	18	34	9	18	34
Makwanpur	Community	7	16	30	7	16	30	7	16	30	7	16	30
	Private	-	-	-	-	-	-	0	0	0	0	0	0
	Total	7	16	30	7	16	30	7	16	30	7	16	30
Dhading	Community	-	-	-	5	9	18	5	9	18	5	9	18
	Private	-	-	-	-	-	-	0	0	0	0	0	0
	Total	-	-	-	5	9	18	5	9	18	5	9	18
Pyuthan	Community	-	-	-	15	15	30	17	32	64	16	17	34
	Private	-	-	-	-	-	-	0	0	0	0	0	0
	Total	-	-	-	15	15	30	17	32	64	16	17	34
Total	Community	135	166	327	172	217	417	174	234	451	218	354	650
	Private	25	73	133	39	122	214	43	136	240	53	153	228
Total		160	239	460	211	339	631	217	370	691	271	507	878

The following three images show the number of homestays from 2017 to 2019. The districts, Ramechhap and Chitwan, are highlighted as GCA is in Ramechhap and CNP is in Chitwan

District	Type	2017			2018			2019		
		No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	No. of Room	No. of Bed
Kathmandu	Community	63	99	214	63	99	176	84	110	188
	Private	49	150	206	49	146	238	49	150	206
	Total	112	249	420	112	245	414	133	260	394
Bhaktapur	Community				13	14	28	13	14	28
	Private				4	11	20	4	11	20
	Total				17	25	48	17	25	48
Kavre	Community	49	83	107	61	95	119	61	95	119
	Private	5	16	30	5	9	14	5	9	14
	Total	54	99	137	66	104	133	66	104	133
Lalitpur	Community	12	24	47	15	28	51	15	28	51
	Private	6	15	30	6	15	30	6	15	30
	Total	18	39	77	21	43	81	21	43	81
Mugu	Community	5	5	10	5	5	10	5	5	10
	Private	0	0	0	0	0	0	0	0	0
	Total	5	5	10	5	5	10	5	5	10
Nuwakot	Community	25	33	66	25	33	66	40	48	96
	Private	0	0	0	0	0	0	0	0	0
	Total	25	33	66	25	33	66	40	48	96

District	Type	2017			2018			2019		
		No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	No. of Room	No. of Bed
Ramechhap	Community	29	54	96	29	54	96	29	54	96
	Private	2	11	20	1	3	6	1	3	6
	Total	31	65	116	30	57	102	30	57	102
Chitwan	Community	7	14	28	0	0	0	29	36	72
	Private	2	4	6	9	18	34	9	18	34
	Total	9	18	34	9	18	34	38	54	106
Kaski	Community				0	0	0	0	0	0
	Private				2	8	16	2	8	16
	Total				2	8	16	2	8	16
Makwanpur	Community	7	16	30	7	16	30	7	16	30
	Private	0	0	0	1	3	6	1	3	6
	Total	7	16	30	8	19	36	8	19	36
Dhading	Community	5	9	18	9	15	18	9	15	18
	Private	1	4	6	1	4	6	1	4	6
	Total	6	13	24	10	19	24	10	19	24
Udaypur	Community							13	13	18
	Private							0	0	0
	Total							13	13	18
Saptari	Community							7	7	12
	Private							0	0	0
	Total							7	7	12

District	Type	2017			2018			2019		
		No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	No. of Room	No. of Bed	No. of Affiliated House	No. of Room	No. of Bed
Rasuwa	Community									
	Private				1	4	8	1	4	8
	Total				1	4	8	1	4	8
Pyuthan	Community	16	17	34	18	17	34	18	17	34
	Private	0	0	0	0	0	0	0	0	0
	Total	16	17	34	18	17	34	18	17	34
Total	Community	218	354	650	245	376	628	310	438	742
	Private	65	200	298	79	221	378	79	225	346
Total		283	554	948	324	597	1006	389	663	1088

(Ministry of Culture Tourism & Civil Aviation, 2020)

Appendix F

International and Domestic Flights (2006 – 2019)

Year	Holiday Pleasure	Trekking & Mountaineering	Business	Pilgrimage	Official	Conv./ Conf.	Others	Not Specified	Total
2006	145,802	66,931	21,066	59,298	18,063	0	72,766	-	383,926
	(27.7)	(12.7)	(4.0)	(11.3)	(3.4)	(0.0)	(13.8)		100.0
2007	217,815	101,320	24,487	52,594	21,670	8,019	78,644	22,156	526,705
	(41.4)	(19.2)	(4.6)	(10.0)	(4.1)	(1.5)	(14.9)	(4.2)	100.0
2008	148,180	104,822	23,039	45,091	43,044	6,938	99,634	29,529	500,277
	(29.6)	(21.0)	(4.6)	(9.0)	(8.6)	(1.4)	(19.9)	(5.9)	100.
2009	140,992	132,929	22,758	51,542	24,518	9,985	87,134	40,098	509,956
	(27.6)	(26.1)	(4.5)	(10.1)	(4.8)	(2.0)	(17.1)	(7.9)	100.0
2010	263,938	70,218	21,377	101,335	26,374	9,627	52,347	57,651	602,867
	(43.8)	(11.6)	(3.5)	(16.8)	(4.4)	(1.6)	(8.7)	(9.6)	100.0
2011	425,721	86,260	17,859	63,783	24,054	10,836	37,311	70,391	736,215
	(57.8)	(11.7)	(2.4)	(8.7)	(3.3)	(1.5)	(5.1)	(9.6)	100.0
2012	379,627	105,015	24,785	109,854	30,460	13,646	48,540	91,165	803,092
	(47.3)	(13.1)	(3.1)	(13.7)	(3.8)	(1.7)	(6.0)	(11.4)	100.
2013	437,891	97,309	30,309	40,678	39,881	15,952	62,214	73,381	797,616
	(54.9)	(12.2)	(3.8)	(5.1)	(5.0)	(2.0)	(7.8)	(9.2)	100.0
2014	395,849	97,185	24,494	98,765	32,395	13,432	53,728	74,271	790,118
	(50.1)	(12.3)	(3.1)	(12.5)	(4.1)	(1.7)	(6.8)	(9.4)	100.0
2015	3,86,065	9,162	20,876	14,996	21,479	9,038	77354		538,970
	71.63	1.70	3.87	2.78	3.99	1.68	14.35		100.0
2016	489,451	66,490	24,322	82,830	21,310	12,801	55,797		753,002
	65.0	8.83	3.23	11.0	2.83	1.7	7.41		100
2017	658,153	75,217	na	141,033	na	na	65,815		940,218
	70.0	8.0		15.0			7		100
2018	703,843	187,692	na	169,180	na	na	112,357		1,173,072
	60.0	16.0		14.4			9.6		100
2019	778173	197786	na	171937	na	na	49301		1,197,191
	65.0	16.52		14.36			4.12		100

Appendix G

Percentage of Tourism Employees/Caste (Ethnic Group) - 2014

Industry Type	Ethnicity of Employee						Number of ind
	Brahmin / Chhetri	Janjati	Madhesi	Dalit	Other	Total	
Star Hotel	36.8	51.9	4.4	5.6	1.3	4,739	37
Tourist Standard Hotel	40.4	47.9	3.6	6.4	1.7	2,059	48
Home Stay	64.7	17.4	0.0	13.3	4.6	218	18
Trekking Agency	22.2	70.6	0.4	6.7	0.1	703	23
Travel Agency	53.8	44.6	0.6	1.0	0.0	478	40
Rafting Agency	30.8	62.1	0.0	3.6	3.6	195	13
International Airline	52.6	37.7	6.7	2.2	0.8	1,325	3
Domestic Airline	43.9	42.8	10.3	2.9	0.2	1,574	4
Other (Paragliding, Ultra-light)	44.2	33.3	0.0	5.0	17.5	120	6
Total	32.9	57.6	3.4	5.0	1.0	11,411	192

Appendix H

The first interview was conducted with Ashok Sigdel, an expert in the nature conservation and tourism field.

In your opinion, how has tourism impacted the environment in Nepal?

Tourism has two different kinds of impact both positive and negative and if we talk about the negative impacts of tourism, Nepal received about 1400K visitors in 2019. It's not so much a huge number, so we don't have that much level of impact. We have seen impacts in the field, the first one is pollution, the garbage produced by the tourists and they use plastic bottles, that has created a pollution in protected areas and other parts of Nepal. Similarly, tourism impacted the forest resources and the natural resources and if we talk about the mountainous region of Nepal, mountains/protected areas are popular for trekkers and if we go for the trekking in the mountain, then we don't have the electricity and the other alternative energy in the mountains. They used to use forest resources, especially the firewood to keep their rooms warm and to cook the food for the tourists. In addition to this, there is another pressure of the tourism, especially for the development of the tourism infrastructure, the collection of the sand, stones from the rivers for the construction of the buildings, of the hotels, restaurants. Another pressure of tourism is also from the use of the timber, especially in the mountain region. They use the construction of the timber for the buildings. This is also observed in the field in different areas. If we talk about the positive impacts, it has created the opportunities for the rural people and even in the cities. It has also helped to create the openness of the local people and also create a fund for the protected areas.

How has tourism changed/impacted society in Nepal?

Tourism has also created awareness among the local people about the nature conservation and in some places we can observe that impact of the culture. In some places, the local people copied something from the visitors and the tourists. In some places, the local people may copy some aspects of visitor's culture.

What are the biggest environmental threats in Nepal?

In my opinion, the pollution is the biggest environmental threat, especially in the cities; cities like Kathmandu, Pokhara, ... these are the cities that we have observed that pollution has created major challenges, environmental challenges in Nepal. Besides this we have also faced several issues in the mountain, in the rural areas, especially from the climate change, many glacial lakes have been observed which were not there before and we have also observed drying out of the natural springs which were there before. We also observed some wildlife crimes, forest fires and some bad development on some activities, especially the road construction in the rural areas. Nepal is a mountainous country; we see that the roads have a severe impact in the hilly areas. These are the source of soil erosion and landslides in many parts of the mountains.

In your opinion, what is the first step that residents and tourists need to do to alleviate environmental threats?

I think the first step is that they can be responsible to the environment, they can reduce the garbage or the waste that they are producing. The people can dispose the waste in the proper place and besides this, they can also reduce their use of firewood and to minimize impact of climate change. They can reduce the amount of deforestation, reduce the amount of pesticides and other things which creates pollution in the land and in the water. This is the major role that residents can play. If we talk about tourists or visitors, they can be responsible towards the environment, and they can minimize the consumption of plastic bottles and waste producing things. In addition, they can spend more money on environmentally friendly things. They can choose hotels that which have been using the alternative energy. These are few things that tourists can do for the environment in Nepal.

Do you believe that Nepal has a strong tourism infrastructure that can deal and adapt to climate crisis?

It is very difficult to say. We have a very limited infrastructure in the tourism sector and this tourism infrastructure is not sufficient to deal with the climate change crisis. Sometimes we have observed the heavy snowfall in the mountains, in that case, we don't have the infrastructure for the center or even to rescue them. We have very limited infrastructure, so I think the existing infrastructure can't deal with the climate crisis, so we need to invest more in infrastructure development; security for the visitors/tourists.

How is it more beneficial to have nonprofits and locals heavily involved in conservation efforts?

I think in developing countries, government has very limited resources. The government can't go to every corner, so they should engage the local people and the nonprofit organizations.

Should the government get more involved?

Government has given priority to the local people and government has been engaging the local people for nature conservation. They have been forming the community-based institutions. They have been mobilizing them. We have many organizations in Nepal that have been working for the environment. Nonprofit organizations have been raising the funds and creating awareness. The nonprofits have been reaching out in the remote areas where the government is very limited. It is important to include nonprofits to minimize the environmental impact [tourism has on Nepal].

What changes could the government make, if any, to protect the nature of Nepal?

There are several good policies. Government should give emphasis on the proper implementation of the existing policies, regulations and rules. Government should be ore engaged in monitoring these kinds of things. Government should monitor the infrastructure development project. We [Nepal] need to have an environmental impact assessment report for the implementation of the project. Government should monitor whether they have been implementing the mitigations measures in proper ways, allocating the necessary funds for the mitigation program. I think the government should be more responsible and give more effort on monitoring these kinds of things and policy preparation. The government needs to be much more focus on the law enforcement

Do you think that the tourists who come to Nepal are environmentally conscious/try not to add to the environmental problems in Nepal?

Most of the visitors, especially from the Western countries, they are much more responsible with the environment. Visitors from developing countries, based on observation, who prefer to visit the city, prefer mass tourism, they are less sensitive towards the environment. The professional trekkers, and the people who chose to visit more rural areas are more responsible towards the environment. When trekkers go to the mountain, they use to bring their garbage themselves.

What changes should the tourism industry adopt to reduce their environmental impact?

Tourism needs to promote the environmentally friendly things. They need to reduce the consumption of wood, like firewood. They can use electricity or other alternative energy, especially in the rural area, where they don't have access to these kinds of things. Tourism needs to emphasis solar panels, solar energy. They need to put emphasis for the reduction of the garbage, for example they can introduce user plastic bottles. The industry should promote the local products and respect the local culture and local practice.

How much has tourism played a role with the environmental issues in Nepal?

Tourism doesn't play a huge role with the environmental issues in Nepal. If I had to rank them from 1 –5 [1 being the lowest; 5 the highest], I would rank tourism 2. Pollution is a major problem in the city because of the dense population, that is not because of the tourism.

Which locals of Nepal are environmentally conscious? Which locals are more involved with conservation efforts?

People in rural areas, they have limited access to education in the beginning. They are a bit aware, but they are less aware than the people who live in areas where tourism is promoted. Even in the mountains, where there is tourism, people are much more aware about the environment. But where there is no tourism, no visitor, all the people are in the remote area, they are less aware about the environment. The people in the city know the importance of the environment, they don't follow the regulations and do not take pollution seriously.

Do you think the residents/locals of Nepal want to work more with nonprofits to help reduce environmental issues? Is there an interest from locals for more government involvement?

I think so. The government has very limited resources in the rural areas. The government's presence is not so frequent, so local people want the nonprofit organizations who want to work in the rural areas and who want to engage the nature conservation or wildlife conservation. They always welcome the nonprofit organizations if they want the work in close collaboration with the local community. The local people want the government to be present every time, but the government has very limited infrastructure and resources. The government can't meet the public need or public interest, so the local people want to work with the nonprofit organizations.

Any last thoughts/comments?

Domestic visitors/Nepali tourists are less sensitive towards the environment than the foreign tourists.

The second interview was conducted with Paras Pokhrel, an expert in the environmental field.

In your opinion, how has tourism impacted the environment in Nepal? How has tourism changed/impacted society in Nepal?

When we look to the literature, there is a very intrinsic nature between tourism and the environment. When we talk about Nepal, Nepal's tourism is our environment-based tourism because people come for trekking, mountains, parks, protected areas, animals, biodiversity, etc. Most of these things are related to the environment. It's very important that the environment is conserved, not only for the tourists, but for the people who are dependent on tourists, for their livelihood and overall, sustainable development. It has been some time since we've had national parks, sanctuaries, protected areas, wildlife conservation acts and so many other policies that preserve the environment. All of these things attract tourists to Nepal. Tourism impacts the economy, businesses, employment. Even in small pockets of areas that has scenic beauty, people are promoting themselves now with media, etc. These are the positive impacts for people. Tourism has also impacted animals and biodiversity because they are conserved now. If we didn't have designated protected areas or national parks or sanctuaries, they would have been loss of biodiversity and animals because of poaching and other illegal activities. We still have these activities, but it is much less. One major negative aspect is the Westman. When you see the news, you see loads of west along the trek of Mt. Everest (one of the key areas where we have been struggling a lot). Because the areas have been designated as tourist areas, you start construction of roads in rural areas and these roads are not developed according to the environmental standard. You see losses of biodiversity. There could be landslides, because the environmental assessments are not done. Poaching is also an issue, but this is not due to tourism. Another aspect for biodiversity and wildlife is that they have been surrounded by people now. You can see small hotels, etc by the boundary of the protected areas and you hear in the news that rhinos will come out of the protected areas. For the wildlife, the area is still their habitat, so if they slightly come out of the protected area boundary, they will see people there. We are encroaching on their habitat. Although we are protecting them, the animals probably do not feel free.

What are the biggest environmental threats in Nepal?

Pollution is one of the major threats in Nepal. The effect of climate change poses a greater threat to Nepal. Nepal is almost top ten countries in the world to feel affect to climate change without a significant contribution to climate change. This includes the melting of ice, the rising temperature. The kind of geographical range that is from 60m below sea level to the tallest mountain the world, there is lots of changes, even if there is a small change in temperature; this could lead to loss of biodiversity. The major one is the melting of glacier ice, outbursts of glacial lakes and landslides – all the effects of climate change. Pollution of air, land and water is also an issue. There are rules, policies and regulations in place but it is very difficult to monitor, to implement. It's very hard to penalize the people who pollute it. Deforestation, natural resource depletion and ground water extraction are also environmental issues. The construction of roads especially in the hill areas of Nepal, where there is massive road construction going on without

any environmental conservation. Every year, you hear about landslides and so many other disasters in the news. Road constructions needs to be planned. We also use a lot of pesticides, you are completely relying on pesticides which leaks in the land – causing land pollution, air pollution.

In your opinion, what is the first step that locals and tourists need to do to alleviate environmental threats?

Tourists have a moral responsibility of not making the place dirty. I would say the majority of the responsibility lies with the residents and the government and the local government. The local government, the municipalities have the full authority to making laws regarding the environment and tourism as long as it doesn't overlap with other cities and other states. One of the key aspects is awareness, we are talking about very remote places with trekking, etc. These places are used to seeing tourists, they have their regular tourists. I think one of the key aspects is raising awareness among those local people, showing the relationship between the environment and tourism, if its sustainable, will help them sustain their livelihood and have more tourists come in, help the local economy and government. We need to link the relation between tourism and environment, with livelihood and economy and this is how local people will be intrigued to protect the local environment. Regarding the tourists, the tourists could choose those kinds of hotels and places that promote sustainability, renewable energy, green energy. They can ensure that they are not setting an example of throwing things away, and if they demand this from the tourist agencies. It also depends if tourists can pay or not for sustainable products as green energy, etc is at a higher price. They could also play a role in awareness, they have seen sustainability in their countries, developed countries, practice of green environment. This could be replicated in a localized way. They could use organic food; this is a small step in terms of conserving the environment. There is no other option that working with the local government, they are the ones that are making policies. They implement those policies. Those local people who are willing to work with the local government is the perfect combination. Government is responsible for providing an environment for them to do the businesses, the people are obliged to follow the green rules that the government makes. Local government could play a role in making their own municipality green and environmentally friendly. They could promote that as well, the whole area could promote this, not just the hotels. It's best done with everyone together, when you do it alone, it's difficult to get the outcome you want.

Do you believe that Nepal has a strong tourism infrastructure that can deal and adapt to climate crisis?

I would say no. When we are talking about the climate crisis, I think in terms of policies, we are fine. When it comes to practice at the local level, it is quite bad. I think local people, local community have their own way of dealing with crisis. They bounce back from crisis, but this doesn't mean that they don't suffer. We could use their local knowledge and bring it into policies and bring it to other places, what are they doing to avoid the climate crisis.

How is it more beneficial to have nonprofits and locals heavily involved in conservation efforts?

When we scroll through the web and when we go travel to tourist areas, we can see that is how it is looked upon, government presence is quite low in conservation practice. Then, with these areas that we are looking at, trekking routes, these parks, these are all government properties, they are not private. This makes it the government's responsibility. The government needs to have that local community that depends on that setting for their business and the tourists who come in their area. This has to be mutually worked upon. International NGOs, etc. working on conservation, they bring expertise. Local people are experts in a way that have been managing it throughout time. NGOs bring in finances which helps support the conservation. The government needs to come in. NGOs can show us some sort of model on how locals and governments can work on a certain area. The local government can replicate or make a policy of what the NGOs can do. Financial gaps are being fulfilled by NGOs.

Should the government get more involved?

Government is completely involved; the problem is finances. The priority of the local government is mostly with the infrastructure of Nepal. It's developing in those areas, where roads are not there, the priorities are given to those kinds of things. Government talks about conservation, but this comes a bit later. People will remember that this government official built us a road, not that he planted 500 trees. Government should have more clear policies. Government's role is to formulate and enforce policies.

Do you think the national government should be more involved with enforcing the policies or do you think the local government should enforce the policies?

I think the local government. But if you have a national park that lies between two municipalities, then there is some sort of correlation needed. If there is an area's boundary crosses between two states or provinces, then the provincial government should come into the picture. First, we have the central government, then the provincial government, then the local government. A park could be a boundary between two cities. Trekking routes will normally not be in one city, it will go throughout cities. All the policies are within the central government, there is a guideline from the central government, and based on that guideline, local governments make their own policies. When they are needed, the central government will interfere.

What changes could the government make, if any, to protect the nature of Nepal?

Climate change is the biggest threat to the nature of Nepal. When we talk about Nepal, the types of tourist we attract are the trekkers, people who like the biodiversity, etc. Government, with support from NGOs, should implement those plans with the local people. Government can use the local people to help with the conservation of the land. Ensuring that laws and policies are implemented and monitored, in terms of poaching, deforestation, endangered species.

Do you think that the tourists who come to Nepal are environmentally conscious/try not to add to the environmental problems in Nepal?

A majority of them are. It depends on the types of tourists that we have. If I had to categorize the types of tourists that come to Nepal, I would categorize them in 3 sections. The first ones that

come here are looking for the cheapest options, they are looking for the cheapest flights, hotels, they roam around in their backpack. They would be the least of the tourist category to consider the environment. The second ones are the medium ones, who book their accommodation online, medium budget, accommodation (not supported by data). This group is environmentally conscious. These tourists are from developed countries. They also make an effort of conserving the environment. The third group is the high end, come to nice hotels, have all their packages booked. They are concerned, but we wouldn't be able to find out what can they do. They are going to see sites that the buses take them to. This is an environmentally conscious group. The second group, due to the sheer number, are the most environmentally conscious. Waste management is the biggest issue for Nepal. The amount of waste that we collect from the mountains is huge. There has to be some provision that if you come into the country that you are going to throw out your waste. Government's role is key in this area.

What changes should the tourism industry adopt to reduce their environmental impact? How much has tourism played a role with the environmental issues in Nepal?

The travel agencies can help reduce pollution if they switch to electric vehicles for carrying tourists. There are communities that have green practices, with organic/local food. There are tourists that are looking for places that have sustainable practices. There are some places that ban plastics. When creating the hotels, roads, etc, the forests can be degraded. However, this is could be managed.

Which locals of Nepal are environmentally conscious? Which locals are more involved with conservation efforts?

The youth of Nepal are quite aware now. I think the major people who are environmentally conscious are the ones whose livelihood depend on that area. The people still go in there to collect the firewood, they have shops outside the protected areas – these people are really concerned about the environment because that would affect their livelihood. People living in the cities are practicing conservation less, but they do know more about conservation.

Do you think the locals of Nepal want to work more with nonprofits to help reduce environmental issues? Is there an interest from locals for more government involvement?

People ideally want the government to take over, but because of lack of resources, nonprofits come in. Nonprofits come in with a different baggage. It is more attractive for people to work with nonprofits because you have meetings, some sort of allowances, etc. Once local people and local government are involved, things fall into place.

Any last thoughts/comments?

I would highlight climate crisis – it is not possible for Nepal to mitigate; we can only adapt. We strictly need to adapt now. Tourism is going to suffer a lot if we don't manage that part. All of our touristy areas can be affected by climate change with our snow-capped mountains, near the rivers that can be flooded, and there can be biodiversity loss.