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# GALAHGROW: COMMUNITY-BASED SHRIMP AQUACULTURE FOR RURAL ECONOMIC EMPOWERMENT

Ateerah Abdul Razak*[1,2], Rahmat Hidayat Masludin[3], Mohamad Afzza Rosaidi[4], Che Mohamad Aiman Mohammad[5], Muhammad Shahmim Roslan[6], Muhammad Azlan Azman[7], & Virayut Soom Mat[8]

[1]Institut Penyelidikan dan Pengurusan Kemiskinan (InsPeK), Universiti Malaysia Kelantan, Malaysia
[2]Fakulti Pengajian Bahasa dan Pembangunan Insan, Universiti Malaysia Kelantan, Malaysia
ateerah@umk.edu.my https://orcid.org/0000-0003-2987-2999
[3] Fakulti Pengajian Bahasa dan Pembangunan Insan, Universiti Malaysia Kelantan, Malaysia
l24a0435@siswa.umk.edu.my https://orcid.org/0009-0002-9038-9349
[4] Fakulti Pengajian Bahasa dan Pembangunan Insan, Universiti Malaysia Kelantan, Malaysia
l24a0535@siswa.umk.edu.my https://orcid.org/0009-0008-3727-428X
5 Fakulti Pengajian Bahasa dan Pembangunan Insan, Universiti Malaysia Kelantan, Malaysia
l24a0499@siswa.umk.edu.my https://orcid.org/0009-0003-0711-3470
[6]Fakulti Pengajian Bahasa dan Pembangunan Insan, Universiti Malaysia Kelantan, Malaysia
l24a0558@siswa.umk.edu.my https://orcid.org/0009-0007-5641-5511
[7]Fakulti Pengajian Bahasa dan Pembangunan Insan, Universiti Malaysia Kelantan, Malaysia
l24a0551@siswa.umk.edu.my https://orcid.org/0009-0001-5637-4584
[8]Fakulti Pengajian Bahasa dan Pembangunan Insan, Universiti Malaysia Kelantan, Malaysia
l24b0437@siswa.umk.edu.my https://orcid.org/0009-0006-3564-3972
*Corresponding Author

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**Abstract:**

Shrimp aquaculture has potential to support food production and rural economic development, but community-based projects often face water-quality problems, disease outbreaks, rising feed costs, weak waste management, limited technical knowledge and inconsistent labour participation. This study examined GalahGrow as a community-based shrimp aquaculture initiative and explored its operational challenges, enabling factors and sustainability strategies. A qualitative case-study design involved 30 purposively selected participants: eight local residents, 15 community representatives, five project facilitators

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and two aquaculture stakeholders. Data were generated through semi-structured interviews, field observation and document analysis and analysed thematically. Five themes were identified: water quality and pond cleanliness; disease control and biosecurity; operating costs and feed dependency; technical skills and labour commitment; and continuous training with appropriate technology. Drawing on the community-based enterprise perspective and aquaculture innovation-systems literature, the findings indicate that technical resources alone are insufficient without collective participation, management capability, institutional guidance and market linkages. The proposed GalahGrow Community Aquaculture Empowerment Model integrates these technical, organisational and enterprise conditions into a context-specific framework. The findings suggest potential pathways for rural economic empowerment but do not establish causal income or livelihood effects.

**Keyword:**

Community Aquaculture; Community Entrepreneurship; Pond Management Shrimp Farming; Rural Economy

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## Introduction

Aquaculture plays an important role in supporting food security, rural livelihood and local economic development (Béné et al., 2016; FAO, 2020; FAO, 2022). Among various aquaculture activities, shrimp farming is one of the sectors with strong commercial and community-based potential. Shrimp products have market demand and can contribute to household income, local employment and food supply when managed systematically (Little et al., 2016).

In rural communities, shrimp farming can be developed as a community entrepreneurship initiative. It provides opportunities for local participants to engage in productive economic activities using available land, water resources and community labour. Unlike purely commercial aquaculture, community-based shrimp farming emphasises local participation, skills development, income generation and shared responsibility (Peredo & Chrisman, 2006; Krause et al., 2015).

The GalahGrow initiative was introduced as a community-based shrimp aquaculture project to support rural economic empowerment. The project focuses on developing shrimp farming as a practical livelihood activity that can enhance technical skills, strengthen entrepreneurship and improve community wellbeing. Through this initiative, community members are exposed to pond preparation, water quality management, feeding practices, disease monitoring, harvesting and basic business management (Tran Thi Phung Ha et al., 2013).

However, shrimp farming is technically demanding. Successful production depends on water quality, pond hygiene, stocking density, feed management, disease prevention, labour commitment and technical knowledge (Boyd & Tucker, 2014; Joffre et al., 2018). Failure to manage these factors can lead to poor shrimp growth, high mortality, disease outbreaks and financial loss. For community-based projects, these challenges may become more serious if participants lack experience and continuous technical support. Therefore, this study examines GalahGrow as a qualitative case study of community-based shrimp aquaculture. It explores the problems faced in shrimp farming management, the factors influencing project effectiveness and the strategies needed to ensure long-term sustainability.

***Problem Statement***

Community-based shrimp farming has strong potential to strengthen rural livelihood and economic resilience. However, many community aquaculture projects face sustainability problems after the initial implementation phase (Ahmed, 2025). These problems are often caused by technical weaknesses, high operating costs, poor pond management, limited monitoring and insufficient community commitment.

Shrimp farming requires careful attention to water quality, pond cleanliness, waste management and disease control (Yusoff et al., 2019). If these aspects are not managed properly, shrimp growth and survival rates may decline. Water pollution, temperature changes, poor oxygen levels and disease outbreaks can cause production failure. In addition, feed cost is a major operating expense in shrimp farming. Rising feed prices can reduce profit margins and affect project continuity (Tacon & Metian, 2015).

Another issue is the lack of skilled workers. Rural community members may be interested in aquaculture but may not have sufficient knowledge of shrimp farming practices. Without training and technical guidance, they may find it difficult to manage pond operations systematically (Krause et al., 2015; Joffre et al., 2018). Furthermore, community-based projects require cooperation, clear task distribution and shared responsibility. If only a few individuals are actively involved, the project may become unsustainable.

Although previous studies have examined shrimp production risks and community aquaculture separately, limited research has integrated technical pond management, collective participation, enterprise capability and institutional support within a single community empowerment model. This study addresses that gap by examining GalahGrow as a bounded qualitative case and by developing a context-specific model that explains how technical, organisational and market conditions interact in community-based shrimp aquaculture.

***Research Objectives***

The objectives of this study are:

1.To identify the key problems faced in community-based shrimp farming management.
2.To examine the factors influencing the effectiveness of shrimp farming operations.
3.To explore the role of community participation and technical guidance in supporting project implementation.
4.To analyse the sustainability challenges of community-based shrimp aquaculture.

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5.To propose improvement strategies for strengthening GalahGrow as a rural entrepreneurship model.

### *Research Questions*

This study is guided by the following research questions:

1.What are the main problems faced in managing community-based shrimp farming?
2.What factors influence the effectiveness of shrimp farming operations?
3.How does community participation contribute to the implementation of GalahGrow?
4.What challenges affect the sustainability of community-based shrimp aquaculture?
5.What strategies can improve productivity and long-term project sustainability

## Literature Review

### *Shrimp Aquaculture and Rural Economic Development*

Shrimp aquaculture is an important economic activity that contributes to food production, employment and income generation. In rural communities, shrimp farming can provide an alternative livelihood source, especially in areas with suitable land and water resources. It can also support local economic development through input supply, labour involvement, harvesting, processing and marketing activities. Shrimp farming is not only relevant as a production-based activity, but also as a livelihood pathway that can improve household income, strengthen economic resilience and support rural wellbeing when farmers have access to appropriate resources, knowledge and support systems (Tran Thi Phung Ha et al., 2013).

Community-based shrimp farming differs from large-scale commercial farming because it emphasises local participation and capacity building. The main goal is not only production but also empowerment. Community members gain technical knowledge, practical skills and entrepreneurial exposure through involvement in the farming process (Mair & Martí, 2006). This reflects the broader role of aquaculture as a community-based economic activity that can enhance livelihood capabilities, particularly when participants are supported with training, technical guidance, access to inputs and opportunities to participate in the aquaculture value chain.

However, the contribution of shrimp aquaculture to rural development depends on the ability of farmers and community participants to manage production risks and sustain project operations. Shrimp farmers may experience different livelihood outcomes depending on their access to capital, technical skills, environmental conditions, market opportunities and institutional support (Tran Thi Phung Ha et al., 2013). Therefore, rural shrimp aquaculture initiatives such as GalahGrow should integrate technical training, financial planning, risk management and continuous mentoring to ensure that shrimp farming can function as a sustainable pathway for rural economic empowerment.

### *Community-Based Aquaculture*

Community-based aquaculture refers to aquaculture activities that involve local communities in the planning, implementation, monitoring and benefit-sharing process. This approach is commonly used as a livelihood strategy in rural development because it allows communities to

utilise available local resources such as land, water sources, labour and existing community networks. Unlike commercial aquaculture that is often driven mainly by profit and large-scale production, community-based aquaculture places greater emphasis on participation, shared responsibility and local empowerment (Oyeboade & Olagoke-Komolafe, 2024). Through this approach, aquaculture can become a practical platform for improving household income, strengthening food security and encouraging collective economic participation among rural communities.

For community-based aquaculture to succeed, participants must have adequate understanding of basic aquaculture management practices. These include pond preparation, feeding practices, water monitoring, disease prevention, harvesting cycles and post-harvest handling. Since aquaculture involves biological, environmental and technical factors, poor management can affect fish or shrimp growth, increase mortality and reduce project profitability. Therefore, community members need continuous training and hands-on exposure to ensure that they are able to manage daily farming activities systematically (Carlino-Costa & Belo, 2025). In this context, technical guidance from facilitators, aquaculture officers, university experts or local stakeholders is important to help participants develop confidence and practical skills.

In addition to technical knowledge, community participants also need business-related skills to ensure project sustainability. These include costing, pricing, sales planning, record keeping, profit calculation and reinvestment planning. Without these skills, a community aquaculture project may generate production but fail to sustain long-term income. The project may also become too dependent on external support if local participants are not prepared to manage operations and make decisions independently (Baporikar, 2021). Therefore, community-based aquaculture should be developed as both a technical and entrepreneurial intervention, where participants are trained not only to produce aquaculture products, but also to manage the project as a sustainable community enterprise.

***Pond Management and Water Quality***

Pond management is one of the most important aspects of shrimp farming because the pond functions as the main production environment for shrimp growth and survival. Good pond management involves several key practices, including pond preparation, water quality monitoring, waste management, aeration, feeding control and regular cleaning. Before shrimp are stocked, the pond must be properly prepared to ensure that the water condition, pond bottom and surrounding environment are suitable for production. If pond preparation is weak, the risk of poor water condition, disease outbreak and low survival rate may increase (Mandal & Duyari, 2024). Therefore, systematic pond management is essential to support healthy shrimp growth and improve production performance.

Water quality is a critical factor in shrimp farming because shrimp are highly sensitive to changes in their aquatic environment. Important water quality parameters such as dissolved oxygen, pH, ammonia, salinity and temperature can directly affect shrimp health, feeding behaviour, growth rate and survival. For example, low dissolved oxygen may cause stress and mortality, while high ammonia levels can reduce water quality and increase disease risk. Similarly, sudden changes in temperature or salinity may affect shrimp adaptation and weaken their resistance to disease. Thus, regular monitoring is necessary to ensure that pond conditions remain stable throughout the farming cycle.

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Poor water quality can lead to shrimp stress, disease and mortality. Therefore, community participants need basic knowledge and simple monitoring routines to ensure that pond conditions remain suitable for production. Pond cleanliness and waste management are also important because uneaten feed, organic waste and sludge accumulation can pollute the water and create an unhealthy environment. In community-based shrimp farming, participants should be trained to observe water colour, shrimp behaviour, feeding response and pond cleanliness as part of daily management. This is important to ensure that problems can be detected early, and corrective actions can be taken before they affect the entire production cycle.

***Disease Control and Biosecurity***

Disease outbreaks are among the major risks in shrimp farming because shrimp diseases can spread rapidly and cause serious production losses if they are not detected and controlled at an early stage. In shrimp aquaculture, disease problems may be influenced by poor water quality, weak pond management, contaminated seed stock, excessive waste accumulation and uncontrolled movement of people or equipment around the pond area (Kumar et al., 2026). Once disease occurs, it can affect shrimp growth, reduce survival rates and lead to financial loss for farmers or community participants. Therefore, disease control should be treated as a core component of shrimp farming management rather than as an emergency response after problems have already occurred.

Biosecurity practices are essential to reduce the risk of disease transmission and protect the health of shrimp throughout the farming cycle. These practices may include controlling pond access, using healthy seed stock, disinfecting equipment, managing water exchange, removing dead shrimp and monitoring shrimp behaviour. Simple preventive measures such as limiting unnecessary visitors to the pond area, cleaning tools after use and observing changes in shrimp movement or feeding response can help reduce the possibility of disease outbreaks. In addition, the use of quality seed stock and proper pond preparation can strengthen the overall health condition of the farming system before production begins.

For community-based projects, biosecurity practices must be introduced in a simple and practical way so that participants can apply them consistently in daily operations. Community participants need to understand the early signs of disease, such as weak movement, reduced feeding, unusual colour changes, floating shrimp or sudden mortality. They also need to know appropriate response actions, including reporting problems quickly, separating affected areas where possible, checking water quality and seeking technical advice from aquaculture experts or project facilitators. Continuous technical guidance is important because disease management requires specific knowledge, regular observation and disciplined practice. Therefore, GalahGrow should include basic disease control and biosecurity training as part of its community aquaculture module.

***Feed Cost and Financial Sustainability***

Feed is one of the highest operating costs in aquaculture and plays an important role in determining the profitability of shrimp farming. In shrimp aquaculture, feed is not only a production input but also a financial factor that affects the overall cost structure of the project. If feed is not managed properly, the cost of production may increase while the level of profit decreases. For community-based aquaculture projects, this issue is particularly important because participants may have limited capital and may depend on project funds or shared

community resources (Pamesa et al., 2025). Therefore, proper feed planning is necessary to ensure that feed use supports shrimp growth without creating unnecessary financial burden. Inefficient feeding can increase waste, pollute the water and reduce profit. Overfeeding may cause uneaten feed to accumulate at the pond bottom, leading to poor water quality, higher ammonia levels and increased risk of disease. Underfeeding, on the other hand, may slow shrimp growth and affect production output. Proper feeding management is therefore important for both biological performance and financial sustainability. Community participants need to understand feeding schedules, feed conversion, stock monitoring and cost control so that feeding practices can be adjusted according to shrimp size, growth stage, pond condition and observed feeding behaviour.

Financial sustainability also depends on good record keeping, market access, pricing and reinvestment. Community participants should be trained to record feed costs, seed stock costs, equipment expenses, labour contributions, sales income and profit margins. Without proper financial planning, a community-based aquaculture project may generate sales but fail to produce sustainable profit. In addition, income from shrimp sales should be managed carefully so that part of the profit can be reinvested into the next farming cycle. Therefore, GalahGrow should include basic financial management and feed cost monitoring as key components of its community aquaculture training module.

***Technology and Capacity Building***

Appropriate technology can improve aquaculture management by helping community participants monitor pond conditions, reduce production risks and increase operational efficiency. In shrimp farming, technology may include water quality testing kits, aeration systems, automatic feeders, pond liners, simple monitoring tools and mobile-based advisory systems. These tools can support better decision-making because participants are able to detect changes in pond conditions, control feeding practices and respond more quickly to potential problems (Prapti et al., 2021). For example, water quality testing kits can help monitor important parameters such as pH, dissolved oxygen, ammonia and temperature, while aeration systems can improve oxygen levels in the pond. However, technology must be suitable for the community's capacity, financial resources and level of technical readiness.

Although technology can support shrimp farming activities, it should not be introduced without considering the local context. Community-based aquaculture projects may face limitations in terms of cost, maintenance, technical knowledge and consistent usage. If the technology is too expensive, difficult to operate or not properly maintained, it may become unused after the initial project period. Therefore, the selection of technology for GalahGrow should prioritise tools that are affordable, practical, easy to understand and suitable for daily community use. Technology should also be introduced gradually, beginning with basic tools such as water testing kits and simple monitoring checklists before moving towards more advanced systems such as automatic feeders or digital advisory platforms.

Capacity building is essential because technology alone cannot guarantee project success. Community participants need training, demonstration, mentoring and follow-up monitoring to ensure that they can apply aquaculture practices effectively (Mohanty et al., 2024). Training should not be conducted as a one-off activity, but should be structured according to the farming cycle, including pond preparation, stocking, feeding, water quality monitoring, disease prevention, harvesting and financial management. Continuous mentoring can help participants

solve problems, improve confidence and reduce dependency on external facilitators. Therefore, GalahGrow should integrate appropriate technology with systematic capacity building so that community members are not only able to use aquaculture tools, but also understand how these tools contribute to productivity, sustainability and rural economic empowerment.

### *Theoretical Foundation*

This study is guided by the community-based enterprise perspective, which views a community as both the entrepreneur and beneficiary of an enterprise that mobilises local resources for collective social and economic outcomes (Peredo & Chrisman, 2006). This perspective directs attention to local participation, shared responsibility, collective decision-making, benefit distribution and the development of community capability. In GalahGrow, these principles are reflected in the involvement of residents, community representatives, facilitators and aquaculture stakeholders in managing technical and organisational aspects of shrimp farming. The study also draws on aquaculture innovation-systems research, which emphasises that sustainable aquaculture depends on interactions among producers, technical knowledge, institutions, technologies and markets rather than on production inputs alone (Joffre et al., 2018). Combining these perspectives provides the theoretical basis for examining GalahGrow across five connected dimensions: local aquaculture resources, technical capacity, operational and financial management, community organisation, and external guidance and market support. The proposed model is original in its project-specific integration of these dimensions into an empowerment pathway for community-based shrimp farming.

## Methodology

### *Research Design*

This study employed a qualitative case study design. A qualitative approach was selected because the study aimed to explore the experiences, challenges, needs and sustainability issues related to community-based shrimp farming. The case study design was appropriate because the research focused on GalahGrow as a specific rural aquaculture initiative.

### *Study Location*

The study was conducted in the rural community where the GalahGrow shrimp aquaculture project was implemented. The location was selected because it provided a suitable context for examining community-based shrimp farming, pond management and rural economic empowerment.

### *Participants and Sampling*

Participants were recruited purposively through the GalahGrow project and relevant community networks because they had direct experience of, responsibility for, or specialised knowledge about the shrimp-farming initiative. Eligibility required direct involvement in project activities, community coordination, facilitation or the aquaculture value chain. The final sample comprised 30 participants across four categories, enabling comparison of operational, community, programme-delivery and market perspectives.

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The confirmed participant distribution is presented in Table 1. The sample was intended to provide information-rich perspectives across the project ecosystem rather than statistical representation of a wider population.

**Table 1. Participant Categories**

| Participant Category | Confirmed Number | Rationale |
|---|---|---|
| Local residents | 8 | To explore direct experiences, learning outcomes, skills gained and challenges in community-based shrimp farming. |
| Community representatives | 15 | To understand local coordination, community participation and the project's relevance to community needs. |
| Project facilitators | 5 | To examine training delivery, monitoring processes, technical guidance and programme evaluation. |
| Aquaculture stakeholders | 2 | To understand input supply, market potential, sales opportunities and sustainability issues. |

Source: Authors' compilation based on field data (2026).

***Data Collection***

Data were collected over approximately one month through semi-structured interviews, field observations and document analysis. Interviews were conducted with participants from all four categories using a common interview guide, with follow-up questions tailored to their respective roles. Each interview lasted approximately 45 minutes and was conducted at a location mutually agreed upon by the researcher and the participant. With the participants' consent, all interviews were audio-recorded to ensure the accuracy of data transcription and analysis. The interviews explored project involvement, pond operations, water quality, disease control, feed costs, technical learning, community participation and project sustainability.

Field observation was conducted at the shrimp farming site to understand pond conditions, farming activities, feeding practices, water management, equipment use and community participation. Observation notes were used to support the interview findings (Widowati et al., 2021).

Document analysis was conducted on relevant materials such as project records, training notes, pond monitoring records, photographs, cost records and supporting documents related to shrimp farming management. These documents helped provide contextual information on the implementation process.

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***Interview Protocol***

The interview questions were developed based on the research objectives. The following questions were used as a guide:

1.Can you explain your involvement in the GalahGrow shrimp farming project?
2.What activities are involved in managing the shrimp pond?
3.What are the main challenges in shrimp farming management?
4.How do water quality and pond cleanliness affect shrimp growth?
5.What problems are faced in controlling shrimp disease?
6.How do feed costs affect project sustainability?
7.What skills have participants gained from this project?
8.What type of technical support is needed by the community?
9.How does community participation influence project implementation?
10.What strategies can improve the sustainability of GalahGrow?

***Data Analysis***

The data were analysed thematically through familiarisation, initial coding, category development, theme construction and review (Ahmed et al., 2025). Interview transcripts or detailed interview records were read alongside observation notes and project documents. Codes were compared across participant categories and data sources, allowing areas of convergence and divergence to be identified before the five themes were finalised.

Analytical sufficiency was assessed based on the recurrence of issues across participant categories and corroboration through observations and document analysis. Although thematic saturation was not formally documented during data collection, the dataset demonstrated sufficient depth and consistency to address the study objectives. Following theme development, the findings were interpreted using the community-based enterprise perspective and aquaculture innovation-systems literature to explain the relationships among technical capability, collective organisation, institutional support and market sustainability.

***Trustworthiness of the Study***

Several strategies were used to strengthen the trustworthiness of the study. First, data triangulation was applied by combining interviews, field observation and document analysis. Second, participant triangulation was used by involving community participants, project facilitators and aquaculture stakeholders. Third, member checking was conducted by confirming key points with selected participants. Fourth, peer review was conducted with the research team to refine the themes. Fifth, thick description was used to explain the project context, farming activities and implementation challenges (Donkoh & Mensah, 2023).

***Ethical Considerations***

The study was conducted according to ethical research principles. Participants were informed about the purpose of the study and their participation was voluntary. Consent was obtained before interviews were conducted. Participants' identities were protected using codes such as P1, P2 and P3. The data were used only for academic and research purposes. The study also respected community practices, local knowledge and the privacy of participants.

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## Findings

The analysis generated five themes, supported by observations of the farming site and relevant project documents. The themes were: water quality and pond cleanliness; disease control and biosecurity; operating costs and feed dependency; technical skills and labour commitment; and continuous training with appropriate technology. Evidence should be presented through participant-coded quotations alongside observational or documentary corroboration. The quotation fields below must be replaced with verbatim extracts from the original interview records before submission.

### *Theme 1: Water Quality and Pond Cleanliness as Critical Production Factors*

The first theme reflects participants' shared concern that water condition and pond cleanliness directly shaped daily farming decisions and perceived shrimp health. Local residents described the need to monitor changes in water, while facilitators and aquaculture stakeholders connected waste, uneaten feed and unstable pond conditions with production risk.

Across participant categories, accounts converged on the need for regular observation rather than occasional pond checks. Field observations of pond conditions and routine farming activities supported the importance of water monitoring, waste control and timely corrective action.

> *"We need to check the water every day. If the water becomes dirty or changes colour, we worry that the shrimp may become unhealthy" (Local Resident 3)*

Pond cleanliness was also identified as important. Waste accumulation can affect water quality and increase the risk of disease. This finding suggests that community-based shrimp farming requires clear routines for pond cleaning, water monitoring and waste management (Hatje et al., 2016).

### *Theme 2: Disease Control and Biosecurity Challenges*

The second theme concerns disease control and biosecurity. Participants across operational and technical roles described disease as a major threat because problems could spread rapidly and jeopardise a farming cycle. Aquaculture stakeholders and facilitators emphasised prevention, early identification and prompt technical advice.

Participants identified uneven knowledge of disease symptoms, seed quality, equipment hygiene, pond access and the removal of dead shrimp. This evidence indicates a practical capacity gap: participants recognised biosecurity as important but did not necessarily possess consistent procedures for applying it.

> *"Disease can spread very quickly from one pond to another. Therefore, farmers need to identify the symptoms early, control access to the ponds and ensure that all equipment is properly cleaned before use" (Aquaculture Stakeholder 1)*

This theme shows that disease management must be included in community training. Without proper biosecurity practices, community-based shrimp farming may face serious sustainability risks.

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***Theme 3: Rising Operating Costs and Feed Dependency***

The third theme concerns operating costs, particularly feed dependency. Participants identified feed as a recurring expense with direct implications for project viability. Community representatives and facilitators also linked feeding decisions to cost control and the continuity of future farming cycles.

Participant accounts connected feed management with both biological and financial performance: overfeeding was associated with waste and poorer water conditions, whereas underfeeding was viewed as a risk to shrimp growth. This demonstrates that feeding schedules, stock monitoring and expenditure records must be managed together.

> *"Feed is one of our main expenses. We cannot give too much because it will increase the cost and pollute the water, but giving too little may affect the growth of the shrimp" (Community Representative 4)*

The findings suggest that financial sustainability is a major concern in community-based aquaculture. The project requires proper cost records, feeding plans and profit calculations to ensure that production remains economically viable.

***Theme 5: Continuous Training and Appropriate Aquaculture Technology***

The fifth theme concerns continuous learning and context-appropriate technology. Participants viewed one-off training as insufficient because technical decisions recur throughout the farming cycle. Facilitators emphasised staged guidance and follow-up, while aquaculture stakeholders highlighted the need to match equipment with users' skills, costs and maintenance capacity.

Participants identified water-quality testing tools, aeration systems, simple feeding equipment and pond-monitoring methods as potentially useful. However, their accounts also indicated that affordability, ease of use, maintenance and continued technical guidance would determine whether such tools were used consistently.

> *"Training should not be conducted only once because participants may face different problems at each stage of the farming cycle. They need continuous guidance and equipment that is simple to operate and maintain" (Project Facilitator 2).*

The findings suggest that GalahGrow should be supported by a structured capacity-building plan. Training should be delivered in stages, beginning with basic pond management and later expanding to disease control, financial planning, marketing and technology use.

**Discussion**

Rather than demonstrating economic impact, the findings explain the conditions under which a community shrimp-farming initiative may progress towards rural economic empowerment. Across the five themes, sustainability emerged as an interaction among ecological control, operational discipline, collective organisation, institutional guidance and enterprise capability. This interpretation supports the community-based enterprise view that local resources create

collective value only when communities develop the capacity and governance needed to manage them (Peredo & Chrisman, 2006).

The emphasis on water quality and pond cleanliness is consistent with research identifying pond conditions and waste management as central to shrimp survival and production risk (Hatje et al., 2016; Mandal & Duyari, 2024; Yusoff et al., 2019). GalahGrow extends this evidence by showing that, in a community setting, monitoring is also an organisational issue: routines, responsibilities and accessible tools must be distributed among participants rather than left solely to technical specialists.

The biosecurity theme similarly aligns with evidence that disease risk is shaped by water conditions, seed quality, equipment movement and early response (Kumar et al., 2026). The present findings add a capacity-building dimension by showing that awareness of disease risk does not automatically translate into consistent community practice. Biosecurity therefore requires simple protocols, repeated demonstration and clear responsibility for reporting and response.

Participants' concern about feed cost supports earlier evidence that feed is a major determinant of aquaculture expenditure and profitability (Tacon & Metian, 2015). However, the GalahGrow case demonstrates that financial sustainability cannot be separated from pond management: feeding decisions simultaneously affect expenditure, waste accumulation and water quality. This relationship justifies integrating technical records and financial monitoring within one community-management system.

The findings on technical skills and labour commitment are consistent with studies emphasising participatory management and sustained capacity development in community aquaculture (Mbane et al., 2019; Mohanty et al., 2024). GalahGrow contributes by identifying labour organisation as a central link between training and sustainability. Skills produce limited value if daily tasks are not assigned, monitored and shared, while weak participation increases dependency on facilitators and undermines community ownership.

The technology findings support research advocating accessible water-quality monitoring and context-sensitive farming tools (Prapti et al., 2021; Dhillon & Moncur, 2023). In this case, technology was not interpreted as a stand-alone solution. Its usefulness depended on affordability, maintenance, user confidence and expert follow-up, reinforcing the innovation-systems argument that technology, institutions, knowledge and users must function together (Joffre et al., 2018).

The theoretical contribution of the study lies in integrating these relationships into a community aquaculture empowerment pathway. The proposed model links local resources to technical capacity, operational and financial management, community organisation, and external guidance and market support. This moves beyond a production-focused account by explaining empowerment as a conditional process rather than an automatic outcome of introducing ponds, stock or equipment.

### *Implications of the Study*

This study provides several implications for community development, aquaculture management and rural entrepreneurship.

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First, community-based shrimp farming should be implemented with proper technical assessment. Water source, pond suitability, labour availability and market demand must be considered before project expansion.

Second, training should be continuous and practical. Participants need hands-on learning in pond preparation, water monitoring, feeding, disease control and harvesting.

Third, financial management should be integrated into aquaculture training. Participants should be taught how to record costs, calculate profit and plan reinvestment.

Fourth, community participation should be organised through structured roles. Clear task allocation can improve accountability and reduce dependency on a small number of individuals.

Fifth, appropriate technology should be introduced gradually. Tools such as water testing kits and aeration systems can improve productivity if participants are trained to use them properly.

***Recommendations***

The recommendations follow directly from the empirical themes. In response to the water-quality, disease-control and technical-skills findings, a structured GalahGrow training module should cover pond preparation, water monitoring, feeding, biosecurity, harvesting and basic enterprise management (Taher et al., 2023). Training should be staged across the farming cycle and supported by practical demonstrations. A simple monitoring checklist should record water condition, pond cleanliness, feeding patterns, shrimp behaviour and corrective actions.

In response to the labour-commitment and financial-management findings, a community aquaculture committee should allocate responsibilities, monitor daily activities and support collective decisions. Feeding schedules, pond checks and production records should be assigned to named roles. Financial records should document feed, seed stock, equipment, labour, sales and profit, allowing the community to assess viability and plan reinvestment.

In response to the training, technology and sustainability findings, GalahGrow should strengthen market linkages with buyers, restaurants, suppliers and community markets while maintaining technical mentoring after each farming cycle. Water-testing kits, aeration systems and other tools should be introduced only with user training, maintenance plans and consideration of community resources. Follow-up evaluation should assess survival rate, output, sales, costs, profit, skills retention and participation. Youth involvement may further support labour continuity, record keeping, technology use and digital marketing (Dhillon & Moncur, 2023).

***Proposed GalahGrow Community Aquaculture Empowerment Model***

Based on the participant-derived themes and the theoretical foundation, this study proposes the GalahGrow Community Aquaculture Empowerment Model. The model integrates five connected components: local aquaculture resources; technical aquaculture capacity; operational and financial management; community organisation and shared responsibility; and external guidance, technology and market linkages.

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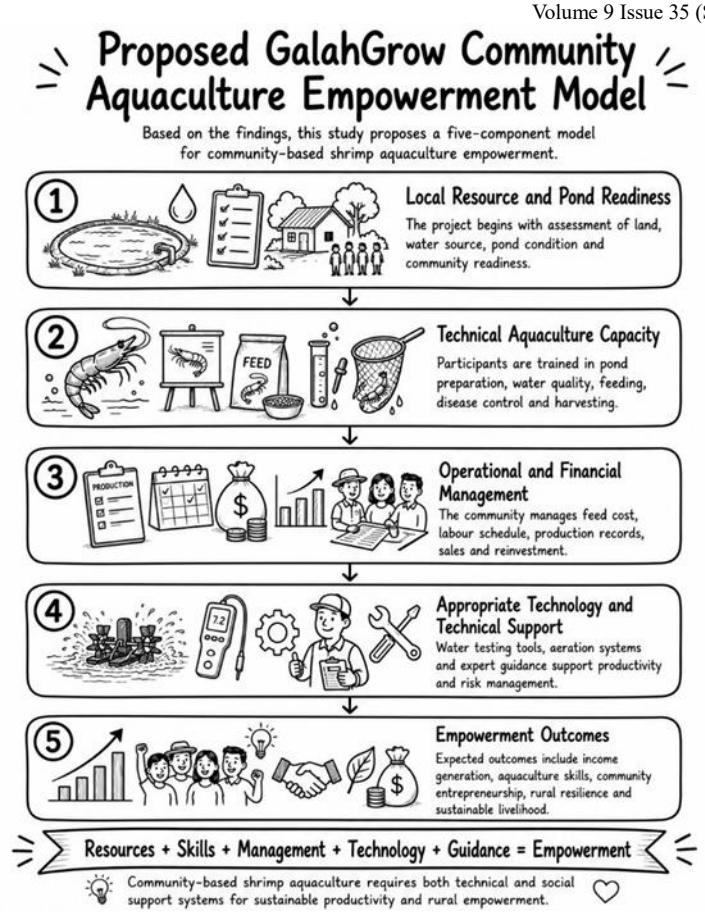



**Figure 1. Proposed GalahGrow Community Aquaculture Empowerment Model**

The model proposes that empowerment is generated through interaction among resources, capabilities and support systems rather than through aquaculture inputs alone. The community-based enterprise perspective explains collective participation, shared responsibility and local benefit, while the aquaculture innovation-systems perspective explains the roles of knowledge, technology, institutions and markets. Its project-specific contribution is the integration of technical pond management with community governance and enterprise sustainability. The model should be treated as an emerging analytical framework derived from one qualitative case and should be tested in other settings and across multiple farming cycles.

## Conclusion

This study examined GalahGrow as a community-based shrimp aquaculture initiative involving 30 participants across four stakeholder categories. The findings identified interconnected challenges involving pond conditions, biosecurity, feed costs, technical capability, labour organisation, training and appropriate technology. These findings explain participants' experiences and perceived project needs; they do not establish causal changes in income, productivity or wellbeing.

The study suggests that GalahGrow may develop into a sustainable rural entrepreneurship initiative when technical management is combined with collective responsibility, financial records, institutional guidance and market planning. The proposed model contributes a context-

specific explanation of how these conditions interact, but it should be regarded as an emerging framework rather than a validated universal model.

The study is limited by its focus on one project, purposive sampling and the absence of longitudinal production, income and wellbeing measurements. Future research should test the model across additional communities and farming cycles, combine qualitative evidence with operational and financial indicators, and examine whether skills, participation and enterprise outcomes are sustained over time.

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## References

Ahmed, R. (2025). Eco-friendly shrimp farming: Balancing economic growth and environmental sustainability in agriculture. *International Journal of Science Education and Science, 2*(1), 61–68. https://doi.org/10.56566/ijses.v2i1.326

Ahmed, S. K., Mohammed, R. A., Nashwan, A. J., Ibrahim, R. H., Abdalla, A. Q., M. Ameen, B., & Khidhir, R. M. (2025). Using thematic analysis in qualitative research. *Journal of Medicine, Surgery, and Public Health, 6*, Article 100198. https://doi.org/10.1016/j.glmedi.2025.100198

Baporikar, N. (2021). Outlook on aquaculture community-based projects for socio-economic development: A case study. In *Behavioral-based interventions for improving public policies* (pp. 155–175). IGI Global. https://doi.org/10.4018/978-1-7998-2731-3.ch009

Béné, C., Arthur, R., Norbury, H., Allison, E. H., Beveridge, M., Bush, S., Campling, L., Leschen, W., Little, D., Squires, D., Thilsted, S. H., Troell, M., & Williams, M. (2016). Contribution of fisheries and aquaculture to food security and poverty reduction: Assessing the current evidence. *World Development, 79*, 177–196.

Boyd, C. E., & Tucker, C. S. (2014). *Handbook for aquaculture water quality*. Craftmaster Printers.

Carlino-Costa, C., & Belo, M. A. de A. (2025). Ensuring fish safety through sustainable aquaculture practices. *Hygiene, 5*(4), Article 51. https://doi.org/10.3390/hygiene5040051

Dhillon, R., & Moncur, Q. (2023). Small-scale farming: A review of challenges and potential opportunities offered by technological advancements. *Sustainability, 15*(21), Article 15478. https://doi.org/10.3390/su152115478

Donkoh, S., & Mensah, J. (2023). Application of triangulation in qualitative research. *Journal of Applied Biotechnology & Bioengineering, 10*(1), 6–9. https://doi.org/10.15406/jabb.2023.10.00319

FAO. (2020). *The state of world fisheries and aquaculture 2020: Sustainability in action*. Food and Agriculture Organization of the United Nations.

FAO. (2022). *The state of world fisheries and aquaculture 2022: Towards blue transformation*. Food and Agriculture Organization of the United Nations.

Hatje, V., de Souza, M. M., Ribeiro, L. F., Eça, G. F., & Barros, F. (2016). Detection of environmental impacts of shrimp farming through multiple lines of evidence. *Environmental Pollution, 219*, 672–684. https://doi.org/10.1016/j.envpol.2016.06.056

Herron, E. (2004). *Training volunteer water quality monitors effectively*. National Facilitation of Cooperative State Research, Education, and Extension Service Volunteer Monitoring Efforts.

Joffre, O. M., Klerkx, L., & Khoa, T. N. D. (2018). Aquaculture innovation system analysis of transition to sustainable intensification in shrimp farming. *Agronomy for Sustainable Development, 38*(3), 1–11.

Krause, G., Brugere, C., Diedrich, A., Ebeling, M. W., Ferse, S. C. A., Mikkelsen, E., Pérez Agúndez, J. A., Stead, S. M., Stybel, N., & Troell, M. (2015). A revolution without people? Closing the people-policy gap in aquaculture development. *Aquaculture, 447*, 44–54.

Kumar, V., Mitra, A., Roy, S., Majumder, A., & Das, B. K. (2026). Disease in shrimp aquaculture: Diagnosis and strategies for sustainable management. *Annals of Animal Science, 26*(2), 521–554. https://doi.org/10.2478/aoas-2025-0063

Little, D. C., Newton, R. W., & Beveridge, M. C. M. (2016). Aquaculture: A rapidly growing and significant source of sustainable food? Status, transitions and potential. *Proceedings of the Nutrition Society, 75*(3), 274–286.

Mair, J., & Martí, I. (2006). Social entrepreneurship research: A source of explanation, prediction and delight. *Journal of World Business, 41*(1), 36–44.

Mandal, A., & Duyari, M. (2024). Better management practices (BMPs) for sustainable shrimp farming. *Chronicle of Aquatic Science, 1*(9), 52–66.

Mbane, J. O., Muthomi, S., & Wabwire, E. (2019). Investigation of participatory management and sustainable aquaculture development in Kirinyaga County, Kenya. *International Journal of Development and Sustainability, 8*(4), 296–310.

Mohanty, B. P., Sinha, A., Phand, S., Das, S., & Basade, Y. (Eds.). (2024). *Capacity building in fisheries and aquaculture* (1st ed.). NIPA.

Oyeboade, J., & Olagoke-Komolafe, O. (2024). Sustainable aquaculture practices: Balancing economic viability and environmental integrity in developing nations. *International Journal of Advanced Multidisciplinary Research and Studies, 4*(4), 1373–1386. https://doi.org/10.62225/2583049X.2024.4.4.4853

Pamesa, D. D., Ferolin, M. C. M., Sison, M. P. M., Suson, P. D., & Porras, M. D. C. (2025). Harnessing community-based aquaculture for the sustainable development of small scale fishery. *Journal of Interdisciplinary Perspectives, 3*(4), 75–88. https://doi.org/10.69569/jip.2024.0663

Peredo, A. M., & Chrisman, J. J. (2006). Toward a theory of community-based enterprise. *Academy of Management Review, 31*(2), 309–328.

Prapti, D. R., Shariff, A. R. M., Man, H. C., Ramli, N. M., Perumal, T., & Shariff, M. (2021). An overview of water quality monitoring in IoT based aquaculture. In *2021 ASABE Annual International Virtual Meeting* (Paper No. 2100189). American Society of Agricultural and Biological Engineers. https://doi.org/10.13031/aim.202100189

Prasetyo, Y. E., & Sari, E. P. (2022). *Business and human rights in the fisheries sector: The role and support of stakeholders in shrimp aquaculture*. International NGO Forum on Indonesian Development (INFID).

Shaker, I. M., Farouk, A. E. D., Zakar, A. H., & Abd El Hamid, E. A. A. (2017). Pond management, water sources and its impact on the accumulation of heavy metals and contaminants of microbial content in water, soil and fish in polyculture. *Abbassa International Journal for Aquaculture, 10*(1), 18–39.

Tacon, A. G. J., & Metian, M. (2015). Feed matters: Satisfying the feed demand of aquaculture. *Reviews in Fisheries Science & Aquaculture, 23*(1), 1–10.

Taher, T. B., Althaus, C. E., Tranter, P. J., & Evans, M. C. (2023). Impacts of shrimp aquaculture on the local communities and conservation of the world's largest protected mangrove forest. *Environmental Science & Policy, 147*, 351–360. https://doi.org/10.1016/j.envsci.2023.07.002

Tran Thi Phung Ha, H., van Dijk, J. W. M., Bosma, R. H., & Sinh, L. X. (2013). Livelihood capabilities and pathways of shrimp farmers in the Mekong Delta, Vietnam. *Aquaculture Economics & Management, 17*(1), 1–30. https://doi.org/10.1080/13657305.2013.747224

Waite, R., Beveridge, M., Brummett, R., Castine, S., Chaiyawannakarn, N., Kaushik, S., Mungkung, R., Nawapakpilai, S., & Phillips, M. (2014). *Improving productivity and environmental performance of aquaculture: Creating a sustainable food future, installment five*. World Resources Institute.

Widowati, L. L., Ariyati, R. W., Rejeki, S., & Bosma, R. H. (2021). The impact of aquaculture field school on the shrimp and milkfish yield and income of farmers in Demak, Central

Java. *Journal of the World Aquaculture Society, 52*(2), 362–377. https://doi.org/10.1111/jwas.12770

Yusoff, F. M., Banerjee, S., Khatoon, H., & Shariff, M. (2019). Biological approaches in management of nitrogenous compounds in aquaculture systems. *Dynamic Biochemistry, Process Biotechnology and Molecular Biology, 3*(1), 21–31.