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Empowerment of Community Self-Help Groups (KSM) in Maggot Cultivation to Support the Economy in Pudak Village, Muaro Jambi Regency in 2024

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A B S T R A C T

This method is considered to provide the greatest benefits and is relatively easy to implement. One of them is by empowering the community through Community Self-Help Groups (KSM) in managing organic waste. Maggots or maggots are the larvae of the Black Soldier Fly (Hermetia Illucens, Stratimydae, Diptera) which is a family of flies, but the size of the BSF, known as the soldier fly, is longer and larger. Even though it is from the fly family, BSF does not transmit bacteria, diseases or even germs to humans. Like maggots, ecologically maggots are useful in the process of decomposing organic materials. Maggots eat vegetable and fruit waste, therefore maggots are very suitable for use in organic waste management. Even though it is made from organic waste, the fertilizer produced does not smell

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INTRODUCTION

In addition to reducing the amount of waste, waste management at TPS 3R Pudak Village also carries out maggot cultivation, this is because many of the people of Pudak Village cultivate fish, so to provide fish food, it is very good if maggot cultivation is carried out, apart from providing fish food, of course it also provides protein. high so that the fish produced will be healthier and reproduce faster. Based on the description above, it is very important for Community Self-Help Groups (KSM) and farmers to be given knowledge and know and even carry out maggot cultivation, where we both know that this mangot makes a very big contribution in reducing the volume of organic waste from the activities of housewives. , therefore it is necessary to get benefits on the one hand to get alternative animal feed and secondly to be environmentally friendly and to process waste so that it becomes environmentally friendly. Based on this, it is important to educate mangots in reducing waste.

Enlarged maggots or caterpillars are food spoilage larvae that have many benefits and can be grown hygienically and can be sold at high prices. Maggots or maggots are the larvae of the Black Soldier Fly (Hermetia Illucens, Stratimydae, Diptera) which is a family of flies, but the size of the BSF, known as the soldier fly, is longer and larger. Even though it is from the fly family, BSF does not transmit bacteria, diseases or even germs to humans. Like maggots, maggots are ecologically useful in the process of decomposing organic materials. Maggots eat vegetables and fruit. Not only fresh fruit and vegetables, maggots also consume vegetable and fruit waste. Therefore, maggots are very suitable for use in organic waste management. Animal feed and fertilizer produced from maggots are very suitable for animal husbandry and organic farming.

BSF larvae or what are commonly called maggots have a high protein and fat content, have a chewy texture, and have the ability to secrete natural enzymes. So that ingredients that were previously difficult to digest can be simplified and can be utilized by fish. Apart from that, maggots have a fairly high protein content, namely around 42%. Another advantage of maggots is that they contain antimicrobial and antifungal properties, so that when consumed by fish it will increase the body's resistance to bacterial and fungal diseases. The protein content in BSF insects is classified as high quality and is a good source of protein for fish. Therefore, I encourage innovation in the use of alternative feed for fish cultivation using Maggot. "One of the alternative raw materials that has great potential is Maggot which comes from insects that eat organic waste. The ability of these insects, called black soldier flies (BSF), is very unique because they are able to decompose waste and produce high levels of protein for fish feed needs. Reference to BSF cultivation techniques, starting from obtaining broodstock, preparing cages, maintenance stages, to harvesting. This book, prepared by the BSF Indonesia Raya Team, also contains various tips for maintaining BSF and analysis of its business results.

Maggots grow in rotting organic material or waste such as carrion, fruit, damaged vegetables or other things. When whole, maggots have a high protein content of around 44% and when made into pellets, the protein content becomes 30% to 40%. The protein content in maggots is quite high, namely 44.26% with a fat content of 29.65%. The value of amino acids, fatty acids and minerals contained in maggots is not inferior to other protein sources, so maggots are an ideal raw material that can be used as alternative animal feed.

Apart from being able to reduce waste, waste management at TPS 3R Pudak Village will also be good if maggot cultivation is carried out, because in Pudak Village many people cultivate fish, so to provide fish food it would be very good if maggot cultivation is carried out, apart from providing fish food of course also. high levels of protein are provided so that the fish produced will be healthier and reproduce faster. Based on the description above, it is very important for Community Self-Help Groups (KSM) and farmers to be given knowledge and know and even raise maggots, where we both know that maggots can make a very big contribution in reducing the volume of organic waste from the activities of housewives. Therefore, efforts are needed to make a profit, where on the one hand, we get alternative animal feed and on the second, it is environmentally friendly and able to process waste so that it becomes environmentally friendly. Based on this, it is important to educate the mango community in reducing waste.

IMPLEMENTATION AND METHODS

Program Implementation

In implementing this program, there are several stages carried out, namely: the approach taken is by seeking policy support from the regional government, namely stakeholders in Pudak Village, Muaro Jambi Regency, the Livestock Service, industry, and the Muaro Jambi Regency Environmental Service, and also partners or NGOs caring for waste in Muaro Jambi Regency and MSME groups or Dasa Wisma, in Pudak Village, Muaro Jambi Regency; carry out advocacy and coordination meetings with the Livestock Service, Muaro Jambi Regency Environmental Service and organic waste management in maggot cultivation in Pudak Village, Muaro Jambi Regency by approaching residents who raise fish; create work plans and activity schedules that are mutually agreed upon and adapted to partner conditions and situations; and monitoring and evaluating activities that have been implemented.

The steps taken in this activity are: holding a meeting with the Livestock Service and Environment Service of Muaro Jambi Regency, especially the Head of Waste Management; hold meetings with Village Apparatus, Community Health Center/Waste Bank Cadres/Head of Neighborhood Units (RT); make joint activity plans; creating promotional media (You Tube education and posters about maggot cultivation); and creating a WhatsApp group for maggot craftsmen as a form of information about maggot cultivation.

Establish Partner Participation

In implementing this maggot cultivation service, the partners involved are Community Self-Help Groups (KSM) which prepare media or places for maggot cultivation, then the KSM after attending maggot cultivation training will become facilitators for fish farmers to invite and socialize about maggot cultivation. What was carried out in this activity included: gathering the community and RT Heads, maggot waste cultivation activists in their work areas, preparing a meeting place and the necessary supporting equipment; write a letter to the Head of the RT, community leaders, religious leaders, regarding the implementation of maggot cultivation; prepare evaluations together with the community service team.

The benchmark for the success of this activity is increasing community knowledge and understanding about maggot cultivation using the RT Head's approach and is determined in detail in several indicators, including: Input Indicators (stakeholder support and commitment, availability of community groups, and availability of media and equipment); Process Indicators (joint planning of maggot cultivation activities for the community and activists in Pudak Village, Muaro Jambi Regency, socialization of maggot cultivation with the RT Head's approach and what behavior the community must carry out as well as implementing maggot cultivation practices and managing organic waste at the source in daily life) days), Output Indicator (increasing public knowledge and understanding about maggot cultivation, promotive and preventive, especially on several partner issues including being able to improve maggot cultivation conditions and environmental sanitation, as well as increasing community access to maggot cultivation facilities and infrastructure). Each output target consists of 1 Community Health Center, 2 Villages, 76 Heads of Families, 19 maggot cultivation activists, 19 RT Heads.

RESULTS AND DISCUSSION

After carrying out several community service activities, you will answer the objectives outlined previously, namely:

Education and Increasing KSM Knowledge about Maggot Cultivation

The level of education achieved by society will influence their mindset and knowledge. Generally, people with a high level of education will have more adequate knowledge than people with only low education. The mindset, knowledge and behavior of communities with a high level of education tend to be dynamic, while communities with a low level of education are usually less developed. This education also includes non-formal education in the community such as socialization/counseling and training. People who receive socialization/counseling about waste management will be more aware and behave well in protecting the surrounding environment compared to people who do not receive socialization/counseling at all.

Figure 1. Preparation and Meeting with KSM Managers at TPS 3R, Pandan Berseri Pudak Village, Kumpeh District, Muaro Jambi Regency..

Activities carried out in cultivating maggots and increasing education for Community Self-Help Groups (KSM) aim to cultivate maggots while reducing organic waste at the source and how to create or improve the community's economy by utilizing or cultivating maggots which will reduce the cost of fish and other livestock feed while preserving the environment. in Pudak Village, Kumpeh District, Muaro Jambi Regency by bringing together the community and KSM in order to increase knowledge and education about maggot cultivation which can be seen in the following activities:

Figure 2. Approach and Advocacy with Village Apparatus and KSM in Pudak Village, Kumpeh District, Muaro Jambi Regency in 2024.

Figure 3. Maggot Cultivation Education with KSM and Community Leaders in Pudak Village, Kumpeh District, Muaro Jambi Regency in 2024

Figure 4. Approach and Advocacy with the Housewife Community Empowerment Team in Pudak Village, Kumpeh District, Muaro Jambi Regency in 2024

Figure 5. Maggot Cultivation Education for Housewives in Pudak Village Kumpeh District, Muaro Jambi Regency in 2024

Maggot Cultivation Training for KSM

Maggots are actually the larvae of the Hermetia illucens fly. Hermetia flies are jet black, nicknamed black soldiers, and are found living in the wedelia ground cover plants. Wedelia trilobata is easy to find around residential areas. When hatched, the first instar larva measures about 2 mm, body length before molting is about 5 mm. Second instar larvae grow to about 10 mm before molting into third instar larvae. Third instar larvae grow to between 15 mm and 20 mm before wandering as prepupae. The front end is armed with a hooked mouth that is used for tearing. The rear end consists of a chamber, the anus and posterior spiracles are located. The spiracles are used for breathing and the posterior spiracles are used for eating and are able to eat 24 hours a day.

Figure 6. Maggot Cultivation Cycle

Figure 7. Maggot Cultivation Training with KSM and Housewives in Pudak Village, Kumpeh District, Muaro Jambi Regency in 2024

Kandungan Gizi Belatung

Maggots are rich in nutrients, the protein content of maggots reaches 40%. This level is higher than the protein value of artificial pellets, around 20-25%. Protein is important for fish survival, especially for growth and increasing the body's resistance to disease. Let's look at the amino acids contained in maggots through proximate analysis which are really needed by fish. The results of the maggot test as feed using rare ornamental fish from the waters of Jambi and West Kalimantan, Balantiochelius melanopterus fish weighing 1-2 g/fish showed satisfactory results. Feeding 70% shrimp pellets and 30% maggot for 12 weeks made balantiochelius fish grow 3 times larger than controls given 100% shrimp pellets. The survival rate of balantiochelius fish doubled to 90% from the previous 65% in the grow-out phase.

Catfish farmers in Kulonprogo, Yogyakarta, need 350 kg of pellets for 2 months to raise 4,000 catfish fry measuring 3-5 cm. That's with an FCR of around 1.1. Assuming the FCR value drops to 0.9 after the feed is mixed with 50% maggot, it can save 63 kg of feed. If converted to rupiah value with the benchmark price for 30 kg of pellets ranging from IDR 190,000 - IDR 200,000, you can save IDR 380,000 - IDR 400,000.

Benefits of Maggots in the World of Fisheries

LRBIHAT research using the ornamental fish Chromobotia macracanthus showed similar results. The growth of one-month-old botia fish that were fed maggots increased twice compared to fish from rivers in Sumatra and Kalimantan that were fed bloodworms and earthworms. Other tests using consumption fish such as catfish Clarias gariepinus, tilapia Oreochromis niloticus, and snakehead Chana micropeltes showed the same effect. Tests carried out by the Sukabumi Freshwater Aquaculture Development Center (BBPBAT) team in January - December 2006 on catfish even showed a significant decrease in the FCR (feed conversion ratio) value. By using a mixture of 50% maggot in pellet feed, the FCR value fell to 1.16 from the previous 1.42. Here there is a difference in the FCR value of 0.26. This means that to produce one kilo of catfish you only need 1.16 kg of feed.

Meanwhile, in Kulonprogo Yogyakarta, catfish farmers need 350 kg of pellets for 2 months to raise 4,000 catfish fry measuring 3 - 5 cm with an FCR of around 1.1. Assuming the FCR value drops to 0.9 after the feed is mixed with 50% maggot, it can save 63 kg of feed. If converted to rupiah value based on the price per sack of 30 kg pellets ranging from Rp. 190,000-Rp. 200,000, you can save Rp. 380,000-Rp. 400,000.

Maggots as a Pellet Substitute

It turns out that maggots can replace pellets as an alternative feed for fish. Apart from its high nutritional content, these insect larvae are also environmentally friendly because they do not contain preservatives in their cultivation. So far, most fish farmers still rely on pellets as fish food. Apart from being easy to obtain and long lasting, the manufacturing process is also relatively easy. Therefore, cultivators can produce it themselves. Unfortunately, pellets contain preservatives and can damage the aquatic environment. Pellets that are not consumed by the fish will also leave residue. This makes the water cloudy and dirty.

Maggots come from fly eggs which undergo metamorphosis in the second phase after the egg phase and before the pupa phase which then turns into adult flies. The larvae live in rotting flesh. Sometimes it also nests in the wounds of living animals. Including humans. The results of the research show that maggots can be bred in certain media. One of them is tofu dregs. By adding salted fish, tofu dregs turned out to be quite effective as a breeding medium for maggots. Salted fish functions as an attractant for flies to lay eggs in the media which then become maggots. In the process, the addition of salted fish should not exceed half or 50 percent of the weight of the tofu dregs. Breeding is most effective if salted fish is added as much as 20 percent of the weight of tofu dregs. What if the tofu dregs are not mixed with salted fish or the tofu dregs are mixed with salted fish that exceeds 50 percent of tofu dregs, what happens is that it is useless because it cannot produce maggots. This means that this indicates that flies need the right ratio of tofu dregs and salted fish or rubbish with a certain composition.

Salted fish or trash fish serve as ready-to-use larval food. Its presence is also needed to attract flies to lay eggs on the media. However, the ratio of tofu dregs and salted fish did not affect the protein content of larvae. Why tofu dregs? One of the reasons is, apart from reducing environmental pollution, especially water, tofu dregs flour still contains nutrients. Namely, protein (23.55 percent), fat (5.54 percent), carbohydrates (26.92 percent), ash (17.03 percent), crude fiber (16.53 percent), and water (10.43 percent).

Making BSF Cages and Maggot Cultivation Stages

Before making a cage, we multiply maggots first, which can be done easily using palm kernel cake as a medium. Apart from using palm kernel meal, you can also use organic waste. It turns out that if the waste was just thrown away, if it is reprocessed it can be used into something useful. This should also be a motivation for the younger generation who are involved in fisheries and animal husbandry to continue working and discovering the latest innovations.

	
The process of obtaining Black Soldier Fly (BSF) larvae naturally is conditioned on fruit skin with the hope that the Black Soldier Fly (BSF) larvae will lay eggs on the wooden structure provided.	After obtaining the eggs and waiting for 12 days, the eggs will hatch into maggots.
	
Then the larvae are placed in a medium measuring 60 x 120 cm and given larval food from fruit dregs or tofu dregs and can also be made from coconut dregs and animals such as fish and chicken carcasses and they are odorless.	After 18 days they become adult maggots, a reproductive cycle occurs, then they are harvested, some are given to livestock and some are kept until they become pupae according to a continuous cycle rotation.

BSF Larva Food Waste Compost (Kasgot)	Black Soldier Fly Larvae (BSF) Breeding Cage as a Breeding, Mating and Hatching Place to Produce Maggot Eggs

Figure 8. Sequence of Maggot Breeding Cycle Process Up to Compost from Maggot Breeding Remains

CONCLUSIONS AND RECOMMENDATIONS

Based on the activities that have been carried out, the following conclusions and suggestions can be drawn: 1) Increasing KSM knowledge by simulating maggot cultivation to support the community economy in Pudak Village, Kumpeh Ulu District, Muaro Jambi Regency was carried out smoothly without any problems or obstacles; 2) Implementation of maggot cultivation training for KSM and Fish Farmers in Pudak Village, Kumpeh Ulu District, Muaro Jambi Regency with great enthusiasm from KSM; 3) Implementation of socialization on the making of BSF cages as a place for cultivating and breeding maggots in Pudak Village, Muaro Jambi Regency. There needs to be continuous coaching and mentoring so that it runs sustainably.

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