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# Utilization of Local Microorganisms (MOL) as Organic Fertilizer in Women's Farmer Group, Sanur Kauh Village, Denpasar

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**A B S T R A C T**

The partner in implementing this community service program (PKM) is the Farmer Grou located in Sanur Kauh Village, South Denpasar District, Denpasar. The group is cultivatin organic plants by utilizing organic waste such as dry leaves, household waste, *canang* residues (waste from Hindus Bali ritual events) , and cow and chicken manure. The grou does not yet know how to properly process organic waste to produce good organic fertilize During this time, the garbage is just piled up just like that, and let the decomposer proces takes place naturally. The group also does not know the proper composition of organic wast so as to produce a complete organic fertilizer containing NPK nutrients. The method tha will be carried out in the implementation of this training is by interviewing, face-to-fac methods, counseling and direct practice, Gradually the activity will be carried out: First, w will hold counseling on the use of local microorganisms as organic fertilizers. Second, w will provide direct training on the use of local microorganism (MOL), carried out severa evaluations The third time, if the PKM activity will end we will motivate farmers so that i growing vegetables such as lettuce, kale, green vegetables and long beans by applying th use of MOL as organic fertilizer. From this activity, the external target to be achieved is tha training participants understand how to use MOL as organic fertilizer to get healthy organi vegetables. The women's farmer group was able to make MOL which was used as physically quality liquid organic fertilizer. Partners by 70% understand and can apply liqui organic fertilizer from household waste. Partners were able to reduce production costs b 25%, partners were able to reduce organic waste that causes environmental pollution by 80% and partners were able to increase crop production by 25% thereby increasing group profit

## 1. INTRODUCTION

### *1.1. Research Background*

The "*O yess"* women's farmer group is a group located in Sanur Kauh Village, Denpasar. The group of 12 members was established in June 2021 and manages an area of 40 acres. Currently, the group is cultivating vegetables such as lettuce, green vegetables, long beans, kale, spinach, eggplant, and corn. The group is currently cultivating organic plants by utilizing organic waste such as dry leaves, household waste, *canang* residues, and cow and chicken manure.

Waste has indeed become something that has two sides for us, namely good and bad. But of the two sides, it is the bad side of the garbage that is the most dominant. The biggest source of waste is from daily human activities. The good side of the waste we usually get it after the waste is reprocessed. A vivid example is a fertilizer from organic waste. Law No. 18 of 2008 provides a reference on "Waste Management". An effective way to reduce the amount of waste heaped from the source is to reuse organic waste into organic fertilizer (compost) [1].

Local Microorganisms (MOL) are fermented solutions based on various locally available resources. MOL solutions contain micro and macronutrients and also contain bacteria that have the potential to spear organic matter, stimulate growth, and as a controlling agent for pests and plant diseases so that MOL can be used both as a decomposer, biofertilizer, and an organic pesticide, especially as a fungicide [2][3][4]. MOL solution is made very simple, namely by utilizing waste from households or plants around the environment, for example, plant residues such as banana weevils, pineapple fruit, rice straw, vegetable residues, stale rice, and others [5].

The group does not yet know how to properly process organic waste to produce good organic fertilizer. During this time, the garbage is just piled up just like that, and let the decomposer

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process takes place naturally. The process of composting organic waste naturally requires a long time to be used as compost. In addition, the group also does not know the right composition of organic waste to produce a complete organic fertilizer containing NPK nutrients.

The use of MOL as an organic fertilizer is very easy to apply in the community and the necessary materials are also easy to obtain so that the "*O Yess*" Women's Farmer Group can practice directly. Amalia [6] states how to make MOL is easy, everything around us can be used, and all ingredients are mixed with glucose-containing solutions such as juice, sugar water, or coconut water. Then covered with paper, and left for up to 7 days. After that, it is used for spraying into the fields. According to Ref. [7], in detail the main ingredients in MOL consist of 3 types of components including Carbohydrates: rice washing water, used rice (stale), cassava, potatoes, and wheat. The most frequently used is rice washing water.

Figure 1. Interviews with partners

Figure 2. The condition of the land managed by the Partner

## 2. MATERIALS AND METHODS

### *2.1. Implementation Methods*

The method of implementing PKM activities The application of the use of MOL in the planned vegetable planting is to use:

1. Interview and discussion methods to be able to find out the problems experienced by partners
2. Face-to-face method and providing direct counseling, so that partners gain knowledge about how to make MOL and can apply it directly in vegetable growing.
3. Hands-on practice is guided by instructors who are competent in their fields so that partners can directly apply the given methods.

### *2.2. Activity Plans and Procedures*

Plans and Procedures for PKM Activities implemented are:

1. The approach to the group, the selection of places as well as selecting participants, who will subsequently be referred to as trainees.
2. Interview and Ask answers about Problems the one faced friend at once Plan Activities that show step- step solutions above Issues that Faced.
3. Partners will first be given material that has been prepared by the team in the form of modules on how to make some MOLs and their application in vegetable growing.
4. Direct application to farmers starts from counseling and hands-on practice. Here is how to make MOL and its application as an organic fertilizer.
   1. Crush/chop/blender the available fruits and then strain.
   2. Put brown sugar/molasses
   3. Mix with coconut water
   4. Put all the ingredients in the jerry can, close tightly give the upper air hole, and insert the hose that is hollowed out with a bottle that has been filled with water, the end of the plastic hose should be submerged in water.
   5. Ferment for ±14 days.

### *2.3. How to Make Stale Rice MOL*

1. Put stale rice in a bottle
2. In a separate place dissolve sugar and water. Sugar serves as food for microorganisms in stale rice
3. Pour water into stale rice. Try to keep room for air in the bottle
4. Close the bottle tightly and store it in a place not exposed to sunlight
5. After 2 days slightly open the bottle cap so that the air in it comes out. Regroup and beat until the rice and water mix into a solution. Then loosen the bottle cap and store the solution again.
6. On the seventh day, how to make liquid organic fertilizer has been completed and the STALE rice POC can be harvested. Strain the solution and store it on the bottle and loosen the lid a little.

### *2.4. Concentration and how to use*

1. For the culprit of compost: mix 5 l of water every 1 liter of MOL. Add 1 ounce of sugar and then spray it onto the mixture of organic matter such as manure, dry leaves, and waste from *canang* (waste from Hindu Bali ritual event), then close tightly.
2. For fertilizer: dilute with water 15 liters per 1 liter of MOL. Spray onto plants morning or evening

5.

6. If the activity implementation period will end, several examples of several MOLs and tools will be submitted to support the business.

### *2.5. Partner Participation*

A total of 8 group members were trained to make liquid organic fertilizer from household waste and apply it directly to plants that are being cultivated. Participants were very enthusiastic about participating in the training. Partners have replaced the use of chemical fertilizers with liquid organic fertilizers that have been produced in-house.


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## 3. RESULTS AND DISCUSSION

### *3.1. Implementation of Activities*

Community service activities begin with counseling in the form of providing material on how to make MOL and applying it directly in growing vegetables as liquid organic fertilizer.

Figure 2. Providing Materials for making MOL

The activity continued with the direct practice of making MOL from household waste. All the ingredients used in the manufacture of liquid organic fertilizer are materials from household waste and agricultural waste such as vegetable residues, fruit peels, rice washing water, meat washing, stale rice, and coconut water.

Figure 3. Participants practice making MOL from household waste

MOL that has been fermented for 10-14 days is applied to vegetable crops. Service participants are also trained in the application of MOL as an organic liquid fertilizer. Liquid organic fertilizers are applied by diluting liquid organic fertilizers in a ratio of 1:10. Furthermore, liquid organic fertilizers can be directly applied by watering plants on leaves and roots according to the dosage.

Figure 4. Participants applied MOL as a liquid organic fertilizer to vegetable crops

### *3.2. Economic Impact*

The community partnership program implemented in the *O Yess* women's farmer group provides benefits to partner groups, especially that partners can already produce MOL from household waste and be used as environmentally friendly liquid organic fertilizer independently to the packaging stage, with such progress, expenditure on the production process of vegetables can be minimized, in the future it is expected to be able to produce more so that it can be marketed to the wider community. Based on the results of activities as many as 75% understand and can apply liquid organic fertilizer from household waste. Mitra was able to reduce production costs by 25%, partners were able to reduce organic waste that causes environmental pollution by 80%, and partners were able to increase crop production by 25% thereby increasing group profits.

Figure 5. Participants harvest vegetables fertilized with an organic liquid fertilizer from household waste

Figure 6. Organic Liquid Fertilizer made by the Women Farmer Group

## 4. CONCLUSION

From the community partnership program that we carried out, it can be concluded that the **"***O Yess***"** women's farmer group can make MOL which is used as a physically quality liquid organic fertilizer. Partners by 70% understand and can apply liquid organic fertilizer from household waste. Partners were able to reduce production costs by 25%, partners were able to reduce organic waste that causes environmental pollution by 80%, and partners were able to increase crop production by 25% thereby increasing group profits.

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