

THE IMPACTS OF ADVENTURE TOURISM IN MOUNTAIN REGIONS – A REVIEW

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Abstract Recently, mountain regions have become highly attractive and important areas for tourism (Beedie & Hudson, 2003; WTO & UNEP, 2008; Rama et al., 2019). One of the most dynamic components of tourism in mountains is adventure tourism, which combines travel, sport and outdoor recreation (Beedie & Hudson, 2003). Since mountains represent sensitive areas in terms of sustainability, it is important to approach them appropriately, in order to apply measures to optimize the impacts of tourism. This study covers a review of the impacts of adventure tourism on mountain areas and an examination of measures that might optimize the impacts of such tourism. The purpose of this paper is to present the latest findings in the field of the impacts of adventure tourism in mountain areas, and certain measures that can be taken to balance the positive and negative impacts. The findings show that the impacts of adventure tourism in mountain destinations vary, and therefore each destination must be treated individually. Furthermore, a thorough approach to achieve balance is needed on a case by case basis, since there is no universal formula for sustainable development of destinations due to their different characteristics. The implications and further research opportunities are given.

Keywords:

tourism impacts,
measures,
sustainable
tourism,
mountain tourism,
adventure tourism

1 Introduction

Mountains have always had great significance in human culture, although in earlier times many people avoided mountain regions, since they represented an unknown world full of danger. They believed that mountains were the dwelling place of gods, and this belief is still present in many places today. People initially ventured into mountain areas for economic reasons, seeking ore and salt, and armies, by force of circumstance, crossed them in search of new territories, goods, markets and trade caravans (Mrak, 2011). By the term “mountain” we consider landforms that rise prominently above their surroundings, generally exhibiting steep slopes, a relatively confined summit area, and considerable local relief. Mountains are generally understood to be larger than hills, but the term has no standardized geological meaning (Molnar, 2020). About 12% of the world’s population live in mountain regions, with another 14% living next to or very near such areas and dependent on their resources. Of these people, about half are concentrated in the Andes, the Hengduan-Himalaya Hindu Kush system, and a variety of different African mountains. While mountains in the northern hemisphere are often sparsely populated, some tropical mountain areas have population densities of more than 400 people per square kilometre (UNEP, 2007).

Nowadays, mountain regions are attractive and important destinations for tourism (Beedie & Hudson, 2003; WTO & UNEP, 2008; Rama Maldonado-Erazo, Duran-Sanchez & Garcia, 2019), as outdoor recreation is gaining in popularity among tourists. One of the most dynamic components of outdoor recreation is adventure tourism, which Hall (1992) defines as a fast-growing segment of the tourism market. Adventure tourism combines travel, sport and outdoor recreation (Beedie and Hudson, 2003) and represents a wide range of outdoor tourism activities that are often commercialized and involve interaction with the natural environment outside the participants' home environment, and contain some element of risk (Hall & Weiler, 1992), with some adventure tourism carried out in the mountains (Beedie, 2008). Hiking, trekking and mountain climbing, broadly defined as mountaineering, represents a subset of adventure tourism and is becoming more popular each year (Apollo, 2017). Mountaineering is a long-established adventure sport based on physical activity, challenges and risk. It was long reserved for experienced individuals, but today the social boundaries separating mountaineers from tourists are increasingly blurred (Beedie & Hudson, 2003). Therefore, in this paper more attention is paid to adventure tourism and adventure sports (especially

mountaineering) than other sports performed in the mountains. Moreover, the impacts of tourism in mountains considered in this study refer to those related to adventure tourism.

Although many tourists visit mountain destinations, these tend to suffer from poor accessibility and infrastructure, as well as social, political and economic marginality — either due to neglect by the state or the mistrust of peripheral populations — and thus tourism may appear to many local actors as a rare lever for development. However, even if the curiosity of tourists and the wishes of local stakeholders converge, this does not guarantee that genuine development will take place, or that it will be equitable and sustainable.

Nyaupane, Morais and Dowler (2006) note that the economic, environmental and cultural impacts of tourism development in mountain regions vary greatly, and that a number of critical factors may explain this. Travel to mountain destinations has increased considerably over time, resulting in amplified discussions on both the benefits and risks to mountain environments, cultures and communities (Mutana & Bukwada, 2018). There are literature reviews that cover the impacts of tourism on a particular destination, but these focus little on destinations in mountain areas. Since mountain areas represent sensitive areas in terms of sustainability, it is important that we study them, and, with this, we will find measures for optimization of tourism impacts. Since few surveys cover such measures, this study also provides an examination of those that can maximize the positive and minimize the negative environmental, socio-cultural and economic impacts of tourism on mountain destinations. The issue addressed in this paper is therefore the importance of researching the impacts of tourism on mountain areas and their lack of optimization in practice. The aim is thus to present a review of these impacts, as well as measures to reduce the negative and the increase positive impacts on the basis of previous research.

As stated by Vodeb (2014), it is crucial to increase the positive and reduce the negative effects of tourism, as this can then help integrate tourism successfully into other economic activities. Although the impacts of tourism are extremely interconnected (*ibid.*), those in this study are subdivided into environmental, socio-cultural and economic impacts, and in the second chapter details of these are presented, along with support from case studies. This paper obtained its data using a literature, but it should be noted that this review covers all kinds of tourism in the

mountains, and the most fundamental measures for monitoring sustainable tourism in such areas. Therefore, the goal of this paper, which does not distinguish between niches, is to point to those impacts that are common to all of these tourism niches. After collecting the data, the results are presented and discussed in relation to previous research.

2 Sustainable mountain tourism

If looking globally, most mountain communities are rural, and most live in poverty. These communities often have little or no political power, and are dependent on economies based largely on barter trade and agriculture, besides forestry, mining, transport and industry. Mountain ecosystems hold important social, cultural, environmental and economic significance for the health and livelihood of these communities, and their close relationship with the land has helped them develop unique cultural identities, knowledge and skills. Mountain communities include several thousand different ethnic groups, and the uniqueness and diversity of these cultures is particularly attractive to many tourists (UNEP, 2007). UNWTO (2019) defines mountain tourism as a type of "tourism activity which takes place in a defined and limited geographical space such as hills or mountains, with distinctive characteristics and attributes that are inherent to a specific landscape, topography, climate, biodiversity (flora and fauna) and local community. It encompasses a broad range of outdoor leisure and sports activities."

Mountain areas are second only to coasts and islands as popular tourism destinations, generating 15 to 20% of annual global tourism, or US\$70 to 90 billion per year (UNEP, 2007). Tourism development in mountain regions depends on many factors: the attractiveness / uniqueness of the destination, safety, professionalism of local businesses and hospitality structures, availability of capital, etc. Tourists are attracted to mountain destinations for many reasons, including the climate, clean air, unique landscapes and wildlife, scenic beauty, local culture, history and heritage, and the opportunity to experience snow and participate in snow-based or nature-related activities and sports (UNEP, 2007). However, often there is insufficient capital to create the infrastructure needed for reaching sites or accommodating visitors (Debarbieux et al., 2014).

Tourism is nowadays widely recognized as a strong factor in the development of rural areas (Rangus, Brumen & Potočnik Topler, 2017). Well-managed tourism can be an ally in preserving local culture and values, while, at the same time improving the social conditions of the socially vulnerable and local communities. Poorly managed tourism, however, can contribute to the loss of cultural integrity and identity through cultural assimilation (UNEP, 2007). Providing sustainable tourism activities based on natural and environmental values is fundamental for mountain areas seeking to attract tourists with optimized impacts on the natural and cultural heritage that exist there (Euromontana, 2017). While negative impacts of tourism always appear, these can be reduced with sustainable development measurements. Nevertheless, the means used to develop tourism do not always favour its sustainability. Sometimes major projects are carried out without first assessing or anticipating their effects on the environment, employment, or the communities concerned. At other times, the proliferation of small individual initiatives is not sufficiently regulated, a situation which can also have detrimental impacts on the landscape, environment, and social relations. Often, the impacts on local economies fail to meet expectations, particularly when benefits remain in the hands of a few large stakeholders, frequently from outside the regions concerned (Debarbieux et al., 2014). Brumen et al. (2016) state that national and local governments are harmonizing regional policies to enable the more balanced development of regions. Rural and mountain tourism have a high potential to stimulate local economic growth and social change because of their complementarity with other economic activities, contribution to GDP and job creation, and capacity to promote the dispersal of demand in time (and thus reduce seasonality) and along a wider territory (UNWTO, 2019).

In many mountain destinations, the tourism sector drives the socioeconomic growth and development of local communities, yet mountain areas often face challenges to their development, including harsh climate conditions, vulnerability to natural disasters, and problems of remoteness and accessibility. These challenges may hinder economic activities, infrastructure development and industrial production in mountain regions. In this context, tourism represents an opportunity to improve local communities and stimulate growth in mountain destinations (UNWTO, 2018). In any case, it is necessary to work in terms of sustainability and prepare a plan that will follow the guidelines of sustainability before each intervention. In this context, Coalter et al. (2010) report that there is a limited amount of specialized literature and research on the economic and social impacts of mountaineering activities. Musa,

Thompson-Carr and Higham (2015) say that, from a theoretical perspective, the philosophies, changing values, attitudes and other psychological aspects of the mountain tourism experience deserve ongoing attention. Histories of mountain tourism destinations, including development, but also cultural, spiritual and religious aspects, need to be researched and written about. Research exploring social issues, including community development, workers' rights and age-related or gendered influences, would further illustrate the human dimensions of mountain tourism.

3 Structure and methods of the review

The method used in this paper is literature review, which represents a data collection process wherein information is gathered in a comprehensive way. This review presents an overview of recent research that captures the impacts of tourism on mountain regions. The data was obtained through the Science Direct website, which also covers the Scopus database. This database was used due to its coverage of peer-reviewed articles and free access. Because of the scope of the research, conference papers, book chapters, review articles and others were not used. The aim of the research was to gain the original scientific articles through the English keywords in titles, abstracts or author-specified keywords. The research was conducted in June 2019, and the years of publication were not limited. The search was divided into three parts. First, the focus was on environmental impacts, where scientific articles were searched based on the keywords “mountain”, “tourism”, “environmental”, “impact”. There were 30 such articles. For the subject of socio-cultural impacts the search was conducted based on keywords: “mountain”, “tourism”, “socio-cultural”, “impact”. There were two such articles. Because of the small number of articles, a further search was made using the keywords “mountain”, “tourism” and “socio-cultural impact” in the category of terms in articles, and another 44 articles were found. Based on the key words “mountain”, “tourism”, “economic”, “impact”, 14 scientific articles on the topic of economic impacts were found. Among the articles found, the survey covered those related to the impacts of adventure tourism in mountain regions and measures to optimize positive and negative impacts, with all the related research being conducted on a scientific basis. The articles that met these criteria are presented in the following chapter. Of the 14 original research articles identified on this topic that have been published in English language peer-reviewed academic journals, most were for research conducted in Europe and Asia, two were conducted in Australia, one in Canada and one in the USA. All articles except one were published in the years after 2000. Most articles used primary data obtained from

interviews, case studies, field observations, and similar. Some of them also used secondary data.

4 Impacts of tourism in mountain regions

Debarbieux et al. (2014) state that tourism is one of the fastest growing industries in the world, and in mountain regions it can give rise to high expectations for development. It has the capacity to create jobs and extend services and products that support both tourists and local people alike in otherwise marginal areas. Tourism thus has the potential to reduce poverty and provide alternatives to existing economic activities and traditional livelihoods that may be precarious, or otherwise threatened by global competition. Kostić, Lakićević and Milićević (2018) say that, in the last couple of decades, people did not pay much attention to the protection of natural resources and the living environment when creating a tourist offer, since the main aim was simply to make a profit. Mountain tourism must, therefore, for example, work on increasing the energy efficiency of resorts during the winter season. On the other hand, the potential negative impact of tourism development on mountain landscapes in terms of visual pollution must be addressed on a case-by-case basis by tourism developers, in order to strike an aesthetic balance between tourism structures and the natural environment (UNWTO, 2018). However, the rise of ecological issues, due to uncontrolled and accelerated tourism development, made mountain areas less desirable among tourists, this leading to the idea of sustainable development being applied to this context, which should provide for the preservation of both the natural resources and living environment, minimizing the negative impacts of tourism and maximizing positive ones (Kostić, Lakićević & Milićević, 2018). It should be noted here that there are limited possibilities for creating wealth in mountain economies, and besides certain forms of agriculture and animal husbandry, tourism is the only other territory-bound activity which can provide economic growth. Nevertheless, its sustainability depends on keeping the fragile mountain environment and landscapes intact (UNWTO, 2018).

Sustainable tourism balances all the related indicators without ignoring any of them (Karim et al., 2014). There are certain economic benefits that satisfy one pillar of sustainability (e.g. economic growth), but, at the same time there are major environmental consequences that affect another pillar of sustainability (e.g. environmental protection). The third pillar (social equity) is affected in a complex way. On the one hand, people involved in tourism-based businesses may benefit a

lot from, say, the opening of a ski centre, while those involved in the primary sector of production are affected negatively (Tsiaras, 2015). As the definition in Tsiaras (2015) refers to positive and negative effects, this definition was also the guideline to address sustainable tourism in this paper. Nepal (2002) states that if tourism is based on principles of sustainability and equity, it can be instrumental in improving the living conditions of mountain communities, and increasing their stakes and interests in local, regional and national policy issues. Sustainability encompasses ecological, economic and social components. In the context of tourism development, this means that both the types and intensity of tourism activities in the mountains must have limits, and that the benefits must reach the wider community.

In order to optimize the impacts of tourism on the mountain regions, it is necessary to introduce some measures that differ according to the situation in the specific area. Meyer-Cech and Pröbstl (2006) conclude that recreation and tourism have a high economic importance, and at the same time the mountains encompass a great array of ecologically sensitive habitats, which means that a balance between regulation and development policy needs to be found. Yet often the great variety of mountain tourism is not taken into consideration enough, as different tourism structures call for very different, and especially regionally specific, strategies of response. Nepal (2002) states that it is essential to monitor, regulate and control activities that may jeopardize the resource base on which mountain tourism depends. Economic and social monitoring are also important to ensure that differences in income and employment from tourism do not create social friction or disharmony. Sustainable tourism plans should not only focus on resource conservation, but should also address issues of equity, community development and social harmony. Sustainable mountain tourism encompasses three basic components: conservation of the natural resources on which tourism depends; improvement in the quality of life of the local population; and enhancement of visitor satisfaction. For these to be realized, effective policies and control mechanisms, strong local and regional institutions and sound management capabilities – based on both modern and traditional knowledge systems – are necessary. Stursa (2002) notes that it is very important to be aware of visitors' behaviour and attitudes, their wishes and motivation for a visit, their knowledge of what is unique, significant or typical with regard to the visited area, and what types of visitors' rules are valid within the area. All these aspects can significantly influence the negative impacts of visitors. Nepal (2002) adds that without these essential elements mountain tourism could easily be a short-term, boom-and-bust enterprise. Without adequate local control, self-reliance and strong

participation in decision-making, tourism is likely to benefit only a few rich individuals, often outsiders, at the expense of a large, poor section of the community. Mountain communities are often limited in financial, technical and managerial resources, which hinders their ability to develop and market tourism attractions effectively. In contrast, outside stakeholders, such as tourism developers, entrepreneurs and tour operators, usually have the knowledge and needed resources to make tourism a competitive business. Thus, mountain tourism policies must balance the interests of local communities with those of outside stakeholders carefully. Government institutions with the necessary capacity to plan and implement projects are crucial for the sustainable development of such regions. The opportunities from mountain tourism are significant, as long as plans and policies are in place to ensure that it does not pose an environmental and social threat. This calls for the judicious use of natural (tourism) resources, community planning, local awareness and reliance, strong local institutions and policies, and a vision for the long-term sustainability of tourism projects (*ibid.*).

The income that people earn from tourism should be used in different sustainable income generating activities, giving due care to maintaining the region's unique ecological diversity and ecosystem (Rai, 2017). In the mountains, tourism has become a boon for the survival of local people in terms of providing income for them. However, it has also contributed to the disruption of the environment. In this light, the trade-off between the environmental problems and economic gains created by tourism cannot be measured so easily. Tourism needs to be encouraged, but not without policies to improve and maintain the environment (Pandey, Chettri, Kunwar & Ghimire, 1995). In addition to that, it is crucial to realize well-prepared education and information programmes, and also to increase the knowledge about feedback in visitors' behaviour (Stursa, 2002). Pop et al. (2011) conclude that it is important to develop and promote sustainable tourism, to enhance environmental conservation, and to ensure that tourism development goes well with nature, leading to increased awareness of the importance of conserving natural attractions.

In order to ensure a sustainable form of tourism development and thus preserve a destination for future generations, it is necessary to promote sustainable development, create products for specific market segments of visitors, create and maintain competitiveness, improve visitor experience, preserve local resources, improve the quality of life, consider the needs of stakeholders, and so on. It is necessary to work with a long-term vision and within the mentioned pillars of

sustainable development. Nyaupane, Morais and Dowler (2006) find that the current literature focused on tourism development in mountain regions consists predominantly of case studies about unique destinations in such areas. The following subsections address the different (specific) groups of the impacts of tourism in mountain areas, and are supported by examples from different destinations. The cases were selected according to the adequacy of addressing the environmental, economic or socio-cultural effects of tourism in mountain regions. Although the effects are very intertwined in specific destinations, in this case they are divided in order to make them more transparent.

4.1 Environmental impacts

Mountain landscapes are particularly fragile and susceptible to environmental change and degradation. Landslides, avalanches, lava flows, earthquakes, floods and rock falls can alter the landscape unexpectedly. Mountain ecosystems include a wide range of small and unique habitats, with flora and fauna that may have very short growing and reproductive seasons, and may be particularly sensitive to disturbance by human activity. Tourism activities often involve the development and intense use of tracks, paths and sports slopes by vehicles, non-motorized transport and pedestrian traffic (UNEP, 2007). Kozorog and Poljak Istenič (2013) state that although outdoor sports are sometimes connected to environmentalism discourses, which promote nature-friendly recreation, they also encourage people to perform daring activities that few have done before. Visitor presence is also usually concentrated in small areas, contributing to increased noise and waste, which have negative impacts on particular places. The negative environmental impacts of poorly managed tourism activities can include vegetation clearing and soil erosion, removal of scarce habitat, altering of critical landscapes and water flows, water and air pollution, and wildlife relocation or behavioural changes. The introduction of exotic and invasive species and diseases can also have a significant, negative impact on local plant and animal species (UNEP, 2007). However, from a global perspective, mountain tourism is not a major contributor to environmental pollution and degradation. In fact, it suffers more from waste and pollution than it contributes to it. While the tourism sector cannot solve the global environmental crisis, it must be aware of its specific responsibility in terms of preventing local ecological damage and the destruction of unspoilt landscapes, which can be caused by tourism growth (UNWTO, 2018). Targeting lesser-known routes is good in terms of relieving more congested routes, but care must be taken to manage the route or activities sustainably.

Table 1: Environmental impacts and measures

Environmental impacts	Environmental measures
<ul style="list-style-type: none"> – Soil pollution – Visual pollution – Air pollution – More waste generated – More frequent transportation of waste – Higher burden – Impact on ecological quality of vegetation landscapes – Increases in sediment loadings and/or elevated phosphorus release from the sediments. – Soil erosion – Affecting lake chemistry – Influencing forest management – Trampling of vegetation – Firewood extraction – Forest degradation and deforestation – Pollution of river waters – • Expansion of built-up areas on forestland 	<ul style="list-style-type: none"> – Investments in tourism infrastructure – Creating a database of ecology oriented services – Organizing meetings between various stakeholders – Exchange knowledge about the standards in force regarding the consumption of natural resources – Selecting particular services and preparing products for an ecological value network – Promoting regional products on websites – Organizing competitions for pro-ecological projects involving residents – Co-financing the individual investments made by residents – Imposing fines for actions threatening the environment and people – Serving food prepared mainly from local products – Aesthetic interior design minimizing the consumption of resources – Waste segregation – Obtaining energy from alternative sources – Local wastewater treatment plant – Running campaigns for saving water – The offer of educational classes covering issues related to nature or culture – Creating tourist routes respecting nature – Creating purchase groups – Extending a given place's attractions by means of cross-selling – Controlling tourist density – A reduced focus on extraction to maintain the visual value of an area – An inclusion of more stakeholders in the management system – Spreading tourists throughout vulnerable locations – Careful management of routes by the use of fences and track edge marking – Multipathing – Regulating tourist flows – Developing all-season tourism – Identifying new tourist destinations – Zoning scheme or other forms of management – • Extending research

Sources: Bakowska-Morawska, 2014; Zhang, Xiang & Li, 2012; Sanchez-Espana et al., 2017; Gilani, Innes & Grawe, 2018; Arrowsmith & Inbakaran, 2002; Malik and Bhat, 2015; Geneletti and Dawa, 2009

The results from different authors (Table 1) show that the ecological quality of vegetation landscapes is influenced by tourism. The findings also confirm the statement of UNEP (2007), that mountain landscapes are particularly fragile and susceptible to change and degradation. If more tourists visit a mountain destination, the more air pollution will result from the arriving vehicles (Bakowska-Morawska, 2014), which is also likely to affect lakes' chemistry to some extent through emissions of nitrogen oxides (NO_x), sulphur dioxide (SO₂) or metals (Sanchez-Espana et al., 2017). Rivers and lakes can also be polluted by hotels, which are constructed on a riverfront and discharge solid and liquid waste into the water (Malik & Bhat, 2015). There is also more waste generated, and therefore more frequent transportation of such waste, and a higher burden due to the need for clean bed linen and food deliveries (Bakowska-Morawska, 2014). The improper disposal of solid waste results in soil, air and visual pollution (Malik & Bhat, 2015). There are also increases in sediment loadings and/or elevated phosphorus release from the sediments, and increases in soil erosion rates (Sanchez-Espana, 2017). Tourism impacts are also manifested in gully erosion, trampling of vegetation, and general wear along hiking trails (Arrowsmith & Inbakaran, 2002). The impacts can be seen in forests as firewood extraction for heating and cooking purposes in hotels and guesthouses. Hotels being built in forests can lead to forest degradation and deforestation (Malik & Bhat, 2015). Braided patterns of unmarked tracks cause soil erosion and forest degradation (Malik & Bhat, 2015), while a shift in the seasonal management of a mountain resort influences forest management in the surrounding land base, moving it more towards recreation and visual values, and with a lesser focus on extraction (Gilani, Innes & Grawe, 2018). Activities such as trekking, camping, dumping, pack animal grazing and off-road driving all have impacts on soil, water, wildlife and vegetation (Geneletti & Dawa, 2009).

The authors suggest some measures which can help to prevent or minimize the negative environmental impacts of tourism in mountain regions. Bakowska-Morawska (2014) says that there should be specified levels of investments in tourism infrastructure and co-financing of the individual investments made by residents from municipal funds. The author further states that there should be a database of ecology-oriented services, and that more of the food served should be prepared mainly from local products, and thus regional products should be promoted and cross-sold. Education and cooperation among stakeholders is also seen as important. Organized meetings between various stakeholders to exchange knowledge about the standards in force regarding natural resource consumption, educational classes

covering issues related to nature or culture, and inclusion of more stakeholders in the management system are all some of the measures that can lead to sustainable development. Some activities can be introduced to prevent environmental impacts, such as waste segregation, obtaining energy from alternative sources, or using a local wastewater treatment plant. Competitions can also be organised for pro-ecological projects involving residents, along with campaigns for saving water (Bakowska-Morawska, 2014). In mountain regions there should also be a shift in seasonal management that encourages outdoor recreation all year round, not only in the main seasons (Gilani, Innes & Grawe, 2018). Tourism products and the interior design of tourism infrastructure should minimize the consumption of resources, and tourist routes should respect nature (Bakowska-Morawska, 2014). Tourist density should be controlled in some districts, and in some regions the daily total tourist numbers should also be limited, and by spreading tourists throughout vulnerable locations the negative impacts would be dissipated over a wider area. By using multiple paths, more tourists could be accommodated into one area without changing the tourism experience significantly (Arrowsmith & Inbakaran, 2002). For example, trekker inflow could be diverted towards less sensitive areas, or be distributed more homogeneously among the different trails (Geneletti & Dawa, 2009). Identifying new tourist destinations, zoning schemes or other forms of management, can help prevent further environmental degradation (Malik & Bhat, 2015; Geneletti & Dawa, 2009). For such procedures, research in mountain regions should be extended to gather important information and data, with the goal to optimize the environmental impacts of tourism (Geneletti & Dawa, 2009). This is also in line with the findings of Sgroi (2020), who states that the sustainable management of mountain areas through tourism requires an analysis of the various services or goods offered by the mountain economy and, based on their specific characteristics, a management-payment mechanism must be activated that involves the actors who are interested in the transaction.

4.2 Socio-cultural impacts

Mountain communities can also be very susceptible to impacts and change from tourism activities. The negative social impacts of poorly managed tourism can include disturbances from high levels and concentrations of visitor noise and activity, and the reduced availability of scarce shared resources such as firewood, fish and fresh water. In addition, exposure to and adoption of foreign traditions, lifestyles and products can pose a threat to the unique culture, traditions, knowledge and

livelihoods of mountain populations, particularly in remote and indigenous communities (UNEP, 2007). It causes the interaction of peoples from diverse parts of the world, fostering the diffusion of ideas, values, technology, consumer tastes, and lifestyles. Such interactions may weaken local culture, and lead to a variety of types of socio-cultural change (Rai, 2017). Such contact may also precipitate changes in the everyday lives, traditions, values, norms and identities of destination residents (Ghaderi & Henderson, 2012). Therefore, it is useful to set measurable objectives for the proposed tourism activities and to communicate them to local residents in a manner they can respond to, thus engaging them in the process of tourism planning (Vodeb & Medarić, 2013). However, if the local population is involved in the design of tourism at the destination, the above-mentioned influences and changes can have a favourable effect on the development of the community. For example, Rai (2017) focuses on the Everest region and finds that cultural imitation has increased due to tourism, as reflected in dress, language, food and events, especially among the more influential and younger people in this area. For this reason, tourism has increased the artificialness, socio-cultural conflict and general conflict in the local society. The socio-cultural impacts of tourism on mountain areas and related measures can be seen in Table 2.

In the light of socio-cultural impacts of tourism in mountain regions, tourism can help to improve the living conditions of the local residents, as well as schools, sanitation and alternative energy infrastructure. Tourism revenues can allow residents to afford better food, and even to travel for pleasure. In addition to a general improvement in the quality of life in the entire host communities and the revitalization of ethnic culture, the data also revealed an improvement of women's social status (Nyaupane, Morais & Dowler, 2006). However, the perception of local people can be more positive when they feel that they are profiting financially from tourism (Ghaderi & Henderson, 2012). There are also some negative impacts, like children's absenteeism from school, prostitution, loss of local control over the tourism industry, and disruption of traditional kinship and community bonds. This confirms the statement of UNEP (2007), which says that poorly managed tourism can contribute to the loss of cultural integrity and identity through cultural assimilation. Nyaupane, Morais and Dowler (2006) concluded that the degree of positive and negative impacts of tourism in destinations varies, based on community involvement, and the number and type of tourists.

Table 2: Socio-cultural impacts and measures

Socio-cultural impacts	Socio-cultural measures
<ul style="list-style-type: none"> – Tourism pressure on municipalities – Improving the living conditions of the local residents. – Improving schools, sanitation and alternative energy infrastructure. – Locals can afford better food, and even to travel for pleasure – Improvement of women's social status – Revitalization of ethnic culture – Children's absenteeism from school – Prostitution – Loss of local control over the tourism industry – Disruption of traditional kinship and community bonds. – Rapid growth of an art and crafts market – Villagers enjoy meeting new people and practising their language skills – Resentment, antagonism, dishonesty and alienation in the relationship between the community and tourists and tour operators – Changed lifestyles of mountain villagers – Adapting ceremonies, events, activities, art and handicrafts 	<ul style="list-style-type: none"> – To include spatial effects in tourism regional analysis – Take into account the diffusion or concentration process within the area – Identification of spatial patterns to propose tourism policies that impact tourism development positively – To allocate new resources – To promote other municipalities in the region – To open new markets in emerging economies – To take measures against seasonality – Promoting new types of tourism – To control non-regulated rental accommodations – When making investment decisions, considering quality and environmental factors – To highlight the importance of quality and sustainability as a priority strategy – A long-term examination of tourism impacts, local involvement in tourism management, number / type of tourists – Opposition and concern about tourism must be addressed – Reconcile divergent viewpoints and devise effective sustainable rural tourism projects – Research into the impacts of tourism

Sources: Sarrión-Gavilán, Benítez-Márquez and Mora-Rangel, 2015; Nyaupane, Morais and Dowler, 2006; Ghaderi and Henderson, 2012

Important measures for optimizing socio-cultural impacts include more research in these impacts. This is inline with Musa, Thompson-Carr and Higham (2015), who say that research exploring social issues, including community development, workers' rights and age-related or gendered influences, would further illustrate the human dimensions of mountaineering tourism. Sarrión-Gavilán, Benítez-Márquez and Mora-Rangel (2015) state that it is necessary for researchers to include spatial impacts in tourism regional analysis, and to take into account the diffusion or concentration process within a territory, both as a whole and in a local context. A long-term examination of tourism impacts, local involvement in tourism management, and number/type of tourists in these regions, might provide an

invaluable insight into the importance of the government and prevailing political ideology with regard to tourism development (Nyaupane, Morais & Dowler, 2006). For policymakers the identification of spatial patterns can play a useful role in coming up with tourism policies that have a positive effect on tourism development. Entrepreneurs or investors should take into account quality and environmental factors when making investment decisions, such as accommodation type, the category of establishments and the municipalities in which to invest. Moreover, all private companies involved should adopt quality and sustainability as a priority strategy in order to be more competitive (Sarrión-Gavilán, Benítez-Márquez & Mora-Rangel, 2015).

4.3 Economic impacts

Tourism development in mountain regions can bring economic growth to host communities (Nyaupane, Morais & Dowler, 2006). While tourism can provide significant local employment, if not properly managed such work can be short-term and seasonal, providing little skill-building or training to local people. Working conditions can be poor, and revenue can easily leak out of local economies to externally owned companies. However, well-managed tourism can play an important role in attracting revenue and reducing poverty. It can also improve infrastructure, provide community services and help diversify local economies. Employment and income can improve the self-sufficiency and sustainability of mountain communities (UNEP, 2007). Moreover, Cocca et al. (2012) found that the choices that need to be made with regard to the economic development of local communities are important. Tourism may offer complementary economic opportunities to farmers in mountain areas. It also requires the conservation of traditional agricultural landscapes, while the development of industrial activities will probably encourage the abandoning of farms. In this way tourism represents an alternative for creating jobs and income growth in mountain areas. However, tourism as an economic force for the development of such areas has limitations, and is more likely to be beneficial if it does not become a dominant sector of the economy (Tooman, 1997).

Table 3: Economic impacts and measures

Economic impacts	Economic measures
<ul style="list-style-type: none"> – Outsiders' dominance in business not only limits economic benefits to local people, but also misinterprets the true culture for commercialization – Improvement of socioeconomic status of the residents – Economic contribution of different types of tourism – The creation of jobs for local people – Generation of prosperity and business to the benefit of the community – Slower growth rates correspond with lower levels of total income – More income is retained locally – Greater ease of entry into the local market – Allowing local linkages to be established to support the tourism economy – Significant barriers to entry exclude newcomers – Where tourism became the dominant economic sector, social welfare indicators failed to show significant improvements – Net debt per capita can grow – Complementary economic opportunities for farmers – Conservation of traditional agricultural landscapes – • Development of industrial activities can encourage the abandoning of farms 	<ul style="list-style-type: none"> – A long-term examination of tourism impacts – Local involvement in tourism management, and number/type of tourists in these regions – Opportunities for tourism destinations to develop their tourism product – Roads in good condition – Safe places to stop – Additional tourism activities – Organizing events – Good relationship with the police – No parking provision – Proper tourism management – Tourism as an economic force for development – Correct choices in the economic development of local communities – • Encouraging multi-purpose choices, such as agro-tourism and on-farm processing

Sources: Nyaupane, Morais and Dowler, 2006; Cater, 2017; Weaver, Lawton, 2001; Tooman, 1997; Cocca, Sturaro, Gallo, Ramanzin, 2012

There are some studies which were carried out in mountain areas in different parts of the world which consider the economic impact of tourism and related measures (Table 3). For example, Rai (2017) examines tourism development and economic consequences in the Everest region. The results indicate that most households have converted their household economies in order to participate in the emerging tourist economy. This major economic change has been accompanied by social and cultural changes, and the income of local Sherpa has been increased significantly. Similarly, Nepal (2002) also concludes that tourism in the Nepalese Himalayas has been a boon to the local economy. Črnigoj, Bartolj and Srakar (2018) show that mountaineering in Slovenia has significant economic effects, up to 14.8 million EUR of direct

economic impacts annually if we estimate the revenue generated by the Slovene Mountaineering Association as part of its key activities.

There are other positive impacts of tourism, like improvement of the socioeconomic status of the local residents (Nyaupane, Morais & Dowler, 2006), creation of jobs for local people, or the overall generation of prosperity and business to the benefit of the community (Weaver & Lawton, 2001). Tourism may also offer complementary economic opportunities to farmers and, in turn, requires the conservation of the traditional agricultural landscapes (Cocca, Sturaro, Gallo & Ramanzin, 2012). However, as stated by UNEP (2007), while tourism can provide significant local employment, if not properly managed this employment can be short-term and seasonal, providing little skill-building or training for local people. Tooman (1997) points out that there are different impacts in different stages of the lifecycle of a tourist destination. In the involvement stage, slower growth rates correspond with lower levels of total income, whereas the opposite holds for the accelerated growth rate of the development stage. The benefit derived from the involvement stage is that more of the income is retained locally, in contrast to the development stage, where profits would be expropriated by outside investors. Once a development stage is entered and large-scale, corporate enterprises become the dominant economic participants, significant barriers to entry exclude newcomers. Some impacts can also be seen where tourism becomes the dominant economic sector in a location, with social welfare indicators failing to show significant improvement.

The measures that are noted by authors include a long-term examination of tourism impacts, local involvement in tourism management, and controlling the number/type of tourists (Nyaupane, Morais & Dowler, 2006). There are also opportunities for tourism destinations to develop new tourism products, like motorcycle tourism, which needs well-maintained roads, safe places to stop, and additional tourism activities, among other things (Cater, 2017). Tooman (1997) says that tourism as an economic force for development has limitations, but is more likely to be beneficial if it does not become the dominant sector of the local economy. Therefore, as stated by Rai (2017), it is better that the money people earn from the tourism sector is derived from different sustainable income-generating activities, giving due care to maintaining the region's unique ecological diversity and ecosystem.

4 Conclusion

Stursa (2002) states that mountains, together with coastal areas, represent the most attractive types of landscape for outdoor recreation, and both are highly sensitive and vulnerable to large-scale human impacts. Therefore, the harmonization of the relationship between the natural environment and its conservation, on the one hand, and its exploitation on the other, is a basic problem that the bodies responsible for the sustainable development of such areas must consider.

Sustainability is one of the most important aspects of tourism management. It is important that all aspects of sustainability are taken into account, and that all stakeholders strive to increase the positive impacts of tourism and reduce the negative ones. However, tourist destinations vary, so each destination must be treated individually. Therefore, there is a complex search for balance on a case-by-case basis, with no universal formula for sustainable development. Due to their specificity, mountain areas represent a special form of tourist areas, which are influenced by environmental, socio-cultural and economic factors. However, in order to deal more effectively with the negative consequences of tourism in such areas, it is necessary to carry out prior scientific research.

This study summarizes examples of the impacts of tourism on mountain areas, including measures to optimize positive impacts and minimize negative ones. The results of the research can be useful for tourism managers and local communities when planning tourism activities in mountain regions. Managers can obtain information on the positive and negative impacts of tourism in the mountains, and measures for optimization of these. Based on this information and depending on the situation, managers can take precautionary measures in the direction of reducing the negative impacts and increasing the positive impacts, following guidelines for sustainable development. In addition to its practical applicability, the literature review presented in this study also helps to understand the impacts of tourism and how to optimize them in mountain regions. We need to be aware, however, that the optimal condition cannot be achieved, although we can strive to get as close as possible to it. Based on the importance of mountain regions for tourism, their sustainable development and the reviewed literature, we can conclude that there is a lack in scientific research covering the environmental, socio-cultural and economic impacts of tourism in such areas.

As this research is currently limited to the selection of papers from the Science Direct database, which covers the Scopus database, it can be extended to other databases, thereby upgrading results because of more cases being taken into consideration. Following an expanded survey, a graphic representation of the most important impacts or groups of impacts and measures in the field of tourism in mountain areas could be made, to deepen our understanding of their complexity. Sustainable tourism development is necessary, and, with similar research we can help to raise the awareness and practice of such development in mountain regions around the world.

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