

ORIGINAL

Improvements and issues in sustainable tourism to make Colombia a greener economy

Mejoras y problemáticas en el turismo sostenible para hacer de Colombia una economía más verde

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ABSTRACT

This article analyzes the evolution of sustainable tourism in Colombia, a crucial area for the prosperity and advancement of the nation. Despite its considerable potential, the tourism boom has triggered significant ecological and social difficulties. The initiatives presented aim to reduce the adverse impacts of tourism, such as greenhouse gas emissions and environmental damage, in line with the Sustainable Development Goals proposed by the UN. Government and private sector efforts are highlighted to promote sustainable practices, although obstacles such as high resource consumption, waste generation and lack of adequate infrastructure persist, also highlighting the importance of environmental education and access to financing for small businesses. and medium-sized tourism companies. Colombia, with its abundant and varied biodiversity in flora and fauna, has the potential to become a fundamental pillar when it comes to the tourism sector. However, it is essential to harmonize economic growth with environmental conservation and the preservation of cultural heritage to ensure a positive legacy for future generations. Policies should focus on improving the management and promotion of cooperation between industries to ensure successful growth of sustainable tourism.

Keywords: Sustainable Tourism; Green Economy; Ecotourism; Sustainability; Pollution; Conservation.

RESUMEN

El presente artículo analiza la evolución del turismo sostenible en Colombia, un ámbito crucial para la prosperidad y el avance de la nación. A pesar de su considerable potencial, el auge del turismo ha desencadenado importantes dificultades ecológicas y sociales. Las iniciativas presentadas tienen como objetivo reducir los impactos adversos del turismo, como las emisiones de gases de efecto invernadero y el daño ambiental, en línea con los Objetivos de Desarrollo Sostenible propuestos por la ONU. Se destacan los esfuerzos gubernamentales y del sector privado para promover prácticas sostenibles, aunque persisten obstáculos como el alto consumo de recursos, la generación de residuos y la falta de infraestructura adecuada, destacando también la importancia de la educación ambiental y el acceso a financiamiento para pequeñas y medianas empresas turísticas. Colombia, con su abundante y variada biodiversidad en flora y fauna, tiene el potencial de convertirse en un pilar fundamental cuando del sector turístico se habla. Sin embargo, es esencial armonizar el crecimiento económico con la conservación del medio ambiente y la preservación del patrimonio cultural para asegurar un legado positivo para futuras generaciones. Las políticas deben centrarse en mejorar la administración y la promoción de la cooperación entre industrias para garantizar un

crecimiento exitoso del turismo sostenible.

Palabras clave: Turismo Sostenible; Economía Verde; Ecoturismo; Sostenibilidad; Contaminación; Conservación.

INTRODUCTION

Tourism is integral to Colombia's economy and contributes to GDP and job creation. By 2023, tourism is projected to generate around 1,9 million jobs and account for 3,9 % of Colombia's GDP. Economic growth has resulted in pressing environmental and social issues, which have become crucial to solving the problem of sustainable tourism in recent decades.

Colombia has made its tourism industry more sustainable and environmentally friendly thanks to the UN's sustainable development goals. This approach not only aims to mitigate the adverse effects of tourism on the environment, CO2 emissions, and ecosystem degradation, but also to help Colombia's tourism industry transition to a green economy, taking into account various factors from resource efficiency and environmental preservation to social inclusion and cultural heritage protection. Colombia's biological and cultural diversity makes it a potential world leader in sustainable tourism.

The article focuses on Colombia's sustainable tourism initiatives and their challenges. Strengthening the industry's 'green' economy is necessary. It examines government initiatives, private sector initiatives, and international partnerships that facilitate this process. In addition, current obstacles are analysed, including the need to improve sustainable infrastructure, enhance environmental education, and encourage the adoption of green technologies in tourism.

METHOD

The research on sustainable tourism in Colombia, with an emphasis on a descriptive qualitative review of the literature, aims to explore the achievements and challenges of the sector as it moves towards a green economy. The method used in this study seeks to present a comprehensive and detailed picture of the essential requirements for sustainable development, including the necessary technologies, processes, and improvements. This promotes a broader understanding of the factors underlying innovation and its influence on economies and societies worldwide—the global community.

In addition, the method allows for a comprehensive assessment that includes collecting data on the progress of sustainable infrastructure, green labels, innovation strategies, and perspectives from key industry stakeholders, gathered from various sources and databases. A total of 50 documents and resources were collected, including digital libraries, academic databases, and a website focused on sustainable tourism. The sources used in this article are diverse and reliable, and this article comes from Google Scholar and Scopus, among other reliable sources of information for the argumentation of this article. Using descriptive qualitative research methods was considered essential for a comprehensive examination of the topic, and a comprehensive assessment was observed and analysed from various angles. By conducting a logical and in-depth analysis, information can be obtained on infrastructure developments that contribute to the transition to a green economy and their effects on the global economy and logistics.

RESULTS

Challenges and barriers to sustainable tourism in Colombia

The development and management of tourism in Colombia face significant sustainability challenges that are important for policymakers and planners. The need for sustainable tourism means reducing negative impacts and maximising benefits for local communities and the environment.⁽¹⁾ According to the Sustainable Tourism Policy implemented by the Colombian government, this approach aims to improve the quality of life and tourism practices to ensure balanced and sustainable development, one of Colombia's main challenges.⁽²⁾ Sustainable tourism in Colombia is:

- Resource consumption: Colombia's tourism industry faces high energy and water consumption, which challenges environmental sustainability. Tourism companies must adopt practices that promote the conscious use of these resources and minimise their environmental impact.⁽³⁾
- Waste generation: Waste management is also an important issue. Efforts should focus on reducing food waste, improving municipal and hazardous waste management, and promoting recycling and reuse in tourism.⁽⁴⁾
- Weak business environment: The business environment can be weak, especially in less developed regions. This limits investment capacity and job creation, affecting tourism sustainability in these regions.
- Skills shortages: Lack of education and training in specific skills in the tourism sector can hinder the implementation of sustainable practices. Investing in staff training and development is important to

improve service quality and promote responsible tourism. Limited access to finance: Access to finance is essential for implementing sustainable tourism projects. Policies should enable mechanisms for small and medium-sized enterprises to access financial resources to develop sustainable initiatives.⁽⁵⁾

High energy consumption and greenhouse gas (GHG) emissions

Globally, tourism is estimated to generate approximately 5.2% to 12.5% of global warming potential due to its relationship with transport, energy consumed in accommodation and other related activities.⁽⁶⁾ In Colombia, where tourism is a key economic driver, this poses significant challenges for environmental sustainability. The Colombian government has implemented several policies to address this issue. Among them are:

- Climate Change Management Plan for the Commerce, Industry and Tourism Sector (PIGCCS): This plan seeks to reduce emissions by 7,7 million tonnes of CO₂ by 2030
- Sustainability Initiatives: More than \$5,6 billion has been allocated to support sustainability in the tourism sector. This includes promoting circular economy practices and projects that seek to mitigate the effects of climate change in vulnerable tourist destinations.
- Environmental Education and Awareness: Training for micro, small, and medium-sized tourism enterprises (MSMEs) is crucial to improving sustainability. These companies are responsible for excessively consuming resources such as water and energy.

Inadequate waste management and treatment

The growth of the tourism industry in Colombia has led to a significant increase in waste generation, a phenomenon observed globally. Tourism generates more than one kilogram of solid waste per international tourist in Europe and up to two kilograms in the United States⁽⁷⁾. This situation is replicated in Colombia, where the lack of adequate waste management in tourist destinations can have serious environmental and social repercussions.

Tourism also directly affects water quality in Colombia. The discharge of untreated wastewater and excessive extraction of fresh water are significant problems. Tourist activities can introduce pollutants such as chemicals, which deteriorate aquatic ecosystems.⁽⁸⁾ In this context, local authorities must implement strict regulations for properly treating wastewater and promote sustainable practices among tourism operators.

Loss of biodiversity and habitat destruction

Colombia's biodiversity, considered one of the richest in the world, exposes the country to a wealth of natural resources on which the country's tourism industry depends. On the other hand, mass tourism could have enormous adverse impacts on biodiversity and ecosystems such as coral reefs,⁽⁹⁾ tropical forests, and wetlands. One example is the development of tourist resorts along the coast, which has destroyed wetlands, a problem affecting the coastline in several parts of the country.

By including biodiversity concerns in tourism management, many devastating environmental effects and conflicts with local communities will be avoided. The key, therefore, lies in developing a model that balances economic growth with the protection of natural capital so that Colombia's wealth in terms of biodiversity becomes a legacy that future generations will marvel at.⁽¹⁰⁾

Renewable energy

Energy is one of the essential elements of tourism activities. The link between energy and the environment, especially between concepts such as energy and sustainable development,⁽¹¹⁾ has been a term linked to the context of Colombia. According to global climate policies, the transition to renewable energy is one of the most important aspects for mitigating greenhouse gases in the tourism sector. It is therefore pointed out that a significant change in energy use within the tourism system in Colombia would have to involve promoting sustainable energy resources.

Innovation programmes: The tourism sector incorporates sustainable practices, and some of the best innovation programmes highlight the energy transition in Colombia.⁽¹²⁾ For example:

- Eco-friendly aircraft: promotion of flights with cleaner technologies.⁽¹³⁾
 - Renewable energy: Introduction of solar, wind, and bioenergy sources in hotels and resorts.
- Advanced energy technology is an advanced system that allows for greater energy use.

- Energy efficiency in hotels: LED lighting and water management systems
- Integration of renewable energies: Despite the potential, there are significant challenges in integrating renewable energies.⁽¹⁴⁾

- Intermittency: energy from renewable sources would therefore depend on weather conditions, and it would not be possible to guarantee a 'reliable' electricity supply.⁽¹⁵⁾ Another important issue is finding solutions for storing the energy generated to ensure a constant electricity supply.

Green transport and sustainable mobility

Sustainable tourism is closely linked to sustainable mobility, because tourism is always associated with travel by plane and bus. It has been observed that 72 % of CO₂ emissions in tourism come from transport, 24 % from accommodation, and 4 % from local activities.⁽¹⁶⁾ Specifically, air transport is responsible for only 17 % of all tourist travel, but still produces up to 43 % of total CO₂ emissions from travel.

Air travel is a significant source of carbon emissions in Colombia, which accounts for only a small portion of total tourist travel, but is very effective. For example, it has been found that CO₂ emissions from air transport are enormous compared to other modes of transport, as is the case globally, where they account for around 43 % of total CO₂ emissions from tourism.⁽¹⁷⁾ The case of Colombia is even more pronounced, as its air transport needs to connect remote regions and popular tourist destinations.

Governance, policies, and framework for sustainable tourism

This will significantly contribute to establishing an integrated approach to policy, regulation, and management in tourism development to ensure positive benefits. Policies, tools, and guidelines for effective governance that plan, guide, support, and coordinate sustainable tourism development should be established.⁽¹⁸⁾

Sustainable tourism can contribute to appropriate tourism development policy and management in Colombia to ensure that local and environmental benefits are achieved. The following are current initiatives by the Colombian government to support this:

- Diversification of the tourism product: The Ministry of Trade, Industry, and Tourism launched a pilot project in five municipalities in Caldas and one in Tolima, based on tourism diversification with a focus on climate change. In this regard, the project seeks to establish experiences within the tourism sector that can be converted into active adaptations to climate and natural phenomena, thereby promoting the conservation of natural attractions and reducing greenhouse gas emissions.⁽¹⁹⁾
- National Climate Change Adaptation Plan (PNACC): focused on reducing vulnerability to the risks posed by climate disruption by incorporating strategies that benefit local communities through the sustainable use of natural resources.⁽²⁰⁾ The disruption of tourism by these changes is important for tourism to be sustainable.
- Some community projects around Lake Tota involve promoting sustainable tourism as an adaptation strategy to the threats of climate change. The project aims to improve local livelihoods in a way that values cultural and natural diversity.⁽²¹⁾

Improving institutional networks and public-private sector participation

This will steer sustainable tourism development strategies in Colombia towards strong and effective cross-sectoral integration. The country's tourism industry will have to address key institutional and structural issues, bearing in mind that the economy's effectiveness in terms of tourism will largely depend on institutional agreements and structural frameworks that work within the socio-economic system.⁽²²⁾ Within this broad area of interest, various group efforts and consensus must be created to keep sustainable tourism in the mainstream of development.

Currently, Colombia has encountered the following challenges in the implementation of sustainable tourism:

- Regional inequality: This multifaceted phenomenon manifests in differences in economic and social progress between geographical regions.⁽²³⁾ This limits equitable access to resources and opportunities and creates an even more adverse environment for the launch of national sustainability policies.
- Lack of infrastructure: The lack of adequate infrastructure is one of the main factors contributing to the impediment of sustainable tourism development. Not only does it reduce the quality and capacity of the services provided, but it also detracts from the tourist experience, as tourists will be unable to reach certain places of great tourist interest.
- Environmental awareness: An environmentally sensitive tourist spirit attaches importance to environmental conservation. Consequently, it involves educating all stakeholders about the importance of these green practices, which will involve educating them or raising awareness about sustainable methods.⁽²⁴⁾

Creation of appropriate economic instruments

An integrated tourism management programme based on sustainability principles has everything to gain from a perspective that includes environmental, economic, social, and cultural factors.⁽²⁵⁾ Therefore, it has much to consider from a perspective that includes environmental, economic, social, and cultural factors. It will align the sector's visions with the regulatory frameworks and public policies in force within the sectoral plan.

- The management plan will, therefore, take into account the respective tourist area's uniqueness, not only in terms of occupancy but also in terms of the specific resources of that particular region.⁽²⁶⁾ This awareness will enable a more effective management approach that responds to local needs, ensuring

relevance and respect for the environment.

- Training should enable local communities to become significant players in the development of tourism so that they can obtain direct economic benefits and preserve their culture. Concrete measures to be taken in the field of sustainable tourism include training local communities, stimulating production, and promoting tourist products that respect the environment and culture.⁽²⁷⁾

- Supervision and monitoring: The performance or effectiveness of a tourism programme should be based on indicators that predict the economic and social impact on the host communities.⁽²⁸⁾ From this point of view, the evaluation process should not focus solely on quantitative results, but also on qualitative aspects that reflect the social and cultural well-being of the population concerned.



Figure 1. Integrating elements of sustainable tourism

New concepts in environmental protection

In the context of Colombia, the notion of smart tourism has emerged rather slowly but to integrate information and communication technologies and the Internet of Things in a synergistic way to improve the experiences of travellers and develop sustainably within the tourism sector.⁽²⁹⁾ This perspective not only makes tourism data personalised and tailored, but also focuses on two other important factors that must be taken into account in the case of a country such as Colombia, which is known for its great cultural and natural diversity: sustainability and connectivity

- Connectivity and availability of ICT: In Colombia, ICT infrastructure is essential for advancing smart tourism. Increasing internet connectivity in remote and rural areas and making real-time tourism information accessible will support the organisation of visitors' trips more efficiently.⁽³⁰⁾ This is particularly the case with Amazon and the Pacific, which have the lowest level of digital services.
- IoT for personalisation: Implementing IoT technologies could change a tourist's entire experience in Colombia. Sensor technology, for example, can provide statistics on the number of visitors flowing through tourist sites.⁽³¹⁾ This approach will be more effective and will be applied to resource management and tourism activities.
- Sustainability and environmental monitoring: Smart tourism also pursues sustainability. Along these lines, wireless sensor systems that consider tourism's impact on local ecosystems could help form environmental monitoring networks.⁽³²⁾ Thanks to this proposal, authorities and tourism companies can modify their tactics to reduce ecological impact and promote responsible behaviour.

Impact on health and well-being

The emergence of the COVID-19 pandemic has once again reinforced the importance of health and well-being in tourism. Today's tourists are interested in facilities where environmental and hygiene considerations and sustainability are at the top of the list. This change requires the Colombian tourism sector to raise its standards and adopt practices that keep water and energy use to a minimum and guarantee food safety. For example, promoting local food production through agrotourism reduces excessive dependence on imports,

thereby reducing the carbon footprint and growing local economies.⁽³³⁾

Key performance indicators (KPIs) as a method for measuring progress towards a greener economy

KPIs can be used to identify complex realities in practice. For example, Singh et al. 2012 have compiled a series of sustainability indices applicable in practice to sustainable development performance: innovation, knowledge, technology, development, market-based, and composite sustainability indices.⁽³⁴⁾ The Colombian context can be applied to KPIs in terms of sustainability and tourism, both qualitatively and quantitatively. This is essential for understanding and governing complex realities within the country's sustainable development.

Introduction of performance-based indices for innovation, technology and sustainable development: This complies with the recommendation of⁽³⁵⁾, for the application of composite indices in sustainability measurement.

- Sustainable tourism: the set of 143 indicators identified and used by⁽³⁶⁾ within wetland tourism and their potential applicability about metrics including, among others, visitor numbers, economic impact and ecosystem conservation.
- Economic performance: Monitor tourism-related programmes using KPIs such as sustainable tourism revenue, hotel occupancy, and customer satisfaction.⁽³⁷⁾
- Acoustic quality and conservation: A subsequent proposal⁽³⁸⁾ suggests that further indicators can be developed to measure a tourist destination's acoustic quality, which can influence the visitor experience and environmental conservation.
- Social and cultural indicators. Addressing the challenge through social indicators means that the respective native communities have a role in developing metrics that reflect their social and cultural realities. This could be an arduous task, as pointed out by.⁽³⁹⁾
- Companies could use CSR reports to reveal meaningful social indicators, such as the rate of community participation in tourism projects or people's perceptions of the economic benefits of tourism.⁽³⁸⁾

Case study: Taiwan's Green Island

Green Island has an area of 15,1 km² and is located in the Pacific Ocean, 33 km off the southeast coast of Taiwan. It was once a penal colony for political criminals and prisoners during martial law, but is now an ecotourism destination. In January 2010, the Taiwanese government launched a low-carbon city programme to develop ecotourism on several demonstration islands, including Green Island, to achieve a green economy.⁽⁴⁰⁾ In this regard, the multidisciplinary approach established in this case includes green energy, green transport, green buildings, a circular economy, SMI, and education/training programmes that have combined forces towards the development of sustainable tourism on Green Island. Green Island already has many integrated infrastructures, such as green energy, green buildings, and a lithium-ion battery (LIB) charging station for sustainable tourism on Green Island. For example, before the sustainable tourism programme, the Green Island's electricity supply was a 29 MW diesel power plant with 28 generator sets. Under this programme, six renewable energy installations have been installed on Green Island, including solar photovoltaic and wind energy.⁽⁴¹⁾ The average wind speed on Isla Verde, between 5 and 7 m/s, makes it ideal for installations that require wind as an energy source.

Prospects in Colombia

The tourism of the future will also depend on the potential for integrating sustainable practices that benefit both the environment and local communities. The concept of the circular economy clearly does not allow current economic growth to undermine the use of natural resources or the standard of living of the local population.⁽⁴²⁾

Transition to a green economy from the perspective of tourism companies

The reorientation of the tourism industry towards sustainability implies profound changes to the current form of tourism. These include developing and improving niches focused on natural, cultural, and social resources.⁽⁴³⁾ There is a balance between the monetary benefits of economic activities, such as the accumulation of tax revenues and jobs, and the benefits derived from ecosystem services, such as wildlife and clean water for leisure. This means that fundamental improvement objectives, such as increasing net tourism income, increasing biodiversity levels, and improving access to tourism, must contain economic, environmental, and social aspects.⁽⁴⁴⁾ Therefore, a multidisciplinary approach must provide a critical assessment of the contributions of tourism sectors to the SDGs to simultaneously address climate change and other competing priorities, such as poverty reduction and the green economy. It is equally important that the SCP guidelines are integrated into tourism-related policies and frameworks. If tourism businesses were more sustainable, green growth could be achieved, green jobs created, benefits for local communities increased, and public awareness raised to support SCP guidelines.⁽⁴⁵⁾ Tourism, through the effective transfer of income from developed to developing economies,

can provide an additional source of income for developing countries. All of this is related to the greening of an economy.^(46,47)

DISCUSSION

As the years pass, sustainable tourism gradually becomes an essential foundation for a country's social and economic development. This is especially true in the current context of a country in post-conflict times. By promoting responsible tourism, the aim is not only to maximise economic benefits, but also to address social, environmental, and cultural issues that affect local communities and visitors daily. This approach is essential to ensure that the growth of the tourism sector does not compromise our nation's environmental resources, but instead conserves them and, in the best-case scenario, enhances them.⁽⁴⁸⁾

One of the most notable aspects of sustainable tourism is the ability to generate a highly positive impact on the country's gross domestic product (GDP). Sustainable tourism is expected to generate up to \$7 billion, representing up to 15 % of national exports. This growth is interpreted in terms of economic benefits, promoting job creation, infrastructure improvements benefiting national communities, and, finally, implementing policies that promote sustainability in the tourism sector to maximise benefits.^(49,50)

According to Romero *et al.*⁽⁴⁶⁾ the new dynamics of tourism and the growth of the aforementioned sector have created many opportunities to promote sustainable and responsible practices, which are fundamental to the country's economic development.

All of the above, coupled with the possible end of armed conflict, allows us to consolidate and enter into many tourist destinations that were not viable or feasible in the past. This has led to a significant influx of foreign tourists and improved the perception of Colombia. In addition, the sector's dynamism promotes the conservation of natural and cultural heritage, which are essential elements for the sector's development.

Ultimately, sustainable tourism in our country represents an excellent opportunity to boost Colombia's economic development. But more than that, it presents us with a great challenge since all this can only be possible if collaboration between various actors is consolidated. Collaboration is a key element in ensuring that the tourism sector can be sustainable and highly beneficial for all. Adopting this model will not only be an ethical responsibility but also a smart strategy for a country's future.

CONCLUSIONS

Sustainable tourism is an essential pillar that can contribute to the growth and well-being of the Colombian population. However, it presents many problems that require swift action. While responsible and sustainable practices are crucial for job creation and the improvement of local communities and facilities, they contribute to broad GDP (gross domestic product) growth as long as they are developed with specific responsible and sustainable measures.

Nevertheless, over the years, the country has faced countless adversities. Regional contrasts, poor infrastructure, limited qualified personnel to carry out these practices, and difficult access to capital are just some of the barriers that prevent us as a country from moving towards a sustainable economy. To this, we can add the degradation of natural resources and the high amount of waste generated, which require immediate intervention through policies that promote environmental education and cooperation between different sectors to contribute to less degradation of our territory.

Implementing strategies such as supporting neighbouring communities neglected by the state, encouraging community projects, and promoting the use of renewable energies are small but positive steps that, although they do not have a major impact, are fundamental for the expansion and strengthening of the sector and contribute to mitigating the negative impacts of other types of tourism on the environment.

Ultimately, ensuring that sustainable tourism in the country is a prosperous sector that does not decline once implemented will depend solely on its cooperation with other relevant actors who are closely involved. From local communities and governments to private sector companies, all are included in a joint commitment to ensure the sector's growth without compromising our current resources, while working to conserve them and improve the quality of life of the local population.

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CONFLICT OF INTEREST

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