

# The Role of Creative Economics in Sei Nagalawan Mangrove Ecotourism Sector

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**Abstract:** Sei Nagalawan Village in Serdang Bedagai Regency, Indonesia, utilizes the mangrove ecosystem for economic benefits through creative activities and fishing. However, long-term use raises ecological and social problems, requiring a balance between conservation and development. This post-positivism-based study explores the transformation of Sei Nagalawan into an ecotourism center, involving stakeholders such as local government, ecotourism managers and the media. Drone mapping reveals a variety of attractions at Mangrove Beach, but challenges such as marketing, infrastructure problems and limited shrimp cultivation skills hinder community empowerment. This program, led by the Muara Baimbai Mangrove Conservation Group, aims to increase capabilities, improve economic prosperity and environmental awareness. Identified weaknesses indicate low awareness and support. Opportunities arise from tourist interests, but threats arise from waste problems and conflicts of interest. The strategy includes mangrove management, conservation, online promotion and education, aiming to achieve a balance between conservation and economic activities, while recognizing existing challenges and the need for sustainable efforts.

**Keywords:** Community Empowerment; Creative Economics; Conservation; Drone Mapping; Mangrove Ecotourism.

## Introduction

Mangrove ecosystems are pivotal environmental components, serving as nurseries and habitats for diverse fish species. The biodiversity within these ecosystems is noteworthy, with reports indicating the presence of 100 fish species in the mangroves of Leizhou Peninsula, China (Wei-dong et al., 2003). Beyond their role as habitats, mangroves act as essential nutrient sources for aquatic organisms due to their abundance in phytoplankton (Andersen et al., 2006). Moreover, mangroves function as green belts, shielding coastlines from erosion and aiding sediment trapping through accretion activities, contributing significantly to estuarine and coastal productivity (Susilawati & Aulia Rahmah, 2023).

Indonesia, home to approximately 202 mangrove species (Jamaludin et al., 2020). features mangrove-rich regions like the coastal area of Sei Nagalawan Village in Serdang Bedagai Regency. The potential of mangrove forests in this area has been utilised by local residents to improve the economic standard of the surrounding community through creative economic activities and fisheries. The scenic beauty of the mangrove forest has also been utilised for marine ecotourism. However, despite these positive aspects, the prolonged utilisation of mangrove areas by local communities has led to ecological and social problems (Puspitaa & Lidya, 2022; Setiawan et al., 2024). This is due to a lack of awareness among some community members regarding mangrove management and over-exploitation, resulting in ecosystem degradation. The potential of mangroves can also be developed in regional development that has

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long-term value in an area (M. R. Al Safar et al., 2023). This potential can also be developed such as ecotourism as in the mangrove forest park area in Langsa City (Bahri, 2022; Bahri et al., 2021; Ramadhan et al., 2022). The conversion of land for shrimp farming and settlements further exacerbates these issues. One key contributing factor is the weak enforcement of laws and the diminishing influence of local wisdom (Diem, 2012; Sartini, 2004; Satria, 2020). Local wisdom, evident in various regions, has proven effective in conserving coastal resources (Cahyani & Bahri, 2022; Kusumastanto, 2004)

The Sei Nagalawan community employs its unique approach to natural resource management, particularly mangroves, with self-initiated rehabilitation efforts. If earnestly applied, these local wisdom practices could serve as norms, ethics, and morals guiding the community to be more environmentally conscious and responsible. This can be a model to encourage other communities to engage, identifying local wisdom priorities for their specific contexts.

Serdang Bedagai Regency, located in North Sumatra Province, holds significant potential in marine and fisheries. The marine capture fisheries production in the region reached IDR 410,001,332,000 in 2018, contributing 4.57% to the marine capture fisheries production of North Sumatra Province (BPS Kabupaten Serdang Bedagai, 2020) The regency boasts a coastline spanning 55 km, covering six sub-districts: Bandar Khalifah, Tanjung Beringin, Sei Rampah, Teluk Mengkudu, Perbaungan, and Pantai Cermin (BPS Kabupaten Serdang Bedagai, 2020).

However, despite the potential, marine fisheries production in certain sub-districts, such as Teluk Mengkudu and Tanjung Beringin, experienced fluctuations and declines in recent years. On the contrary, Pantai Cermin witnessed a significant growth of 4.21% in 2019. This fluctuation in production highlights the need for sustainable fisheries management and conservation efforts in the region. Sumatra Utara has 6,132 villages, with 243 in Serdang Bedagai Regency. The majority of Sumatra Utara is located on the East Coast of North Sumatra, holding 19% of Indonesia's total mangrove area. Unfortunately, 59.6% of this area is severely damaged due to conversion into shrimp farms, plantations, and other critical areas. (BAPPEDA Kabupaten Serdang Bedagai, 2019)

Serdang Bedagai Regency, with its 3,700 hectares of mangrove ecosystems, faces challenges in balancing conservation and economic development. Sei Nagalawan Village, within the regency, stands out as a mangrove-rich area with approximately 20 hectares designated for ecotourism. The local community actively manages this mangrove area, utilizing it for both economic and environmental purposes. The

coexistence of mangrove conservation and economic activities presents a unique case study for understanding the dynamics of community empowerment through creative economics.

This study aims to explore how the Sei Nagalawan coastal community, particularly in Serdang Bedagai Regency, has empowered itself through creative economics, focusing on the sustainable utilization of mangrove resources. The intertwined relationship between ecological conservation, economic activities, and community empowerment provides a compelling subject for investigation. The following sections will delve into the various aspects of this complex interaction, examining the challenges and opportunities presented by the coexistence of mangrove conservation and creative economic endeavors in Sei Nagalawan Village.

Mangrove serves as the ultimate destination for both organic particles and sediment deposits carried by currents from upstream areas due to erosion. The mangrove area is fertile, both in its land and water, as there is a constant nutrient transport resulting from tidal fluctuations in seawater. The mangrove forest ecosystem is beneficial both ecologically and economically (Salampessy et al., 2024). Mangrove forests have two functions: ecological and economic. The ecological function of mangrove forests includes protecting the coastline from erosion, accelerating beach expansion through sedimentation, preventing the intrusion of seawater into the land, providing habitat for various marine biota, and serving as a shelter and breeding ground for various species of birds, mammals, reptiles, and insects, as well as regulating microclimate. On the other hand, the economic function of mangrove forests involves supplying household needs (firewood, charcoal, building materials, food, and medicines), providing raw materials for industries (paper, textiles, cosmetics, tanning, and dyes), as well as producing fish, shrimp, shellfish, crabs, and bird eggs. Additionally, mangrove forests serve as sites for tourism, research, and education (Masruroh, 2022; Wiyanto & Faiqoh, 2015).

## Method

The study adopts a qualitative Methodology grounded in the post-positivism philosophy, where the researcher assumes a central role as the primary instrument (Means & Mowatt, 2024). The research unfolds in Sei Nagalawan Village, situated in the Serdang Bedagai Regency, with a specific focus on the Mangrove Ecotourism site within Sei Nagalawan Village. The researcher's intrigue is piqued by the area's remarkable transformation, evolving from a state of environmental degradation to a flourishing hub of

ecotourism. This metamorphosis gains added significance when considering the substantial proportion of the local community now relying on the mangrove forest for their sustenance (Khaledi Koure et al., 2023). The study meticulously addresses a myriad of stakeholders engaged in fostering community empowerment within the ecotourism domain. These stakeholders encompass the Sei Nagalawan Village

Government, managers overseeing the ecotourism area, visiting individuals, as well as external entities such as academics, researchers, environmental advocates, mass media representatives, and other pertinent contributors actively supporting the enduring viability of the ecotourism initiatives in Sei Nagalawan Village (Miller, 2023).

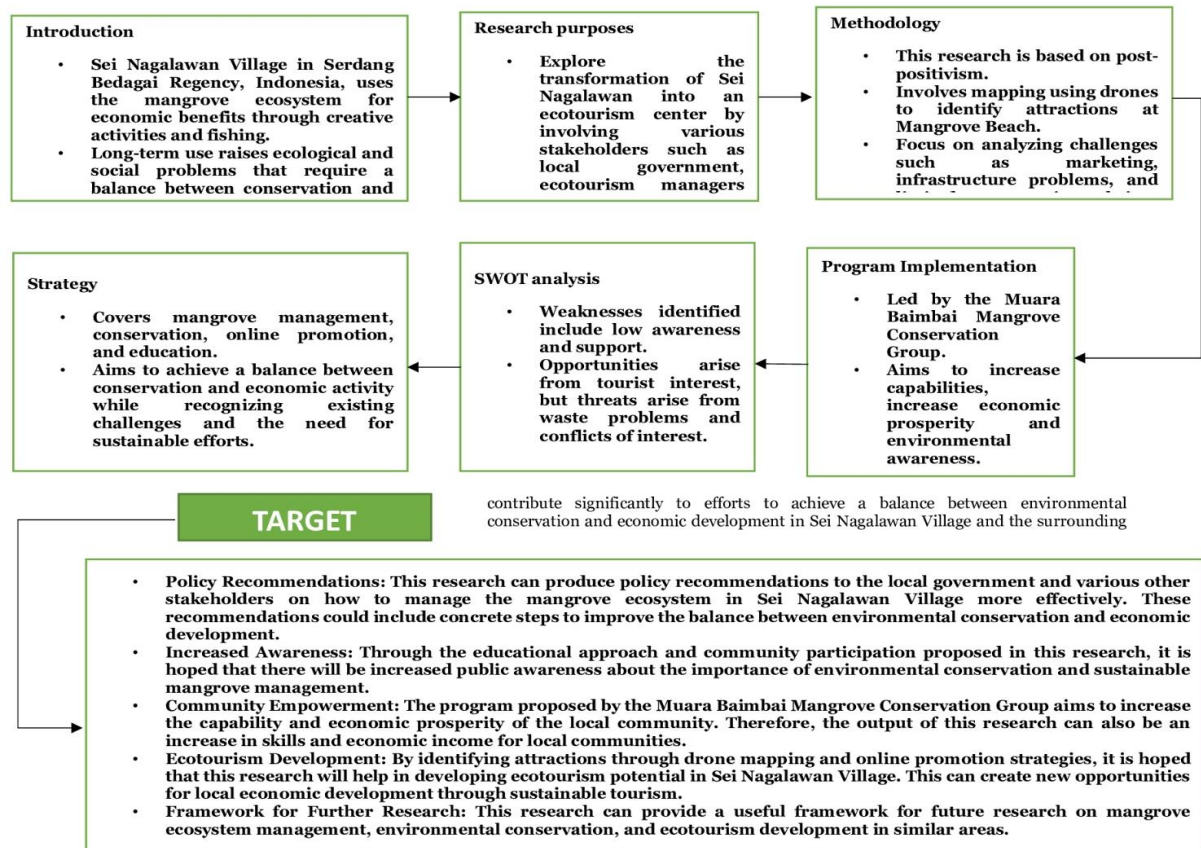


Figure1. Research Model

## Result and Discussion

Tourist attractions, encompassing natural scenery, unique natural phenomena, educational features, and an array of additional enticing elements. The intrinsic allure of the location lies in the captivating natural beauty of its beach, mangrove forest, and pristine white sand. The distinctive and rarely encountered phenomenon of shifting white sandbars further elevates the appeal, with these emergent sandbars adorned with lush green creeping plants, enhancing the overall aesthetic of the white sand attraction (Marican et al., 2018; Silalahi et al., 2024).

Adding an educational dimension to the tourist experience is the mangrove forest, which serves as an invaluable educational resource. This particular mangrove forest has evolved into a hub for various educational institutions and community groups,

providing a conducive environment for learning and teaching about the intricacies of mangrove ecosystems (Kongkeaw et al., 2019; Sathiyamoorthy & Sakurai, 2024). Noteworthy is the fact that a substantial portion of the existing mangrove forest is the result of dedicated rehabilitation efforts initiated as far back as 2010. The success of these mangrove rehabilitation initiatives has not only reinstated the ecological functions of the forest but has also yielded invaluable environmental services, notably in the realm of tourism (Muhamad et al., 2021; Silalahi et al., 2024).

Beyond the realms of natural wonders and educational exploration, the aquatic elements of Mangrove Beach serve as an additional draw. The expansive water body, comprising both the sea and river estuary, presents a captivating backdrop for water enthusiasts. Visitors have the opportunity to partake in water tourism activities, navigating the scenic waters by

boat or indulging in a refreshing swim. Tour packages, including boat rides that circumnavigate the Mangrove Beach area and facilitate access to the intriguing emergent sandbars, are thoughtfully provided by the site managers.

Complementing the coastal attractions, Mangrove Beach in Sei Nagalawan unfolds an array of supplementary delights for visitors. Culinary enthusiasts can savor a diverse range of seafood delicacies, while those seeking leisurely moments can explore the inviting ambiance of café shops. Abundant opportunities for capturing memorable moments present themselves at carefully designated photo spots, and visitors can relax in stylish gazebos, each boasting a unique design. For those seeking a distinctive accommodation experience, glamping options in triangular-shaped structures add to the diverse array of offerings.

Furthermore, the allure of adventure takes center stage with the provision of ATV rides, allowing visitors to traverse the picturesque coastal landscape via land routes. In essence, Mangrove Beach in Sei Nagalawan emerges not merely as a coastal destination but as a multifaceted experiential haven, seamlessly blending the wonders of nature, educational enrichment, aquatic escapades, gastronomic delights, and recreational adventures into an immersive and unforgettable tourist experience.

Firstly, there exists a notable deficiency in the marketing of processed mangrove products. This limitation arises from the exclusive promotion of such products, including jeruju tea, mangrove syrup, and jeruju crackers, solely within the confines of the mangrove ecotourism gallery. The Mangrove Conservation Group of Muara Baimbai endeavors to

market these products through the gallery; however, this approach falls short of reaching a broader audience. Furthermore, the adoption of contemporary technologies, particularly social media, remains suboptimal for effective marketing.

Secondly, a noteworthy inadequacy is observed in the infrastructure at the mangrove ecotourism site managed by the Mangrove Conservation Group of Muara Baimbai. The existing infrastructure can be deemed suboptimal, with numerous facilities found in a state of disrepair, such as bamboo bridges previously utilized to appreciate the beauty of the mangrove plants. Additionally, the mangrove ecotourism site lacks attractive landmarks, such as photo booths, that could serve as focal points for visitors. The limited width of the pathways leading to the ecotourism site poses accessibility challenges, particularly for large vehicles like buses.

Thirdly, a significant challenge stems from the lack of expertise in shrimp cultivation within the Mangrove Conservation Group of Muara Baimbai. The deficiency in human resources specializing in shrimp cultivation results in production failures during the cultivation of vanamei shrimp. This scarcity of expert resources profoundly impacts the community empowerment initiatives of the group.

Lastly, the insufficient shrimp cultivation equipment poses a critical challenge for the Mangrove Conservation Group of Muara Baimbai in their community empowerment endeavors. The available equipment, including six turbines and three water pumps, proves inadequate to meet the requirements of their eleven ponds. Only a subset of these resources is functional for vanamei shrimp cultivation, further exacerbating the challenges faced by the group.



Figure 2. Tourist Facilities in Mangrove Ecotourism in Sei Nagalawan Village

Through analysis of Figure 1, it was found that the total area managed at Sei Nagalawan Mangrove Beach reached 7.83 hectares. This area includes a number of elements, including mangrove forests, pine forests, parking areas, raised land called white sand, and a number of other areas. By describing land use in more detail along the Sei Nagalawan Mangrove Beach, it can be identified the existence of mangrove forests which include protected land, the existence of pine forests which provide special characteristics, parking areas for visitors, raised land which forms stunning white sand, as well as a number of other areas that complement the diversity of land uses in the area.

#### *Strengthening Community Empowerment Program in the Ecotourism Area*

The community empowerment strengthening program in the ecotourism area of Sei Nagalawan Village aims to enhance the capabilities and negotiating positions of the community for greater self-reliance. Empowerment is defined as a process of strengthening the capacities and capabilities of individuals, groups, institutions, and the networking system among individuals and social organizations, occurring outside the societal system. This process involves increasing the capacities of individuals, groups, and institutions to understand and implement development comprehensively and sustainably (Kongkeaw et al., 2019; Sathiyamoorthy & Sakurai, 2024).

The implementation of community empowerment involves continuous stages, starting from building relationships with the community, understanding the established programs, identifying potential problems that can be addressed, identifying groups and other stakeholders willing to engage, formulating goals, programs, and needs, to the implementation of planned programs (Bahri et al., 2021; Kamaly & Bahri, 2021). The empowerment program takes various forms, including training, workshops, funding, assistance with production tools, improvement of facilities and infrastructure, and various other activities (Wibowo et al., 2023).

Economic empowerment of the community is expected to enhance the welfare of Sei Nagalawan Village. This program also aims to educate the community about the importance of preserving mangrove forests, coastal areas, and marine life within them, as well as utilizing mangrove forests wisely (Alessa et al., 2022; Biswas & Banu, 2023). This initiative laid the foundation for the establishment of the Mangrove Conservation Group Muara Baimbai. The Muara Baimbai Conservation Group adheres to the principles of community empowerment, including leadership from group members, active participation of members, self-reliance in the gradual development of

members' capabilities, attention to family unity, the application of self-discovery learning methods, and efforts to achieve independence gradually (Mercado et al., 2023; Utari et al., 2024).

Based on this description, the Mangrove Conservation Group Muara Baimbai plays a role as an institution managing the business unit program to provide empowerment for the community (Harahap & Absah, 2022). This program involves education, knowledge, and facilitation for the residents of Sei Nagalawan Village with the aim of improving economic well-being and achieving self-reliance. This approach aligns with related research, indicating that village development activities and mangrove forest utilization are conducted through methods such as counseling, mentoring, training, and conservation. The community empowerment program in Sei Nagalawan Village is expected to serve as an example for other regions in efforts to maintain the sustainability of the mangrove ecosystem and improve the well-being of the community sustainably (MB Sibuea & YA Putra, 2021).

#### *Exploring the Ecotourism Potential of Sei Nagalawan Village*

The economic potential, as identified in this research, is underpinned by the results obtained through drone mapping. This methodology offers a comprehensive overview of the physical landscape and available facilities designated for tourist destinations. The aerial mapping of the entire Sei Nagalawan Mangrove Coast management area intricately illustrates the developed tourist infrastructure and diverse land utilization, encompassing mangrove forests, pristine white sandy beaches, designated parking spaces, and other specific areas. The effective management of this ecotourism zone is further reinforced by the presence of essential amenities, including cafes, designated photo spots, camping grounds, bridges, gazebos, prayer rooms, toilets, and various other facilities (Silalahi et al., 2024).

The land utilization within this region spans mangrove forested areas, beachfronts, pristine sandy beaches, pine tree groves, and additional features, each contributing to its unique appeal for visitors. A comprehensive analysis of land use provides an overarching perspective of the entire Sei Nagalawan Mangrove Coast management area. The distribution of tourist facilities and land use is visually represented through the aerial map, encompassing a diverse array of tourist attractions, complementary facilities, and varied land cover.

The potential tourist attractions within this area feature natural landscapes, land emergence phenomena such as white sandy beaches, educational components represented by mangrove forests, and supplementary attractions like a diverse selection of seafood, café

establishments, and designated photo spots. By capitalizing on this identified economic potential, it is anticipated that the Sei Nagalawan Village ecotourism area will continue to flourish as a distinguished tourist destination. Beyond providing economic benefits, this growth is expected to contribute to environmental conservation efforts and foster the sustainable development of the local community in accordance with international theories and standards.

#### *Unveiling Challenges in Mangrove Ecotourism: Bridging Gaps in Community Empowerment Based*

These identified weaknesses and obstacles to community empowerment align with the findings, titled "A Study of Mangrove Ecotourism Development Strategies in the Sei Nagalawan Coastal Area, Perbaungan District, Serdang Bedagai Regency, North Sumatra." Siagian's study revealed similar challenges, including low community and visitor understanding of mangrove resources, ecosystem dynamics, and ecotourism, along with insufficient support from the local village government and a lack of information regarding mangrove tourism in Sei Nagalawan (Luthfi et al., 2019; Suhardjono, 2013; Sulistiyowati, 2009).

Furthermore, potential opportunities for community empowerment in mangrove ecotourism arise from the high interest of tourists in mangrove-related activities and the unique status of mangrove ecotourism as the sole attraction of its kind in North Sumatra. However, considering SWOT theory, competition with other tourist destinations poses a potential threat to sustaining community enthusiasm for mangrove ecotourism (Halbac-Cotoara, 1970). Additionally, the negative aspects of increased tourism activities, such as rising waste levels, potential waste disposal issues, and activities that may harm the mangrove ecosystem, present significant challenges. Another critical threat is the potential for conflicts of interest in mangrove ecotourism management, which could disrupt the system due to shifting priorities (Alalhesabi & Masoum, 2019; Petroman et al., 2016).

In formulating strategies for community empowerment in the mangrove ecotourism area around Sei Nagalawan, various factors, both external and internal, were considered. To commence, a pivotal aspect of the strategy for community empowerment in the mangrove ecotourism area involves enhancing efforts in the management of the mangrove ecosystem through ecotourism activities. Subsequently, a focus is placed on preserving the mangrove ecotourism site while remaining mindful of the area's carrying capacity. Another integral component of the strategy involves promoting the mangrove ecotourism experience through various online platforms, including social media. Although initial efforts have been initiated

through Instagram with the handle @wisatamangrove\_kampoengnipah, these endeavors are acknowledged as currently insufficiently informative. Parallel to social media initiatives, promotion and increased visibility of locally processed mangrove products to tourists constitute an essential facet of the strategy. Educational endeavors aimed at enhancing environmental awareness and conservation practices among visitors are crucial in maintaining cleanliness at the tourism site. Another strategic element involves the creation of mangrove-derived products with original and contemporary packaging, thereby elevating the perceived value of these products in terms of both quality and presentation. Lastly, additional training programs for the community groups responsible for managing the area aim to empower them to effectively share environmental education insights with tourists.

SWOT analysis serves as a tool for identifying the strengths, weaknesses, opportunities, and threats of a specific project or business (Halbac-Cotoara, 1970). In practical terms, SWOT analysis is valuable for strategic planning and staying attuned to ongoing trends. Simply put, SWOT analysis aids in enhancing team performance and identifying competitive opportunities, both professionally and personally (Phadermrod et al., 2019; Puyt et al., 2023). The following provides definitions related to the components of SWOT analysis:

#### *Strengths:*

Strengths refer to the internal advantages that contribute to goal achievement. Identifying strengths helps understand aspects that provide an edge. Leveraging strengths is a technique to improve other areas. They are: The long-standing community empowerment program of Mangrove Ecotourism has established a robust organizational structure; and the managerial competence of the operators is highly commendable.

#### *Weaknesses:*

Weaknesses pertain to internal shortcomings and poor performance. Weaknesses can hinder goal achievement and offer insights into areas requiring more attention to enhance quality or quantity as needed. They are: Limited competency in technology and the utilization of social media, particularly among key stakeholders, the residents of Sei Nagalawan Village; and Inadequate availability of supporting infrastructure.

#### *Opportunities:*

Opportunities are external aspects that emerge. Opportunities become apparent after understanding internal strengths and weaknesses. Opportunities are beneficial for achieving advantageous positions and

capitalizing on strengths. They are: Increasing awareness among the community, especially regarding the importance of environmental conservation; and Growing interest from the government and business sector in environmental preservation.

#### Threats:

Threats relate to potential issues in the future. The distinction between threats and weaknesses is that threats are external and beyond control. They are: Potential climate change impacting the environment directly; and Use of materials that may harm the environment.

#### Conclusion

The Sei Nagalawan Mangrove Coast management area has been identified as a significant economic destination due to its unique allure for visitors. The area is home to mangrove forests, pristine beaches, and various amenities such as cafes, photo spots, camping grounds, bridges, gazebos, prayer rooms, toilets, and more. The land use in the area spans mangrove-forested regions, beaches, pristine sandy beaches, pine tree groves, and other features. The area's economic potential is expected to continue to flourish as a distinguished tourist destination. Strategies for community empowerment in the mangrove ecotourism region include enhancing ecosystem management, preserving the site, and promoting the experience through online platforms. These strategies, combined with educational initiatives and the creation of value-added mangrove products, aim to empower the community and contribute sustainably to environmental conservation efforts. However, ongoing efforts are needed to address challenges and threats, such as climate change impact and potential conflicts of interest.

#### Author Contributions

The authors have their own contributions. Ayu Anggraini Tambunan and Tiomy Butsianto Adi did the theoretical development according to the research topic and did the investigation, analysed the data, and wrote the draft. Tukijan and Hardiyanti did the editing according to the journal template and translated the draft article.

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#### Conflicts of Interest

The authors declare there are no conflicts of interest.

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