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Alternative Fish Food Production Technology: Case Study in Trenceng Village, Tulungagung Regency

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Abstract

Purpose: The development of ornamental fish feed technology plays a crucial role in ensuring the long-term viability of fisheries in Trenceng Village, Sumbergempol, and Tulungagung Regency. The objective is to develop alternative technology for manufacturing fish feed that may effectively reduce production expenses and fulfil the requirements of ornamental fish growers.

Method: The approach promotes self-sufficiency among ornamental fish producers in producing fish feed. This is done in response to the declining pricing of ornamental fish and the comparatively high feed cost.

Practical Applications: This technology's practical application is to create food self-sufficiency for ornamental fish farmers in terms of ease of price access and physical.

Conclusion: Ornamental fish farmers are anticipated to benefit from implementing alternative fish feed technologies, as it will assist them in managing volatility and reductions in product revenue. Therefore, this technology can enhance the sustainability of fisheries in Trenceng Village, Sumbergempol, and Tulungagung Regency.

Introduction

Trenceng Village, located in the Sumbergempol District of Tulungagung Regency, serves as a prominent hub for breeders of decorative fish. According to the 2021 report from the Tulungagung Regency Fisheries Service, this community is responsible for approximately 60-70% of the ornamental fish production in Tulungagung Regency. The ornamental bred fish include koi fish, goldfish, and guppy fish. Koi fishes are the primary species of ornamental fish that are intentionally developed. Trenceng Village exhibits many potentials in ornamental fish breeding, which can be further enhanced. The available land capacity for potential fish breeding ponds remains substantial. Figure 1 illustrates the precise placement of the current pool area. Furthermore, the ornamental fish breeding region is in a relatively untouched environment, allowing fish farmers to easily obtain raw materials from the surrounding areas.

Figure 1. Fishpond Land in Trenceng Village

Source: Pre-Research of Community Economics RG Abdimas Team, 2022

In addition to possessing the physical capabilities, ornamental fish farmers in Trenceng Village also demonstrate potential in their administrative abilities to enhance fish production and breeding. The primary pisciculture enterprise in the area comprises approximately 15-20 pisciculturists. They possess the drive and capability to improve the characteristics of their resources collaboratively. They created technologies for purifying and purifying water, circulating water, and providing food for fish in a group. Figure 2 illustrates the pond for cultivating fish seeds, fitted with lighting, filtration systems, and a water circulation motor. The current manufacturing or breeding of ornamental fish seeds is not a significant issue. Nevertheless, ornamental fish producers encounter a reliance on fish food sourced only from fish feed companies. The need for fish feed, averaging 3000-4000 packs of pellets each month for approximately 15-20 farmers, does not hinder physical accessibility or price. This condition is triggered by the decrease in farmers' monthly revenue. Farmers' monthly revenue decline is primarily attributed to the volatility in ornamental fish output prices. The declining price of ornamental fish has led to a corresponding decrease in farmers' revenue. Intensifying rivalry among ornamental fish producers is leading to a decline in market pricing (Tribuzy-Neto et al., 2020). In addition, there have been instances where unhealthy competition has arisen among different groups of ornamental fish breeders, leading to social conflict (Huntingford, 2020; Mirera et al., 2020). However, it is worth noting that certain groups exhibit collaboration and intimate engagement as a manifestation of social capital (Lambert, 2016; Liu et al., 2016). Amidst market pressure, Khud Khoirul Basor, the chairman of Karang Taruna TARUNA BAKTI and the ornamental fish farmer association group in Trenceng Village, stated that the farmers remained united. He noted that production independence (6), (7), and (8) is crucial for the long-term viability of their business.

Figure 2. Fishponds that have been provided with Facilities in Trenceng Village

Source: Pre-Research of Community Economics RG Abdimas Team, 2022

Moreover, Khud stated that the primary factor that may decrease production expenses is the expenditure on fish feed. Ornamental fish producers concur that manufacturing their fish feed can reduce production expenses and become independent from factory-made feed. According to the sequence of events described above, the partner (Karang Taruna TARUNA BAKTI) is currently experiencing pressure on the market price of ornamental fish, which is changing but generally decreasing. Fish growers are facing additional challenges due to the exorbitant costs of commercially produced fish feed. The fundamental issues business partners encounter in sustaining their operations revolve around these two factors. Consequently, the RG Economic Community service team cooperates with BPR Sukadana, an additional partner, to facilitate the ongoing breeding of this attractive fish. Karang Taruna TARUNA BAKTI stated that achieving self-sufficiency in fish food production would alleviate the burden of issues, particularly the reliance on factory-made feed. Farmers can enhance breeding and achieve high-quality ornamental fish output by reducing production costs. PKM aims to augment the volunteer's capability using the following approaches. Initially, ascertain the mean nutritional needs of Karang Taruna TARUNA BAKTI. Next, establish the objectives for using fish food and collaboratively develop a prioritization framework with Karang Taruna TARUNA BAKTI and BPR SUKADANA. Next, establish criteria for acquiring alternative feed producing technology/machines. Next, commence endeavors to implement alternative feed production technology/machines in collaboration with Karang Taruna TARUNA BAKTI. PKM aims to empower volunteers to enhance the efficiency and efficacy of fish feed utilization.

Method

Various methodologies are employed in community service endeavours. The lecture method is selected to communicate the essential components of alternative fish feed production (Parodi et al., 2018; Stevens et al., 2018). Training participants are allowed to directly inquire about the speaker if they find the material delivered ambiguous, without waiting for the designated question and answer session. This instructional approach uses laptops and LCDs to exhibit PowerPoint materials containing visual elements, such as images and video presentations. Therefore, by providing substantial training content within a restricted training time, participants can better comprehend the administration of alternative fish feed technology. Furthermore, the demonstration approach illustrates the operational procedures of technology or alternative machinery used in feed production. The primary objective of this initiative is to offer convenience to participants undergoing training, with a particular focus on ornamental fish producers. The service team conducts the demonstration to train participants to effectively

perform simulations related to acquiring technology or alternative feed production machines and related tasks. Additionally, the demonstration aims to guide participants in independently producing fish feed, following the instructions provided by the speaker.

Table. 1 Program and Activity Output

No.	Program	Activity Output
1	Identifying the average need for feed with Karang Taruna TARUNA BAKTI.	There are 2 Identification activity units in Trenceng Hamlet with at least 4 meetings; (@ 3 hours). Carried out following health protocols and restrictions on discussion participants
2	Identify the agenda for the process of using fish feed and create a priority scale together with Karang Taruna TARUNA BAKTI and BPR SUKADANA	There is a work program design and priority pilot activities
3	Prepare requirements for procurement of alternative feed production technology/machines	There are technology/machinery startups for alternative feed production
4	Initiating activities to use alternative feed production technology/machines with Karang Taruna TARUNA BAKTI.	The use of technology/machines for alternative feed production is starting to be used and evaluated gradually

Source: Private Documentation, 2022

This community service activity encompasses multiple crucial stages. Initially, a lecture is delivered regarding the imperative nature of autonomous fish feed manufacturing and the challenges faced by the fish feed industry in Indonesia and globally. This lecture also addresses the role of the service provider, fish farmers, and the geographical extent of their service. The second step involves engaging in a debate or question-and-answer session about alternative fish-producing technologies or equipment and their management. This conversation aims to help participants achieve self-sufficiency in food production. The last stage showcases the utilization of technology or machinery to produce fish feed autonomously. This demonstration encompasses the specific demographic, the mechanism employed, and the monitoring process. Therefore, participants can gain a firsthand comprehension of the technology's or machine's functioning in the context of independent fish feed production.

Result

The establishment of this service system is a direct response to the goal of achieving food independence for ornamental fish, as previously discussed. The primary component of fisheries' sustainability in Trenceng Village, Sumbergempol, and Tulungagung Regency is the presence of advanced technology for producing decorative fish food. Due to the decreasing trend in ornamental fish prices and the relatively expensive feed cost, ornamental fish farmers must adopt alternative technologies for producing fish feed. Ornamental fish growers are anticipated to possess the capability to manufacture their fish feed to decrease production expenses independently. This becomes pivotal when they also encounter product sales or revenue that is relatively volatile and even tend to decrease. The development of alternative fish-feeding technology is anticipated to achieve food self-sufficiency by providing affordable and readily available options to suit the dietary requirements of ornamental fish growers.

The initial outcome of this initiative was the successful observation of the residents of Trenceng Village concerning the fish food self-sufficiency system. In terms of production

equipment, Trenceng Village already possesses autonomous fish feed production equipment. Nevertheless, this instrument necessitates technical enhancements to function as an operational production tool. In addition, a range of outreach events were organized to enhance the enthusiasm of village inhabitants in promoting the development of alternative ornamental fish food. The outreach involved promoting an affordable and readily producible independent fish food.

Discussion

Implementing the service scheme in Trenceng Village, Sumbergempol, Tulungagung Regency, as a response to the food independence of ornamental fish raises several critical points for discussion. Firstly, the declining prices of ornamental fish and the high cost of feed necessitate the development of alternative technologies for fish feed production (Cottrell et al., 2020; Rasal et al., 2016). This is particularly important given the fluctuating and often declining revenue from product sales. The expectation is that ornamental fish farmers will be able to produce their fish feed (Ng, 2016; Nielsen et al., 2017), thereby reducing production costs and achieving food independence. However, the question remains regarding how feasible this is in practice and what challenges farmers may face in this endeavour (Boyd et al., 2020; Evers et al., 2019; Pouil et al., 2020). Secondly, the program's initial results indicate that Trenceng Village already possesses the equipment necessary for independent fish feed production. However, this equipment requires technical improvements to become an active production tool (Evers et al., 2019). This raises the issue of how these improvements can be made, who will be responsible for them, and what resources will be required. Lastly, the outreach events held to increase the enthusiasm of village residents to support the production of alternative ornamental fish food were successful (Loury et al., 2021). These events focused on socializing independent fish food production, emphasizing its low cost and ease of production. These outreach events' effectiveness and impact on the community's engagement with fish food production are worthy of further exploration (Tribuzy-Neto et al., 2020). In conclusion, while the program has made significant strides towards achieving food independence for ornamental fish in Trenceng Village, several challenges and questions still need to be addressed. These include the feasibility of farmers producing their fish feed (Cottrell et al., 2020; Rasal et al., 2016), the technical improvements required for the existing production equipment, and the effectiveness of the outreach events in engaging the community.

Conclusion

The discussions and observations revealed that the problems faced by partners revolved around the repair stage of alternative, independent production equipment. The solution offered by the community service team is innovation in providing alternative ornamental fish feed using simple feed production equipment. Alternative ornamental fish feed can reduce feed production costs and the selling price of the ornamental fish themselves. The second result achieved by the court team in this program was the implementation of socialization, training and mentoring. This scheme requires adjustments to address the consequences of the Covid-19 pandemic. Face-to-face activities are limited to reduce the potential for transmission covid-19. However, service activities can still be carried out in various alternative ways. To achieve outcomes, the service team has tried innovation in the form of a system to reactivate alternative feed production tools. The service team offers a system to sustain alternative ornamental fish food technology.

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