

CALL FOR PAPERS

Towards Sustainable Aquaculture in Latin America: Innovation, Food Security, Equity, and Economic Sustainability

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General objective

This special issue aims to bring together an interdisciplinary collection of research articles, reviews, technical notes, debates, and interviews that examine the different dimensions of sustainable aquaculture in Colombia and Latin America. The objective is to deepen the academic understanding of the environmental, social, economic, and institutional factors that shape aquaculture practices aligned with sustainability, equity, and resilience. The issue welcomes research that addresses both the challenges and opportunities for aquaculture to contribute to food and nutrition security, biodiversity conservation, climate change mitigation and adaptation, and inclusive rural development. In particular, it encourages contributions that explore how aquaculture systems can adapt to changing climatic conditions while reducing their own environmental footprint.

Special attention will be given to studies that explore the role of technological innovation, governance frameworks, mitigation efforts, and traditional knowledge, as well as the participation of women, youth, and marginalized communities in aquaculture systems.

By emphasizing Latin American experiences, this issue seeks to strengthen the academic dialogue on sustainable food systems and provide insights that are both scientifically robust and relevant to policy and practice in the region.

Keywords

Sustainable aquaculture, food security, environmental monitoring, risk assessment, climate change, Latin America.

Origin and relevance of the call for papers

Aquaculture is increasingly positioned as a central component of sustainable food systems, particularly in the Global South, where it contributes not only to food and nutrition security but also to livelihoods, local economies, and climate resilience (FAO, 2022; Beveridge et al., 2013). The sector holds significant potential in Latin America due to the region's aquatic biodiversity and varied socio-ecological landscapes. However, realizing this potential requires addressing various interconnected challenges, including environmental degradation, governance limitations, climate change impacts, and socio-economic inequality (Froehlich et al., 2018; Soto et al., 2021).

International bodies such as the High Level Panel of Experts on Food Security and Nutrition (HLPE, 2014) have highlighted the importance of developing sustainable aquaculture systems that align with the Sustainable Development Goals (SDGs), particularly those related to hunger (SDG 2), responsible production (SDG 12), climate action (SDG 13), and life below water (SDG 14). These goals call for integrative approaches that consider not only productivity and technological innovation but also governance, equity, and environmental constraints.

In Colombia, aquaculture has emerged as a sector of growing importance for rural development and food security. However, its expansion has raised critical environmental and social questions, particularly in highland and freshwater ecosystems, where the potential impacts of aquaculture on sediment quality, water resources, and ecosystem health have been identified (Másmela-Mendoza & Lizarazo Forero, 2021; Carrera-Quintana et al., 2022). At the same time, the sector remains uneven in terms of gender equity and social participation, with women and small-scale producers often facing limited access to decision-making spaces, credit, and technical assistance (Leal et al., 2024). These challenges show the need for place-based approaches to aquaculture governance, grounded in robust science and social inclusion.

This thematic issue responds to these intersecting concerns and opportunities. It also reflects the outcomes of ongoing international collaborations led by Norway in partnership with countries such as Colombia, Mexico, and Cuba, aimed at strengthening aquaculture's scientific, regulatory, and institutional capacities. These collaborations have focused on mutual learning and knowledge co-production, including developing environmental mon-

itoring and risk assessment tools grounded in local ecological and social realities. Rather than promoting prescriptive models, these efforts support creating adaptive, inclusive, and context-specific decision-making frameworks.

Drawing on Latin American research and international experiences, this issue seeks to contribute to the academic literature on sustainable aquaculture and inform policy debates around the region's equitable, resilient, and environmentally sound aquaculture systems. It aims to create a platform for interdisciplinary and cross-sectoral dialogue among scientists, stakeholders, and policymakers, fostering a deeper understanding of how aquaculture can develop in environmentally sustainable, socially just, and culturally grounded ways.

This dossier is particularly timely as several countries in the region are currently revising or developing their aquaculture strategies in response to climate change, environmental pressures, and shifting socio-political dynamics. By covering diverse case studies, methodological innovations, and critical reflections, the special issue aspires to strengthen the evidence base for decision-making and highlight emerging priorities for both research and governance. Moreover, it seeks to amplify regional voices and experiences often underrepresented in global academic fora, thereby contributing to a more plural and situated understanding of what sustainable aquaculture can and should look like in Latin America.

Thematic strands

- To analyze the importance of sustainable aquaculture innovations, the following concepts should be considered, which also constitute the thematic strands of this special issue:
- **Innovations for sustainable aquaculture:** This theme explores cutting-edge farming techniques, such as the integration of biotechnology to enhance productivity and environmental performance, ecosystem-based aquaculture, and Integrated Multi-Trophic Aquaculture (IMTA), where different species are farmed together to mimic natural ecosystems and reduce environmental impact. It also values contributions that link science, technology, and public policy, promoting innovative and coherent regulatory frameworks that respond to current challenges.
- **Biosecurity, animal welfare, and disease management:** Papers under this topic will address strategies for preventing, monitoring, and controlling aquatic animal diseases through improved welfare standards for farmed species and reinforcing biosecurity protocols in aquaculture systems. Discussions around health governance and public policy that integrate scientific and social perspectives are encouraged.
- **Environmental monitoring and risk assessment:** This theme focuses on the development and application of environmental monitoring tools, bioindicators, and modelling approaches to assess the impacts of aquaculture on surrounding ecosystems. It supports evidence-based policy and management by providing reliable data to minimize ecological risks and ensure sustainability. Conceptual frameworks such as ecological economics and systems thinking are also welcome to understand the interactions between biophysical, economic, and social factors.
- **Climate resilience:** Contributions in this area examine how aquaculture systems can adapt to climate change, including rising temperatures, ocean acidification, and extreme weather events. Case studies, best practices, and innovations in climate-resilient

infrastructure and species selection are encouraged. Transdisciplinary approaches integrating science, local knowledge, and environmental policy are especially valued.

- **Aquaculture and food security:** Highlights the role of aquaculture in tackling hunger and malnutrition by providing affordable and accessible sources of protein and micro-nutrients. It encourages reflection on how these contributions can be embedded into integrated food security and national nutrition strategies. Approaches from political ecology are welcomed to explore tensions around production, access, and resource distribution.
- **Social and gender equity in aquaculture:** This thematic axis invites contributions that examine the social dimensions of aquaculture, with a particular focus on equity, inclusion, and livelihoods. It encourages research on gender dynamics, youth participation, labor conditions, and the roles of marginalized communities within aquaculture systems. This theme also welcomes analyses of the economic viability and distributive impacts of different production models, with attention to how social equity intersects with the broader sustainability of the aquaculture value chain.
- **Policy and governance for sustainable aquaculture:** Addresses the regulatory, institutional, and market-based frameworks that shape aquaculture practices. Contributions that explore the science-policy interface and participatory or intersectional governance approaches are welcome. Ecological economics may offer valuable tools to analyze hidden social and environmental costs in conventional regulatory schemes.
- **Community-based and indigenous aquaculture models:** This area focuses on local innovations and traditional knowledge systems contributing to sustainable aquaculture. Studies are invited that explore how indigenous and community-led practices can be integrated into public policy while respecting territorial knowledge. In times of global change, political ecology can help highlight struggles over territories and aquatic resources.
- **Regional trends and scientific advances in sustainable aquaculture:** This theme welcomes systematic reviews, comparative studies, and meta-analyses that map out recent scientific advances and regional trends in Latin America. It seeks to identify key knowledge gaps and highlight methodological innovations driving sustainable aquaculture forward. Interdisciplinary collaboration is promoted, along with integrative conceptual frameworks that address the socio-ecological complexity of sustainable aquaculture in the region.

Submission

Authors interested in participating in this call for papers should consult the editorial and ethical policies of *Naturaleza y Sociedad. Desafíos Medioambientales*, as well as send their manuscript through the journal's website:

<https://revistas.uniandes.edu.co/index.php/nys/article-prep>

The editorial team is available to answer your questions or queries through the journal's e-mail address:

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