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EXPLORING WASTE BEHAVIOUR IN NATURE-BASED TOURISM: A CASE STUDY FROM THE NEPALESE HIMALAYA

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Abstract: The generation of solid waste is one of the major environmental issues in mountain areas with high concentrations of tourism. To improve the waste situation in sensitive mountain areas, visiting tourists need to be aware of the impacts and consequences of their waste practices. Educational programmes play a crucial role in improving the waste situation, but are ineffective if they do not consider different target groups. The main purpose of this paper is to explore different types of tourists based on their reported waste practices, environmental concern and personal responsibility. A survey based on a convenience sample of trekking tourists was conducted in Sagarmatha National Park and Buffer Zone in Nepal during the spring season of 2013 (n=335). The obtained results of the cluster analysis point to segment specific differences in visitors' environmental attitudes and behaviours. Managerial implications of the findings may help to develop effective educational strategies and thus contribute to the improvement of the rapidly growing waste issues in mountain regions.

Keywords: Mountain Regions; Consumer Behaviour; Tourism Segmentation; Environmental Behaviour; Sustainable Development; Waste Management

Introduction

In remote mountain areas, the high influx of tourists generates many positive and negative impacts. While local people and work-related migrants can often benefit from economic development, international exposure, and cross-cultural exchange, the dramatic expansion of the tourism industry can increase pressures on the environment such as continuous trail degradation, soil erosion, deforestation and land-use changes (Nepal, 2003a). In popular mountain destinations, the generation of solid waste is another major threat to environmental sustainability and as the numbers of tourists increase each year, so does the accumulation of solid waste (Manfredi et al., 2010; Salerno et al., 2010a).

Visiting tourists in sensitive mountain areas are often not aware of the impacts and consequences of their waste practices. Educational programmes can play a crucial role in improving waste behaviour and awareness towards waste issues, but are ineffective when different target groups are not taken into account (Simmons and Widmar, 1990). The main purpose of this paper is (1) to explore different types of tourists based on their reported waste practices, environmental concern and knowledge, and (2) to analyse differences based on sociodemographic and travel-related characteristics. The segmentation aims to summarize certain characteristics in order to illustrate latent patterns. In doing so, segmentation analysis (such as latent class and cluster analysis)

can identify homogeneous groups of people across different characteristics. This might be especially useful for the development of educational programmes and planning interventions to better understand the heterogeneity of different groups (Aldrich et al., 2007).

To achieve these research aims, the study used data from a quantitative survey conducted in April/May 2013 in Nepal. Based on a literature review, several items related to environmental concern, consumer behaviour and personal responsibility were chosen to perform a tourist segmentation. The tourists were then profiled regarding specific sociodemographic attributes (such as age, gender, level of education) and travel-related characteristics (including overnight stays, size of travel party, travel arrangements).

Literature Review & Theoretical Background

Theoretical frameworks are useful in explaining people's behaviour and providing valuable insights for planning interventions (Timlett and Williams, 2011). Amid the number of concepts, two approaches were chosen to form the theoretical basis for this research: the *Theory of Planned Behaviour (TPB)* and the *Norm-Activation Model (NAM).* Both social-psychological theories were developed in the 1960s and are most frequently used to explain how individuals behave, particularly where environmental problems exist (Kollmuss and Agyeman, 2002). Unlike economic theories, which declare that an individual's actions are rational choices, social-psychological behavioural models acknowledge the context of the actor's environment and the importance of social factors (Timlett and Williams, 2011).

The TPB has a long history to explore psychological determinants of pro-environmental behaviour and states that behavioural intentions are determined by attitudes towards the behaviour, subjective norms and perceived behaviour control (Ajzen, 1991, 2011). The term 'environmental attitudes' is often used interchangeably with other concepts, such as environmental concern, awareness or value (Barr, 2007). According to a definition provided by Zelezny and Schultz, environmental attitudes refer to "psychological factors that lead people to act in pro-environmental ways" (2000, p. 367). Sánchez and Lafuente declare that an environmentally conscious person is "someone who engages in a wide range of pro- environmental behaviours as well as holding certain values and attitudes that different theories have associated to this type of conduct" (2010, p. 732). Pro-environmental attitudes do not necessarily lead to behaviours and many studies discuss the ambiguity surrounding the usefulness of environmental attitudes as predictors of ecological behaviour. While Heberlein claims that "environmental attitudes are fundamentally important, widely discussed, frequently measured, and poorly understood" (2012, p. 241), several studies acknowledge the powerful role of environmental attitudes in understanding environmental behaviour (cf. Kaiser et al., 1999a; Kaiser et al., 1999b; Kollmuss and Agyeman, 2002; Eilam and Trop, 2012).

Perceived behavioural control is defined as one's perceived ease, difficulty or perception about the existence of factors that facilitate or hinder the performance of certain behaviours (Ajzen, 1991). Perceived behaviour control has strong similarities to the

concept of self-efficacy and is often used interchangeably (Kaiser et al., 1999b). The NAM focuses on moral obligations of behaviour and emphasizes the relationship between personal and social norms, awareness of consequences, and the feeling of responsibility (Schwartz, 1977). Personal norms are influenced by the feeling of responsibility and the awareness of consequences meaning that an individual who feels morally obliged to act accordingly to the behaviour in question is more likely to act if he or she believes in the consequences of the action. This increases if the person feels personally responsible for the consequences of the given behaviour (Bortoleto et al., 2012). Both theories – TPB and NAM – are built on the concept of subjective norms and several studies show that behaviour is strongly influenced by social norms (Godfrey et al., 2012; Hunecke et al., 2001). While NAM refers to social norms, TPB characterizes the same external normative expectations as subjective norm (Hunecke et al., 2001). Subjective norms refer to social pressures, expectations and moral principles and can be defined as an individual's perception of whether people think that certain behaviours should be performed (Kaiser et al., 1999a). The feeling of responsibility is shaped by values and attitudes and is influenced by perceived behaviour control (Darnton et al., 2004; Kollmuss and Agyeman, 2002). It can be described as "personal responsibility for the development and/or elimination of environmental problems" (Dembkowski, 1998:62).

Despite empirical support of the TPB and NAM, critical questions have been raised concerning the usefulness of these theories when it comes to improve the understanding of environmental behaviour. Therefore, this paper will not discuss the interrelation and correlation of all psychological factors involved in the TPB and NAM, but rather focus on a segmentation of nature-based tourists based on items related to environmental concern, personal responsibility and reported waste behaviour. These constructs were chosen because they yielded a high internal consistency.

Methodology

Study site

The data collection took place in Sagarmatha National Park and Buffer Zone (SNPBZ) in the Himalayas of Nepal. The National Park with his unique landscape and fascinating peaks, attracts people from all over the world and is among the most popular nature-based tourism destinations in Nepal (Ministry of Culture, Tourism & Civil Aviation, 2014, 2015). The National Park, a protected area since the 1970s, is located in the north-eastern part of Nepal and includes some of the world's highest mountains (Fig. 1).

In the late 1960s, when mountaineering started to flourish in Nepal, tourist numbers began to increase rapidly because of improved access, promotion, and publicity (Stevens, 1993). After the first airport was constructed in Lukla, access became easier and the tourism economy grew exponentially – from a mere twenty trekkers in 1964 to more than 35,000 in 2014 (Ministry of Culture, Tourism & Civil Aviation, 2015). Today, nature-based tourism is the main source of income and employment in the region (Nepal, 2003a; Spoon, 2011b).

While the standard of living has improved quickly, the expanding tourism industry has simultaneously led to environmental issues in the fragile alpine environment. Significant amounts of solid waste are being generated due to the high import of packaged consumer goods and are now posing serious threats to the fragile biodiversity, ecosystem, and people of SNPBZ (Byers, 2005; Stevens, 2003; Stevens, 1993). Solid waste ranges from food packages, wrappers, bottles, glass and metals to hazardous waste items such as batteries, medical supplies and light bulbs. According to Manfredi et al. (2010), these items are divided into burnable (85%) and non-burnable waste (15%) and are treated as such. Considering the seasonal fluctuations of the tourism industry, the accumulated waste amounts up to 4.6t/day during the tourist season and only 2t/day during the off season (Manfredi et al., 2010). Plastic items and PET bottles belong to the most problematic waste type in the SNPBZ, compromising 21.4% of the collected waste (Zuser et al., 2011a). While classified burnable waste is either burned in incinerators or open landfill sites to reduce volume, non-burnable waste is dumped and buried at landfill sites. The Sagarmatha Pollution Control Committee (SPCC), a non-profit organization established in the early 1990s, and other local community initiatives are responsible for the collection, separation and treatment of solid waste (Dhakal, 2009). The waste management system in SNPBZ is still rudimentary, with limited resources and capacities, leading to improper handling of waste. Classified non-burnable waste items are often dumped in open landfill sites, posing a serious hazard to environmental and human health (Posch et al., 2015). The potentially harmful effects of these disposal practices include surface and groundwater pollution, soil contamination and air pollution (Basnet, 1993; Manfredi et al., 2010; Salerno et al., 2010a; Pokhrel and Viraraghavan, 2005; Guzzella et al., 2011; Zuser et al., 2011b). Burnable waste items generate significant emissions of heavy metals and hazardous organic compounds due to poor incineration practices (Salerno et al., 2010b).

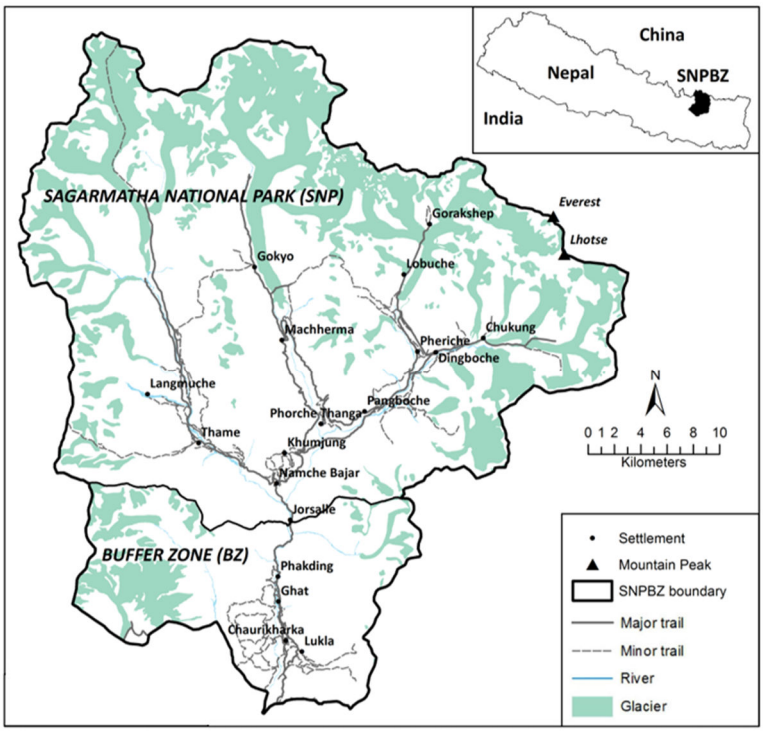

Figure 1: Overview of Sagarmatha National Park and Buffer Zone (Map courtesy of ICIMOD, first published in Posch et al., 2015)

Data collection

A quantitative survey based on a convenience sample was conducted in Lukla between April and May 2013 using a standardized questionnaire. The survey was conducted with tourists over the age of 15 on their last day of visit to the National Park. Lukla is the gateway and entry point for most tourists to the Everest region as it is connected by regular air service and hosts several lodges and tourist facilities. Tourists usually spend their last afternoon and evening in Lukla before flying out the next morning. Respondents were approached in ten major lodges with permission obtained from the owners beforehand. A self-administered questionnaire was used and completed in an average time of 10 minutes and contained two main sections. The first section examined the environmental dimensions (concern, knowledge, reported waste behaviour); the second section collected socio-economic data of the respondents and general data of their visit to SNPBZ (trekking arrangements, travel-related characteristics). The surveys yielded very high cooperation and low refusal rates, a total of 360 surveys were distributed and 335 questionnaires were returned, yielding a response rate of 93%.

A convenience sample was chosen to represent the population of tourists visiting the National Park in the spring season. To check for representativeness of gender, age, education and nationality, the collected data were compared with official tourism statistics (Ministry of Culture, Tourism & Civil Aviation, 2014) and an extensive visitor survey (HKKH Partnership, 2008). The sample offered good results in terms of representativeness concerning sex, age, and education. However, the structure of participants according to their national composition was not representative. Therefore, the study excluded respondents with over- or under-represented nationalities focusing only on respondents from Australia, Canada, Germany, the United Kingdom, and the United States (see n the National Park is 14 days. **Table 1**). The final sample size amounts 230 respondents.

Measurement of constructs

The three constructs environmental concern, reported waste behaviour, and personal responsibility form the basis of the cluster analysis. The constructs were measured by 15 items, which were entered into a factor analysis using principal component analysis to confirm the presumed concepts. All items were measured on a five-point Likert scale with response categories ranging from “strongly agree” (5) to “strongly disagree” (1). Items with loadings below 0.5 and low communalities were removed. This led to the exclusion of one item. The six-item construct ‘environmental concern’ is based on a study by Sánchez and Lafuente (2010). It included statements such as “I’m well informed about environmental issues.”, “I often talk with friends about environmental issues.”, and “There is need to conserve resources for future generations.”. The three-item construct ‘personal responsibility’ and five-item construct ‘reported waste behaviour’ are based on observations and a study by Bortoleto et al. (2012). The construct ‘personal responsibility’ included statements such as “It's my personal responsibility to manage waste properly in SNPBZ.” and “My consumer behaviour is influencing the waste situation in SNPBZ.”. Reported waste behaviour was described by statements such as “I avoid package intensive products and prefer local products in SNPBZ.”, “I do not buy bottled water, but look for alternative drinking sources in SNPBZ.”, and “I buy things that are produced with as little package as possible in

SNPBZ.". The constructs were tested for internal consistency. While the reliability value (Cronbach's alpha) for environmental concern was .76, it reached .77 for reported waste behaviour and .56 for personal responsibility.

Data analysis

The data were statistically analysed using the statistical software SPSS 21.0. The factor mean scores were clustered by first using a single linkage method to detect outliers, followed by a hierarchical cluster analysis applying Wards minimum variance method with squared Euclidean distance. The elbow criterion pointed to a three-cluster solution. In order to test the validity of the cluster analysis, a multiple discriminant analysis was conducted. The discriminant function achieved a high degree of classification accuracy: 90.4% of all cases were classified correctly. Finally, the socio-demographic characteristics of the clusters were compared using cross-tabulations and one-way analysis of variance (ANOVA), where applicable.

Results

Socio-demographic profiles

The majority of respondents were men (57.7 %), which coincides with official visitor data as male visitors are predominant in the National Park (HKKH Partnership, 2008) (see n the National Park is 14 days. **Table 1**). The age group '23-32' predominates the sample (34.9%), while the age groups are still evenly distributed. The mean age is 38.5 years and the median 35 years. The sample is characterised by a high level of education which is in line with other visitor surveys (HKKH Partnership, 2008): 45.6% of the respondents have an undergraduate degree and 29.5% a postgraduate education.

Concerning travel related characteristics, about 16.6% of respondents stated that they were organizing their trip on their own, 18.3% chose a domestic travel agency from Nepal, while the majority chose an agency from their country of origin (53.9%). More than half of the respondents travelled in an organized group (53.5%), while additionally, 76.8% of respondents indicated that they travelled with a tour guide. The average length of stay in the National Park is 14 days. **Table 1**: Selected sociodemographic and travel-related characteristics

Socio-demographic characteristics	Lower education	24.9%
	Undergraduate	45.6%
	Postgraduate	29.5%
	Age (mean in years)	38.5 years
	Male	57.7%
	Female	42.3%
	Australia	17%
	Canada	7.4%

	Germany	16.1%
	New Zealand	16.5%
	UK	30.9%
	USA	12.2%
	Length of stay (mean in days)	14.44 days
	Travelling in organized group	53.3%
	Travelling with guide	76.8%
Travel-related characteristics	Organized by domestic agency	18.3%
	Organized with international agency	53.9%
	Organized individually	26.6%
	Visited before	10.4%

Tourist segmentation

In the following, the three different tourist types are presented (Table 2). The "concerned but inactive" form the largest group (n=99, 43%). Although they appear to have a high feeling of perceived personal responsibility, their responsibility does not translate into action. While they agree strongly that their consumer behaviour is influencing the waste situation in SNPBZ, they are not likely to form active waste behaviour intentions. Although they have a high feeling of responsibility, their general environmental concern is the lowest among the other groups.

The second type is called "disengaged" (n=46) and forms the smallest segment (20% of all respondents). This group is concerned about the environment; they agree that there is need to conserve resources for future generations. They also strongly consent that there is need to conserve resources for future generations and that environmental conservation should be more important. Still, this concern about the environment does not extend to their perceived personal responsibility and even less to their reported waste behaviour in SNPBZ. This is mirrored in their stated waste behaviour: they are neither likely to avoid buying bottled water, but look for alternative drinking sources nor are willing to support a ban of plastic bottles in SNPBZ.

The third cluster is labelled "concerned and active" (n=85, 37%) and scored highest for being concerned about the environment. Compared to the other groups, this type translates his concern into action regarding waste behaviour. Correspondingly, they prefer local products and safe drinking water from springs instead of buying water bottles and package intensive products in SNPBZ. They are also the segment that most strongly agrees that they recycle waste in their home country and that they often talk with friends about environmental issues.

Table 2: Cluster solutions and rescaled mean scores for reported waste behaviour, general environmental concern and personal responsibility (5=strongly disagree/very poor; 1=strongly agree/very good)

	the concerned and active		the disengaged		the concerned but inactive	
	n=85; 37%		n=46; 20%		n=99; 43%	
	Mean	SE	Mean	SE	Mean	SE
reported waste behaviour	1,77	0,06	3,24	0,12	2,43	0,07
general environmental concern	1,49	0,04	1,98	0,05	2,32	0,05
personal responsibility	2,08	0,07	2,79	0,13	2	0,06

The cluster types differed significantly in their environmental concern, perceived personal responsibility and reported waste behaviour. Also, the three cluster types vary socio-demographically: Significant differences were found concerning age, gender and level of education (Table 3). The “concerned but inactive” contain more men than women and the share of people with lower education or an undergraduate degree are the highest among all clusters. With an average of 36 years, this is the youngest cluster. The “disengaged” have the highest percentage of men (67.4%) and an average of 40 years. The “concerned and active” have the highest percentage of females (55.3%) and the greatest share of people with an under- or postgraduate degree (45.9% and 34.1%). This segment is most active about their reported waste behaviour in SNPBZ and is willing to give up some conveniences.

Travel-related characteristics such as overnight stays or trekking arrangements did not differ significantly between the three groups. However, there is a significant difference with the perceived level of information and content with the provided information about waste management in SNPBZ (Table 4). The “disengaged” are most satisfied with the information provided to visitors about waste management. In contrast, the “concerned and active” are eager to receive more information about waste management and rate the provided information about waste management in SNPBZ the poorest compared to the other two groups. Also, they disagree most that adequate information about waste management in SNPBZ is provided to visitors.

Table 2: Statistically significant socio-demographics

	the concerned and active	the disengaged	the concerned but inactive
Gender*			
Female	55.3%	32.6%	36.4%
Male	44.7%	67.4%	63.6%
Level of Education*			
Lower Education	20.0%	23.9%	30.3%
Undergraduate	45.9%	43.5%	47.5%
Postgraduate	34.1%	32.6%	22.2%
Age*			
<24	9.4%	13.0%	21.2%
25-34	27.1%	34.8%	36.4%
35-44	18.8%	13.0%	7.1%
45-54	21.2%	13.0%	23.2%
>55	23.5%	26.1%	12.1%

*p<0.05

Table 3: Satisfaction with provided information about waste management (mean value) (5=strongly disagree/very low; 1=strongly agree/very high)

	the concerned and active	the disengaged	the concerned but inactive
Level of satisfaction with provided information about waste management. *	4,18	3,76	4,06
Adequate information to visitors before and during their visit about waste management in SNPBZ is provided. **	2.49	1.98	2.36

*p<0.05; **p<0.0001

Discussion and Implications

The results show that different tourist types exist concerning environmental attitudes, knowledge and reported waste practices. The three types also show significant differences in terms of age, gender and level of education. However, no statistical significant differences were found concerning travel-related characteristics. Contrary to the findings of other studies, travel-related characteristics such as the company of guides did not play a significant role (Poudel and Nyaupane, 2013; Poudel et al., 2013).

The identification of different tourist types may help destination managers and environmental educators to create and implement effective educational programmes with specific focus on certain target groups to make waste practices among tourists more sustainable (Poudel and Nyaupane, 2017). Environmental education programmes could focus on tourist types which do not yet show environment-friendly waste behaviour, but are highly interested in environmental issues such as the identified type of 'the disengaged'. Other studies have shown that tourists who are guided by a structured educational programme can easier change their behaviour and

become more environmentally responsible (Orams, 1997). A greater attention on educational measures concerning waste management may help to improve the overall waste management situation in fragile mountain destinations.

Being consistent with related studies, it's the well-educated women, who actively deal with waste issues (see Finisterra do Paço et al., 2009 for an overview). The gender differences concerning environmental concern and waste behaviour pictured in this study are in line with a great amount of studies who suggest that women are more aware and generally more likely to deal with environmental issues (Tindall et al., 2003; Davidson and Freudenburg, 1996). Nonetheless, some authors argue that gender should be acknowledged more when it comes to environmental education (Sakellari and Skanavis, 2013; Zelezny et al., 2000).

The group being most concerned about the environment and most active about reported waste management practices perceive the provided information as unsatisfactory. Previous research findings are inconsistent and contradictory how information and data connect with environmental concern and behaviour. While some studies suggested that information influences actions and behaviour (Cheung et al., 1999; Barr, 2007), other studies found that the relationship between "knowing what to do and acting on that knowledge" is tenuous (Godfrey et al., 2012)2164). Metag et al. (2015) showed that different typologies correspond with different communicative behaviour concerning climate change. Nevertheless, one can argue that if more information is available on waste management, it is more likely that it will affect a person's waste management practices. The provision of information material might be a first and simple step of the responsible park management to increase public awareness among visitors and local inhabitants alike to improve the overall waste situation.

Conclusions and Limitations

The purpose of this paper is to identify different segments of consumers and whether and in which way tourists differ in their self-assessments of environmental concern, reported behaviour and personal responsibility. While the study is embedded within the broader arena of social science, it makes several noteworthy contributions to environment-behaviour research and tourism studies. The study set out to identify a typology of trekking tourists based on variables related to waste management in SNPBZ. In doing so, I relied on analytical dimensions used in previous studies on environmental attitudes, behaviour and waste management. This paper also aimed to know whether different types are characterized in terms of their socio-demographic and travel-related characteristics.

The survey was conducted in a remote trekking destination in the Himalayan Mountains of Nepal. As a direct consequence of this methodology, the study encountered a number of limitations, which need to be considered: First, the questionnaire was only available in English, excluding tourists who are not able to understand this language. Second, following the presumable linguistic barrier, the study is not representative in terms of the respondents' nationality leading to a reduction of the sample size. Third, a fundamental issue of this study methodology is

the inconsistency between reported behaviour and actual actions. The author acknowledges that the study relies fully on self-reports of behaviours and attitudes instead of observed behaviours. Unfortunately, reported behaviours are often been interpreted as wishful intentions but do not reflect actual behaviour, but we face limitations by what we can discover through questionnaires or interviews (Kollmuss and Agyeman, 2002).

Future studies could investigate in more detail trekking tourist from a specific country of origin to ensure representativeness. Future work should also focus on the potential impact of travel-related characteristics such as the company of tour guides and its influence on waste behaviour. Research is also needed about the relation of the level of information about waste management provided by the national park and the reported waste practices and environmental concerns of trekking tourists.

This study is a first attempt to analyse reported waste behaviour, environmental concern and personal responsibility of trekking tourists. The number of tourist arrivals in SNPBZ is expected to grow in the coming years and it might exacerbate the waste management situation in the park. Feasible and effective strategies of managing solid waste are urgently needed. The identification of different segments may represent a first step in helping visitors to adopt environmentally friendly practices. Comparable studies from different destinations could help to find practical recommendations and useful interventions to trigger more environmentally friendly waste behaviour among visitors.

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