

## **Socialize the Biopore Modification and Utilization as a Composting Media and Disaster Mitigation Efforts in Blawi Village, Karangbinangun, Lamongan**

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### **Abstract**

Blawi is a village where geographically located near the Bengawan Solo River crosses Lamongan Regency. During the wet season, Blawi Village often experiences flooding, however the contrary during the dry season it often experiences drought. Thus, with the background of these problems, it is necessary to carry out outreach the "Socialization and Utilization of Biopori with modification of Giving Effective Microorganism 4 (EM4)" to overcome the society problems in Blawi. This activity was held on Saturday, July 23, 2022 at 18.00 WIB until it is finished at the Blawi Village Hall, Karangbinangun District, Lamongan Regency. The event started with the opening, counseling, focus group discussion and question and answer sessions, until the closing. The participants of this activity were Blawi residents along with Karangtaruna and women society called PKK who enthusiastically participated in this activity. The counseling activity went smoothly and was well implemented, and it is hoped that similar activities can be carried out in the future so that collaboration between the academic community of the Faculty of Health Sciences, Universitas Islam Lamongan and the Blawi Village Government.

**Keywords** : Community Service, Biopore, EM4, Blawi Lamongan

### **INTRODUCTION**

Blawi Village is geographically located in the Karangbinangun District, Lamongan Regency, East Java Province, Indonesia. The area of Blawi Village is 377 hectares, consisting of 19 hectares of yard area, 297 hectares of pond rice fields, 26 hectares of village area, and 35 hectares of others. Geographically, Blawi Village is located between 7°23'6 south latitude and between 112°33'12, east longitude with boundaries in the west with Ketapang Telu and Palangan villages, in the north with Banjarejo and Putatbangah, in the east with Baranggalayam, in the south with Banjarejo and Putatbangah. Blawi River/Bengawan Jero. Blawi village is a lowland area with an altitude of 1.50 above sea level. Blawi village is a fertile area because between the rainy and dry seasons there is almost no difference. While the land can be planted with anything, for example, rice fields or ponds can be planted with corn, bananas, mangoes, chilies, and the like. The residents of Blawi Village who generally make a living as pond farmers and rice farmers. Blawi village consists of 6 RW, 16 RT, 537 houses. According to the 2020 population in Blawi Village, there are 3,776 residents with a male-gender ratio of 1,933 and a population of 1,324 women (Badan Pusat Statistik Kabupaten Lamongan, 2021).

Blawi village is an area where the majority of the land is used as aquaculture. Although there are many infiltration lands in the Blawi Village area, Blawi Village is a village located in the lowlands which is an area prone to flooding. Quoted from Media Indonesia news conveyed by Afandi said "that the flooding in the Blawi Village area was caused by the flow of water from the Deket River entering the Bengawan Jero area rising". Even though during the rainy season Blawi Village floods, it is inversely proportional to during the dry season, which is felt by the community to experience drought and difficulty in getting water supplies for daily life. The increasing number of residents

causes a lot of land use change from rice fields to housing which results in the lack of water absorption. According to (Ward et al., 2020) states that the surface of the soil that is compacted due to the process of soil compaction due to development, causes a reduction in the pores in the soil, causing a decrease in the absorption of water into the soil, as a result during the rainy season water cannot be infiltrated into the ground. People's behaviour in throwing garbage into rivers and into waterways can also cause clogging of waterways and potentially cause flooding.

Several technologies for infiltrating water into the ground can be used, such as infiltration trench, infiltration basin, and French drain, which may be familiar to the public. However, the impregnation technology has not been implemented optimally and widely due to several reasons, including the need for a relatively large area, a relatively long time, and high costs (Alslaibi et al., 2013).

Biopores are holes created with the help of living things or microorganisms (Loso et al., 2020). Biopori is a simple technology, effective, environmentally friendly, and easy to make. This technology was invented by Kamir R. Brata and is one of the solutions in flood prevention. Biopori in the form of making cylindrical holes with a diameter of 10 cm and a depth of 100 cm (Nurzal, 2019). In addition to functioning as a water absorption hole, biopori can also be used to decompose organic waste so as not to cause odor by placing it at the depth of the biopore hole so as to minimize the negative impact of organic waste on humans and the environment. The effectiveness of the biopore hole infiltration rate depends on several factors such as the biopore hole model made. The type of organic waste that is included can also affect the rate of composting (Palaniveloo et al., 2020). Modification of the addition of Effective of Microorganisms (EM4) in the biopore hole can also be done to provide nutrients so that microorganisms create holes in the biopore infiltration hole. Use of Microorganisms such as EM4 is a starter material for building agriculture by utilizing spoilage microorganisms that are beneficial for soil fertility, by composting manure using EM4, which is in accordance with the right dose or use based on the instructions for use (Hendriani et al., 2017).

In supporting the flood and drought prevention program in Blawi Village, it is necessary to socialize the manufacture of biopori and modification of the addition of EM4 to residents of Blawi Village, Karangbinangun District.

According to (Haas & Horn, 2018), biopores are small holes in the soil that are formed due to the activities of organisms in the soil such as worms or the movement of roots in the soil. The biopore infiltration hole will be filled with air and become a path for water to flow. So the rainwater does not go directly into the sewer, but seeps into the soil through the biopore hole and will be stuck in the hole, because it contains organic matter in it.

Based on the Regulation of the PermenLHK Number 12 of 2009 concerning the Utilization of Rainwater, Biopore Infiltration Hole is a hole made vertically into the ground, with a diameter between 10-25 cm and a depth of about 100 cm or not exceeding the depth of the ground water table. .

In the PermenLHK Number 70 of 2008 concerning Technical Guidelines for Forest and Land Rehabilitation, LRB is an effective and environmentally friendly technology in dealing with floods by increasing water absorption, converting organic waste into composting media and reducing greenhouse gas emissions (CO<sub>2</sub> and methane). ), as well as utilizing living things that are in the soil and plant roots and can overcome problems caused by stagnant water such as dengue fever and malaria.

According to (Anggraeni et al., 2013), there are several benefits of making biopore infiltration holes as follows:

- Improving Soil Ecosystem.  
LRB will help the hydrological function of the soil as a catchment for falling rainwater, LRB will be a suitable habitat for soil organisms due to the availability of organic matter, water, oxygen and nutrients.
- Preventing Floods and Overcoming Drought  
LRB helps increase water infiltration into the soil because biopori can absorb rainwater faster and more so that it increases water absorption into the soil. Thus LRB is expected to increase

the absorption of water by the soil, it will be able to prevent flooding in the rainy season and overcome drought in the dry season.

- LRB Turns Organic Waste Into Compost

LRB is made by digging a vertical hole into the ground with a diameter of about 10 cm with a depth of about 100 cm or not exceeding the depth of the ground water surface. This size is highly recommended for efficient use of the increasingly limited horizontal space, but it can also reduce the composting load.

The composting process is the process of changing organic materials through biological decomposition, especially by microbes that utilize organic materials as an energy source (Jurado et al., 2015). Thus, organic waste is very useful as raw material for making compost and food for soil biota.

## METHOD

The community service activity to socialize the use of biopore modification as a composting medium as well as flood and drought control in Blawi Lamongan Village was carried out on Saturday, July 23, 2022 at the Blawi Village Hall, Karangbinangun District, Lamongan Regency. Activities carried out include counseling related to the explanation of biopori and its benefits, as well as modification of biopori as an effort to overcome floods and droughts. Socialization activities regarding the introduction of biopori and manufacture to the Blawi Village community are carried out through the following stages:

Preparation of activities include:

- The survey activity for community service is at the Blawi Village Hall, Karangbinangun District, Lamongan Regency.
- Application for permission for community service activities to the Blawi Village Head
- Administration (correspondence)
- Preparation of tools and materials as well as accommodation
- Preparation of places for counseling, namely tables, chairs, biopori tools and materials, EM4, along with door prizes for participants.

Extension activities include:

- Opening and introduction to the community of Blawi Village, Karangbinangun District, Lamongan Regency which is the target of the activity.
- Counseling on the explanation of biopori, benefits of biopori, making of biopori, and modification of biopore with the addition of EM4.
- Discussion/Question and Answer sessions with extension participants.

Closing

- Giving door prizes for participants who are able to answer questions
- Group photo with counseling participants
- Say goodbye to the village community and the village head of Blawi
- Making reports on community service activities

The activity "Socialization on the Utilization of Biopori Modification as a Composting Media and Flood and Drought Management in Blawi Lamongan Village" was aimed at the Blawi Village community. There were 47 participants who were involved in this socialization event.

The outputs obtained from this community service activity include:

- The people of Blawi Village are given counseling and socialization of making biopori and EM4
- From the results of the counseling, the village community understood the contents of the material and at the end of the session was given a question and answer time. Several questions were received from farmers including:
- How to include organic waste material in the biopori?

- Is there a special size in the manufacture of biopori?
- How many doses of EM4 are used as compost booster in biopore holes?
- To evaluate the level of understanding of the village community towards the content of the extension material, several questions related to the content of the extension material are given and the village community is welcome to answer. The people of Blawi Village who managed to answer the questions correctly were given door prizes as a sign of appreciation.

While the outcomes obtained include:

- With the community service program in the form of counseling about the manufacture and use of biopori in flood and drought mitigation, it is hoped that it can increase the knowledge of the village community regarding explanations of biopori, the benefits of biopori, making biopori, and modification of biopori with the addition of EM4. In addition, it is expected to be an effort to overcome floods and droughts, especially in Blawi Village, Lamongan Regency.
- Furthermore, it is hoped that similar activities can have an impact on efforts to reduce organic waste and minimize odors caused by organic waste by making it a composting media material for biopori in Blawi Lamongan Village.
- Lamongan Islamic University, especially the Faculty of Health Sciences is increasingly recognized as an institution that has concern for community problems, especially the younger generation.

**Table 1.** Schedule of Community Service Activities

No	Activity	1 <sup>st</sup> Month				2 <sup>nd</sup> Month			
		(July 2022)				(August 2022)			
		1	2	3	4	1	2	3	4
1	Problem observation	■							
2	Interview with the Village Head		■						
3	Preparation of the concept of material that is socialized Permission Application			■					
4	Preparation of teaching tools and materials			■					
5	Preparation of the counseling site			■					
6	Implementation of activities			■					
5	Article writing and journal submission process as outputs of PkM kegiatan activities				■				
6	Reporting					■	■	■	■
7	Problem observation								■

## RESULTS

The activity "Socialization of the Utilization of Biopore Modification as a Composting Media and Flood and Drought Management in Blawi Lamongan Village" generally went smoothly. The village

head of Blawi prepares the place and coordinates the village community as the counseling participants. The counseling participants were residents of Blawi Village, Karangbinangun District. The place used in this activity is located at the Blawi Village Hall. Before doing the counseling, the emer introduced himself first and then tried to explore basic knowledge about Biopori. The presenter asked several questions related to general knowledge about biopori, the benefits of biopori, making biopori, and modification of biopore with the addition of EM4. After exploring the basic knowledge, the presenters began to demonstrate related to the manufacture of biopori and EM4 from beginning to end. During the counseling activities, the participants seemed enthusiastic and paid attention to the contents of the counseling.



**Figure 1.** Dissemination Activities of Biopori Utilization and Modification

The socialization activity and material delivery lasted approximately 90 minutes and at the end of the session the presenters gave the opportunity for participants to ask questions related to the material that had been presented. There were 3 questions from the counseling participants related to the content of the material. After answering questions from the participants, the presenters evaluate the provision of material that has been presented by asking questions and providing opportunities for farmers to answer these questions. Participants who are able to answer the questions will get a door prize as a sign of appreciation. After that, the extension activity was closed with a photo session between the speaker and the farmers participating in the extension. The obstacles encountered during the counseling process were counseling was carried out at night because the majority of the community could participate in activities at night.



**Figure 2.** Biopore Hole Making

On August 12, 2022, the practice of making biopore holes in the yards of residents around Blawi Village. The residents were very enthusiastic about participating in this activity. Before making biopore holes, residents were educated to be able to make EM4 independently. Then EM4 is dissolved with 500 mL of water and mixed with organic waste which is inserted into the biopori pipe.

### **CONCLUSION AND RECOMMENDATION**

The outreach activity "Socialization on the Utilization of Biopori Modifications as Composting Media and Flood and Drought Management in Blawi Lamongan Village" was carried out well, even the participants seemed enthusiastic and hoped that the socialization activities could continue with the provision of other materials, especially related to the manufacture and use of biopori and EM4 in flood prevention. and drought.

- Similar activities should be carried out continuously to increase public knowledge regarding the efforts that can be taken to reduce the risk of flooding.
- Further cooperation is held for monitoring or assisted villages in utilizing biopori as composting media and efforts to overcome floods and droughts in Blawi Village.

The obstacles encountered during the activity process were the difficulty of gathering counseling participants due to the clash of individual community schedules. In addition, counseling is carried out at night where the enthusiasm of the community decreases slightly in listening to the material presented.

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