POLICY BRIEF

Harnessing multi-stakeholder innovation platforms for knowledge transfer and aquaculture value chain development in Uganda

EXECUTIVE SUMMARY. Uganda's aquaculture subsector contributes 22% of the country's total fish production but faces significant challenges, including limited access to extension services, production inputs, post-harvest handling facilities, value addition skills, disease management, and weak market linkages. These challenges negatively impact productivity, profitability, rural employment, food security, and export revenue. Despite isolated interventions, these issues persist, indicating a need for coordinated and sustainable solutions.

To address these challenges, a zonal innovation platform approach was adopted. This involved conducting household surveys among aquaculture stakeholders across Uganda's nine agro-ecological zones and establishing nine zonal and one national aquaculture innovation platform. These platforms bring together key stakeholders, including fish farmers, hatchery operators, traders, extension workers, researchers, input suppliers, local leaders, and financial institutions, to identify and address common challenges at each value-chain node. The initiative emphasizes gender-centered aquaculture development and aims to foster innovation, skill transfer, and technological advancement. By linking value-chain actors, particularly youth and women, to business opportunities, the zonal innovation platforms are expected to enhance productivity and promote sustainable growth in Uganda's aquaculture sector.

INTRODUCTION

Aquaculture is among the fastest-growing food production systems, significantly contributing to global food security and nutrition (FAO, 2022). Despite its rapid growth, the sector must embrace transformative changes in policy, management, innovation, and investment to achieve sustainable, inclusive, and equitable development. Innovation and technological advancements are critical in addressing poverty and enhancing productivity, particularly in aquaculture, where its share of global aquatic food production reached 49.2% in 2020 (Kakeu et al., 2024). Continued innovation in farming systems is essential to tackle persistent challenges such as feed and seed quality and to expand market access. These advancements are pivotal for mitigating production risks and driving the transition toward sustainable and intensive aquaculture production, ensuring the sector maintains its global importance.

Innovation platforms (IPs) have become increasingly popular as a framework for organizing multi-stakeholder interactions and exploring ideas, people, and resources to address challenges and opportunities embedded in complex settings (Bush et al., 2021). Although IPs have only recently joined the toolkit of agricultural research for development programs in Uganda, they are currently widely used as a core part of strengthening agricultural productivity, smallholder farmer livelihoods, and agricultural innovation systems (Magala et al., 2018). IPs have been used in the agricultural sector to facilitate interactive learning, thereby enhancing the ability to respond to collective challenges and identified needs (Magala et al., 2018).

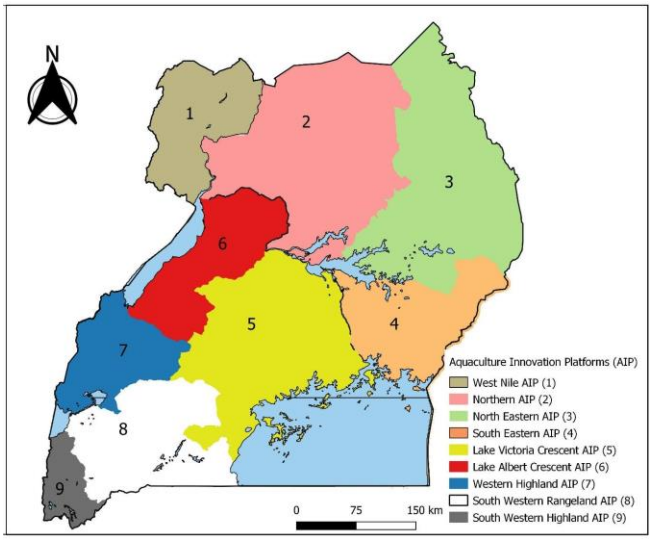
In aquaculture, IPs play an important role in solving production and marketing challenges, contributing to the transformation of the sector, as evidenced in Bangladesh, Vietnam, and Thailand (Bush et al., 2021). Despite the importance of IPs in enhancing sustainable agriculture globally, their application in Uganda's aquaculture sub-sector is still lacking. As such, the aquaculture value chain is still characterized by uncoordinated small-scale, medium- to large-scale commercial fish farmers, processors, input dealers, and middlemen/merchants/traders (Adeleke et al., 2020) that are disjointed. These stakeholders operate in a complex and uncertain environment, which requires continuous improvement and innovation.

Consequently, effective uptake pathways through IPs are required to improve aquaculture growth over linear and less inclusive traditional research and ex-tension approaches that are currently used in Uganda.

This policy brief highlights key findings on the role of innovation platforms (IPs) in advancing aquaculture in Uganda. It focuses on the creation and implementation of zonal aquaculture platforms to coordinate value-chain actors, fostering a collaborative system designed to enhance aquaculture productivity, profitability, and sustainability for inclusive growth and development.

KEY FINDINGS

***Nine Innovation platforms created at zonal and national levels*.** A participatory approach through workshops was adopted to facilitate different groups of stakeholders to identify, categorize, and analyse constraints and propose solutions and strategies in aquaculture (Figure 1).



Map of location of major aquaculture value chain actors in Uganda nine zones

***Identification of key challenges facing aquaculture*.** Fish farmers identified high cost of feed and poor feed quality as major constraints to the viability of aquaculture across all zones in Uganda (Table 1). The high feed cost situation is complicated by the lack of adequate local capacity to produce sufficient feed to satisfy the demand. Additionally, financial capital emerged as the top constraint across all stakeholders in all zones.

Similarly, findings from the present study indicated that traders complained about high interest rates from financial institutions. To solve this challenge, small groups of traders often come together to create informal financial groups through which they borrow funds amongst themselves at zero interest, as revealed during the focus group discussions. It was observed that farmers who live within close proximity of extension workers' offices utilized the opportunity to request farm visits. Extension workers highlighted low staffing levels, underfunding, and poor linkages between research and extension as major challenges facing Uganda's aquaculture extension services.

Table: Main constraints identified per stakeholder

Category	No. 1 ranked constraint
Financial institutions	Poor record keeping by farmers
Extension officers	Under-funding of the aquaculture sub-sector
Input dealers	Poor-quality feed ingredients
Researchers	Limited funding for research
Farmers	high cost of feed and poor feed quality

***Linkages established among key actors in the aquaculture value chain*.** The workshops brought together different aquaculture stakeholders in the zone to address challenges, share knowledge, and promote sustainable practices. Through this, linkages were fostered among key actors, including fish farmers, hatchery operators, feed suppliers, processors, traders, researchers, extension workers, policymakers, and financial institutions.

Capacity building of aquaculture value chain (AVC) actors. Creating a collaborative environment through the innovation platforms formed was key addressing the challenges of stakeholders like farmers and hatchery operators which later promotes sustainable growth.

CONCLUSION

The nine confirm their potential for addressing a range of short-term production risks and long-term goals of sustainable aquaculture production. This study demonstrates that actors within an IP face multiple challenges (including developmental, material, and economical challenges). As highlighted, there are technical knowledge gaps across the entire aquaculture value chain, mainly affecting hatchery operators, input suppliers, and farmers. Farmers rely heavily on technical assistance from local government fishery officers and extension workers.

POLICY RECOMMENDATIONS

Develop and implement standardized record-keeping tools. Designing simple, user-friendly templates for tracking key aspects such as production inputs, fish growth, sales, and expenses will help fish farmers and hatchery operators to track their records. This information is key while securing credit from the financial institutions. The Ministry of Agriculture, Animal Husbandry and Fisheries (MAAIF) should ensure that these standardized record-keeping templates are used by all stakeholders.

Strengthen partnerships with the private sector and NGOs. Leverage partnerships with private organizations, development partners like FAO, BMZ, NGOs, and academic institutions to supplement extension services and research activities in aquaculture. Development of public-private partnership (PPP) frameworks to engage private actors in providing extension and research support is key.

Promote training and capacity building among the stakeholders. Through organizing training programs for feed producers, hatchery operators, and farmers on best practices for producing and handling quality feeds and fingerlings. Supporting collaboration between research institutions, private sector actors, and universities to innovate and scale up production of high-quality inputs. For example, conducting research on black soldier fly farming as a potential alternative animal protein source to fishmeal is key in enhancing feed supply.

Raise awareness among the farmers. Integrate feed and fingerling quality education into routine extension services and community meetings. This is possible through formation of social network groups to enhance communication among various value chain actors.

References

FAO (2022). The State of World Fisheries and Aquaculture 2022. Towards blue transformation. Rome, FAO. https://doi.org/10.4060/cc0461en

Kakeu, C. B. P., Wendji, C. M., Kouhomou, C. Z., & Kamdoum, G. C. M. (2024). Can technological innovations contribute to more overcome the issue of poverty reduction in africa?. *Technology in Society*, *76*, 102463.

Bush, S. R., Pauwelussen, A., Badia, P., Kruk, S., Little, D., Newton, R., & Sung, Y. Y. (2021). Implementing aquaculture technology and innovation platforms in Asia. *Aquaculture*, *530*, 735822.

Magala, D. B., Mangheni, M. N., & Miiro, R. (2018). Formation of effective multi-stakeholder Platforms: Lessons from coffee innovation platforms in Uganda. *African Journal of Rural Development (AFJRD)*, *3*(1), 617-632.

Adeleke, B., Robertson-Andersson, D., Moodley, G., & Taylor, S. (2020). Aquaculture in Africa: A comparative review of Egypt, Nigeria, and Uganda vis-a-vis South Africa. *Reviews in Fisheries Science & Aquaculture*, *29*(2), 167-197.

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