

Development and Sustainable practices in Rural Ecotourism: An Overview

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Abstract

Growing in popularity, rural ecotourism combines environmental protection with community-based activities to attract ecotourists looking for genuine experiences and boost local economies. However, it faces challenges such as environmental sustainability, financial limitations, and social implications. As the existing literature highlights, this study addresses technological integration, community-centric perspectives, creative business models, policy governance, and climate resilience. With an emphasis on stakeholder participation, new trends, and problems in rural ecotourism, this study uses interdisciplinary techniques to fill in the gaps in the current literature. Wellness, regenerative tourism, and the integration of digital technologies are key developments. According to the study, a sustainable balance between tourist development and environmental preservation can only be achieved by community engagement, legislative frameworks, technology integration, and sustainable practices. Ethical tourism, sustainable infrastructure, community empowerment, and international cooperation have all been suggested. Sustainable development, cultural preservation, and ecological conservation all come together in rural ecotourism, which requires stakeholder collaboration to ensure its global relevance and long-term success.

Keywords:

Rural ecotourism, environmental protection, sustainable development, cultural preservation, community empowerment

1.Introduction

Rural ecotourism, which integrates community-based activities with environmental preservation, is a growing sector within the global tourism industry. Travelers can simultaneously benefit the local economy and appreciate the great outdoors (Jin & Gao, 2025; Woldu, 2024). Among the challenges rural ecotourism encounters are sociocultural ramifications, economic limitations, environmental concerns, infrastructure and management concerns, and technology integration (Oltean et al., 2025; Purba et al., 2023). Environmental sustainability is critical due to the detrimental effects of unregulated tourism on ecosystems, marine life, and wildlife. Striking an equilibrium between accommodating a surge in tourist activity and preserving the environment is an ongoing challenge (Gao et al., 2023). Community members must be entitled to an equitable portion of economic benefits, as sociocultural consequences such as commercialization or loss of cultural



significance may ensue. The region is burdened financially by the over-commercialization of attractions, the depletion of natural resources, and the absence of adequate waste management systems and visitor centers (Amalu et al., 2018; Egbali et al., 2011; Howitt & Mason, 2018; Kirkby et al., 2010).

Development components include technology integration, sustainable practices, community participation, and legislation. Rural ecotourism can become more sustainable by incorporating sustainable practices, involving local communities in decision-making, and supporting cultural preservation (Gabriel-Campos et al., 2021; Howitt & Mason, 2018). To promote the sustainable development of ecotourism, it is imperative that governmental bodies and relevant stakeholders establish conducive policy environments, enforce regulations, and provide incentives. Integrating technology into rural ecotourism can significantly enhance visitor experiences, facilitate the management and promotion of sustainable tourism, and attract more visitors (Silva, 2022; Sun et al., 2021). Based on the findings of Nugroho et al. (2016) and Sun et al. (2021), incorporating comprehensive pre-planning, engaging stakeholders, and implementing flexible management strategies are necessary to address the paradoxical challenges and prospects that arise from this research.

Additional research is required to address certain voids in the literature. Technological integration, community-centric perspectives, novel business models, policy effectiveness and governance, climate change resilience, and studies that concentrate on a specific environment or period are all areas that need more research (Dwivedi et al., 2022; Guandalini, 2022). While neglecting to consider context-specific concerns sufficiently, most current research provides overarching frameworks and perspectives that impact the intricacies of rural ecotourism. More longitudinal studies have been conducted to examine temporal changes, the emergence of patterns, and the efficacy of adaptive methods (Fan, 2020; Morales-Hernández et al., 2022). These research deficiencies must be filled to foster innovation, promote sustainable practices, and advance knowledge in rural ecotourism.

This study addresses these disparities by implementing interdisciplinary approaches, engaging diverse stakeholders, and exploring emerging trends and challenges within the ever-evolving domain of rural ecotourism. Accomplishing this will enable researchers to significantly contribute to developing theories, formulating policies, and practically applying the field. The scope of this study encompasses rural ecotourism and incorporates adaptive management, ongoing evaluation, and monitoring. This study examines emerging trends, innovative approaches, and policy implications to guide sustainable development in this industry's rapid expansion. This study contributes to the broader discourse on sustainable tourism, community empowerment, and environmental conservation by examining the interplay between challenges and advancements in rural ecotourism.

2.Sustainable Practices, Ecological Impacts and Growth Factors in Rural Ecotourism

2.1 Importance of sustainable practices in rural ecotourism

To ensure the longevity of rural ecotourism initiatives, this paper examines the advantages and disadvantages of sustainable approaches and emphasizes the importance of integrating ecological, social, and economic

sustainability. To preserve the integrity of the ecosystem, ecotourism in rural regions must employ sustainable practices (Gabriel-Campos et al., 2021; Ramaano, 2025). The International Union for the Conservation of Nature and local environmental organizations have provided recent statistical evidence establishing a direct correlation between unsustainable tourism practices and environmental degradation (Tilavova et al., 2024). It is vital to implement sustainable practices, including proper waste management, habitat preservation, and carrying capacity adherence, to mitigate the severity of such repercussions (Abiddin et al., 2022; Rajabi et al., 2021).

In addition to considering environmental implications, sustainable approaches in rural ecotourism also prioritize social benefits. Improving social welfare in rural areas is achieved by implementing sustainable practices prioritizing cultural sensitivity, equitable labor standards, and local community engagement (Abdurakhmanova & Ahrorov, 2025; Yanan et al., 2024). Rural ecotourism depends on long-term financial success, and new data indicates that sustainable practices bear fruit. According to a study by the World Travel & Tourism Council (WTTC), sustainable tourist destinations experienced a fifteen percent increase in tourism-related GDP growth over the preceding five years, surpassing non-sustainable competitors (Amalu et al., 2018; Rahimian et al., 2022). Sustainable practices, such as community-based tourism and responsible resource management, ensure the economic viability of rural regions and bolster their long-term economic resilience (Jackson, 2025).

Recognizing the importance of sustainable behaviors also requires a candid analysis of the challenges that impede their implementation and potential remedies. Recent data from the United Nations Environment Programme (UNEP) indicates that a need for more comprehension and application of sustainability criteria gives rise to significant obstacles. Conversely, instances of destinations that have effectively executed sustainable ecotourism methodologies, such as Costa Rica, illustrate how such barriers can be surmounted (Shah, 2020). The strategy should include business incentives for sustainable practices, stakeholder education, and robust regulatory frameworks. In conclusion, the emphasis of rural ecotourism on sustainable practices is vital from an ethical and strategic perspective (Gabriel-Campos et al., 2021). This study showed that the tangible benefits highlighted include ecological preservation, economic prosperity, and community well-being. This summary paper advocates for a comprehensive approach that urges policymakers, businesses, and communities to adopt sustainable practices as the fundamental basis for developing rural ecotourism. We can thus pave the way for a future in which the development of rural ecotourism is environmentally sustainable and positively impacts the livelihoods of the local population (Abiddin et al., 2022; Rajabi et al., 2021).

2.2 Impact of Ecotourism on local Ecosystems and propose conservation strategies

Ecotourism is often hailed as a sustainable alternative to conventional tourism, combining economic development with environmental conservation. Recent meta-analyses by Rhama (2020) and Roberts et al. (2022) has revealed that ecotourism has both positive and negative impacts on the ecosystem. An advantageous outcome is the increased allocation of funds towards conservation activities. Protected area budgets saw a 20% boost in locations driven by ecotourism. Specific ecotourism areas are experiencing a significant decline of 15% in biodiversity, associated with habitat degradation, pollution, and disturbance to wildlife. Improper management of ecotourism can significantly damage indigenous ecosystems (Heshmati et al., 2022). Ijeomah & Aiyeloja (2009) and Newsome (2020) indicated over 25% of the environmental degradation in the ecotour-



ism destinations. If issues such as unregulated tourist influx, inadequate garbage disposal practices, and insufficient infrastructure development are not resolved, these problems can be exacerbated. Disruptions to the indigenous plant and animal species may result in population declines and alterations to ecological systems (Purba et al., 2023).

An important advantage of ecotourism is its potential to provide economic incentives for conservation initiatives. Effective ecotourism management can lead to a 30% boost in local revenues. A positive feedback loop will occur as the generated revenue can be reinvested in conservation initiatives. However, ensuring these financial gains are allocated towards long-lasting conservation activities takes time and effort (Gössling & Lane, 2014; Li et al., 2023). Ecotourism implements strict carrying capacity control to prevent habitat degradation and overcrowding. The number of visits is monitored in real-time through sophisticated technologies like geolocation analysis. In order to mitigate adverse environmental impacts, the utilization of renewable energy sources and the implementation of low-impact infrastructure designs are being employed (Dorobantu & Nistoreanu, 2012; Nguyen, 2021; Yang et al., 2021). Both residents and tourists are encouraged to actively engage in and acquire knowledge about the town through educational activities. Scientific research is employed to examine the impact of ecotourism on local plant and animal life through extensive biodiversity monitoring programs to inform adaptive management plans (Ramaano, 2025; Zainal et al., 2024). Ecotourism funds are allocated to local conservation projects using transparent financial mechanisms. Community-managed funds place a high importance on ensuring long-term ecological sustainability (Kim et al., 2019; Shang et al., 2020; Shannon et al., 2017).

This study critically analyzes the impact of ecotourism on local ecosystems, utilizing up-to-date statistical data to substantiate its arguments. To contribute to the ongoing discourse on responsible tourism, this study recognize the advantages of ecotourism and propose conservation strategies that prioritize sustainability. The proposed strategies offer a clear plan for ecotourism practitioners, conservationists, and policymakers to achieve a harmonious coexistence between economic development and the protection of irreplaceable ecosystems.

2.3 Factors contributing to the Development of Rural Ecotourism

Rural ecotourism, a growing industry, is influenced by various factors contributing to its development. Tourist interest in locations with unique cultural and natural features has increased by 22% over the last decade, according to a new study by the (United Nations World Tourism Organization (UNWTO), 2023). While these assets are part of rural ecotourism's allure due to their singularity, their protection is paramount. The danger of overexploitation and deterioration grows in proportion to the increase in demand. For this reason, it is essential to employ sustainable management strategies to balance the attraction and preservation of unique assets (Gao et al., 2023, Li, 2013 and Randall and Rollins, 2009). According to Chapman et al. (2022), funding for ecotourism in rural areas has climbed by 15% worldwide. Overdevelopment, lax enforcement, and a lack of community involvement are some of the problems that can prevent rural ecotourism from growing sustainably. Finding a middle ground between expansion and preservation is crucial for policymakers. Although community participation and involvement are crucial, sustainable growth of rural ecotourism can be hindered by issues like the commercialization of local culture and the unequal distribution of benefits (Han et al., 2025; Yanan et al., 2024). For local communities to feel truly empowered, they must be included in

decision-making procedures that respect their culture and distribute economic advantages fairly (Khan et al., 2021; Özgüt & Akanyeti, 2022; Panzer-Krause, 2022; Yang et al., 2021).

Chen et al. (2022) revealed that there has been a yearly increase of 20% in online bookings for rural ecotourism excursions. While technology does make things more accessible, critics point out that there are drawbacks, such as the possibility of over tourism and the watering down of genuine experiences. Finding a middle ground between being too technological and being too fake is critical. Despite ecotourism's emphasis on sustainability, some companies engage in greenwashing and fail to apply sustainable methods adequately (Chon & Hao, 2024). The ecological impact can be minimized, and rigorous certification criteria, public reporting, and continuing evaluation can maintain real conservation efforts (Mekonnen et al., 2022; Rahimian et al., 2022; Rezaeinejad & Khaniwadekar, 2021; Samal & Dash, 2023a).

Several reasons contribute to expanding the rural ecotourism industry, which supports conservation and sustainable development. An impressive 38.16% increase in tourist arrivals to ecotourism locations in 2021 was recorded by Department of Tourism, Philippines (2022), showcasing the allure of the country's distinct features. Sustainable development can be traced back to ecotourism, fueled by different cultural and environmental attractions in countries like the Philippines and China. Government policies and assistance greatly influence the expansion of rural ecotourism. It creates an enabling environment for its development (Ha Van et al., 2024; Salman et al., 2024). For rural ecotourism to succeed, local communities must be actively involved and empowered. Communities involved in decision-making, providing genuine cultural experiences, and sharing economic advantages are more likely to see ecotourism flourish sustainably, which is good news for the economy (Duong et al., 2024). According to the China Tourism Academy, online reservations for rural ecotourism experiences increased by 25% each year in 2021, proving the power of digital marketing and platforms (Baloch et al., 2023, 2023; Özgüt & Akanyeti, 2022).

At a rate of 15% every year, more and more ecotourism spots worldwide are getting sustainable certification in 2012. This shows that people are getting serious about protecting the environment. Rural ecotourism has grown in recent years, and one of the main reasons for this is the increased emphasis on sustainable practices and environmental protection (Habibullov et al., 2024; Samal & Dash, 2023b). It is becoming increasingly important to balance the growth of tourism with environmental responsibility, as seen in the increasing awareness and adoption of eco-friendly techniques in both China and the Philippines (L. Chen et al., 2022; Üzülmöz et al., 2023).

To sum up, rural ecotourism development is a complex process that necessitates analysis. There is statistical evidence of good trends, but a balanced view is needed to spot any dangers. The compelling argument is based on maintaining a balanced approach, which includes safeguarding cultural and natural assets' uniqueness, assessing the effects of government policies, getting the community involved, finding a balance between technology and authenticity, and adhering to strict sustainability and conservation standards. To ensure that development is synonymous with responsible and sustainable progress, this crucial overview calls on stakeholders to navigate the difficulties of rural ecotourism with care. In order to build development strategies that preserve the cultural and biological diversity of rural locations while simultaneously increasing tourism, it is crucial to understand and use these characteristics. If rural ecotourism is to reach its full potential, it will require both strategic and adaptable approaches.



3. Future Trends and Innovations

Sustainable development, community participation, digital technologies, regenerative practices, wellness experiences, educational opportunities, collaborative collaborations, and stakeholder involvement are the key components of rural ecotourism, which is on the rise. Responsible tourism, environmental protection, cultural preservation, social and economic progress, and overall health are all on the rise, and these trends reflect that. The main points of attention are integrating local communities into conservation efforts, recovering habitats, encouraging responsible travel, and striking a balance between environmental protection and tourism (Abiddin et al., 2022; Ma et al., 2020; Rezaeinejad & Khaniwadekar, 2021).

Another growing trend is community-based tourism, which emphasizes local involvement, empowerment, and social and economic advantages. When it comes to making decisions, planning, and managing tourism operations, local communities are essential. They are the ones that showcase cultural traditions, provide authentic experiences, and share the advantages that come from tourism. Strength, pride, ownership, and progress are nurtured in the community (Lu et al., 2022; Rasool et al., 2021; Rodríguez-García et al., 2023). In rural China, for instance, there is a rising interest in promoting cultural experiences, heritage tourism, indigenous knowledge, storytelling, festivals, arts and crafts, cuisine, music, dance, and traditional lifestyles. This has led to an upsurge in the popularity of cultural experiences and heritage tourism. Rural ecotourism hotspots provide visitors various outdoor activities, scenic views, adventure possibilities, and leisure options (Sun et al., 2021; Zhao et al., 2020; Zhong et al., 2008).

Travelers are increasingly drawn to experiential and genuine tourism to interact with local people, customs, nature, and culture through deep, meaningful, and life-changing events. By improving accessibility, connectivity, marketing, booking, payments, customer engagement, sustainability monitoring, and data-driven decision-making, digital technology, online platforms, mobile applications, virtual reality, augmented reality, and digital storytelling are transforming rural ecotourism. Positive effects on social, cultural, ecological, and economic systems are the primary goals of regenerative tourism. Efforts aim to restore ecosystems, bolster regional economies, revive cultural practices, build resilient communities, encourage sustainable behaviors, and secure advantages for generations to come (Chang et al., 2018; Khan et al., 2021; Oduor, 2020 and Patel & Anuragi, 2023).

Travelers looking for peaceful rural settings to relax, rejuvenate, get mental health benefits, and generally improve their health are driving growth in the wellness, health, and mindfulness tourism industry. This sector includes yoga retreats, spa experiences, mindfulness practices, health-focused activities, eco-therapy, and wellness-oriented programs. Travelers, communities, stakeholders, and future generations benefit from educational tourism, including hands-on workshops, skill-building programs, nature interpretation, guided tours, environmental education, sustainability, and cultural immersion experiences (Chapman et al., 2022; Kobori & Primack, 2003 and Zhong et al., 2008). Promoting sustainable development, innovation, resilience, and inclusion in rural ecotourism requires establishing collaborative partnerships and actively engaging stakeholders. Addressing challenges, leveraging opportunities, scaling initiatives, replicating successful models, ensuring equitable benefits, and fostering a resilient, inclusive, and sustainable rural ecotourism sector in China and beyond requires continuous efforts, investments, policies, incentives, regulations, monitoring, evaluation, adaptive management (Lu et al., 2022; Qin et al., 2011 and Zhao et al., 2020).

One potential strategy to improve guest experiences, encourage environmental protection, assist community development, and cultivate long-term sustainability in rural ecotourism is the combination of sustainable practices and technology. Travelers can virtually explore rural ecotourism destinations through digital platforms and internet access, such as virtual tours and augmented reality programs (Loureiro et al., 2022). This enhances anticipation, engagement, and education. Online booking systems and mobile applications improve accessibility, convenience, and consumer happiness. Sustainable development and energy efficiency rely on renewable energy sources, green building practices, and eco-friendly building materials (Abiddin et al., 2022; Randall & Rollins, 2009 and Samal & Dash, 2023). Utilizing Internet of Things devices and sensors, rural ecotourism destinations may implement smart management strategies, optimize resources, monitor the environment, conserve wildlife, and run sustainable operations. Rural ecotourism regions can benefit greatly from GIS and remote sensing technologies in planning, conservation, land use management, monitoring biodiversity, ecosystem restoration, and resilience building (Liu et al., 2022; Petursson & Kristofersson, 2021; Purba et al., 2023 and Yang et al., 2021).

Important parts of this integration include raising awareness, educating people, and using digital learning tools. Digital content and e-learning platforms promote sustainability education, capacity building, skill development, information sharing, and awareness raising among stakeholders, communities, and future generations (Constantin et al., 2022; Dwivedi et al., 2022; Nguyen, 2021; Panzer-Krause, 2022). Cultural preservation efforts, virtual museums, storytelling platforms, multimedia content, and digital technology all work together to preserve the cultural heritage for future generations. In order to foster the growth of rural ecotourism, it is crucial to involve the community and implement social innovations (Chen et al., 2018; Constantin et al., 2022; Kaltenborn et al., 2019 and Loureiro et al., 2022). When developing rural ecotourism, digital marketing, and social media tactics boost exposure, branding, outreach, customer engagement, stakeholder communication, and cooperation. By utilizing crowdfunding platforms and collaborative economy models, rural ecotourism can achieve its goals of community empowerment, economic support, alternative livelihood generation, innovation promotion, entrepreneurship, and fair benefit sharing. Ultimately, rural ecotourism incorporating sustainable practices and technology can provide visitors, locals, and ecosystems with experiences that are one-of-a-kind, genuine, educational, unforgettable, and long-lasting. This can all happen while also helping people adapt to a world that is always changing (Löhr et al., 2021; Mekonnen et al., 2022; Wani et al., 2023).

4. Conclusion

Rural ecotourism represents a significant change in the global tourism industry since it combines cultural immersion, environmental preservation, and sustainable development. The achievement of this undertaking relies on the intricate network of cultural genuineness, community involvement, and environmental preservation. Costa Rica's Monteverde Cloud Forest Reserve, Namibia's community-based conservancies, and China's Zhangjiajie National Forest Park are all locations that place high importance on responsible tourist management, active involvement of local communities, and the preservation of biodiversity. Nevertheless, this comprehensive investigation reveals other challenges that hinder the successful development of rural ecotourism, including inadequate infrastructure, apprehensions regarding cultural conservation, and potential



environmental degradation. Several global examples demonstrate the importance of integrating indigenous knowledge, promoting community ownership, and developing robust regulatory frameworks. Notable instances include the Great Bear Rainforest in Canada and Vatnajökull National Park in Iceland.

In addition, emerging trends in rural ecotourism emphasize wellness experiences, regenerative tourism, and incorporating digital technologies. Stakeholders may effectively address obstacles and optimize advantages to ecosystems and local communities by leveraging technology, such as digital platforms and IoT devices. In essence, rural ecotourism encompasses not only the act of observing picturesque locations but also acquiring the knowledge and skills to coexist harmoniously with the environment. Amid worldwide endeavors to tackle sustainability, rural ecotourism is gaining significance as a model for ethical and holistic development and a sustainable economic approach. If governments, businesses, communities, and travelers collaborate to promote sustainable practices, rural ecotourism may persist as a positive catalyst for change and conserving our planet's cultural diversity and ecological wonders, ensuring their preservation for future generations.

4.1 Implications

Rural ecotourism has the potential to bring about a significant transformation in sustainable development due to its positive impact on economic growth, environmental protection, and cultural preservation. The participation of communities, businesses, and lawmakers is vital to formulate strategies that respect local customs, protect ecosystems, and ensure equitable economic benefits. The efficacy of ecotourism initiatives such as the Monteverde Cloud Forest Reserve and community-based conservancies in Namibia underscores the imperative of community empowerment. Elements of the legislative framework, such as sustainable transportation choices, waste management systems, and visitor quotas, can contribute to achieving a harmonious balance between satisfying tourists and conserving the environment. Ecotourism's educational component is enhanced by offering visitors to rural regions opportunities to learn about local ecosystems, cultures, and sustainable practices. This is achieved through educational programs, workshops, and interpretative experiences, all of which aim to promote environmental stewardship. Technological integration enables the implementation of innovative solutions that can enhance resource management and optimize tourist experiences in rural ecotourism. The solutions encompass digital platforms, Internet of Things devices, and social media. However, to improve the authentic rural experience, technology should be included while carefully considering the local environment. As rural ecotourism continues to evolve, global collaboration and knowledge-sharing among countries will become imperative. In order to stay current with the latest trends and advancements, stakeholders involved in rural ecotourism must demonstrate adaptability while adhering to essential concepts such as cultural authenticity, community engagement, and sustainability.

4.2 Recommendations

An effective approach to promote the growth of rural ecotourism involves fostering ethical tourist practices and addressing infrastructure challenges through collaboration among community members, businesses, and governments. The involvement of local communities in decision-making and benefit-sharing processes strongly depends on community empowerment. In order to guarantee the preservation of the environment and its long-term viability, it is necessary to implement sustainable practices. These encompass energy preservation, waste control, habitat protection, and rigorous conservation criteria. Facilitating authentic cultural inter-

actions while respecting local traditions and customs is crucial to cultural conservation. In order to address the challenges related to rural ecotourism, such as the requirement to enforce sustainability criteria, monitor the impacts of tourism, and ensure compliance with conservation principles, it is necessary to establish regulatory frameworks. Developing initiatives that promote awareness and educate travelers about the cultural significance of locations, the imperative to preserve natural resources, and the adoption of responsible travel practices is crucial. The primary emphasis in smart infrastructure development should be on implementing sustainable transportation options, environmentally conscious accommodations, and fostering harmonious integration with the natural surroundings. Destinations may enhance their guest experiences by implementing digital integration. Participating in capacity development programs is crucial for equipping local communities, businesses, and politicians with the necessary information, training, and tools to establish and manage ecotourism initiatives in rural areas focusing on sustainability.

Studying and adapting the most efficient rural ecotourism practices worldwide, such as those found in Bhutan's Royal Manas National Park, Norway's Lofoten Islands, and Costa Rica's Monteverde Cloud Forest Reserve, is crucial. Ecotourism in rural areas can contribute to the growth of local economies by providing employment opportunities, generating tax money for local businesses, and fostering an upsurge in entrepreneurial endeavors. Established monitoring and evaluation systems can provide a clearer understanding of the impacts of rural ecotourism on ecosystems, communities, and economies. If all parties involved adhere to these ideas, rural ecotourism projects can provide advantages to residents, natural resources, and tourists while being socially and environmentally conscientious, sustainable in the long run, and culturally authentic.

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there is a significant increase in the demand for tourism visits come from foreign and domestic tourists. This needs to be anticipated by all stakeholders in the all regions. This can be conducted through the following efforts, i. e. (i) to develop products with an emphasis on education, (ii) to develop entrepreneurship in managing tourism services, (iii) to strengthen leadership for guiding a conservation vision, (iv) to develop infrastructure with regard to the carrying capacity of the environment, (v) to develop homestay as a place of learning development for products and services, and services standards, (v) to promote rural tourism and environmental values elsewhere.

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