University of Reading

PAYING FOR NATIONAL PARKS: PARK PRICING AND THE VALUE OF NATURE-BASED TOURISM IN SRI LANKA

Thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Agricultural, Environmental and Food Economics

School of Agriculture, Policy, and Development

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Declaration of original authorship

I confirm that this is my own work, and the use of all the material from other sources has been properly and fully acknowledged.

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ABSTRACT

In the last couple of decades, an increasing trend has been observed globally for outdoor recreational activities at natural sites, and national parks are no exception. Despite the benefits received from national parks, whether parks receive enough funds for conservation and management is still questionable. Currently, Sri Lanka charges a park entrance fee of Rs.60 (US$ 0.17) per local tourist and US$ 15 per foreigner, which are considerably lower than other comparable countries. Out of the total revenue earned from park entry fees, more than 90% was contributed by foreign tickets. Even though the country has experienced a substantial rise in tourism following the end of the civil war, tourist arrivals were reduced by the Easter Sunday attack and the COVID-19 pandemic. Within this context, this study examines the conservation and management of park resources for the sustainable development of national parks in Sri Lanka.

The literature on the theories and rationales behind park entry fees were explored, and key informant interviews were conducted with Department higher officials and park wardens to determine their perceptions about funding for national parks and park prices. This established that national parks are often considered club goods or public goods, and Sri Lankan parks can be considered club goods. Though the current entrance fee is relatively low, it was found that the total amount of money a tourist has to spend to enter the park is nearly ten times higher than the entrance fee. It was also observed that Sri Lanka had made use of differential pricing in national parks, and a comparatively higher revenue was received from foreigners than locals.

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A contingent valuation study was used to estimate the willingness-to-pay of local tourists and estimated the revenue-maximizing entrance fee for parks in Sri Lanka. This was conducted in four national parks in Sri Lanka, by surveying 150 local tourists. The results suggested that younger tourists were willing to contribute more than older people, and the respondent's income positively influenced their willingness-to-pay. The mean willingness-to-pay by local tourists was Rs. 109.19, which was higher than the current entrance fee. The optimal price that would maximize the expected revenue for the normal distribution was estimated to be between Rs. 77.50, and for gamma distribution was Rs. 79.25. Although the current entry fee is the same for all the national parks in Sri Lanka, it was found that revenue-maximizing optimum entrance fees for Wilpattu, Hikkaduwa, and Pigeon Island parks were Rs. 88.50 Rs. 87.25, and Rs. 74.25 respectively, suggesting that a price differentiation by sites might be implemented. Together these results suggested that there might be some limited scope to raise revenues from local tourists for the sustainable management of parks. Although the study did not include foreigners, secondary data revealed that there is high scope to increase the revenue by increasing the entrance fees for foreigners.

This study further explored how locals who may or may not have visited the parks were willing to fund the national parks in Sri Lanka if there was no revenue from international tourism. In order to accomplish this, a novel qualitative vignette approach was used. Two vignettes were developed, and individual interviews were done with local tourists and non-tourists. The first vignette aimed to understand the participant's background knowledge about the national parks of Sri Lanka. The second vignette was designed to explore the participant's knowledge and perception

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about the sustainable management of national parks as well as to find out the willingness of respondents to conserve the national parks by various means when there is a loss of revenue from park tourism. The results revealed the awareness of the importance and benefits of parks and the positive attitudes of locals towards the conservation of parks. Further, it was found that locals were willing to contribute to the management of parks by direct contributions. They expressed confidence in being able to collect funds through multiple organisations. Therefore, locals would directly or indirectly contribute to the protection of parks when there is no revenue from foreign tourism and the Government of Sri Lanka may have considerable support from its citizens to protect and manage parks in crises.

The results of the study can be used as propositions leading to the development of a comprehensive policy plan for national parks in Sri Lanka. A revenue-maximizing entrance fee combined with voluntary donations at park sites is considered to be a viable option to overcome any sudden loss of tourism revenue. It is proposed to initiate necessary action to revise the entrance fee of national parks since the entrance fee was not revised for more than a decade. Moreover, the department can consider implementing a park-specific entrance fees system after carrying out a detailed willingness-to-pay study focusing on foreign tourists, and gradually after assessing the actual demand responses of each park.

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ABBREVIATIONS

BC	Before Christ
CF	Consolidated Fund
COVID-19	Coronavirus Disease 2019
DWC	Department of Wildlife Conservation
GEF	Global Environmental Facility
IUCN	International Union for Conservation of Nature
LMIC	Lower Middle-Income Country
LOO	Leave-One-Out
MCMC	Markov Chain Monte Carlo
m	Meter
Mn	Million
Rs	Sri Lankan Rupees
UNFCC	United Nations Framework Convention on Climate Change
UK	United Kingdom
US	United States
USA	United States of America
US$	United States Dollar
VAT	Value Added Tax
WAIC	Widely Applicable Information Criterion
WTA	Willingness-To-Accept
WTP	Willingness-To-Pay
WWF	World Wildlife Fund

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1 INTRODUCTION

In the last couple of decades, there has been an increasing trend observed globally for outdoor recreational activities at natural sites, including national parks which are important tourism destinations (Moore and Carter, 1993; Laarman and Gregersen, 1996; Bushell and Eagles, 2006; Lavorel et al., 2020). Many countries use nature-based tourism sites as a vital strategy for revenue generation (Eagles, 2002). The name "national park" is closely associated with nature-based tourism and can be considered as a symbol of a high-quality natural environment with a well-designed tourist infrastructure (Eagles, 2003).

National parks provide environmental benefits, recreational opportunities, preserve biodiversity, watershed protection, and ecosystem services (Dixon and Sherman, 1990; Ezebilo and Mattsson, 2010; Muhumuza and Balkwill, 2013). In addition, parks indirectly contribute to the protection of cultural and social values of the local community (Platania and Rizzo, 2018), serve as an avenue for rural communities' economic development (Mulwa et al., 2018), provide the potential for employment opportunities, revenue generation and contribute to sustaining human societies (Dharmaratne et al., 2000; Lundmark et al., 2010; Musakwa et al., 2020). They are also considered to be attracting more diverse local and international tourists largely to remote rural areas (Goodwin, 2002; Weber and Sultana, 2013). Despite the benefits received, national parks in lower middle- income countries are unable to meet their conservation needs due to a lack of funding (Baral et al., 2008). Capturing the full

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economic potential of a national park can assist in the conservation and management of parks through increased revenue.

Entrance fees can bring in substantial revenue to maintain and conserve the park resources (Baral et al., 2008), predominantly in low-income countries (Van Zyl, 2019). There is a growing body of literature on park pricing in low-income, lower middle-income and upper middle-income countries (Laarman and Gregersen, 1996; Alexandros and Jaffry, 2005; Reynisdottir et al., 2008; Becker, 2009; Bhandari and Heshmati, 2010; Gregersen, 2012). Many parks in lower middle-income countries (LMICs) generate a small amount of revenue through tourism. It is widely apparent that due to the low entrance fees of protected areas, eco-tourism does not generate adequate income to offset the costs to manage these areas (Laarman and Gregersen, 1996; Maharana et al., 2000; Krug et al., 2002; Baral and Dhungana, 2014; Dikgang and Muchapondwa, 2017; Baral et al., 2017; Witt, 2019). Low park pricing may be a stimulus for a high number of visitors. Moreover, a park with a large number of visitors faces the problems of damage to park resources, environmental deterioration, and degradation in the quality of the visitor experiences due to overuse and misuse. Likewise, when park entrance fees are low, tourists rather than the government reap the surplus from parks. Conversely, very high park pricing may deter tourists and reduce tourism revenue, thereby reducing tourism spendings in and around a park, such as expenditures on accommodation and souvenirs. However, lower entry numbers are likely to cause less ecological damage to parks. Park pricing can therefore be used to regulate the number of tourists and to increase revenue from tourism.

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National park pricing varies across the globe. In some countries, all national parks are free to enter (Wilson and Tisdell, 2004); in others, all visitors pay the same to visit (Reynisdottir et al., 2008); and in others, locals and foreigners are charged different amounts for the same experience. Which countries charge park entrance fees and which countries are not detailed in sections 2.2 and 2.3 of the thesis. Whether or not countries should charge people to visit national parks, the level of any entry fee, and whether differential pricing is appropriate, have each been addressed in the literature to varying degrees.

This thesis will pay particular attention to the park pricing and funding of national parks in Sri Lanka. National parks have long been known as popular tourist destinations in the country. Despite its small size, the country has a relatively large area under the protected area network managed by the Department of Wildlife Conservation and Department of Forest Conservation, where nearly 26.5% of the land area in the country is legally protected (Senevirathna and Perera, 2013). According to Buultjens et al. (2005), Sri Lanka's history of nature protection dates to 247 BC, when the world's first wildlife sanctuary was created in the country. The country has a wide array of ecosystems with the highest level of biodiversity per unit area of land among Asian countries and is rated as one of the 34 biodiversity hot spots in the world (Ashton et al., 1997; Myers et al., 2000). Recently, Sri Lanka also joined among the 100 countries which are united to protect at least 30% of the earth's land and oceans by 2030, also known as "30×30" (https://worldoceanday.org/announcement-more-than-100-countries-commit-to-30x30/). There are currently twenty-six national parks

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on the Island, which are administered by the Department of Wildlife Conservation, Sri Lanka. The prime aim of the department is the "conservation of Sri Lanka's irreplaceable indigenous flora and fauna together with their natural habitat" and the primary duty of the department is to protect the nation's terrestrial wildlife and marine resources (Performance report, Department of Wildlife Conservation, 2017).

Sri Lanka has experienced a substantial rise in tourism following the end of nearly three-decade-long civil war in 2009. In 2018, tourism was the third-largest foreign exchange earner contributing 15.9% of total foreign exchange earnings, followed by worker's remittance and textiles industry (Annual Statistical report, Sri Lanka Tourism Development Authority, 2018). The nation was becoming a major tourist destination in South Asia and in 2018, the top five major sources of markets were India, China, the United Kingdom, Germany, and Australia (Annual Statistical report, Sri Lanka Tourism Development Authority, 2018). After the end of the local civil war, in the last decade, India and the United Kingdom remained to be in the top three sources of origin for foreign tourists in the country (Annual Statistical report, Sri Lanka Tourism Development Authority, 2020). Unfortunately, tourism was brought to a halt after the Easter Sunday attack in April 2019 and again in 2020 due to the COVID-19 pandemic. International tourist arrivals to Sri Lanka during 2019 amounted to 1,913,702, registering a decline of 18 % compared to 2018, following the attack in April 2019. Official tourist receipts were US$ 3606.9 million in 2019, compared to US$ 4380.6 million in 2018, a decline of 17.7% (Annual Statistical report, Sri Lanka Tourism Development Authority, 2019).

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The Department of Wildlife Conservation earns a large part of its revenue from visitor services offered at wildlife national parks. Indeed, it was evident from secondary sources of the Department of Wildlife Conservation, and Sri Lanka Tourism Development Authority, that park entry fees remained the most significant component in the revenue system of national parks in the country. However, insufficient funds for the conservation objectives continued to remain a problem. Furthermore, a lack of up-to-date information on the value of national parks is a serious issue in Sri Lanka (Rathnayake and Gunawardena, 2011).

1.1 Problem statement

Sri Lanka's national parks and protected areas are gaining popularity as wildlife-watching tourism destinations for both local and foreign tourists (Annual Statistical report, 2018, Sri Lanka Tourism Development Authority). Although the potential of tourism to improve the country's economy was initially realized in the early 1960s (Buultjens et al., 2005), tourism in Sri Lanka has been a story of untapped potential. This can be attributed in part to frequent unforeseen negative incidents in the country and in part to a lack of coordination among different tourism service providers and the policymakers of the country. A transformation of the tourism industry is required to make Sri Lanka competitive in the global travel marketplace. According to IUCN (1998), recreational benefits of protected areas can be obtained through concessions, entrance fees, rental fees, and taxes. Currently, in Sri Lanka, the park entrance fee for a local tourist is US$ 0.17 per person per day and for foreigners US$ 15 per person per day (Department of Wildlife Conservation, Sri Lanka). These fees are considerably

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lower than in many other comparable countries. For example, national park entry fees for foreign visitors in Nepal are US$ 30 and US$ 1 for locals (Baral et al., 2017). The evidence presented in the studies by Pandit et al. (2015) and Baral et al. (2017) suggests that the revenue-maximizing entrance fee in Nepalese national parks would be around 2.5 to 3 times higher than the entrance fee at that time. In Botswana, Tanzania, and Kenya, park entrance fees are as high as US$ 120, US$ 80, and US$ 70 respectively for foreign visitors (Sri Lanka Tourism Strategic Plan, 2017-2020). A review of current national park pricing in Sri Lanka revealed that there were no revisions in the current entry fee system for more than fifteen years. Therefore, efforts to estimate the optimal national park entrance fee would be highly beneficial, and a willingness-to-pay study would be a vital component of that work.

Furthermore, Sri Lanka lost an important source of revenue due to the 2019 Easter Sunday attack and COVID-19 pandemic, both of which decimated international tourist arrivals in the country. International tourist park entry fees contribute to the maintenance and management of the country's national parks that are particularly popular with foreign tourists. In situations where foreign tourist park entry fees have typically funded the management and protection of a country's national parks, those countries may need to determine the extent to which, without this revenue stream, they are willing and able to fund the parks. Either the country has to find an alternative source of funding or accept that the parks would be underfunded and, as a result, become degraded. There are currently no extensive studies to explore how

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Sri Lanka's local nationals and long-term residents value and fund their national parks in the absence of foreign tourism. Therefore, this study contributes to filling this void.

1.2 Objective, aim and research questions

The overarching aim of this research is to contribute to the literature on the conservation and management of park resources for the sustainable development of national parks. The broad objective of this study is to provide a better understanding of how Sri Lanka's national parks are valued by local tourists and the implications for park entry fee policies. This is achieved through exploring three key aspects of how parks are valued and how this is linked to park entry fees: first, a detailed articulation of the theory behind, rationales for, and practical aspects of national park entrance fees; second, an assessment of the willingness-to-pay and optimum entrance fee of local tourists for national parks in Sri Lanka; and third, a nuanced qualitative exploration into the role Sri Lankans see for citizens and their government to fund the national park system when there is no revenue from international tourism.

To do this, three specific research questions are addressed:

1. What are the rationales for, and impact of, park entrance fees?
2. What is the optimal price for entrance fees of locals to national parks in Sri Lanka?
3. To what extent are Sri Lankans willing to fund their parks in the absence of foreign entry fee revenue?

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The present study employed both quantitative and qualitative techniques. A willingness-to-pay study was done to estimate the optimum entrance fee for national parks in Sri Lanka. Further, a novel qualitative vignette study explores, how Sri Lanka's locals will respond to conserve and manage the parks when there is a loss in foreign tourism revenue.

1.3 Significance of the study

Over the last couple of years, tourism has evolved into the fastest growing sector in Sri Lanka, even though it has a history of frequent disturbance by more than twenty-five years of civil war, the deadly tsunami in 2004, the Easter Sunday attack in 2019, and most recently the COVID-19 pandemic. All of which severely damaged the country's economy. When distinguished from other types of tourism, wilderness tourism is importantly gaining popularity in many countries and Sri Lanka is no exception. Estimation of willingness- to-pay for park entry fees for the proper management and exploring the perceptions and views of Sri Lankans for the funding of the parks in the absence of foreign entry fee revenue is a timely needed research area. The results of this study will shed light on tourists' willingness-to-pay for park entry fees in Sri Lanka and propose financing mechanisms for the management of parks when tourism revenue diminishes. Several studies used entrance fees, since they were considered to be more realistic, and appropriate for recreational purposes (Walpole et al. 2001; Lee and Han 2002; Reynisdottir et al. 2008; Abedini et al., 2016).

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The study will increase awareness among policymakers on the usefulness of national park tourism and help them to formulate policies for the betterment of park resources and park tourism. Moreover, it seems the increasing reality for Sri Lanka and other lower-income countries, is that they cannot assume that foreign tourists will provide a steady stream of income to fund the protection and maintenance of a country's national parks. This reality has been particularly stark in Sri Lanka but is relevant for many other countries. This is in accordance with the studies by Eagles, (1995); Eagles et al., (2002), where it was reported that there was a decline in share of public going to the management of protected areas.

1.4 Organization of the Thesis

The organization of the thesis is as follows. Following this introductory chapter, chapter 2 discusses the theoretical framework for national park pricing. The first section begins with an introduction. This is followed by the underpinning theories that are relevant to national parks as public, club, or global public goods arguments. The section 2.3 lay out the pricing strategies in practice. Besides, it discusses the arguments for and against charging park entry fees and then proceeds with a discussion on the rationale and scope for raising park entry fees and a brief discussion of park pricing strategies across the world. Section 2.4 expands with the history of the establishment of protected areas and national parks in Sri Lanka, discussion of the results of key informant interviews with department higher officials, evolution of park pricing over time in Sri Lanka, discussion on total fee tourist has to pay to enter the

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park and ends with a discussion of the implications of the findings. Finally, the chapter concludes with a discussion.

Chapter 3 examines the willingness-to-pay (WTP) in terms of entrance fees for national parks. The chapter begins with introduction and proceeds with a brief explanation of park pricing and visitors' willingness-to-pay. The subsequent section describes the trend of tourism in the Sri Lankan context. This is followed by a section on an extensive review of the economic valuation of ecosystem services. This section is categorized into a discussion on different components of total economic value, measures of welfare, and finally an account of the different methods used in previous studies to estimate the WTP for entrance fees along with a discussion of their merits and demerits. Section 3.5 explains the methodology used to elicit WTP. The first subsection under methodology describes the Bayesian inference which is subsequently used to generate WTP estimates. The next subsection explains the survey instrument that was used followed by a brief description of the study area and finally estimation of interval data and the model comparison. The section 3.6 presents empirical results and their interpretations, providing the tourist's socio-demographic characteristics, ratings of visitor experiences, the estimated models, as well as the estimated WTP values and estimated optimum entrance fees. The last section of chapter 3 concludes by discussing the results and any policy implications for the future development and management of national parks in Sri Lanka.

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Chapter 4 presents the study's third objective. This chapter was motivated by the realities of the Easter Bombing and COVID-19 pandemic, and to address the broader issue of how countries might choose to fund their parks when park entry fees collapse, due to crises. This chapter begins with an introduction defining vignettes, discussing the significance of the study, research questions, and objectives of the chapter. The chapter introduction is followed by section 4.2 discussing the history of different shocks to the Sri Lankan tourism sector and its impacts on tourism. Section 4.3 discusses the different types of vignettes, different methods to develop vignettes, how vignettes can be used in qualitative research and ends with a sub-section on the merits and demerits of vignettes. Section 4,4 describes the research methodology used to achieve the objective of chapter 4. The methodology includes the sample selection for vignette interview, construction of vignettes for the study, the developed vignettes and vignette questions, data collection methods, and ends with qualitative data analysis used in the study. During the construction of vignettes, the justification for the development of each line of the vignette is also explained. The next section presents the analytical results of the qualitative data gathered. It includes the results of the word cloud, word tree, and ends with the findings of the thematic analysis of the study. The next section discusses the findings and ends with the conclusions drawn from this qualitative study.

Chapter 5 concludes the thesis by summarizing the results from the three self-contained core chapters, highlighting significance of the study, proposing potential policy implications, and discussing limitations and suggestions for further research.

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2 PARK PRICING IN THEORY AND PRACTICE

2.1 Introduction

Whether or not countries should charge people to visit national parks, the level of any entry fee, and whether differential pricing is appropriate, have each been addressed in the literature to varying degrees (for example, More and Stevens, 2000; Willis, 2003; Reynisdottir et al., 2008; Dikgang and Muchapondwa, 2017). This chapter compares, the theory behind park entrance fee with the practicalities and realities faced by countries as they balance the often-competing demands placed on national parks, such as to provide, for example, government revenue; national and global public goods, including biodiversity conservation; and educational opportunities (Lees, 1998; Stern et al., 2012).

Section 2.2, focuses on the literature that addresses the theory underlying park pricing, focusing in particular on the extent to which a national park has attributes of public or club good. Section 2.3 explores park pricing in practice and highlights the reality that park entry fees can and are manipulated both to increase what are often much-needed revenues for park protection, and to regulate visitor numbers. Section 2.4 uses Sri Lanka as a case, to explore how park pricing has evolved in this low-income country, and the rationale behind the choices made. For this, key informant interviews with higher officials in the Department of Wildlife Conservation were held to explore the details regarding the sources of funding for the management of parks during normal and in crises and to explore the challenges they face in the conservation of parks. In addition, individual interviews were held with park wardens to find out

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their perceptions about the current entrance fees and activities carried out for the management of parks. In common with many low-income countries, Sri Lanka charges entry fees for visitors to its national parks, with foreign tourists being charged considerably more than locals. A descriptive analysis was conducted to compare the total fee for a family comprising of two adults and one child (locals or foreigners) has to pay to enter the park. Further, data on entrance fee revenue from both foreigners and locals for the period of 2010 to 2020 were obtained from different Annual statistical reports by, Sri Lanka Tourism Development Authority and compared. In addition, share of the number of local and foreign visitors who visited popular national parks in 2018, and the share of the revenue from both local and foreign tourists' entrance fees were also plotted. Finally, Section 2.5 concluded with a discussion of the implications of study's findings.

2.2 The theory behind park entry fees

2.2.1 National parks as a club or public good

In economics, goods can be classified across two dimensions: rivalry and excludability. Rivalry characterizes the possibility for the same unit of a good to be used simultaneously, by two individuals. Excludability addresses the extent to which an individual can be excluded or prevented from the use of goods once they have been produced (Perman et al., 2003). Based on these dimensions, goods can be classified into four types: (i) public goods, which are non-rival and non-excludable and freely available to all (Samuelson, 1954); (ii) private goods, which can be considered rival

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goods from the use of which an individual can be excluded; In between these two extremes are 'impure' goods', which hold mixed benefits and partly meet either or both of the criteria such as rivalry and excludability (Kaul et al., 1999). Impure goods are further classified into (iii) "club goods", defined as non-rival and possibly excludable goods; and (iv) common pool goods, defined as rival and non-excludable goods (Adams and McCormick, 1987).

Public goods are defined as "a commodity, measure, fact or service, which can be consumed by one person without diminishing the amount available for consumption by another person (non-rivalry); which is available at zero or negligible marginal cost to a large or unlimited number of consumers (non-exclusiveness); and which does not bring about disutility to any consumer now or in the future (sustainability)" (Reisen et al., 2008, p. 12). They are known for benefiting all members of a society or community and once provided, many can enjoy them for free (Kaul et al., 1999).

National parks have variously been cast as club goods, national public goods, and global public goods. There are several arguments as to why national parks might be best classified as public goods, which in main are focused on the idea that, once the park has been established, anyone can be able to use and enjoy it without cost, because conceptually – the marginal cost of adding one more tourist is zero (Rittenberg and Tregarthen, 2009). Further public goods are non-rival and non-excludable in use, in which case, they cannot be valued directly (Dixon and Sherman, 1990; Mayer, 2014). Specifically, the assumption of non-rivalry in the context of a national park implies that the benefits gained by one individual will not negatively affect other visitors.

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In practice, conceptualizing national parks as public goods is reasonable, up to a point. When few people visit a park, they might reasonably be assumed not to detract from others' own park experience. However, the reality is that each individual tourist is likely to impose some small direct cost on the park in terms of administration and management, and some small externality cost in terms of crowding, and degradation of the ecosystem. This would imply that at the least a small entry fee should be charged. At some point, overcrowding will almost certainly reduce the enjoyment of all those visiting the park, whether due to degradation of the park ecosystems, noise, or simply the number of people in the park (Rathnayake, 2015). As such, many authors suggest that national parks are generally better considered as club goods (Sandler, 1999; Wozniak and Buchs, 2013; Mayer, 2014) which are non-rival and excludable goods except for congestion (Turner, 2002). But in certain situations, national parks may become rivalry in usage. For example, during scuba diving in marine parks, at certain popular locations, congestion may occur, and, in such times, rivalry may set in (Davis and Tisdell, 1995).

Parks may be considered to be "national public goods", in as much as they provide benefits such as recreational facilities, water catchment enhancement, and natural hazard mitigation at the local rather than global level (Vedeld et al., 2016**).** National public goods are considered to be "pure public goods, non-excludable only within the borders of the respective country" (Zai, 2014 p. 138), but other countries also get benefits.

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2.2.2 National parks as global public goods

There are some aspects of national parks that can be considered to be "global public goods", such as biological diversity and genetic heritage, climate change mitigation, and carbon sequestration, because the global population benefits from the presence of the park (Vedeld et al., 2016; Deke, 2008; Varadzin, 2016). The concept of "global public goods" came into popularity in the second half of the 20th century (Stern, 1968). A key issue for resources that are conceptualized as "global public goods" is how to fund the protection and management of these goods, particularly if they are located in one country, but citizens of all countries benefit (Varadzin, 2016).

Governments determine whether their national parks are treated more like public goods, free at the point of use for all; or "user pays" club goods where people have to pay to enter and enjoy, and entry numbers may be limited; through decisions over whether and how to make the parks excludable, and whether and at what level to charge for entry. Opinions towards these two views are mainly centered on such issues as use-value versus non-use value and efficiency versus equity (Reynisdottir et al., 2008, More and Stevens, 2000). National parks are made excludable if there are entrance gates that visitors must go through and where visitors are asked to pay an entrance fee. Some countries may prioritize the protection of natural resources and therefore explicitly choose to exclude people entirely from some areas, for example, to conserve historic and endangered resources for future generations to also enjoy. If the aim of conservation includes consideration for future generations, then treating a national park as a club good rather than a pure public good may be appropriate (Turner, 2002).

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2.3 Pricing strategies in practice

In this section, the literature that addresses the practice of park pricing is explored. It was noted that ultimately, park entry price policies can be seen as political decisions, reflecting the choices of governments as to whether they are aiming to maximize government revenues from the national parks, maximize social welfare, address equity conditions through differential pricing, or simply cover the costs of maintaining the parks (Willis, 2003). Dikgang and Muchapondwa (2017) suggest that there are four objectives linked to choices over whether to charge a park entry fee and what level that fee should be: imputing value to visitation; ensuring parks are managed at economically efficient levels; social equity; and ensuring ecological limits are not breached. Some explored explicitly how entry pricing can be used to manage visitor numbers and reduce crowding (for example, Sutton et al., 2019; Van Zyl et al., 2019). However, there is considerable evidence in the literature that the price elasticity of demand for national parks tends to be low, and as such considerable increases in entry fees would be needed to reduce visitor numbers. Further, sufficiently high entry fees, particularly in low-income countries, are likely to price local tourists out of the market, making the parks only accessible to foreign tourists and the highest-income local households (Tisdell and Wilson, 2003).

2.3.1 Arguments for and against park entry fees

Many countries, particularly higher-income countries, do not charge entry fees for their national parks. In New Zealand, for example, legislation states that national parks cannot charge entry fees, rather, the public has the freedom to enter and access

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the parks (National Parks Act 1980). Similarly in the UK and France, national parks are free at the point of entry, and funded through general taxation (https://www.nationalparks.uk/). Nordic countries also tend not to charge national park entry fees (Reynisdottir et al., 2008). By not charging people to enter their parks, and not limiting numbers, countries are implicitly treating their parks as public goods, with equitable access to all who are able to visit. In developed countries such as Canada, the USA, and Australia some national parks charge entrance fees, and others are free to enter. In Australia, if a park charges a fee, then it is unique for both locals and foreigners (Wilson and Tisdell, 2003).

However, whether to charge entrance fees for national parks remains contested. For example, Iceland does not charge people to enter its national parks. Rather, conservation and management costs of natural attractions have been managed using tax revenue. Over time, higher numbers of tourists visiting the country's national parks have resulted in crowding and imposed increasing costs on the government, which has led some to suggest that entrance fees be charged so that visitors would bear at least some of the costs of conservation and management, thereby reducing the burden on governments to find sufficient funds (Reynisdottir et al., 2008; Bhandari and Heshmati, 2010). Given local resistance to entry fees being introduced, the country opted for a compromise of sorts, including charging parking fees at the most popular sites, and increasing concession fees (Petursson et al., 2016).

Many countries do charge entrance fees for national parks, and these charges are often addressed in terms of practicalities or concepts of fairness. For example, several

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studies found that, even where nature-based tourism sites get public funds for management, they still struggle with inadequate funds for maintenance (Bhandari and Heshmati, 2010). As such, park entry fees are often seen primarily as a practical way of raising much-needed funds to manage the infrastructure and upkeep of a park. A "user pay" perspective further recognizes that a considerable number of individuals never visit national parks, and it might be considered unfair to charge these people indirectly through general taxation. Manning et al. (1984) suggested that, in contrast to public education, recreation in a natural site is not mandatory for the public, and not all the residents of a country benefit from national parks. The implication of this is that all tourists who are using this service should be charged an entrance fee. A "public good" perspective suggests that the enjoyment gained from a public good must be free for all, thereby improving the whole nation's welfare. This implies that the cost of conservation might be contributed to by the public of that nation through government taxation (Reynisdottir et al., 2008). An earlier study by Lindberg (1998) found that the introduction of entrance fees improves better recreational facilities in national parks. Shome (1995) suggests that a zero national park user fee does not correctly reflect the scarcity value of the parks. Versailles park in Paris charges an entrance fee for conservation and management whereas parks in Kenya charge an entry fee to increase the government revenue (Willis, 2003). Galapagos Island in Ecuador charges a differential entry fee for locals and foreigners to manage that world-famous park (Wood, 2002).

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2.3.1.1 Rationale and scope for raising park entry fees

In addition to the choice over whether or not to charge an entry fee, is the decision over how high that fee should be. Government can optimize its economic efficiency for national parks, by charging a fee that could equate to its negative externality. Further user charges can improve the use of a public good more economic efficiently, than would tax (Shome, 1995).

Following Becker (2009), numerous academic studies have explored the feasibility of increasing park entry fees to maximize entry fee revenue for a particular national park or a specific country. Indeed, Dikgang and Muchapondwa (2017) suggest that most park visits are underpriced, as much as tourists have stated that they would be willing to pay more. They further added that if higher-income country tourists are willing to pay more to visit national parks, then they are being subsidized to visit low-income country parks. Stevens et al. (2014) suggest that entrance fees in the USA have only a small impact on the number of visitors, suggesting there is considerable scope for increasing entry fees and total revenue. Dikgang and Muchapondwa (2017) determined that in South Africa, the revenue-maximizing entry fee was 115% greater than was being charged, and this higher fee would almost double the revenue from park entry fees. Yet higher prices could reduce the total spending of tourists in and around a park, or in the destination country more broadly, and so not benefit the host country as a whole. A study in Komodo national park, Indonesia found that a fivefold increase in entrance fee would add substantial revenue to the government for the conservation of parks, but would not significantly affect the visitor numbers (Walpole et al., 2001)

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Various methodologies have been used to determine the revenue-maximizing entry fee, including travel cost methods and choice experiments (for example, Mulwa et al., 2018; Mukanjari et al., 2021b). These papers make important contributions to the literature but can be limited in cases where they focus on just one aspect of revenue, which accrues to the park through entry fees, often ignoring the impact of pricing on accommodation occupancy, spending in restaurants, and additional spending, such as on souvenirs.

In the USA, all visitors pay to visit 108 national parks (out of the 417 parks that belong to National Park Service) that charge an entrance fee. There have been various discussions over whether to increase entry costs to cover the costs of maintaining facilities. For example, in 2017 there were discussions to increase entry fees for some parks from US$ 25 to US$ 70 for a week-long pass (https://www.nationalgeographic.com/travel/article/national-parks-service-entrance-fee-increase-spd). The rationale was that the revenues were needed to renovate and restore the park infrastructure. Arguments against the proposed price increases tended to address the public good aspect of the parks, that there should be equitable access to parks, regardless of ability to pay, and so fees should not be increased, and indeed some argue that they should be eliminated. American national parks that charge an entry fee do offer occasional "free entrance days" to ensure that all people can visit the parks without this cost, and as such address, albeit to a limited extent, equitable access to the parks.

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2.3.1.2 Different park pricing strategies

An earlier study by Eagles (2002), found that several countries charge a flat fee for entrance, typically for facility use, such as for one campsite. Becker (2009) compares four pricing strategies: free entrance, maximum revenue pricing, cost recovery pricing, and differential pricing. The author concludes that a differential pricing system is the best option in terms of cost-effectiveness and reducing the dead-weight loss. Differential pricing for national parks tends to be manifested as different entrance fees being charged to locals and foreigners (Becker, 2009). Foreigners tend to be willing to pay more than locals, suggesting that price discrimination allows park managers to increase total revenue compared to a one-price entrance fee (Cruz, 2008).

Gregersen (2012) identifies three different pricing mechanisms: token charges, going-rate charges, and cost-based charges. The author suggests that tokens, or small charges, have a negligible impact on overall demand, and are too low to raise significant revenues, but have the additional benefit of establishing a pricing policy. An alternate explanation for token charges is that they can be used to impute value to an attraction (Alexandros and Jaffry, 2005). Going-rate charges are described as reflecting "that pricing of a given nature-based attraction should be equivalent to charges at comparable attractions after adjusting for differences in site quality, travel costs, visitors' incomes and other demand factors" (Gregersen, 2012, p. 327). Cost-based charges are higher than the above two, but they are underestimated due to difficulty in quantifying the "ecological impacts" and crowding in parks (Laarman and Gregersen, 1996). The authors further pointed out that, setting a fee needs

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information on tourists' WTP and the pricing objectives of that natural site. These objectives may be categorized into revenue generation, for the government to act freely from outside foreign influences, reduce unfair advantages received by those who do not pay taxes, or reduce the crowding effects inside the parks. Further pricing objectives can focus on improving the local business such as hotels, tour guides, and transport services by lowering the admission fee, hence the implementation finally depends on the respective government's political decision.

Becker (2009), in his study, proposed that park admission prices could be differentiated based on "volume", "individuals" and the "different sites". Volume differentiation refers to those having an affiliation to any natural reserve-related organizations, which gives an advantage of a lower or free entrance into the parks. Differences in prices for locals, foreigners, and school students are called "differentiation by individuals". And finally, price differentiation due to sites means, paying different prices based on types of natural sites.

An earlier study by Sherman and Dixon (1991) introduced different types of fees that can be imposed on tourists such as admission fees; user fees for visitor services such as camping sites, boats, guides, etc.; charges that can be imposed on individuals or companies which provide services to tourists in the form of concessions; royalties-charges for the sale of books, films of parks, t-shirts; special taxes near parks such as for rooms or excise taxes for outdoor equipment.

Many low-income countries practice price discrimination, in which residents are charged nominal park entry fees, whilst foreign tourists are charged much higher fees.

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There are clear rationales presented in the literature as to why differential entry pricing is reasonable and/or efficient. The lower fees that are paid by local tourists tend to be justified in part because the local population bears the opportunity cost of alternative uses of the parkland, and many already pay domestic taxes that may in part fund the establishment and maintenance of parks, where those costs are not covered by entry fees and other related charges (Van Zyl et al., 2019; Mukanjari et al., 2021a, 2021b). In contrast, foreign visitors pay taxes only in their own country, so an entrance fee is seen as a way of recovering from them the benefits they gain from visiting the national parks (Reynisdottir et al., 2008). Foreign visitors typically have a higher WTP, and governments appear more willing to focus on foreigners rather than local tourists as an important source of revenue generation, and more broadly there is an argument that foreign tourists gain the advantage of using public resources should pay for the conservation of those resources (Crompton, 2016). Further Alpízar (2006), in his study, proposed capturing conservation benefits through price discrimination between locals and foreigners. Locals are highly sensitive to price increases, and to resolve the negative marginal effects (such as crowding), a higher entrance fee can be set for locals. Whereas foreigners are less sensitive to price increases and an increased entrance fee can be set to raise the revenue to manage the parks, without affecting visitation.

The issue of differential pricing has also been raised in some higher-income countries, particularly where the parks are free at the point of entry. In order to introduce an entry fee to the Bosco di Capodimonte national park in Naples, a revenue-maximizing discriminatory price was proposed by the author as opposed to a unitary price (Willis,

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2003). To overcome the political barriers to implementing an admission fee, the author proposes an initial lower entry fee with successive increments, followed by a differential pricing with a fair price for locals and low-income people.

2.3.2 Equity aspects of park pricing

In many low-income and lower- middle-income countries, entrance fees for national parks, and other protected areas have been considered to be a controversial issue (Schwartz and Lin, 2006). Many of these countries often have multi-tiered entrance fee system for locals to reduce the inequity issues (Richer and Christensen, 1999). But previous studies have shown that equity beliefs have an impact on entrance fees of protected areas (Nyaupane et al., 2009). Equity principle is based on Adam's equity theory, which prompts the view that anyone who pays more in the form of taxes or entrance fees will get more benefits (Crompton and West, 2008). Entry fees or user fees for protected areas were found to be efficient than tax revenues, since in some countries they are directly used for the management of protected areas. But poor communities and minority groups get affected by the entrance fee systems (Martin, 1999). Moreover, from social equity point of view, protected areas and national parks provide social goods have to be provided free to their citizens (More, 2002). Setting a fee equal to marginal recreation cost and using a differential pricing would be an efficient solution to the equity issues (Mendes, 2003).

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2.4 A case study in Sri Lanka

2.4.1 Background

The Wildlife and Nature Protection Society of Sri Lanka (WNPS) was established in 1894, with the objective of increasing government support for wildlife protection (Buultjens et al., 2005). In 1889, due to the pressure created by the Game Protection Society, the government established the first sanctuary in Asia at Yala (Uragoda, 1994). In 1891, and 1894 two ordinances were enacted by the government to prevent the deliberate killing of buffaloes, elephants, fish, birds, and other games.

A number of sanctuaries were established later and in the 1930s these sanctuaries, including Yala, were converted into national parks. Initially, these areas were managed by the Forest Department. However, a separate Department for wildlife was established in October 1949, due to inadequate staff in Forest Department for managing both wildlife and forest resources. With the appointment of a warden for wildlife in 1950, the administration of protected areas came under the purview of the Department for Wildlife (Nanayakkara, 1987). By 2001 there were 11 national parks established across the country (Buultjens et al., 2005), though due to the local war, only four parks were open to tourists at that time. There are currently 501 protected areas in Sri Lanka, covering the area of 1,767,000 ha (26.5 percent of the total land area), are classified into five categories, strict nature reserves, nature reserves, forest corridors and sanctuaries, and national parks (see Appendix I, showing the protected areas in the country). These protected areas are recognized under the Flora and Fauna Protection Ordinance and managed by the Department of Wildlife Conservation.

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2.4.2 Results of the key informant interviews with Higher officials of the Department of Wildlife Conservation

After gaining ethical approval from the School of Agriculture Policy and Development's Ethics Committee, key informant interviews were held using semi-structured questionnaires with officials of the Department of Wildlife Conservation (DWC), Sri Lanka, to improve the understanding of how Sri Lanka's parks are funded. These interviews supplement the limited literature on park pricing and park funding specific to Sri Lanka. The interviews were digitally recorded and then transcribed verbatim. It was interesting to note that, there was consistency in the answers by the officials which are presented below.

Section A: Conservation and management of national parks

Interviewer: What are the sources of revenue for the conservation of national parks in Sri Lanka?

> *Department official: Mainly from the government fund. It is a consolidated fund (CF). Some foreign aid is also there. But those foreign funds are based on different projects. World Bank or GEF funds are some foreign aided funds.*

Interviewer: That means you are not dependent on foreign tourist revenue?

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Department official: No. not. The income we earn, we use it. Collection from park revenue, we use it. Since we collected the park revenue, it's automatically a government fund, no? We use park revenue but as a government fund.

Interviewer: How important is each of these sources and what share does each contribute?

Department official: 100 percent from CF funds.

Interviewer: What do you mean by "project basis"? Do you have to write a proposal to get grants?

Department official: Yes. These foreign aids are specifically for certain projects. As an example, say, when we write a proposal to conserve dugong, then they provide funds only to conserve that. The general running of the department is only dependent on CF funds.

Interviewer: In particular, is the revenue you receive from tourists, sufficient to cover all the management costs of Sri Lanka's national parks?

Department official: It depends. Last two, or three months, we did not receive enough money. Because of the problem of COVID-19. But generally, the wildlife department receives enough money. So, it depends on the situation. For example, during the pandemic period, we have no tourism. Therefore, we had to depend on Government funding.

Interviewer: How important is international versus national tourism in the management of national parks?

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Department official: International tourism is quality-wise good compared to national tourism. International tourists are well behaved, and the revenue is comparatively very high. Foreigners are charged a high amount of money. In terms of money, in terms of behavior, foreign tourism revenue is better than local.

Interviewer: In terms of behavior means?

Department official: Local tourists sometimes behave badly. Our aim of wildlife tourism is not to disturb the wildlife. And it is just to watch the wildlife without any distractions. But local tourists sometimes, disturb the animals, disturb the vegetation, and disturb the environment. But foreigners are not like that. Income from local tourists is very low. But the cost for them is high. The environmental cost is high since they harm the environment, which is considered a cost. But we cannot say that all local tourists behave badly.

Interviewer: Do you think Sri Lanka's parks have sufficient funding?

Department official: Yes. But in some protected areas, there is not enough tourism. Yala, Wilpattu, and Minneriya national parks, which are some of the popular national parks, get enough revenue for the management. But some rural national parks such as Wasgamuwa, and Somawathiya do not receive enough revenue.

Interviewer: If not (parks do not have sufficient funding), what do you think would be the best way of ensuring the parks are sufficiently funded in the future?

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> *Department official: The tourism facilities should be improved. And we are trying to increase the reserve areas. Our objective is not to earn the money. Our objective is to conserve the national parks. Biodiversity conservation or catchment conservation. Tourism is a byproduct of conservation. (Repeating) Tourism is not the Sri Lanka wildlife department's main target.*

Results of the interview with higher officials of the DWC revealed that currently, revenues from park entry fees and other park services are directly credited to the government's consolidated fund. Each year the government then allocates a certain percentage of this consolidated fund for park management. But unfortunately, the share of revenue earned from the parks cannot be, directly utilized by parks. According to Wickramasinghe, (2009) out of the total income received from national parks in Sri Lanka, 50% is allocated to the wildlife preservation fund and the remaining 50% is paid to the respective provincial councils for the infrastructure development in that particular area. As such, entry fee revenues collected by a particular park are not hypothecated for a specific park, rather funding is allocated based more on the needs of each park. International organizations such as the World Bank and the Global Environment Facility (GEF) also provide funding based on the different proposals submitted by Sri Lanka's Department of Wildlife Conservation. The World Bank is the "single largest international funder of biodiversity conservation projects and spends, on average, US$ 275 million annually for the protected areas in developing countries" (Hickey and Pimm, 2011. p. 269). Further higher officials

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insisted repeatedly that the prime aim of the department is to conserve the parks and that tourism in parks is secondary.

Section B: Conservation and management of national parks in a situation of low revenue from tourism

Interviewer: In situations where there is insufficient funding for the national parks, what actions do you take for the smooth functioning of parks and how do you cope with such situations?

Department official: Funds for the management of national parks come directly from the government. That means the treasury allocates money to run the department, irrespective of whether we earn money or not.

Interviewer: If revenues from park entry fees dramatically declined, what actions do you think might be taken by the government and park managers?

Department official: Basically, we can assure you that the government will fund for management of parks. If the treasury does not have enough money, we can go for donors.

Interviewer: But can you get suddenly any funds from donors?

Department official: Suddenly we cannot. But there are some opportunities.

Interviewer: Would you reduce each park's budget by about the same amount?

Department official: No. we have no experience like that. Same conservation and management. You know that we develop a work plan each year. Annual work plan. The budget will be allocated based on that plan, which will be implemented without any

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issues. Whether we receive enough money or not from parks, the government will allocate based on an annual plan.

Interviewer: Would you prioritize some parks over others, and if so which and why?

Department official: It is automatically prioritized based on the publicity. And in other cases, we prioritize the areas based on conservation values.

Interviewer: Conservation values mean?

Department official: Conservation value includes, biodiversity conservation, catchment conservation, historical value, archeological value, and ecosystem services. But automatically prioritized based on publicity (Repeated). Yala is a popular one. So, it is prioritized based on tourism.

Interviewer: Up to 2020, Sri Lankans faced a number of unexpected disasters, such as local war, tsunami, Easter Sunday attack, and now the COVID-19 pandemic. During those crisis situations did you ever shut down those parks or try to change their designation or use?

Department official: No and never (laughing).

It was noteworthy, that the parks receive continuous funding from the government's consolidated fund irrespective of whether there is tourism in parks or not. These funds are allocated based on the annual plan submitted by the Department of Wildlife Conservation. In situations when there is not enough money in the treasury, the government will approach donors, but parks were never shut down due to insufficient funding in crisis situations.

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Section C: Challenges in the management of national parks

Interviewer: More broadly what are the main challenges you face in the management of national parks?

Department official: Poverty in the surrounding communities. Because they depend on national parks. They go hunting and cut trees because of poverty. Illegally they utilize these resources.

Interviewer: How do you overcome those problems?

Department official: We are trying to control these activities through "community outreach programs". The staff of national parks, help the people who live in the vicinity to improve their income, for example, provide training for self-employment, sometimes funding, and sometimes assistance with infrastructure development. Here funding means, we provide seed money to start their self-employment. For example, if someone wants to start a small shop, then if they do not have enough money, we provide some seed money.

Interviewer: How do you identify people for this seed money funding?

Department official: This is actually a process. We develop a micro plan for villages. During the development process, we identify what are the resources and what are the gaps. If they need training, then we provide training for self-employment. We form a group in a village and register them with the government sector and we provide money to that society. The idea is to improve the relationship between the government i.e., park officers and the villages.

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National parks in low-income and lower-middle-income countries often face a conflict between surrounding communities and park management (Nepal and Weber, 1995), and this is no exception in Sri Lankan parks. Interview results revealed that the poverty of the local community has a negative impact on the conservation activities of parks. These may be due to the fact that local communities are mostly dependent on park resources. The conflicts may be aggravated if the surrounding community do not get any compensation (Goldman, 2011). In the case of Sri Lankan parks, the DWC provides trainings for self-employment, seed money for self-employment activities through various community outreach programs. Locally selected individuals having mutual responsibility to their local community and the park authorities are the beneficiaries of these programs. A survey by the World Wildlife Fund (WWF) determining the "success factors or management effectiveness of protected areas" revealed that "a well-funded, appropriately staffed protected area, with good environmental education and community outreach, and also with excellent enforcement capacity are the minimum critical ingredients for effective management" (World Wildlife Fund, 2004, p. 4). This survey was carried out in 200 protected areas in 34 countries and is the largest global survey of protected area effectiveness. The WWF study especially emphasized that if there is no proper relationship between the management side of the protected area and the surrounding community, it will reduce the effectiveness of conservation activities.

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2.4.3 Park fees and park funding

Personal interviews held with wardens in one national park revealed that, before COVID-19 pandemic, the income received from national parks was sufficient to cover the day-to-day costs of the parks. However, visitor numbers fell dramatically after the tragic Easter Sunday bombings in 2019. Although visitor numbers started to recover, the COVID-19 pandemic and associated travel restrictions resulted once again in the close to complete cessation of international tourism to Sri Lanka and much reduced domestic tourism.

As far back as 1997, researchers have observed that both local and international tourists in Sri Lanka were willing to pay considerably more to visit the country's national parks than they were being charged through entrance fees. Specifically, Silva and Kotagama (1997) found that local tourists were willing to pay an entry fee of Rs. 69.50 to visit Udawalawe National Park, whilst at the time the actual fee was Rs. 18, and this proposed entry fee of Rs. 69.50 would increase revenues by over 200%. The authors suggest these findings reflect a considerable undervaluation of wildlife viewing in the country. However, as discussed earlier in this chapter, increasing entry fees for local tourists is controversial. Interestingly, the authors further suggest that the increase in entry fees would result in visitor numbers falling by around 47% and that this could also have ecological benefits. In Yala at that time there were already concerns over overcrowding, and that the social and environmental carrying capacities of tourists might already have been breached (Buultjens et al., 2003), yet no restrictions were in place to limit visitor numbers. An increase in entry price would have brought both increased revenue and additional ecological benefits. However, a

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reduction in local visitor numbers due to increased entry fees would also have had considerable implications for access and inequality and could be interpreted as Sri Lanka evolving its national parks from public to club goods that only the better off could afford.

In the early 2000s, there was a revision of the entrance fee system. For example, locals were charged Rs. 20 (around US$ 0.25) whilst international tourists were charged US$ 12 (Buultjens et al., 2003). Around five to six years later another revision resulted in park entrance fees for local tourists being increased to Rs. 60. Interestingly, at the time this was not much lower than an entry fee of Rs. 80 that was estimated to be the revenue-maximizing level in Horton Plains National Park (Rathnayake and Gunawardena, 2011).

Although park entry fees for Sri Lankan tourists remain relatively low, at Rs. 60 per adult, the total cost for a local family to enter a park is considerably higher, as illustrated in Table 2.1. Tourists must pay a service charge and vehicle entry charge that are flat rates however many tourists are in a group. Evidence suggests that though entrance fees and government charges are clearly displayed at the ticket counter, vehicle drivers do not display their charges. Therefore, it is difficult for visitors to know how much they are going to be charged and therefore the total cost of a visit to one of the national parks. Interviews with park managers suggest that safari jeep drivers charge around Rs 3000-3500 per trip, depending on the specific location and demand. Some interesting points that arose from the discussions with park managers of Minneriya and Wilpattu parks are presented below.

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2.4.4 Results of personal interviews held with park wardens

Interviewer: When do tourists mostly visit Minneriya and Wilpattu parks?

Park manager: Generally for Minneriya, each year during the dry season (in the months of May to September), when Sri Lankan elephants are attracted to grass fields on the edges of the reservoir. Minneriya contributes to sustaining this large herd of elephants ranging from 300 to 600 elephants. During the dry season, they migrate to Minneriya park from Wasgamuwa National park and benefit from the food and shelter of the park's forest. This gathering of large herds of the elephant is known as World famous "Minneriya Elephant Gathering". So, we can see a large number of tourists during this time in Minneriya national park. In Minneriya the trip covers 20- 25 km of the extent, and it may take nearly two and a half hours.

But an entire day is needed to see the flora and fauna in Wilpattu national park. Because it covers more than 100, 000 hectares of land. And the best time to visit Wilpattu park is from May to September. But the park is open throughout the year for tourists.

Interviewer: What are the main activities you do for the "conservation and management" of parks?

Park manager: We treat injured or sick animals, construct or maintain the road networks inside the parks, management of circuit bungalows, etc. We go and inspect the nearby paddy, and other agricultural crop fields if they are harmed by the wildlife.

Interviewer: What about the circuit bungalows in the park? Do the tourists have to book in advance?

Park manager: Yes, the tourists have to book in advance through the Department of Wildlife Conservation website or by direct booking. Tourists who reserved the

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bungalows will be allowed inside the park after checking their identity. Here the parks will only charge Rs. 250 per vehicle and VAT for the entry of their vehicle to the circuit bungalow. But since the road network is not suitable to use the private vehicles for safari, the visitors in the bungalows can request a safari jeep with all relevant payments.

Interviewer: What about the food availability in circuit bungalows?

Park manager: Tourists can bring dry rations and/or fresh food items for them. If bungalow keepers are provided with necessary ingredients by tourists, keepers will cook the preferred food for the visitors. But we do not charge for this service.

Interviewer: What is your perception about the current entrance fee?

Park manager: The entrance fee for locals is Rs.60 per person. And if two local tourists along with their child visit the park, some feel that they have to pay only Rs. 150. But the reality is that to enter the parks, they have to pay more than Rs. 500 except for the payment of a safari jeep, which is an unexpected amount for some locals. For example, there are some poor parents who bring their children, to do an assignment to be submitted to their child's school hoping that they have to only pay less than Rs. 100 for entry into the park. But when they see the total ticket amount, they have to pay is nearly Rs. 700, they become worried. In addition to this, they have to pay a minimum charge for safari jeeps. Some parents do not have other options, as they feel their children's education is important and try to pay the total amount. But in our experience, we have seen that some others after seeing the total cost, left the parks without visiting inside.

Similar incidents happen to foreigners also during peak times. For two foreigners and their child, the total fee would be around, Rs. 10, 000 (including VAT, service charge, and vehicle entry fee). Some tourists come along with their guides, and those guides

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have an agreement with safari jeep drivers for payments of around Rs. 15, 000. So, the total cost would be nearly Rs. 25, 000 which is more than 100 US$. *Sometimes, foreigners feel it is expensive for them, and they go to other cheaper places.*

Jeep drivers never display their charges. So, the visitors do not have any idea, how much they are going to be charged. But the entrance fee and the government charges are displayed in front of the ticket office and are available on the website. In normal times, safari jeep drivers charge Rs. 3000 to Rs. 3500 per trip. But in peak time, jeep drivers charge Rs. 4500 to Rs. 5000 per seat for foreigners in popular parks such as Wilpattu and Yala.

Some of the agents or hotels provide packages inclusive of accommodation, meals, and safaris, and in a way, they are also benefitted. Some tourists suggest increasing the entrance fees and some foreign tourists suggest increasing the bungalow charges also. But some others do not like increasing the fees. But we suggest that to avoid all this confusion, the government has to display all the charges in digitalized form (including the rate for safari) at the entrance of all parks. So, the tourists could be able to calculate the total expenses before they go to the ticket counter.

Results of the interviews held with park wardens revealed that the size of a park, season, diversity of flora and fauna, and recreational activities in the park may influence the tourism inflow. Park wardens remarked that although the current entrance fee may be a smaller amount, the total sum of money a tourist has to pay to enter the park is unexpectedly 5-10 times higher than the entrance fees. This prevents

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some poor locals from visiting the parks. These pragmatic views of park wardens and the data available on the ticket counter, signaled the primary researcher to estimate the total cost a family has to pay to enter the parks.

Consider a family with 2 adults (local/ foreigners) along with their child visiting a national park in Sri Lanka. Table 2.1 shows the comparison of the amount of fees they have to pay in total to enter the parks. Here the service charge and the vehicle entry fees are flat rates and are uniform across all parks. Further vehicle entry fees apply to all vehicles irrelevant of private vehicles or safari jeeps. From this table, it is clearly evident that foreigners (2 adults + 1 child) have to pay almost twelve times higher the cost than locals of the same number have to pay.

Table 2.1: Comparison of total cost for entry into national parks for local or foreign family consisting of two adults and a child

Description	**No**	**Locals**		**Foreigners**		
		No.* entry fee	**Amount (in Rs)**	**No.* entry fee**	**Amount (in US$)**	**[1]Amount (in Rs)**
Adults	2	2*60	Rs. 120	2* 15 US$	30 US$	Rs.6078.00
Children	1	1*30	Rs. 30	1* 8 US$	08 US$	Rs.1620.80
Service charge			Rs. 300		08 US$	Rs.1620.80
Vehicle entry fee			Rs. 250	[2]Rs. 250	1.24 US$	Rs.250.00
VAT (8%)			Rs. 56		3.8 US$	Rs.769.90
Total			**Rs. 756**		**51.04 US$**	**Rs.10,340.70**

[1] At the conversion rate of 1 US$ = Rs. 202. 60

[2] Irrespective of number of tourists in a group, whether foreigners or locals, the vehicle entry fee is charged at fixed rate of Rs. 250

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Table 2.2 provides a comparison of revenues earned by the Department of Wildlife Conservation, Sri Lanka through local, and foreigner park entry fees for the period from 2010 to 2020. Clearly therefore in Sri Lanka differential pricing is being used, reflecting, and taking advantage of different elasticities of demand for local and international tourists to increase total revenues from entry fees compared with a one-price strategy. These statistics support the possibility of enhancing the differential fee system between locals and foreigners, to exploit the revenue for the conservation of parks.

Table 2.2: Comparison of revenue from locals and foreigners park entry fees

Year	Income from the park entry fee of foreigners (in Rs. 'Million)	Income from the park entry fee of locals (in Rs. 'Million)
2010	227.25	25.92
2011	301.01	31.93
2012	424.85	34.17
2013	578.46	35.83
2014	831.59	41.62
2015	1,011. 59	50.09
2016	1,445.97	70.02
2017	1,730. 72	67.70
2018	2,138.45	73.08
2019	1,827.75	62.72
2020	495.08	33.65

Source: Annual statistical reports from 2010 to 2020, Sri Lanka Tourism Development Authority

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Table 2.3 shows the total number of locals and foreigners, who visited major national parks in Sri Lanka, the revenue earned from entrance fees, and the total revenue received from visitor services in the respective parks. In 2018, the highest number of tourists visited the parks, compared to previous years. From the table, it was found that on average, 59.42% were domestic tourists, but the contribution of revenue from the local entry fee to the total revenue from entry fees was only 3.3%. Even though the total number of local visitors was high compared to foreigners, the revenue earned from foreigners through entrance fees was higher due to the higher entrance fees charged to foreigners. Further, a total of Rs. 2,211.53 million revenue was earned, only from entry tickets in that particular year, which is nearly 70.45% of the total revenue earned from these parks. Balance revenue of Rs. 927.40 million was earned from the other visitor services such as the sale of fisheries permits, filming charges in the parks, campsite occupation fees, sale of books, magazines, periodicals, etc. Moreover, it was evident that the number of tourists visiting each park is not uniform to all parks.

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Table 2.3: Number of local and foreign visitors to major national parks and revenue from entrance fees and visitor services from respective national parks in 2018

National parks	No. of local visitors	Income - entry fees_ locals (Rs. 'Million)	No. of foreign visitors	Income - entry fees- foreigners (Rs. 'Million)	Total Visitors	Total revenue from visitor services (Rs. 'Million)
Yala	317,878	19.23	311,368	684.66	629,246	977.78
Horton Plains	293,626	16.29	117,632	275.03	411,258	417.27
Udawalawa	199,822	11.87	211,810	496.66	411,632	709.35
Wasgamuwa	32,708	1.01	2,545	3.47	35,253	12.1
Minneriya	93,336	5.53	97,578	222.66	190,914	305.52
Bundala	85,571	0.54	12,199	18.96	97,770	30.37
Horagolla	7,346	0.27	5	0.01	7,351	0.32
Kaudulla	129,221	5.08	157,114	240.67	286,335	358.92
Lunugamverera	2,892	0.13	1,118	1.69	4,010	7.62
Gal Oya	12,053	0.35	3,783	2.13	15,836	12.22
Kumana	32,538	1.25	9,554	15.04	42,092	29.53
Angammedilla	3,704	0.14	9	0.02	3,713	0.83
Galwaysland	5,767	0.22	277	0.42	6,044	0.79
Wilpattu	60,869	3.55	32,991	76.88	93,860	129.69
Maduruoya	2,299	0.10	570	0.99	2,869	2.35
Lahugala	797	0.01	42	0.07	839	1.24
Pigeon Island	86,885	3.64	33,120	49.35	120,005	76.96
Hikkaduwa	30,280	0.14	3,699	0.10	33,979	0.24
ETH-Udawalawa	198,043	3.39	99,880	43.29	297,923	56.62
Kalpitiya	14,000	0.28	5,048	6.21	19,048	8.8
Kalawewa	1,153	0.05	93	0.14	1,246	0.41
Total	1,610,788	73.08	1,100,435	2138.45	2,711,223	3,138.93

Source: Performance report, 2018, Department of Wildlife Conservation, Sri Lanka

Annual statistical report 2018, Sri Lanka Tourism Development Authority

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2.5 Discussion and conclusion

The pricing of entry to national parks varies across the globe, and there are multiple perspectives on whether parks should charge entry fees at all, and if so, how high those fees should be. This chapter, motivated by theoretical discussions over whether national parks are best characterized as public goods or club goods, had explored the literature that addresses the practical realities of park pricing. For example, to the extent that a national park can be considered a public good, there are arguments that access should be free at the point of entry. Yet the reality is that governments may not always prioritize funding national parks from general tax revenue when there are many other pressing demands, and so charging entry fees. Further, tourists impose costs on parks and other visitors, and so entry fees, or restrictions on the number of entry permits allocated, can be used to reduce visitor numbers.

The concept of equity come up a lot in the literature, both as an argument for national parks being free at the point of entry and for national parks charging entry fees (Mendes, 2003) . Some people want their national parks to be open and free to all so that people can visit the parks irrespective of their ability to pay, and this can be interpreted as an equitable access argument. Yet others argue that those who benefit from visiting a national park should pay and that it is unfair for those who do not want to visit a national park, or who are unable to visit, still pay for the parks through general taxation. Particularly in low-income countries, differential pricing rather than a single fee enables parks to charge foreign tourists relatively high fees, whilst ensuring access for local tourists through nominal fees (Mendes. 2003; Dikgang and

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Muchapondwa, 2013; Van Zyl et al., 2019). Whether parks are conceptualized as public goods or club goods, the exploration of the literature and different countries' approaches to park pricing suggests that practical aspects of park pricing are complex and messy and are likely to be country specific.

Considerable attention has been paid in the literature to determining the optimal park entry fee that maximizes total revenue from those fees, and almost inevitably the conclusions reached are that higher fees would bring in greater and much-needed revenues. Though increasing park fees also has the benefit of reducing congestion, and reducing the pressure on the broader ecosystem, people living near the park may lose out, given that there are fewer people visiting the parks who also may have less income to spend once the higher entry fee has been paid.

Interviews with higher officials revealed that parks are constantly supported by the government's consolidated fund. Similar observation was found in protected areas of Central European countries, where the income received from protected areas are directly debited to state government's budget and the government finances for the management of parks (Mika et al., 2016; Mayer and Job, 2014). Although the revenue from parks is directly credited to the treasury account, parks don't get their share of the revenue. But in situations when the tourism revenue was depleted, parks were never shut down. Further, to cope with the conflicts between park management and the surrounding community, park authorities implement various outreach programs. According to Goodwin (2002), if the local communities can gain any sustainable

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economic benefits from national parks, the parks can be less exploited, and the local community will support protection.

Park wardens remarked how the total sum of money a tourist has to pay to enter the parks deters some poor locals. This is in line with other studies by Willis, 2010; Dikgang and Muchapondwa, 2013. In addition, they revealed that there is no control over the charges by safari jeep drivers. The descriptive analysis of the total cost tourists has to pay revealed that the amount is surprisingly higher than the current admission fee. This suggests that the total cost one has to pay to enter the parks, must be displayed at the entrance before going to the ticket counter. Secondary data from various sources revealed the importance of foreign park tourism inflow. In Sri Lanka, the double tragedies of the Easter Sunday attack in 2019, and the COVID-19 pandemic, have revealed that, particularly for low-income countries, revenue from park entry fees can fluctuate considerably year on year, and that any park pricing and funding strategy must recognize and be flexible to these realities.

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3 PAYING FOR NATIONAL PARKS: PARK PRICING IN A SRI LANKAN CONTEXT

3.1 Introduction

Protected areas are the cornerstone of biological diversity conservation, shelter the different species and maintain the ecological processes (Prato and Fagre, 2005; Dudley, 2008). As a result, tourism in protected areas has become the "fastest-growing of all tourism submarkets with tremendous potential for increasing visitation in parks' protected natural landscapes" (Eagles and McCool, 2002, p.44). Nowadays, wildlife tourism has become an integral part of the revenue generation and economic growth of most low- and middle-income countries (Spergel, 2001; Lundmark et al., 2010; Musakwa et al., 2020). Further, national parks are a protected area category that conserves biological diversity, maintains the beauty of the landscape, and acts as a "symbol of national pride" (Schägner et al., 2016, p. 71).

Even though protected areas and parks attract a large number of tourists for wildlife-based tourism, the connection between tourism and the protection of wildlife resources for future use is still questionable and has gained a considerable amount of criticism (Ranaweerage et al., 2015). Furthermore, a study by Sumanapala (2018) found that the funds received by parks from the Sri Lankan government are not enough to manage parks. Therefore, the respective government and park officials need to develop mechanisms to balance ecological conservation and capture the benefits of park tourism. As detailed in section 2.3 of the thesis, charging an entrance fee to national parks has still been debated (Reynisdottir et al., 2008). But in the light

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of the prospective conservation benefits derived from the entrance fee, an appropriate fee has to be set for any national park to capture its full economic potential (Walpole et al., 2001). National parks in Sri Lanka charge entrance fees far below the optimum. Further, evidence by Newsome (2013) found that there is poor management of park resources and visitors in some of the national parks in Sri Lanka. Therefore, finding the optimum entrance fee for Sri Lankan national parks is essential, enabling sustainable management of park resources. Motivated by this, the current chapter of the thesis aimed at estimating the tourists' WTP for the conservation and management of national parks in Sri Lanka. This chapter used the dichotomous choice contingent valuation technique to estimate the WTP.

3.2 Park pricing and visitor willingness-to-pay

With the rise of outdoor recreation in national parks, there has been an increasing concern about fixing the appropriate entrance fees for parks and protected areas (Herath and Kennedy, 2004). A great deal of previous research into park entry fees found that the price charged tends to be both significantly lower than the maximum amount tourists are willing to pay and lower than the management costs of parks (Laarman and Gregersen, 1996; Shultz et al., 1998; Lindberg and Aylward 1999; Roberts and Hawkins2000; Walpole et al., 2001; Rathnayake and Gunawardena, 2011; Baral and Dhungana, 2014; Dikgang and Muchapondwa, 2017). An early study by Laarman and Gregersen (1996) discussed that due to the difference between actual park entry fees and the amounts visitors are willing to pay, the low-income countries

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charge higher fees for tourists from high-income countries. They further suggested that determining an appropriate fee for tourist attraction areas is difficult due to the diverse nature of visitors, their different objectives of visitation, and the fee instruments used. Lowering the park entrance fees increases the tourist numbers, thereby increasing the tourism revenue but will lead to environmental degradation in the parks.

In contrast, high park pricing may deplete tourist numbers and reduce tourism revenue (Chase et al., 1998; Spergel, 2001; More and Stevens, 2000). Regardless of the arguments for and against park entrance fees, previous studies have shown that the public generally accepts fixing prices for parks and protected areas (Fix and Vaske, 2007). Setting a park entry fee can be complex due to the varied nature of visitor profiles and the different attributes of parks. Further, it was found that the fee levels suitable for a park cannot be for others (Witt, 2019).

Several factors determine a tourist's willingness to visit a park. An early study in Poas park of Costa Rica by Shultz et al. (1998) found that the sex of the respondent and services available in the park significantly and positively influenced the WTP. Another study in the same period on setting fees for national parks revealed that pricing objectives, visitor demand, and information about tourists influence the WTP for park fees (Laarman and Gregersen, 1996). A study by Baral and Dhungana (2014) found that bid amount, education, and use of a guide were statistically significant predictors of WTP decisions. Another study by Bal and Mohanty (2014) on the

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determination of WTP for Bhitarakanika National Park in India found that the income of respondents, age, number of days spent inside the park, and travel cost positively and significantly affect the WTP for entrance fees. A study in the national parks of Iceland found that income, education level of tourists, and attitude of respondents towards environmental protection positively influenced the WTP (Reynisdottir et al., 2008). Whereas outcome on age is contrary to a study by Bal and Mohanty (2014), in which age negatively influenced the WTP for entrance fees.

3.3 Tourism in the Sri Lankan context

Sri Lanka is a small island having spectacular beauty offering tourism in national parks, protected areas, cultural triangles, botanical gardens, beaches bestowed with natural splendor, archaeological sites, and other artificial attractions (Sri Lanka Tourism Development Authority). In the last couple of years, tourism has played an essential role in boosting the country's economy.

In the early 1960s, with the recognition of the tourism industry's contribution to economic growth and the development of the "Tourist Development Act of 1968", the government continuously tried to develop the tourism industry (Sri Lanka Tourism Development Authority). Figure 3.1 depicts the trend of tourist arrivals from 2000 to 2020. From Figure 3.1, it can be seen that tourism in Sri Lanka has increased to a new limit of over 2.3 million (2,333,796) international tourist arrivals in 2018, which is an increase of 10.3 percent over the previous year's arrivals (Tourism growth trends 1985-2020, Sri Lanka Tourism Development Authority). Up until then, due to local civil

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war and the 2004 deadly Indian Ocean tsunami, the Sri Lankan government has not achieved its expected benefits in the tourism sector. Because during those times, most parts of the Island were unsafe to travel to due to security reasons and poor infrastructure facilities. A detailed account of the trend of tourism in Sri Lanka is given in section 4.2 of the thesis under the heading of "Shocks to Sri Lanka's tourism sector" and in chapter 1, Introduction of the thesis.

In 2013," Lonely Planet", the world's leading travel guide nominated Sri Lanka as the 'Number 1 destination in the world to visit' (lonelyplanet.com). In 2015, Forbes magazine ranked the island among the 'top ten coolest countries' to visit. Global influencers including Condé Nast Traveller, Rough Guides, Lonely Planet, the Guardian, and the New York Times identified Sri Lanka as a top location to visit in 2016. Again, in 2019, the island was named the 'best country to visit' by lonely planet (lonelyplanet.com) and was ranked as the "top warm-weather destination for winter travel" by the USA Today 2019 (usatoday.com). In 2021, based on the Conde Nast 2021 Readers' Choice Awards, the country was ranked among 'The Best Countries to Travel to' (condenast.com). Furthermore, the exotic island is 'One of the Top 25 islands', voted by Travel + Leisure magazine readers for 2021 (travelandleisure.com). All these sources have used the nature-based tourism attributes of the island as an essential criterion for their evaluation, implying the popularity of the country in the world for eco-tourism.

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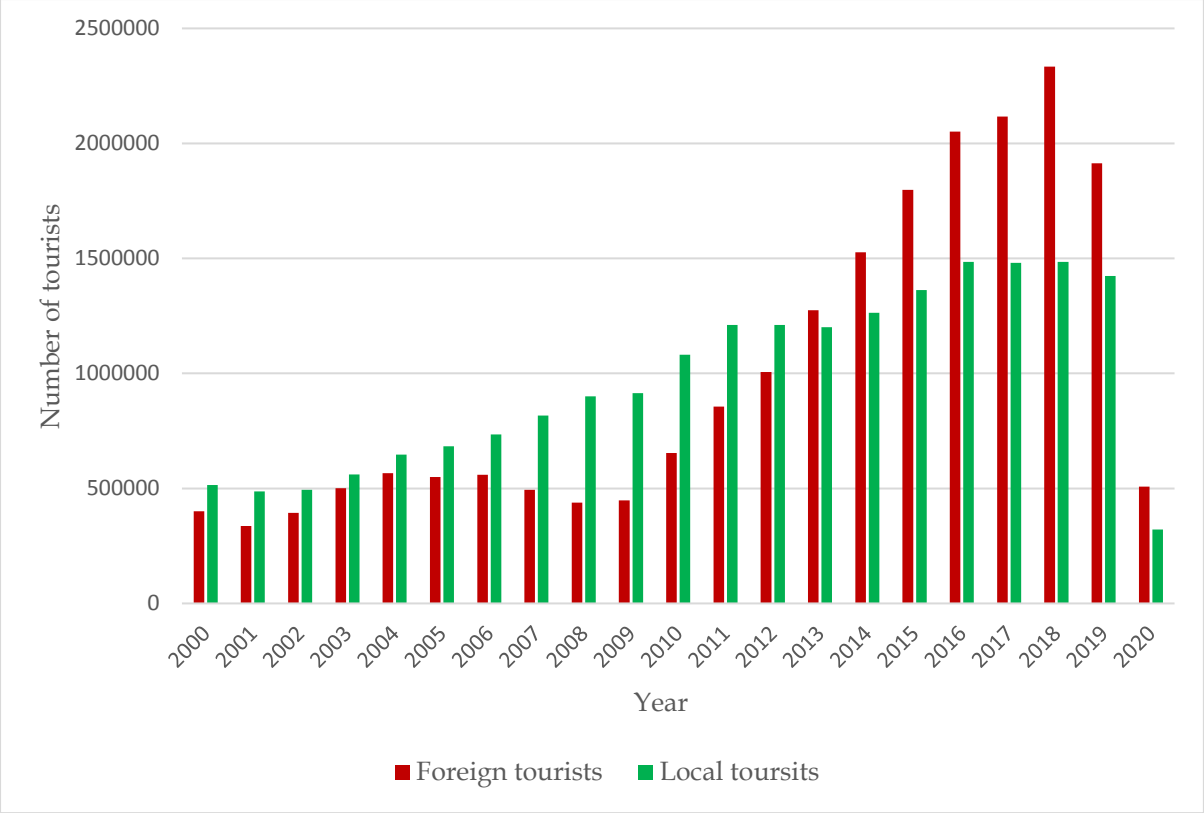

Figure 3.1: Trend of local and foreign tourist arrivals for the period of 2000 to 2020

3.4 Environmental valuation

3.4.1 Components of Total Economic Value

Economists have categorized the total economic value of environmental resources into use-value, nonuse value, and option value. Use values are associated with the direct use of environmental resources, which have further classified into consumptive (e.g., timber extraction, water collected from the river) or non-consumptive (e.g., wildlife viewing, scenic beauty). Option value reflects the value people place on a natural resource with possible future use. Examples include the value of preserving wildlife areas, sanctuaries, etc. Nonuse value indicates the value placed on a resource they will never use. Nonuse values could be further classified into "Bequest value" and

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“Existence value". Bequest value is the value for preserving the environmental resources for the future generation. Existence value is the value placed on a resource for continued existence but without any interest in future use (Tietenberg, and Lewis, 2018; Lew, 2015).

3.4.2 Measures of welfare: Compensating and equivalent variation

Economists use the term “consumer surplus” to measure the changes in welfare (Pauwels, 1978). John Hicks (1939) classified economic welfare changes into two categories, i.e., equivalent variation and compensating variation. According to Hicks (1939), the concept behind assessing the compensatory or equivalent variation is the estimation of the intrinsic value of a good. The main purpose of any contingent valuation studies of environmental goods is to find the equivalent or compensatory variation (Johnston et al., 2017). The Equivalent variation is the “quantity of money income which, if given to the individual without the price fall, would give the same level of utility as he or she would have attained if the price fall had occurred” (Perman et al., 2003, p. 405). In other words, to avoid any price changes, the amount an individual would be willing to pay is the equivalent variation. Even though there are price changes, the consumer will be held at the same level of utility (Johansson, 1990). The compensating variation is the “quantity of money income which, when taken from the individual together with the price fall, leaves the individual at his or her initial level of utility” (Perman et al., 2003, p. 405).

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Venkatachalam (2004) explains the relationships between compensating variation/ equivalent variation and willingness-to-pay / willingness-to-accept as:

> For a proposed welfare gain, due to the provision of public good, the compensating variation refers to the amount of money income that has to be given up by the consumer to attain an increased level of utility (i.e., willingness-to-pay). The equivalent variation refers to the amount of compensation required to be provided to the individual so that she could attain an improved utility level in case the provision of the public good does not take place (i.e., willingness-to-accept) (p.91).
>
> For a welfare loss, the compensating variation refers to the amount of money income that is required to compensate the individual for the welfare loss experienced (i.e., willingness-to-accept) and equivalent variation refers to the amount of money income to be sacrificed by the consumer to prevent the loss from occurring in future (i.e., willingness-to-pay) (p.92).

Willig (1976), in his study, contended that WTP and willingness-to-accept (WTA) are pretty close in values for a price change. In contrast to the findings by Willig (1976), a study by Hanemann (1991) found that if the substitution effect becomes lesser and lesser for any public good, the difference between WTP and WTA will become more prominent, holding the income effect at a constant level.

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3.4.3 Methods to estimate the willingness-to-pay for park entrance fee

Several valuation techniques have been used to value environmental goods and services. These valuation techniques can be broadly classified into revealed preference and stated preference methods (Tietenberg and Lewis, 2018).

3.4.3.1 Revealed preference method

Revealed preference methods involve the valuation of non-market impacts by actual observable behavior (Tietenberg and Lewis, 2018). Travel cost method, hedonic property value, averting expenditure, and hedonic wage values are a few techniques that come under revealed preference methods. In the present study, we only discuss the travel cost method.

3.4.3.1.1 Travel cost method

During the last couple of decades, the travel cost method was considered a better valuation tool for recreational places and amenities since the technique relies on the actual behaviors of visitors (Mulwa et al., 2018). The travel costs are estimated by placing a value using the expenses such as travel costs, entry fees, and expenditure for accommodation, food, and capital equipment (Fleming and Cook, 2008). The theory behind the method is the estimation of consumer surplus (Hailu et al., 2005). One of the problems in the process is the opportunity cost of time, which should be included in the estimation (Freeman, 1993). But there were a lot of alternative methods developed by incorporating time, and one of the major assumptions in the method is that in a single trip, only one location could be visited (Fleming and Cook, 2008). Furthermore, if more people have access to a centrally located park, the main disadvantage in estimating people's recreational value based on travel cost models

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would be the lack of variation in travel costs to estimate a demand curve (Willis, 2003). Many historical studies used the travel cost method to estimate the WTP for park entry fees.

In their study, Santiago and Bulayog (2019) used the travel cost method to estimate the tourists' WTP to entrance fees for the improvement and preservation of Lake Danao Park in the Philippines. They found that tourists were willing to pay more than the current entrance fees. Another study by Khan (2006) in Margalla Hills national park in Pakistan on the estimation of WTP for entry fees for the improvement of the quality of the parks revealed that tourists were willing to pay Rs. 20 as entrance fees. During the study period, entry to national parks in Pakistan was free. The primary purpose of this study was to check whether the government can manage the limited number of parks in a better way by introducing an entrance fee. A survey in Lake Nakuru National Park used the individual travel cost method to estimate the WTP for park entrance fee. This survey revealed that foreign tourists were willing to pay thrice the current entrance fee. Further, locals were willing to pay twice the current entrance fee (Chacha et al., 2013).

A study in Maasai Mara national park in Kenya on the estimation of recreational value and optimal pricing using the individual travel cost method found that the optimal conservation fee was US$ 86.90 per day, which was higher than the current entrance fees (Mulwa et al., 2018). Similarly, Mendes (2003) used the same individual travel cost method to estimate the maximum WTP for visitation to Peneda-Gerês national park in Portugal.

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3.4.3.2 Stated preference method

The stated preference method refers to a group of techniques that uses a respondent's statement about their preferences for an environmental amenity and is measured using a suitable preference model to produce a value (Tietenberg and Lewis, 2018). Choice modeling and contingent valuation come under stated preference methods. The stated preference method has different biases such as strategic, design, and hypothetical (Walpole et al., 2001). In addition, there are starting point biases when fixing a bidding amount as an entrance fee.

3.4.3.2.1 Contingent valuation

Contingent valuation is widely used in most environmental valuation studies and is dependent on every individual's stated WTP for the hypothetical changes in environmental amenity (Walsh, 1986). Natural attractions are non-market goods. Suppose an environmental enhancement occurs when the individual believes he or she is better off in some way, in which case, the individual will be willing to pay for that improvement in nature (Hanley et al., 1997). Contingent valuation is now used around the world for assessing a variety of environmental problems. Davis (1963) did the first contingent valuation survey. He compared the results with the travel cost approach and found that the results were similar. Since then, many studies have been done on different areas such as education, health, sanitation, tourism, and the environment with contingent valuation (Carson et al., 1995). Some noteworthy examples of this method are surveys used to elicit individuals' WTP for such things as reduction in household soiling and cleaning (Ridker, 1967), air quality in the Four Corners area (Randall et al., 1974), the right to hunt waterfowl (Hammack and Brown,

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1974), reduced congestion in wilderness areas (Cicchetti and Smith, 1973), the value of duck hunting permits (Bishop and Heberlein, 1979), air pollution in Southern California(Brookshire et al., 1982), Smith and Desvousges study (1986) on cleaning up the Monongahela River, Carson and Mitchell (1993) on national water quality benefits from the Clean Water Act to name but a few.

The flexible nature of the contingent valuation facilitates the estimation of values in different non-market goods, including those that are not currently provided, and empowers the assessment of passive use values (Carson et al., 2001). In a study by Tisdell (2006), it was found that WTP for a recreational resource has been the most frequently used indicator for valuation. At the same time, there are still many debates regarding the contingent valuation method. But this method is still accepted by most researchers as the best and most powerful tool for studies in environmental valuation and is deep-rooted in welfare economics (Hanley et al., 2001).

There were several studies conducted to compare contingent valuation and direct methods. They revealed that the results were often fairly close; overall, the contingent valuation estimates are slightly lower than the revealed preference estimates and highly correlated with them (Carson et al., 1994). There are two fundamental advantages of contingent valuation methods over travel cost methods. First, it can evaluate current situations and an individual's WTP for hypothetical changes in environmental amenities. In contrast, the travel cost method can be used to value only the visitation made by tourists to a place. Secondly, the contingent valuation method

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can value multi-purposes and multi-destination trips, whereas travel cost methods do not (Sorg et al., 1985; Sorg and Nelson, 1987). Further existence benefits of both users and nonusers can only be estimated by the contingent valuation method (Carson and Mitchell, 1993).

But there were opinions that the responses given by the participants in contingent valuation methods were inconsistent with the principles of rational choice. Where sometimes, the respondents do not understand what it is they are being asked to value, and stated values reflect more than the actual expected value (Arrow et al. 1993). Most of the contingent valuation methods are normally based on conservation value, and it is difficult to determine the values for different services and activities of the parks (Park and Song, 2018).

Whitehead (2006) outlined a series of processes for conducting the contingent valuation survey. The first step is "questionnaire design", in which the questionnaire may contain an attitudinal section, a behavioral section, a valuation section, and a demographic section. The attitudinal section gives an introduction by asking questions on perceptions and thoughts about the survey topic. The behavior section may include questions such as, "how many times have you visited the park in the last five years?". The valuation section would have questions related to valuation, and finally, the demographic section includes questions regarding age, income, education level of respondents, etc. The next step is "writing a valuation scenario", which includes an explanation of the concrete proposed policy scenario and questions

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related to the payment vehicle. After the development of questionnaires, feedback had to be obtained from the experts, friends, family members, and consultants, if any. Once the questionnaire has been revised based on comments, the next step is to conduct the survey and report the study results.

The contingent valuation method includes a range of elicitation techniques: open-ended, closed-ended, dichotomous choice, iterative bidding, or multiple bounded dichotomous choice questions (Boyle et al., 1996, Carson and Groves, 2007). Until the mid-1980s, open-ended questions were predominantly used for surveys. The responses to these open-ended questions were helpful and easy to analyze until the researchers felt the possible cognitive burden faced by the respondents (Hanley et al., 2001). Subsequently, most of the contingent valuation studies have used closed-ended questions (Hanemann, 1994). Initially, closed-ended questions were used as iterative bidding questions (Whitehead, 2006). Double bounded dichotomous contingent valuation techniques were first proposed by Hanemann (1985). As presented by Hanemann (1985), the double bounded dichotomous choice involves asking two sequential binary questions on the acceptance or rejection of a bid to improve an environmental condition. Double bounded dichotomous choice questions have been found to increase statistical efficiency compared to the single-bounded method (Hanemann et al., 1991). The multiple bounded dichotomous choices require more than two successive binary bids. On the other hand, trichotomous choice involves the "don't know" option in addition to the yes/ no answer (Whitehead, 2006).

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An earlier study in Costa Rica used the dichotomous choice bidding contingent valuation technique to determine the WTP for return visits to two different Costa Rican national parks (Shultz et al., 1998). This study found that foreigners would pay 50% more and 150% more for the Poas volcano national park and Manuel Antonio parks, respectively. A study conducted in Komodo National Park, Indonesia, using contingent valuation- dichotomous choice WTP questions revealed that tourists were willing to pay more than ten times the current entrance fee (Walpole et al., 2001). Similar results were obtained in a dichotomous contingent valuation study on tourists' WTP for access to the Annapurna Conservation Area in Nepal (Baral and Dhungana, 2014). The results of this study further supported the idea that the tourists were willing to pay substantially higher entry fees, which was four times higher than the fee at that time. A study by Platania and Rizzo (2018) using the contingent valuation method to estimate tourists' WTP for an admission ticket to access Etna park in Italy revealed that 53% of the sample were willing to pay a ticket fee. During the study period, admission to protected areas was free in Italy, and the government planned to introduce an admission ticket to some regional protected areas. The study further found that 89.7% were willing to pay one of the proposed amounts of €5.00.

3.4.3.2.2 Choice experiments

Choice modelling is a group of methodologies that uses surveys in which the respondents are asked to rank, rate, or choose the goods based on the attributes and levels of different nature-based amenities (Hanley et al., 2001). Tourists to a national park will benefit from various characteristics of the park resources and disutility such

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as overcrowding (Hearne and Salinas, 2002). In their study, Jacobsen and Thorsen (2010, p. 1534) stated, "the Choice experiment method relies on a random utility model, where the utility of a good is described as a function of its attributes and people choose among complex goods by evaluating their attributes". But Adamowicz et al. (1998) observed a notable difference from the above in that they claim that the choice method is based both on Lancasterian consumer theory and Random Utility theory. The findings of Adamowicz et al. (1998) were supported by Garrod and Willis (1999).

The choice experiment has the advantage over contingent valuation in that it allows a particular situation to break down into different attributes. The respondents have to value each attribute, whereas, in contingent valuation, the enumerators have to provide a lot of information about a situation, and that situation would be evaluated as a whole (Garrod and Willis, 1999). But if there is not much distinction between the goods or services being investigated, it would not be easy to differentiate the contribution of every attribute to the overall utility derived. But using choice experiments, this contribution would be estimated by allocating a coefficient to each attribute level in the model (Schroeder and Louviere, 1999). In recent years a considerable number of research have been done using various attributes for the choice experiment of national parks. In 1999, a study by Schroeder and Louviere investigated the effect of user fees at public recreation sites using eight different attributes of varying levels, including water features, development status of the location, campground status, and travel distance.

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A study by Jacobsen and Thorsen (2010) in Denmark found that attributes such as extra nature protection initiatives, extra efforts for unique plants and animals, and different paths significantly influence the WTP for the selected national parks. Juutinen et al. (2011) used attributes related to biodiversity and recreational facilities. The results revealed that the respondents' highly valued features are an increase in biodiversity and a decrease in the number of visitors. Chaminuka et al. (2012), in their study at Kruger national park in South Africa, used attributes related to eco-tourism viz., village cultural tours, visits to village craft markets, accommodation inside or outside the park, and the price. The results revealed that all groups of tourists showed significant interest in village tours and craft villages.

A study by Wang et al. (2014) valued different attributes of national forest parks in China. The features included vegetation coverage, number of pieces of rubbish for every 100 meters and number of bins placed in every 100 m, degree of crowding for every 100m, protection of cultural and historical relics, and entrance fees. They estimated the WTP for each attribute. Shoyama et al. (2013), in an investigation of tourists' preferences in Japan, used attributes related to both natural forest and climate mitigation. Mansfield et al. (2015) researched a choice experiment intending to reduce snowmobiles inside the Yellowstone national park to lessen the negative externalities such as noise, pollution as well as health and safety-related risks to the tourists.

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3.5 Methodology

The majority of the contingent valuation studies followed a classical data analysis approach. The present study adds to the literature by proposing a Bayesian interval-data regression model to estimate the tourist's WTP for the national park entrance fee.

3.5.1 Bayesian inference

Statistical analysis uses two ways for interpretation of probability. They are Frequentist (Classical) inference and Bayesian inference. The Bayesian analysis relies on the Bayesian theorem using prior distributions about a parameter with information coming from the data which it then updates to posterior distributions using the laws of probability (Jackman, 2009; Korner-Nievergelt et al., 2015). In simple words, it updates prior knowledge about a parameter to obtain the posterior knowledge. The more usual form of the theorem is in terms of random variables.

$$Prior\ beliefs \rightarrow Data \rightarrow Posterior\ beliefs$$

The theorem is given by the following equation (Lancaster, 2004; Koop et al., 2007).

$$p\left(\theta \middle| y\right) = \frac{p(y|\theta)p(\theta)}{p(y)} \qquad (1)$$

In this model, θ is a parameter and the value of y is the data. $p\left(\theta \middle| y\right)$ is called the posterior density which represents the beliefs about θ, based on beliefs on priors and the likelihood. $p\left(y \middle| \theta\right)$ is the likelihood and "gives the prediction as to what the data should look like if the parameter takes the particular value given by θ" (Lancaster, 2004 p. 8). $p(\theta)$ is the prior distribution which is the probability distribution that

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would express one's beliefs about the values of θ. The denominator $p(y)$ is the marginal distribution of the data. Since it does not depend on the parameter (s) θ, it does not provide any information about which values of θ are more or less probable.

The equation (1) could be written as,

$$p\left(\theta \mid y\right) \alpha\, p\left(y \mid \theta\right) p(\theta) \qquad (2)$$

Where α indicates proportionality and the above relation could be read as "the posterior distribution is proportional to the likelihood times prior" (Lancaster, 2004 p, 10, Tejedor, 2017).

Even though there are some disadvantages such as sometimes the Bayesian analysis can produce posterior distributions that are influenced by priors and need more advanced statistical software (Jonas et al., 2013), the Bayesian analysis offers distinctive advantages over frequentist analysis. For example, p values are not used in Bayesian analysis and complex models can be fitted flexibly (Kruschke, 2010; Korner- Nievergelt et al., 2015). Furthermore, a complete information about all the parameters can be obtained.

3.5.2 Survey instrument

To find out the optimum park entry fee for national parks in Sri Lanka, a WTP survey was done at the selected national parks. Initially, pilot testing was done to improve the validity, which ultimately permitted the survey questionnaire to be refined. Pre-tested and appropriately designed WTP questionnaires were found to reduce the biases in the survey (Perman et al., 2003).

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According to Garrod and Willis (2001), WTP surveys are normally carried out through various means such as self-administered questionnaires, face-to-face interviews, telephone interviews, and mail questionnaires. This study used face-to-face interviews using Kobo Toolbox software. For the estimation of park price, the sampling frame consisted of local tourists, and a total of one hundred and fifty samples were used for the study. Respondents were provided with an array of potential WTP amounts in the double bounded dichotomous choice format, and from which respondents were asked whether they would still have visited the park at those prices, and if so, for how many days. The tourists only have to answer "yes" or "no" to these bid values, and if yes, for how many days? An open-ended follow-up question to express or reveal their WTP for the fair entrance fee for that specific park was solicited. The questionnaire gathered additional information on respondents' socio-demographic condition, their experience in the national park, motivation behind park visitation, activities in the national park, government's attitudes towards conservation, and rating of experience in the park (see Appendix VI for the questionnaire used for the WTP study).

Tourists were interviewed at the entrance of the national parks, after their visitation, and before they leave the national parks. Every 5th individual who passes the interview point was asked for their consent and then interviewed. To avoid interviewer bias, a single interviewer interviewed all respondents. Each national park was visited multiple times during the survey period. If there were a group of visitors, one individual per group was asked to complete the survey. The respondents who

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had a definite source of income were interviewed. Before commencement of the survey, every respondent was informed of the purpose of the study to avoid possible strategic bias such as interviewees may perceive that their responses will influence Sri Lanka's national park fee system. Informed consent was obtained by all participants and the study was approved by the School of Agriculture Policy and Development's Ethics Committee. Scenarios were verbalized as follows and were explained to the respondents during the survey.

3.5.2.1 Entrance fee increase scenario

A certain percentage of revenues received from park entry fees goes to the conservation and management, habitat restoration, and visitor management of Sri Lanka's parks. There are possibilities that the park fees could be increased. I am going to give you some of those possible new prices and I would like to know whether you would still have visited the park at those prices, and if so, for how many days?

Park entrance fees per person	Would you still have visited the park? (1=Yes, 0=No)	If "Yes" how many days?
Rs. 70		
Rs. 80		
Rs. 100		
Rs. 120		
Rs. 150		
Rs. 200		

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3.5.3 Study area

Sri Lanka, a small island in the Indian Ocean has 26 national parks which are famous for various park-specific attributes. Tourists who visit the Sri Lankan parks don't miss the chance to see "the charismatic and celebrated wild elephants that form the backbone of Sri Lanka's promising ecotourism industry" (The World Bank Group, 2010, p. 6). The Asian Elephant Specialist group which is an integral part of the Species Survival Commission of IUCN reported that Sri Lanka has 11- 12% of Asian elephants which is the second highest percentage of Asian elephants in the world followed by India. So, in the majority of terrestrial parks in the country, largely Asian elephants could be seen. For the present study, two marine national parks namely Hikkaduwa and Pigeon Island, and two terrestrial national parks namely Minneriya and Wilpattu were chosen.

Hikkaduwa is one of the most densely developed tourist sites in Sri Lanka and encompasses the first National marine sanctuary (White et al., 1997). This national park contains a fringing coral reef with a high degree of biodiversity and lies on the South-West coast, approximately 100km from the South of Colombo. The coral reef at Hikkaduwa extends about 130m seaward. A few rocky islands are also found near the shore area (Department of Wildlife Conservation, Sri Lanka).

Pigeon Island national park is another marine national park which is located in Nilaveli, a coastal town in Eastern Province, encompassing a total area of 471.43 hectares. The island's name derives from nationally endangered wild rock

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pigeons which have colonized it and contain some of the best remaining coral reefs of Sri Lanka (Department of Wildlife Conservation, Sri Lanka).

Minneriya national park is in the District of Polonnaruwa in the North Central Province. The total area of the park is 8,889.41 hectares. Minneriya reservoir along with its surroundings plays a vital role as a wetland, hence it has high biodiversity and serves as one of the elephant conservation areas in Sri Lanka (Department of Wildlife Conservation, Sri Lanka).

Wilpattu national park located near the North-West coast, spans the border between the Northcentral province and the Northwestern province of the country. It is one of the oldest and most important protected areas in Sri Lanka. The sanctuary lies inland from the coast encircling a total area of 131,667.1 hectares. The main topographical feature in this park is the concentration of "villus" or "lakes" in the middle of the park. Mammalian diversity and ecological densities are highest in such ecotones as the interfaces, between forest, scrub and grasslands converge in the West (Department of Wildlife Conservation, Sri Lanka).

3.5.4 Analysis

3.5.4.1 Estimation of interval data

The WTP values obtained by double bounded dichotomous choice format methods are not continuous values. For this type of value, the traditional ordinary least squares estimation cannot be used (He et al., 2020). The elicitation procedure used, obtained upper and lower bounds for people's WTP. The appropriate form of estimation for this type of data is the interval regression model developed by Stewart (1983). The

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interval regression model assumes that the latent data for the dependent variable $\{y_i\}_{i=1}^{N}$ are continuous and lie within observed intervals as a normal distribution $\{[l,u]_i\}_{i=1}^{N}$. Denoting N (μ, σ) as a normal distribution with mean μ and standard deviation σ. The underlying form of this model for the latent data is otherwise the same as for the standard linear regression shown below.

$$y_i \sim N\ (\beta_0 + \sum_{k=1}^{K} \beta_k \quad x_{i,k}\ , \sigma) \qquad (1)$$

Or alternatively, the normalized version is

$$y_i \sim N\ [\alpha + \sum_{k=1}^{K} \beta_k\ (x_{i,k}\ -\ \bar{x}_k), \sigma] \qquad (2)$$

where α represents the WTP at the mean of the regressors.

The above model is normally distributed and is available commonly in open-source software. However, as with the standard linear regression, the failure of the normality assumption can lead to extreme values (i.e., very high lower bounds or very low higher bounds) having undue leverage on the actual results. Importantly, there is no underlying reason to assume normality. Here therefore we explore two alternative distributions for the interval regression model. Using the normalized form above, these can be stated as Student-t, and Gamma Distributions[3]. Equation 3 is the Student-t distribution and 4 is the Gamma distribution.[4]

$$y_i\ = t_v\ [\alpha + \sum_{k=1}^{K} \beta_k\ (x_{i,k}\ -\ \bar{x}_k), \sigma] \qquad (3)$$

[3] The Student-t, and Gamma Distributions are defined as in the STAN functions reference 18.4. and 19.6 respectively in https://mc-stan.org/docs/2_29/functions-reference/gammadistribution.ht

[4] I would like to acknowledge Prof. Kelvin Balcombe, University of Reading for the support given to me in developing the equations.

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and

$$y_i = G\{[\alpha + \sum_{k=1}^{K} \beta_k (x_{i,k} - \bar{x}_k)]\sigma, \sigma\} \quad (4)$$

Where t_v (μ σ) is a non-centered t-distribution with mean μ with v degrees of freedom and dispersion parameter σ and G (a, b) is a Gamma distribution. The parameterization above for the Gamma distribution has a mean and variance[5].

$$E(y_i) = [\alpha + \sum_{k=1}^{K} \beta_k (x_{i,k} - \bar{x}_k)] \quad (5)$$

$$Var(y_i) = \frac{[\alpha + \sum_{k=1}^{K} \beta_k (x_{i,k} - \bar{x}_k)]}{\sigma} \quad (6)$$

Note, that the variance here is heteroscedastic which increases with the conditional mean and exists provided this conditional mean is strictly positive.

The t-distributed model is a symmetric distribution. For this model, the degrees of freedom v can be estimated endogenously and therefore has one additional parameter that requires estimation. As $v \to \infty$ this becomes equivalent to the normal model and becomes very similar to the normal model for $v > 25$. The t-distributed model is often used as a "robust" estimator in regressions since it will not be as sensitive to extreme values. This model can also be viewed as a normal model with heteroscedastic errors of an unknown form (See Koop (2003) section 6.4).

The Gamma distributed model has the same number of parameters as the normal model but is asymmetric and assumes that there is a long right-tail in the dependent variable distribution.

[5] Note that the use of the term σ is not meant to denote that it is the standard deviation. This parameter is inversely related to the standard deviation y. Note also that we experimented with parameterising this by its reciprocal. The model gave almost identical results given a Cauchy prior.

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The implementation of the interval model was done by assuming that,

$$y_i = \rho l_i + (1 - \rho)\, u_i$$

where the parameter ρ was bounded on the interval [0, 1]. This additional parameter also requires estimation. Note that using these methods requires that $l_i$and u_i. Therefore, for those individuals who indicated that they would pay more than the maximum amount in the survey (200), it was assumed that they would pay up to double this amount (400) (i.e., between 200 and 400). Those that indicated they would not pay the smallest possible amount in the survey (70) were assumed to have a willingness-to-pay bounded below by zero (i.e., between 0 and 70)

The priors for the models were set as non-informative except for the mean willingness-to-pay which we specified as a Truncated Normal. We specified proper priors for all parameters except β_k which were given uniform priors over an infinite range.

More specifically:

$$\alpha \sim N\ (100, 50)\ T\ (0, 300)$$

$$\rho \sim Uniform\ (0, 1)$$

$$\sigma \sim Cauchy\ (0, 1)\ T\ (0, \infty)$$

$$\beta_k \sim Uniform\ (-\infty, \infty)$$

$$v \sim Uniform\ (1{,}25)$$

Studies of interval-valued data became active research in the form of regression in the early 2000s (Jang and Kang, 2020). Billard and Diday (2000) introduced the first approach by using the midpoint values of the interval data to fit a regression model.

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Further, a study by Lima Neto et al. (2004) used ranges of the interval data to form, two independent regression models. After that, a study by Billard and Diday (2007), proposed regression models based on both midpoints of interval data and ranges of intervals simultaneously. But by considering the demerits of the above methods Lima Neto et al. (2004) applied the constrained model.

Nowadays the use of Bayesian estimation is increasingly popular and efficient due to the development of statistical software such as Stan (Carpenter et al., 2017). Gelo and Turpie (2021, p. 3) in their study reported "Bayesian approach helps attain greater parameters precision". Commenting on Bayesian interpretation, León and Vázquez-Polo (1998, p. 206 and 209) argue that "double bounded responses allow us to consider the estimated probability of the single bounded model as prior information for modelling individual behavior and the answers to the first dichotomous choice questions are utilized to model the prior probability about mean willingness-to-pay". The present study estimated three models, using the most common approach for Bayesian inference, the Markov chain Monte Carlo (MCMC) simulation techniques. They were the normal model, the Student-t model and the Gamma model. For each model we used the Stan of 6 chains run for 1000 warmup and 3000 post-warmup iterations [6]. The Stan codes used in the analysis are given in Appendix II.

[6] I would like to acknowledge Prof. Kelvin Balcombe, University of Reading for writing the RStan codes for estimation of the models.

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1.5.4.2 Model comparison

We compared the three Bayesian models using LOO and/ or WAIC estimates for model selection that are implementable with the LOO package in R[7]. These are described in greater detail in Vehtari et al. (2017). These measures are essentially based on Bayesian information Criteria. However, they contain sampling errors. Moreover, in the estimation of these measures allowance must be made for the dependence that arises for a common dependent likelihood. These comparisons are also implemented in the R package above. Alternative ways to compare models include Bayes Ratios and Posterior Odds (see Koop 2003 section 2.5). However, these require proper priors (the uniform priors for β_k above are not proper) and can be sensitive to these priors.

3.5.4.3 Revenue Maximising Pricing

Let us assume that we know the distribution of the willingness-to-pay (w) for an entry to a park.

$$w \sim f(w)\ with\ \int_p^{\infty} f(w)\, dw = P\ (w \geq p) = 1 - F(p) \quad (7)$$

The probability that somebody will be willing to pay more than or equal to a given price p also serves as the expected proportion of a population that will pay p. If the size of the population is T, then the number of people that will pay p is

$$n\ =\ P\ (w\ \geq\ p)\ T\ =\ \big(1 - F(p)\big)T \quad (8)$$

[7] *see* $https://cran.r-project.org/web/packages/loo/loo.pdf$

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The total revenue at this price will therefore be the number of people prepared to purchase the price

$$R\,(p)\;=\;np\;=\;\big(1-\;F(p)\big)pT \qquad (9)$$

This can be calculated either by directly evaluating F(p) simulating for a large number of draws (N) from f (w) calculating the proportion exceeding p,

$$w_i\;\sim f\;(\;w)i\;=\;1,\ldots\ldots\ldots\ldots N \qquad (10)$$

Denoting $I\;(w_i > p)$ as an indicator function (1 if $w_i > p$ and 0 otherwise) the revenue can therefore be simulated as

$$\widehat{\mathrm{R}}\;(\mathrm{p}) = \left[\frac{\sum_{i=1}^{N} I\;(w_i>p)}{N}\right] p\;T \qquad (11)$$

$$\cong \big(1-\;F(p)\big)pT \qquad (12)$$

The optimal price $\hat{p}$ (interpreted as the one which maximises revenue) requires the first order conditions

$$\frac{\partial \mathrm{R(p)}}{\partial \mathrm{p}}\;|p=\hat{p}=\quad[(1-F(\hat{p})-f(\hat{p})\hat{p}]\;\mathrm{T}=0$$

$$\Rightarrow\quad 1-F(\hat{p})=f(\hat{p})\hat{p}$$

$$\Rightarrow \hat{p}=\frac{1-F(\hat{p})}{f(\hat{p})} \qquad (13)$$

and second order conditions

$$\partial^2 R(p)/\partial p\;\;|p=\hat{p}\;=\quad[(1-F(\hat{p})-f(\hat{p})\hat{p}\,]\;\;T=0$$

$$\frac{\partial^2 R(\mathrm{p})}{\partial \mathrm{p}^2}\;|p=\hat{p}=\;-2f(\hat{p})-f'(\hat{p})\hat{p}<0$$

This differs from the expected willingness-to-pay.

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3.6 Results

This section presents the important results and findings of the study.

3.6.1 Descriptive statistics

Descriptive and summary statistics of socio-demographic characteristics of tourists, the number of tourists who visited the different national parks, motivation to visit the parks, main activities in parks, and rating of tourists' experiences are presented in the following tables.

3.6.1.1 Tourist's profiles

Out of the total number of respondents investigated for this study, 56% of the respondents were males, and the rest were females. It is evident from Table 3.1 that the majority (31.5%) of respondents were in the annual individual income group of Rs. 700,001.00- 800,000.00, and less percentage were in the lower income group. A general image that emerged when looking at the income group of the tourists is that affluent people mostly visit the parks. Respondents were also sorted into six categories based on their age. Most (59.7%) of the respondents were from the younger age group, followed by 41 to 50 years. Very few visitors were above 60 years.

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Table 3.1: Demographic characteristics of the respondents

Demographic Characteristics	Number	Percentage
Gender of the respondent		
Male	84	56
Female	65	44
The age group of the respondent		
31 to 40 years	89	59.7
41 to 50 years	33	22.2
18 to 30 years	14	9.4
51 to 60 years	10	6.7
61 to 70 years	2	1.3
71 and above	1	0.7
The individual income per annum		
Rs. 700,001.00- 800,000.00	47	31.5
Rs. 600,001.00- 700,000.00	43	28.9
Above Rs. 800,000.00	39	26.2
Below Rs. 600,000.00	20	13.4

There are 25 districts in Sri Lanka. The sampled tourists were visiting from 20 districts. 16.1% of the tourists were from the Kandy district, followed by the Colombo district (Figure 3.2). It was interesting to note the heterogeneity in the origin of the respondents who visit the parks.

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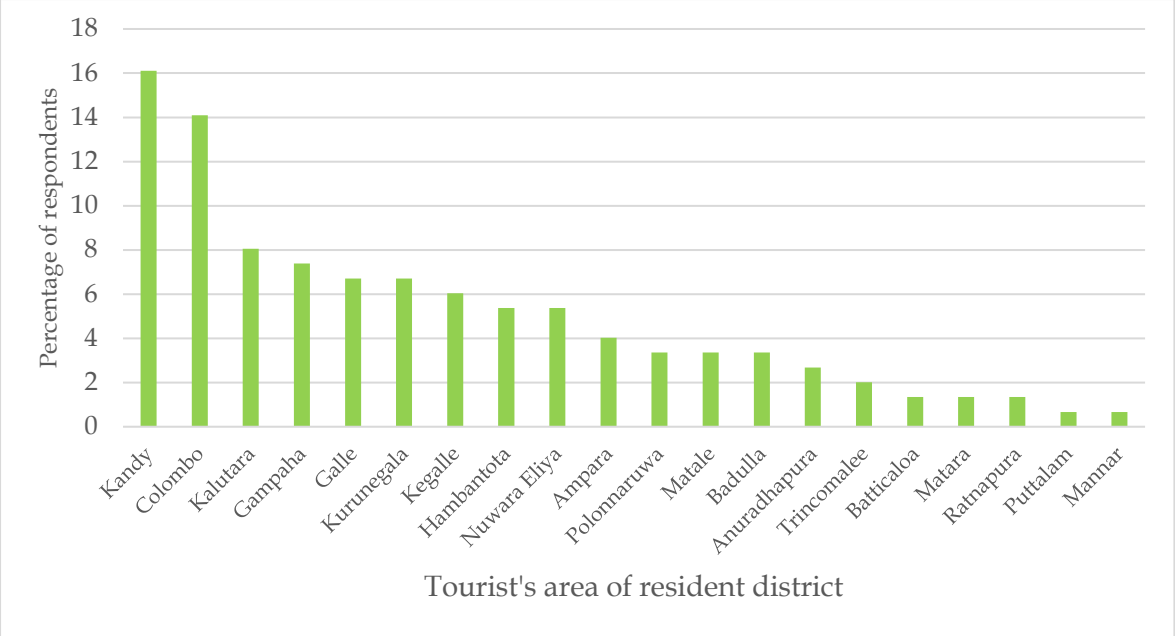

Figure 3.2: Respondents' area of residence

3.6.1.2 National parks visited and the type of trips

Across the four different national parks under study, most of the respondents visited Wilpattu national park, followed by Minneriya, both of which are terrestrial national parks (Figure 3.3). Wilpattu park is famous for its diverse exotic flora and fauna, and Minneriya is renowned for its large herds of Asian elephants. Among the respondents, 72% of the tourists had never visited the national parks before, and this was their first visit.

The majority (85.33%) had a day trip to the park. Those who had an overnight trip spent only two nights in those respective parks. In large part, Minneriya national park is suitable only for a day trip since the whole park can be visited in a day.

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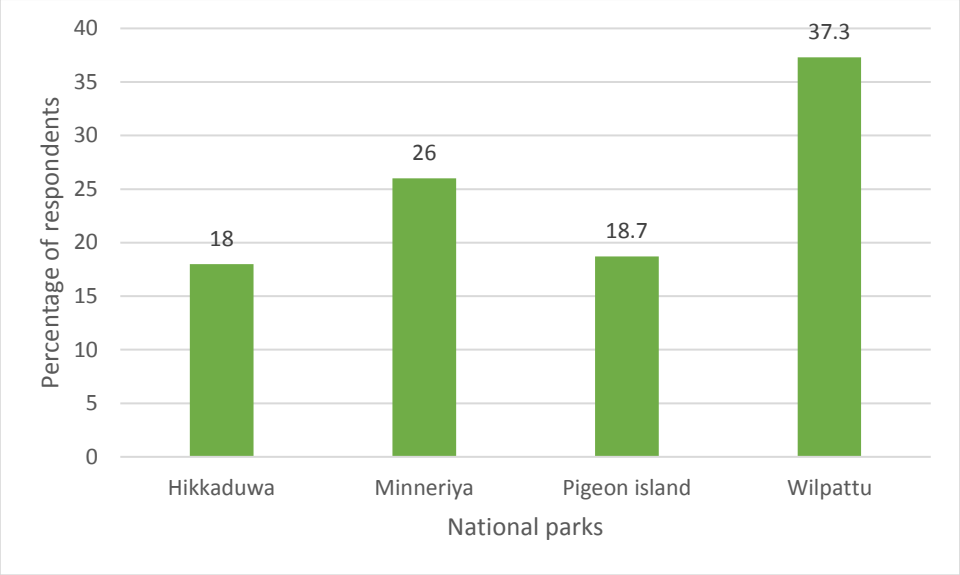

Figure 3.3: Frequency distribution of different national parks visited by tourists

3.6.1.3 Appropriate fee and maximum fee

To get an idea of the appropriate fee, the respondents were asked, "In your opinion, what daily entrance fee do you think would be fair for this park?" The results revealed that the mean entrance fee that would be fair for national parks would be Rs. 94.40. And if the entrance fee were increased, the visitors were asked, "How high would the daily entrance fee per person have to be so that you would choose not to visit this park". The results found the mean entrance fees that would make the locals not visit those parks would be Rs. 210.80 (Table 3.2).

Table 3.2: Descriptive statistics of appropriate entrance fee for a park and highest entrance fee for not to visit that park

Variables	Mean	Median	Standard deviation	Min	Max
Appropriate entrance fee	94.40	100.00	24.54	50	150
Highest entrance fee would lead tourists not to visit the park	210.8	200.00	90.8	70	500

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3.6.1.4 Motivation to visit the parks and activities in the parks

Respondents were asked to state their motivations for visiting the national parks. As evident from Table 3.3, the major reasons for locals to visit the national parks were vacation/ recreation, followed by the opportunity to see diverse and rare flora and fauna. Less than 15% of the respondents indicated cultural events as the less critical motive to visit the national park.

National parks in Sri Lanka offer activities such as nature and wildlife observation, environmental education, swimming, scuba diving, snorkeling, etc. A wide variation was observed between activities in the study area. Respondents overwhelmingly chose nature and wildlife observation and environmental education in the two terrestrial parks. At the same time, swimming, snorkeling, and scuba diving were the most popular option for visitors in marine parks. The proximity of cultural sites to both terrestrial parks may have made the tourists to carry out cultural activities during the visit. The main activities done by tourists in parks and their motivations to visit are tabled below.

Table 3.3: Main activities and motivations to visit the park

Activities	Percentage
Nature and wildlife observation	79.2
Environmental education	71.8
See national park exhibitions	41.6
Eat at restaurants	19.5
Swimming	30.2
Cultural activities	17.5
Snorkeling / Scuba diving	18.1

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Surfing	4.7
Motivations to visit the park	
Vacation/recreation	78.5
The opportunity to see diverse and rare flora and fauna	61.1
Educational visit	35.6
Adventure (surfing, snorkeling, scuba diving, hiking etc.)	25.5
Cultural events	13.4
Work/ Business trip	33.6

3.6.1.5 Tourist's willingness-to-pay for hypothetical increases in the entrance fees

Distributions of different bid amounts and the respondent's willingness are reported in Table 3.4. Results imply that the current entrance fee of Rs. 60 is not a limiting factor for the visitors to visit the parks. However, a hypothetical twofold rise in entrance fee will lead to a 67% reduction, in visitation and a more than threefold increase in the entrance fee to Rs. 200 leads to an 87% reduction in visitation. This implies that demand is sensitive to a price increase.

Table 3.4: Tourist's willingness-to-pay for hypothetical increases in the entrance fee for national parks

Entrance fee	Yes	No
70	141	9
80	129	21
100	93	57
120	49	101
150	34	116
200	19	131

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3.6.1.6 Rating of visitor's experience at the park and on Sri Lankan government's attitudes toward nature conservation

Tourists were asked to rate their experiences in the park. Table 3.5 presents the results on the rating of the tourists toward the visitor experiences of the particular park, their experience on ability to see the flora and fauna, and rating on the government's attitude towards conservation. The majority (48.3%) said they had a good experience inside the parks. Only 4.1% stated that they had a poor experience. Further, the tourists revealed their opinion on the experience of seeing the diverse flora and fauna during their visit to the parks. The majority (64%) stated that they had seen more than half of the flora and fauna species they expected to see, 22% mentioned that they had seen less than half what they expected to see, and the rest stated that they had seen all the species. From the Table 3.5, it is evident that more than half of the respondents had the experience good and above inside the parks.

Finally, respondents were asked to rate the Sri Lankan government's attitudes towards nature conservation. Only 14.1% of the respondents stated that the government had an excellent attitude towards conservation, and the majority (47%) said that the government's attitude for conservation was good.

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Table 3.5: Rating of tourist's experience, ability to see the flora and fauna, and the rating of the Sri Lankan government's attitude towards the conservation

Rating of visitor experience	**Percentage**
Excellent	36.9
Good	48.3
Satisfactory	10.7
Poor	4.1
Visitors experience on the ability to see the flora and fauna	**Percentage**
More than half of what I wanted to see	64
Less than half of what I wanted to see	22
Yes, all of them	14
No, none of them	00
Rating of Sri Lankan government's attitudes	**Percentage**
Excellent	14.1
Good	47
Satisfactory	26.9
Poor	10.7
Very Poor	1.3

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3.6.2 Results of interval regression

Table 3.6 provides the variables and their description used in interval regression.

Table 3.6: Variables and their descriptions used in interval regression

Variable	Description
Wilpattu	Visit Wilpattu park (1 = Yes; 0 = otherwise, reference park-Minneriya)
Hikkaduwa	Visit Hikkaduwa park (1 = Yes; 0 = otherwise, reference park-Minneriya)
Pigeon island	Visit Pigeon island park (1 = Yes; 0 = otherwise, reference park-Minneriya)
before_visit	Have you visited to this national park before (1 = Yes; 0 = no, reference no)
daytrip	Which category best describes the length of your current visit (1=day trip, 0=overnight, reference is overnight)
vacation_rec	Motivation to visit park (1=Vacation/recreation; 0 = otherwise, reference business trip)
flora_fauna	Motivation to visit park (1= to see diverse and rare flora and fauna ; 0 = otherwise, reference business trip)
education	Motivation to visit park (1=educational visit; 0 = otherwise, reference business trip)
adventure	Motivation to visit park (1=adventure; 0 = otherwise, reference business trip)
cultural	Motivation to visit park (1=cultural events; 0 = otherwise, reference business trip)
female	Gender (male=0, female=1, reference=male)
age	Age data by midpoint values
income	Income data by midpoint values

Table 3.7 compares the estimated values of the expected Leave-One-Out (LOO) prediction errors of the three models, along with the standard errors. Based on LOO values, this study selected the Gamma model (Table 3.8) as the best model for interval regression. The results for the double bounded interval models are shown in Table 3.8. Appendices III and IV present the normal and Student-t model estimates, respectively. The first column of Table 3.8 describes the variable names. The second

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column shows the mean WTP values of corresponding variables, and column three represents the standard deviations.

Table 3.7: LOO values for the three different models

	elpd_diff	se_diff
Gamma model	0.0	0.0
Normal model	-7.7	2.0
Student-t model	-13.2	3.6

Table 3.8: Output of interval regression for gamma model

Variables	mean	sd	median	5%	95%	Pr>0
before_visit	26.02	8.21	25.97	12.58	39.70	0.99
daytrip	-13.98	11.29	-13.81	-32.91	4.44	0.11
vacation_rec	13.92	8.56	13.87	0.04	28.11	0.95
flora_fauna	2.15	7.78	2.14	-10.65	14.87	0.61
education	8.16	8.17	8.01	-5.19	21.68	0.85
adventure	22.88	11.47	22.96	3.91	42.0	0.98
cultural	-3.05	10.27	-3.28	-19.49	13.94	0.38
female	-4.54	6.95	-4.53	-15.85	6.94	0.25
Wilpattu	27.91	9.06	27.91	13.08	42.80	0.99
Hikkaduwa	26.48	13.74	26.55	4.28	49.36	0.98
Pigeonisland	8.46	12.34	8.38	-11.79	28.56	0.76
Mean WTP	93.48	15.41	93.45	68.35	119.00	1
Age	-0.16	0.21	-0.16	-0.51	0.19	0.23
Income	0.07	0.03	0.06	0.01	0.12	0.97

The Bayesian interval regression results revealed that, compared to tourists who had never visited the parks in Sri Lanka, those who had visited before would be willing to pay Rs. 26.02 more for entrance fees. The model further suggests that there is an 89% chance probability that a day trip has a lower WTP than an overnight trip. Those

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motivated by vacation- recreational activities and adventures were willing to pay more by Rs. 13.92 and Rs. 22.88, respectively, than those who visit the parks during work or business trips. This may be due to the time constraints tourists' face on business trips, who could not enjoy the wildlife watching leisurely. It is apparent from the model that the respondent's age negatively influences the tourists' WTP. Younger tourists may be more aware of the importance of national parks and are more willing to contribute to conservation than older people. Further, the model suggests that 75% chances of the probability that females have a lower WTP. The reference category for gender is males. Here females are willing to pay Rs. 4.54 lesser than their male counterparts.

Interestingly, different types of national parks influence WTP because tourists were willing to pay more by the amount of Rs.27.91 and Rs. 26.48 respectively for Wilpattu (Terrestrial Park), and Hikkaduwa (Marine Park) than Minneriya (Terrestrial Park) park. Here Minneriya park is the reference category and local tourists are willing to pay Rs. 93.48 for Minneriya national park. When tourists were asked about their experience in Wilpattu, they remarked on the beauty of sand-rimmed water bodies, transparent road network, good accommodation facilities, diverse fauna such as elephants, leopards, sloth bears, spotted deer, and birds such as peacocks, egrets, hornbills, orange-breasted green pigeons etc.

Pigeon Island has a low WTP compared to Hikkaduwa. Based on respondents' comments, Hikkaduwa is a good place for swimming, and snorkeling and could see diverse corals, sea turtles, shrimp, and fish such as lionfish and butterfly fish. But some respondents commented on the poor management of corals and crowded boats. On

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the other hand, the respondents observed colourful coral reefs, sharks, and colourful fish on Pigeon Island and reported it as a good place for snorkeling and surfing. But the island is small and has no accommodation facilities inside.

The respondent's income has an obvious effect on the probability of positive WTP. When the respondent's revenue increased by Rs.1.00, the respondents were willing to pay nearly seven cents more for park entrance fees. The mean WTP for national parks by the local tourists was Rs. 109.19. This result validates the results of a previous study in Sri Lanka. A study by Rathnayake (2016 a) on the estimation of WTP for two improved ecotourism schemes in Kawdulla national park in Sri Lanka using the contingent valuation technique found that tourists were willing to pay Rs. 95.68 and Rs. 173.88 as entrance fees for the two different schemes. Here scheme one included improved infrastructure facilities, and scheme two consisted, in addition to the facilities in scheme one, wildlife officers at each viewpoint, proper guides, self-guided brochures, the opportunity for paddle boating etc. In another study by Rathnayake (2016 b), on the estimation of WTP for elephant watching in Minneriya national park revealed that the local tourists were willing to pay Rs. 172.00.

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3.6.3 Revenue maximizing optimum entrance fees

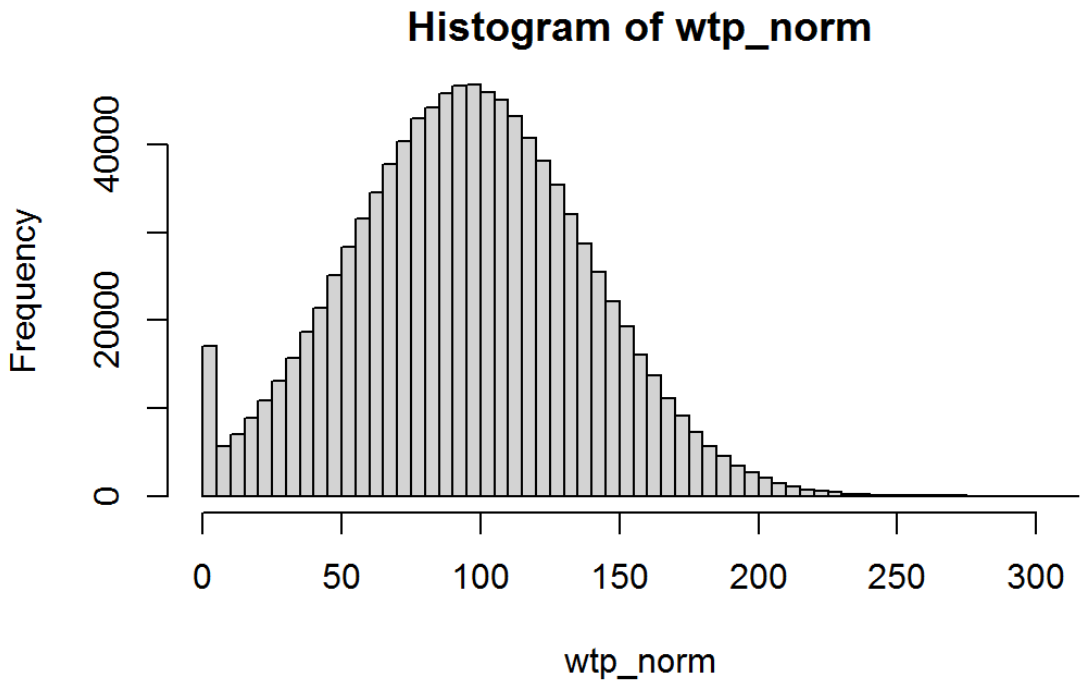

Figure 3.4: Histogram showing the willingness-to-pay for normal model

The histogram in Figure 3.4 is based on 1,000,000 simulations of predictive distributions of WTP for the normal model. Most posterior density lies above zero, with a small percentage lying on zero. The highest frequency lies between 95 and 100.

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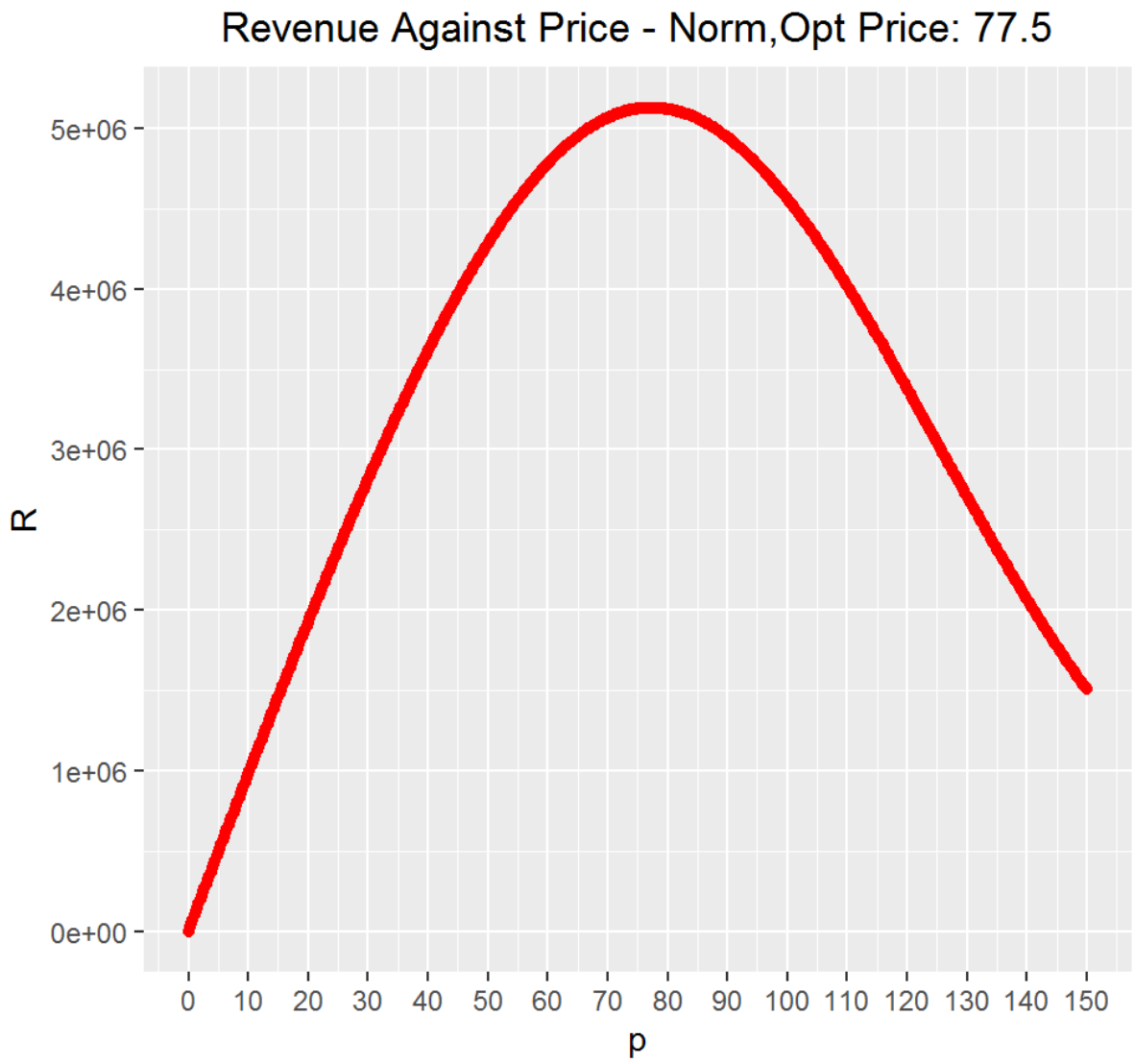

Figure 3.5: Revenue maximizing entrance fees for normal model

The predictive distribution of WTP is used to determine the optimum entry fees for normal and Gamma distribution. Figure 3.5 shows the predictive distribution of total revenue (in millions of Sri Lankan rupees) obtained for a population of 100,000. Here the revenue-maximizing entrance fee is Rs. 77.50, for the normal distribution.

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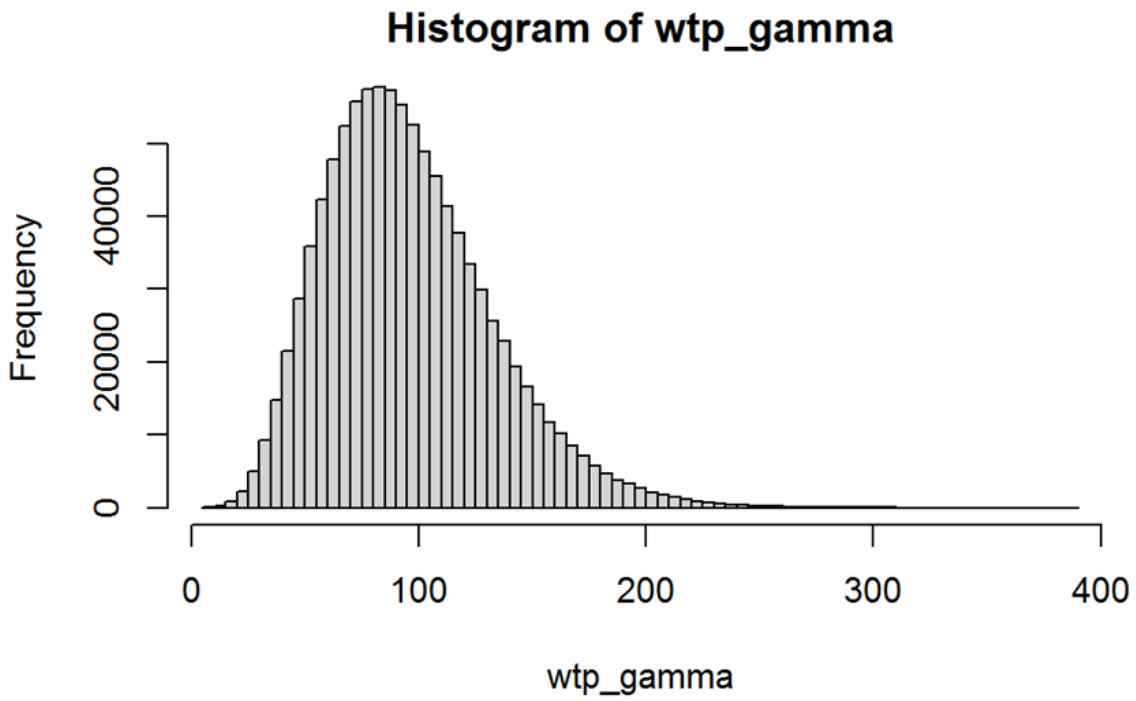

Figure 3.6: Histogram showing the willingness-to-pay for the Gamma model

Figure 3.6 shows a histogram based on 1,000,000 iterations, and 100,000 sampled values, presenting $p\left(\theta \middle| y\right)$ to be right-skewed. Here almost all of the posterior density lies above zero.

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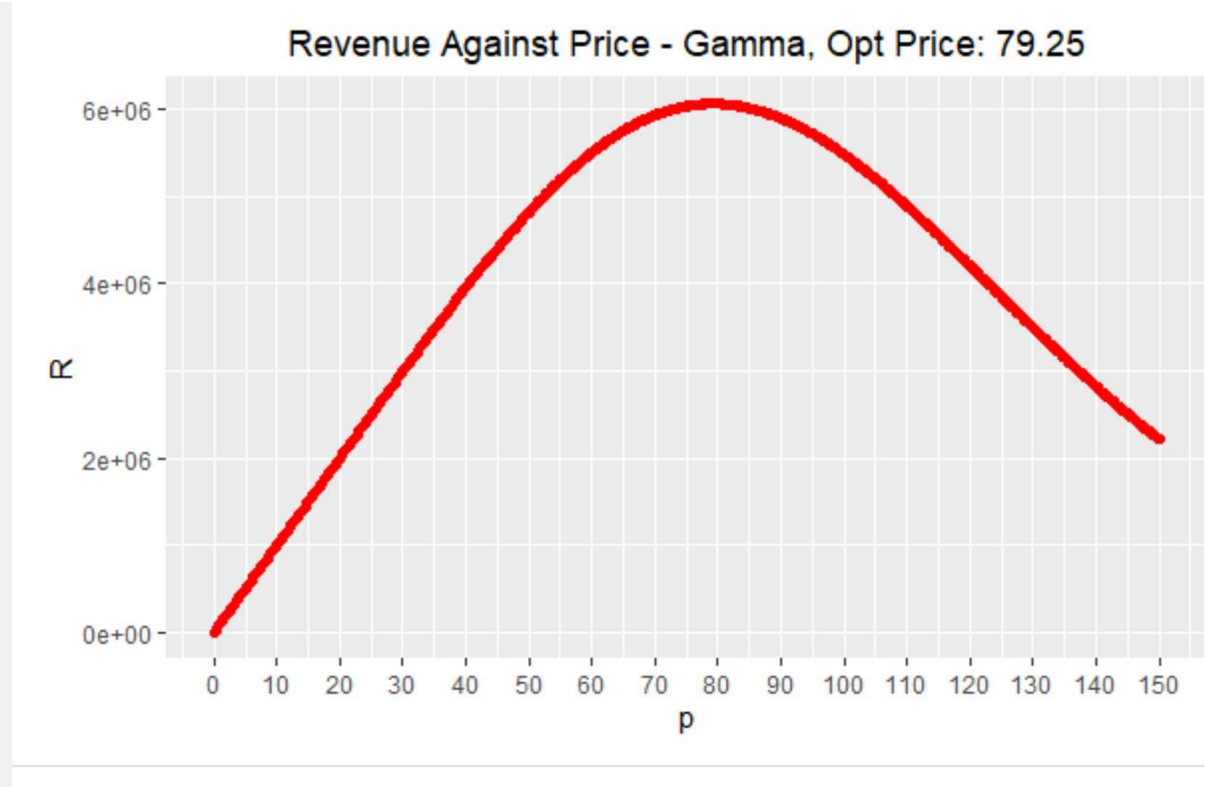

Figure 3.7: Revenue maximizing entrance fees for the Gamma model

The entrance fee that is currently charged is sub-optimal and the optimum entrance fee was found to be Rs. 79.25 for gamma distribution. Figure 3.7 shows the predictive distribution of maximum total revenue (in millions of Sri Lankan rupees) obtained for a population of 100,000 for the gamma model. Since the present study has chosen the gamma model as the best model, the optimum entry fee for gamma model is chosen as the optimal park entry fee for national parks in Sri Lanka.

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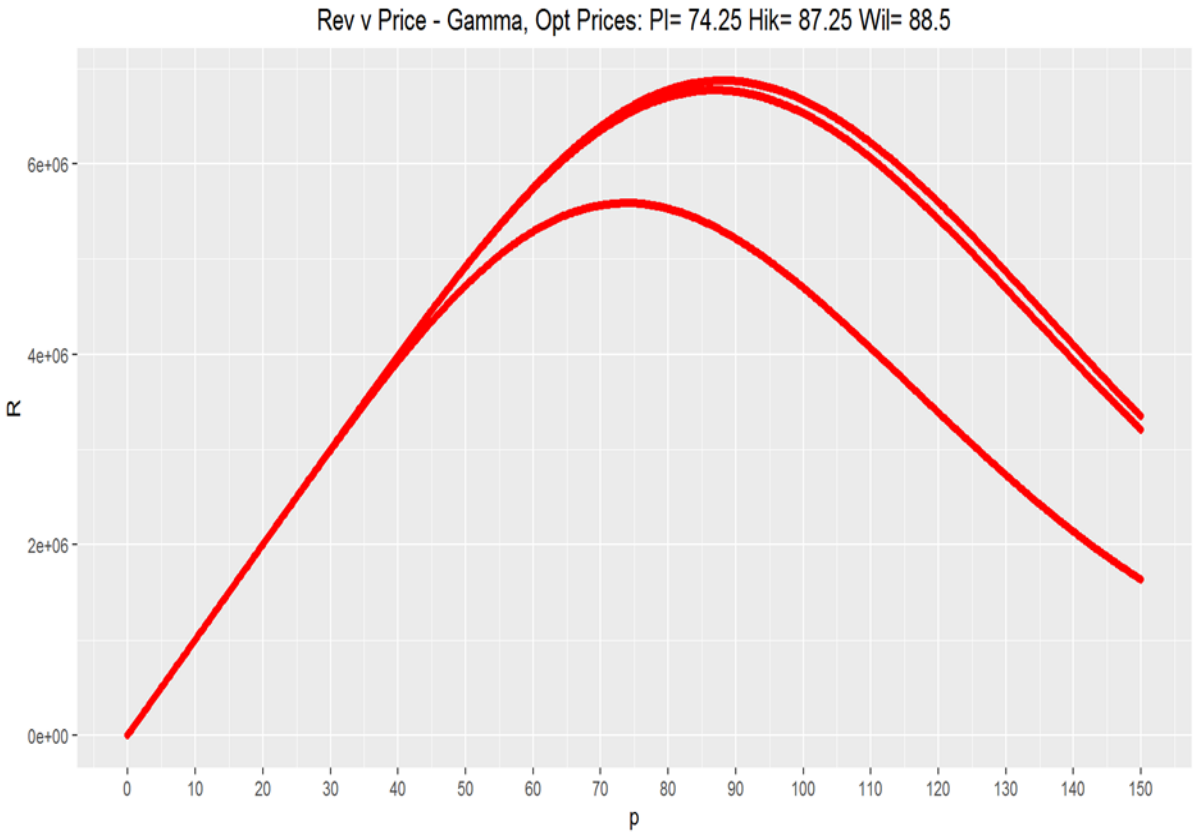

Figure 3.8: Revenue distribution for optimum entrance fees for Wilpattu, Hikkaduwa, and Pigeon Island national parks

Figure 3.8 shows the predictive distribution of total revenue (in millions of Sri Lankan rupees) obtained for a population of 100 000 for three different national parks. The results of the profit-maximizing optimum entrance fees for Wilpattu, Hikkaduwa, and Pigeon Island national parks were Rs. 88.50, Rs. 87.25, and Rs. 74.25 respectively. But the current entrance fee of Rs.60.00 is unique for all the parks. Higher optimum fees for all three parks can be due to the fact those parks may have better recreational, and infrastructure facilities, and the tourists could be able to see the expected flora and fauna. This result shows that a discriminatory revenue-maximizing entry fee among different parks can be implemented in the country.

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3.7 Discussion

Tourism plays a significant role in the Sri Lankan economy, and national parks are becoming increasingly recognized as vital in developing nature-based tourism. The present study analyses tourists' WTP to the entrance fee of national parks in Sri Lanka.

If we see the origin of tourists, higher visitation was observed from the districts in Western, Central, and Southern provinces. Most of the districts that come under these three provinces have comparably high household income on average than the other districts on the island. People who live in densely populated cities commonly prefer to visit natural areas for mind relaxation and relief from daily work stress. The higher income group in the present study formed the largest group of tourists. According to the Household Income and Expenditure survey (2019), the mean monthly income of "income receiver" in Sri Lanka was Rs. 42,308 in 2019 (i.e., Rs. 507,696 per year per income receiver). 86.6% of the respondents in the present study were receiving income above this mean annual income per person, indicating that wealthy people visit the parks. Except for Hikkaduwa, other parks are located far away from the capital city of Sri Lanka. Even though Hikkaduwa park is most popular and known to be one of the most kaleidoscopic locations for its colourful corals and marine species, a comparably smaller number of respondents visited the park. This may be because nearly 43% of the respondents are from the Southern province (where Hikkaduwa park is located) and the neighboring Western region. They may have visited the Hikkaduwa park before and wanted to explore the other parks away from their home.

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Tourists were more interested to undertake passive activities such as nature and wildlife observation, and environmental education followed by watching national park exhibitions. Since in all four national parks, a combination of different activities can be done together, and therefore the total percentage of respondents who carried out different activities in the parks exceeded a hundred percent. Only very few tourists participated in scuba diving, snorkeling, and surfing which normally needs skill and experience. The present study was carried out during the COVID-19 pandemic period. Travelling continued to be risky and this may be one of the reasons the sample had more day trippers. 91.3 percent of the visitors were below the age of fifty, indicating that older tourists did not prefer to travel to national parks and a substantial number was represented by young people who enjoy and appreciate nature.

Those who visited the parks before would be willing to pay more than those who never visited the park implies that frequent park users have more understanding of the value of national parks, and thereby would like to pay more. Similar results were observed in the study by Majumdar et al. (2011). Daytripper has a lower WTP than those who stay overnight, which implies that overnight wilderness visitors may have enjoyed camping out at night, benefitted from dining various Sri Lankan cuisine at different restaurants, etc.

Male respondents tend to pay more for park entrance fees than females. This may be due to the fact that male counterpart earns more than females or more males are

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employed than females. This was supported by the fact that, according to the International Labor Organization, in 2020 the percentage of female labor force participation in the country was between 30-35% and this remained the same for the last two decades. But these results contradict the study in Korean national parks by Lee and Han (2002), where females tended to pay more for preserving the national parks than males. But another study by Horton et al., (2003) in two high-income countries, males tended to pay more than females for the implementation of a proposed programme in protected areas.

Wilpattu national park had the highest WTP among the four parks followed by Hikkaduwa. A possible explanation may be that Wilpattu national park is highly valued for its species richness and is one of the largest parks in the country. A whole day is needed to see the flora and fauna in Wilpattu national park, because of its larger extent of nearly 131,693 hectares of land. Even though the park is open throughout the year for tourists, the best time to visit Wilpattu park is from May to September. But in the other terrestrial park under study (Minneriya), a trip will cover a smaller extent (park size is nearly 8900 hectares) and can visit the entire park in less than three hours. Each year during the dry season (from May to September) large herds of Sri Lankan elephants gather in Minneriya park. This gathering is known as World famous 'Minneriya Elephant Gathering", the star attraction to the park. So, a large number of tourists can be seen only during the dry season in Minneriya park mainly to see the large herds of elephants, but in Wilpattu national park throughout the year tourists could be seen due to its exotic fauna, flora, dense dry zone jungle scattered with

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beautiful lakes. These may be the reasons, why tourists were willing to pay more for Wilpattu park than Minneriya.

When we compare the marine national parks, Hikkaduwa had a high WTP compared to Pigeon Island. This result may be explained by the fact that Hikkaduwa has a long sandy beach, a colourful coral reef extending up to 130m seaward, and some rocky islands (Department of Wildlife Conservation, Sri Lanka) which may have attracted the tourists than Pigeon Island. In addition to snorkeling and surfing, Hikkaduwa is famous for lagoon safari, glass bottom boat tours, and canoeing. Hikkaduwa lagoon has more than 50 coral species and more than 150 reef fish species.

The age of the respondent negatively influences the WTP for entrance fees. This was in accordance with the previous studies by Reynisdottir et al., (2008); Lee and Han (2002); Abedini et al., (2016), where age negatively and significantly influences the WTP. This may be because younger generation are more aware about the national parks and would like to explore more about parks. This outcome is contrary to that of Maharana et al. (2000), and Ilukdeniya and Thirumarpan (2019) where age positively influences the WTP.

The income of the respondent positively influences the WTP. Be noticed that these results strongly support the economic theory as tourists with higher income have a greater ability to pay for the conservation of parks and want to preserve them for future generations. This finding broadly supports the work of other studies by

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Reynisdottir et al. (2008); Han et al., (2011); Abedini et al., (2016); Bal and Mohanty (2014); and Mmopelwa et al. (2007). Perceived enjoyment tourists had inside the parks may have led to proposing a higher amount of WTP of Rs. 109.19. The majority of the estimated coefficients influenced the WTP, indicating that respondents were sensitive to the scope of the conservation of national parks. The optimal park entry fee that would maximize the expected revenue was Rs. 79.25. Currently, even though all the parks are charged with the same entrance fees, it was found that revenue-maximizing optimum entrance fees for Wilpattu, Hikkaduwa, and Pigeon Island parks were Rs. 88.50 Rs. 87.25, and Rs. 74.25 respectively. This is in accordance with the study by Lee and Han, (2002) in Korean national parks. These results suggest that price differentiation among parks can be implemented in the future.

Even though the study did not include foreign tourists, based on the secondary data used in the section 2.4 of the thesis, the higher WTP results of locals can be extrapolated to foreigners. This can be supported by studies in other countries, where foreign tourists have a comparably higher WTP than domestic tourists. An early study by Shultz et al. (1998) on the estimation of WTP for repeat or future visits to two different Costa Rican national parks revealed that foreigners were willing to pay more for the entrance fees than Costa Ricans. Maharana and Sharma, (2000), in their study in Khangchendzonga national park in India, revealed that foreign tourists were willing to contribute more than the domestic and local community. A study by Wilson and Tisdell (2003) on introducing a minimal entry fee to Lamington national park, Queensland, Australia, found that foreign tourists were willing to support the user

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fees more than locals. Another study by Asafu-Adjaye and Tapsuwan (2008) on WTP for scuba diving in a marine national park, in Thailand, revealed that foreign divers were willing to pay more than Thai divers.

Distance to parks and travel costs have been key variables elicited in much research on valuation, not least because they can be employed for the well-known form of valuation, the "travel cost" method. In this thesis, we did not ask participants the distance they travelled from the park nor the costs they had incurred to travel to the park. This was because a central aim of the thesis was to elicit tourist's willingness-to-pay for park entry, not to elicit people's valuation of parks in general. That is, this research sought to explore whether additional revenue could be obtained by increasing the entry price (along with considering whether some descriptors such as age, gender, income, and motivations for visiting also were determinants of the willingness-to-pay higher entry prices). While we recognize that distances travelled (and other costs incurred) may also impact people's WTP for entry fees, we view the responses of tourists as being conditional upon these costs and therefore reflective of distances needed to travel.

If the aim of this research was to make a valuation of parks, then knowing the distance of visitors from parks and/or the costs they had incurred to travel to the park would be useful, or even essential. However, a non-market valuation of parks was not the purpose of this research, and we did not intend to use travel cost and as indicator of value. Including distance or travel cost as a covariate in our regression is not required to obtain measures of WTP for entry fees that we produce. If two people are asked

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whether they would pay a given entrance fee, the distance that they have travelled may have a bearing on their answers, but this would be reflected in their answers. To be clear, the models we run would deliver valid WTP for entrance without any covariates other than the park visited. The addition of other covariates in the models was to obtain a deeper understanding of what may drive WTPs for entry. We do, however, acknowledge that how far someone might need to travel, or the expense incurred to visit the park might also have been used as a further predictor of how much a given individual might be prepared to pay. Indeed, we would conjecture that those that had travelled far or had paid more to get to the parks would be less sensitive to increases in the level of the entry fee.

3.8 Conclusion

In the present study, the normal distribution was the starting point and estimated Student-t and gamma models. Results concluded that the gamma model distribution is favoured over normal and Student-t models. The empirical results of all four national parks show that revenue will be maximized by setting an entry price of Rs. 79.25, which is slightly higher than the current entrance fee and lower than the estimated mean WTP. Further there is high scope for implementing price differentiation among parks.

The results of the present study show that the DWC can use optimum price for national parks as well as optimum entrance fee differences between national parks to design the payment mechanism to conserve parks sustainably. Thus, the results of

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the present study supports that there is high scope for increasing the entrance fees, for improved conservation of national parks in Sri Lanka. Further, the findings of this study have substantial implications for the promotion of national park tourism in the country.

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4 VALUING AND FUNDING NATIONAL PARKS IN TIMES OF CRISIS: A QUALITATIVE VIGNETTE APPROACH

4.1 Introduction

This chapter uses a qualitative vignette study to explore the extent to why and how local communities are willing to fund their national parks when there is no revenue from international tourism and in particular an individual's desire to preserve national parks for others and future generations. Sri Lankans have, unfortunately, experienced two such instances recently, the terrorist attacks of 2019 and the current COVID-19 pandemics, both of which dramatically and suddenly resulted in a fall in international and domestic tourism. The country lost an important source of revenue, international tourist park entry fees, which contributed to the maintenance and management of the country's national parks that are particularly popular with foreign tourists. In situations where foreign tourist park entry fees have typically funded the management and protection of a country's national parks, those countries may need to determine the extent to which, without this revenue stream, they are willing and able to fund the parks. Either the country has to find an alternative source of funding or accept that the parks would be underfunded and as a result could become degraded.

A vignette approach was used for this study to explore the extent to which presenting a story with familiar and memorable incidents to local communities enables the researcher to explore in depth, the participants' attitudes towards funding the parks when there is loss of park entry fees revenue predominantly from foreign tourists.

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Vignettes have long been used to study attitudes, perceptions, beliefs, and norms within social science (Finch, 1987). Several definitions of vignette can be found in the literature. A vignette has been described as a "short, carefully constructed description of a person, object, or situation, representing a systematic combination of characteristics" (Atzmüller and Steiner, 2010). Steiner et al. (2016, p 52) define a vignette as "a set of systematically varied descriptions of subjects, objects, or situations to elicit respondents' beliefs, attitudes, or intended behaviors concerning the presented vignettes". As such this chapter provides a novel qualitative approach to explore how best Sri Lanka's national parks can be funded and maintained when revenue from foreign tourists falls. This approach can create a comfortable environment for the respondents to express their views and can encourage them to talk more freely. This study intends to explore the experiences, perceptions, and valuations of local people and long-term residents in terms of conservation and management of national parks when there is no income from foreign tourism. Further this vignette study explores the value of national parks, such as an individual's desire to preserve national parks for others and future generations or simply for "existence"; or to maintain the biodiversity, habitat, or other functions of the parks (Bateman and Langford, 1997).

In the following section, the context for this study is provided, by documenting how foreign tourism in Sri Lanka has repeatedly been affected by natural and human-caused shocks. Section 4.3 introduces the concept of vignettes, with a review of the relevant literature, and Section 4.4 provides the specific methodological approach

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taken in this research. The results of the vignette approach are given in Section 4.5, and Section 4.6 discusses the findings and concludes.

4.2 Shocks to Sri Lanka's tourism sector

There was a dramatic drop in international tourist inflow in May 2019 following the Easter Sunday attack in April 2019 (Figure 4.1). The associated loss of revenue from tourism affected both the economies of poor communities that are particularly dependent on tourists and the nation itself. Tourism did recover. For example, in December 2019, 241,663 foreigners visited the country, only a little less than the same month in the previous year (253,169 foreigners visited in December 2018) (Monthly Tourist arrival reports, Sri Lanka Tourism Development Authority). Overseas tourism numbers were similarly not much down in January and February 2020, in comparison to 2018 and 2019.

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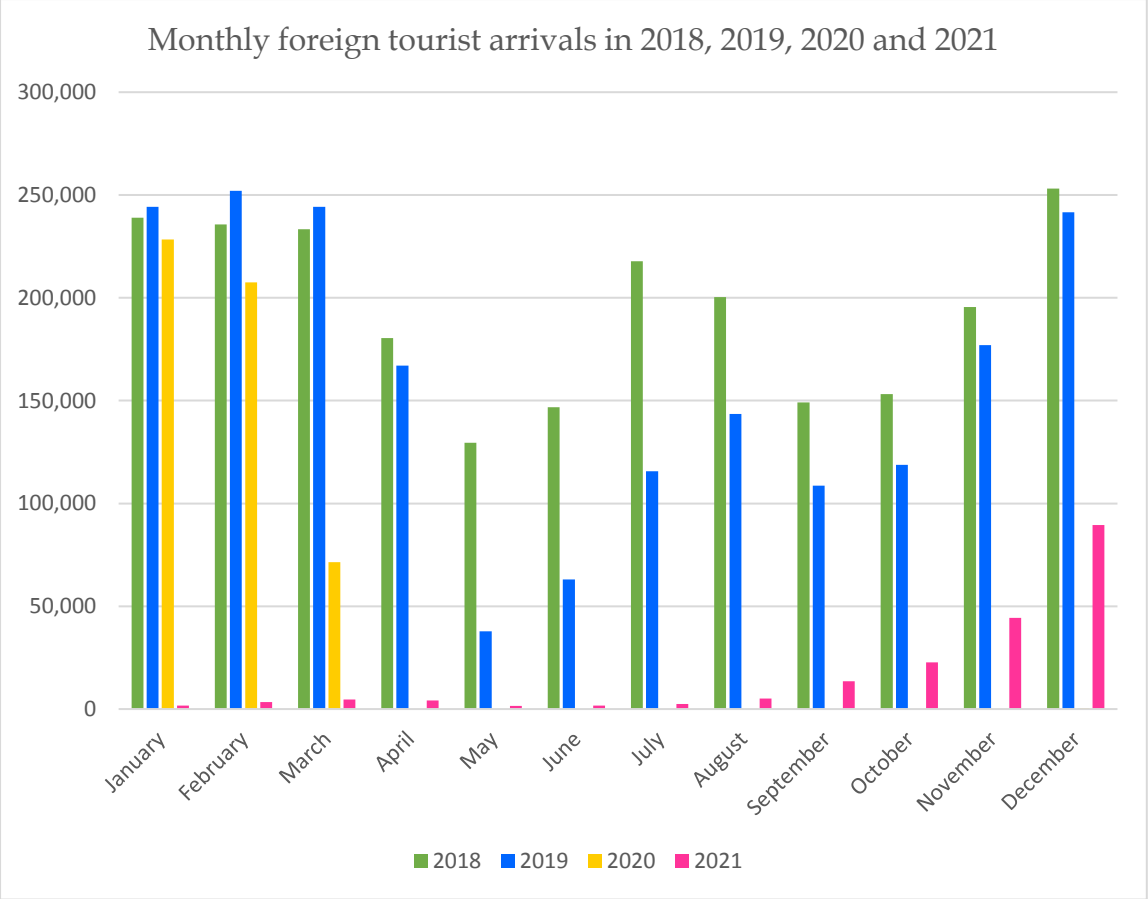

Figure 4.1: Monthly international tourist arrivals for the period of 2018- 2021

Source: Sri Lanka Tourism Development Authority

Yet once again, when tourism numbers seemed to have recovered, in March 2020, due to the global pandemic COVID-19, there was another considerable drop in tourist arrivals, down to 71,370 international arrivals in that month. Sri Lanka first imposed temporary travel bans on arrivals from Italy, Iran, and South Korea, because these countries were identified as potentially high-risk destinations for COVID-19. But from 18th March 2020, the country terminated all passenger arrivals from all countries into Sri Lanka, and no tourist arrivals have been recorded from April 2020 to December

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2020 (Monthly Tourist arrival reports 2020, Sri Lanka Tourism Development Authority). National parks, nature reserves, museums, botanical gardens, cultural heritages, and zoos were closed for several months due to the COVID-19 crisis.

The country's tourism industry has therefore been particularly hard hit by the economic fallout due to the global novel coronavirus outbreak. Due to this, more than nine months long travel ban had been imposed in the country, and after December 28th of the same year, 393 tourists from Ukraine arrived in the island under a pilot project. A total number of 1,682 international tourist arrivals was observed in January 2021 and 4,168 in April 2021. In comparison to January 2020, a 99.3 % drop was observed in international tourist arrivals in January 2021 due to the outbreak of COVID-19.

More broadly, Sri Lankan tourism has been frequently disturbed by more than twenty-five years of civil war and the deadly tsunami in 2004 that severely damaged the country. The civil war started in 1983, and after that, a rapid fall in tourist arrivals was observed in 1983- 1988, 1995, and 1999-2002 due to various civil unrests (Sri Lanka Tourism Development Authority). After the end of the local war in 2009, foreign tourist arrivals peaked in 2017 and 2018 before being virtually halted after the Easter Sunday bombings in April 2019.

The literature suggests that the decision to visit national parks is not only influenced by socio-demographic factors of tourists, distance, and attributes of the park, but also non-economic elements such as financial crises, natural disasters, and violence (Song et al., 2010; Poudyal et al., 2013). McIntosh and Wilmot (2011) explored the variables

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that influence recreational visitation in 353 US national park service sites. They found that the September 11th, 2001, attack (9/11) had a significant negative impact on national park visitation. They concluded that such regional terrorism reduces national park service site visitation across a country, creating a pervasive fear of travel throughout the country (Stevens et al., 2014). On average 'large' sites (parks on average having larger than 1,000,000 annual visitations) experienced a 48.4% reduction in visitation for two months following the terrorist attack.

A dramatic drop in park tourism was observed in Uganda after the massacre of eight tourists at Bwindi park. This resulted in the tourist number falling not only in Bwindi but also in other two important Ugandan parks, namely Mgahinga and Kibale. Ugandan tourism did not recover fully for several years (Archabald and Treves, 2001). More broadly, civil unrest in Kenya, civil wars in Rwanda, and terrorism in Uganda have created an image of an insecure region in the world, resulting in the volume of park tourists falling substantially (Mulholland and Eagles, 2002).

4.3 Vignette approaches in the literature

Depending on the specific research objectives, vignettes can be presented to respondents in different forms, such as text vignettes in a keyword, dialog, or narrative style in papers (Hughes, 1998); as cartoons, pictures (Quigley et al., 2014); as audio or video vignettes (Atzmüller and Steiner, 2010, Johnson 2000); or through computers (Taylor, 2006). Textual vignettes can be of many forms and range from short written prompts to extended stories (Hughes and Huby, 2004). Although the

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scenarios in vignettes commonly tend to be in the form of texts, some studies used moving images (Hughes and Huby, 2004). Mostly images are used when participants face difficulty in reading.

Vignettes are frequently considered to be an "icebreaker" since they can encourage people to talk about a specific topic (Nygren and Oltedal, 2015). The literature suggests that the vignette technique is an important tool for exploring in a painless way complex issues which are not easy either for investigators to ask or for respondents to answer (Barter and Renold, 2000; Hughes, 1998). Therefore, vignettes are an effective technique for the study of value orientations, attitudes, behavioral norms, and more broadly what people think in difficult circumstances (Finch, 1987). Vignettes have been used to "elicit information through inviting responses, encouraging discussions, and probing for understandings to gain insights to participants' beliefs, emotions, judgments, attitudes and values about the particular phenomenon that lies at the heart of the research" (Skilling and Stylianides, 2019, p.542). When decision-making problems seem to be complicated, vignettes can be a particularly valuable way in prompting information on cognitive processes (Brauer et al., 2009). Hughes and Huby (2002) found that vignettes may be constructed from real-life events or unrealistic events and act as a motivation to continue a conversation. It was also found that too much information in vignettes can make it too complex for the respondents to answer (Stecher et al., 2006). But sufficient information is needed for participants to understand the scenario sufficiently (Bloor and Wood, 2006). In most cases, respondents are assured that there are no right or wrong answers to vignettes (Hughes and Huby, 2004).

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There are two types of vignettes based on the structure of stories in the vignette studies: the "snapshot" vignette (i.e., a static situation); and the "development vignette" that has various stages (Jenkins et al., 2010). In snapshot vignettes "scenarios are smaller and are independent of each other, presenting an individual, a situation or an event" (Atzmüller and Steiner, 2010, p. 128). In contrast, for developmental vignettes, "researchers use a vignette showing partially and ask participants' opinion about various stages of it or the sequence of scenario." (Finch, 1987, p. 106-109; Jenkins et al., 2010, p. 176).

There are two main methods used in vignette development. The storytelling method and the factorial method (Brauer et al., 2007). In the storytelling method, vignettes are considered to be one or more carefully constructed and pretested short stories that are created by the researchers mostly based on their experiences and that simulate real-life experiences (Schoenberg and Ravdal, 2000). In contrast, the factorial method is an experimental method that was first developed by Rossi and Nock (1982) and the vignettes are created based on a set of predefined factors. The factors are formed from all or a subset of possible combinations seen in a situation or decision problem (Taylor 2006).

Several studies have reported on the applicability of vignettes to collect data in the fields such as health (Wilson and While, 1998; Hughes and Huby, 2002; Magin et al., 2017); social research (Barter and Renold, 2000); education (Stravakou and Lozgka, 2018); developmental psychology (Howie et al., 2012); and school psychology (Baudson and Preckel, 2013). In contrast, the application of vignettes to tourism-related studies is less well developed. At the time of writing, there were no studies

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reported on the usage of vignettes for increasing understanding of national park values. The importance and originality of this study will therefore make a significant contribution to the field.

4.3.1 Vignettes in qualitative research

Vignettes in qualitative research are brief stories on the reaction to a particular situation or the perception of another person, generally, a character in the story, and are particularly useful for exploring sensitive and delicate issues (Hughes and Huby, 2002; Finch, 1987), since this approach encourages participation in a discussion by creating a non-threatening and comfortable environment between the investigator and the interviewee (Barter and Renold, 2000; Hughes and Huby, 2002; Barter and Renold, 2000; Finch, 1987). Further vignettes have been considered a powerful tool for the investigation of perceptions about complex work tasks, to help investigate emotions that emerge in difficult situations, and to explore, professional decision-making (Kriz and Skivenes, 2013). Vignettes in qualitative research allow respondents to define situations using their own words. Respondents are asked what their reaction to a situation presented in a vignette is, or how a third person would react to such a situation (Barter and Renold, 1999). Vignettes are normally used as elicitation tools enabling the study of hypothetical situations which are reproductions of real events (Wilks, 2004). They also can be used with open-ended questions and interviews in qualitative research studies (Hughes and Huby, 2004).

Based on the aim of the study, responses can be open-ended or closed. Most quantitative studies employ closed questions (Hughes and Huby, 2004), while in

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qualitative studies, open-ended interviews tend to be used. It has been found that, in vignette studies, open-ended questions have significant value (Sheppard and Ryan, 2003; Hughes, 1998). Closed responses are often used in factorial and for the rating of responses along a scale (Alves and Rossi, 1978). Although closed questions are popular in quantitative vignettes, they do not capture as many details as open-ended ones (Hughes and Huby, 2004).

Based on the respondent group and research aim, the respondents may answer "what they would do" assuming themselves as the vignette characters or provide general viewpoints or tell their perception of how a third person mostly a character in the study would react (Hughes and Huby, 2004; Barter and Renold, 2000). For example, in a study by Barter and Renold (2000), vignettes were employed to depict different forms of violence. Participants were invited to give their opinion on how they thought characters in the story would feel and behave and how they might feel and respond if presented with a similar scenario and why.

In some other studies, the respondents were asked to adopt a role from the vignette and requested to explain their perceptions about the role. Coleman et al. (1999) used both qualitative and quantitative methods to study the participant's attitudes on the financial obligations toward children after divorce. Participants were asked what they thought the character in the vignette should do.

Other studies have used vignettes to reveal how participants themselves react to particular vignette scenarios (Quigley et al., 2014; Mc Keganey et al., 1995; Stravakou and Lozgka, 2018). Quigley et al. (2014) use photograph vignettes to find out the

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perceptions of Kenyan teachers on the human–nature interaction through focus-group interviews. Stravakou and Lozgka (2018) undertook an investigation on school principals' values in primary education in Greece. The principals were asked to answer the questions based on the hypothetical scenarios about primary education and were prompted to share similar incidents from their experiences.

4.3.2 Merits and negatives of using vignettes in studies

Traditional pre-established questionnaires commonly provide investigative bias, whereas in vignette studies the bias is less by providing a consistent, non-personal frame of reference (Schoenberg and Ravdal, 2000). Vignettes can be used to explore potentially difficult topics of interest (Hughes and Huby, 2002, p. 384), offering "a glimpse into how individuals' thoughts, feelings, behaviors, and decisions are affected by factors that may not be easily accessible in real-life situations because of mystifying sources of variability that cannot be controlled" where the researcher can manipulate the vignette stories (Evans et al., 2015, p. 160). A concrete vignette situation offers a detailed answer than asking abstract questions about attitudes and perceptions (Alexander and Becker, 1978). Since vignettes are non-personal, they are found to be more comfortable to provide their opinions about a vignette (Wilks, 2004, Hughes and Huby, 2004).

Although there are many merits in using vignettes, some negatives were also reported. The detachment of respondents' perception of vignette character plays a major role, while this gap is high it would be difficult to get the exact opinion from participants (Hughes and Huby, 2002). The most cited theoretical issue is that there

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might be a discrepancy between what people think they would do in a given situation and their real behavior (Barter and Renold, 2000; Paddam et al., 2010). There is no guarantee on the respondent's behavior to a vignette and what they would do in reality (Wilks, 2004).

4.4 Methodology

Two vignettes were developed and used in this study. Before the interviews, the vignettes were piloted with locals and based on the interview results, the vignettes were refined. The discussion was prompted by the interviewer who presented each respondent with two vignettes and asked them a series of related questions. These interviews were audio recorded.

4.4.1 Sample selection for vignette interview

For this vignette study, ten individual interviews were held with locals. Respondents were selected based on purposive sampling, following Patton (2002) and Denscombe (2010) who wrote that most qualitative studies use purposive sampling. Further, to identify and select "information-rich cases", purposive sampling is broadly used (Patton, 2002). Participants aged above 20 years were selected and the respondent pool was made-up of mixed gender. Interviews were held with both local tourists and local people who have not visited the country's national parks. To identify whether they are tourists or non-tourists, they were asked "Have you visited any national parks in

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Sri Lanka?" If they say "yes" and/ or "no", they were included in the sample, until making the sample size of five local tourists and five local non-tourists.

4.4.2 Construction of vignettes for the present study

Vignettes are descriptions of simulations of real events or scenarios or stories or case studies (Hughes and Huby 2004; Jeffries and Maeder, 2005). Even though there is no clearly defined documented process (Jeffries and Maeder, 2005; Paddam et al., 2010) for how to construct vignettes, Hughes and Huby (2002) in their study identified the establishment of the research problem and topic of the vignette as an important step in the development of vignette. Moreover, according to Hughes and Huby (2004), certain factors have to be considered when constructing vignettes such as relevance to the research under study, timing of vignettes, type of respondents, etc. In this study, the research problem was "how do locals respond to the conservation and management of national parks, if there is a loss in tourism revenue by park entry fees?". Hughes and Huby (2002) further suggested that during the development of the vignettes, stories can be formulated based on the investigator's personal or professional experiences or from relevant past studies. Several lines of evidence by Schoenberg and Ravdal (2000) suggest that vignettes were mostly based on the researcher's experiences, and they can stimulate real-life experiences. The approach to developing the vignettes for this study was mainly based on the researcher's real-life experience with frequent unprecedented crises in Sri Lanka, their effect on tourism and past literature related to vignettes. The generalizability of much-published

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research related to vignettes was in the fields of health science, education, psychology, etc. This study will provide new insights into vignettes and Environmental economics.

Although several definitions were put forward for vignettes, this study drew upon the definitions of Hughes and Huby (2002), Hughes and Huby (2004), Jeffries and Maeder (2005), Finch (1987), Steiner et al. (2016), and Skilling and Stylianides (2019) to construct the vignettes. The definitions are given above. Furthermore, present study used "developmental vignettes" or according to Hughes, (1998) "continuous narrative". It was also found that there should be a balance in the number of details provided in the vignettes since less information in short stories gives chances for the participants to provide more personal elements (Stravakou and Lozgka, 2018) and thoughtless answers were expected in lengthier vignettes since the respondents lose attention and get tired on reading the vignettes (Nosanchuk, 1972). Jeffries and Maeder (2005) in their study claim that normally when vignettes are created, they should encourage independent thinking of respondents and give unique responses to the question. The first vignette was to get an idea of respondents' knowledge about national parks, followed by their perception and views on the "value" of national parks. This was composed to prompt the discussion and allow the next vignette to flow as a continuous narrative. Arguably, this will stimulate the respondents to answer freely based on their experiences. Moreover, the confidence of interviewees will increase spontaneously to respond for the second vignette. The storyline of each vignette was built based on the past literature in conjunction with detail specific to Sri Lanka's national parks and the disasters which made a loss in tourism revenue in the

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country. Hughes and Huby (2002) suggest that vignettes do not essentially require participants to have extensive knowledge about the subject matter under discussion. In the present study also, rigorous knowledge about the national parks and how they are maintained was secondary. Careful consideration was made on the words used in the vignette, since according to Torres (2009), the texts used in vignettes must match respondents' literary skills and other social backgrounds. Jeffries and Maeder (2011) set a limit to the number of words for each vignette as two hundred words, and the following vignettes adhered to this. Once the vignettes were developed, associated open-ended questions were incorporated with them to get the responses from the interviewee. In the second vignette closed ended (yes/ no) question was incorporated in relevant places. Besides these standardized questions, based on the interviewee's responses, a few unscripted questions arose to encourage the respondents to answer without any hesitation. The developed vignettes were reviewed against the research question. Moreover, based on the feedbacks from experts, the vignettes were revised and used in the study.

4.4.2.1 Vignette 1

This first vignette was developed to understand the participant's background knowledge about the national parks of Sri Lanka. The first and second sentences were constructed to give respondents a clue about the importance of Sri Lanka's national parks in Asia and what Sri Lanka's national parks are famous for. The third sentence gives an idea of the main purpose of any national park. The rest of the first vignette

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explains the prominent wildlife of Sri Lanka's parks. The interview session was built up by follow-up questions in the vignette.

> *"Sri Lanka is reputed as one of the best places in Asia for seeing wildlife. It is also known as one of the all-around wildlife destinations in the world for a mix of big game camps, marine life, and varied landscapes, all packed into different national parks with very good tourism infrastructure. National parks conserve biodiversity and protect nature's beauty. National parks in Sri Lanka are a haven for diverse flora and fauna and are home to "The Big Four"; the Sri Lankan Elephant, the Elusive Leopard, the Sloth Bear, and the Blue Whale".*

Questions

1. Have you visited any national parks in Sri Lanka?

   a. If yes, do you think it was worth visiting those national parks? (If no, just move on to Q2)

   b. Why do you say it was worth visiting those national parks?

2. In what ways do you feel that national parks are important to a country, if at all? Why do you feel this way?
3. When you think about Sri Lanka's national parks, what mainly comes to mind?
4. Who, or which groups of people, do you feel benefit most from Sri Lanka's national parks? Why do you say this?

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4.4.2.2 Vignette 2

Jeffries and Maeder (2005, p. 18) defined vignettes as "incomplete short stories that are written to reflect, in a less complex way, real-life situations to encourage discussions and potential solutions to problems where multiple solutions are possible". This definition of vignettes gave an idea to develop the second vignette on the estimation of national park values. In the following vignette, adequate information was provided about the financial benefits of park tourism. This vignette was formulated to understand the knowledge and perception of participants about the sustainable management of national parks and to find out the willingness of respondents to conserve the national parks by various means when there is a loss of revenue from park tourism.

> *"Sri Lanka's tourism industry had been on a steady rise since the end of more than 25 years long civil war in 2009. And at the end of 2018 a total annual revenue of Rs. Mn. 3,138.93 was earned from the national parks of Sri Lanka. Of this revenue, nearly 70% was from park entry fees. Among these Rs. Mn. 2,138.5 was from foreign tourists and Rs. Mn. 73. 08 was from local tourists. Tourism was hit hard following the attack in April 2019 which made a considerable drop in tourist arrivals. It was also harmed again following the unprecedented crisis triggered by the COVID-19 pandemic after which there was a steep fall in the earnings from tourism including that from people visiting national parks. As a consequence, the government has to find other ways to fund the country's national parks or accept that there will be less funding available for the protection and enhancement of the parks and the wildlife found in them".*

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Questions

1. In this situation when revenue from park entrance fees falls dramatically, do you think that the government should find other ways of ensuring the same level of funding for Sri Lanka's national parks?

   Yes/ No

   Please explain why you think this.

2. In this situation, do you think that people like you should contribute directly to the costs of ensuring the existence and conservation of these parks?

   Yes/ No

   Please explain why you think this.

   a. If yes "how" do you think people like you can contribute directly to the existence of these parks??

   b. If no "who" do you think others should contribute to the conservation of national parks or should the parks just accept that they will no longer be funded? (Prompt foreign tourists or local tourists or all Sri Lankans or foreign donors or others).

4.4.3 Data collection

Protection and safety of the respondents and the interviewer were ensured during this COVID-19 pandemic situation. The government health guidelines for the COVID-19 pandemic were followed during the interview such as maintaining the social distance (2-meter distance) between the interviewer and the respondent and more importantly

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it was ensured that the respondents and interviewer wore masks properly. Hand sanitizers were used to clean both interviewer's and respondent's hands. Data collection was done at the entrance of Royal Botanical gardens, Peradeniya, Sri Lanka. Interviews were held in well-ventilated places, and crowded places were avoided.

An open-ended approach was used which enables opening the door for a holistic view from the respondents. Having informed the respondents about the purposes of the study, participants were encouraged to answer the questions after reading the scenarios. The study was approved by the University of Reading, United Kingdom's Ethical Committee (Participant information sheet and the vignette questionnaire were attached in appendix VII).

Kinicki et al. (1995) in their study outlined that, 'paper-people' vignettes execute low cognitive demands on respondents than watching a videoed or live event. For this study, text vignettes were used. Each vignette was read out by the interviewer and the respondents were asked to take some time to comprehend the story, before answering the questions. Participants were encouraged to talk freely. Interviews were recorded using digital recorders.

4.4.4 Data analysis

The qualitative data analysis follows Yin's (2015) five phases: Compiling, Disassembling, Reassembling (and Arraying), Interpreting, and Concluding. Analysis of the present study began with compiling the data. First, the voice recordings were transcribed verbatim and stored as word documents. For verification, voice records

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were again compared with respective transcribed word documents. Further, the anonymized transcribed documents were read several times, to get a sense of what each contained. This allowed a detailed assessment of the content of the interview transcripts and stimulated a process of determining where to start the analysis.

The second phase of "Disassembling" involved breaking down the transcribed compiled data into smaller fragments (Yin, 2015). After a process of reading and re-reading the transcripts, line-by-line analysis was undertaken to obtain the meaning of individual pieces of data. Codes are considered to be the smallest components that reflect the most interesting elements of the data and are considered to be the building blocks of themes (Clarke and Braun, 2017). This coding process is part of what Braun and Clarke (2006) term thematic analysis.

Once all the data are coded, each of the sections that fit into each code was collated. This is the "Reassembling procedure" where the disassembled fragments or codes are grouped into various sequences or groupings. The fourth phase, "Interpreting", takes the reassembled data, which are used to create tables, graphics, and reports. In this chapter, the interview data are displayed in themes, categories, relationships, and typologies based on the research questions (Srivastava and Thomson, 2009). In the final "Concluding" phase, conclusions from the study are drawn. Data displays are used together with thematic analysis to convey the results in an easy and visually stimulating format.

A wide range of qualitative analytic tools are used in different fields, and thematic analysis is considered an important analytic option (Grbich, 2012) as a foundational

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method for qualitative analysis (Holloway and Todres, 2003). Thematic analysis is a method used in the identification, analyzing, and reporting of the different patterns in qualitative data (Braun and Clarke, 2006). Themes are defined as units derived from patterns such as "conversation topics, vocabulary, recurring activities, meanings, feelings, or folk sayings and proverbs" (Taylor and Bogdan, 1984, p.131). They are the "outcome of coding, categorization, or analytic reflection, not something that is, in itself, coded" (Saldaña, 2021, p19). Thematic analysis is useful for large or small data sets and works with a wide range of research questions (Clarke and Braun, 2017). This study undertakes thematic data analysis using Nvivo 11 software and the transcripts were imported into the software. The transcribed document of the interviews was examined line by line to identify noticeable statements linked to the research questions, employing open coding at different levels of abstraction. Then a set of first-order codes were assigned to the transcribed data. All codes were built inductively, based on the research questions. This procedure was repeated many times to obtain meaningful codes. Multiple comparisons were done across interviews with the developed codes to avoid missing any important themes. Child nodes were then formed to represent salient features of each parent node.

Based on the different codes that were developed, those with similarities were identified and formed into themes. A theme has a profound pattern and is consistent with the research question of the study (Braun and Clarke, 2006). These themes were reviewed and named. The analysis then involved an examination of relationships and interactions between codes and an explanatory schema was constructed (Braun and

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Clarke, 2006); a word search query to identify the most used words, word trees, and the creation of different maps was also undertaken (Hilal and Alabri, 2013).

To protect the anonymity of respondents, the transcribed voice records were named and numbered in sequential order based on the order of interviews held, for example, Respondent 1, Respondent 2, and Respondent 3.

4.5 Results

4.5.1 Socio- demographic information of the respondents

Table 4.5.1: Socio- economic status of respondents

Socio demographic information of respondents	**Percentage**
Gender	
Male	70
Female	30
Age group	
18 to 30 years	40
31 to 40 years	10
41 to 50 years	20
51 to 60 years	20
61 to 70 years	00
71 and above	10
Individual income level of the respondent per annum	
Below Rs. 600, 000.00	30
Rs. 600, 001.00- 700, 000.00	10
Rs. 700, 001.00- 800, 000.00	20
Above Rs. 800, 000.00	40
Education level of the respondent	
Primary education	00
Secondary education	20
Diploma/ vocational training	10
Degree	50
Postgraduate degree and above	20

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It was found that majority (70%) of the respondents were male, and the rest were female. 40% of the respondents were young and in the age category of 18 – 30 years followed by 20% in the age categories of 41- 50 years and 51- 60 years. moreover majority (40%) of the respondents were earning an annual income of above Rs. 800,000.00. It was interesting to note that almost all of the respondents were educated up to secondary and above level. Majority (50%) of the respondents had their first degree and 20% had their postgraduate degree.

4.5.2 Word cloud analysis

Figure 4.2 summarizes the most frequent words in the interviewee's responses. The size of the word is directly correlated with its frequency of use (Wattenberg and Viégas, 2008). The higher the word frequency, we can see larger and denser the font. Word cloud analysis has been an emerging way of presenting data and starting point for a deeper analysis of texts (Heimerl, et al., 2014). Here the word "national park" was excluded when running the word frequency analysis, since by default the respondents will use it frequently when answering the questions. The display was set for the hundred most frequently used words in the transcribed document. The visual representation of the word cloud highlighted the most frequently and prominently used words. As can be seen in the Figure 4.2, the most frequently used and prominent words include "visited", "government", "animals", "foreigners", "contribute", "natural" etc. This word cloud analysis is found to be effective in presenting evidence for deeper textual analysis of the transcribed voices.

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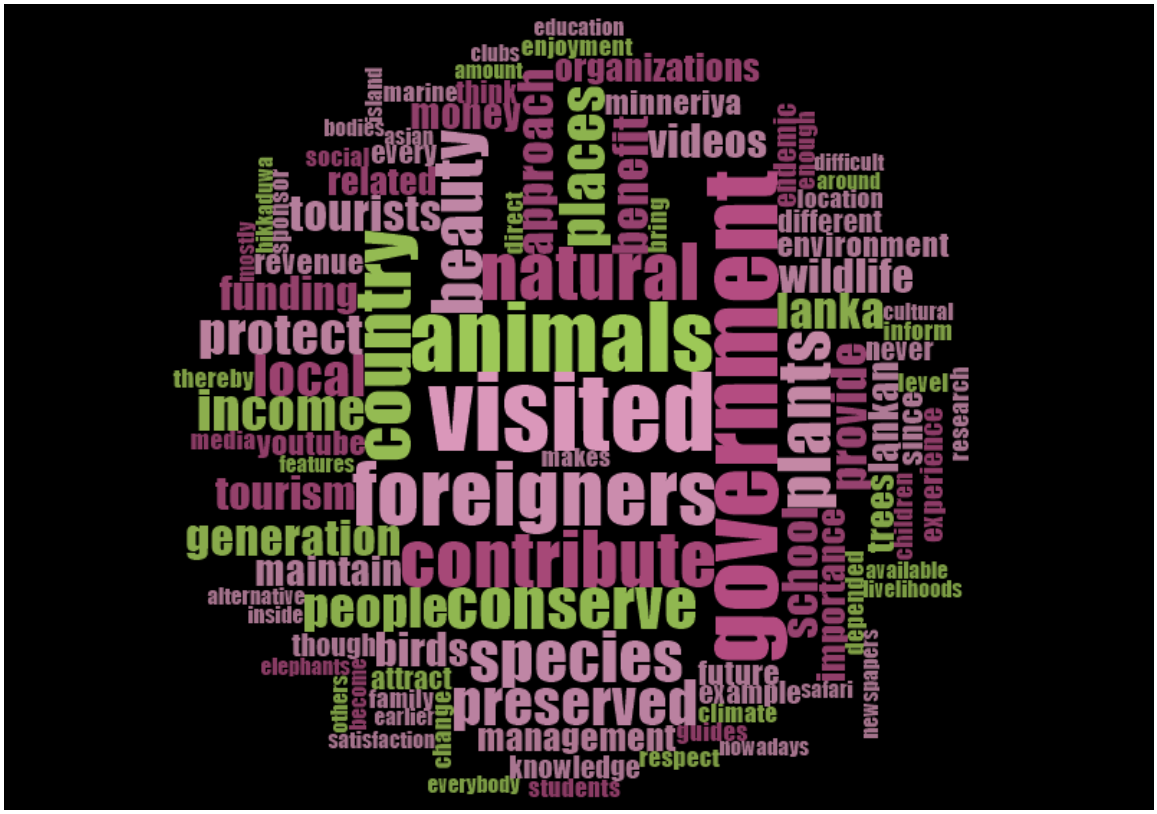

Figure 4.2: Word cloud showing most frequently used words

Figures 4.3 and 4.4 compare the visual representation of word frequencies more frequently used by tourists and non-tourists. The display was set for the hundred most frequently used words in the transcribed document. Tourists used the word "visit" most frequently followed by "contribute", "animals", "beauty", "plants" etc. In contrast in non- tourists' word cloud, the words "foreigners", "government", and "animals" were most frequently used. This may be because majority of the non-tourists have the perception that mostly foreigners benefitted from national parks and government has the high responsibility to conserve the parks. These two-word clouds are shown to contrast the word usage between the two different groups in the study.

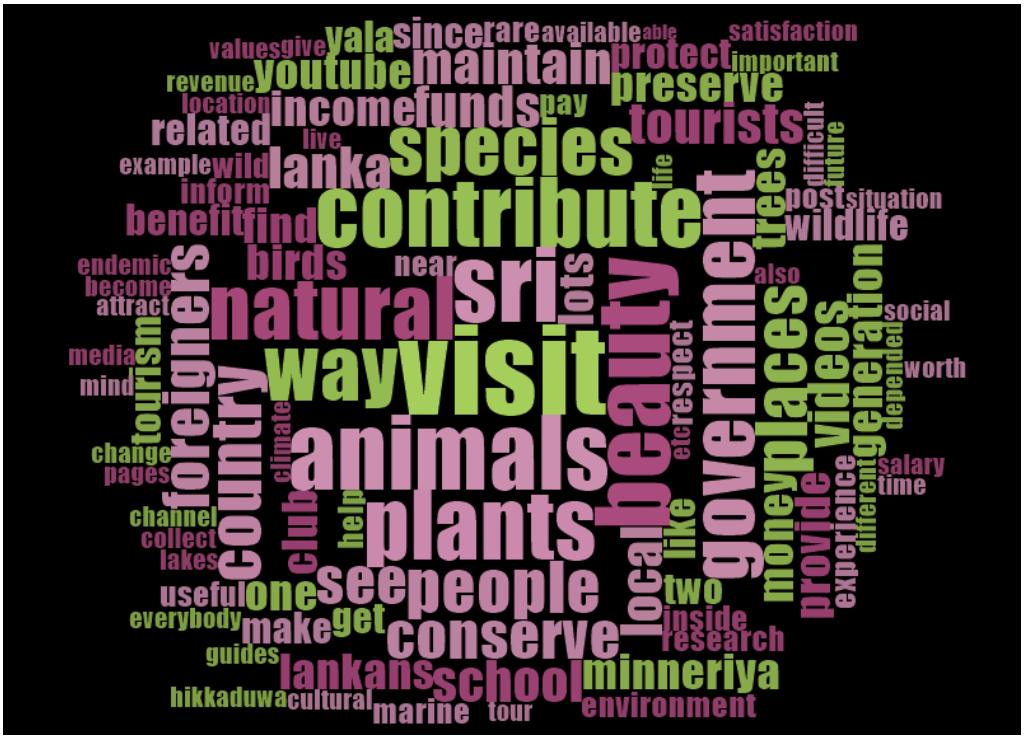

Figure 4.3: Word cloud showing most frequently used a hundred words by tourists

Figure 4.4: Word cloud showing most frequently used a hundred words by non- tourists

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4.5.3 Word tree analysis

NVivo allows for the creation of word trees, a technique that permits in-depth analysis of keywords in context relationships across the transcribed interviews collected for this study. The advantage of this technique is that it allows the reader to visualize how these keywords were displayed about one another (Wattenberg and Viégas, 2008; Culy and Lyding, 2010). Based on the word cloud, three of the most frequently used words such as "contribute", "foreigners" and "conserve" were chosen to formulate the word trees. Visualizations of the word tree analysis, on the words "contribute", "foreigners" and "conserve", provided a sense of the words used in their various forms. The results of word tree analysis show the perception, and enthusiasm of locals to contribute to the conservation of parks.

Figure 4.5 shows the relationship in examining the breakdown of appropriate uses in the bi-directional word tree with the keyword "contribute" (contribution). The sequence of words and phrases linked to the word "contribute" suggests a positive attitude towards contribution to conservation, and indeed an obligation towards nature conservation. However, this word tree makes clear that perceptions linked to who should contribute, and who is able to contribute, are nuanced.

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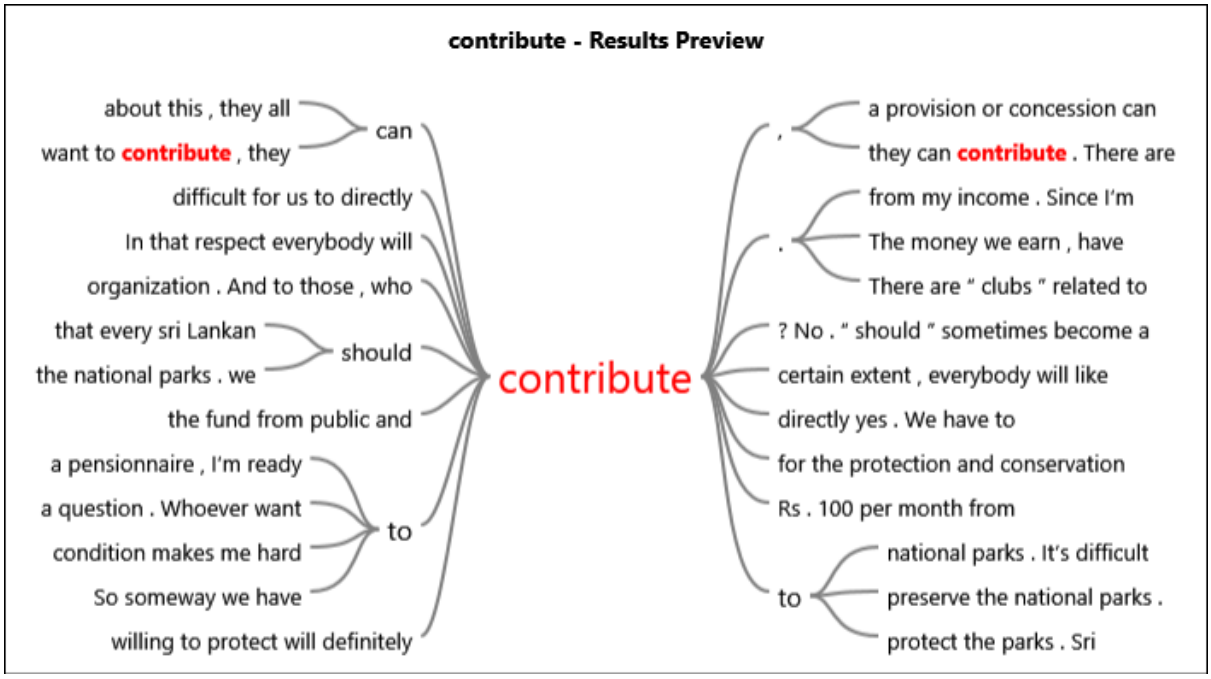

Figure 4.5: Word tree showing all instances of the word "contribute"

To analyze how the word "contribute" was used within the texts by tourists and non-tourists, the word tree analysis was done separately and displayed in Figures 4.6 and 4.7. These two-word trees provide a context for the word "contribute" used by tourists and non-tourists. It is evident from these two word trees that, tourists use the word "contribute" more frequently than non- tourists. Further tourists would like to contribute directly or indirectly to the conservation of national parks more than non-tourists. This may be due to the fact tourists were aware on the recreational importance of national parks.

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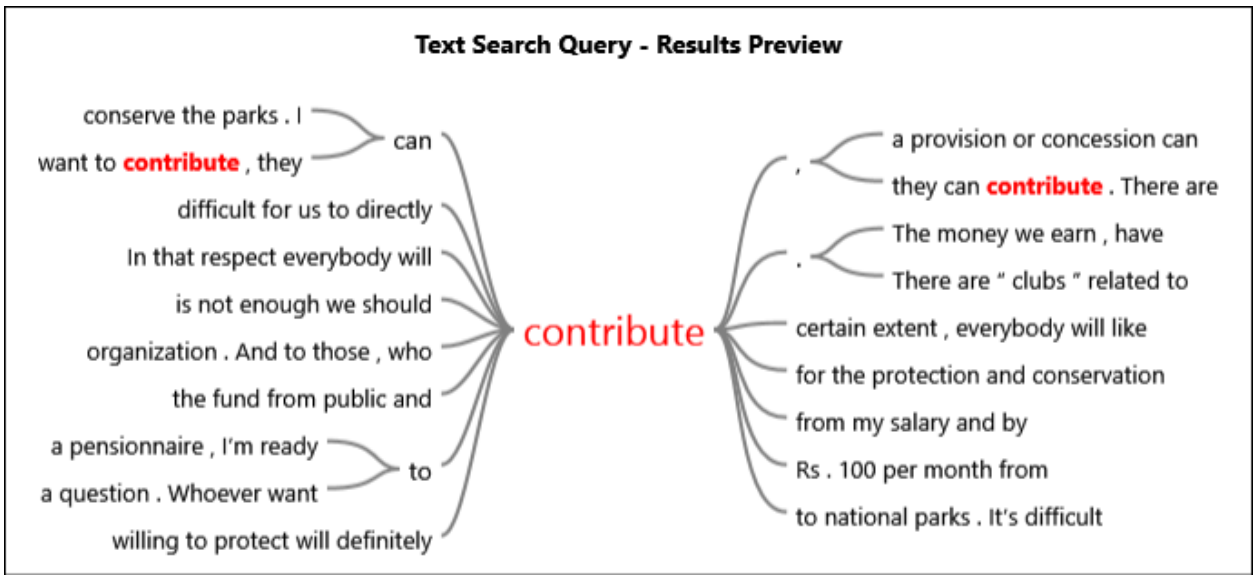

Figure 4.6: Word tree showing all instances of the word "contribute" in tourist quotes

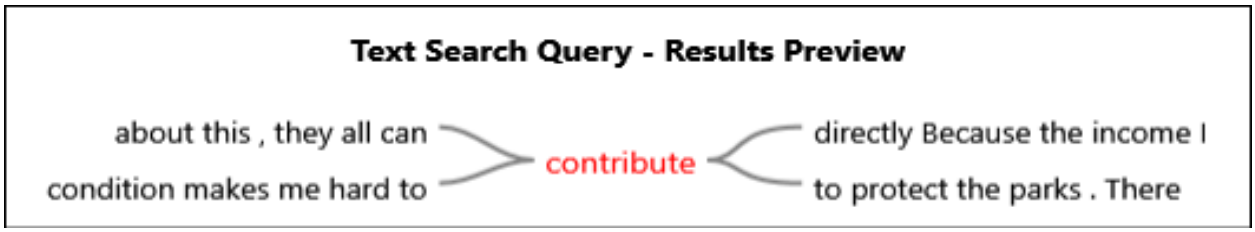

Figure 4.7: Word tree showing all instances of the word "contribute" in non - tourist quotes

Figure 4.8 reveals all the different contexts in which the keyword "foreigners" appears in a word tree, and how these contexts are clustered within "branches". The word tree "foreigners" was associated with meaningful insights into how national parks attract "foreigners" and how "foreigners" benefitted from national parks. No explicit responses stated that foreigners "should" contribute to the conservation and management costs of national parks. But it is clear that the respondents see foreigners

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as a source of funding: "parks get more income by foreigners"; "They attract foreigners. And thereby earn income from..."

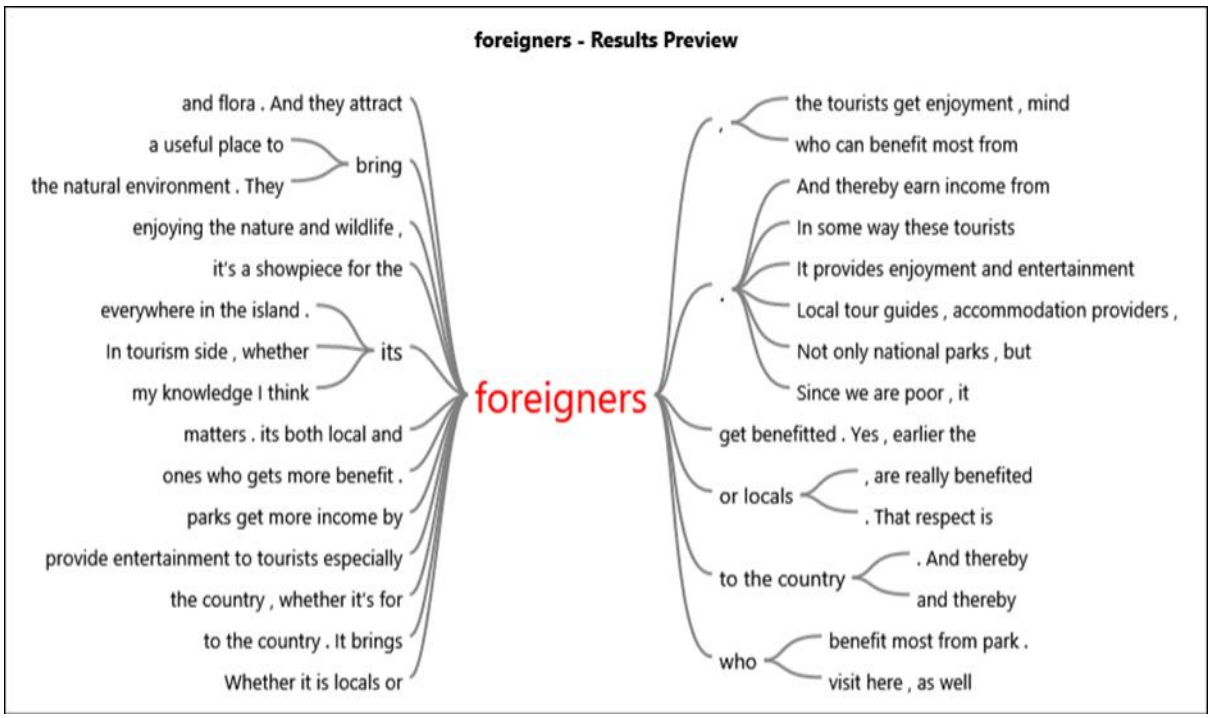

Figure 4.8: Word tree showing all instances of the word "foreigners"

To view how the word "foreigner" was used within the texts by tourists and non-tourists, the word tree analysis was repeated separately. The results are displayed in Figures 4.9 and 4.10. Resulted word trees suggest that non-tourists were reflecting more about foreigners than tourists. But it was interesting to note that both categories were aware of the benefits received by foreigners visiting national parks.

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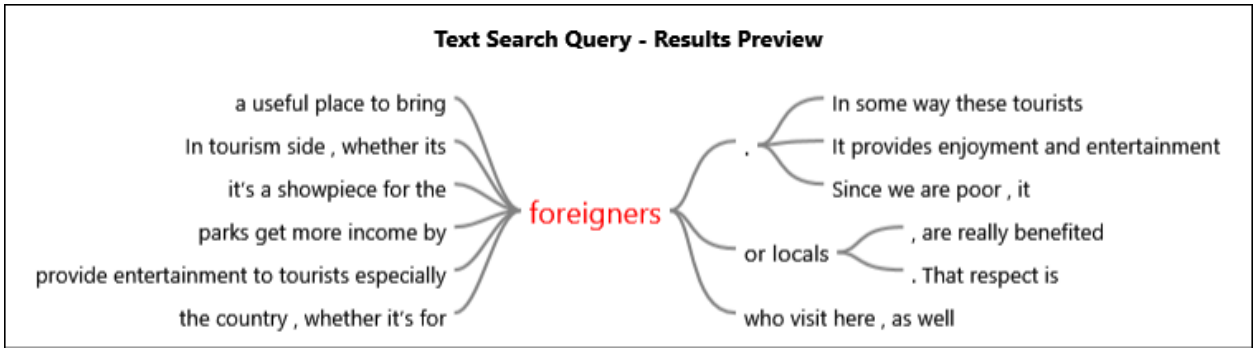

Figure 4.9: Word tree showing all instances of the word "foreigners" in tourist quotes

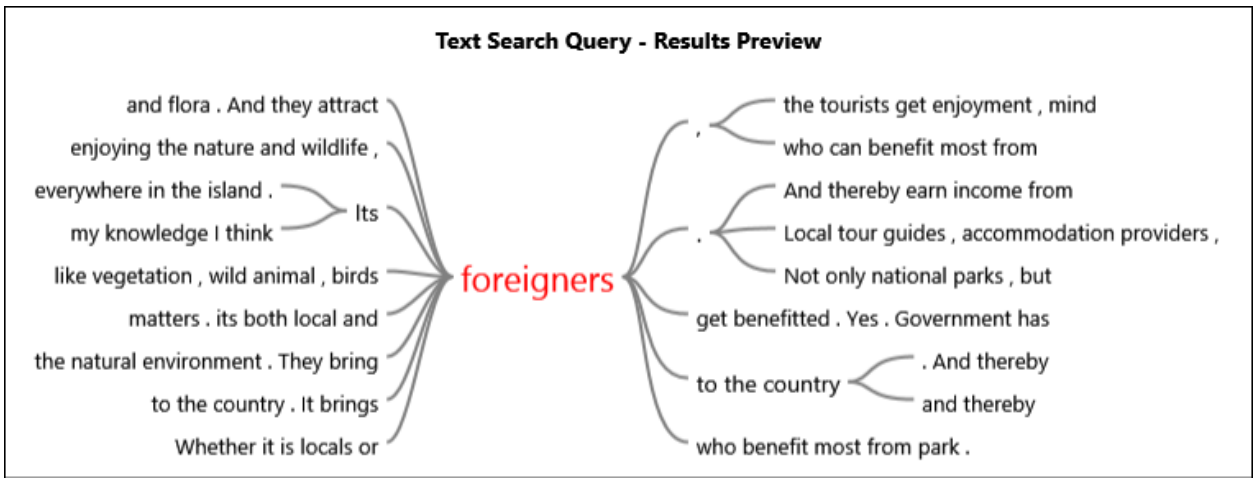

Figure 4.10: Word tree showing all instances of the word "foreigners" of non-tourist quotes

Figure 4.11 shows the word tree for the word "conserve", and the clusters of different respondents' opinions on the conservation of Sri Lanka's national parks. Interestingly, the word "government" is highlighted many times, with a suggestion that the government has a responsibility to conserve Sri Lanka's nature, including "rare" and "endemic" species. Juxtaposing this observation with the "foreigner" text search

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above suggests the idea that the government is responsible for ensuring that conservation happens, but that foreign tourists might be those who benefit most from that conservation and who are most able to fund that conservation.

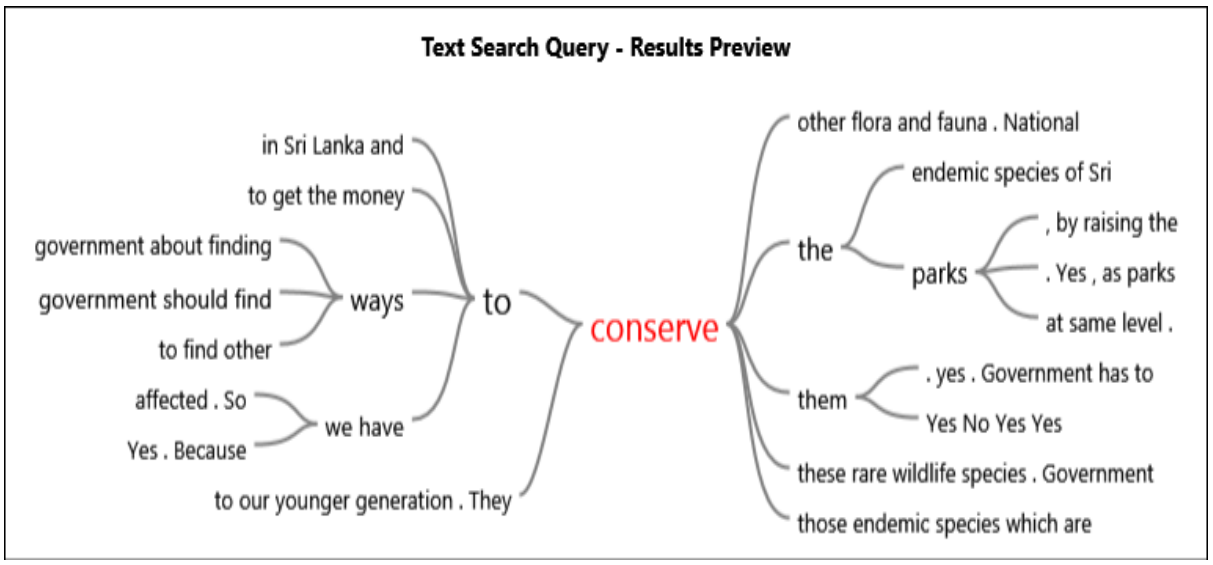

Figure 4.11: Word tree showing all instances of the word "conserve"

The following word trees in Figures 4.12 and 4.13 show a comparison among tourists and non-tourists on how the word "conserve" used within texts. From the two figures, it could be seen that tourists use the word "conserve" more frequently than non-tourists, since by visiting the parks, tourists may have more concern about the importance of parks.

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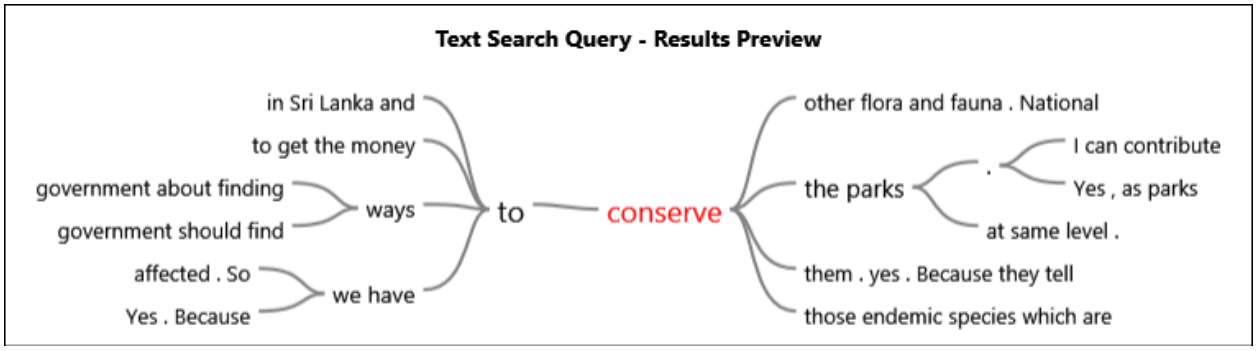

Figure 4.12: Word tree showing all instances of the word "conserve" in tourist quotes

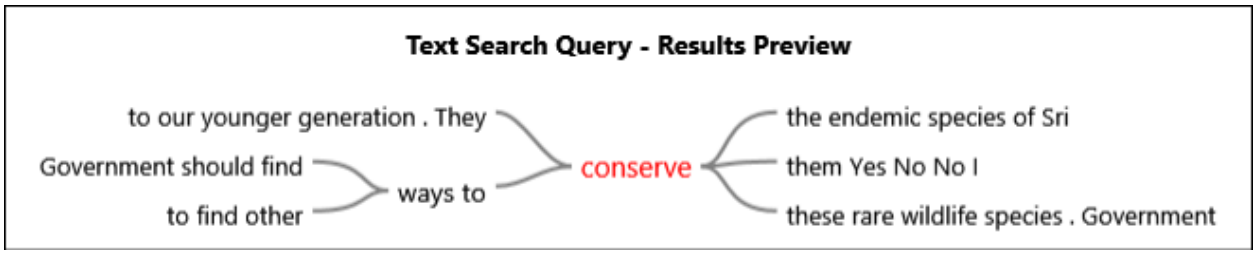

Figure 4.13: Word tree showing all instances of the word "conserve" in non-tourists' quotes

4.5.4 Specific respondent comments

Respondents one, two, four, six, and seven were tourists of national parks in Sri Lanka; and three, five, eight, nine, and ten were non-tourists. Respondent 1 visited Yala, Wilpattu, and Minneriya national parks, while Respondent 2 had gone to see Yala and Udawalawa national parks. Respondents four and six had visited both marine and

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terrestrial parks and they already knew the categorization of these two different types of parks:

> *Respondent 4 (tourist): I have visited national parks such as Pigeon island, Hikkaduwa, Yala, Wilpattu, and Udawalawe. Hikkaduwa and Pigeon Island are coral parks and marine-related parks. On the other, we can see wildlife.*

> *Respondent 6 (tourist): In Sri Lanka, we can see two different types of parks. But I have visited Minneriya, Horton Plains, and Wasgamuwa parks. And in parks like Minneriya and Wasgamuwa, we can see wild animals, plants, and biodiversity.*

Interviewer: What do you mean by two different types of parks?

> *Respondent 6 (tourist): errr…. Aaahhh…. There are two types of parks such as in one we can only see wild animals and plants. The other park is marine-related, where we can see marine life such as fish. coral reef, sharks, etc. Hikkaduwa is marine related.*

All five respondents who have visited at least one national park mentioned that all the visits were worthy for them. Most of the key informants were aware of the importance of specific rare wild animals and plants in national parks. Respondents two and four commented:

> *Respondent 2 (tourist): Because for leisure and mind relaxation, they were the best places. We were able to see lots of "unseen" plants and animals. We never saw those species in our life. And we can enjoy it by visiting those places.*

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Respondent 4 (tourist): We got some real experience with the environment and wildlife. We learned about national parks from textbooks during school days and on the internet. But when we visit there, we got a marvelous experience.

Expanding on the same "worthy visit" to national parks, sixth and seventh respondents acclaimed the importance of the "passive use value" they obtained from visitation to parks.

Respondent 6 (tourist): Because we were able to see rare species of animals and trees. And also, some parks have beautiful lakes like in Minneriya. Admiring the beauty of nature in the evening near lakes was a good experience. We forgot all our problems, work stress, and worries inside the park.

Respondent 7 (tourist): As an ordinary man, national parks made me realize on importance of maintaining rare species of plants, animals, and birds. It gives satisfaction to the mind and soul in stress and strained moods and gives immense pleasure to know different kinds of plants and rare animals.

4.5.5 Findings from the thematic analysis

Themes are considered to be the most important component of any qualitative thematic analysis which produces practical results (Green et al., 2007; Krauss, 2005). Each theme may have some sub-themes to obtain a detailed view of data (Aronson, 1994). Four main themes emerged from the present study, with the fourth theme having two sub-themes. The themes, sub-themes, nodes, and child nodes of the current study are visualized in Appendix V.

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4.5.5.1 Theme 1: Significance of national parks to Sri Lanka

From the interview with respondents, the importance of national parks to a country emerged. The respondents signaled the importance of national parks across different dimensions: "active use values" such as parks providing income from tourism and foreign earnings; and "passive use values", such as entertainment opportunities, a showpiece for foreigners and locals, the reflection of the country's beauty and most important national parks act as a safe place for endemic native species. Expanding on the same theme, some other respondents remarked on the importance of parks as "bequest value" in ways such as parks providing education opportunities for future generations. What was interesting to note is that all the respondents, whether tourists or non-tourists, highlighted the importance of national parks. This was demonstrated in the following statements by non-tourists:

> *Respondent 3 (non-tourist): Although I never visited the national parks, I understand they are the places to preserve the rare wild animals and flora. And they attract foreigners. And thereby earn income from tourism.*

> *Respondent 5 (non-tourist): From newspapers, the internet, and books I read about national parks. But I never visited those parks. National parks are considered to be tourist attractions places. Through tourism, the country can earn huge revenue. And different animals and plant species can be seen.*

One respondent linked the importance of national parks to the experiences of nature and the attraction of natural beauty:

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Respondent 1 (tourist): Because first of all, it reflects the beauty of the country. Country's features, country's natural beauty, and other things. So, it's a showpiece for the foreigners who visit here, as well as for our local people. It's a showpiece of the country, whether it's for foreigners or locals. That respect is very important.

Substantiating the issue, other tourists commented:

Respondent 4 (tourist): When we consider Sri Lanka, within one or two parks, we can find lots of diverse plants and animals. The species that are, how can I say?....errr, is it called endemic species? Some species which are only available in a particular place?

Interviewer: Yes, they are endemic species.

Respondent 4 (tourist): Then those endemic species are protected in these parks. They are untouched. And our children and future generation can learn about these species. It improves our knowledge.

Respondent 6 (tourist): People living in the surrounding area depend on national parks for their livelihoods. And it provides revenue to the country through tourism. Since tourists are prohibited to touch or disturb the wildlife and trees, an undisturbed ecosystem is maintained in the park.

To the next question in the first vignette (When you think about Sri Lanka's national parks, what mainly comes to mind?), each of the respondents interviewed explicitly gave an overview of what comes to their mind when they think about Sri Lanka's national parks. Keywords and phrases mentioned include: "ecosystems", "flora and

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fauna", "sustainable", "green space", "dry condition", "charmness", and "recreation". The flora and fauna that are found in national parks along with some parks having water bodies were commented on by many respondents. Sustainability and the beauty of the landscape inspired the first respondent:

> *Respondent 1 (tourist): First that all national parks are very sustainable. They are not environmentally degraded; it preserves the wildlife in an old way. National parks don't have modern construction. They kept it as it is. The beauty is that they are maintained in such a way to preserve the natural beauty in existence for a long time. That is one particular thing I can say.*

Respondent 7 enjoyed the visit to the parks with the family members and explained what came to his mind when we say "Sri Lanka's national parks" as his meaningful experience of seeing flora and fauna:

> *Respondent 7 (tourist): Wildlife, trees, and natural lakes. These water bodies help to maintain the temperature of the environment and provide drinking water to animals and birds. And spending more time together inside the parks with family members, away from stress also increased family unity.*

Respondent 2 hinted about the hot weather conditions inside the parks. Although he enjoyed the trip, he stated the following,

> *Respondent 2 (tourist): For me, it is a "Dry condition", it's very difficult to walk inside the park because it's too hot inside the parks that I've visited. But we like it.*

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4.5.5.2 Theme 2: Who benefits from Sri Lanka's parks

Analysis of the data revealed a second theme regarding groups who benefit from Sri Lanka's national parks. Many of the respondents pointed out that in addition to the income that parks generate from park fees that contributes to the park management, locals gained an advantage from Sri Lanka's national parks in several other ways. The respondents mentioned not just the opportunity to be a local tourist, but the income and job opportunities for accommodation providers (such as hotels, guest houses, villas); safari jeep drivers; those who own food outlets such as restaurants and cafes which are located near parks; tour guides; students and researchers. Some other respondents stated that foreigners are the group that benefits most since these parks provide entertainment and relaxation for them. Interestingly, some participants reflected on the Government of Sri Lanka as a group that benefits because tourism to national parks generates huge funds used to manage the parks:

> *Respondent 1 (tourist): As far as tourism is concerned, two sides are there. One is income generation, another is satisfaction. Two parties are benefited. On the tourism side, whether its foreigners or locals are benefit by seeing, visiting the places and get satisfaction, satisfy the mind of those people. Second is the tour guides and other sectors who receive income from tourists. They mostly live in the vicinity of the parks.*

> *Respondent 3 (non-tourist): Foreigners. Not only national parks, but wild untouched areas are there everywhere on the island. Its foreigners, who can benefit most from these parks.*

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Respondent 4(tourist): Locals who are dependent on national parks such as tour guides, those who own food outlets near parks, those who sell crispy hoppers, curd sellers, safari jeep drivers, hotels, and guest house owners benefit from national parks, and finally the government of Sri Lanka

Respondent 5 (non-tourist): It's the Sri Lankan government. From websites, television, and newspapers I have seen that by tourism in parks, lots of revenue is earned by the government.

Respondent 6 (tourist): National parks provide education opportunities for school, and university students, and income for the government and those who depended on parks for their livelihoods. It's ultimately Sri Lankans who benefit most from parks.

Respondent 9 (non-tourist): For my knowledge, I think it is foreigners who benefit most from the park. Our local people are less involved in visiting national parks. They normally visit beaches and gardens.

Interviewer: What may be the reason behind a low number of locals visiting the parks?

Respondent 9 (non-tourist): This may be due to high expenses for the travel to parks, or less awareness about parks. I feel mostly due to less understanding of the importance and, features of national parks. Distance and the location of parks also matter.

From these statements, we can see that the national parks of Sri Lanka act as a thriving tourism destination for both locals and foreigners.

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4.5.5.3 Theme 3: Funding strategies

The second vignette led to the emergence of the third and fourth themes. Park tourism numbers have been extremely sensitive to the pandemic, extreme climate or weather events, and civil unrest in the country. In unexpected situations when the government suddenly loses the revenue from park entry fees and conservation activities are underfunded, endemic species and habitats more broadly are at risk. Park tourism provides a strong incentive for governments to conserve biodiversity.

In the second vignette, respondents were asked about the implications of an unexpected reduction in revenue from park entrance fees, and whether the government should find other ways of ensuring the same level of funding for the management of Sri Lanka's national parks. Almost all the respondents answered "yes". As the responses illustrate, various reasons why the government needs to find alternative ways to conserve the parks are provided:

> *Respondent 6 (tourist): Yes, the government has to find alternative means. Because they tell our history, they help to mitigate climate change effects, and they are useful for our students to get knowledge and do research. Government can approach international funding organizations to get the money to conserve the parks.*

It was interesting to note that this respondent addressed the role of climate change mitigation that national parks can play. Expanding on the same issue, Respondent 7, a retiree, commented:

> *Respondent 7 (tourist): Yes, as parks are important to habitat, environment and to reduce climate change effects. National parks are places for trees, plants as well as*

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animals and birds to live in. if it is not maintained properly, these areas will become a wasteland, which leads to desertification.

Respondents, one and four remarked on the need to find alternative ways to conserve the parks:

Respondent 1 (tourist): Yes, the government has to find alternative approaches. Earlier the government relied on park entry fees, and now during the loss of tourism revenue, we have to find ways and means to fund the parks. One option through any projects, like from World Bank in a sustainable manner. Otherwise, we have to generate the money to preserve the parks with the help of local people. Either way by local government, citizens of the country, and by school people. They must pay something to safeguard the parks. We have to find mechanisms to generate funds from these local people.

Interviewer: ok you said something about school students. How can school students play a role in funding the parks*?*

Respondent 1 (tourist): Nowadays in education from the elementary level, subject related to "environment" is incorporated into the syllabus. And every school collects money from school children for field trips to these places. Schools can donate this money to maintain the parks.

Respondent 4 (tourist): Yes. Because we have to conserve those endemic species which are only found in Sri Lanka and conserve other flora and fauna. National parks such as Yala, and Minneriya have cultural values also since they are located near the cultural triangle or due to the location of ancient temples near them. Sri

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Lankans, regardless of their religions respect all religious and cultural values. So, the government should find ways to conserve them.

4.5.5.4 Theme 4: Who ought to pay for the conservation of national parks

Almost all the respondents had a positive attitude towards conserving the national parks directly or indirectly. Respondents suggested funds could be raised through remitting from their salaries or pension funds; donations or collecting funds from societies or clubs; or on social media. Two sub-themes emerged under this theme.

4.5.5.4.1 Sub-theme 1: Direct contribution to conservation

During the interview, in response to the interview question "In this situation, do you think that people like you should contribute directly to the costs of ensuring the existence and conservation of these parks?" except for the second, fifth, sixth, eighth and ninth Respondents, others said "yes". Those who expressed "no" to this question tended to be from low-income households.

Those respondents who suggested that they were willing to make a direct contribution stated various reasons, with many emphasizing the "passive use value" in terms of conservation of endemic native species, protecting biodiversity, recreation, and the supply of oxygen from the untouched parks and forests. For example:

Respondent 1 (tourist): Now everybody loves nature. Either by preserving plants or by tree planting etc. Sri Lanka is blessed with natural beauty. Because of its natural beauty, Sri Lanka became popular in the world. In that respect, everybody

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will contribute to a certain extent, and everybody would like to preserve nature. For example, if I say, I have enough time for recreation. So, if I'm contributing in some way to these parks, it enhances me to visit the parks. There is justification that "I'm contributing", which makes me take my family to visit those parks.

Interviewer: You mean that every Sri Lankan should contribute?

Respondent 1 (tourist): No. "Should" sometimes become a question. Whoever wants to contribute, can contribute. There are "clubs" related to nature loving. In such a way, we can meet the committees or clubs around those places. For example, around "Yala national park", you can organize a club to collect the fund from the public and contribute to national parks.

Respondent 7 (tourist): We should contribute to the protection and conservation of the parks. Thereby we are supporting the "United Nations Framework Convention on Climate Change". Am I correct? Is that UNFCC?

Interviewer: Yes, it's UNFCC.

Respondent 7 (tourist): And mainly to conserve the rare species in the parks.

Respondent 10 (non-tourist): Nowadays we hear lots of news related to climate change. To provide a continuous supply of oxygen, these untouched parks and forests should be conserved.

Those respondents who said that they were willing to contribute directly said that they would contribute through their salaries or pension funds. This reflects the growing interest of locals in the conservation of national parks. Respondents one,

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three, and four stated that they would like to pay a portion of their salary for the conservation. And respondent ten hinted that he would pay an amount from his salary as a donation.

Respondent 1 (tourist): By remitting through our salaries. For example, nowadays, every government servant has to pay some amount of money to a certain charity organization. And to those, who contribute, a provision or concession can be given using a card system. Whenever these people, visit those parks can be given a concession rate. It's a kind of mutual respect. This is another option other than collecting funds through societies.

Respondent 3 (non-tourist): I will pay a portion of my salary to manage national parks. Maybe around Rs. 1000 per annum.

Respondent 4 (tourist): We have to secure the national parks for protecting biodiversity and for the future generation. The natural beauty of Sri Lankan and its location attracts lots of tourists to the country. In case there is no COVID-19 problem, foreign tourism wouldn't be affected. So, we have to conserve the parks, I can contribute from my salary and by raising the funds through clubs such as Lion's club.

Respondent 10 (non-tourist): I can pay some amount of money from my salary as a donation to the government to protect these parks. Even though the money I pay is a very little amount, if every citizen of this country thinks about this, they all can contribute to protecting the parks.

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Respondent 7 is a retiree, on a low income:

> *Respondent 7 (tourist): From my income. Since I'm a pensioner, I'm ready to contribute Rs. 100 per month from my pension. And by doing awareness programs for the citizens of the country who are not aware of the parks, we can conserve the parks.*

4.5.5.4.2 Sub-theme 2: Who else can fund conservation activities

Those who felt that they could not or would not be able or willing to directly fund the parks suggested alternative funding sources. These included alumina associations; campaigning; asking societies such as the Lions Club; asking foreign donors; asking conservation agencies; and wealthy people. Respondent two suggested that social media such as YouTube videos could be created on for national parks, and by increasing the number of subscribers, funds for the protection of parks could be collected. Respondents suggested that in crises, measures of conservation success could be reached by various alternatives:

> *Respondent 2 (tourist): Sri Lankans who can give donations and the government. By posting on social media. And by gathering people, we can inform them of the situation or by campaigning. Social media such as Instagram, Facebook, and YouTube can be used to inform others. By making videos of national parks, we can spread the message.*

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Interviewer: Videos? How do you think videos can be used?

Respondent 2 (tourist): By visiting the national park, and by making videos and posting on YouTube, we can inform the public about the situation of parks, and the need for conservation and management. Then we have to sponsor those videos.

Interviewer: Sponsor? What do you mean by that?

Respondent 2 (tourist): That means even though if we post those videos on YouTube, not all are going to watch that. There are pages for "sponsor". Through them, we can make those videos to be available to whole Sri Lankan.

Interviewer: Can you explain further about this sponsor?

Respondent 2 (tourist): There are some people who own" YouTube pages" or "YouTube channels". If we pay them, then they will post my video on their channel. Those YouTube channels already have lots of subscribers. Then the video I created will reach all the relevant subscribers.

And there are alumina associations in schools and societies such as the Lions club, and we can approach them by explaining the situation. Then through them, we can inform the government, or we can make an impact on the government by finding ways to conserve the parks at the same level.

Substantiating the issue, Respondent five reiterated the idea of approaching international organizations or companies that support nature conservation.

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Respondent 5 (non-tourist): There are some organizations. For example, for wetland preservation; they help to preserve all wetlands. Likewise, there may be organizations internationally, to preserve national parks. We can approach them. And there are nature lovers, in every country and there are so many groups to protect nature. We can approach those bodies for funding. And there are some reputed companies for example. Dilmah Company. One of their areas is nature conservation. So, we can approach that organization to fund national parks. The founder of this company can be approached. And I'm sure that he would be positive about this funding.

On the same issue Respondent, nine suggested approaching multilateral organizations for funding support.

Respondent 9 (non-tourist): The government can approach foreign donors like the Asian Development Bank, and World Bank for the sustainable management of parks.

4.6 Discussion

This novel vignette study has implications for revealing how the country's citizens, both those that have visited the national parks and those that have not, feel about the national parks and how they might be funded in times of crisis when tourism revenues dry up. This makes several important contributions to the literature.

First, study results suggest considerable support from locals for the conservation of national parks, whether that requires individual contributions, government funding,

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or searching for other funding sources. Indeed, almost all respondents commented that during crises that result in a loss in tourism revenue, the government should find alternative ways to conserve the parks. Many respondents suggested that they were willing to contribute directly towards conserving the national parks by remitting through their salaries or pension funds or by donation; or indirectly by collecting funds through societies, clubs, social media, or alumina association. There was also, however, a feeling that foreign donors, conservation agencies and wealthy people should be encouraged to contribute.

Second all respondents, whether or not they had visited a national park, were aware of the importance of parks to their country in terms of use, intrinsic, and bequest values. Some interviewees also remarked on the value of parks in providing education opportunities for future generations, which resonates with the studies by Bauer (2003) and Vodouhê et al. (2010) which highlight the importance of the local community's insights on the need for conservation of nature reserves for the future generation. In this study, respondents were aware that parks provide recreational benefits and mind relaxation to all tourists, whether foreigners or locals. In addition, respondents remarked that parks provide vital economic support to other local communities across the country such as to those accommodation providers, safari jeep drivers, food outlet owners, tour guides, etc. These pragmatic views on the benefits of parks and the awareness of the importance of parks may have increased the positive attitudes towards the conservation of parks revealed by the respondents.

Third the support of the respondents for the conservation and protection of national parks reinforces the findings of previous studies on the conservation of the protected

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area in other countries. Several have examined and found positive attitudes in the local community towards the conservation of national parks and protected areas (Walpole and Goodwin, 2001; Allendorf et al., 2006; Vodouhê et al., 2010; Sirivongs and Tsuchiya, 2012). Walpole and Goodwin (2001) examined Indonesian residents' opinions towards protected area tourism of Komodo national park, Indonesia. Their research revealed high support for the conservation of the park and positive attitudes towards park tourism. Allendorf et al., (2006), focusing on the local community's views towards three protected areas in upper Myanmar, revealed that the majority of the respondents had a positive attitude towards conservation of protected areas that were highly correlated with conservation and management benefits. In a study on biodiversity conservation in Pendjari National Park, Benin participants' perceptions of biodiversity conservation were found to be high and strongly related to locally perceived benefits of the park (Vodouhê et al., 2010). Sirivongs and Tsuchiya (2012) investigated local residents' perceptions, attitudes, and participation in the management of the national protected area in Phou Khao Khouay, Central Lao, and found a high level of enthusiasm for conservation and protection.

Fourth, at the time of writing, no studies appear to have used a vignette approach to understanding the funding of national parks in LMICs in times of crisis when there is no foreign tourism revenue. The importance and originality of this study will therefore make a significant contribution to the field of Environmental Economics. Improving this understanding is important, because if the government is to have the support of the population with respect to finding alternative funding sources, that could include asking the local population to contribute.

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Relying predominantly on international tourism to fund park management is risky when there are frequent and unexpected crises. This study's findings suggest that the Government of Sri Lanka may have considerable support from its citizens for the protection and management of parks in crises.

4.7 Concluding thoughts

To date there is insufficient understanding of how people in Sri Lanka believe the national parks should, and could, be funded when park entrance fees from foreign tourists dry up, whether due to natural or human-made disasters. Qualitative vignette study investigated the perceptions and valuations of local people in terms of conservation and management of national parks when there is no income from foreign tourism. This research aimed to explore the extent to why and how Sri Lankans would be willing to fund their parks in the absence of foreign entry fee revenue, and in particular an individual's desire to preserve national parks for others and future generations using a novel vignette approach. The use of vignettes is a well-established route for exploring complex and sensitive issues, thereby providing more nuanced insights than quantitative approaches. The cornerstone of this novel qualitative vignette results revealed the awareness of the importance and benefits of parks and the positive attitudes of locals towards the conservation of parks. The present study also adds to the body of literature relating to the findings of the previous studies on conservation attitudes of the local community, towards protected area management in other countries.

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5 CONCLUSION

Tourism in nature-based recreational sites such as national parks has gained importance over the last couple of decades in many countries, and Sri Lanka is no exception. This study contributes to the literature on the rationales behind the park entry fees, and optimal park pricing. Recognising that the reality for many lower-income countries is that international tourists cannot be guaranteed, the study explores how national parks are valued by local tourists and the perceptions of locals to fund and manage the national parks in times of crisis. This study used a contingent valuation method to determine the mean WTP for the park entrance fee and a novel qualitative vignette approach to explore locals' perceptions of funding the national parks when there is no revenue from international tourism.

The next section highlights the key contributions made in this study to achieve the three objectives. The following section discusses the significance of the study. Section 5.3 proposes implications for policy. Section 5.4 concludes with the study's limitations and suggestions for further research.

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5.1 Summary and key contributions of the study

This section addresses the extent to which each of the study's three objectives have been achieved, and the implications of the findings.

5.1.1 Objective 1

The first objective of the thesis was to explore the theory behind, rationales for, and impact of park entrance fees, to provide the theoretical and practical underpinnings for the rest of the study. This was undertaken primarily in chapter two. Interestingly, a detailed assessment of the literature reveals that there is no clear consensus as to whether countries should indeed charge entry fees. In part, this is because national parks are often considered either club or public goods (Rittenberg and Tregarthen, 2009; Dixon and Sherman, 1990; Mayer, 2014). In as much as a national park can be considered a global public good, there are arguments in the literature for the parks being free at the point of entry, and the review of the literature reveals that this is the case for many higher income countries. Yet the reality, especially for lower-income countries, is that park entry fees from overseas tourists provide much needed revenue. To the extent that parks are not pure public goods, the literature makes clear that charging an entrance fee limits the number of tourists in the park, thereby reduces the environmental degradation. Even though national parks are largely non-rivalrous when visitor numbers are low, rivalry becomes a reality when visitor numbers are high and there is congestion in the parks (Turner, 2002). The review of the literature also revealed that concepts of fairness are also important: should those who do not visit parks pay for their upkeep through taxation; should high-income foreign tourists

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contribute to the costs of maintaining parks, or for the benefits they gain from visiting these parks. A detailed review of the literature revealed how complex park pricing strategies can be, and that they can be country-specific or type of tourist-specific, or park-specific. However, certain important regularities are revealed, particularly that differential entry fees are charged for local and foreign tourists, a classic example of price discrimination to increase overall park revenues.

It is interesting that even though much of the park pricing literature still focuses on how to maximize revenue from park entry fees, there is increasing attention being paid in the literature to the other implications of park pricing. Higher park entry fees typically reduce the number of visitors to a national park. This may or may not increase total fee revenue; is likely to reduce pressure on ecosystem services within the park; and may reduce the amount spent by tourists in and around the park, such as on food and souvenirs. Chapter two also takes a deep dive into park pricing in Sri Lanka, to provide a case study of key practical aspects of park entry fees for a lower-income country. Sri Lanka proved to be a particularly interesting case study, because the country has suffered from natural and terrorist disasters that have proven devastating in terms of lives lost and livelihoods disrupted, but also because these disasters have led to an almost full cessation of foreign tourists and the potentially high park entry fee revenue that these tourists pay. Key informant interviews suggested that the wildlife department received enough revenue from park tourism under normal circumstances when foreign and local tourists are visiting the country. Yet the historical perspective provided in this chapter makes clear that the country cannot assume that park entry fees, particularly from foreign tourists, are guaranteed.

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Although the receipts from parks are directly credited to the government's consolidated fund, the share of funding that individual parks get is not proportionate to the revenue that they bring in. That is, park entry fees are not hypothecated. Nonetheless, since the department's primary aim is park conservation, parks are provided with sufficient funding to ensure that conservation objectives are achieved, and even if there is inadequate revenue from tourism, parks remain funded from central government funds, which never let parks shut down. Further, the reality for tourists visiting parks is that entrance fees are just a small proportion of total costs that tourists pay, and there are several additional charges that go to the government. In addition to the entrance fee, tourists must pay service charges, and vehicle charges, both of which are flat rates, and VAT. Safari jeep charges, if applicable, are also high, and shared amongst the number of people in the safari. Therefore, the total amount each tourist has to pay to enter the park was nearly ten times higher than the current entrance fees, even excluding safari jeep charges. This amount makes a visit to a national park in Sri Lanka unaffordable for some low-income families. Further, the analysis of secondary data revealed that Sri Lanka is getting comparably higher income from foreign tourism entry fees (See section 2.4.4 of the thesis).

5.1.2 Objective 2

The second objective of the thesis was to estimate the willingness-to-pay for park entry fees and to estimate the optimum entrance fee of national parks in Sri Lanka. To achieve this objective a contingent valuation study was undertaken, and the results are presented in chapter three. The study was conducted in four national parks in Sri

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Lanka, and the WTP question was used in the double-bounded dichotomous choice format. A Bayesian interval regression model was used to estimate the WTP. The study estimated three models such as the normal model, Student-t model, and Gamma model. The Student-t and the Gamma models had not previously been implemented within the contingent valuation literature. The estimation approach also facilitated model comparisons and the Gamma model was selected as the best model for interval regression. Since the vast majority of previous studies have employed models that require a normal distribution, the results here suggest that the literature may in large being employing sub-optimal models, though in practical terms the three models yielded similar results.

The regression results revealed that younger tourists were willing to contribute more to conservation than older people, and the respondent's income unsurprisingly positively influenced their WTP. Those motivated by vacation, recreational activities, and adventures had a higher willingness-to-pay than those who visit the parks during work or business trips. The mean WTP by local tourists was Rs. 109.19, which was higher than the current entrance fee. This result is consistent with the previous studies on the estimation of WTP, where the majority of studies reported a higher WTP for park entry fees than are currently being charged (Laarman and Gregersen, 1996; Silva and Kotagama, 1997; Lindberg and Aylward, 1999; Roberts and Hawkins, 2000; Walpole et al., 2001; Rathnayake and Gunawardena, 2011; Baral and Dhungana, 2014; Dikgang and Muchapondwa, 2017). However, it must be acknowledged that the sample contained only those that had previously visited parks and is therefore WTP is likely to be biased upwards.

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The "optimal" park entry fee that would maximize the expected revenue from locals was estimated to be Rs. 79.25 (where at the moment it is Rs.60). Although the current entry fee is the same for all the national parks in Sri Lanka, it was found that revenue-maximizing optimum entrance fees for Wilpattu, Hikkaduwa, and Pigeon island parks were Rs. 88.50 Rs. 87.25, and Rs. 74.25, respectively. All the parks are currently charged with the same entrance fees irrespective of their diversity, popularity, and available facilities. The results here therefore suggest that there is some limited scope for increasing revenues from local's entry fees, but that this might best be achieved by setting differential fees across parks. However, as revealed in Chapter 2, maximizing revenue from local tourists is not necessarily a sensible objective for governments, especially those in lower-income countries.

Sri Lankan national parks currently practice a differential pricing system, where locals and foreigners are charged different entrance fees, according to Becker (2009), "differentiation by individuals". Under normal circumstances the revenue earning potential from foreigners is arguably large relative to locals. Exploring the WTP of foreigners was initially an objective but was not possible due to the circumstances arising during the survey period. However, a detailed look at secondary sources makes clear that park entry fees are a relatively small component of foreigners' holiday costs (given travel, accommodation etc.). Consequently, there is a possibility that foreigners price elasticity of demand is low in respect to park entry. Therefore, this study concluded that a slightly higher location differentiated revenue-maximizing entry fee for locals was possible, but there may well larger scope for

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increasing revenues be sustainable management of parks through charges to foreign tourists. Though, this contention warrants further investigation.

5.1.3 Objective 3

The third objective of the thesis was to explore whether locals are willing to fund the national parks in Sri Lanka when revenue from international tourism is low which was achieved in chapter four. This study used a novel qualitative vignette approach, for which individual interviews were undertaken with ten locals (including both visitors and non-visitors to national parks). Two vignettes were developed: The first vignette was used to motivate the participants to share their knowledge about the national parks of Sri Lanka. The second vignette was formulated to determine respondents' willingness to fund the national parks when there is a loss of revenue from park tourism. The use of vignettes to prompt a discussion over how Sri Lankans might fund their national parks revealed some important insights. Notably, the respondents were aware of the importance of parks, including the educational benefits to their children and grandchildren, recreational benefits, and economic benefits. These views on the benefits of parks may be the reason for respondents' positive attitudes toward contributing to conservation. Even though respondents were aware that foreigners were a source of income for park conservation, none of the respondents stated that foreigners should have to fund national parks. Further, respondents felt that since the government receives millions of rupees from park tourism, the Government of Sri Lanka has a high responsibility for the protection of parks. Locals stated that they were willing to contribute to preserving the parks by direct

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contributions such as salaries, pensions, funds, and voluntary individual donations. In addition, their confidence in collecting funds through alumina associations, foreign donors, conservation agencies, and non-governmental organizations reflects the insight of locals on the value and importance of national parks and their benefits. While the sample size was small, this component of the study supported the contention that that locals were willing to contribute to the protection of parks directly or indirectly during periods when there is low revenue from foreign tourism.

5.2 Significance of the study

Currently, Sri Lanka charges Rs. 60 for locals and 15 US$[8] for foreigners uniformly for entry into it's all national parks. If a certain percentage of revenues received from park entry fees goes to the conservation and management, habitat restoration, and visitor management of the parks, then local tourists were on average willing to pay for entrance fee is Rs. 109.19, which is higher than the current entrance fee. Similar results were obtained in a World Bank study (2008) conducted in four national parks in Sri Lanka, where local tourists were willing to pay Rs. 93 for the entrance into the parks. These results are in line with other empirical studies conducted in different countries showing higher WTP for entrance fees (Laarman and Gregersen, 1996; Shultz et al., 1998; Maharana et al., 2000; Walpole et al., 2001; Krug et al., 2002; Casey et al., 2010;

[8] At the time of data collection, the conversion rate was 1 US$ = Rs. 202. 60. But at the time of writing the concluding chapter of the thesis, the conversion rate is 1 US$ = Rs. 363.65

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Baral and Dhungana, 2014; Dikgang and Muchapondwa, 2017; Baral et al., 2017; Witt, 2019).

The present study suggested that the current entry fee system at the national parks may not be optimal. The revenue-maximizing optimum entrance fee of locals for all parks is Rs.79.25. This suggests that there is positive but marginal potential to increase the entrance fees for locals to protect and develop parks, particularly in the light of the fact that further price differentiation across parks might increase revenues. But when fixing higher entry fees, careful consideration should be taken about the social inequity when the poor locals are prevented from accessing the parks. In addition to this, revising the price has political influences also. Considering these, park authorities have to think carefully about revising the current fee since there has been no revision for more than a decade.

Although it was not possible to interview foreign tourists due to disruption to tourism during almost the full duration of this PhD study, there is sufficient evidence that Sri Lanka is gaining an advantage from the differential pricing in park entrance fees, where foreigners are charged with much higher entry fees than locals. Several studies in low-income and lower-middle-income countries show that local tourists are charged lower entrance fees than foreigners (Krug, 2000). Though foreign tourism in parks is small in terms of volume compared to locals, the differential pricing between locals and foreigners in Sri Lanka has led to a situation where inbound foreign tourism accounts for more than 90% of the share of the revenue for the parks (see section 2.4.4 of the thesis). Similar observations were found in other countries such as Costa Rica

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(Chase et al., 1998), Nepal (Baral et al., 2017), and Ecuador's Galápagos National Park (Spergel, 2001). Further several studies on park entry fees showed that revenue maximization goals are targeted toward international tourists (Chase et al., 1998; Mendes, 2003; Baral et al., 2017; Spergel, 2001). Although a survey of foreigners was not possible for this study due to pandemics and the closure of the country's borders, raising the entrance fee for foreigners potentially offers greater scope for an increase in revenue. This seems a reasonable possibility based on the secondary evidence used in the study, and the higher WTP results of locals. Furthermore, foreigners are usually from a high-income group, and the entrance fee is a small fraction of their recreation expenditure. After the end of the local civil war, European countries continued to be the top source of the market, capturing nearly 50% of foreign tourism to the country. After 2010, among European countries, the United Kingdom and Germany continued to remain in the top four sources of markets for the Sri Lankan tourism sector. The other high-income countries such as France, Australia, and the USA (except in 2013), Malaysia (an upper middle-income country), and India (a lower middle-income country) continued to be in the top ten sources of markets for international tourist arrivals to Sri Lanka. The other high-income countries such as Canada, Netherland, and Japan and upper- middle-income countries such as China and Russia were the other nations that came under the top ten market sources in the last decade (Annual Statistical reports, Sri Lanka Tourism Development Authority, 2010- 2020). These statistics indicate that there is high scope to increase the entrance fee for foreigners as most tourists are from high-income and upper-middle-income countries.

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Additionally in Sri Lanka, foreigners are charged with a hard or stable currency (US$), and locals with local currency. African countries such as Kenya, Zambia, Uganda, Tanzania, and Zimbabwe similarly quote park fees for foreigners in US$ (Krug et al., 2002). This has the advantage when there is a depreciation in local currency; park authorities can make the most of foreign park tourism (Krug, 2000).

Although the current entry fee is the same for all the national parks in Sri Lanka, as evidenced by the estimates, there is a greater scope to capture benefits by implementing different entrance fees for the different parks, depending on their key characteristics. It was found that revenue-maximizing optimum entrance fees of locals for Wilpattu, Hikkaduwa, and Pigeon island parks were Rs. 88.50, Rs. 87.25, and Rs. 74.25, respectively. It can be conjectured that different optimum entry fees for separate parks might be obtained for foreigners also. These results suggest that price differentiation by various parks can be implemented to obtain maximum revenue. This result is in line with Krug et al. (2002), where Namibia charges different entry fees to different parks in that country.

In situations where there was no tourism, Sri Lankan parks were never closed, abandoned, or converted to crop or livestock production. This was because park management receives continuous funding from the government's consolidated funds, even though the revenues received are not earmarked for conservation expenditure. Similarly, in African countries except for Kenya and South Africa (Krug et al., 2002), and in Southeast Asian countries such as Indonesia (Walpole et al., 2001), park

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revenues are directly debited to the Central government's treasury. Continuous government funding for national parks supports maintaining the conservation aim of the Department of Wildlife Conservation, Sri Lanka. Further, results of the vignette study revealed that locals had a good understanding of the benefits they received from national parks and that they would like to contribute to conservation in times of crisis through direct and indirect contributions such as salaries, pensions, funds, and voluntary individual donations.

Further, this study has some methodological contributions. To our knowledge, although several previous studies use the classical method in the estimation of interval regression models, no previous studies are using the Bayesian method of interval regression for the analysis of WTP for the park entrance fee. This enabled the comparison of several distributional forms that would currently not have been possible using standard classical software.

The proposed model for WTP estimation will serve as a guide for future research using foreign tourists. The present study also gathered data using a novel qualitative approach that was not found in any park recreation literature or Environmental Economics studies. Recognizing these, the qualitative vignette study might contribute to developing future research tools and extend the value of the research in the area of public perceptions of the value of environmental goods and park pricing specifically.

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5.3 Implications for policy

The present study has some important implications for policy.

1. While this concluding chapter was being written, the Sri Lankan government was facing its worst financial crisis in the last seven decades. The country's economy had suddenly collapsed, and the government was facing deficient foreign reserves. The tourism industry once again finds itself highly sensitive to the crisis situation of the destination country, experiencing frequent power outages, skyrocketing prices of food and several other commodities, and shortage of cooking gas and fuel. Again, there has been a fall in inbound tourism with a commensurate negative impact on national park tourism. The resulting loss, again, of foreign tourist revenues, may make the conservation objectives of the DWC more difficult to achieve. But, from the past history of tourism industry in Sri Lanka, there are chances that tourism industry will bounce back to a historically normal situation. Further, the DWC could consider revising the entrance fees. Results of current research provide evidence that a revenue-maximizing entrance fee can be implemented to generate additional income that could be used for the conservation of national park resources and could help to overcome any earlier or anticipated financial crisis in park management. Involving voluntary donations at park sites is another viable option to overcome any sudden loss of tourism revenue. Even though it might be difficult for the Wildlife Department to increase the entrance fee rapidly, they can consider revising the fee in the next couple of years to provide more sustainable conservation revenues. Increasing the park entrance

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fees without affecting the social equity of locals, especially targeting foreigners, can reduce the government's economic burden and thereby contribute to the long-term continuous conservation of parks. A combination of optimum entrance fees especially targeting foreigners, with greater efforts to encourage funds, and donations, would be the more effective way for the sustainable conservation of parks in Sri Lanka. Department of Wildlife Conservation, Sri Lanka along with the Ministry of Wildlife and Forest Resources Conservation, coordinating other relevant stakeholders, have to initiate necessary action to revise the entrance fee since the entrance fee was not revised for more than a decade.

2. It is proposed to have different entrance fees to various national parks, to capture the park-specific benefits. The findings from this study suggest that terrestrial parks with higher flora and faunal diversity could charge higher entry fees than comparably lower diversity parks. Further, marine parks having distinct, colourful marine life and a park having facilities for snorkeling, scuba diving, lagoon safari, and glass-bottom tour could charge more than those having fewer facilities and less diversity. The department can consider implementing a park-specific entrance fees system after carrying out a detailed willingness-to-pay study focusing on foreign tourists, to see whether their preferences are similar to those of local tourists, and gradually after assessing the actual demand responses of each park.

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3. The positive estimate of the respondent's income on the WTP has the potential policy implication that higher-income groups have the potential for financing park improvements, and they can be targeted for park conservation and development activities. Further pairing the development of national parks targeting the younger generation could contribute to sustainably managing the parks because younger tourists were shown to be willing to pay more than older ones.

In addition, the researcher's experiences during the survey in the parks have resulted in the following policy-relevant insights.

A detailed description of the different costs associated with entering parks, including the current percentage of VAT a tourist has to pay, service charges, and, more importantly, the amount tourists have to pay for safari jeeps, could be displayed at the entrance of the parks in the digitalized form in all three languages (Tamil, Singhala, and English). This could enable tourists, individually or in a group, to calculate the total amount more easily they must pay before entering the park, making the costs more transparent. This would be particularly useful for low-income families who want to engage in recreational activities in the park or bring their children for education, as they can get a clear idea of the total cost they must pay before going to the ticket counter. This insight is based on the discussion with park managers and the personal observation of the researcher during the survey (see section 2.4.4 in thesis for more detail). Additionally, park authorities could consider

appointing park wardens or park employees who can at least communicate in English. Because most park employees can speak only the Singhala language, this may be why a smaller number of Tamil-speaking people visit parks.

Congestion at national parks can jeopardize the nature experience of tourists and degrades the ecosystems. Park authorities could consider how to provide better wildlife viewing opportunities to tourists. This can be done by limiting the number of vehicles entering the park or the number of tourists at a wildlife viewpoint. The present study did not directly focus on congestion inside the parks. But the open-ended question regarding the experience of tourists revealed that crowding affected the wildlife viewing from some viewpoints. Notably, some respondents reflected their crowding experiences in terrestrial parks as "park looks small, a smaller number of wildlife, but crowded with jeeps," "diverse animal and trees, grass, but in some places lot of safari jeeps," "some area crowded." Some others commented on their negative experiences about crowding in marine parks as "good place for snorkeling, but crowded," "snorkeling facilities are there, but some places with lots of boats," and "unregulated tourism damages to park, but good for snorkeling." These experiences resonate with the previous studies in national parks in Sri Lanka. Buultjens et al. (2005), in their study in Yala park, observed that a large number of vehicles gather if they happened to see any famous wildlife in the park. This disturbs animals' natural behavior and their movement. A study by Newsome (2013) reported that in Yala national park, nearly a hundred safari vehicles

lined up to enter the park, and overcrowding was observed at a leopard viewing point. Further, it was reported that the disturbance created by safari vehicles in an elephant viewing point made the elephants move towards the nearest vehicles aggressively. In one sighting, elephants damaged a safari vehicle that was standing near their habitat. Another study by Prakash et al. (2019), based on the tourists' reviews posted on a travel website, and exploring the reasons behind visitor dissatisfaction in highly visited national parks in Sri Lanka, revealed that "heavy traffic congestion" is the primary cause having nearly 53% of reviews. In the present study, the researcher personally experienced the crowding of safari jeeps at the Minneriya elephant viewing site during the survey. Considering all these, park authorities should review their regulations on the congestion inside the parks and formulate policies for better wildlife viewing.

DWC's website is still in its infancy state and doesn't provide detailed information on national parks in the country, park entrance fee, number of tourists entering the park each day, revenue earned by each park, etc. Moreover, the department was reluctant to provide any secondary data related to tourism in parks. Most of the secondary data for the study was obtained through Sri Lanka Tourism Development Authority, and they maintain an appealing website, which is essential for tourism. It is proposed that the DWC should consider updating their website by incorporating the statistical details of monthly tourist arrivals into different parks, revenue from different park

resources etc. Further park information such as the details of parks in the country, accommodation facilities in and around parks, location of visitor facilities, travel information portals have to be published in their website, since it will make the foreign tourists to attract and easily access the parks.

In Sri Lanka, park opening hours for tourists are only between 6 a.m. to 6 p.m. each day. But the park authorities can consider taking advantage of full moon nights by establishing viewpoints near lakes/ reservoirs inside the parks. For example, Minneriya, Uda Walawe, and Wilpattu parks have attractive natural lakes and are famous for birdwatching. The park authorities could also consider planning for pilgrims to visit cultural sites through parks on full moon nights (for example, the famous Kataragama sacred town and the Kataragama temple have to access through Yala park). Full moon day ("Poya day" in the local language) is a public holiday in Sri Lanka and both Hindus and Buddhists visit temples to do their rituals or go on pilgrimages to cultural sites. The marine parks would also be a better place to relax on these full moon nights, and park authorities can consider revising the park opening time. This recommendation is based on the researcher's own experience with activities carried out by Sri Lankans on full moon day.

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5.4 Limitations and suggestions for further research

Importantly, the study did not include any foreigners in the survey. Initially, the WTP research was planned to survey foreign and local national parks' tourists. Separate questionnaires were prepared for locals and foreigners, and ethical clearance was obtained from the University of Reading ethics committee. Shortly after the arrival of the researcher in Sri Lanka for data collection, an Island-wide curfew was imposed, and all the national parks were closed from March 2020 for nearly four months. The Sri Lankan government suspended all passenger arrivals from Mid-March 2020, and all airports were closed until late December 2020. So, there was no foreign tourism to the country during this period. After several discussions with the Supervisors and Monitor, the WTP study narrowed to only local tourists. See section 4. 2 of thesis for more details about foreign tourism during the pandemic in Sri Lanka.

But to survey local tourists, even if the curfew was lifted, additional time was needed to travel inter districts since all the national parks are located in other districts. Internal travel across districts was permitted only under exceptional circumstances, especially with police passes. There was an optimistic hope that the pandemic situation would become normal after some time, but it worsened. Again, the second wave of COVID-19 hit the country hard from the latter part of September 2020, and Sri Lanka witnessed a deadly third wave of the COVID-19 pandemic in 2021. Frequent closures of national parks, national-wide lockdown, or internal travel restrictions made data collection only when the travel restriction eased. Online interviews were not possible since the Sri Lankan parks don't maintain any contact details of tourists who visit parks. The

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only option was to do face to face interview, following the strict COVID-19 health guidelines. But during the survey, the visitation rate of tourists to the park was meager compared to previous years. So, several visits had to be made than expected to complete the data collection. This clearly shows the delays in the planned fieldwork due to this pandemic, which was beyond anyone's control. The distance between the hometown of the researcher to Hikkaduwa national park is 350 km which takes more than 8 hours to drive one way, nearly 250 km to Wilpattu park, and the other two parks are more than 100km away. Further, staying in outside accommodations or hotels became risky due to the pandemic and sudden lockdowns. The writing-up was continued during the curfew or lockdown periods but was limited only to online resource materials.

Another obstacle was obtaining permission from the Director-General, DWC, Sri Lanka, to interview tourists in parks. The Department rejected the initial research permit application because, while filling the application for "collaborating institution," the University of Reading, United Kingdom, was used. The guidelines for filling out the application were not given earlier. Later the DWC, Sri Lanka, informed that they have a regulation that a "collaborating institution" must be any Sri Lankan-based organization or institution. But this is a severe drawback to those who research Sri Lankan parks and are not attached to any Sri Lankan institutions. Resubmission and approval of the research permit application also delayed the data collection since it had to be approved by the researcher's employer during the pandemic.

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The results of the present study provoked several new avenues of exploration for future research on park entrance fees and tourism.

The present study was limited only to local tourists due to the country's pandemic and the closure of borders. As seen from section 2.4 of the thesis, revenue from foreigner's entrance fee is considerably much higher than revenue from local tourists. There is a high scope for replicating the current research by incorporating foreign tourists to estimate the optimum entrance fee for foreign tourists.

Present vignette study focused on exploring locals' perception of funding for parks in qualitative terms and received positive responses from all respondents. No study in Sri Lanka has been recorded using voluntary funding or donation as a payment mechanism for conserving parks. There is an avenue for new research to demonstrate locals' perception of the funding for parks quantitatively.

Another potential area for future research is valuing the national parks by incorporating various attributes, including congestion inside the parks, infrastructure facilities, recreational facilities, etc. A choice experiment can be more appropriate for this.

Qualitative research can be done by incorporating other stakeholders of parks, such as safari jeep drivers, tour guides, accommodation providers, and the local community surrounding the parks, on conservation and management. In addition to the biodiversity conservation, national parks play a key role in local

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economic development. A qualitative study with these stakeholders will identify the pros and cons of park tourism and can make avenues for collaborative development of park tourism with DWC, Sri Lanka.

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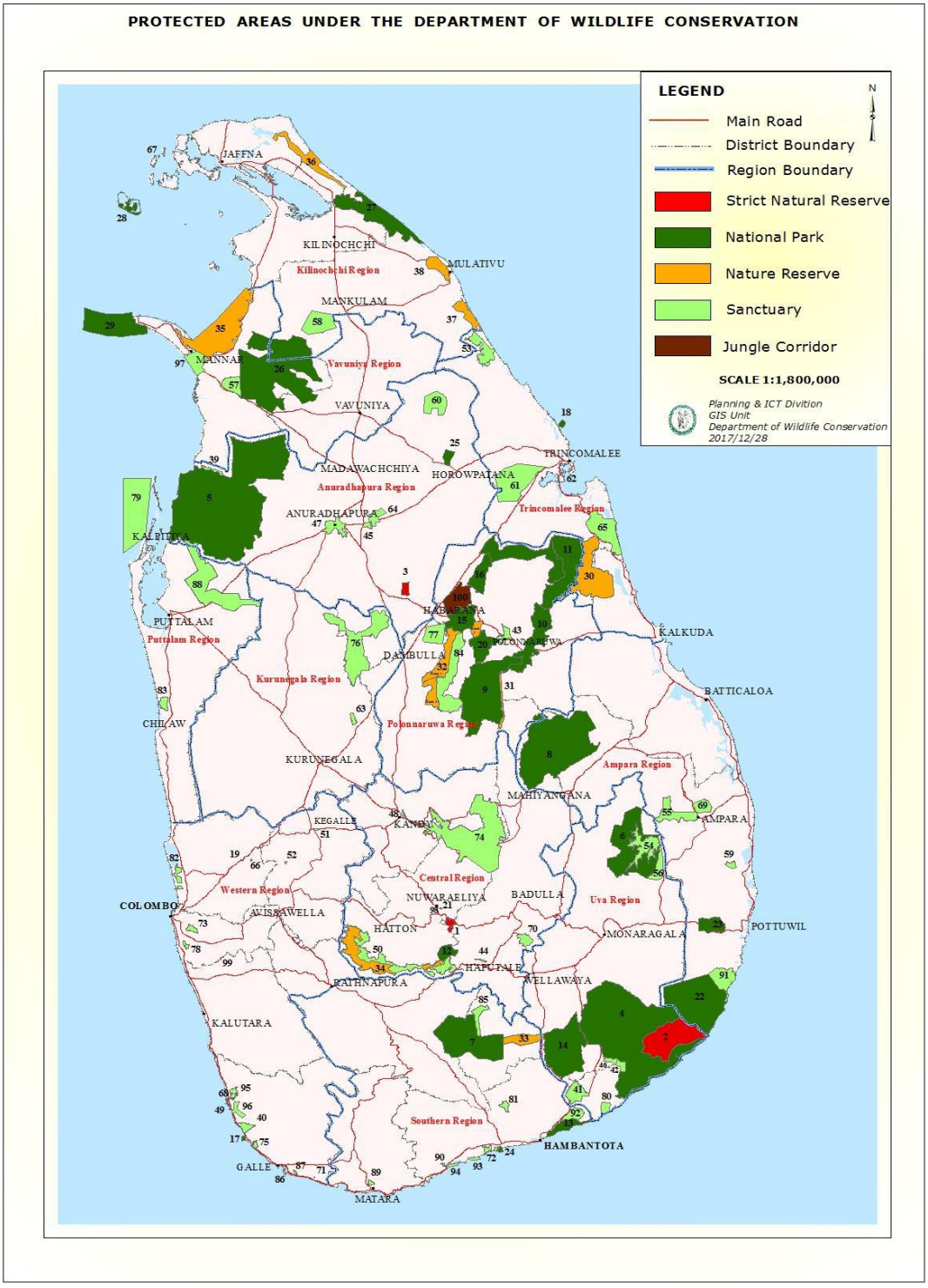
7 APPENDIX

Appendix I: Map of Sri Lanka showing the protected areas



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Appendix II: STAN codes used for analysis

STAN code for normal model

```
data {
        int N; int K;   int KX;  int KA;  real Up[N];  real Lw[N];   matrix[N,KX] X;  matrix[N,KA] A;
        matrix[N,3] Z; matrix[N,K] W;
        }
parameters {
        real<lower=0,upper=1> alpha[N]; vector<lower=-1>[KX] beta; vector[KA] lamda; vector[3]
        theta;vector[K] omega; real<lower=0,upper=300> mu;real<lower=0,upper=50> sigma;
        }
transformed parameters {

        real y[N];

        for (i in 1:N)

                y[i]=Lw[i]+alpha[i]*(Up[i]-Lw[i]);}

model {

        mu ~normal(100,50); sigma ~ cauchy(0,1);alpha ~uniform(0,1);

        for (i in 1:N)

                y[i] ~ normal(mu+ X[i]*beta + A[i]*lamda +Z[i]*theta +W[i]*omega, sigma);

        }

generated quantities {vector[N]

        log_lik;

        for (i in 1:N)

                { log_lik[i]=normal_lpdf(y[i]|mu+ X[i]*beta + A[i]*lamda +Z[i]*theta +W[i]*omega,
                sigma);

                } }
```

`

STAN code for Student-t model

```
data {

int N;  int K;  int KX;  int KA;  real Up[N];  real Lw[N];   matrix[N,KX] X;  matrix[N,KA] A;  matrix[N,3] Z;
matrix[N,K] W;

}

parameters {

 real<lower=0,upper=1> alpha[N];  vector<lower=-1>[KX] beta;  vector[KA] lamda;  vector[3] theta;
vector[K] omega;  real<lower=0,upper=300> mu;  real<lower=0,upper=50> sigma;
real<lower=1,upper=25> df;

}

transformed parameters{

real y[N];

for (i in 1:N)

      y[i]=Lw[i]+alpha[i]*(Up[i]-Lw[i]);

}

model {

            mu ~normal(100,50);  sigma ~ cauchy(0,1);

            for (i in 1:N)

                        y[i] ~ student_t(df,mu+ X[i]*beta + A[i]*lamda +Z[i]*theta +W[i]*omega, sigma);

}

generated quantities  {

            vector[N] log_lik;

               for (i in 1:N)

                        {log_lik[i]=student_t_lpdf(y[i]|df,mu+ X[i]*beta + A[i]*lamda +Z[i]*theta
+W[i]*omega, sigma);  }

      }
```

`

STAN code for Gamma model

```
data {
        int N;int K;  int KX;  int KA;  real Up[N];  real Lw[N];   matrix[N,KX] X;  matrix[N,KA] A;
        matrix[N,3] Z;   matrix[N,K] W;
}
parameters {
        real<lower=0,upper=1> alpha[N];  vector<lower=-1>[KX] beta;  vector[KA] lamda;
        vector[3] theta;  vector[K] omega;  real<lower=0,upper=300> mu;  real<lower=0> sigma;
}
transformed parameters{
        real y[N];
        for (i in 1:N)
                y[i]=Lw[i]+alpha[i]*(Up[i]-Lw[i]);
}
model {
        mu ~normal(100,50);sigma ~ cauchy(0,1);
        for (i in 1:N)
        y[i] ~ gamma((mu+ X[i]*beta + A[i]*lamda +Z[i]*theta +W[i]*omega)*sigma, sigma);
}
generated quantities {
        vector[N] log_lik;
        for (i in 1:N)
                { log_lik[i]=gamma_lpdf(y[i]|(mu+ X[i]*beta + A[i]*lamda +Z[i]*theta
                +W[i]*omega)*sigma, sigma); }
    }
```

`

Appendix III: Output of interval regression for normal model

Variables	mean	sd	median	5%	95%	Pr>0
before_visit	26.99	8.25	26.89	13.62	40.67	0.99
Daytrip	-16.99	11.27	-16.69	-35.69	1.33	0.06
vacation_rec	15.12	9.15	15.13	0.09	30.27	0.95
flora_fauna	3.44	8.24	3.42	-10.164	17.13	0.66
education	4.42	8.52	4.29	-9.41	18.49	0.69
adventure	27.28	11.76	27.27	8.05	46.85	0.99
cultural	-3.81	11.14	-3.87	-22.13	14.51	0.36
female	-5.88	7.59	-5.86	-18.32	6.63	0.22
Wilpattu	29.16	9.89	29.19	13.01	45.40	0.99
Hikkaduwa	25.89	14.48	25.91	1.98	49.72	0.96
Pigeon island	3.30	13.79	3.15	-19.24	25.87	0.59
Mean WTP	92.68	16.11	92.44	66.55	119.21	1
Age	-0.19	0.23	-0.19	-0.56	0.18	0.20
Income	0.08	0.04	0.08	0.02	0.14	0.98

`

Appendix IV: Output of interval regression for student t model

Variables	mean	sd	median	5%	95%	Pr>0
before_visit	25.92	7.82	25.74	13.33	38.95	1.00
Daytrip	-6.64	12.81	-6.11	-28.34	13.25	0.32
vacation_rec	12.32	7.94	12.12	-0.39	25.79	0.94
flora_fauna	5.86	7.07	5.88	-5.77	17.44	0.80
education	8.17	7.51	8.29	-4.37	20.29	0.86
adventure	14.41	12.61	13.79	-5.24	36.27	70.88
cultural	-3.35	9.06	-3.499	-18.01	11.73	0.35
female	-4.34	6.39	-4.20	-15.05	5.93	0.25
Wilpattu	28.83	8.31	28.61	15.72	42.93	1
Hikkaduwa	30.35	12.31	30.11	10.62	50.76	0.99
Pigeon island	12.64	11.89	12.96	-7.43	31.78	0.86
Mean WTP	76.59	16.11	75.85	51.19	103.99	1
Age	-0.18	0.19	-0.18	-0.51	0.14	0.17
Income	0.05	0.03	0.05	-0.00	0.11	0.97

`

Appendix V: Emergent themes, sub-themes, nodes, and child nodes of the qualitative vignette study

Themes	Sub-theme (If any)	Nodes	Child nodes (If any)
1. Significance of national parks to Sri Lanka		Endemic native species Tourism income Preserve flora and fauna Future generation Foreign earning Reflection of country's beauty Entertainment	
2. Who benefits from Sri Lanka's parks?		Locals	Local tourists Accommodation providers Owners of food outlets Safari jeep drivers Tour guides Students
		Foreigners Government of Sri Lanka	
3. Funding strategies		Tourism income Future generation's education Native species maintenance Cultural value	
4. Who ought to pay for the conservation of national parks	a. Direct contribution to conservation	Active use value Passive use value Bequest value Existence value	
	b. Who else can fund conservation	International donors Societies and clubs Social media Alumina	

`

Appendix VI: Questionnaire for the willingness-to-pay study of local tourists

Survey title: PRICING POLICIES OF NATURE BASED TOURISM IN SRI LANKA_LOCAL TOURISTS

Introduction:

National parks are founded to maintain the biodiversity, to preserve the attractiveness of settings and to provide environmental services to the society. Park entrance fees can be considered to be an important source for the revenue generation for many governments including Sri Lanka. This study focuses on the estimation of the optimum park price of national parks in Sri Lanka. Currently I'm doing this research for the partial fulfillment of degree of PhD in Agricultural, Environmental and Food Economics in University of Reading, United Kingdom. And this is purely an academic research, and all your answers will be treated with strictly confident.

`

Consent

Thank you in advance for sharing your valuable time in filling out this questionnaire. I will not collect any names or personal details as part of the interview/survey. Your identity will not be revealed to anyone other than the researchers conducting this survey. Participation is entirely voluntary, and you are free to withdraw from the interview/survey at any time you feel uncomfortable or unwilling to participate, and you do not have to specify a reason. I would like to invite the participants for an individual interview. Do you agree to participate?

1=Yes, proceed

0=No, I don't like to participate

Date of interview:	
Time of interview:	
Location :	

`

Section A:
Questions about the visits to national parks in Sri Lanka

A1. Name of the National park …….

A2. Have you visited to this national park before?

a) Yes b) No

A3. Which category best describes the length of your current visit into the park?

1)Day trip 2) overnight trip

A4. If you are staying overnight, how many days in total do you intend stay at this park? _____Days

A5. How much did you pay as entrance fee for this park? In Rupees

A6. Entrance fees increase scenarios

A certain percentage of revenues received from park entry fees goes to the conservation and management, habitat restoration and visitor management of Sri Lanka's parks. There are possibilities that the park fees could be increased. I am going to give you some of those possible new prices and I would like to know whether you would still have visited the park at those prices, and if so, for how many days?

Park entrance fees per person	A6.1. Would you still have visited the park? (1=Yes, 0=No)	A6.2. If "Yes" how many days?
Rs. 70	A6.1.1	A6.2.1
Rs. 80	A6.1.2	A6.2.2
Rs. 100	A6.1.3	A6.2.3
Rs. 120	A6.1.4	A6.2.4
Rs. 150	A6.1.5	A6.2.5
Rs. 200	A6.1.6	A6.2.6

`

A7. In your opinion, what daily entrance fee do you think would be fair for this park? …….

A8. If the entrance fee were increased, how high would the daily entrance fee per person have to be so that you would choose not to visit this park and choose another park to visit in Sri Lanka? ……

A9. What motivated you to visit this national park?

1) Vacation/recreation
2) The opportunity to see diverse and rare flora and fauna
3) Educational visit
4) Adventure (surfing, snorkeling, scuba diving, hiking etc.)
5) Cultural events
6) Work/ Business trip
7) Others

A9.7. Others (Please specify): _____

A10. What are your main activities in the national park? You can select more than one

1) Nature and wildlife observation
2) To see national park exhibitions
3) Snorkeling/Scuba diving
4) Surfing
5) Swimming
6) Cultural activities
7) Environmental education
8) Hiking
9) Eat at restaurants
10) Other

A10. 10. Other (please specify) …….

`

A11. Overall, how would you rate your experiences at this National Park?

1) Excellent
2) Good
3) Satisfactory
4) Poor
5) Very Poor

A12. Were you able to see all the types of flora and fauna that you wanted to see?

1) Yes, all of them

2) More than half of what I wanted to see

3) Less than half of what I wanted to see

4) No, none of them

A13. Tell me the experience (on the diversity, facilities available) of your visit to this national park:

…….

A14. How would you rate Sri Lankan government's attitudes towards nature conservation based on your experience in this park?

1) Excellent
2) Good
3) Satisfactory
4) Poor
5) Very Poor
6) Don't know

Section B: Background information

B1. Gender of the respondent?

1) Male 2) Female

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3) Other/ Prefer not to say

B2. Which District you are from: ----------

B3. Age group of the respondent belongs to.

a) 18 to 30 years
b) 31 to 40 years
c) 41 to 50 years
d) 51 to 60 years
e) 61 to 70 years
f) 71 and above

B4. Individual income level of the respondent per annum (before tax)?

a) Below Rs. 600, 000.00

b) Rs. 600, 001.00- 700, 000.00

c) Rs. 700, 001.00- 800, 000.00

d) Above Rs. 800, 000.00

`

Appendix VII: Participant information sheet and questionnaire for vignette qualitative study

APD MSc and PhD Participant Information Sheet Basic Template

Reference number:

Participant Information Sheet_Locals

Project name: Paying for National parks: Park pricing in a Sri Lankan context

I am PhD student at the University of Reading. As part of the requirements to obtain my PhD degree from the University I am conducting research on "Paying for National parks: Park pricing in a Sri Lankan context".

This research project aims to contribute to the conservation and management of park resources for sustainable development of Sri Lanka national parks, by providing a better understanding of how national parks are valued by locals.

To undertake this research, I am currently contacting local tourists and non-tourists of national parks in Sri Lanka. I would like to invite the participants for an individual interview. The interviews will take place, in a convenient place, which will take less than thirty minutes of your time.

You have been selected based on your interest in conservation of national parks. You are encouraged to freely express your opinions and please be assured that your views are valued and that there are no right or wrong answers to the questions asked.

I will not collect any names or personal details as part of the interview. Your identity will not be revealed to anyone other than the researchers conducting this survey. Participation is entirely voluntary, and you are free to withdraw from the interview at any time during the interview process, you feel uncomfortable or unwilling to participate, and you do not have to specify a reason.

After the interview, you will be given two weeks cooling off period. During this time if you wish to withdraw your data, you have the right to contact me in writing, quoting the unique reference number that has been given to you during the interview, to withdraw your data, without giving a reason.

But after that, it will not be possible to withdraw your contribution. If at any stage, you wish to receive further information about this research project please do not hesitate to contact Krishnal Thirumarpan [details below] before June 2022. The findings will be written up into my thesis and will be published in academic journals. This will not affect your anonymity.

The discussion will be audio recorded with your agreement, and the anonymised transcripts of the audio recordings will be used by the students/researchers working on the project. Once

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transcribed the original recording will be deleted. Your anonymity will not be compromised as only the reference number above will be used to identify the transcript.

All data I collect will be stored securely electronically on a password-protected computer or in hard copy version in a locked cupboard. The data will be destroyed at the end of the research project no later than 30/06/2022.

By participating in this interview, you are acknowledging that you understand the terms and conditions of participation in this study and that you consent to these terms.

This research project has been reviewed according to the procedures specified by the University Research Ethics Committee and has been given a favourable ethical opinion for conduct.

Thank you very much for taking time to take part in this survey.

Krishnal Thirumarpan

Student Contact Details

School of Agriculture, Policy, and Development

Agriculture Building

Earley Gate, Whiteknights Road

PO Box 237

Reading RG6 6AR

United Kingdom

E-Mail: k.thirumarpan@pgr.reading.ac.uk

Supervisor Contact Details

Prof. Elizabeth J Robinson

E-Mail: e.j.robinson@reading.ac.uk

Click here to paste your supporting documents into a text box

`

Safety precautions for the data collection during COVID_19 pandemic

Protection and safety of the respondents and the interviewer will be ensured during this COVID_19 pandemic situation. Interview will be held in well-ventilated places inside the garden. Social distance (2-meter distance) will be maintained between the interviewer and the respondent and more importantly it will be ensured that respondents and interviewer wear masks properly. Hand sanitizers will be given frequently to clean both interviewr and respondents' hands.

Click here to paste your supporting documents into a text box

Survey title: PAYING FOR NATIONAL PARKS: PARK PRICING IN A SRI LANKAN CONTEXT

Introduction:

This vignette study focuses on the value of national parks for Sri Lanka's local nationals and long-term residents, and in particular non- use value, such as an individual's desire to preserve national parks for others and future generation during sudden loss of foreign tourism revenue. Currently I'm doing this research for the partial fulfilment of degree of PhD in Agricultural, Environmental and Food Economics in University of Reading, United Kingdom. And this is purely an academic research, and all your answers will be treated with strictly confident.

Consent

Thank you in advance for sharing your valuable time for this interview. I will not collect any names or personal details as part of the interview. Your identity will not be revealed to anyone other than the researchers conducting this study. Participation is entirely voluntary, and you are free to withdraw from the interview at any time you feel uncomfortable or unwilling to participate, and you do not have to specify a reason. I am going to read you a few sentences about Sri Lanka's national parks, and then ask you some questions. There are no right or wrong answers, I am interested in different people's perceptions of the country's national parks and how they are funded. Do you agree to participate?

1=Yes, proceed

0=No, I don't like to participate

Date of interview: ☐

Time of interview: ☐

`

Location :

Vignette 1

"*Sri Lanka is reputed as one of the best places in Asia for seeing wildlife. It is also known as one of the best all-round wildlife destinations in the world for a mix of big game camp, marine life, and varied landscapes, all packed into different national parks with a very good tourism infrastructure. National parks conserve biodiversity and protects natures beauty. National parks in Sri Lanka are haven for diverse flora and fauna and are home to "The Big Four"; the Sri Lankan Elephant, the Elusive Leopard, the Sloth Bear, and the Blue Whale".*

Questions

5. Have you visited any national parks in Sri Lanka?
   a. If yes, do you think it was worth in visiting that/ those national parks? (If no, just move on to Q2)

   b. Why do you say it was worth in visiting that/ those national parks?

6. In what ways do you feel that national parks are important to a country, if at all? Why do you feel this way?

3. When you think about Sri Lanka's national parks, what mainly comes to mind?

4. Who, or which groups of people, do you feel benefit most from Sri Lanka's national parks? Why do you say this?

Vignette 2

"*Sri Lanka's tourism industry had been on a steady rise since the end of more than 25 years long civil war in 2009. And at the end of 2018 a total annual revenue of Rs. Mn. 3,138.93 was earned from National parks of Sri Lanka. In this revenue, nearly 70% was from park entry fees. Among this Rs. Mn. 2,138.5 was from foreign tourists and Rs. Mn. 73. 08 was from local tourists. Tourism was hit hard following the attack in April 2019 which made considerable drop in tourist arrivals. It was also harmed again following the unprecedented crisis triggered by the COVID-19 pandemic after which there was a steep fall in the earnings from tourism including that from people visiting national parks. As a consequence, the government has to find other ways to fund the country's*

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national parks or accept that there will be less funding available for the protection and enhancement of the parks and the wildlife found in them".

Questions

1. In this situation when revenue from park entrance fees falls dramatically, do you think that the government should find other ways of ensuring the same level of funding for Sri Lanka's national parks?

Yes/ No

Please explain why you think this.

2. In this situation, do you think that people like you should contribute directly to the costs of ensuring the existence and conservation of these parks?

Yes/ No

Please explain why you think this.

   a. If yes "how" do you think people like you can contribute directly for the existence of these parks?

   b. If no "who" do you think others should contribute for the conservation of national parks or should the parks just accept that they will no longer be funded? (Prompt foreign tourists or local tourists or all Sri Lankans or foreign donors or others)