

SUSTAINABILITY AND RENEWABLE ENERGY

HAVE A LOT OF ROOM FOR GROWTH

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ABSTRACT

Tourism contributes 10% to global gross domestic product (GDP), yet it generates 5% of all anthropogenic CO₂, while 50 to 60% of carbon emissions are indirectly related to the sector. High levels of poverty afflict rural areas in developing countries, and sustainable tourism based on renewable energy is an ideal approach to generate local development. Our objectives are thus to gauge sustainable tourism's influence on local development in the community of La Florida, Huaral, Peru and to evaluate the potential of renewable energy (solar and wind power) to propose an eco-efficient business alternative. A non-experimental, quantitative approach was used, in which 265 local residents completed a survey to ascertain their perspectives on the proposal. Moreover, the potential for solar and wind energy was measured to identify sustainable alternatives that residents might incorporate into local ventures. The results demonstrate a relationship between sustainable tourism and local development, as tourism activity enables community members to improve their quality of life and offers them the opportunity to generate new enterprises. Likewise, the assessment of renewable energy potential confirms its feasibility in this area.

Keywords: local community; community development; sustainable community; tourism and renewable energy

I. Introduction

Tourism has become one of the fastest growing industries in the world, creating millions of jobs, increasing global income, helping to curb inflation, and spurring the development of diverse infrastructure (Khan et al. 2021). Tourism now contributes 10.3% of global GDP and 319 million jobs, meaning one in ten jobs are attributed to this sector (Li et al. 2019; Tian et al. 2020; WTTC 2021). The popularity of tourist destinations is linked to demand for various resources and to the supply of accommodation, food, and various types of services (Becken et al. 2003; Becken et al. 2001). This implies the provision of significant logistics services and especially high energy demand. The latter is a serious impediment to the development of sustainable tourism, particularly in Latin America where a high proportion of tourist centers are located in rural areas with high poverty rates and little or no access to energy resources (Gössling 2010; Carbone 2005). The Economic Commission for Latin America and the Caribbean (ECLAC) revealed that, in 2019, 30.8% of the population was below the poverty line, with 11.5% in a situation of extreme poverty (CEPAL 2019). This rate has increased considerably in response to the COVID-19 pandemic, and ECLAC estimate that in 2020 the extreme poverty rate will stand at 12.5%, while the poverty rate will reach 33.7% (CEPAL 2021).

II. Literature Review

Despite the great economic benefits that tourism generates in various countries, the sector presents an environmental concern, as it gives rise to massive CO₂ emissions (Li et al. 2019). A study carried out by the UNWTO and the United Nations (UN) reveals that tourism contributes 5% of all anthropogenic CO₂, while between 50 and 60% of carbon emissions are indirectly related to the industry (Dwyer et al. 2010; Calderón-Vargas et al. 2019; OMT-a 2019). The need thus arises to direct tourism activity using sustainability guidelines and to think about sustainable tourism. The latter must fully take into account current and future economic, social, and environmental repercussions while satisfying the needs of visitors, the industry, the environment, and host communities (UNWTON 2021). Some authors firmly believe that the sustainability of tourism development is based on the creation of a tourism product with particular characteristics that suit the present and future needs of tourists (Michalena et al. 2009). The concept of “sustainable tourism development” thus refers to economic, social, and environmental development that continually aims to improve the experiences of tourists. For others, this type of development is an additional opportunity for local communities to benefit from the products of their particular local identity and natural resources (Burns and Sancho 2003; Michalena et al. 2009). Sustainable tourism is positively linked to economic development and has been an important source of income (Comerio and Strozzi 2019). The optimal management of sustainable tourism must take into account the principles of sustainability, encompassing the environmental, economic, and sociocultural aspects of tourism development. An adequate balance must be struck between these three dimensions to guarantee long-term sustainability.

III. Materials and Methods

A quantitative approach was used, as numerical data were collected and subjected to statistical analysis to verify the correlation of two variables, as well as the generalization and objectification of sample results. The design was non-experimental since there was no manipulation of the variables; rather, they will be examined and compared as they occur in the natural environment. The design is transverse, as data was collected only for the year 2021 (Hernández Sampieri 2010). This research focuses on a case study of the rural community of La Florida, located in the AtavillosBajo District, Huaral Province, Lima Department, Peru. The community is considered the base tourist center of the “Rúpac-MarcaKullpi” archaeological complex, also called “El Machu Picchu Limeño”, which was designated as national cultural heritage through National Directorial Resolution 283/INC on 25 June 1999. This archaeological site dates to 1200 CE and belongs to the pre-Inca culture of Los Atavillos (Congreso de la República 2017a). During the research process, direct contact was made with residents of La Florida to obtain information and to learn about the residents’ perspective on the relationship between sustainable tourism and local development in their area. The statistical population was delimited by a selection criterion for those over the age of majority. All individuals over 18 years of age who live in this population center were considered, yielding a total of 843 persons of undifferentiated sex. Using a simple random probability sampling under the finite population formula, given a confidence level of 95% and a margin of error of 5%, a sample number (n) of 265 inhabitants was selected.

IV. Environmental Aspect

Particular emphasis is placed on the optimal use of environmental resources, which are fundamental elements of tourism development, while maintaining essential ecological processes and conserving natural resources and

biological diversity (UNWTON 2021). A wide range of economic sectors have joined strategies to reduce climate change, and tourism is no stranger. Thus, strategies can be promoted that contribute to lowering the carbon footprint through the management of sustainable destinations and the construction of ecological tourist infrastructure (Urkullo 2015). In this regard, 73.2% of La Florida's residents affirm that they always promote the social responsibility of tourists to protect natural attractions, while 9.4% do so regularly. Nonetheless, this leaves 17.4% with whom local governments must work to achieve greater awareness (Table 4). Meanwhile, 78.5% claim to actively collaborate in programs, workshops, and training for the care and preservation of green areas, while 15.5% do so regularly. Similarly, 66.8% confirm that they always take into account the conservation of local resources. They also note a commitment from the local government, in which the municipality promotes action and awareness to maintain green areas in good condition. Excessively high tourist influxes are known to entail a series of negative aspects, e.g., environmental pollution, degradation of ecosystems, soil erosion, and even desertification (Drius et al. 2019). Challenges introduced by overtourism have also been reported in Barcelona, Amsterdam, and Rio de Janeiro (Brtnický et al. 2020). Our results indicate that, while the community is positively predisposed toward the preservation and care of the environment, it needs a more concrete understanding of what environmental sustainability encompasses. The entire community must be involved in developing plans and strategies, not only in terms of local knowledge but also in taking action and implementing sustainable tourism infrastructure, since the greatest threat to the planet is the construction of new infrastructure (Davenport and Davenport 2006). The seriousness of global environmental problems now requires rapid action at the highest level to avoid catastrophic degradation (Thommandru et al. 2021). Such actions are not only the responsibility of government, but also of each individual, each district, and each community, all of whom must help in any way they can to achieve this objective (Thommandru et al. 2021). SDGs 7 and 9 assert that tourism activity can incentivize national governments to renew infrastructure and modernize industry. When based on the use of renewable energy sources, this can contribute to reducing greenhouse gas emissions, mitigating climate change, and implementing new and innovative energy solutions (ONU 2022)

V. Results and Discussion

Within the 2030 agenda's framework, the World Charter for Sustainable Tourism +20 is recapitulated, recognizing that SDGs present an opportunity to direct tourism activity along inclusive and sustainable pathways (NacionesUnidas 2015a). The document thus stipulates that tourism must contribute effectively to reducing inequality, promoting peaceful and inclusive societies, achieving gender equality, and creating permanent opportunities for all. It also highlights that the ecological footprint of tourism can be significantly reduced, and that this process should drive innovation by developing green, inclusive, low carbon economies. Finally, it emphasizes that indigenous cultures, traditions, and local knowledge, in all their forms, must be respected and valued, underlining the importance of promoting the full participation of local communities and indigenous peoples in tourism development decisions that affect them (Urkullo 2015). Regarding the Peruvian legislative framework, tourism activity is governed by Law 29408, the general tourism law, which aims to promote, encourage, and regulate the sustainable development of tourism activity and is mandatory at all three levels of government: national, regional, and local. This legal framework applies to the development and regulation of tourist activity, and MINCETUR is the national governing body for matters related to tourism.

Article 3 of this law sets out the principles of tourism activity, which are: sustainable development, inclusion, non-discrimination, promotion of private investment, decentralization, quality, competitiveness, fair trade in tourism, tourism culture, identity, and conservation.

VI. Conclusions

Tourism was identified as a main focus for economic activity in La Florida, with more than 32% of the population employed primarily in this field. Moreover, the degree of influence between sustainable tourism and local development was found to be at a medium level. Thus, as tourist activities develop gradually, they contribute to improving the quality of life of locals, providing better job opportunities and entrepreneurship, and generating an economic boost. Nonetheless, it was noted that existing development is premature, since it is evident that income from tourism is below the average, with 12% of inhabitants not generating an income greater than 150 USD per month. Environmentally, the inhabitants were found to exhibit a positive awareness of the issue, since they have been undertaking activities to conserve their natural environment. The influence of professionals is needed, however, to help direct the community toward sustainability and to take advantage of natural sources of renewable energy. This might support the creation of sustainable accommodations, which would in turn increase the likelihood of tourists staying longer than one day. This would result in an increase in income to the inhabitants. The evaluation of local renewable energy potential revealed the existence of sufficient solar and wind energy for the generation of electricity through the use of photovoltaic systems and wind generators. It would easily be possible to meet the energy demands of a house-lodging in the study site, thus consolidating an alliance between tourism and the sustainable use of clean energy sources. This in turn has implications in reducing the fixed and variable costs associated with energy supply. It is worth mentioning that this research faces some limitations. Care must be taken when comparing our results with studies of other countries whose populations' standards of living, national legislation, geographical conditions, etc. may differ. Moreover, the carbon footprint linked to tourist activity in the study location is unknown. However, this work is presented in hopes of stimulating further research elsewhere to validate the tourism— renewable energy binomial and thus to motivate the practice of sustainable tourism in rural communities.

VII. References

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