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Analysis of Policy Interventions, Community-based Approaches, and Industry Partnerships that have Led to Positive Outcomes in Indonesia

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Project: 101129136 — SustainaBlue — ERASMUS-EDU-2023-CBHE

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INTRODUCTION

Indonesia's position as the world's second-largest seafood producer and its vast archipelago of 17,000 islands have made sustainable fisheries and aquaculture critical for food security, livelihood preservation, and ecosystem conservation. This analysis examines successful interventions across policy, community engagement, and industry collaboration that have driven positive outcomes in the sector.

1. **Policy Interventions: Enabling Frameworks for Systemic Change**
2. **Community-Based Approaches: Locally Led Stewardship**
3. **Industry Partnerships: Scaling Innovation Through Collaboration**
4. **Cross-Cutting Success Factors**

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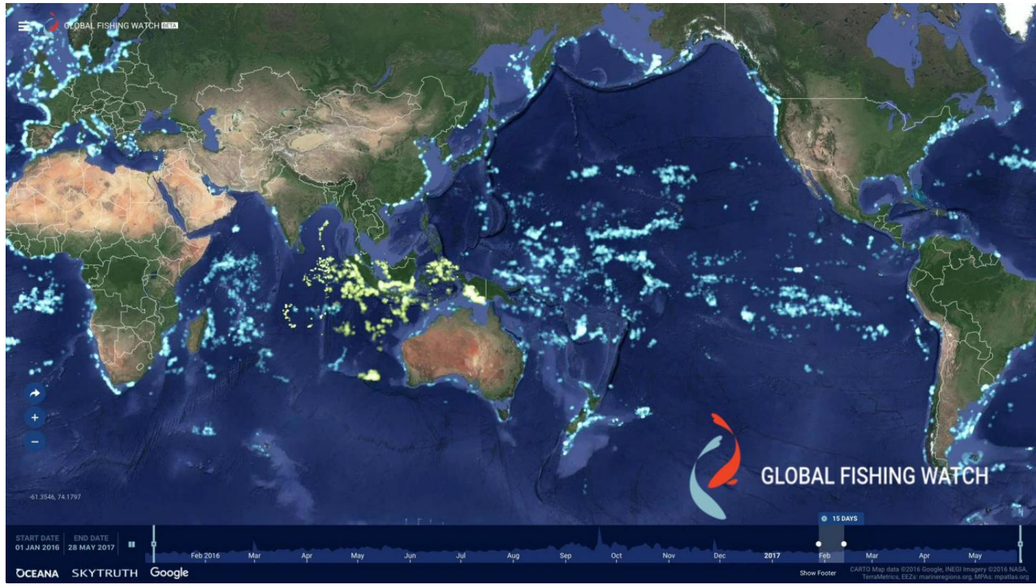
1. Policy Interventions: Enabling Frameworks for Systemic Change (1)

- **Combating Illegal Fishing and MSC Certification**: Under Minister Susi Pudjiastuti's leadership, Indonesia implemented hardline policies against illegal fishing, including public destruction of illegal vessels. This was coupled with transparency initiatives like adopting **Global Fishing Watch** for satellite vessel tracking. These measures contributed to fish stock recovery, with catches doubling for small-scale fishers. The PT Crac Sorong tuna fishery achieved Southeast Asia's second Marine Stewardship Council (MSC) certification, validating policy effectiveness and opening premium export markets [1].

merdeka.com



eurekalert.org

Global Fishing Watch uses publicly broadcast AIS signals to track fishing vessels. On the Global Fishing Watch heat map, every lighted point represents a fishing vessel. The blue points are vessels detected through AIS. The green points represent nearly 5,000 additional vessels revealed through Indonesia's government Vessel Monitoring System. This data has never been made available to the public before now.

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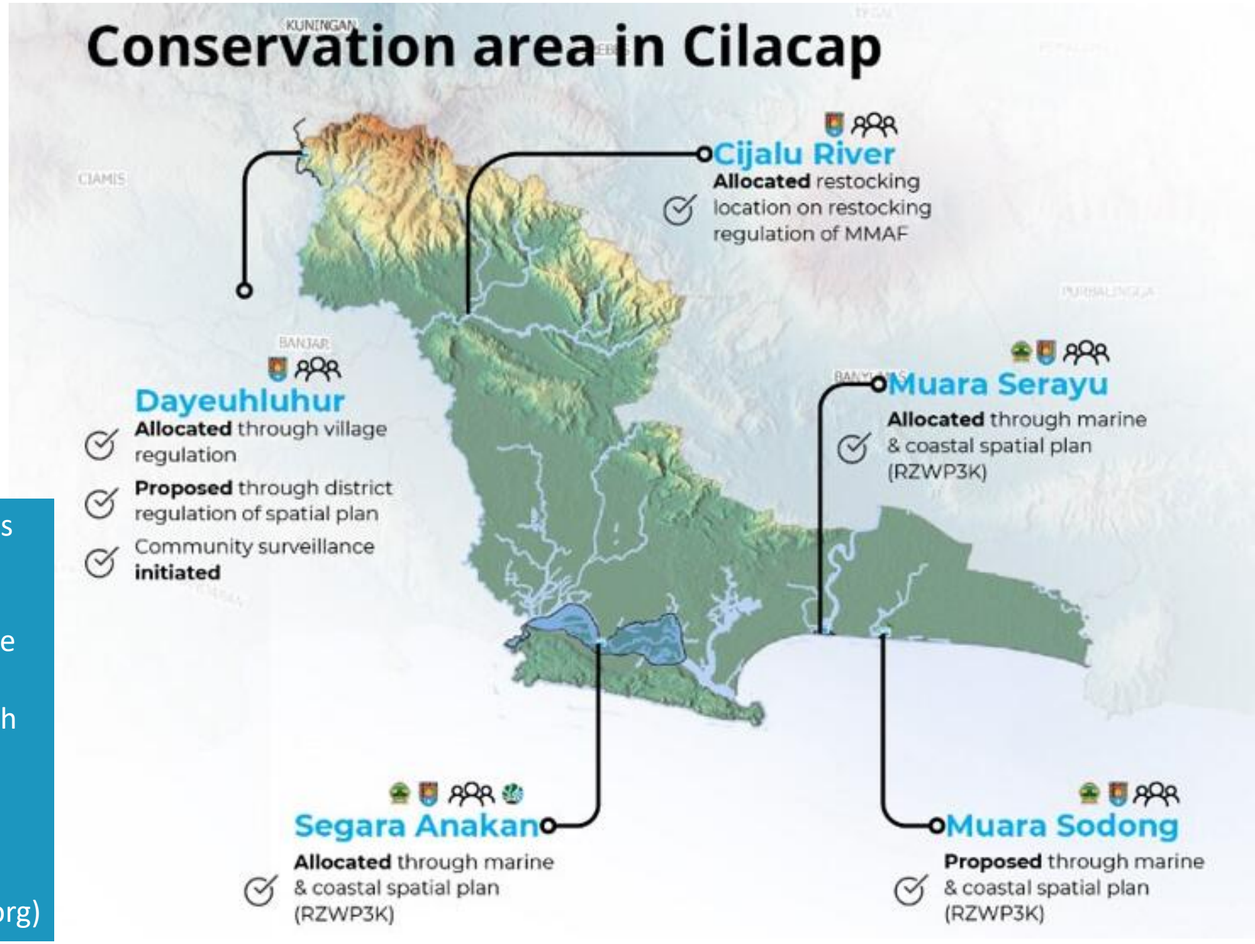
1. Policy Interventions: Enabling Frameworks for Systemic Change (2)


Lubuk Larangan in Kampar (Tirto.id)

- **Ecosystem-Based Spatial Planning**: The IFish project (2017-2024), supported by FAO and the **Global Environment Facility**, developed 15 national/regional policies governing over 11,800 km² of freshwater ecosystems. Key innovations included integrating traditional management systems (e.g., Lubuk Larangan no-catch zones in Kampar Regency) into formal policy and establishing Indonesia's first sustainable fish passages for migratory species like eels, now incorporated into national infrastructure standards [2].



In Cilacap, the project focuses on the conservation of *Anguilla bicolor*, a species recognised as crucial by experts. The Indonesian government has granted this species a limited protection status, highlighting the need for enhanced conservation and sustainability efforts. Spanning across different habitats in the area, from Dayeuhluhur to Muara Sodong, IFish is deeply committed to integrating local expertise and fostering community involvement. This approach is important to the project's main goal: to create a robust and sustainable framework for managing inland water biodiversity to protect vital freshwater ecosystems and enhance food security for communities that rely heavily on inland fisheries.

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1. Policy Interventions: Enabling Frameworks for Systemic Change (3)

- **Incentive-Based Aquaculture Zoning**: Coastal zoning policies reduced mangrove destruction by 75% since 2000 when combined with tools like NOAA's OceanReports platform for data-driven site selection. However, challenges persist in balancing regulation with livelihood needs, as seen in early over-regulation of Indonesian shrimp farming that caused salinization, versus under-regulation of U.S. oyster farming that missed water-quality opportunities [1][2].

Schematic figure of a designated aquaculture zone (hatched area in blue color) representing an estuary and the adjacent coastal marine area. Individual farms/sites (F) owned by different farmers, are presented in different colors. Four clusters of farms illustrate examples of aquaculture management areas (AMAs), grouped according to a set of criteria that include risks and opportunities.
FAO / World Bank (2015)

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2. Community-Based Approaches: Locally Led Stewardship (1)

- **Participatory Resource Governance**: Indonesia's IFish project established community-based monitoring systems and multi-sector forums that trained over 10,500 community members in sustainable practices. In Cambodian-influenced models (applicable to Indonesia), elective management committees with mandated women's participation increased compliance with fishing regulations by 40-60% through hybrid enforcement combining community patrols and authority referrals [3].

- **Indigenous Knowledge Integration**: Recognition of traditional systems like Lubuk Larangan (community-managed river reserves with seasonal closures) formalized local wisdom into policy frameworks. Similarly, Hawaii's loko i'a (traditional fishpond) restoration increased local seafood production by 25% while creating restoration jobs—a model applicable across Indonesian archipelago communities [2].

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IFish has played a crucial role in guiding the community back to a harmonious relationship with nature, much like the eels instinctively finding their way back to their origins, thus completing a cycle that benefits both the environment and the people who depend on it.

(fao.org)

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2. Community-Based Approaches: Locally Led Stewardship (2)

- **Gender-Responsive Livelihood Diversification**: IFish promoted zero-waste processing empowering women's groups to create value-added products for nutrition programs combating stunting in West Java. During COVID-19, communities incorporating aquaculture alongside fishing suffered 34% lower income losses, demonstrating aquaculture's role in risk diversification for coastal economies [2].

- **Technology-Enhanced Participation**: The AgResults Indonesia Aquaculture Challenge incentivized technology adoption among smallholders through Pay-for-Results prizes. In Year 4, winners distributed 2,486 units of aerators/auto-feeders and provided 199 technical assistance packages, reaching 735 small-scale farmers. This improved feed efficiency, water quality, and market access while reducing environmental impacts [4].

VENAMBAK
Climate Smart Aquaculture

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VENAMBAK BERPARTISIPASI PADA KEGIATAN ROADSHOW AGRESULTS WWF MEMPERKENALKAN TEKNOLOGI UNTUK MEMPERBAIKI KUALITAS AIR TAMBAK

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AgResults Indonesia Aquaculture Challenge Project is a competition with a Pay-for-Results scheme that will be held for five years. In this event, many technological enterprises participate to transfer novel aquaculture technology to the farmer.

(fistx.co.id)

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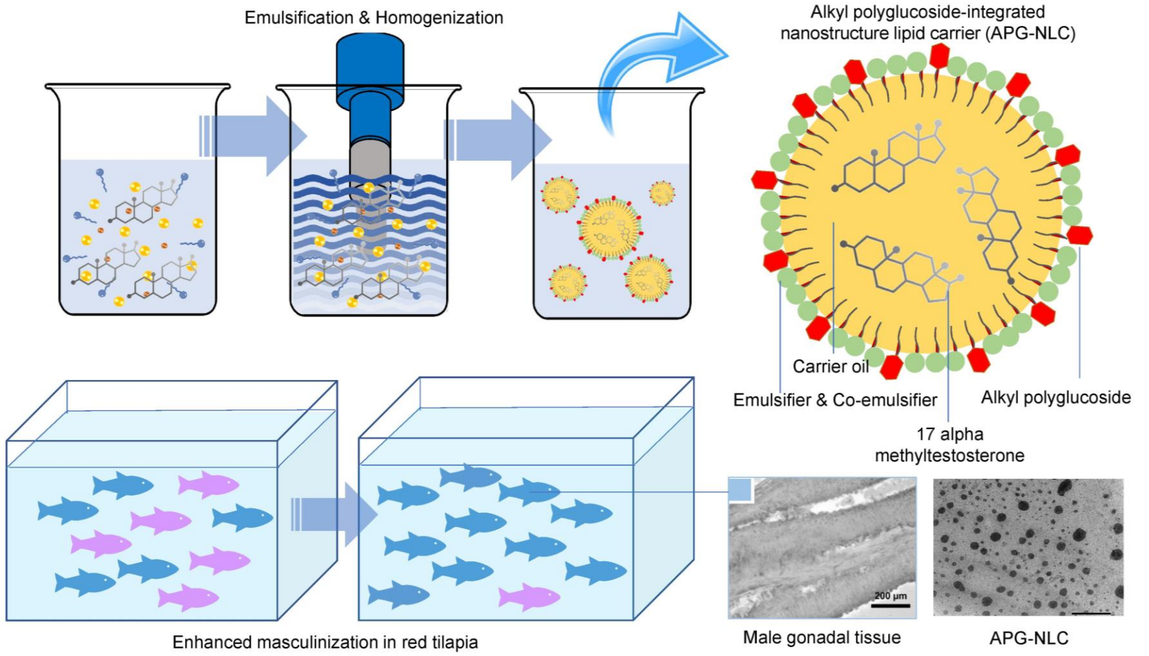
3 . Industry Partnerships: Scaling Innovation Through Collaboration (1)

- **Genetic Improvement and Sustainable Feeds**: De Heus Indonesia partnered with Larive International on PT Indo Aqua Sukses, introducing hormone-free Natural Male Tilapia (NMT) using Dutch genetics. This eliminated hormone-related environmental/health risks while increasing survival rates and growth uniformity. The partnership developed soybean-free feeds to prevent estrogenic effects on fish development, demonstrating how industry collaboration can address biological and environmental challenges.

- **Market-Led Certification and Transparency**: The Tuna Consortium united industry players (IPNLF, Fair Trade USA, WWF) to support Indonesia's science-based tuna management plan. Concurrently, the Ocean Disclosure Project enabled companies to report sourcing practices, reducing non-compliant sourcing by 22% among participants. These market mechanisms created incentives for fisheries adopting MSC standards [1].

Masculinization of Red Tilapia (*Oreochromis* spp.) Using 17α-Methyltestosterone-Loaded Alkyl Polyglucosides Integrated into Nanostructured Lipid Carriers
Yostawonkul et al. (2023)



Natural Male Tilapia (thefishsite.com)

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3 . Industry Partnerships: Scaling Innovation Through Collaboration (2)

- **Aquatech Startups and Supply Chain Innovation**: Startups like eFishery (aquaculture feeding automation) and Aruna (fishery supply chain aggregation) attracted significant investment (eFishery: $200M Series D). Aruna operates in 177 locations, supporting 40,000+ fishers by reducing supply chain layers and increasing profit shares for smallholders. These models align with Indonesia's blue economy roadmap by combining profitability with sustainability.

- **Fisheries Improvement Programs** (FIPs): YKAN (TNC's partner) launched a FIP for deepwater snapper-grouper fisheries, engaging 14 buyers/processors to limit juvenile catch to ≤5%. The program used Crew-Operated Data Recording Systems (CODRS) and FishFace AI technology (95% species ID accuracy) to overcome data gaps, demonstrating how industry partnerships enable science-based management [1].

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4. Cross-Cutting Success Factors

- **Polycentric Governance**: Effective initiatives like IFish blended top-down policy (national EAFM standards) with bottom-up implementation (community monitoring). This balanced oversight with flexibility, avoiding pitfalls of over-regulation that stifled innovation or under-regulation that enabled habitat loss [1][2].

- **Technology-Enabled Equity**: Platforms like Aruna reduced supply chain layers from 7 intermediaries to direct buyer connections, increasing fisher incomes. Similarly, CODRS and FishFace empowered fishers as data collectors, enhancing stock assessments while building stewardship ethics [1].

- **Gender-Inclusive Design**: Programs explicitly addressing women's roles—like IFish's post-harvest training and AgResults' technical assistance—achieved broader livelihood impacts. However, women still hold <10% of fisheries leadership positions despite comprising 50% of aquaculture labor, indicating persistent gaps [2][4].

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5 . Challenges and Opportunities

- **Data and Evaluation Gaps**: 85% of sustainable food policies rely on proxy metrics rather than direct environmental measurements, while SSF projects suffer from inadequate post-project evaluation. The absence of standardized longitudinal monitoring hinders impact assessment [3].
- **Equity and Scale Limitations**: Geographic bias persists with 92% of aquaculture research from high-income countries. Women remain underrepresented in leadership, and technology adoption (e.g., aerators) is limited without subsidy mechanisms like AgResults [5].
- **Climate and Market Vulnerabilities**: Shrimp farmers face price volatility (18% price drop in 2014–2015) and climate-induced disease risks. Tilapia genetics projects address breeding resilience but require scaling to reach remote smallholders [6].

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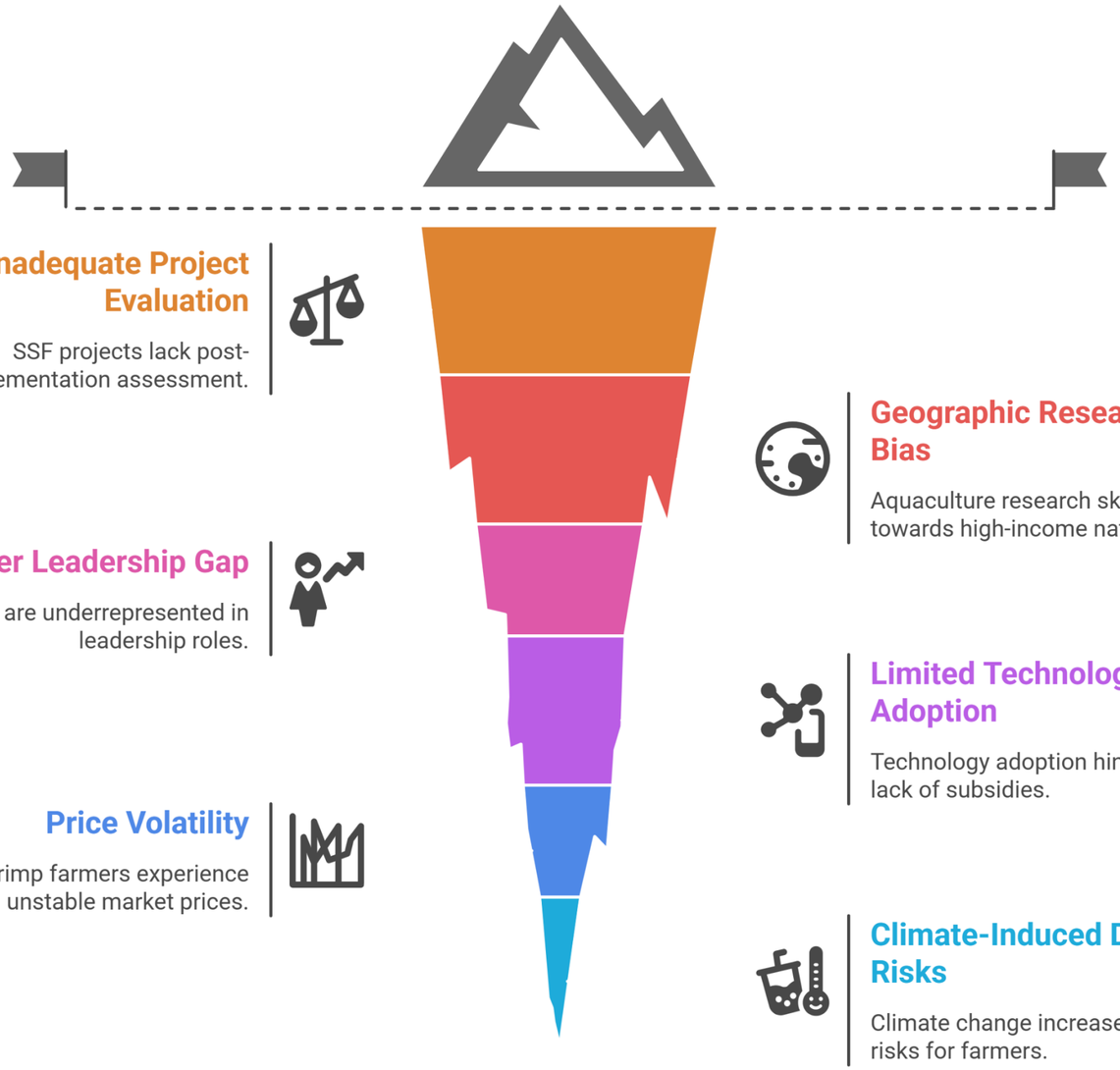
Sustainable Food Policies: Unveiling the Underlying Challenges.



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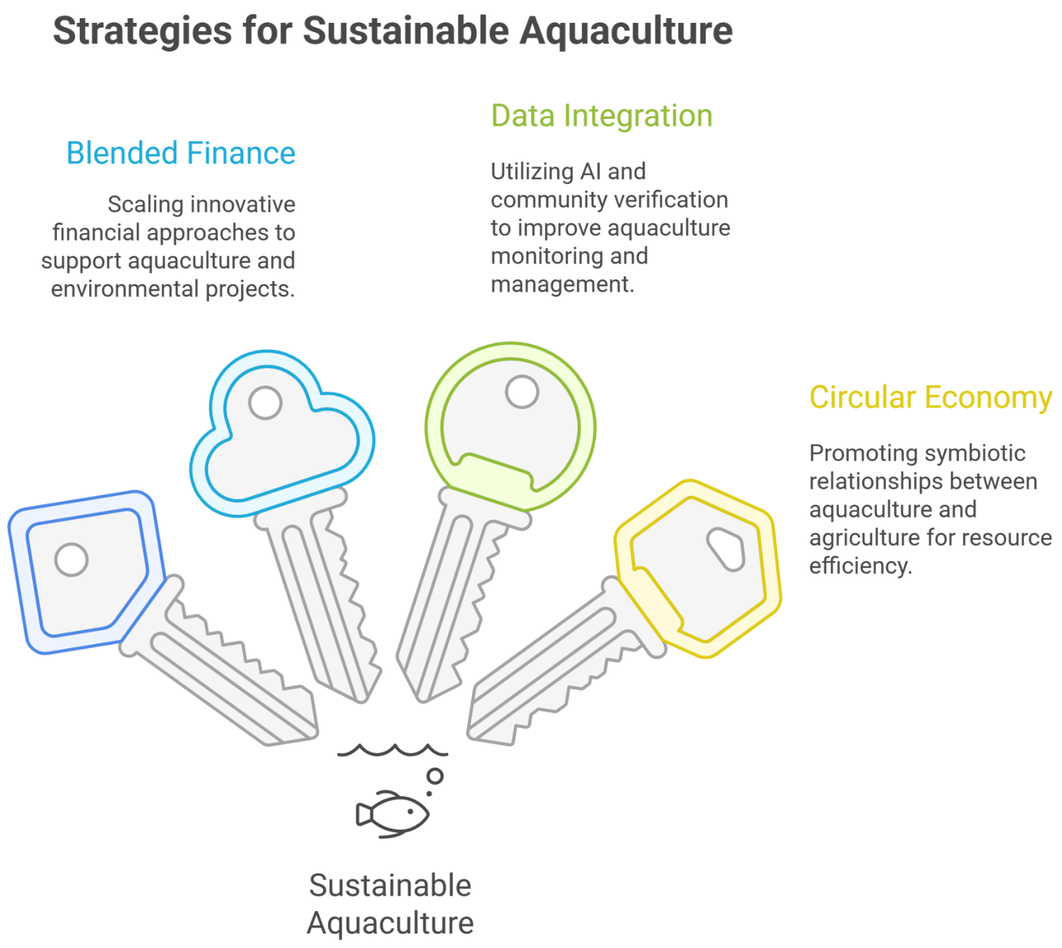
6. Recommendations for Sustainable Transformation

- **Strengthen Co-Governance Models**: Expand participatory rulemaking like Kampar's Lubuk Larangan recognition to other regions, ensuring gender quotas in management committees [2].
- **Scale Blended Finance Mechanisms**: Replicate AgResults' Pay-for-Results approach beyond aquaculture tech to habitat restoration and climate adaptation, leveraging impact investment [4].
- **Bridge Data Gaps**: Integrate FishFace AI and CODRS into national monitoring frameworks, with community-based verification to support adaptive management [1].
- **Promote Circular Economy Partnerships**: Develop industrial symbiosis models where aquaculture effluents feed agriculture (e.g., rice-fish systems), incentivized by tax breaks or certification premiums.



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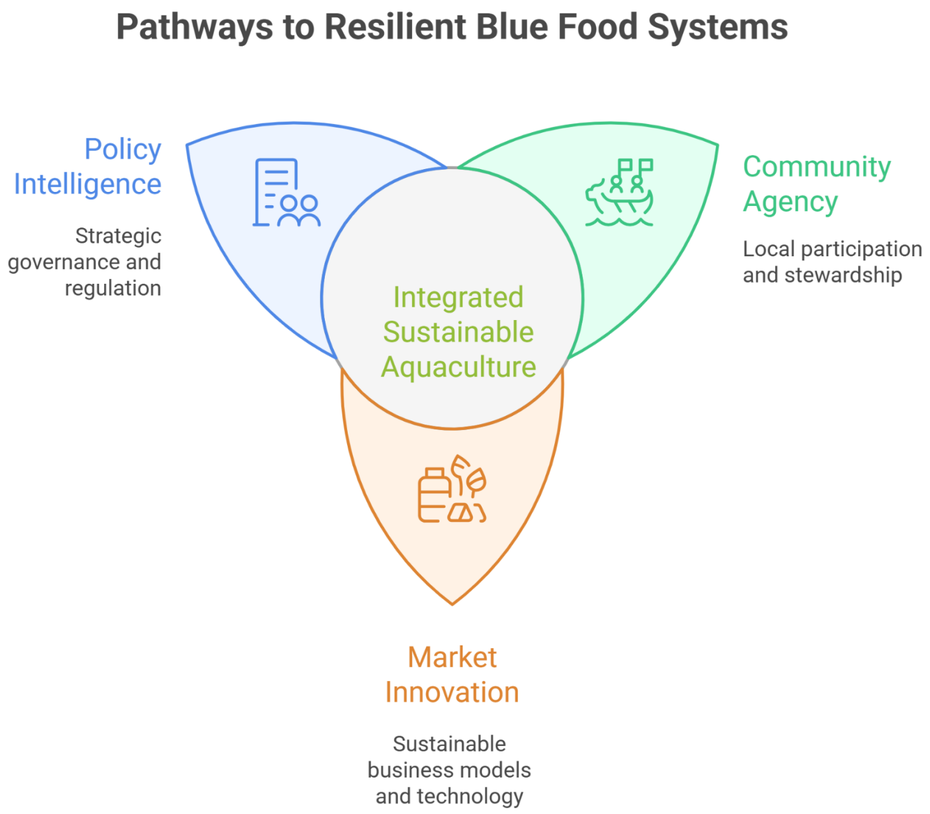
CONCLUSION

Indonesia's transformation demonstrates that sustainable blue food systems emerge from orchestrated networks of policy intelligence, community agency, and market innovation. As aquaculture production is projected to rise 32% by 2030, integrated approaches balancing ecological, economic, and social dimensions—exemplified by the IFish and SNAPPER frameworks—offer pathways toward resilient food futures.



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06

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