Cultivation Of *Galah* Shrimp Using Aquaponic System As An Effort To Improve The Economy In Drin Mangko Village Woyla District

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Abstract.
The purpose of this research-based community service program is to apply the research results of the proposing team's research for community empowerment. The application of research results is carried out in the aquaculture program on economic biota in the aquaponic system as an effort to improve the economy in Drin Mangko Village, Woyla District, which is a potential for aquaculture that must be developed. The application system is shrimp cultivation with aquaponic technology. Aquaponic technology is a cultivation technique through environmental engineering that relies on oxygen supply and the use of microorganisms that can directly increase the digestibility value of feed. This community service activity aims to increase farmer income with high shrimp productivity and increase shrimp production. The activity was carried out for 6 months at Drin Mangko Village, Woyla District, West Aceh. The results obtained were a relative growth rate of giant prawns of 3.98%. The outputs produced were in the form of international journals, services, and methods as well as mass media

Keywords:*Akuaponik; SGR and Galah shrimps.*

1. INTRODUCTION

Fish farming businesses as micro-entrepreneurs in West Aceh Regency have begun to grow, but unfortunately, the species being farmed are foreign fish introduced from outside Aceh and even outside the country. This situation puts pressure on the local native fish population. Meanwhile, Aceh also has the potential for native fish that are no less in terms of quantity and quality, for example serukan fish and giant freshwater prawns (1). According to the research team's results, local fish whose production has been successfully increased include serukan fish (2), giant freshwater prawns (3), banana shrimp (4), and local snakehead fish (5).

The potential and business opportunities for prospective entrepreneurs arevery potential, because the location of the activity is very strategic, namely having The area boasts abundant and superior natural resources, and the majority of human resources in the area are farmers and fish farmers. However, due to a lack of knowledge, they are unable to cultivate fish, leading to widespread fishing. This community service initiative aims to increase the income of fish farmers and farmers through the application of aquaponics technology.

The problem faced by partners is the lack of knowledge and science that can increase their production yields. The technology used to increase shrimp production is the application of aquaponics technology. Aquaponics technology is a cultivation technique through environmental engineering that relies on oxygen supply and the use of microorganisms that can directly increase feed digestibility (6); (7); (8).

The abundance of natural resources in the area and the limited human resources lacking specialized knowledge make this community service program highly suitable for improving the economic well-being of farming groups. This program utilizes local fish farming solutions through aquaponics technology. This cultivation technique utilizes environmental engineering that relies on oxygen supply and the use of microorganisms, which can directly increase feed digestibility.

II. METHODS

Location and Time of Activity

The proposed method involves implementing an appropriate technology program for aquaponic shrimp cultivation in Woyla District, West Aceh. This is a container engineering system that implements a mutualistic system of plant and aquaculture cultivation. This activity was carried out for six months. The program aims to increase farmer incomes by increasing shrimp productivity and aquaculture production.

Tools and Materials for Activities

The materials used in this activity were: giant freshwater prawns, kale plants, coarse salt, compost, charcoal, and shrimp pellets. The tools used in this study were: an aquaponics pond, a water pump, an aeration hose, scales, a ruler, labels, a measuring tape, a safety net, and stationery.

Method of Implementing Aquaponic

Pond Construction Activities

Prepare a tarpaulin pool measuring 1.5 x 1.5 meters and 110 cm deep. Make sure the pool isn't too shallow to allow the shrimp more room. to move, so their development is more optimal. Before using the tarpaulin pond, it's best to add water and banana stems to it for a full day. This action is done to remove toxins from residue and any lingering odors in the pond. Fill the pond with clean water to the correct level. Once the pond is ready, you can use it to raise shrimp. Add 100 shrimp seeds to the pond. The shrimp in the pond will produce waste that acts as good organic material for the plants

Making an aquaponic installation

The first step that must be done is to prepare the Aqua Bottle 1.5 liters to create a water installation that will be installed at the top, middle, or bottom. Make 3 holes in each bottle with a diameter adjusted to the planting media cup. In the bottle cap and the bottom end of the bottle, make a hole the size of the aeration hose with a length the same as the top bottle to the bottle below. The pipe placement is inside the pipe connection that is modified in size with the bottle so that it does not shift. After all the bottles are installed from the top connector to the bottom bottle hole. Then prepare the plant seeds, then insert them into the center of the netpot/cup. Then add fertilizer soil as a planting medium. Once ready, place the netpot/plastic cup in the bottle hole that has been made. After that, turn on the water pump. Water from the fish pond will flow through the top bottle then will fill the bottom bottle and flow to the shrimp maintenance pond. The water flowing into the pond will be cleaner because the dirt is filtered and absorbed by the plants. Making a water flow system includes: Pump water from the fish pond to the top installation; Flow water to the middle installation; Distribute it to netpots/ plastic cups, which have been placed with seeds using soil as a planting medium on the edge of the pond, using a top flow system; Then from the netpot, the water is discharged back into the pond containing the shrimp; and this aquaponics method can produce a mutualistic symbiosis or mutual benefit between the shrimp pond and the kale plants grown in the hydroponic medium. This is because the plants can purify the fish pond and the remains of fish waste can become a means of distributing nutrients for the plants.

Spreading of giant freshwater prawn seed

Shrimp in the pond are initially stocked with 100 shrimp. The shrimp in the pond are fed regularly according to their age and size. The larger the shrimp, the better the yield. The amount of feed that must be provided depends on the type of shrimp. Harvesting is carried out when the shrimp reach a size of 9-12 per kg within 2.5-3.5 months.

Planting water spinach in aquaponics

Seedlings for kale plants to be planted use a soil medium of compost and coconut shell charcoal mixed with a ratio of 2:1. The use of soil media is to better anticipate the death of kale plants. Seeds are directly sown by soaking them in water for 1 day, after which, they are transferred to plastic cups/netpots that have been prepared beforehand. Then, they are transferred into the holes of the bottles that have been prepared. To ensure that kale can grow well, avoid excessive exposure to sunlight. Once the vegetables are

healthy, they are ready to be harvested. Harvesting aquaponic vegetables for kale plants has rapid growth, so it is quicker to harvest vegetables, before harvesting shrimp. The advantage of this technique is that it can harvest two simultaneously: kale and shrimp

III. RESULT AND DISCUSSION

Minapadi Fish Cultivation Process

Preparing the aquaponics installation

The aquaponics installation consists of a vegetable growing rack, fish pond, water machine, and pipe installation that can connectall over system. Essentially, the plant racks required are the same as those used in hydroponic systems. The fish pond used is a rectangular tarpaulin pool.

Preparation of planting media and nutrients

In an aquaponic system, the growing media used is almost the same as in a hydroponic system, such as compost and coconut shell charcoal. The growing media requirements depend on the type of plant. Another advantage of this system is that it eliminates the need for nutrients or fertilizers, as these are already provided by the pond water.

Types of shrimp for aquaponics

Commonly used fish include catfish, tilapia, gourami, patin, and carp. The type of fish can be tailored to the farmer's preferences. The species used in this community service activity is giant freshwater prawns. Feed is required. For fish growth and the remaining feed from the pond can be useful for plant growth after the decomposition process has been carried out.

Fig 1. Aquaponic pond for giant prawn cultivation

Important Factors in the Aquaponic Shrimp Cultivation Process

The local shrimp cultivation process using aquaponics systems requires careful consideration in shrimp farming to increase production and economic efficiency. These factors include:

- Acclimatize (adjust) the seeds to the environment/water first. This aims to reduce seedling mortality due to stress (9)
- Providing shelter in a maintenance container in the form of PVC pipes to reduce the level of shrimp cannibalism (10)
- Providing apartments in cultivation containers in an effort to increase shrimp density (11)
- The best time to feed shrimp is at night. This is because shrimp are nocturnal and forage at night (12).

Relative Growth Rate of Giant Prawns

The results of the growth rate of giant prawns in the aquaponic system maintained for 90 days with one production cycle and one cultivation container with percentages can be seen in graph 1 below.

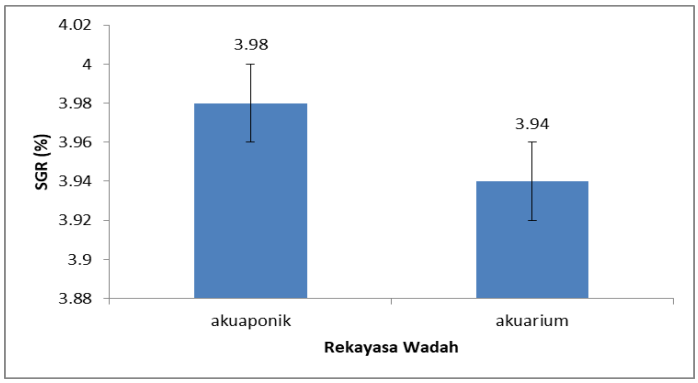

Fig 2. Relative growth rate of giant prawns

The relative growth rate of giant prawns during community service activities shows that the use of aquaponic containers is better than growth in aquariums based on descriptive data. The relative growth rate of giant prawns using the aquaponic system is 3.98% compared to the relative growth rate using aquarium containers which produces a value of 3.94%/ day. This is suspected that aquaponic containers can support the growth of giant prawns. Aquaponic containers also produce healthier water media compared to aquarium containers.

Shrimp grown using aquaponics are healthier, use less water, and have lower feed production costs than conventional shrimp farming methods. This is because the shrimp consume nitrogen regenerated from leftover feed and waste, which they then use to feed their offspring, plankton, thus reducing the need for feed.

IV. CONCLUSION

The technology used is the use of an aquaponic system which aims to increase farmers' income and improve Shrimp production. The results obtained showed a relative growth rate of giant freshwater prawns of 3.98% per production in one container for 90 days.

V. ACKNOWLEDGMENTS

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