

## **WASTE UTILIZATION TO IMPROVE FAMILY WELFARE**

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### **ABSTRACT**

After the closure of the Piyungan final waste disposal site (TPA), the people of Yogyakarta city are currently having difficulty disposing of their household waste. This is also experienced by the PKK RT 1, RW 21 group, Klitren Village, Gondokusuman District, Yogyakarta City, DIY. To overcome this problem, the group members consisting of 16 mothers must start managing and processing the household waste produced. Community service in the PKK RT 1 group aims to provide awareness of the importance and benefits of processing household waste. The community service method used is Action research and mentoring. The community service was carried out for 6 months, from April to September 2024. The results of the community service showed an awareness of managing household waste. This can be seen from the discipline of group members in utilizing the biopores they already have and processing cooking oil waste into soap. The soap produced can reduce family expenses that have been used to buy soap. As a result of the discipline in utilizing biopores, each group member gets organic fertilizer that can be used to fertilize vegetable plants and ornamental plants in their homes. Another result obtained is that the environment remains clean and the remaining waste that must be disposed of because it cannot be processed is only very little. This means that group members do not need to join the queue to dispose of waste at the TPS provided by the government, and there are savings in expenses because they do not need to subscribe to dispose of waste. Thus, group members can have more time for their productive activities.

**Keywords:** Biopores, Family Welfare, Organic Fertilizer.

### **INTRODUCTION**

PKK RT 1, RW 21, Klitren Village, Gondokusuman Sub-district, Yogyakarta City is a women's group consisting of 16 RT women. The location of the PKK group is in the city and in one of Yogyakarta's bustling centers. The location is behind Solo Street and in front of the campus of Duta Wacana Christian University (UKDW). Because of the location of the village in the middle of the city, the distance between houses is only limited by the village road which is about 1 meter wide. Almost all houses do not have a yard, and if they have a terrace, it is very narrow. In the RT 1 area, there is no open space for children to play, nor for community activities.

Because RT 1 is close to the city center and several universities, some residents open their houses for student boarding businesses (simple). In addition to boarding houses, some residents also sell food with the target market being boarding students who live around RT 1. The conditions and professions of RT 1 PKK women are shown in the table below:

**Table 1. Profession of PKK Members in RT. 1**

No	Type of Profession	Total
1	Food Vendor	5
2	Washing and Ironing Services	1
3	Grocery store	1
4	Fried food vendor	2
5	Employee	4
6	Snack maker and seller	3
TOTAL		16

Source: primary data processed

Table 1 shows that most of the group members are food vendors, but some are employees. All PKK RT 1 members are housewives (both as employees and as entrepreneurs), who make food for the family every day (cooking themselves), so each family will generate family waste. Family waste is mostly kitchen waste, in the form of leftover cooking ingredients (vegetables), used cooking oil, wrappers and others. The waste is divided into organic waste and unorganic waste.

So far, the women of PKK RT 1 (group) have been collecting garbage in special bins and then someone will pick up the garbage every day. Each family paid Rp50,000 per month for the garbage subscription. However, the garbage subscription fee has now increased to Rp100,000 per month. The increase in the garbage subscription is quite burdensome for group members.

Household garbage is still piled up in the garbage bins once a week and then picked up by the garbage man, causing a bad smell and the accumulation of garbage makes the environment uncomfortable. This has caused unrest among RT 1 residents, especially mothers who are usually responsible for the cleanliness of the environment. The problem of waste disposal arose after a government regulation on the closure of the waste disposal site (TPA) in the Piyungan area of Yogyakarta.

Starting May 1, 2024, the waste landfill in Piyungan, Yogyakarta is officially closed by the government. This is implemented with the legal basis of the DIY Governor's Letter Number. 658/11898 dated October 19, 2023, regarding the official closure of the Piyungan landfill. The closure of this landfill affected the community, making it difficult for people to dispose of their waste. This has resulted in making the city of Yogyakarta dirty, because garbage is piled up in many places. People are confused about disposing of their waste because many people are not ready for this government policy. So far, the community has relied heavily on those who transport household waste to the temporary waste disposal site (TPS), which will later be picked up by the government to be disposed of at the TPS. Because the landfill is closed, the disposal of waste at the TPS is also limited.

The difficulty of garbage disposal makes family garbage piled up and creates an unpleasant smell. It also makes the home environment look dirty and invites flies. According to the group, this situation needs to be addressed immediately so that it does not cause disease and the home environment can be clean, comfortable and beautiful again.

The government has been trying to prepare people to be responsible for the waste generated by households. Through the zero organic waste movement program stated in the Circular Letter (SE) of the Mayor of Yogyakarta Number 660/6123/SE/2022 concerning the Zero Organic Waste Movement, the government urges people to process organic waste from households. The government not only urges, but also provides understanding through PKK meetings at the village and sub-district levels. In addition to understanding, the government also provides training on how to process organic waste and provides processing facilities. The facilities provided for each family include providing 3 biopore holes per family to process their organic waste. The biopores that have been given and installed, it turns out, are also less functional. Not all people want to use the biopore holes they already have, for reasons that are complicated and afraid of odors.

The problem arises because there is no awareness from the community to sort between organic and unorganic waste. So, it is still necessary to understand the importance of sorting between organic and unorganic waste. In addition to the importance of waste segregation, the community also needs to be given understanding and skills to utilize waste to produce more useful products. The skills to manage and process waste can improve the welfare of the community, still need to continue to be understood by the community.

## METHOD

Community service is carried out using the action research (AR) method. Action research applied research methods are often used in social research. The use of the Action research method was chosen because in this method actions are taken that will produce changes in society (Dadds, 2008).

The implementation of action research will run smoothly if there is active participation from the object of research, in this case the PKK RT 1 group. Researchers and objects will collaborate and work together starting from finding the problems faced, the process and methods of solving problems and the time of implementation, all done as a joint decision. Therefore, through this action research method, the object does not feel as an object, but as a subject. Thus, it is expected that awareness will arise and implementation will run smoothly.

In this action research, the participation of the object together with the researcher is required. This participation cannot be done only once. Usually, it must be done repeatedly until it gets results that can be concluded. The researcher participates in the object, blends and becomes part of the object and works together with the object of research.

In the service using the AR method, the service provider is directly involved together with the service partner group from the initial process (finding problems), planning the action activities to be carried out, carrying out the planned activities and evaluating the implementation of the activities. Thus pengabdian is directly involved in this service.

The steps of action research (Hasan, 2009):

1. Diagnosis,
2. Action planning,
3. Action taking,
4. Evaluation.

The steps of the activity can be described as shown in figure 1 below:



**Figure 1.**  
**Action Research (AR) Implementation Process**

In Figure 1, it appears that the first step is to carry out a diagnosis to find the problems faced by the service partners. After the problem is known, action planning is carried out to solve the existing problems. Action planning that has been compiled is made an implementation schedule and detailed activity planning. This action planning will be a guideline for both service providers and service partners in solving problems. Based on this planning, action activities are carried out. After completing the action activities, an evaluation will be carried out to assess whether the activities are carried out in accordance

with the plan and get feedback for each activity carried out. Evaluation is also used to assess whether the goal of solving existing problems has been achieved or not.

The implementation of Action Research is carried out with discussions in groups. Between service providers and service partners sit equally in the group discussion. It is expected that all decisions taken through discussion will be effectively implemented. This is possible because each group member will feel that the results of the decision are their decisions too, so they will be more responsible and happy to carry it out (Adison, J., & Suryadi, 2021).

The implementation of activities is carried out with assistance. Pengabdian accompanied every activity carried out and recorded the process and results of each activity. Because of the assistance, the servant participates in every activity, participates in carrying out activities and provides examples of how to carry out the activity process. Assistance was chosen with the hope that the process of implementing the service can run better and smoothly (Dahlia et al., 2017).

## RESULTS

This service is expected to have an impact on service partners as shown in table 2 below:

**Table 2. Service Outcome**

No	Before	Changes	Measure of Change
1	There is no understanding of the importance of sorting waste	There is an understanding of the importance of sorting waste	Doing waste segregation with no compulsion
2	There is no awareness of sorting household waste.	There is awareness of sorting household waste (there is a change in waste management behavior)	Doing household waste segregation
3	Not yet orderly in utilizing biopores	More orderly utilization of biopores	No longer throwing organic waste into the trash can, but putting it into biopori holes
4	There is no understanding of the dangers of used cooking oil waste when disposed of carelessly	No more littering of used cooking oil waste	Collecting used cooking oil to sell, thus increasing family income

The main service outcome is to provide an understanding of managing waste and after the service partners have a correct understanding, it will then change the behavior of the service partners (Lisa & Yulastini, 2024; Purnama et al., 2022). The behavior that is expected to change is behavior in managing household waste. To strengthen service partners willing to change behavior in managing waste, information is also given on how to manage used cooking oil waste which can increase family income. Thus, indirectly, an increase in the household economy can be obtained through processing used cooking oil and organic fertilizer from organic waste management. In addition, understanding the benefits of biopores is expected to encourage service partners to be more interested in changing their behavior in managing waste (Mukhlisin, 2017).

## DISCUSSION

In accordance with the service method used, namely Action Research, this service was first carried out by holding a meeting with the PKK RT 1 group. The meeting was held when the group held a routine monthly meeting every 9th. In the first meeting, an explanation of the purpose of the meeting and cooperation with the PKK group was discussed as well as a discussion on identifying the problems faced by the group. The identification of problems was done by means of discussion, because this discussion method will provide an opportunity for all members to express their opinions. The discussion method is also quite effective in capturing the aspirations of all members participating in the discussion (Tentrem Budihartini, 2022). In the discussion, there were many complaints from group members about the impact of the closure of the Piyungan landfill by the government. Some of the things conveyed by group members include:



1. The garbage fee (for household garbage collection) increased by 100%, from Rp50,000 per month to Rp100,000 per month. This was felt to be very burdensome, as their income did not increase, but there was an increase in routine monthly expenses. In addition, the garbage retribution collected by the kelurahan has also increased slightly.
2. Garbage was previously collected every day, but now only once a week. This has resulted in a lot of accumulation of garbage in front of houses. The accumulation of garbage for up to a week causes a bad odor and many flies come around the garbage. Group members are afraid that the flies will cause a disease outbreak for the family.
3. The government has provided rocks for biopore holes, but they have not utilized them because it is complicated to separate organic and non-organic waste, so biopores have not been utilized.
4. There is no separation of organic and non-organic waste, the reason is that it is complicated, takes time and energy and requires additional trash bins.
5. Do not know how to separate waste efficiently and effectively.
6. Do not know the benefits of separating waste.
7. The benefits of putting organic and non-organic waste into biopore holes are unclear.
8. Some group members did not understand the types of organic and non-organic waste.
9. Every member of the group (as all are housewives), produces used cooking oil waste every day.
10. The used cooking oil waste has been disposed of in the dishwashing water stream. The disposal of bathroom and washing water (family wastewater), so far all flowed into the culvert that empties into the river near the village.
11. Group members are not aware of the dangers of disposing of used cooking oil waste in the river. They do not know that used cooking oil can cause animals (especially fish and other aquatic biota) to die due to the contamination of used cooking oil waste.
12. Group members do not know if used cooking oil waste can be sold (to generate income).

From the results of the discussion to obtain a diagnosis of problems, 12 problems emerged as mentioned above. The 12 problems were then filtered by group members based on priority of importance and those that must be resolved in the short term, so the group selected the problems:

1. Waste segregation
2. Utilization of biopore holes
3. Used cooking oil waste management.

After obtaining the agreement of group members to solve the problem of waste is sorting waste, utilizing biopore holes that have been owned and utilizing used cooking oil waste, the next step is to develop an action plan.

An action plan was developed together with group members at the next meeting. The action plans that have been developed are:

1. Learn the importance and benefits of family waste segregation.
2. Learn the benefits of biopores for families.
3. Learn the dangers and management of used cooking oil waste.

The action plan schedules the time for learning the importance and benefits of sorting waste and the benefits of biopores for families to be done at the next month's regular meeting. Meanwhile, learning the dangers and management of used cooking oil waste will be conducted in the following month again.

The third stage is action to carry out the plan that has been set. The action activities carried out also support the government regulations contained in the Circular Letter issued by the government through the environmental agency SE No. 100.3.4/476 concerning the Implementation of Waste Management in Community / Business Activities in Yogyakarta. The circular letter states that:

1. Waste sorting from the location of community/business activities according to the type of waste, namely organic waste, inorganic waste, organic residue and inorganic residue.
2. Organic waste processing is carried out independently using various methods such as biopores, losida, composter and / or channeling to organic processing partners.

Waste segregation has become a regulation set by the government, so all community members are obliged to sort household waste. The community cannot avoid sorting, because this has become a government decree. Apart from being a government regulation, sorting waste according to its types can also provide benefits. If waste is not sorted, it can cause (Yuwana & Adlan, 2021):

1. Environmental health is declining,

2. Various diseases caused by landfill
3. Flooding
4. Organic content needed for fertility of agricultural land decreases
5. Increased global warming

Given the dangers posed by the absence of proper handling of waste and the government's SE on waste segregation, it is necessary to start from now on to sort waste. Through the provision of understanding about waste segregation, it is hoped that group members will understand and be motivated to sort waste. Waste segregation is only divided into two, namely organic waste and unorganic waste.

The material delivered was not only about waste segregation but also about biopores. Biopori is one of the government programs given to all families in the city of Yogyakarta. Each family gets three biopore holes for free and has been installed by officers. The existing biopores have been left empty and have not been utilized by the community. One of the reasons is that people do not understand the function and benefits of biopores. In providing understanding, it is discussed that the benefits of biopores include (Baguna et al., 2021):

1. To prevent flooding. Given that RT 21 is not far from the river, it is not uncommon for residents to throw garbage in the river, especially when it is difficult to find a place to throw garbage. The river usually floods during the rainy season when it rains heavily for two consecutive days, let alone to dispose of garbage, which will definitely accelerate the arrival of flooding during the rainy season. So this biopore pit is the only easy and fast way to dispose of organic waste.
2. Organic waste disposed of in biopore holes will decompose and invite soil dwellers, such as worms that will help the waste to be destroyed. Worms that eat and destroy organic waste will make small tunnels so that the water produced by this waste will flow around it. If there is water from above, for example rainwater, then this biopore hole will also absorb the water quickly. Therefore, flooding can be avoided because the water absorbs into the ground.
3. The absorption of water into the soil can balance the water content in the soil, making it one of the sources of water for wells. Water needs for RT 21 residents are mostly supported by well water (groundwater), only a small portion of which uses PDAM flow water. So making biopores can maintain the availability of water for many residents. Especially during the long dry season, where lately many residents' wells have run out of water (become dry).
4. The results of organic waste that has been decomposed by worms can be used as plant fertilizer. During this time fertilizing plants need to be bought, but now it can be produced by yourself from the use of biopori holes. So there will be a reduction in spending on buying fertilizer (Yohana et al., 2017).

Given the location of RT 21 in the middle of the city and the distance between houses is only about 1 to 1.5 meters for pedestrians, causing houses to squeeze together. Rarely does a house have a yard and there is no open space for the community, so the choice of biopores to manage organic waste and regional water management is more appropriate. Biopores for densely populated areas are one option for organic waste management (Adidarma et al., 2019). Biopore holes can be placed in the corner of the house or on the road near the house. This biopore hole does not interfere with the road because the hole will be covered with bricks and open only when it will be filled with organic waste.

Making biopore pits is so simple that it can be done by anyone. This makes environmental water management and organic waste very suitable in the RT 21 area using biopore pits. The result of biopores in addition to organic fertilizer is the preservation of groundwater sources, making it possible for community wells not to experience drought in the dry season. In recent years, during the long dry season, many wells in RT 21 have dried up. Therefore, biopores as rainwater catchment and storing rainwater in the soil will greatly help maintain the availability of community well water. Biopores as rainwater catchment can be made in mutual cooperation by RT 21 residents, thus strengthening the relationship between each resident and maintaining the silaturahmi of the residents.

The practice of waste sorting and filling biopore holes can be done simultaneously. After waste segregation, group members can collect organic waste and put it into the biopore holes that each group member already has. The biopore holes have been left empty and not filled with organic waste. After providing material on the dangers and benefits of organic waste and government regulations on organic

waste management, the community became motivated to fill their biopore holes with organic waste from sorting family waste.

The sorting of household waste into organic and unorganic waste has been running for 3 months. During the group meeting, an evaluation was conducted through discussion. Each member enthusiastically expressed their opinions and shared their experiences in sorting and filling biopores. All group members have done the sorting and they are enthusiastic in doing it. Every day the sorting was done in an orderly manner. One interesting comment from the group was that sorting waste did not require as much time and effort as they had imagined. They only needed 10 minutes and all the tasks of sorting and filling biopore holes could be completed. This further encouraged the group members to continue doing this activity and it became a new behavior for them.

From the discussion, members of the RT 21 PKK group stated that they now understand the benefits of sorting and managing waste (especially organic waste). After they understood the importance of sorting and managing waste, they now utilize biopore holes to manage organic waste. They now feel that the environment is cleaner and less smelly. In addition, it has become easier to dispose of unorganic waste to the TPS because there is not much of it. Because the amount of waste is less, they decided not to subscribe to a garbage collector to dispose of the family's waste. This saved the family Rp100,000 that would have been spent on a garbage subscription. It is now realized that the household waste generated is more organic waste than unorganic waste. The amount of unorganic waste is relatively small, so they dispose of the waste only once a week to the TPS. Unorganic waste can be collected for up to one week because it does not cause unpleasant odors (because it does not rot), so it does not disturb the environment.

Although they have not been able to harvest their organic fertilizer (because it is not finished yet), they are eager to sort and fill biopore holes because they have felt the results of the waste management that has been carried out. One of the results is that they don't have to queue to throw garbage to the TPS every day. Because they do not have to queue every day, they feel less stressed because of the waste problem. The time that has been wasted waiting in line can be used for other things that are more useful, such as preparing breakfast for the family and cleaning the house. Another result is the saving of Rp100,000 from the monthly garbage subscription.

Management of household waste, especially used cooking oil waste, has not been done. Members of the RT 21 PKK group have been disposing of used cooking oil through the dishwasher. This is done because they do not know the dangers of used cooking oil waste for the environment, especially for biota that live in water. The danger of using cooking oil for aquatic biota is that it can kill fish, and animals and aquatic plants in the river (Mulyaningsih & Hermawati, 2023). Public knowledge is still very low about the dangers of used cooking oil waste. The results of the study stated that the community's understanding of the hazards of used cooking oil was only 31.6% of the respondents (Br Gultom et al., 2022), so it is natural that the PKK members of RT 21 also do not understand it. Therefore, counseling is needed about the dangers of used cooking oil waste.

Members of the RT 21 PKK group do not know that waste cooking oil can be sold, and can also be used as raw material to make products needed by the family. If the used cooking oil waste is collected, then there are parties who want to buy the used cooking oil, so that the waste that has been discarded can provide additional income for the community.

The management of used cooking oil waste is to collect it in 1.5 liter aqua bottles. Each member collects the used cooking oil waste produced, then collects it from the head of the PKK RT 21 during monthly meetings. Because the program to collect used cooking oil waste has only been carried out for 3 months, the PKK group has only been able to sell 2 times. The proceeds from the sale of used cooking oil according to the group agreement are used to fill the PKK treasury. This cash will usually be used to support PKK RT programs and RT tourism. It is hoped that this additional source of funds from used cooking oil can reduce the burden on the PKK RT 21.

## **CONCLUSION AND SUGGESTION**

From the results of the evaluation of all these service activities carried out together with PKK RT 21 members, as well as observations from the pengabdi, it is concluded that there is a change in behavior. Changes in behavior that previously did not want to manage household waste, now every member has



done household waste management. This change in behavior can be seen with each member already sorting waste, disposing of organic waste into biopori holes and collecting used cooking oil waste for sale and the proceeds are put into the RT 21 PKK treasury.

In addition to behavioral changes, PKK members have also felt that with better waste management, the home environment has become more comfortable. PKK members also have more time to take care of their families because they have less time to queue for garbage disposal. Another benefit is the reduction of family finances by Rp100,000 per month, as they no longer need to subscribe for waste disposal.

Thus it can be concluded that this service was successful in accordance with the planned objectives, although during the service there were several obstacles. The obstacles include the members of the PKK RT 21 group, who do not immediately want to carry out waste sorting. There are still some who need to be encouraged, visited and assisted in sorting and managing their waste.

The suggestion for the next service is to conduct training and practice making family needs products derived from family waste. These products can come from waste cooking oil. Used cooking oil waste becomes raw material for making candles, laundry soap or dish soap and other products.

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