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# LIMAQUA: African interdisciplinary laboratory in sustainable, nutrition-sensitive marine aquaculture

**Brett Macey**, Maretha Opperman, Pascal Raux, Marissa Brink-Hull, Frank Wieringa, and Maria Darias
Government, Forestry, Fisheries and the Environment (DFFE), South Africa (bmacey@dffe.gov.za)

Over the past three decades, global capture fisheries production has remained relatively unchanged, while aquaculture production has strongly increased to satisfy the demands of a growing world population. Since 2022, aquaculture production has surpassed that of capture fisheries. Although the environmental performance of aquaculture has shown positive trends over the last 20 years, further research is necessary to address its sustainability challenges, such as reducing the use of marine resources in aquafeeds, limiting habitat degradation, and improving disease management.

Research in aquaculture has traditionally focused on enhancing the growth and health of farmed species, rather than addressing human nutrition concerns. Nutrition-sensitive aquaculture proposes a new paradigm that moves beyond merely producing aquatic foods to fostering well-being. This involves promoting diversification and sustainable intensification of aquaculture production, investigating a wider range of aquatic species and their dietary contributions to prioritize nutrient-rich alternatives that improve dietary diversity, and encouraging nutrition-enhancing aquaculture feeding practices, among other strategies.

Based in South Africa, the International Joint Laboratory LIMAQUA—*lima* means ‘to cultivate’ in Xhosa, a language spoken in Southern Africa—conducts an interdisciplinary research and training programme to tackle nutritional and sustainability challenges of marine aquaculture, contributing to food and nutrition security, poverty alleviation, and income creation in the region. LIMAQUA brings together a team of scientists specializing in biology, biotechnology, socioeconomics, food science and human nutrition. The research and training activities are grounded in the sustainability science approach—an inter- and transdisciplinary approach co-constructed with academic, governmental, private sector, and civil society actors. Specifically, LIMAQUA focuses on i) developing sustainable marine aquaculture practices for target species, including research on culture technologies, sustainable nutrition, welfare and health of farmed organisms (One Health approach), and aquaculture-environment interactions; ii) adopting an integrated approach to marine aquaculture development; iii) creating aquaculture-based food and nutritional products; iv) providing capacity-building and training; and v) fostering collaborations within Africa.

This presentation will examine examples of research activities undertaken within the framework of LIMAQUA. This includes the development of integrated multitrophic aquaculture systems,

assessments of social acceptability of aquaculture development, and evaluations of the nutrient supply from local aquaculture production, highlighting sustainable and nutrition-sensitive approaches in marine aquaculture.