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Does the altitude of habitat influence residents' attitudes to guests? A new dimension in the residents' attitudes to tourism

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ABSTRACT

Host-guest interactions have been widely examined in the literature, and the residents' attitudes have been the object of many studies that focus on identifying factors influencing such behaviour. However, no previous research has examined if the attitudes of residents change with increasing altitude of habitation. The present study examined the residents' attitudes to tourism in relation to the altitude of their habitat in the Bhurungdi Valley, Nepal. Being a part of the Annapurna Conservation Area, this Valley is a popular destination among tourists engaging in high-altitude hiking, trekking, and mountain climbing. In total, 83% of households (N = 101) residing in Ulleri (2,080 m), Nangethanti (2,450 m), and Ghorapani (2,870 m) participated in this research. Based on linear regression analysis, the findings suggest that residents have a greater appreciation of tourism activity and are more reciprocal as the altitude of their habitat increases. The study argues that the previously neglected aspect/variable 'altitude' can bring new insights and help to better manage vulnerable destinations in a sustainable manner.

Management implication

Mountaineering tourism might generate development and at the same time, bring negative encounters between hosts and guests. With limited resources, these politically and economically marginalised high mountain communities should use those resources very precisely and purposefully. This study demonstrated that people living at higher altitudes have more patience and understanding of tourists. Therefore, all management plans should be introduced in the villages located at lower altitudes first.

1. Introduction

Until the end of the twentieth century, mountaineering (subdivided into hiking, trekking, and mountain climbing) represented a form of elite activity (Holt, 2008; Apollo, 2017a). Stories of summiting Annapurna and Everest in the 1950s were widely reported in the world's media, which resulted in the popularisation of mountaineering. Due to diversification, commodification and commercialisation of this form of leisure, mountaineering is becoming a popular mass tourism activity (Apollo, 2017a; Beedie & Hudson, 2003; Johnston & Edwards, 1994; Jones et al., 2018; Miller & Mair, 2020; Pomfret, 2006; Wengel, 2020).

Mountaineering can create sustainable development opportunities worldwide (Apollo & Rettinger, 2019; Baral et al., 2008; Kruczek et al., 2018; Miller & Mair, 2020; Musa et al., 2015; Żemła, 2020); however, residents' attitudes to tourism activity and the hospitality given to the guests visiting their home regions is crucial for sustainable tourism development (García et al., 2015). The residents' attitudes were well

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explained by Doxey's (1975) irritation index. Its four stages (euphoria, apathy, irritation, and antagonism) explain the deteriorating responses of residents to tourism development. Moreover, this is leading to 'irritation' of the local community, affecting it on social, economic, and environmental levels (Apollo, 2015). Previous studies identified and widely discussed the factors influencing residents' attitudes to tourism and host-guest exchange (Apollo, 2015; García et al., 2015; Nunkoo & So, 2016; Sharpley, 2014; Smith, 2012; Wengel et al., 2018).

However, what is not yet clear is the impact of the altitude of habitation on the residents' attitudes to tourism activity. This research attempts to understand how communities exposed to mountaineering activity respond to it and whether the sensitivity to 'guests' and tourism changes with increasing altitude. The study results were described by using the Doxey (1975) model.

2. Conceptual background

High mountain areas are becoming increasingly accessible, and hence the impact from outside influences on the animate and inanimate environment is increasing (Apollo & Andreychouk, 2020; Rahmonov et al., 2017). Humboldt (1807) and Darwin (1859) mentioned that the sensitivity of the environment increased as altitude increased. Today, altitudinal zonation represents a core concept in research on the mountain environment. The evidence presented in previous research suggests that the environment in high mountain areas and the residents' reaction to external impacts (tourism) may differ with increasing altitude (Apollo, 2015; Apollo & Andreychouk, 2020). In the same vein, Lee (2007) indicates that tourists' characteristics and ecotourism behaviour are diverse and depend on the recreational destinations located in different altitude zones. However, it is believed, no one has ever introduced altitude as a variable and assessed the effect of altitude of habitation on residents' attitudes. Thus, this work attempts to capture the phenomenon of the diversity of changes to local communities exposed to mountaineering activity and their sensitivity with increasing altitude.

The objective of this investigation is to take a closer look at the attitudes of residents towards host-guest interactions and how they change with increasing altitude. Thus, the hypothesis that will be tested is that *the increased sensitivity of residents/communities that are exposed to mountaineering activities is directly proportional to an increase in the altitude of the destination area.*

By knowing the progressive nature of the changes, which in mountain regions may result from an altitude of habitation, it will be easier to plan tourism development in mountain areas and thereby introduce sustainable community development. With limited resources, and this is common in mountain areas of developing countries (Messerli & Ives, 1997), the help should depend on real needs and should be purposeful, especially in the case of vulnerable populations, like mountain people.

It is well-known that the popularisation of mountain tourism impacts residents' way of life, culture, and customs (Ap & Crompton, 1993; Apollo, 2015; Lama & Sattar, 2004; McCool & Martin, 1994; Musa et al., 2004; Serku, 2019). Furthermore, local communities acknowledge that tourism can stimulate changes in social, cultural, environmental, and economic dimensions in places where tourism activities have had a close connection with local communities (Ap, 1992; Apollo, 2015; Aquino et al., 2018; Beeton, 2006; Godde et al., 1999; Lama & Sattar, 2004). Overall, there is a general consensus that local people and their cultures should be respected (Wall, 1997). However, the cultural and economic distance between host and guest is higher in remote mountain destinations and results in significant socio-cultural impacts (Lama & Sattar, 2004; Nyaupane & Thapa, 2004; Upadhyay, 2020). To understand those impacts, the mechanism that leads to those changes first needs to be known.

Previous studies have examined interrelations of host-guest exchange and identified the factors influencing residents' attitudes to tourism. For example, in their review García et al. (2015) mentioned several aspects that could explain and predict the responses of residents to tourism; they are: (1) the community's economic dependence on the tourism industry; (2) the level of tourism development; (3) attachment to the community; (4) the distance between the local resident's home and the tourist area; (5) the residents' level of knowledge about tourism; (6) the type of tourist; (7) the type and level of contact between the residents and tourists; and (8) access to recreational activities. However, during previous research on various mountains around the world, the authors noticed that the local communities' reaction to the impact of mountaineering was different at different altitudes, despite the same intensity and nature of the disturbing factor's impact. Perhaps, in the mountain environment, the altitude of habitat is the overriding factor that changes or modifies host-guest reciprocity.

In recent years, studies on the attitudes of the residents have been accompanied by an increase in sophisticated research tools in order to research the subject in-depth and thus reveal new relationships (Kuvan & Akan, 2005). One of these theoretical frameworks, the saturation model proposed by Doxey (1975), tries to explain or predict the behaviour of the resident, according to the increasing number of tourists in a destination. It is worth pointing out that in mature destinations the attitude of residents continually supports tourism (see, e.g., Andriotis & Vaughan, 2003; Sheldon & Abenoja, 2001), thus they have a positive attitude. However, it contradicts with Doxey's model (1975), according to which, residents should have an antagonistic attitude to tourism. But, in the mountain areas of developing countries, this model is describing reality well (Apollo, 2015; Kariel & Draper, 1992).

The study was designed to examine residents attitude to mountaineer tourists at different levels of hosts residence altitude using the Doxey's irritation index. Overall, Doxey (1975) suggests that communities pass through a sequence of reactions as the impacts of the evolving tourism industry in their area become more distinct, and their perceptions change with experience. The residents' attitude to tourism activity and the hospitality to the guests visiting their homes is crucial for tourism development, and thus residents' prosperity.

3. Research methodology and study area

3.1. Methodology

Broadly framed within a positivist approach, a survey in the form of the structured face-to-face interview was considered the most appropriate method for this study (Hall, 2011; Phillimore & Goodson, 2004; Seidman, 2013). The survey questions were prepared in the Nepalese language; however, due to the low level of literacy, most of the interviews were carried out face-to-face and further translated into English. The researchers tried to visit every household. In total, 101 surveys (representing 83.5% of all 121 households) were conducted with the residents (Table 1). Each survey was completed by an entire family (household). The families filled in the questionnaire consulting each other on the answers. Hence, this approach eliminated other factors that could affect the test results, such as gender and age. The interviews were conducted in November 2013.

The survey contained questions concerning the social, environmental, and economic impacts of tourism. Later the questions were simplified into yes/no answers to understand the changes in the residents' attitudes towards tourism and tourists with changes in the altitude of their homes. The data received from the respondents were converted into percentages. To check the hypothesis concerning the progressive nature of the interactions, the residents' points of view on each topic (questionnaire section) a linear regression was used.

Simple linear regression analyses were performed to fit the regression models that best approximated the relationship between the changing points of view of residents and the place where they lived. Also, t-tests within simple linear regression were used to test if the altitude of the residents' habitats homes significantly predicted residents' points of view.

3.2. Study area and its representativeness

The surveys were conducted in Nepal's Western Development Region in the Bhurungdi Valley at three localities: Ulleri (2,080 m), Nangethanti (2,450 m), and Ghorapani (2,870 m) (Fig. 1). The mean number of individuals per household was 3.56 (Table 1). The occupation of each study sample was mostly related to tourism (mainly accommodation and catering services) and accounted for approximately 60% of total employment.

The Valley is part of the Annapurna Conservation Area Program (ACAP) which is a popular mountaineering region. The Bhurungdi Valley, as the point of entry to the ACAP and, has tourist checkpoints where an ACAP permit and TIMS (Trekkers' Information Management System) card must be presented. According to the statistics provided by Nepal Tourism Statistics (NTS, 2013), 113,459 domestic and foreign tourists visited ACAP in 2012. As part of the conservation area this region is under many programs that focus on nature conservation (see, e.g. Bajracharya, 2011; Bajracharya et al., 2006; Bajracharya, Furley, & Newton, 2005; Gurung et al., 2008; Jampen, 2000; Nepal, 2008) and cultural protection (see, e.g. Apollo, 2015; Bajracharya et al., 2006; Nyaupane & Thapa, 2004; Upadhyay, 2020).

ACAP is based on various management methods. The goal is to provide a wide range of experience to various interest groups. Currently, there are three clearly defined ways of managing tourism in ACAP: 1) community-based sustainable tourism management; 2) controlled sustainable tourism management; and 3) ecotourism management (Bajracharya, 2011; Bajracharya et al., 2006). These forms of management are based on the assumption that people living in the area are best suited to manage it. Therefore, tourism activities and enterprises are developed and supported mainly by local communities, and certainly with their consent and support (Bajracharya, 2011; Nyaupane & Thapa, 2004).

Nature-based tourism has been firmly established as one of the most important and competitive sectors of the Valley's local economy. The majority of income is derived from accommodation and food services and thus creates an economic disparity between tourism-related business owners and non-owners. For example, the average annual gross income for hoteliers (546 in total) in ACAP is US$ 20,212 (Baral et al., 2008) which is far higher than the per capita income of US$ 721 (NTS, 2013).

The study area was chosen because 1) it is inhabited by a community with an ethnically and culturally homogeneous structure; 2) it is a peripheral area (that is, distant from urbanised and economically active centres, and difficult to reach by public transport); and 3) all the villages studied received equal numbers of visitors; thus all villages were under the equal influence of mountaineering (that is, all participants use the same route). Therefore, the only factor changing along the route is the altitude of habitation above sea level.

Table 1
Study sample.

	Ulleri	Nangethanti	Ghorepani	Total
Altitude [m a.s.l.]	2,080	2,450	2,870	
Population (households) number	199[a] (56[b])	36[a] (10[b])	196[a] (55[b])	**431 (121)**
Population (households) sample	47 (47)	10 (10)	44 (44)	**101 (101)**
Percentage of the study population (households) [%]	23.6 (83.9)	27.8 (100)	22.4 (80)	**23.4 (83.5)**
Profession of a study sample [%]				**Mean**
Tourism	60	60	64	**61.33**
Accommodation services	37	10	48	**32.67**
Gastronomy services	13	40	10	**21**
Transport services	3	0	3	**2**
Accompanying services	7	10	3	**6.67**
Agriculture	23	10	16	**16.33**
Others	17	30	20	**22.33**
Number of visitors	113,459[c]			

[a] The estimated value of the population was created by multiplying the number of households by the average number of people living in a household in the Shikha Village Development Committee NCP, 2012, i.e. 2212 people ÷ 621 households = 3.56 people per household.

[b] The number of households was initially estimated based on satellite images obtained from www.google.com/maps and then verified during field studies.

[c] NTS (2013).

4. Results and discussion

Data on the attitudes of residents towards tourists were transformed using the common logarithm to make meaningful interpretations. Only "YES" responses of the residents on five key questions were considered as dependent variables for each regression model while fitting regression models. Overall, five regression models were fitted using a statistical tool, considering the altitude of the habitats as an independent or predictor variable:

$$Q_1 = 6.0033 - 1.6589A; p = 0.6403, and\ R^2 = 0.2866 \quad (1)$$

$$Q_2 = -0.6941 + 0.4802A; p = 0.0188, and\ R^2 = 0.9991 \quad (2)$$

$$Q_3 = 8.3937 - 2.2287A; p = 0.0102, and\ R^2 = 0.9997 \quad (3)$$

$$Q_4 = -1.3814 + 0.6325A; p = 0.3946, and\ R^2 = 0.6624 \quad (4)$$

$$Q_5 = -1.1702 + 0.3534A; p = 0.1126, and\ R^2 = 0.9690 \quad (5)$$

where: Q_1 denotes "Do tourists know the local culture?", Q_2 denotes "Do more tourists mean better life or do tourists bring prosperity?", Q_3 denotes "Do tourists annoy you? ", Q_4 denotes "Do tourists introduce new patterns of life which you adopt later? ", and Q_5 denotes "Are tourists guilty of environmental pollution?", and A denotes the altitudes of residents' habitats (homes), namely three villages: Ulleri, Nangethanti, and Ghorapani.

As this research is the first attempt to assess the effect of the altitude of residents' habitats on their attitudes the papers used for discussion provided below focus mainly on questions Q1-Q5 and not the influence of altitude on residents' attitudes.

4.1. Q1: Do tourists know the local culture?

From regression model (1), the results indicate that the altitude of residents' habitats **does not** significantly explain whether "tourists know the culture" as the p-value is very high (p = 0.6403, which is more than 5% level of significance), and the value of R-square is very low ($R^2 = 0.2866$).

Although the research has not proved a correlation between an increasing altitude of habitat and the level of understanding of local culture by tourists, in the opinion of residents only an average 40% of tourists know the local culture. Apollo (2015) proved that with the increase in tourist numbers, the lack of knowledge of local culture also increased. Tourists should know the culture, customs and living environment of the local community to minimise the foreign influence and not disrupt the life of the locals (Apollo, 2015; Craig-Smith & French, 1994; Kunwar, 1997; Reisinger & Turner, 2003; Upadhyay, 2020; Wu, Wall, & Tsou, 2017). Moreover, tourists' lack of understanding of local customs and community values can result in conflicts and aggression (Wu et al., 2017).

4.2. Q2: Do more tourists mean better life or do tourists bring prosperity?

Further findings (model 2) point out that the altitude of residents'

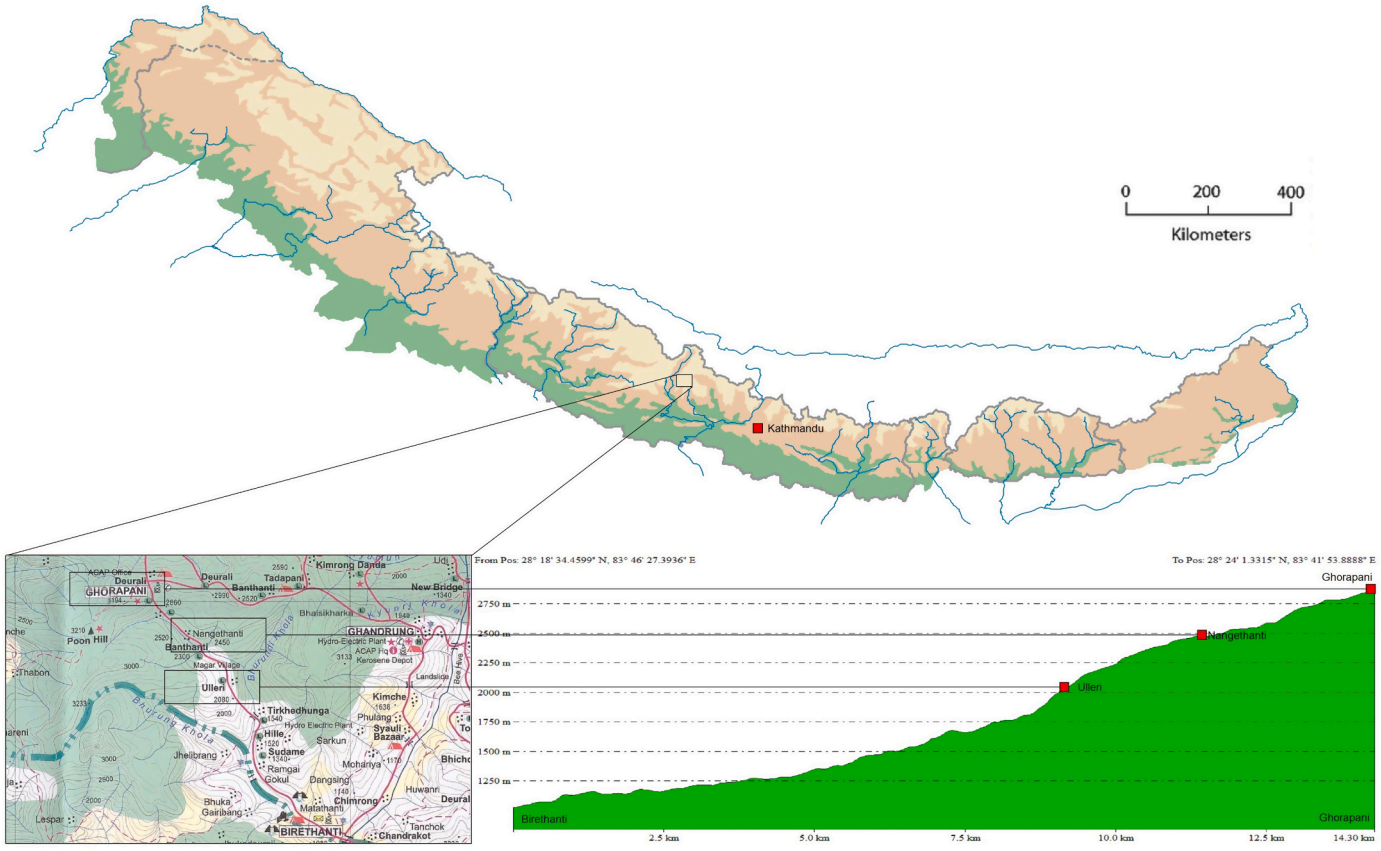

Fig. 1. Location of the research areas on (a) the Himalayan Range map (redrawn from Zurick & Pacheco, 2006); b) a topographic map 1:125,000 (Around Annapurna Map, 2002); c) and longitudinal profile of the Bhurungdi Valley between Birethanti and Ghorapani (Global Mapper V12 - SRTM 3).

habitats **does** explain significantly whether "more tourists means better life or if tourists bring prosperity" as the p-value is very low ($p = 0.0188$, which is less than 5% level of significance), and the value of R-square is very high ($R^2 = 0.9991$). Additionally, the relationship between "altitude of the residents' habitats" and "more tourists - better life" is positive; this indicates that as the altitude of residents' habitats rises their perception that "tourists bring prosperity" also rises significantly.

With an increasing altitude of habitation, especially in high mountain areas of developing countries, the earning possibilities for locals are pastoralism and tourism, and the latter is much more profitable. Overall, tourists do bring prosperity to local populations (Andereck et al., 2005; Apollo & Rettinger, 2019; Baral et al., 2008; Craig-Smith & French, 1994; McCool & Martin, 1994). Moreover, residents' attitudes towards tourists are more positive if their wellbeing depends on tourists' money (Andereck et al., 2005; García et al., 2015).

4.3. Q3: Do tourists annoy you?

Model (3) shows that the altitude of residents' habitats **does** significantly explain whether "tourists annoy local people", as the p-value is very low ($p = 0.0102$, which is less than 5% level of significance), and the value of R-square is very high ($R^2 = 0.9997$). Perhaps this finding can suggest that tourists do disturb the residents. Additionally, the relationship between "altitude of the residents' habitats" and "tourists annoy local people" is negative; this indicates that as the altitude of residents' habitats rises, the perception of the local population of "tourists annoying local people" declines significantly.

It is well documented in the literature that residents have different attitudes towards tourism development (Apollo, 2015; Craig-Smith & French, 1994; Reisinger & Turner, 2003). Residents who do not support the development of tourism have been identified in almost all segmentation studies concerning attitudes towards tourism (so-called 'Haters') (Zhang et al., 2006). In some communities, the proportion of 'Haters' exceeds that of 'Lovers' (residents who support the development of tourism). In that case, Doxey (1975) argues that residents' irritation is determined by the degree of incompatibility between residents and tourists. This happens when tourism becomes a high-volume activity, and the impacts may eventually reach levels that could disrupt community life and antagonise local residents (Apollo, 2015; Zhang et al., 2006). This research proved that the number of 'Lovers' increased with the altitude of habitat.

Furthermore, it is worth noting that the development of antagonistic feelings is closely connected to tourists' background knowledge of the destination culture (see section 3.1.) and, as many scholars note, tourists on holiday behave more freely and differently than at home (Kozak & Tasci, 2005) – they are in 'play mode' (Reisinger & Turner, 2003).

4.4. Q4: Do tourists introduce new patterns of life which you adopt later?

The results (model 4) specify that the altitude of residents' habitats does not significantly explain whether "tourists introduce new patterns of life which residents adopt later", as the p-value is very high ($p = 0.3946$, which is higher than 5% level of significance), and the value of R-square is moderate ($R^2 = 0.6624$).

Perhaps, it can be inferred that tourists introduce new patterns of life that residents adopt moderately. This kind of moderate adoption has been proved already. Apollo (2015) proved that the speed of adopting new patterns in a mountain environment is strictly connected with the level of tourism development and tourist numbers. Also, at well-developed destinations, the percentage of residents who do not adopt anything from tourists is zero (Apollo, 2015). Among other consequences, local cuisine, traditional medicine, behavioural patterns,

agricultural culture, folk art or languages gradually fade away (Banerji & Fareedi, 2009).

It is worth noting that the relationship between "altitude of the residents' habitats" and "tourists introducing new patterns of life which residents adopt later" is positive; this indicates that as the altitude of residents' habitats raises the perception of the local population of "tourists introducing new patterns of life which residents adopt later" also rises, but is statistically insignificant.

Residents must constructively combine the new with the old and not lose their identity (such as traditions and culture), which is as important as the natural environment and the landscape (Apollo, 2015). Furthermore, a loss of cultural identity leads to an increase in the social problems of crime, drugs, and the degradation of community values and religious practices that once held the society together (Lama & Sattar, 2004; Nyaupane & Thapa, 2004; Upadhyay, 2020).

4.5. Q5: Are tourists guilty of environmental pollution?

Finally, model (5) indicates that the altitude of residents' habitat **does not** significantly explain whether "tourists are guilty of environmental pollution", as the p-value is moderately high ($p = 0.1126$, which is higher than 5% level of significance), and the value of R-square is high ($R^2 = 0.9690$). Potentially, this finding shows that residents perceive that tourists do not contribute to environmental pollution. Additionally, the relationship between "altitude of the residents' habitats" and "tourists are guilty of environmental pollution" is positive; this also specifies that as the altitude of residents' habitats raises the perception of the local population that "tourists are guilty of environmental pollution" also rises, but insignificantly.

This question can also be treated as a control (checking) question. The developed model does not explain that relationship significantly, as residents of mountain regions of developing countries do not blame tourists for pollution, as much research shows (Apollo, 2015; Shen et al., 2009). Furthermore, tourism contributes to better waste management in the mountain regions (Apollo, 2017b; Kaseva, 2009; Shen et al., 2009).

In the ACAP, garbage pits, landfills and waste incineration plants were built, which reduced the number of traditional, open ones. Biodegradable waste is sorted, and that which is recyclable is sold (Gurung et al., 2008). To mobilise the local community, waste management training programs and various cleaning campaigns are conducted (Bajracharya et al., 2005). Accordingly, the results indicate that the altitude of residents' habitat **does not** significantly explain whether "tourists are guilty of environmental pollution".

5. Additional considerations

Existing studies suggest that locals perceive a range of positive and negative impacts from tourism development (Apollo, 2015; Apollo & Andreychouk, 2020; García et al., 2015; Nunkoo & So, 2016; Sharpley, 2014). The aspects presented at the beginning that explain and predict the responses of residents to tourism by García et al. (2015) have one serious limitation; they were not tested in the high mountain altitude. The findings of this research show another important factor that has a significant influence on residents' approach to tourism: altitude.

The high-altitude environment brings severe stress for humans. Mountain people have learned how to deal with it (Barry, 2008), as according to Cruz-Coke (1978) too little time has passed for microevolution to form a genotype responsible for adaptation to high mountain conditions. Highlanders are often credited with character traits such as courage, strength, dexterity, endurance and pride that have evolved from the hardships of life (Zurick & Pacheco, 2006). Despite numerous adversities, Himalayan highlanders are characterised by a strikingly cheerful temperament. Himalayan culture is steeped in harmony, coexistence, friendship, compassion, and tolerance (Bajracharya, Furley, & Newton, 2005; Zurick & Pacheco, 2006). All this makes them much more patient, and overall, it is much more difficult to disrupt this balance. According to this research, this mechanism also plays an important role in their changing attitude to tourists as the altitude of their homes increases.

With increasing altitude of habitation, other variables could be connected with the explanation for residents' attitudes. For example, residents' attitudes towards tourists can be more positive if their well-being depends on the tourist dollar (Andereck et al., 2005; García et al., 2015). In the mountains of developing countries, as altitude increases, employment is limited to agriculture, pastoralism, and tourism, which is the most profitable of the existing options. Thus, altitude of habitation plays the dominant role. Fig. 2 presents findings showing the development of Doxey's stages according to the amount of time the local community has been exposed to mountaineering, and the altitude of habitation.

The findings suggest that residents have a greater understanding of tourists as altitude increases. Thus, the development of Doxey's stages and the road to antagonistic feelings among residents about tourists takes more time. This concept is also supported by Apollo's (2015) research done at the head of the Bhurungdi Valley in the village of Birethanti (1,025 m). The residents of Birethanti clearly showed some movement towards apathy and presented more antagonistic feelings than their neighbours living at a higher altitude.

6. Management implications

The high mountains are home of some of the poorest people on earth, who are unfortunately marginalised politically and economically by both national and local administrations (Messerli & Ives, 1997). Mountaineering tourism might generate development, and at the same time, create conflicts between hosts and guests (Apollo, 2015; Apollo & Rettinger, 2019; Johnston & Edwards, 1994). However, to gain this development, the positive attitude of residents to tourism and tourists is necessary (Andereck et al., 2005; Lankford & Howard, 1994; Smith & Krannich, 1998). Previous investigations were studying residents' attitudes in order to explain and predict the responses of residents to tourism (Garcia et al., 2015; Sharpley, 2014).

Among several aspects that could explain and predict the responses of residents to tourism (see Garcia et al., 2015), residents' altitude has a special place. The 'altitude' factor should not only be considered separately; but on the contrary, it should be integrated with all other factors (which is well demonstrated in Fig. 2). By adding a new dimension (altitude) to well-known Doxey's (1975) Irridex model, we draw the attention of managers on this factor that influences resident behaviour toward tourism; namely, it slows down that influence. Put simply, altitude is a factor slowing down the negative/antagonistic influence of tourists.

Overall, this study demonstrated that people living at higher altitudes have more patience and understanding of tourists. Therefore, all management plans should be introduced in the villages located at lower altitudes first. Furthermore, those plans should be introduced starting from villages located at the same altitude, not in the whole valley. This finding is of great importance, especially in mountain areas located in developing countries, as limited resources should be used sustainably, that is, very precisely and purposefully.

The results of this study indicate that the altitude of residents' habitats does not significantly explain whether "tourists know the culture" and "tourists introduce new patterns of life which residents adopt later". However, the relationship between "altitude of the resident's habitats" and "tourists introducing new patterns of life which residents adopt later" is moderate and positive. This indicates that as the altitude of residents' habitats rises, the perception of the local population of "tourists introducing new patterns of life which residents adopt later" also increases (but is statistically insignificant). Neither is it surprising that the altitude of residents' habitat does not significantly explain whether "tourists know the culture" as this is usually that they do not know, especially when mass tourism is considered (Apollo, 2015; Butler,

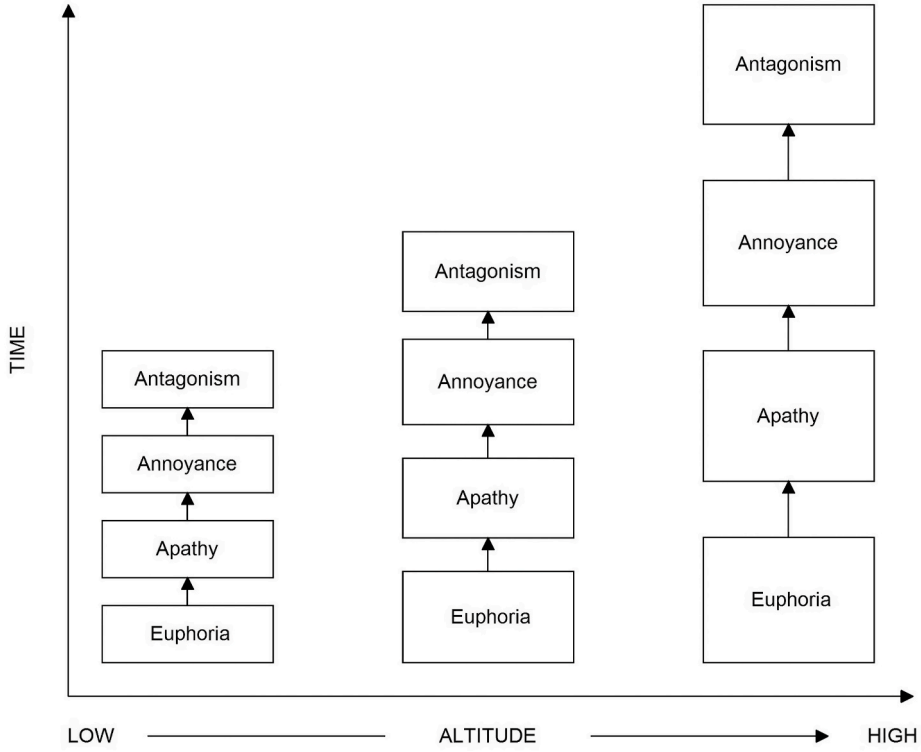

Fig. 2. Doxey's (1975) Irridex model and its evolution according to the time and altitude.

1991; Pearce, 1995; Tribe & Liburd, 2016).

Even if the level of tourist knowledge of local culture is not connected directly with the increase/decrease of altitude, one thing is certain - its level is too low. Studies highlight that with greater knowledge, attitudes towards tourism are more favourable (Andereck et al., 2005; Lankford & Howard, 1994). Thus, authorities and managers should ensure that tourists (especially those choosing high mountains) are provided with the necessary knowledge about the culture of the area. On the other hand, local communities must constructively combine the new with the old and not abandon their traditions and culture, which is as important as the natural environment and the landscape for tourists (Apollo, 2015). However, we emphasise that any projects focused on sustainable development of mountain regions (run by authorities, NGOs, and others) should be implemented first in the villages at lower elevations.

7. Conclusions

The present study was designed to determine whether residents' attitudes towards tourism changes with increasing altitude. The progressive nature of these interactions was observed. Almost all the results correlated highly with the altitude of habitation. Hence, this study indicates that altitude plays an important role in the attitude of residents. The study has gone some way towards enhancing an understanding of the role of altitude and its impact on tourism activity. Consequently, by knowing the progressive nature of the changes, which in mountain regions is strictly associated with the altitude of habitation, it will be easier to allocate limited resources in a sustainable way. Concluding, this study proved that people living at high altitude have a better understanding of tourists. Thus, all management plans should be introduced in the villages located at lower altitudes first.

8. Limitations and the areas of future research

This research is the first attempt to assess the effect of altitude of habitation on residents' attitudes. It is understood that this pilot research project is basic and has several limitations, such as a sample of only three locations. Also, it is worth noting that tourists do not spend/stayed in every village for the same time, despite having to trek the same route. However, all three locations have accommodation and restaurant facilities. Nevertheless, it is believed that it has been proved that in high mountain regions of developing countries, the altitude plays an important role in the host-guest reciprocity.

More research is needed to better understand the influence (direct and indirect) of the altitude factor on the nature and degree of changes taking place under the influence of mountaineering in local communities who live at different altitudes. To do that, a larger sample is needed, and future research should focus on more detailed characteristics of respondents. Also, the locations should be chosen according to the real-time that tourists spent there, that is, only those where tourists spend a night should be taken under consideration. This will help to receive the same impact from tourists towards residents. Overall, to run more precise regression, future studies should cover a greater population and focus not only on the location of villages but also at the location of all respondents. By doing this, future studies can create a map of points that will be more precise, and models will be more accurate.

CRediT authorship contribution statement

Michal Apollo: Project administration, Methodology, Conceptualization, Writing - original draft, Visualization, Investigation, Formal analysis, Validation, Writing - review & editing. **Viacheslav Andreychouk:** Conceptualization, Methodology, Writing - review & editing. **Pahlaj Moolio:** Software, Formal analysis, Validation, Writing - review & editing. **Yana Wengel:** Writing - review & editing. **Urszula Myga-Piątek:** Conceptualization, Writing - review & editing.

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