

Dissemination of Sustainable Whiteleg Shrimp Farming Practices for GEDSI Groups in Dadap Village, Sambelia, East Lombok

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Article Info

Received : August 10, 2026

Revised: August 28, 2026

Accepted: September 9, 2026

Published: September 30, 2026

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DOI: [10.29303/ujcs.v7i3.1807](https://doi.org/10.29303/ujcs.v7i3.1807)

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Abstract: GEDSI groups in coastal areas still face limited access to information, training, technology, and decision-making in productive economic activities, including whiteleg shrimp farming. This community service activity aimed to improve the knowledge and understanding of GEDSI groups in Dadap Village, Sambelia District, East Lombok Regency, regarding sustainable, inclusive, and environmentally friendly whiteleg shrimp farming practices. The target partners consisted of 50 participants, including women, men, persons with disabilities, young people, and other social groups. The activity was implemented through several stages, including preparation and needs assessment, a pre-test, socialization, participatory discussions, technical demonstrations, a post-test, and evaluation. The materials covered GEDSI concepts, water quality management, post-larvae selection, feed management, biosecurity, disease prevention, production record-keeping, and waste management. Qualitatively, participants showed active involvement during discussions and demonstrations and were able to identify the roles of GEDSI groups in aquaculture activities. Quantitatively, the participants' mean knowledge score increased from 32 to 72, representing an improvement of 40 points. All participants were able to identify at least three sustainable aquaculture practices and considered the activity beneficial. This activity strengthened participants' basic knowledge, although further technical assistance and site suitability assessments are still required before whiteleg shrimp farming can be developed.

Keywords: Community Service, Dissemination, GEDSI, Whiteleg Shrimp Farming, Coastal Communities.

Introduction

Gender Equality, Disability, and Social Inclusion (GEDSI) is a development approach that places gender equality, the fulfilment of the rights of persons with disabilities, and the participation of groups facing social barriers at the core of every programme. This approach

aims to provide all members of society with equitable opportunities to access information, participate in activities, use resources, express their views, and engage in decision-making. GEDSI does not focus solely on women or persons with disabilities, but also considers differences in age, economic status, educational background, social background, and other forms of

How to Cite:

Affandi, R. I., Scabra, A. R., Wibowo, S., Abiyyu, N., Abidin, Z., Lumbessy, S. Y., ... Himawan, M. R. Dissemination of Sustainable Whiteleg Shrimp Farming Practices for GEDSI Groups in Dadap Village, Sambelia, East Lombok. *Unram Journal of Community Service*, 7(3), 243–254. <https://doi.org/10.29303/ujcs.v7i3.1807>

vulnerability. GEDSI must be implemented in a planned manner because public understanding of this concept remains limited. GEDSI-based development programmes must also remove physical, social, and communication barriers so that all participants can take an active role and receive equitable benefits (Abdurrohman et al., 2023; Rimbawan & Nurhaeni, 2023; Rokhmah et al., 2024).

Dadap Village is located in Sambelia District, East Lombok Regency, in a lowland area situated at the foot of the hills and close to the coast. The village consists of six hamlets and is closely associated with agriculture, plantations, fisheries, and the use of coastal resources. Sambelia District covers approximately 23,290 ha and is dominated by agricultural land and coastal areas. The area also has considerable fisheries potential, as indicated by marine capture fisheries production reaching 6,608 tonnes (Misbahuddin et al., 2023). However, the people of Dadap Village face risks from flooding, drought, and earthquakes, as well as limited water supplies and dependence on bore wells to meet household and agricultural needs. Communities in Sambelia District also remain closely connected to local knowledge, natural resource-based livelihoods, and uneven access to public services in several areas. These conditions indicate that any economic development initiative must consider the social and environmental context, accessibility, and capacity of the local community (Misbahuddin et al., 2023; Oktorani et al., 2024; Setiawan et al., 2025).

The coastal location of Dadap Village and the presence of fisheries activities in Sambelia District provide opportunities to develop aquaculture-based economic activities, including whiteleg shrimp farming. However, the total pond area and the number of whiteleg shrimp farmers currently operating in Dadap Village remain uncertain. Therefore, this potential should be viewed as a development opportunity that still requires assessments of land suitability, water sources, salinity, environmental quality, infrastructure, and disaster risks. This opportunity is supported by the position of West Nusa Tenggara as one of Indonesia's major whiteleg shrimp-producing provinces and by the high economic value of the commodity. Experiences from shrimp farming development in other coastal areas indicate that whiteleg shrimp farming can increase production and community income when supported by markets, skilled human resources, production facilities, strong institutions, and technologies that are appropriate to the environmental carrying capacity (Muchtar et al., 2020; Muhtar et al., 2026).

The development of whiteleg shrimp farming should not focus solely on increasing production. Sustainable farming practices must integrate ecological, social, economic, technological, and institutional

dimensions. Water quality management, the use of healthy post-larvae, efficient feeding, biosecurity implementation, shrimp health monitoring, waste management, and the maintenance of water channels are essential for reducing the risks of disease and pollution. Muhtar et al. (2026) showed that limited technical understanding among farmers and inadequate waste management can reduce the sustainability of whiteleg shrimp farming. Muchtar et al. (2020) also emphasised that shrimp farming development must consider environmental carrying capacity, market demand, spatial planning, and the use of environmentally friendly technologies. Dadap Village's vulnerability to flooding and drought makes an understanding of water management, waste management, environmental risks, and disaster mitigation increasingly important before the community expands aquaculture activities.

GEDSI groups can play an important role in implementing sustainable whiteleg shrimp farming in Dadap Village. Women, persons with disabilities, young people, low-income communities, and other social groups should receive equal access to extension services, technology, financing, markets, farmer organisations, and decision-making processes. Studies of coastal communities show that women often perform both domestic and economic roles, yet still face limited access to and control over resources, information, training, and business decisions. The involvement of GEDSI groups can also strengthen production record-keeping, water quality monitoring, waste management, post-harvest processing, marketing, and coastal environmental protection (Handayani et al., 2023; Rimbawan & Nurhaeni, 2023; Yanfika et al., 2021). Therefore, this community service programme aims to improve the knowledge and understanding of GEDSI groups in Dadap Village regarding sustainable, environmentally responsible, safe, and economically viable whiteleg shrimp farming principles and practices. The programme also aims to encourage the active and equitable participation of GEDSI groups in aquaculture business management and to increase community awareness of the importance of maintaining coastal environmental quality to support the sustainability of whiteleg shrimp production.

Method

Time, Location, and Activity Partners

This community service activity was conducted on 28 April 2026 at the Dadap Village Hall, Sambelia District, East Lombok Regency, West Nusa Tenggara. The target partners were members of the Gender Equality, Disability, and Social Inclusion (GEDSI) group in Dadap Village, comprising 50 participants. The participants consisted of 28 women, 5 men, 2 persons

with disabilities, 5 young people, and 10 individuals from other community groups interested in whiteleg shrimp farming.



Figure 1. Map of the Activity Location

Participants were selected through coordination with the Dadap Village Government, GEDSI group administrators, community leaders, and group facilitators. They were selected based on their willingness to participate in the entire series of activities and their involvement in coastal economic activities, fisheries, post-harvest processing, or household business development. Participation was not restricted by gender, educational level, economic status, age, or physical ability.

Activity Approach

The activity employed participatory, educational, and demonstrative approaches. The participatory approach positioned participants as the main actors in identifying problems, sharing experiences, engaging in discussions, using equipment, and formulating follow-up plans. The educational approach aimed to improve participants' knowledge of GEDSI and sustainable whiteleg shrimp farming practices. The demonstrative approach was applied through practical activities involving water quality measurement, feed requirement calculations, biosecurity implementation, shrimp health assessment, and aquaculture record-keeping.

The activity design adapted community service models that combine initial surveys, extension activities, training, mentoring, hands-on practice, and evaluation. Affandi, Abidin, et al. (2023) applied preparation, extension, technical assistance, and evaluation to aquaculture farmer groups. Affandi, Setyono, et al. (2023) used extension, discussion, and direct training so that participants not only received theoretical information but could also apply the introduced technologies. Affandi, Scabra, et al. (2023) added surveys, partner coordination, visual media, and pre-tests and post-tests to measure changes in participants' knowledge.

Location surveys and Focus Group Discussions (FGDs) were also conducted to ensure that the materials addressed the actual problems faced by the community. This approach had been applied in previous community service activities on coastal environmental education and mangrove planting (Affandi, Diniariwisan, et al., 2024; Affandi, Scabra, et al., 2024), in which survey results and discussions with partners formed the basis for programme development. To strengthen programme sustainability, this activity also adapted the stages of surveying, socialisation, training, technology application, mentoring, evaluation, and programme sustainability described by Affandi, Azhar, et al. (2025). This approach emphasises that the introduced technology should be easy to use, appropriate to local conditions, and independently applicable by the partners.

Stages of Activity Implementation

The activity consisted of eight stages: survey and coordination, needs assessment, preparation of materials, pre-test, socialisation, demonstration and practice, evaluation, and mentoring and follow-up.



Figure 2. Stages of the Community Service Activity

1. Location Survey and Coordination with Partners

The team conducted an initial survey to obtain an overview of the conditions in Dadap Village, the characteristics of the GEDSI group, community

economic activities, coastal resource potential, and participants' initial understanding of whiteleg shrimp farming. The survey also identified locations that could potentially support aquaculture activities, available water sources, road accessibility, flood and drought risks, and facilities that could be used for the socialisation activities.

The survey was conducted through observation, brief interviews, discussions with the Dadap Village Government, and field documentation. The observed aspects included environmental conditions, water sources, water channels, location accessibility, community fisheries activities, and barriers that could limit participants' involvement in the training. Observation, interviews, and documentation were necessary to ensure that the materials and mentoring activities corresponded with the partners' actual conditions (Affandi, Abidin, et al., 2025; Affandi, Setyono, et al., 2026).

Coordination with partners covered the objectives of the activity, implementation time and location, number of participants, division of responsibilities, equipment and material requirements, and the support needed. This stage was also used to determine reasonable accommodations for participants with disabilities and other participants requiring assistance.



Figure 3. Activity Location

2. Needs Assessment of the GEDSI Group

The needs assessment aimed to identify participants' levels of knowledge, aquaculture experience, division of roles in economic activities, access to information, training needs, and the social and physical barriers they faced. Information was collected through interviews and group discussions.

The assessed aspects included:

1. Participants' Experience in Fisheries Activities;
2. Knowledge of Whiteleg Shrimp;

3. Understanding of Water Quality, Feed, Shrimp Health, and Waste;
4. Access to Technology, Capital, Markets, and Extension Services;
5. Involvement in Decision-Making;
6. Accessibility and Assistance Need;
7. Participants' Interest in the Division of Roles Within Aquaculture Enterprises; and
8. Participants' Expectations Regarding Follow-Up Activities.

The assessment results formed the basis for preparing the materials. Through this approach, the materials did not merely explain technical procedures but also addressed the needs and problems identified within the target group.

3. Preparation of Materials, Media, and Instruments

The team prepared the socialisation materials based on the survey and needs assessment results. The materials were delivered in simple Indonesian and could be combined with the Sasak language when necessary. The activity media included PowerPoint presentations, posters, images, short videos, information sheets, water quality measurement instruments, sample record-keeping forms, and demonstration materials.

Visual media, video tutorials, and printed materials can help participants understand technical information and review it after the activity. This approach was used in a previous community service programme that improved lobster farmers' capacity through presentations, videos, and leaflets (Affandi, Scabra, et al., 2023).

The prepared materials covered:

1. Basic GEDSI Concepts;
2. Access, Participation, Control, and Benefits;
3. Opportunities and Risks Associated with Whiteleg Shrimp Farming;
4. Site and Water Source Selection;
5. Preparation of Culture Facilities;
6. Selection of Healthy Post-Larvae;
7. Water Quality Management;
8. Stocking Density and Feed Management;
9. Biosecurity and Sanitation;
10. Identification of Healthy and Diseased Shrimp;
11. Disease Prevention;
12. Waste Management;
13. Safe Use of Medicines, Probiotics, Disinfectants, and Chemicals;
14. Production Record-Keeping; and
15. Inclusive Division of Group Responsibilities.

The emphasis on water quality, feed, sanitation, biosecurity, organism health, and waste management followed the principles applied in previous community service activities involving assistance based on Good

Aquaculture Practices (Affandi, Abidin, et al., 2025; Affandi, Setyono, et al., 2026).

4. *Pre-test*

Before the materials were delivered, participants completed a pre-test to determine their initial level of knowledge. The instrument consisted of 10 multiple-choice or true-or-false questions. The questions covered GEDSI concepts, the potential of whiteleg shrimp, post-larvae, water quality, feed, biosecurity, disease prevention, disease treatment, waste management, and production record-keeping.

The use of 10 questions in pre-tests and post-tests had previously been applied in community service activities to measure changes in participants' knowledge during capacity-building programmes for aquaculture farmers (Affandi, Scabra, et al., 2023). Participants who experienced difficulty reading or writing received assistance from the community service team. The team read the questions aloud without directing participants towards any particular answer.

5. *Socialisation and Interactive Discussion*

The socialisation activity used interactive lectures and FGDs. The materials were delivered in a communicative manner. Participants were given opportunities to ask questions and share their experiences throughout the session. The GEDSI materials explained the importance of providing equitable access, opportunities, and benefits to women, men, persons with disabilities, young people, and vulnerable groups. The technical materials covered whiteleg shrimp farming from the planning stage to post-harvest handling.

After the presentation, the activity continued with a discussion. Participants described potential problems, including limited capital, water sources, ability to use equipment, disease risks, feed management, marketing, and the division of group responsibilities. Interactive lectures and open discussions were necessary to ensure that the proposed solutions corresponded with participants' aquaculture conditions and experiences (Affandi, Abidin, et al., 2026).

6. *Demonstration and Participatory Practice*

The demonstration aimed to connect the materials with practical actions that participants could apply. The practical activities included:

1. Using Thermometer;
2. Using pH Meter;
3. Measuring Salinity with Refractometer;
4. Introduction to the Use of Dissolved Oxygen Meter;
5. Collecting Water Samples;
6. Observing the Physical Condition of the Water;
7. Calculating Biomass and Feed Requirements;

8. Identifying Signs of Healthy and Diseased Shrimp;
9. Sanitising Equipment;
10. Restricting Access to the Aquaculture Area;
11. Recording Water Quality, Feeding, Mortality, and Growth; and
12. Introduction to Wastewater Management.

The demonstrations were conducted in groups so that every participant had an opportunity to use the equipment. Hands-on practice was selected because training that directly involves participants in the use of equipment and technology can improve skills and support partner independence (Affandi, Azhar, et al., 2025; Affandi, Setyono, et al., 2023).

The shrimp health materials also introduced changes in appetite, swimming responses, body colour, gill condition, and abnormal mortality. Participants were encouraged to perform early detection because symptom identification, water quality management, sanitation, stocking density, and feeding are essential components of disease prevention (Affandi, Abidin, et al., 2026).

7. *Group Discussion and Action Planning*

Participants were divided into 10 small groups. The groups were formed inclusively by combining participants of different genders, ages, levels of experience, and abilities. Each group identified:

1. Opportunities for Whiteleg Shrimp Farming in Dadap Village;
2. Technical, Social, Economic, and Environmental Risks;
3. Roles that GEDSI Group Members Could Perform;
4. Facility and Mentoring Requirements;
5. Measures for Preventing Pollution and Disease; and
6. Action Plans to be Implemented After the Activity.

The discussion results were presented by group representatives. Other participants provided responses, while the community service team offered clarification, reinforcement, and corrections.

8. *Evaluation, Monitoring, and Programme Sustainability*

Evaluation was conducted through a post-test, participation observations, skills assessments, and reflective discussions. The post-test used the same questions as the pre-test. Knowledge scores were calculated using the following formula:

$$\text{Knowledge Score} = \frac{\text{Number of Correct Answers}}{\text{Total Number of Questions}} \times 100$$

Knowledge improvement was calculated using the following formula:

$$\text{Knowledge Improvement} = \text{Mean Post-test Score} - \text{Mean Pre-test Score}$$

The data were analysed descriptively using the mean, minimum, and maximum values, score differences, and percentage increases. Qualitative data from observations, discussions, and participant responses were analysed by grouping them into themes, including participant understanding, forms of participation, barriers, follow-up needs, and readiness to apply the materials.

The evaluation did not focus solely on knowledge. It also assessed participants’ ability to use equipment, participation in discussions, ability to explain the materials, and attitudes towards sustainable aquaculture. This approach to evaluating knowledge and skills had been applied in community service activities involving Good Aquaculture Practices assistance and water management technology implementation (Affandi, Abidin, et al., 2025; Affandi, Azhar, et al., 2025; Affandi, Setyono, et al., 2026).

Monitoring was conducted two weeks after the activity through visits, group meetings, telephone communication, and a WhatsApp group. The team provided written materials, short videos, and consultation contacts so that participants could obtain assistance when facing difficulties. The provision of guidelines and consultation channels aimed to maintain programme sustainability after the main activity had ended (Affandi, Azhar, et al., 2025).

Success Indicators

Table 1. Success Indicators

Indicator	Success Target
Participant attendance	≥80% of registered participants
Participants completing the pre-test and post-test	≥80%
Increase in the mean score	≥20 points
Participants actively involved in discussions or practical sessions	≥75%
Participants able to use equipment with minimal assistance	≥75%
Participants able to identify three sustainable aquaculture practices	≥75%
Participants who considered the activity beneficial	≥80%
Completion of a follow-up plan	One document

Application of GEDSI Principles

GEDSI principles were applied from the planning stage through to the evaluation stage. The team ensured that all participants had access to information, media, equipment, and opportunities to express their opinions. The activity location was selected by considering safety, accessibility, lighting, ventilation, and the needs of participants with disabilities.

The materials used easy-to-read text, clear illustrations, and examples that were relevant to the community’s daily life. Participants requiring assistance were permitted to be accompanied by family members or facilitators from the community service team. Participants could also ask questions verbally, in writing, or through a facilitator. Activity documentation was conducted only after obtaining participants’ consent. Participants’ personal data were not published without permission.

Result and Discussion

Activity Implementation

The socialization of sustainable whiteleg shrimp farming practices for the GEDSI group was conducted on 28 April 2026 at the Dadap Village Hall, Sambelia District, East Lombok Regency, West Nusa Tenggara. The activity involved 50 participants, consisting of 28 women, 5 men, 2 persons with disabilities, 5 young people, and 10 individuals from other community groups.

The activity involved the community service team, the Dadap Village Government, GEDSI group administrators, and members of the local community. The implementation stages consisted of a survey and needs assessment, pre-test, socialization, discussion, demonstration, post-test, evaluation, and preparation of a follow-up plan. This sequence was consistent with several community service activities in aquaculture that used structured stages to ensure that knowledge transfer was followed by practical activities, mentoring, and evaluation (Affandi, Abidin, et al., 2023; Affandi, Azhar, et al., 2025; Affandi, Scabra, et al., 2023).

Table 2. Characteristics of Activity Participants

Characteristic Category		Participants (person)	Percentage (%)
Gender	Male	15	30
	Female	35	70
Disability status	Persons with disabilities	2	4
	Persons without disabilities	48	96
Age	<25 years	20	40
	25–40 years	20	40
	41–60 years	10	20
	>60 years	0	0
Aquaculture experience	Previous experience	5	10
	No previous experience	45	90

Participant representation is an important aspect of GEDSI-based activities. The GEDSI approach requires equitable access to information, participation, and opportunities to contribute to decision-making for

women, men, persons with disabilities, and groups vulnerable to social exclusion. This approach also seeks to remove physical, social, and communication barriers that may limit participants’ involvement (Rimbawan & Nurhaeni, 2023).



Figure 4. Activity Participants

Results of the Survey and Needs Assessment

The initial survey showed that the participants had diverse levels of knowledge and experience. Some participants were already familiar with whiteleg shrimp, but their understanding of water quality, feed, diseases, and waste management remained limited. The participants also expressed a need for information regarding capital, suitable farming locations, water sources, post-larvae, feed, and marketing.

The surveys and interviews provided the information required to adapt the materials to the participants’ actual conditions. Affandi, Abidin, et al. (2025) and Affandi, Setyono, et al. (2026) showed that initial identification through observation, interviews, and documentation helped community service teams prepare materials and mentoring strategies based on the actual conditions faced by aquaculture farmers. The needs assessment also identified several barriers to the participation of GEDSI groups. These barriers included limited time, domestic responsibilities, access to the activity location, educational level, reading ability, physical conditions, and low confidence in expressing opinions.

Participants’ Initial Knowledge

The pre-test results showed that the participants’ mean initial knowledge score was 32 out of a maximum score of 100. The highest score was 60, while the lowest score was 10. A total of 46 participants, or 92%, were classified in the low-knowledge category, while 4 participants, or 8%, were classified in the moderate

category. No participants were classified in the high-knowledge category.

The aspect most widely understood before the activity was the potential of whiteleg shrimp, whereas the GEDSI concept received the lowest percentage of correct answers. These results indicated that the participants had general knowledge of shrimp farming activities but did not yet understand the relationship between GEDSI concepts and sustainable shrimp farming. The pre-test provided an objective overview of the participants’ learning needs. Affandi, Scabra, et al. (2023) used ten multiple-choice questions to assess participants’ initial knowledge before the materials were delivered and subsequently compared the results with the post-test scores.

Table 3. Participants’ Initial Knowledge

Topic	Correct Answers
GEDSI concepts	8%
Potential of whiteleg shrimp	56%
Post-larvae selection	48%
Water quality	44%
Feed management	40%
Biosecurity	26%
Disease prevention	28%
Disease treatment	26%
Waste management	34%
Production record-keeping	30%

The participants’ limited initial understanding of GEDSI may be attributed to the fact that the term is not yet widely used in everyday community activities. Rokhmah et al. (2024) found that participants were able to recognize gender and disability issues but were not always able to analyse them using the GEDSI framework. This condition indicates that GEDSI should be introduced through practical examples that are closely related to people’s daily lives, rather than through definitions alone.

In this activity, GEDSI was explained through examples of role distribution in aquaculture enterprises. These examples included opportunities to participate in training, use equipment, record water quality data, manage finances, access capital, market harvested products, and participate in decision-making. These explanations helped participants understand that GEDSI does not require everyone to perform the same tasks. Instead, GEDSI promotes a fair distribution of roles based on the abilities, needs, interests, and opportunities of each group member.

Socialization of GEDSI Principles

The first material covered gender equality, disability, and social inclusion. Participants received explanations of access, participation, control, and benefits. Access refers to the opportunity for all group

members to obtain information, attend training, use technology, and access resources. Participation means that every member can become involved in activities. Control relates to involvement in decision-making, while benefits indicate that the outcomes of an activity can be enjoyed equitably.

Participants provided responses regarding the division of roles, access to training, capital, and decision-making. The discussion indicated that roles in aquaculture should not be restricted based on gender or physical condition. Group members can participate in record-keeping, water quality measurement, feed scheduling, financial management, marketing, post-harvest processing, and environmental monitoring according to their respective abilities. The FGD method helped participants openly share their experiences and problems. FGDs and the preparation of materials based on partner problems have been applied in coastal community education activities to make the materials easier to understand and more relevant (Affandi, Diniariwisan, et al., 2024; Affandi, Scabra, et al., 2024).

Studies of coastal communities show that women contribute to household economic activities but may still face limited access to information, extension services, equipment, capital, and decision-making. Handayani et al. (2023) found that access to and control over various coastal resources remain largely dominated by men. This condition reinforces the importance of extension programmes that provide women and vulnerable groups with direct opportunities to improve their skills and participate in business-related decision-making.

Yanfika et al. (2021) also stated that extension programmes in coastal communities should enhance women's participation, access, control, and benefits. Therefore, the success of GEDSI-based activities should not be measured solely by the number of women or persons with disabilities who attend. It should also be assessed based on their involvement in discussions, use of equipment, preparation of activity plans, and participation in group decision-making.

Socialization of Sustainable Whiteleg Shrimp Farming

The second material explained that whiteleg shrimp farming must consider technical, social, economic, environmental, technological, and institutional aspects. Participants learned that business success is not determined solely by the quantity of shrimp harvested. It also depends on feed efficiency, shrimp health, water quality stability, production costs, waste management, and the group's capacity to manage the enterprise.

The material on post-larvae selection explained the characteristics of suitable post-larvae, including active movement, uniform size, responsiveness to water currents, the absence of physical deformities, and origin

from a reliable source. Participants also received information on the importance of acclimatization in reducing stress caused by changes in temperature and salinity.

The water quality material covered temperature, salinity, pH, dissolved oxygen, ammonia, and nitrite. Participants were informed that water quality must be routinely monitored and recorded. Proper water quality management helps maintain appetite, growth, health, and the survival of cultured organisms. The application of water management technology by Affandi, Azhar, et al. (2025) showed that training, technology implementation, and mentoring could improve partners' knowledge and skills in maintaining aquaculture environmental conditions.

The feed material explained that the amount of feed must be adjusted according to biomass, age, size, appetite, and environmental conditions. Excessive feeding increases production costs and accelerates the accumulation of organic matter. Affandi, Abidin, et al. (2023) emphasized that stocking density and feed management influence growth, survival, culture duration, and business efficiency.

The biosecurity material covered equipment hygiene, access restrictions, the use of separate equipment, culture-container sanitation, control of disease-carrying organisms, and the handling of diseased shrimp. Assistance based on Good Aquaculture Practices showed that sanitation, water quality, feed, biosecurity, organism health, waste management, and documentation are interconnected components of sustainable aquaculture (Affandi, Abidin, et al., 2025; Affandi, Setyono, et al., 2026).

Muhtar et al. (2026) showed that the sustainability of whiteleg shrimp farming is determined by ecological, social, economic, technological, and institutional dimensions. The study also identified waste management, the condition of water channels, farmers' level of understanding, and training programmes as important factors in improving the sustainability of aquaculture enterprises. These findings support the use of socialization and demonstration activities as an initial step in strengthening the capacity of GEDSI groups in Dadap Village.

Muchtar et al. (2020) explained that increases in shrimp production should be aligned with environmental carrying capacity and supported by environmentally friendly technologies. Aquaculture development that focuses solely on increasing production may degrade environmental quality, increase disease risks, and lead to unstable production. Therefore, the community service materials did not only explain the economic benefits of whiteleg shrimp farming but also emphasized the risks that need to be managed from the planning stage onward.

Relevance of the Materials to Conditions in Dadap Village

Water management was an important component of the activity because Dadap Village is located in a coastal area that is vulnerable to flooding and drought. These conditions can affect water sources, salinity, embankment stability, environmental stability, and the potential entry of disease-carrying organisms. Participants were informed that this activity should not be considered a direct basis for establishing new shrimp ponds. Aquaculture development still requires assessments of water sources, soil quality, salinity, environmental carrying capacity, spatial planning, disaster risks, infrastructure, and economic feasibility.

Coastal conditions also require careful attention to aquaculture waste management. Wastewater containing uneaten feed, feces, dead plankton, and organic matter must be properly managed to prevent deterioration of environmental quality. This discussion reinforced participants' understanding that sustainable aquaculture must maintain productivity while protecting coastal ecosystems.

Technical Demonstration

The technical demonstration was conducted after the socialization session. Participants were introduced to thermometers, pH meters, dissolved oxygen (DO) meters, refractometers, and water quality test kits. The team explained the function of each instrument, its proper use, how to interpret the results, cleaning and storage procedures, and data recording.

A total of 45 participants, or 90%, were able to operate the instruments after receiving guidance. Participants still experienced difficulties when using the water quality test kits. These results highlight the importance of hands-on practice and repeated training. The Budikdamber training conducted by Affandi, Setyono, et al. (2023) showed that participants could understand technology more easily when they were directly involved in preparing equipment, constructing culture units, and carrying out the aquaculture process. The same principle was applied in the demonstrations of water quality measurement and whiteleg shrimp farming management.

The feed calculation demonstration used examples based on shrimp biomass. Participants were asked to calculate the amount of feed required using the available data. A total of 40 participants, or 80%, were able to perform the calculations correctly. The main difficulties were related to unit conversions and feed percentage calculations.

The shrimp health demonstration included observations of appetite, swimming patterns, body condition, coloration, gill condition, and responses to disturbances. Early recognition of clinical signs is important because delays in identifying health problems

can increase mortality and economic losses. The fish disease mitigation activity conducted by Affandi, Abidin, et al. (2026) showed that interactive lectures, discussions, demonstrations, and mentoring could improve participants' understanding of early disease detection and water quality management.



Figure 5. Technical Demonstration

Participant Participation

Participants demonstrated active involvement by asking and answering questions, operating equipment, participating in group discussions, and presenting discussion results. A total of 10 participants asked questions, all 50 participants practiced using the equipment, and 15 participants expressed their opinions during the discussions.

Table 4. Application of GEDSI Principles During the Activity		
Element	Form of Implementation	Result
Access	Materials, equipment, and information were provided to all participants	Achieved
Participation	Participants took part in discussions and practical activities	Achieved
Control	Participants expressed problems, opinions, and suggestions	Achieved
Benefits	Participants acquired knowledge and skills	Achieved
Accessibility	The venue and learning media were adapted to participants' needs	Achieved

Participants' questions mainly concerned the prevention and treatment of diseased shrimp. The high level of interest in shrimp health indicated that this aspect was particularly relevant to the participants.

Active participation was also reported in the community service activity conducted by Affandi, Abidin, et al. (2023), particularly through the large

number of questions raised by participants regarding aquaculture management. Participant involvement is an important indicator that an activity addresses the needs of the target partners and facilitates two-way communication.

Improvement in Participants' Knowledge

The participants' mean score increased from 32 to 72. This represented an increase of 40 points or 125%. The highest post-test score was 100, while the lowest was 50. The greatest improvement occurred in the GEDSI concept material, whereas the smallest improvement occurred in the material on the potential of whiteleg shrimp.

Table 5. Comparison of Pre-test and Post-test Scores

Topic	Pre-test	Post-test	Improvement
GEDSI concepts	8%	86%	975%
Potential of whiteleg shrimp	56%	60%	15%
Post-larvae selection	48%	68%	55%
Water quality	44%	68%	70%
Feed management	40%	68%	79%
Biosecurity	26%	68%	162%
Disease prevention	28%	80%	186%
Disease treatment	26%	80%	208%
Waste management	34%	74%	131%
Production record-keeping	30%	72%	140%
Average	32%	72%	123%

The increase in scores indicates that the combination of lectures, visual media, discussions, hands-on practice, and evaluation helped participants understand the materials. Affandi, Scabra, et al. (2023) used comparisons between pre-test and post-test scores to evaluate knowledge transfer. A similar evaluation approach was also applied in Good Aquaculture Practices mentoring activities to assess changes in participants' understanding and skills (Affandi, Abidin, et al., 2025).

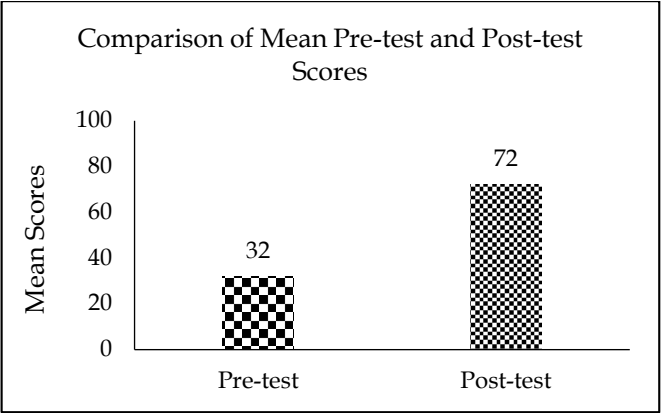


Figure 6. Comparison of Mean Pre-test and Post-test Scores

However, the post-test scores only reflect short-term changes in knowledge. These results do not yet demonstrate that participants are capable of independently managing a complete shrimp production cycle. Technical competence requires repeated practice, continued mentoring, access to production facilities, and field-based evaluation.

Follow-up Plan

The group discussions identified several areas requiring further action:

1. Site Suitability Assessment;
2. Assessment of Water Sources and Water Quality;
3. Advanced Technical Training;
4. Repeated Practice in Water Quality Measurement;
5. Information on Sources of Post-Larvae and Feed;
6. Mentoring on Biosecurity and Shrimp Health;
7. Establishment or Strengthening of Community Groups;
8. Training on Cost and Production Record-Keeping;
9. Preparation of Business Plans; and
10. Development of a Small-Scale Demonstration Unit.

Follow-up programmes need to be implemented gradually. Affandi, Diniariwisan, et al. (2024) and Affandi, Scabra, et al. (2024) used evaluation results as a basis for identifying programme limitations and planning subsequent activities. Continued mentoring should also provide communication channels through which participants can seek consultation after the activity. Sustainability strategies involving written guidelines, videos, facilitator contacts, and partnerships with relevant stakeholders have previously been applied in water management technology programmes for coastal aquaculture farmers (Affandi, Azhar, et al., 2025).

Activity Achievements

Table 6. Achievements of the Community Service Activity

Indicator	Success Target	Result	Status
Participant attendance	≥80% of registered participants	100%	Achieved
Participants completing the pre-test and post-test	≥80%	100%	Achieved
Increase in mean score	≥20 points	40 points	Achieved
Participants actively involved in discussions or practical activities	≥75%	100%	Achieved
Participants able to operate equipment with minimal guidance	≥75%	100%	Achieved

Indicator	Success Target	Result	Status
Participants able to identify three sustainable aquaculture practices	≥75%	100%	Achieved
Participants who considered the activity beneficial	≥80%	100%	Achieved
Preparation of a follow-up plan	1 document	1 document	Achieved

Based on these indicators, the activity was considered successful. The main achievements included active participation in discussions and demonstrations, the ability to operate the equipment, the ability to identify three sustainable aquaculture practices, and the preparation of a follow-up plan. The aspect that still requires further improvement is the increase in the mean knowledge score.

Limitations of the Activity

The activity had several limitations. First, the one-day implementation period was insufficient to provide participants with experience in completing an entire aquaculture production cycle. Second, the evaluation primarily measured short-term changes in knowledge. Third, limitations were related to the availability of equipment, the number of facilitators, and accessibility.

Differences in participants' initial levels of knowledge could also affect the rate at which they understood the materials. Similar challenges were reported in fish disease control activities, particularly limited implementation time and variations in participants' knowledge. These limitations need to be addressed through gradual delivery of materials and continued mentoring (Affandi, Abidin, et al., 2026).

Implications of the Activity

This activity provided the GEDSI group with basic knowledge to understand the opportunities and risks associated with whiteleg shrimp farming. Participants not only received information about its economic potential but also developed an understanding of capital requirements, water quality, feed management, biosecurity, shrimp health, waste management, and production record-keeping.

From a social perspective, the activity created opportunities for women, persons with disabilities, young people, and vulnerable groups to participate in coastal economic activities. Their involvement should be continued in the planning, management, monitoring, and decision-making processes.

From an environmental perspective, aquaculture development in Dadap Village needs to be approached carefully because the area is vulnerable to flooding, drought, and pressure on water resources. Subsequent

activities should prioritise land suitability assessments, water quality analysis, business plan development, institutional strengthening, and the establishment of a demonstration unit.

Conclusion

The socialization of sustainable whiteleg shrimp farming practices for the GEDSI group in Dadap Village strengthened participants' knowledge of gender equality, disability, and social inclusion concepts and their application in aquaculture activities. Participants gained a better understanding of water quality management, the use of healthy post-larvae, feed management, biosecurity, disease prevention, production record-keeping, and aquaculture waste management. The combination of socialization, discussion, and demonstration also created more equitable opportunities for women, persons with disabilities, young people, and other social groups to participate. Based on the evaluation results, the participants' mean knowledge score increased from 32 to 72, representing an improvement of 40 points. These findings indicate that the community service activity successfully improved participants' initial understanding, although the increase in knowledge does not yet directly reflect their ability to independently manage whiteleg shrimp farming.

Acknowledgments

This work was financially supported by RIIM Kolaborasi Internasional LPDP – KONEKSI.

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