Biodiversity Conservation through Agro-Tourism: A Case Study of Saguna Baug, Maharashtra

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Abstract- The growing urgency of biodiversity conservation demands integrated solutions that balance ecological, economic, and social priorities. Agrotourism has emerged as a powerful model where tourism and sustainable agriculture intersect to serve the dual goals of rural development and environmental stewardship. This study explores the role of agrotourism at *Saguna Baug*, a pioneering eco-tourism farm located in Neral, Maharashtra, in advancing biodiversity conservation. As a model farm established in 1985, Saguna Baug exemplifies sustainability through its practices in organic farming, water conservation, wildlife protection, and educational tourism.

Using a structured questionnaire and a sample of 65 visitors, the study assesses awareness, attitudes, and participation in conservation-oriented activities. Both descriptive and inferential statistical methods were employed to analyze responses across demographic segments and their experience levels. Key findings reveal a strong correlation between participation in ecotourism programs and a heightened awareness and commitment to biodiversity protection. Visitors with prior environmental knowledge demonstrated higher engagement in eco-friendly practices, while awareness programs significantly influenced post-visit behavior.

The study confirms the transformative role of agrotourism in shaping sustainable behavior, especially among young and first-time visitors. It further identifies existing communication gaps and recommends strategies such as interactive exhibits, previsit digital resources, and stronger community involvement to enhance the conservation impact.

Ultimately, Saguna Baug offers a replicable model for harmonizing tourism with conservation. This research contributes to policy dialogues on eco-tourism and biodiversity conservation and provides data-driven recommendations to expand the impact of agro-tourism initiatives in India and beyond.

Keywords- Agro-tourism, Biodiversity Conservation, Eco-tourism, Environmental Awareness, Sustainable Tourism

I. INTRODUCTION

In the face of escalating ecological degradation, the need for models that integrate development with environmental sustainability has never been more critical. Among such models, agro-tourism has emerged as a creative and impactful solution, particularly in rural India. Agro-tourism allows visitors to experience rural life and farming practices while promoting sustainable livelihoods and environmental education. It provides a platform for communities to showcase local biodiversity and promote awareness among tourists.

One such exemplar is *Saguna Baug*, located at the foothills of Matheran in Maharashtra. Founded by Gandhian agriculturist Harikaka Bhadsavle, this 55-acre farm is a living demonstration of ecological harmony. With activities like organic rice farming, beekeeping, pisciculture, and guided nature walks, the farm provides a full immersion into eco-friendly living. Moreover, it champions the *Saguna Rice Technique* (SRT), a no-tillage farming method promoting soil conservation and biodiversity protection.

The need for such integrated models is underscored by the growing biodiversity crisis. India, though rich in natural ecosystems, faces threats due to unsustainable agriculture, urban expansion, and climate change. Conservation efforts are often government-led, but grassroots and communitydriven interventions—like Saguna Baug—can play an equally vital role. They not only help preserve native species but also instill a sense of ecological responsibility in visitors.

This research evaluates the effectiveness of Saguna Baug's agro-tourism model in enhancing biodiversity awareness and promoting sustainable practices. It focuses on three core areas: the impact of eco-tourism activities on visitor awareness, the role of prior knowledge in sustainable behavior, and the influence of awareness programs on conservation commitment. Through a combination of quantitative and qualitative methods, the study aims to provide actionable insights for policy makers, tourism operators, and educators.

Ultimately, the goal is not just to document a case study, but to highlight the broader potential of agrotourism as a driver of environmental change—linking conservation with community empowerment and experiential education.

II. LITERATURE REVIEW

The literature on agro-tourism and biodiversity conservation highlights a growing consensus on the need for sustainable tourism practices. Globally, several studies have emphasized how eco-tourism can support biodiversity goals when integrated with community participation and education.

International Reviews:

- 1) UNWTO's Biodiversity and Sustainable Tourism Case Studies (2020) document how tourism, when well-regulated, can aid in conservation by providing economic alternatives to destructive practices. A key takeaway is the importance of stakeholder collaboration and sustainable planning.
- 2) The FAO Global Collection of Good Practices (2019) emphasizes the role of sustainable farming systems that incorporate conservation strategies. These systems support both agricultural and wild biodiversity, particularly when they involve community stewardship.
- 3) Agroecology Case Studies in Africa (World Agroforestry Centre, 2018) highlight knowledge-intensive, participatory farming models that preserve biodiversity while improving livelihoods. These models often use traditional knowledge systems as a foundation for sustainable practice.
- 4) Community Agrobiodiversity Management studies from SEPLS (2021) demonstrate that local management of agrobiodiversity contributes significantly to ecosystem resilience and food security, suggesting a strong link between rural tourism and conservation.

Indian Reviews:

1) *Kumar & Patel (2020)* discuss agro-tourism in the Western Ghats and its role in reviving

traditional knowledge and promoting sustainable land use. The study found that eco-tourism increased visitor appreciation of local flora and fauna.

- Gupta & Sharma (2021) conducted a case study of the "Farm of Happiness" in Maharashtra, highlighting how organic farming and tourism can coexist to conserve biodiversity while generating rural income.
- 3) *Das & Chatterjee (2021)* emphasize the transformative power of eco-tourism programs in shaping visitor behavior, particularly among students. Their study supports the view that immersive environmental education fosters long-term conservation commitment.
- 4) The Ministry of Environment, Forest and Climate Change (2023) underlines agro-tourism as part of its National Strategy for Biodiversity Conservation, advocating for nature-based solutions through tourism to achieve SDG goals.

Overall, literature confirms that agro-tourism, when implemented ethically and inclusively, can be a potent strategy for biodiversity conservation. It educates, empowers, and provides sustainable income—all while reinforcing environmental values.

III. METHODOLOGY

This study employed a quantitative research design to assess visitor awareness, participation, and perception of biodiversity conservation at Saguna Baug. A sample of 65 respondents was selected using stratified random sampling, representing various age groups and visitor profiles. Data was collected using a structured questionnaire consisting of closed and open-ended items covering demographics, prior experience, conservation awareness, and post-visit behavioral intentions.

Surveys were conducted both online and on-site, supplemented by direct field observations of ecotourism and farming activities. The collected data were analyzed using descriptive statistics (percentages, frequencies) and inferential statistics (Pearson correlation, chi-square, and t-tests) to test the research hypotheses. Ethical considerations, including informed consent and respondent anonymity, were strictly followed throughout the study.

Data Analysis

The descriptive analysis revealed significant trends in visitor engagement and conservation awareness. The majority of visitors (35%) belonged to the 26–40 age group, indicating that eco-tourism appeals most to young professionals and families. Notably, 55% had prior agro-tourism experience, which correlates with higher initial awareness of biodiversity issues.

Visitors primarily cited "exploring biodiversity and nature" (50%) and "leisure" (40%) as motivations for visiting. However, only 65% were aware of specific conservation initiatives at Saguna Baug, highlighting a communication gap for first-time visitors. Participation in awareness programs such as birdwatching and eco-talks stood at 60%, yet 20% of visitors were unaware of these offerings.

Importantly, 52% of respondents reported a significant increase in awareness post-visit, while another 32% reported slight improvement. This shows the educational potential of the site. Additionally, 55% frequently or always practice eco-friendly habits at home, and 74% expressed willingness to recommend agro-tourism as a tool for environmental education.

These insights suggest that while Saguna Baug is effective in promoting sustainability, there is scope for better outreach, particularly toward new or unaware visitors. Tailored programs, clearer signage, and engaging content can improve the depth and reach of its impact.

Inferential Analysis

Inferential statistics provided robust evidence supporting the study's hypotheses.

H1 posited that participation in agro-tourism positively influences perceptions of biodiversity conservation. A Pearson correlation test revealed a strong, statistically significant correlation (r = 0.82, p < 0.001), confirming that visitors who engaged in conservation activities were more likely to perceive Saguna Baug as a major contributor to environmental protection.

H2 explored whether prior knowledge of conservation correlates with sustainable habits. The Chi-square test ($\chi^2 = 18.56$, p = 0.003) showed a significant relationship. Visitors with prior knowledge reported higher frequency of eco-friendly behaviors such as waste segregation and water conservation.

H3 examined the impact of biodiversity awareness programs on post-visit conservation commitment. An independent t-test comparing program participants with non-participants showed a significant difference in commitment scores (t = 4.72, p < 0.001), validating that experiential learning enhances visitor motivation to act sustainably.

These findings indicate that well-designed ecotourism experiences, enriched by education and prior awareness, can significantly enhance conservation outcomes. They also highlight the importance of targeting educational efforts both before and during visits to maximize impact.

IV. CONCLUSION

The findings of this study confirm that agro-tourism, when executed with a focus on education and engagement, can serve as a catalyst for biodiversity conservation. Saguna Baug, through its holistic model of sustainability, offers an insightful case study for understanding how rural tourism can be transformed into an instrument of ecological change. Participation in eco-tourism activities was shown to directly enhance awareness and appreciation for biodiversity among visitors. The hands-on, immersive experience at Saguna Baug enabled tourists-especially younger and first-time visitorsto understand ecological challenges and reflect on their personal consumption patterns. Visitors not only observed sustainable farming techniques and conservation strategies but also became emotionally and intellectually engaged in the cause.

Another key takeaway is the power of education in fostering sustainable behavior. Those with prior knowledge of environmental issues were more inclined to adopt eco-friendly practices. Additionally, the post-visit impact of awareness programs was substantial—visitors who attended guided nature walks or eco-talks exhibited greater intent to act sustainably in their daily lives.

Despite its many strengths, the study also reveals areas for improvement. Awareness initiatives need to be more visible and accessible. Not all visitors noticed conservation messaging, and some missed opportunities to participate in programs. To address this, Saguna Baug can introduce multi-lingual audio guides, interactive exhibits, and digital pre-tour resources. The farm's efforts also have ripple effects beyond environmental outcomes. By involving local communities in eco-tourism, it supports rural employment and promotes cultural preservation. The model shows that conservation and development are not mutually exclusive but can be harmonized through inclusive, locally driven frameworks.

This study affirms that agro-tourism has the potential to influence both the mindsets and behaviors of visitors. Its educational power lies in its ability to merge experience with reflection, allowing individuals to connect their personal choices to broader ecological outcomes.

In conclusion, Saguna Baug stands as an effective, scalable model for biodiversity conservation through agro-tourism. If replicated with contextual adaptations across India's rural landscape, such initiatives could significantly advance the country's conservation goals while supporting socio-economic development. Future studies should consider longitudinal designs to track behavioral changes over time and include larger samples across multiple sites to validate generalizability.

V. RECOMMENDATIONS

- 1. Expand Educational Engagement:
 - Introduce guided tours tailored to different age groups.
 - Use digital tools like QR-coded signage and AR/VR installations for interactive learning.
- 2. Pre-Visit Awareness Campaigns:
 - Offer online orientation modules and short videos explaining key conservation themes.
 - Provide educational packets to schools and eco-clubs planning field visits.
- 3. Strengthen Biodiversity Programs:
 - Regularly update biodiversity trails and exhibits.
 - Organize monthly conservation drives involving visitors and local residents.
- 4. Improve Visitor Communication:
 - Install more visible, multilingual signage explaining ongoing eco-initiatives.
 - Train guides to deliver consistent conservation messaging.
- 5. Empower Local Communities:
 - Engage nearby farmers and artisans in ecotourism programs.

- Promote community-led sustainability initiatives like composting and tree plantations.
- 6. Monitor Long-Term Impact:
 - Conduct follow-up surveys to evaluate behavioral changes post-visit.
 - Use data analytics to improve program design and outreach.

By implementing these strategies, Saguna Baug can further elevate its role as a hub for ecological education and biodiversity conservation.

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