SOCIO-ENVIRONMENTAL GOVERNANCE IN THE SELVA MAYA: EVALUATING THE FEASIBILITY OF AN INTEGRATED CONSERVATION STRATEGY FOR 2030

GOVERNANÇA SOCIOAMBIENTAL A LA SELVA MAYA: AVALUANT LA VIABILITAT D'UNA ESTRATÈGIA DE CONSERVACIÓ INTEGRADA PER AL 2030

GOBERNANZA SOCIOAMBIENTAL EN LA SELVA MAYA: EVALUANDO LA VIABILIDAD DE UNA ESTRATEGIA DE CONSERVACIÓN INTEGRADA PARA 2030

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ABSTRACT

This article analyzes the feasibility of the Comprehensive Selva Maya Strategy (EISM) for 2030, aimed at conserving the "Selva Maya" biological corridor, a transboundary ecosystem shared by Mexico, Belize, and Guatemala. Recognized as one of the world's most important biodiversity hotspots, the Selva Maya faces critical challenges, including deforestation, habitat fragmentation, climate change, and socio-economic pressures. Effective governance is identified as a key determinant of the success of the EISM, particularly given the institutional disparities among the three countries. Belize demonstrates advanced multilevel governance supported by a strong institutional framework prioritizing conservation. Conversely, Mexico and Guatemala encounter significant limitations in their conservation management mechanisms, reflecting a lack of coordination and capacity. These institutional differences pose substantial obstacles to the implementation of integrated policies under the EISM for 2030. The methodology combines a multidisciplinary analysis of governance structures and conservation strategies, highlighting the role of collaborative governance in addressing cross-border challenges. Key findings emphasize the need for enhanced coordination, community participation, and strengthened legal frameworks to align conservation efforts across the region. The study concludes that the sustainability of the Selva Maya depends on overcoming institutional heterogeneity and fostering a comprehensive, collaborative approach. Ensuring the success of the EISM requires the integration of ecological, socio-economic, and governance perspectives, in line with the objectives of the 2030 Agenda. The findings contribute to broader discussions on transboundary environmental governance and its application in other global biodiversity hotspots.

Key words: Selva Maya; Socio-environmental Governance; Biodiversity Conservation; Sustainable Development; 2030 Agenda.

RESUM

Aquest article analitza la viabilitat de l'Estratègia Integral per a la Selva Maya (EISM) per al 2030, que té com a objectiu conservar el corredor biològic de la Selva Maya, un ecosistema transfronterer compartit per Mèxic, Belize i Guatemala. Reconeguda com un dels punts més significatius de biodiversitat a escala global, la Selva Maya afronta reptes crítics, com la desforestació, la fragmentació dels hàbitats, el canvi climàtic i les pressions socioeconòmiques. La governança efectiva es presenta com un factor clau per a l'èxit de l'EISM, especialment davant les disparitats institucionals entre els tres països. Belize mostra una governança multinivell avançada, recolzada per un marc institucional sòlid que prioritza la conservació. En canvi, Mèxic i Guatemala pateixen limitacions significatives en els seus mecanismes de gestió de la conservació, reflectint una manca de coordinació i capacitat. Aquestes diferències institucionals representen obstacles substancials per implementar polítiques integrades sota l'EISM per al 2030. La metodologia combina una anàlisi multidisciplinària de les estructures de governança i les estratègies de conservació, destacant el paper de la governança col·laborativa per afrontar els desafiaments transfronterers. Els resultats clau subratllen la necessitat de millorar la coordinació, la participació comunitària i l'enfortiment dels marcs legals per alinear els esforços de conservació a la regió. L'estudi conclou que la sostenibilitat de la Selva Maya depèn de superar l'heterogeneïtat institucional i fomentar un enfocament integral i col·laboratiu. L'èxit de l'EISM requereix la integració de perspectives ecològiques, socioeconòmiques i de governança, en línia amb els objectius de l'Agenda 2030. Les troballes contribueixen a discussions més àmplies sobre la governança ambiental transfronterera i la seva aplicació en altres punts calents de biodiversitat global.

Paraules clau: Selva Maya; governança socioambiental; conservació de la biodiversitat; desenvolupament sostenible; Agenda 2030.

RESUMEN

Este artículo analiza la viabilidad de la Estrategia Integral para la Selva Maya (EISM) para el 2030, cuyo objetivo es conservar el corredor biológico de la Selva Maya, un ecosistema transfronterizo compartido por México, Belice y Guatemala. Reconocida como uno de los puntos de biodiversidad más significativos a nivel global, la Selva Maya enfrenta retos críticos, como la deforestación, la fragmentación de hábitats, el cambio climático y las presiones socioeconómicas. La gobernanza efectiva se identifica como un factor clave para el éxito de la EISM, especialmente ante las disparidades institucionales entre los tres países. Belice demuestra una gobernanza multinivel avanzada, respaldada por un sólido marco institucional que prioriza la conservación. En contraste, México y Guatemala presentan limitaciones significativas en sus mecanismos de gestión de la conservación, lo que refleja una falta de coordinación y capacidad. Estas diferencias institucionales representan obstáculos sustanciales para implementar políticas integradas bajo la EISM para el 2030. La metodología combina un análisis multidisciplinario de las estructuras de gobernanza y las estrategias de conservación, destacando el papel de la gobernanza colaborativa para enfrentar los desafíos transfronterizos. Los resultados clave enfatizan la necesidad de mejorar la coordinación, la participación comunitaria y el fortalecimiento de los marcos legales para alinear los esfuerzos de conservación en la región. El estudio concluye que la sostenibilidad de la Selva Maya depende de superar la heterogeneidad institucional y fomentar un enfoque integral y colaborativo. El éxito de la EISM requiere la integración de perspectivas ecológicas, socioeconómicas y de gobernanza, en consonancia con los objetivos de la Agenda 2030. Los resultados contribuyen a debates más amplios sobre la gobernanza medioambiental transfronteriza y su aplicación en otros focos mundiales de biodiversidad.

Palabras clave: Selva Maya; gobernanza socioambiental; conservación de la biodiversidad; desarrollo sostenible; Agenda 2030.

1. INTRODUCTION

The Selva Maya is an amalgamation of biological, cultural, and economic resources, spanning Chiapas (Mexico), Petén (Guatemala), Campeche, Quintana Roo (Mexico), and Belize. Recognized as the second most forested region in Latin America after the Amazon, it provides critical ecosystem services essential for climate change adaptation and mitigation (Laako et al. 2022). The region hosts 230 protected areas and is home to approximately 600,000 culturally diverse individuals, including Mayas, Garifunas, Tzeltales, Tzotziles, Mestizos, and Mennonites, among others (Laako and Kauffer 2021; Schmook et al. 2022).

However, the Selva Maya faces pressing challenges, including deforestation, habitat fragmentation, climate change, and socio-economic pressures, which threaten its ecosystems and biodiversity. These issues are compounded by governance complexities, such as insufficient coordination among multilevel and multi-stakeholder actors and the marginalization of indigenous communities in decision-making processes (Dachary 1993). Addressing these challenges requires fostering socio-environmental governance that emphasizes collaborative approaches and resilience rooted in commons-based practices (Espeso-Molinero and Pastor-Alfonso, 2020; Ostrom, 1990).

This article aims to evaluate the feasibility of the Integral Selva Maya Strategy (EISM) for 2030. Specifically, it analyzes the governance structures, conservation strategies, and institutional capacities of Mexico, Belize, and Guatemala. The study adopts a multidisciplinary approach, combining governance analysis with ecological and socio-economic perspectives, to identify barriers and opportunities for implementing the EISM.

The article is structured as follows: The next section, details the geographical, ecological, and socio-political characteristics of the Selva Maya. Subsequent sections discuss the methodology, governance analysis, and practical recommendations to ensure the

sustainability of the region. Through this comprehensive evaluation, the study contributes to broader discussions on transboundary environmental governance and the implementation of conservation strategies in biodiversity hotspots.

2. GOVERNANCE AND CONSERVATION CHALLENGES IN THE SELVA MAYA: AN INTEGRATED APPROACH TO BIODIVERSITY AND SUSTAINABLE DEVELOPMENT

The Selva Maya is a transboundary ecosystem shared by Mexico, Guatemala, and Belize, encompassing some of the most biologically diverse regions globally. As the second most forested area in Latin America after the Amazon, it provides essential ecosystem services, such as climate change mitigation, carbon sequestration, and water regulation, alongside socio-economic and cultural benefits. The Integral Selva Maya Strategy (EISM) for 2030 was developed to address the conservation and sustainable development challenges this region faces, aiming to create a coordinated governance framework across these countries (Bulkeley 2005; Pintor-Pirkzall 2020). Despite its potential, the implementation of the EISM is hindered by governance disparities, conflicting stakeholder priorities, and varying levels of institutional capacity (Eklund and Cabeza 2017).

The governance structures within the Selva Maya region differ significantly across the three countries. Belize has established a robust multilevel governance system with a strong institutional framework that prioritizes conservation (De la Torre et al. 2021). This includes policies that promote collaboration across governmental and non-governmental sectors. In contrast, Mexico faces challenges related to resource allocation and bureaucratic inefficiencies, which limit the effectiveness of its conservation management mechanisms (Ruelas, Travieso and Sanchez 2015). Guatemala, with its emerging institutional framework, struggles with limited financial and technical capacities for effective environmental

management (Mejía-Ortiz et al. 2021). These institutional disparities complicate the coordination needed to achieve the unified objectives outlined in the EISM (Moore 2011).

The region's indigenous communities, including Mayas, Garifunas, Tzeltales, Tzotziles, and Mestizos, are critical stakeholders in this governance framework. However, these groups often face marginalization in decision-making processes, despite their historical and cultural ties to the Selva Maya. Incorporating their traditional knowledge and promoting equitable participation in conservation strategies are vital for fostering resilience and sustainable development (Espeso-Pastor 2020; Ostrom 2015).

The primary objective of the EISM is to promote biodiversity conservation while simultaneously fostering sustainable development and cultural preservation within the Selva Maya region. This requires addressing the unique socio-political and ecological characteristics of each country and ensuring the alignment of their policies and priorities. The strategy emphasizes the following key areas:

1. Biodiversity Conservation: the Selva Maya is home to numerous endangered and emblematic species, such as jaguars, tapirs, and quetzals. The strategy prioritizes the protection of critical habitats and ecosystems to maintain species populations and ecological processes (Ellis et al. 2020).

2. Sustainable Development: integrating economic activities like ecotourism, agroforestry, and sustainable agriculture within conservation efforts is crucial. These activities create income opportunities for local communities while minimizing ecological impacts (Mitchell, Walker and Walker 2017).

3. Cultural Heritage Protection: the Maya Forest holds significant archaeological and cultural heritage, including ancient Maya ruins. The strategy aims to preserve these sites and promote cultural tourism that respects indigenous traditions and values (Ruelas, Travieso and Sanchez 2015; Rosado-May and Poot-Cahun 2020).

4. Climate Change Adaptation: the Selva Maya is highly vulnerable to climate change, facing increased temperatures and altered rainfall patterns. The strategy includes measures for climate resilience, such as reforestation and sustainable land management practices (Ellis et al. 2020).

5. Regional Cooperation: effective implementation of the EISM requires transboundary collaboration among Mexico, Guatemala, Belize, and, where applicable, Honduras. This cooperation strengthens joint efforts to address shared challenges and facilitates the exchange of knowledge and best practices (Ellis, Navarro and García-Ortega 2021).

Despite the potential benefits of the EISM, its implementation faces several challenges. First, the lack of coordination among the three countries poses a significant barrier. Each country operates within its own governance framework, resulting in misaligned priorities and duplicated efforts. Belize's advanced conservation policies often stand in contrast to the more fragmented approaches in Mexico and Guatemala, which lack sufficient financial and human resources to enforce their policies effectively.

Second, the exclusion of indigenous and local communities from decision-making processes limits the strategy's inclusivity and undermines its sustainability. Ensuring that these communities play an active role in planning and implementation is essential for creating equitable and culturally appropriate conservation measures.

Third, the strategy must address the socio-economic drivers of environmental degradation, including agricultural expansion, illegal logging, and infrastructure development. Without addressing these root causes, the region's biodiversity and ecosystem services remain at risk.

Finally, achieving consensus among stakeholders with divergent interests —such as governments, NGOs, private sector actors, and local communities— requires robust

mechanisms for conflict resolution and collaborative decision-making. The strategy must foster trust and shared responsibility among these groups to ensure its long-term success.

The EISM holds significant potential to address critical environmental, social, and economic challenges in the Selva Maya. The following sections underscore its importance:

a) Biodiversity Conservation: the Maya Forest is one of the most biologically diverse regions in the world, hosting a wide range of flora and fauna, many of which are endangered. The strategy focuses on protecting critical habitats, emblematic species, and ecosystem services. This ensures the survival of species like jaguars, tapirs, and quetzals, which are vital for maintaining ecological balance and cultural identity. Preserving biodiversity also contributes to global efforts to combat climate change and protect ecosystem services that benefit both local communities and the broader global population (Ellis et al. 2020).

b) Sustainable Development: integrating conservation efforts with sustainable development is a cornerstone of the EISM. Economic activities such as ecotourism, sustainable forestry, and agroforestry are promoted to create employment and income opportunities for local communities. These practices aim to balance current economic needs with long-term ecological sustainability, fostering resilient livelihoods that do not compromise the region's environmental health (Mitchell et al 2017; Valenzuela, Cossio & Rodríguez 2023).

c) Protection of Cultural Heritage: the Maya Forest is rich in cultural heritage, including archaeological sites and indigenous traditions. The EISM emphasizes the preservation of these cultural assets through responsible tourism and the promotion of traditional practices. By safeguarding the region's cultural identity, the strategy enhances its global significance and supports cultural enrichment for both local communities and international visitors (Ruelas, Travieso and Sanchez 2015).

d) Adaptation to Climate Change: the region's vulnerability to climate change necessitates proactive measures to enhance its resilience. The strategy includes actions to mitigate climate risks, such as reforestation, conservation of carbon sinks, and promotion of sustainable agricultural practices. These measures aim to reduce greenhouse gas emissions and protect the region's ecological integrity, ensuring that it continues to provide critical ecosystem services (Ellis et al. 2020).

e) Regional Cooperation: the EISM facilitates collaboration among the three countries, addressing transboundary challenges through coordinated policies and actions. Regional cooperation strengthens joint conservation efforts, fosters knowledge sharing, and promotes stability across the Selva Maya. This approach ensures that conservation initiatives are aligned and mutually reinforcing, maximizing their impact (Ellis, Navarro and García-Ortega 2021).

The successful implementation of the EISM requires a holistic approach that integrates ecological, socio-economic, and governance perspectives. Key recommendations include:

- Enhancing Governance Capacity: strengthening the institutional frameworks in Mexico and Guatemala to align with Belize's advanced conservation policies is critical. This involves capacity-building initiatives, increased funding, and technical support.

- Promoting Inclusive Participation: indigenous and local communities must be actively involved in planning and decision-making processes. Their traditional knowledge and cultural practices are invaluable for creating sustainable and context-specific conservation strategies.

- Addressing Root Causes: tackling the socio-economic drivers of environmental degradation, such as illegal logging and agricultural expansion, is essential for long-term sustainability. Policies should incentivize sustainable practices and provide alternative livelihoods for communities dependent on resource extraction.

- Fostering Regional Collaboration: establishing mechanisms for regular communication and joint decision-making among the three countries can enhance coordination and reduce conflicts. Shared databases and monitoring systems can also facilitate better resource management.

The EISM represents a significant opportunity to align conservation and development efforts in the Selva Maya. By addressing governance challenges, fostering inclusivity, and promoting regional cooperation, the strategy can ensure the sustainability of this vital ecosystem and its contributions to global biodiversity and cultural heritage.

3. THEORETICAL AND CONCEPTUAL FRAMEWORK FOR TRANSBOUNDARY CONSERVATION IN THE SELVA MAYA

The Selva Maya, shared by Mexico, Guatemala, and Belize, represents a transboundary biodiversity hotspot facing critical ecological and socio-political challenges. To address these complexities, the Integral Selva Maya Strategy (EISM) for 2030 aims to foster conservation, sustainable development, and collaborative governance. This section outlines the theoretical and conceptual framework underpinning the study, focusing on governance models, feasibility assessments, and collaborative mechanisms as tools for evaluating the EISM's implementation potential.

The governance models applied in this study draw from Hajer et al. (2003) and Falcão and Marini (2010), which emphasize integrated approaches to managing socio-environmental systems. These models align with the principles of commons-based governance articulated by Ostrom (1990), highlighting the capacity of local communities to organize and manage shared resources sustainably. The governance of the Selva Maya requires balancing local traditions with broader institutional frameworks to address issues such as deforestation, illegal logging, and habitat fragmentation.

Key governance elements —vision, leadership, coordination, incentives, planning, and monitoring (Worboys et al. 2016)— are central to the success of transboundary conservation efforts. These elements are examined through the lens of the EISM, assessing how effectively they align with the conservation goals and socio-economic realities of the region.

Additionally, public policy approaches inform the framework by evaluating the effectiveness of existing legal, political, and institutional structures in supporting biodiversity conservation and sustainable development (Eklund and Cabeza 2017). This perspective highlights gaps in regional coordination and identifies opportunities to strengthen policy coherence across the three countries.

The feasibility of implementing the EISM 2030 is assessed through a multidimensional framework that evaluates technical, financial, social, and political dimensions. This approach ensures that proposed actions are not only theoretically sound but also practically viable within the region's complex governance landscape:

1. Technical Feasibility: the technical dimension examines the practicality of conservation interventions, such as sustainable forest management, reforestation, and ecosystem restoration. These actions require rigorous technical analysis to ensure they align with local capacities and conservation objectives (Eklund and Cabeza 2017). For example, identifying areas most vulnerable to deforestation and implementing targeted reforestation projects can maximize ecological benefits while minimizing resource use (Stolton, Shadie and Dudley 2013).

2. Financial Feasibility: the financial dimension addresses the need for adequate and sustainable funding mechanisms. Conservation initiatives often depend on diverse funding sources, including government allocations, international donor contributions, and public-private partnerships (Hajer et al, 2003). The EISM emphasizes the

importance of aligning financial investments with conservation priorities to avoid resource misallocation and ensure long-term sustainability.

3. Social Feasibility: the social dimension evaluates the acceptance and participation of local communities in conservation efforts. Indigenous groups, such as the Mayas, Garifunas, and Tzeltales, possess invaluable traditional knowledge that can enhance conservation practices. Ensuring their inclusion in decision-making processes fosters a sense of ownership and cultural relevance, which are critical for the strategy's success (Espeso-Molinero and Pastor-Alfonso 2020).

4. Political Feasibility: the political dimension analyzes the alignment of existing policies and governance structures with the EISM's objectives. Political will and institutional coherence are essential for addressing transboundary challenges, such as illegal resource extraction and land use changes. Collaborative policy frameworks that integrate diverse stakeholder interests can mitigate conflicts and enhance strategy implementation.

Collaborative governance is identified as a cornerstone for the successful implementation of the EISM 2030. This approach integrates diverse perspectives and knowledge systems by fostering partnerships among government agencies, NGOs, private sector actors, and local communities. Collaborative governance addresses governance gaps and ensures that conservation efforts align with the socio-economic and cultural realities of the region.

Key Contributions of Collaborative Governance:

- Inclusive Participation: engages a wide range of stakeholders, including indigenous communities and civil society organizations. This inclusivity enhances the quality of decision-making by incorporating diverse perspectives and knowledge systems (Trench et al. 2018).

- Building Trust and Legitimacy: promotes trust among stakeholders through transparent dialogue and decision-making processes. Trust is particularly critical in regions like the Selva Maya, where historical conflicts and mistrust have hindered conservation efforts (Graham, Amos and Plumptre 2003).

- Conflict Resolution and Consensus Building: provides a platform for negotiating divergent interests and finding common ground. Collaborative governance facilitates open communication, enabling stakeholders to resolve conflicts constructively and build consensus (Borrini-Feyerabend et al. 2013).

- Knowledge Sharing and Learning: encourages the exchange of traditional and technical knowledge, fostering collective learning. This approach optimizes conservation practices and reduces the likelihood of repeating past mistakes (Ansell and Gash 2008).

- Adaptability and Sustainability: promotes adaptive management practices that respond to evolving socio-environmental conditions. This flexibility ensures that conservation initiatives remain effective and relevant over time (Graham, Amos and Plumptre 2003).

The theoretical framework is applied to analyze the specific challenges faced by the Selva Maya region, focusing on deforestation, climate change, and socio-economic pressures. The EISM's integrated approach aims to address these issues through targeted interventions and collaborative efforts:

1. Deforestation and Habitat Fragmentation: the Selva Maya is threatened by agricultural expansion, illegal logging, and infrastructure development, which fragment habitats and disrupt ecological connectivity. The strategy emphasizes coordinated land-use planning and reforestation initiatives to mitigate these impacts.

2. Climate Change Adaptation: Rising temperatures and altered rainfall patterns pose significant risks to the region's biodiversity and communities. Climate-resilient

practices, such as sustainable agriculture and forest conservation, are critical for maintaining ecosystem services and reducing vulnerability.

3. **Cultural Heritage Preservation:** The region's rich cultural heritage, including archaeological sites and indigenous traditions, is increasingly under threat from tourism and resource exploitation. The EISM integrates cultural preservation into its conservation objectives, promoting responsible tourism and the valorization of traditional practices.

4. **Economic Pressures and Livelihoods:** Socio-economic drivers, such as poverty and reliance on natural resource extraction, exacerbate environmental degradation. The strategy promotes sustainable economic activities, such as ecotourism and agroforestry, to create alternative livelihoods and reduce dependence on extractive industries.

The feasibility of the EISM 2030 hinges on its ability to integrate ecological, socio-economic, and governance perspectives. Recommendations for enhancing feasibility include:

- Strengthening institutional capacities in Mexico and Guatemala to align with Belize's advanced governance systems.

- Establishing mechanisms for regular stakeholder engagement to foster trust and consensus.

- Developing innovative funding models that align financial resources with conservation priorities.

- Promoting knowledge-sharing platforms to disseminate best practices and lessons learned across the region.

The EISM 2030 provides a robust framework for addressing the governance and conservation challenges of the Selva Maya. By combining governance models, feasibility assessments, and

collaborative mechanisms, the strategy aligns ecological conservation with socio-economic development and cultural preservation. The following section delves into the practical implications of implementing these strategies, exploring how theoretical models can inform real-world interventions to ensure the sustainability of the Selva Maya.

4. CHALLENGES AND OPPORTUNITIES IN TRANSBOUNDARY ENVIRONMENTAL GOVERNANCE OF THE SELVA MAYA

The Selva Maya, shared by Mexico, Guatemala, and Belize, is a biodiversity hotspot of global significance. Its ecological richness and cultural heritage are under increasing pressure from socio-economic activities, environmental degradation, and governance challenges. The Integral Strategy for the Selva Maya (EISM) sets out an ambitious framework for conservation and sustainable development, emphasizing regional collaboration and inclusivity. However, achieving its objectives requires addressing critical obstacles rooted in transboundary environmental governance. This discussion explores these challenges and the theoretical and practical implications for governance in shared ecosystems.

The governance frameworks in the Selva Maya region are characterized by significant disparities among the three nations. Belize demonstrates strong institutional capacity and a well-developed multilevel governance agenda that prioritizes conservation. Conversely, Mexico faces challenges in implementing conservation strategies effectively, largely due to bureaucratic inefficiencies, insufficient resources, and overlapping responsibilities. Guatemala, with its nascent institutional framework, struggles to address governance gaps caused by limited financial and technical capabilities.
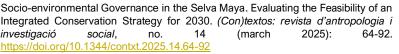
These differences complicate efforts to develop a unified transboundary conservation strategy. For instance, while Belize may excel in establishing protected areas and enforcing conservation laws, Mexico and Guatemala face constraints that limit their ability to align with

regional objectives. The absence of standardized policies and practices across the three nations hinders coordination and reduces the overall effectiveness of conservation initiatives.

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The Selva Maya is home to diverse communities, including the Mayas, Garifunas, and Tzeltales, who have deep cultural and spiritual ties to the land. These communities possess valuable traditional knowledge that can inform and enhance conservation practices. However, their participation in governance structures has historically been limited, reducing the cultural relevance and local ownership of conservation initiatives.

The socio-economic realities of these communities further complicate conservation efforts. Many rely on resource extraction, agriculture, and informal economies for their livelihoods, often leading to activities that conflict with environmental goals. For instance, agricultural expansion and logging contribute significantly to deforestation and habitat loss, while poverty and lack of access to alternative livelihoods perpetuate unsustainable practices.

To address these socio-economic pressures, the EISM emphasizes the integration of local communities as active stakeholders. This involves:

- Empowering Indigenous Voices: ensuring that community leaders have a platform to influence decision-making processes.

- Promoting Sustainable Livelihoods: supporting initiatives such as ecotourism, agroforestry, and sustainable agriculture to reduce dependence on resource extraction.

- Enhancing Cultural Preservation: incorporating traditional knowledge into conservation policies to ensure that strategies are culturally relevant and context-specific.

Such measures not only enhance the social sustainability of the EISM but also foster a sense of ownership and commitment among local communities, making conservation efforts more effective in the long term.

The Selva Maya faces numerous environmental threats that undermine its ecological integrity. Habitat fragmentation, driven by agricultural expansion, infrastructure development, and illegal logging, disrupts ecological connectivity and threatens the survival of emblematic species such as jaguars, quetzals, and tapirs. Climate change exacerbates these threats by altering rainfall patterns, increasing temperatures, and intensifying extreme weather events.

The EISM incorporates measures to address these challenges, including:

- Reforestation Initiatives: targeted efforts to restore degraded areas and reconnect fragmented habitats.
- Sustainable Land Use Planning: integrating conservation priorities into agricultural and urban planning to minimize environmental impacts.
- Climate Adaptation Strategies: promoting practices such as agroforestry, water management, and climate-resilient infrastructure to enhance ecosystem and community resilience.

While these measures are promising, their success depends on effective implementation and long-term monitoring. Collaborative governance structures are essential to ensure that environmental initiatives are coordinated and that their impacts are sustained over time.

One of the most significant challenges in implementing the EISM is the lack of coordination among the three nations. Conservation efforts are often fragmented, with each

country pursuing its own objectives and priorities. This results in duplication of efforts, inefficiencies, and missed opportunities for collaboration.

Policy coherence is another critical issue. Differences in legal frameworks, enforcement mechanisms, and resource allocation hinder the development of a unified strategy. For example, while Belize's conservation policies are well-developed and enforceable, Mexico and Guatemala face challenges in policy enforcement and resource mobilization.

To address these issues, the EISM must promote transboundary coordination through mechanisms such as:

- Joint Management Frameworks: Establishing regional bodies to oversee and align conservation efforts.

- Shared Databases and Monitoring Systems: Facilitating the exchange of information and tracking progress across borders.

- Harmonized Policies: Standardizing regulations and enforcement mechanisms to ensure consistency and reduce conflicts.

These measures would enhance regional cooperation and provide a more integrated approach to managing the Selva Maya's resources.

Collaborative governance is identified as a cornerstone for addressing the governance challenges of the Selva Maya. By fostering partnerships among government agencies, NGOs, private sector actors, and local communities, this approach ensures that diverse perspectives are integrated into decision-making processes.

Key contributions of collaborative governance include:

- Inclusive Participation: Engaging all relevant stakeholders to enhance the legitimacy and effectiveness of conservation efforts.

- Conflict Resolution: Providing platforms for dialogue and negotiation to address conflicts of interest among stakeholders.

- Knowledge Sharing: Promoting the exchange of traditional and technical knowledge to optimize conservation practices.

- Adaptability: Encouraging flexible management practices that can respond to changing socio-environmental conditions.

Collaborative governance not only strengthens the implementation of the EISM but also contributes to broader goals of social equity and environmental justice.

The Selva Maya case offers valuable insights into the theoretical development of transboundary environmental governance. By analyzing the region's challenges and opportunities, the study advances the understanding of how shared ecosystems can be effectively managed:

- Integrating Governance Models: the study applies and refines governance models that prioritize inclusivity, adaptability, and collaboration. These models are particularly relevant for transboundary contexts, where diverse political systems and cultural landscapes intersect.

- Advancing Policy Frameworks: the findings highlight the importance of policy coherence and regional cooperation in managing shared ecosystems. By aligning policies across borders, transboundary governance can achieve greater efficiency and impact.

- Bridging Local and Global Objectives: the Selva Maya illustrates the potential for aligning local priorities with global conservation goals, such as the Sustainable Development Goals (SDGs). By integrating traditional knowledge and community-driven initiatives, governance frameworks can achieve ecological and social sustainability.

While the EISM represents a significant step forward, several challenges require further attention to ensure its success:

- Institutional Weaknesses: addressing the institutional disparities among the three nations is critical for enhancing regional coordination.

- Resource Constraints: securing sustainable funding mechanisms is essential for long-term conservation efforts.

- Political Dynamics: overcoming political resistance and fostering alignment among diverse interests will require sustained advocacy and engagement.

These challenges underscore the need for continuous refinement of governance frameworks and adaptive management practices.

The Selva Maya, a region of unparalleled ecological and cultural significance, faces complex challenges that demand innovative and inclusive governance solutions. The EISM provides a comprehensive framework for addressing these challenges, emphasizing transboundary collaboration, socio-economic integration, and environmental sustainability.

By focusing on the governance and socio-environmental dynamics of the region, this discussion highlights the critical factors that influence the success of the EISM. Institutional capacity, community participation, policy coherence, and collaborative governance emerge as key enablers for achieving the strategy's objectives.

The insights gained from the Selva Maya case contribute to advancing theoretical and practical approaches to transboundary environmental governance. By aligning local and global priorities, fostering inclusivity, and promoting sustainability, the EISM offers a roadmap for conserving shared ecosystems and enhancing the well-being of their communities.

As the region navigates the complexities of conservation and development, the collective will, and collaboration of stakeholders will determine the future of the Selva Maya. This study underscores the importance of holistic, forward-thinking strategies that balance

ecological, socio-economic, and cultural considerations, ensuring a resilient and sustainable future for this invaluable region.

5. CONCLUSIONS

This paper provides a comprehensive analysis of the challenges and opportunities surrounding the feasibility of implementing the Integral Selva Maya Strategy (EISM, 2030). The strategy aims to balance biodiversity conservation and sustainable development in the Selva Maya, a transboundary region shared by Mexico, Belize, and Guatemala. Central to this effort is a multidimensional, multilevel, and multi-stakeholder governance framework. However, the success of the EISM depends on addressing critical institutional, socio-political, and ecological challenges that vary significantly across the three countries.

The paper emphasizes the importance of assessing the feasibility of implementing the EISM through technical, economic, social, and political dimensions. This comprehensive approach ensures that resources are allocated efficiently, stakeholders' interests are aligned, and the strategy remains sustainable and adaptable over the long term. Below, we summarize the key findings and contributions of this analysis while addressing the evaluators' comments.

One of the primary conclusions drawn from this study is the asymmetry in institutional capacities among the three nations involved in the Selva Maya. Belize exhibits a robust institutional framework, underpinned by multilevel governance structures that prioritize conservation. This proactive approach has enabled Belize to create common goods that generate sustainable value through effective coordination. In contrast, Mexico faces challenges due to inefficient conservation management mechanisms, which limit its ability to achieve impactful outcomes. Meanwhile, Guatemala's institutional structure remains underdeveloped, reflecting a lower prioritization of conservation in favor of addressing pressing issues such as violence, food security, and irregular labor mobility.

These disparities pose significant challenges to the EISM's implementation. A lack of institutional coherence undermines the potential for coordinated action, creating barriers to developing shared policies and practices. Addressing this issue requires tailored strategies that account for each country's unique governance landscape. For instance, Mexico and Guatemala could benefit from capacity-building initiatives that enhance technical expertise, resource allocation, and inter-agency coordination. Belize, on the other hand, could share its best practices to foster regional collaboration.

The concept of feasibility emerges as a critical linchpin in ensuring the EISM's success. The analysis underscores the importance of evaluating the strategy's technical, social, economic, and political dimensions. Each dimension is interdependent, collectively shaping the strategy's long-term viability:

- Technical Feasibility: the implementation of sustainable forest management practices, habitat restoration initiatives, and monitoring systems requires rigorous technical analysis to ensure that desired conservation outcomes are achieved. However, technical tools alone are insufficient without addressing underlying socio-political barriers.

- Social Feasibility: community participation is essential for the success of the EISM. Effective collaborative governance relies on the inclusion of indigenous and local communities, whose traditional knowledge and cultural practices can enrich conservation efforts. Trust-building, equitable decision-making, and benefit-sharing mechanisms are critical to fostering social acceptance of the strategy.

- Economic Feasibility: adequate funding is necessary to support conservation initiatives, strengthen institutions, and facilitate community participation. Diversified funding sources, such as international donors, public-private partnerships, and ecotourism revenues, can enhance financial sustainability.

- Political Feasibility: the successful implementation of the EISM depends on strong political will, clear legal frameworks, and transparent governance structures. Building trust among stakeholders and ensuring accountability are essential for mitigating conflicts of interest and promoting effective decision-making.

Collaborative governance plays a pivotal role in addressing these feasibility dimensions. By fostering inclusivity, transparency, and capacity building, collaborative governance creates a foundation for shared responsibility and collective action. The EISM provides a blueprint for achieving this, emphasizing principles such as co-creation of solutions, conflict resolution, and joint monitoring.

The Selva Maya represents a microcosm of the challenges faced by many transboundary ecosystems worldwide. As such, the insights gained from this analysis contribute to the broader field of transboundary environmental governance. Key contributions include:

- Institutional Asymmetry: the study highlights the importance of recognizing and addressing disparities in institutional capacities. Tailored approaches that strengthen weaker institutions while leveraging the strengths of more advanced frameworks, such as Belize's, are essential for achieving regional coherence.

- Policy Coherence: aligning policies across borders is crucial for avoiding duplication of efforts and conflicting objectives. The EISM can serve as a model for developing harmonized policies that address shared challenges while respecting national priorities.

- Community Engagement: the analysis underscores the value of integrating local and indigenous perspectives into governance structures. By empowering these communities, transboundary strategies can achieve greater social sustainability and cultural relevance.

- Knowledge Sharing: collaborative governance fosters the exchange of technical and traditional knowledge, enabling stakeholders to learn from one another's experiences. This enhances the adaptability of conservation initiatives and promotes continuous improvement.

These contributions reinforce the importance of designing governance frameworks that are inclusive, adaptable, and context-specific. Despite its ambitious vision, the EISM faces significant challenges that must be addressed to ensure its success. These include:

- Coordination Deficits: the lack of effective mechanisms for intergovernmental collaboration undermines the potential for cohesive action. Establishing joint management bodies and shared monitoring systems can enhance coordination and resource allocation.

- Socio-political Conflicts: competing interests among stakeholders, such as economic development versus conservation priorities, often lead to conflicts. Facilitating dialogue and negotiation can help reconcile these differences and foster mutual understanding.

- Resource Constraints: limited financial and technical resources hinder the implementation of conservation initiatives. Securing sustainable funding and building technical capacity are critical for overcoming this barrier.

- Accountability and Transparency: corruption and lack of transparency in governance structures erode trust and compromise the strategy's effectiveness. Strengthening accountability mechanisms and promoting ethical governance practices are essential.

To address these challenges, the EISM must adopt a holistic approach that integrates environmental, social, and economic considerations. This includes promoting sustainable livelihoods, enhancing legal frameworks, and fostering regional cooperation.

The conclusions drawn from this analysis provide a foundation for further research and action. Potential areas of exploration include:

- Localized Case Studies: conducting in-depth case studies within each participating country can identify best practices and context-specific challenges. These insights can inform the development of tailored strategies.

- Post-implementation Evaluations: monitoring and evaluating the EISM's outcomes can provide valuable feedback on its effectiveness. This includes assessing the strategy's impact on biodiversity, community well-being, and regional collaboration.

- Integration of Technology: leveraging technologies such as remote sensing, GIS, and data analytics can enhance monitoring and decision-making processes. These tools can improve the efficiency and accuracy of conservation efforts.

- Public-private Partnerships: exploring the role of private sector involvement can unlock new funding opportunities and innovative solutions. Partnerships with businesses, NGOs, and international organizations can strengthen the strategy's implementation framework.

- Grassroots Movements: supporting grassroots initiatives and local leadership can enhance community engagement and ownership of conservation efforts. These movements can serve as catalysts for social and cultural transformation.

By addressing these areas, future research can build on the foundations laid by this study, advancing the theoretical and practical understanding of transboundary environmental governance.

The Integral Selva Maya Strategy (EISM, 2030) represents a bold vision for conserving one of the world's most important ecosystems. This study has illuminated the complexities and challenges involved in its implementation, emphasizing the critical role of feasibility and collaborative governance in achieving its objectives.

Key takeaways include the recognition of institutional asymmetries, the importance of community participation, and the need for policy coherence. By addressing these challenges, the EISM has the potential to serve as a model for transboundary conservation initiatives, offering valuable lessons for other regions facing similar issues.

Ultimately, the success of the EISM hinges on the collective will and collaboration of all stakeholders. By fostering inclusivity, transparency, and adaptability, the strategy can harmonize conservation and development priorities, ensuring a sustainable future for the Selva Maya and its communities. This study underscores the importance of holistic approaches to governance, paving the way for innovative solutions that balance ecological preservation with social and economic progress.

AKNOWLEDGMENTS

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