

Regional collaboration for sustainable and nutrition-sensitive marine aquaculture in Africa

David Mirera^{1*}, Antoinette Adingra², Teejaswani Bachoo³, Célestin Blé², Marissa Brink-Hull⁴, Henriques Bustani⁵, Mame Seynabou Gueye⁶, Gladys Mwaka Holeh^{1,7}, Betina Lukwambe⁸, Brett M. Macey⁴, Francis Pius Mmunda⁹, Nadeem Nazurally³, Hilka Ndjaula¹⁰, Mbaye Tine⁶, Martin Tjipute¹⁰, Maria J. Darias¹¹

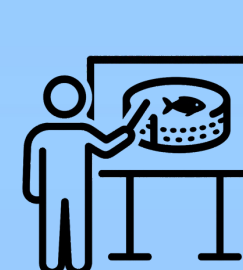
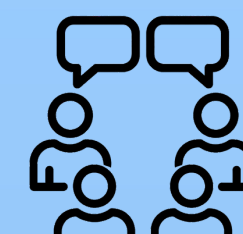
¹Kenya Marine and Fisheries Research Institute, Mombasa, Kenya, dimirera@yahoo.com; ²Centre de Recherches Océanologiques, Abidjan, Côte d'Ivoire; ³University of Mauritius, Faculty of Agriculture, Department of Agricultural and Food Science, Reduit, Mauritius; ⁴Department of Forestry, Fisheries and the Environment, Aquaculture Innovation and Technology Development, Sea Point 8001, South Africa; ⁵Instituto Oceanográfico de Moçambique, Centro de Pesquisa de Pemba, Cabo Delgado, Moçambique; ⁶Université Gaston Berger, UFR Sciences Agronomiques, de l'Aquaculture et des Technologies Alimentaires, Saint-Louis, Senegal; ⁷Ghent University, Blue Growth Research Lab, 8400 Ostend, Belgium; ⁸University of Dar es Salaam, Department of Aquaculture Technology, Dar es Salaam, Tanzania; ⁹University of Dar es Salaam, Institute of Marine Sciences, Zanzibar, Tanzania; ¹⁰University of Namibia, Department of Fisheries and Aquatic Sciences, Henties Bay, Namibia; ¹¹MARBEC, Univ Montpellier, CNRS, Ifremer, IRD, Montpellier, France.

Context

Aquatic foods—fish, invertebrates, algae, and aquatic plants—are rich sources of essential nutrients and are vital for food and nutrition security. Yet, their role is frequently undervalued in national policies, which often prioritise economic outputs and exports over local nutritional needs. In Africa, per capita consumption of aquatic foods is projected to decline by 2030 due to population growth outpacing supply. Although aquaculture has expanded rapidly across the continent, it still accounts for less than 2% of global production, with marine aquaculture among the lowest worldwide. Promoting nutrition-sensitive approaches is key to harnessing the potential of aquatic food systems to improve nutrition, public health, and livelihoods across Africa.

Objectives

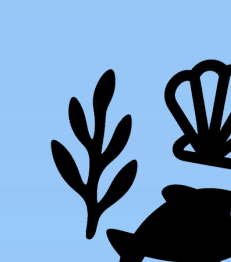
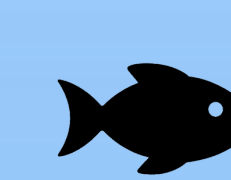
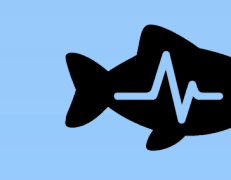
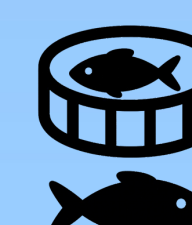
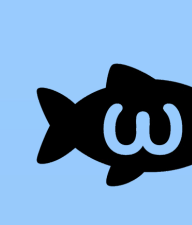
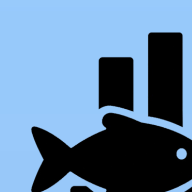
AfriMAQUA aims to contribute to the development of sustainable and nutrition-sensitive marine aquaculture in Africa to improve food and nutrition security, generate income, and support livelihoods. The programme promotes South–South–North collaboration through:

-  Fostering joint research initiatives on marine aquaculture development
-  Strengthening technical and scientific capacities through training and knowledge exchange
-  Using participatory approaches to identify local drivers and barriers to sustainability

The Network

AfriMAQUA is a collaborative research network established in 2019 to foster scientific cooperation in marine aquaculture across Africa. It brings together researchers from sub-Saharan Africa, in partnership with French institutions, to advance the development and sustainability of marine aquaculture on the continent. In 2023, AfriMAQUA was endorsed as a programme of the UN Decade of Ocean Science for Sustainable Development (2021–2030). Building on its initial achievements, the network now has an expanded focus on nutrition-sensitive approaches, aiming to support the development of sustainable aquatic food systems that contribute to healthier and more resilient diets.

Research Topics

-  Sustainable aquaculture technologies (e.g., diversification strategies that maximise the use of nutrient-rich species, indigenous low-trophic species, and integrated multi-trophic aquaculture)
-  Sustainable aquafeeds that optimise the nutritional value of farmed species
-  Welfare and health of farmed organisms and farming systems (One Health approach)
-  Interactions between aquaculture and the environment
-  Nutritional composition and contaminants of marine aquaculture species and their by-products
-  Socio-economic aspects of sustainable aquaculture development

Key Initiatives Across the Network

Collaborative Research Projects

Joint research initiatives have been conducted across member countries, exploring sustainable practices, species diversification, and local socio-economic contexts:

- Integrated multi-trophic aquaculture in intertidal ponds (Tanzania)
- Integration of Artemia aquaculture in traditional saltworks (Mozambique)
- Nutritional composition analyses of silver kob *Argyrosomus inodorus* (Namibia)
- Evaluation of the nutritional value and socio-economic importance of oyster farming (Senegal)
- Development of sustainable feeds for rabbitfish *Siganus sutor* reared in intertidal ponds (Kenya)
- Development of sea urchins *Tripneustes gratilla* aquaculture technology in IMTA system (Mauritius)
- Bioremediation capacity and nutritional profile of *Arenicola loveni* in a sea urchin–seaweed IMTA system (South Africa)

Capacity Building and Training

The network has supported knowledge exchange through regional training programmes and individual capacity-building actions:

Short Courses

- Integrated aquaculture
- Sustainable aquaculture practices
- Designing and facilitating participatory processes

Individual Training

- Microbiology and molecular biology techniques
- Fish reproduction and larval rearing
- Enzyme activity analyses in aquaculture species

Outreach and Engagement

The network has facilitated collaboration and knowledge dissemination through high-level events:

- Organisation of a scientific conference on marine aquaculture in Africa (Kenya)
- Multi-stakeholder workshops engaging academia, governments, the private sector, and civil society (Kenya, South Africa)



Training course on sustainable marine aquaculture in Kenya



Training course on integrated aquaculture in Namibia



Tripneustes gratilla farming in IMTA system in South Africa



Milkfish aquaculture in intertidal ponds in Kenya

AfriMAQUA is funded by



Partner Institutions

Contact us

afriumaqua@ird.fr

