

## Community Partnership Program of Making Liquid Organic Fertilizer from Fish Waste in Pedungan Village, Denpasar

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### ABSTRACT

The concept of implementing Blue Economy is highly expected in this activity. The implementation of Zero Waste of Community Partnership Program conducted at Ni Wayan Sarimi's household industry turned waste into Liquid Organic Fertilizer. The purpose is to provide Liquid Organic Fertilizer Manufacturing Technology in managing tuna skin waste. The method began with partner's application to Service Team, doing examination and interview by the team to find out the partner's problems. The team conducted Counseling related to Liquid Organic Fertilizer Production, Packaging, and Marketing and did practicing three (3) times. The results include making Liquid Organic Fertilizer properly, having new products with good packaging to be sold, publishing activities on Electronic Media or Journals, and uploading activities videos on YouTube.

## INTRODUCTION

### Situation Analysis

Fish waste is often used as a term for the remaining material from the processing production of fishery products or catches that are not targeted by fishermen or the catches which are no longer suitable for consumption. If seen from the definition above, it seems that the fish waste is very unlikely to be reprocessed, whereas if the waste is kept fresh, it is still very possible to be processed into additional food ingredients, such as fish sauce, fish paste, and others. The waste can also be used as fish food and also the most recent production is as fertilizer. Based on Government Regulation no. 18/1999 Jo.PP 85/1999, waste is defined as residue or waste from a business and or human activity. In other words, waste is leftover goods from an activity that is no longer useful or has economic value (Anonymous, 1999).

The fish part, if it is processed or consumed directly, around 30-60 percent of the fish will remain which we then call waste. The remaining fish parts such as heads, tails, fins, innards, fish scales, and even the remains of fish blood have the opportunity to be reprocessed. One of the processing is to make a liquid organic fertilizer. Liquid organic fertilizer has the advantage of being easy to apply, requires not too much material, it is easily utilized by plants (Saragih Evi Warintan *dkk.* 2021), and can also grow plankton and increase nutritional efficiency in fish (Syafika Nurul *dkk.* 2022). Making liquid organic fertilizer also supports the creation of the Zero Waste Principle in fishery activities. The principle of zero waste in making liquid organic fertilizer really provides a solution in processing fish waste (Mulyadi, Y., Sudarno, & Sutrisno, E. 2013). Fish waste, which usually disturbs the surrounding environment by emitting an unpleasant smell, is treated by ermentation Technology. In general, fish waste contains many nutrients, namely N, P, and K and microelements which are the components of organic fertilizers (Nana Ariska1, *dkk.* 2021).

Organic fertilizers are fertilizers derived from dead plants, animal excrement, and/or animal parts, and/or other organic wastes that have gone through an engineering process, are in solid or liquid form, can be enriched with mineral and/or microbial materials, which are useful for increasing nutrient content, function as soil organic substances as well as improving the physical, chemical, and biological properties of the soil. Organic fertilizers are fertilizers produced from the decomposition of organic materials which can be accelerated by the help of microbes in controlled, warm, and humid conditions (Nurjanah N. *dkk.* 2019). Minister of Agriculture Requirements No.70/Permentan/SR.140/10/2011 concerning Organic Fertilizers, Biological Fertilizers, and Soil Improvers for Nitrogen values 3-6%, Phosphate (P<sub>2</sub>O<sub>5</sub>) 3-6%, Potassium 3-6%, and C-Organic at least 6% (Anonymous. 2011).

Processing organic materials into useful materials around us will speed up the process of changing the appearance of the product so that zero waste principle is immediately created, not accumulating around the cage or waste storage area which can contaminate the surrounding environment. The nature and characteristics of liquid organic fertilizer cannot be used as the main fertilizer in farming. Liquid organic fertilizer is an additional fertilizer, preferably rich in micro nutrients. To get the micronutrient content, it can be sorted from fertilizer raw materials (Suardani.S, dkk 2022a).

Pedungan Village, which is a village in Denpasar city, is close to the Benua Port and also close to the Tuna Processing Center (Exporter), which produces a lot of fish waste. One person named Mrs. Ni Wayan Sarimi used the fish waste, especially tuna skin, to make fish skin crackers. Together with five employees, the household industry managed by Mrs. Ni Wayan Sarini (hereinafter referred to as Partner) is able to process 300 kg of fish skin waste on a regular basis. From the business of making tuna skin crackers, there are still fluids left from washing the fish skin, scales, and fish blood, which can disturb the environment. With this community partnership program, a solution was given to the household industry to turn fish waste into liquid organic fertilizer. This liquid organic fertilizer production activity will be used as a side hustle that has the opportunity to increase the income. Partner really likes this solution because apart from the waste being handled, the partner can also get additional income. The purpose of this activity is to provide solutions to problems that have not been handled, to create new products, and to get more income.

### **Partner's Problems**

Based on the situation analysis above, several findings that have been identified as partner's problems can be formulated as follows:

1. Partner did not have the knowledge to handle fish waste.
2. Partner did not know about fish waste handling technology.
3. Partner did not know how to utilize and increase the economic value of fish waste.
4. Partner did not have knowledge about zero waste principle in her activities.
5. Partners did not have knowledge about liquid organic fertilizer marketing.
6. Based on the partner's problems above, the priorities agreed to be resolved during the implementation of the community partnership program is to conduct counseling related to handling fish waste, to provide counseling in increasing the economic value of fish waste, to provide training in the manufacture of liquid organic fertilizer from fish waste, to carry out packaging / bottling of liquid organic fertilizers produced as well as product labeling and product marketing.

## **IMPLEMENTATION AND METHODS**

### **Implementation Method**

The community service was held at the household industry owned by Mrs. Ni Wayan Sarimi located at Jalan Diponegoro Gg. Pantus Sari No.44, Pedungan Village, Denpasar City, South Denpasar, Denpasar City, Bali Province. The activity took place from April to December 2023. The activity was attended by six (6) participants, namely the owner and 5 employees.

### **Service Method**

In planning the community service, the methods used are as follows:

1. Interview and discussion methods to find out the problems faced by partners.  
Counseling methods through direct face-to-face so that partner gained knowledge in handling fish waste in order to increase the economic value of fish waste, to produce the liquid organic fertilizer from fish waste, as well as to know more about product bottling and labeling
2. Direct practice method by providing appropriate technology in handling waste, making liquid organic fertilizer from fish waste, and its bottling and labeling as well as product marketing

### **Procedure of the Activity**

To carry out the activity, the community partnership program was organized through:

1. Assessment to the partner's location in order to find out the situation of the partner's production place.
2. Conducting interviews, questions and answers regarding the problems faced by the partner so that the team can provide solutions to the problems faced by the partner appropriately.
3. Distributing modules and providing these following counseling:
  - a. Counseling on technology for handling fish waste and increasing its economic value
  - b. Counseling on making liquid organic fertilizer from fish waste
  - c. Counseling on product bottling and labeling.
  - d. Counseling on product marketing.

The implementation of counseling can be seen in the following pictures:



**Picture.1 The implementation of counseling.**

4. Conducting Training on Appropriate Technology for Making Liquid Organic Fertilizer from fish waste (held 3 times). Training activities can be seen in the following pictures.



**Picture.2 Training activities**

5. Carrying out the Bottling and Labeling. Bottling and Labeling activities can be seen in the following pictures.



**Picture.3 Bottling and Labeling**

6. Handing over assistance in the form of equipment and materials for production
7. Carrying out the periodic monitoring and assistance.

## RESULTS AND DISCUSSION

By providing training on a regular basis three times, it will provide a knowledge of appropriate technology in making liquid organic fertilizer from fish waste. To deal with the partner's problems above, the team leader proposed community partnership program which has competence in processing fish waste into fish sauce, processing fish waste into liquid organic fertilizer, processing fish waste into fish food. Besides, the activity also involves making a book entitled Standard Operating Procedures for Developing Competent Professional Human Resources in the Field of Integrated Agriculture (Suardani. S, dkk 2022b). A book with the title of Strategy for Developing Competent Professional Human Resources in the Field of Agriculture with Integrity Through Local Wisdom (Suardani. S, dkk 2022c). Those two books provide guidance on making Liquid Organic Fertilizer.

The Community Service Team provided innovation in handling waste in the form of fish blood, fish skin wash, fish scales, and small flakes obtained from fish skin into liquid organic fertilizer. The community service team also provided training on making liquid organic fertilizer from fish waste to the packaging stage. Training about fish waste handling, packaging, and labeling, as well as product marketing went really well. During the training and counseling, the partner followed it with discipline. The results of the training can be seen in the table below.

**Table.1 Achievements of PKM Activities**

No	Activities	Achievements
1	Providing knowledge of handling fish waste	Partner knew and understood about handling fish waste (70%)
2	Providing knowledge of how to increase the economic value of fish waste	Partner understood how to increase the economic value of fish waste (70%)
3	Providing knowledge of the production of liquid organic fertilizer from fish waste	Partner understood the production of liquid organic fertilizer from fish waste (75%)
5	Providing knowledge of product bottling and labeling.	Partner understood about product bottling and labeling (75 %)
6	Providing knowledge of product marketing.	Partner understood about product marketing (75 %)
7	Providing repeated training as well as appropriate technology in handling fish waste	Partner can handle fish waste (100 %)
8	Providing repeated training about appropriate technology in the production of liquid organic fertilizer from fish waste	Partner could produce liquid organic fertilizer from fish waste (100%)
9	Provide training to partner about product bottling and labeling	Partner was able to carry out product bottling and labeling properly (100%)

## CONCLUSIONS AND RECOMMENDATIONS

Community Partnership Program which was conducted in Pesanggaran Village with the partner named Mrs. Ni Wayan Sarimi and 5 employees can be said to be going well and can solve the problems faced by the partner. The Community Service Team provided solutions which are suitable and in accordance with the problems faced by the partner. Accordingly, the partner has been able to make Liquid Organic Fertilizer from fish waste and do the packaging. In this case, the partner must continue to be provided with assistance because the partner has considerable potential to be able to move forward with a new product, namely Liquid Organic Fertilizer from Fish Waste.

Partner must be accompanied, periodically given counseling and training so that the partner is able to carry out the production of the three products including Fish Skin Crackers, Fish Tendon Crackers, and Liquid Organic Fertilizer in terms of their Quality, Quantity, and having a wide market reach.

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