

Strengthening Aquaculture Through Red and White Cooperatives

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Indonesia is one of the world's leading aquaculture producers, contributing approximately **5.9 million tonnes of aquatic animals** (around 7% of global production) and **40 million tonnes of algae** (25% of global production) in 2024. Despite this strong position, Indonesia faces increasing challenges in maintaining its competitiveness as global demand for aquatic protein continues to rise.

Competing countries such as China, Vietnam, India, and Ecuador continue to strengthen their aquaculture sectors through technological modernization, efficient supply chains, digitalization, standardized production, and stronger business institutions. Meanwhile, Indonesia still struggles with relatively low productivity, limited certification, high feed costs that account for over half of production expenses, dependence on imported ingredients for aquafeed, disease outbreaks, inadequate cold chain infrastructure, restricted financing, and the weak bargaining power of small-scale farmers.

Global markets have also evolved. Buyers increasingly demand products that are not only affordable but also sustainable, traceable, safe, certified, and produced with lower environmental impacts. Importing countries now apply stricter environmental and social standards, requiring

Indonesian aquaculture products to meet increasingly rigorous international requirements.

Since Indonesian aquaculture remains dominated by small-scale producers, meeting these standards individually is difficult. In this context, the Government's **Red and White Cooperatives (KDMP)** present an important opportunity. Beyond simply establishing cooperatives, the priority is ensuring they operate professionally, adopt sustainable business models, and generate long-term economic benefits for their members.

For aquaculture, KDMP should function as more than savings-and-loan institutions or harvest traders. Instead, they should become integrated one-stop service centres that support the entire production system. Cooperatives can collectively procure feed, seed, medicines, probiotics, and other production inputs, lowering production costs through economies of scale. They can also manage cold storage, processing facilities, and digital marketing platforms that are often beyond the reach of individual farmers.

Equally important, cooperatives can aggregate production from many farmers, allowing products to meet the volume requirements of processors and export markets. Through centralized grading, quality assurance,

certification, and traceability systems, KDMP can improve product consistency, strengthen farmers' bargaining power, and expand access to premium domestic and international markets.

KDMP as a distribution centre for ingredients for aquafeed

One of KDMP's most strategic roles is supporting feed production. Feed represents approximately **50–60% of aquaculture production costs**, while many small and medium-scale farmers depend heavily on commercial feed because they cannot access quality feed ingredients. As a result, farm profitability is highly sensitive to feed prices and fluctuating market conditions.

A practical solution is for KDMP to establish a distribution channel to distribute ready-to-produced feed ingredients to farmers. Feed consists of macronutrients such as protein, carbohydrates, and fats, together with micronutrients such as essential vitamins and minerals. In connection with previous government investments in feed production machinery, KDMP can distribute formulated feed ingredient packages containing balanced macro- and micronutrients directly to the farmers. Working with **PT Agrinas Jaladri Nusantara**, which coordinates strategic ingredient, these ingredients can be efficiently supplied to aquaculture production centres nationwide. Universities and research institutions can also contribute by developing formulations that combine approximately **70% imported and 30% locally sourced ingredients**, reducing dependence on imports while maintaining



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feed quality and strengthening domestic supply chains and then distributed by KDMP and KNMP.

KDMP as the initiator of sustainability, quality and traceability certification

KDMP should also become a driving force for sustainability, certification, and traceability. Each cooperative that already has one person responsible in quality assurance can establish a units responsible for monitoring product quality and safety throughout production, storage, distribution, and marketing while maintaining integrated reporting systems. Such an approach would help farmers consistently comply with national and international standards.

A useful model is **AMUL**, India's internationally recognized dairy cooperative. Its three-tier structure links village-level cooperatives with district processing unions and a state-level federation responsible for marketing, branding, exports, research, and product development. This integrated system has played a major role in making India the world's largest milk producer.

A similar model could strengthen Indonesia's aquaculture sector. At the production level, community-based organizations such as KNMP can produce fish and shrimp based on sustainable farming practices and robust traceability systems. KDMP can function as the operational layer by disseminating Good Aquaculture Practices and standardized production protocols to the farmers. At the national level, the Ministry of Cooperatives and SMEs can coordinate research, innovation, branding, and export development to ensure Indonesian aquaculture products consistently meet international quality standards. In this way, production quality meets market standards and economic value increases, thereby enhancing the prosperity of farmers.

KDMP and beyond

Beyond production and marketing, KDMP can become centres of aquaculture villages innovation. Through partnerships with universities, research institutions, feed manufacturers, financial institutions, technology companies, and local

governments, cooperatives can accelerate the adoption of innovations such as biosecurity systems, digital farming, Internet of Things (IoT) technologies, artificial intelligence for water quality monitoring, and low-emission aquaculture practices. These innovations directly support Indonesia's commitment to sustainable aquaculture development while enhancing competitiveness in premium global markets.

Indonesia's aquaculture industry is at a pivotal moment. Although international competition and market requirements continue to intensify, significant opportunities exist through the transformation of village-based institutions. If the Government's Red and White Cooperatives evolve into professional centres for production services, innovation, marketing, quality assurance, certification, and supply chain management, they can substantially improve farmers' welfare while accelerating Indonesia's ambition to become one of the world's leading and most sustainable aquaculture producers.

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