



Environment for Development

RESEARCH BRIEF - March 2024

Topic: Sustainable Aquaculture in Colombia

Title: Examining the Success of the Tilapia Industry in Huila, an Emerging Aquaculture Hub in the Colombian Southwest

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Questions: 1. Is tilapia production in Huila a sustainable endeavor from the Triple Bottom Line (Economic, Social, Environmental) perspective?

2. Are there any significant differences in sustainability performance between the export- and domestically oriented sectors?

Key Messages

- Two main tilapia production sectors exist in Huila: large-scale exporters (over 80% of output) and mid- to small-scale producers, mainly focused on the domestic market with minimal exports (less than 15% of output).
- Large-scale exporters exhibit superior performance in economic and social sustainability compared to domestic producers. However, both production sectors present similar levels of environmental performance.
- Despite a larger share of certified production in the export-oriented sector, environmental performance is constrained by the scale of operations. While complying with environmental requirements, such as water quality, feed sources, waste management, and impact assessments, some gains are offset by the larger footprint of their operations.
- The social sustainability gap is attributed to improved working conditions in the export-oriented sector, which, benefiting from higher rents through international trade, can offer superior employee benefits, e.g., higher salaries and access to better health and education service.
- The economic advantages of large-scale exporters, including economies of scale, enhance their resilience to environmental and economic shocks. Those shocks could put small- and mid-sized producers out of business.

Background and Methodology

Located in the southwest of Colombia, the Huila department has emerged as a leading aquaculture hub and the most important producer of farmed tilapia in the country. Growing at an average rate of 10% since 2012, tilapia production in Colombia reached approximately 200,000 tons in 2022, with the Huila and Meta departments accounting for 40% and 11%, respectively. In 2022, Huila exported approximately 16,000 tons of the 84,000 tons it produced, representing 90% of Colombian tilapia exports. Two distinct production sectors can be identified in Huila: large-scale producers who export over 80% of their output, and mid- and small-scale producers who predominantly cater to the domestic market and have minimal export activity (less than 15% of output). The fast growth of tilapia production in Huila can be explained by two closely interlinked factors: the entrepreneurship abilities and tenacity deployed primarily by large-scale producers in the region, and the signing of the Free Trade Agreement between Colombia and the US in 2007. While a consensus has emerged on the importance of practicing aquaculture in the most sustainable way, it is equally important to establish a shared understanding of the practices and conditions that guarantee the three pillars of sustainability – economic, environmental, and social – in any aquaculture production sector. Building upon the success of the Fishery Performance Indicators (FPIs) as an instrument to evaluate sustainable

management of fishery systems, the Aquaculture Performance Indicators (API) were developed as an innovative assessment tool to address the sustainability concerns associated with fast aquaculture development. This study used the API methodology as an assessment framework to evaluate the sustainability and compare the performance of export-oriented versus domestically oriented tilapia production sectors in the Huila department.

Results

Results show that the export sector exceeds the performance benchmark for the three dimensions (economic, social, and environmental) of sustainability while the domestic sector reaches the benchmark for only one dimension (environmental). The assessment revealed that the two production sectors are characterized by different production and investment capabilities as well as different cost, risk, and vulnerability profiles. The difference in performance between the two sectors related to economic and social dimensions is statistically significant. Notable differences were also observed in post-production, co-management, and property rights outcomes. The economies of scale and other economic advantages enjoyed by large firms provide them with a greater capacity to withstand and recover from environmental and economic shocks. Those shocks could put small- and mid-sized producers out of business.

Policy Implications

This study aims to offer valuable insights pertinent to the challenges arising from shifting climatic conditions, fluctuations in feed supply, and increasing energy costs. To improve the future performance of the tilapia industry, efforts by policymakers should be oriented toward improving the enabling conditions that incentivize profitable and socio-ecologically sustainable production sectors, leading to the creation of sustainable livelihoods and upkeep of ecosystems. Major challenges center around gender, land rights, and data quality and availability. Women face limited influence in managing exporting businesses, with lower involvement in decision-making, ownership, and financing. Legal access to water resources poses a significant challenge for mid- and small-scale producers, hindering formalization of economic activities due to high associated costs.

Informal water access negatively impacts certifications, market access, and production commercialization in contract farming. This disparity between the two sectors may widen with growing international demand for tilapia and increased entry barriers for new producers. Additionally, the absence of a dedicated institution in the tilapia industry for continuous data collection hampers monitoring progress, with 62% of current sector data requiring adjustments or clarifications, often relying on gray literature and interviews. Realizing these policy recommendations necessitates close collaboration among government agencies, research institutions, industry stakeholders, and local producers. Regular monitoring is crucial to assess the effectiveness of policies and make necessary adjustments. Our methodological framework can serve as a benchmark for monitoring progress in sustainable tilapia production over time.

The Environment for Development initiative is a capacity-building program in environmental economics focused on international research collaboration, policy advice, and academic training. It consists of centres in Central America, Chile, China, Colombia, Ethiopia, Ghana, India, Kenya, Nigeria, South Africa, Sweden (University of Gothenburg), Tanzania, Vietnam, Uganda, and the US (Resources for the Future). Financial support is provided by the Swedish International Development Cooperation Agency (Sida).