COMMUNITY EMPOWERMENT THROUGH TRAINING IN ORGANIC COMPOST USE ANAEROBIC METHOD IN BINA KELUARGA REMAJA (BKR) KANDANG VILLAGE, PEMALANG REGENCY

Ahmad Zubaidi[1]*, Yulada Syurfa[1], Vivi Ariyanti[2]

[1] UIN Sunan Kalijaga, Yogyakarta
[2] UIN Prof. KH. Saifuddin Zuhri, Purwokerto
*ubedaljabiri@gmail.com

Abstract - *The discussion about waste is a discussion that will most likely never end. As long as humans occupy the earth, the volume of waste continues to increase. Kandang Pemalang is one of the villages in Indonesia that experiences this problem. People tend to burn waste rather than reprocess it according to the 3R principle (Reuse, Reduce, and Recycle). Meanwhile, the government is less serious about dealing with this problem. Counseling on composting at Bina Keluarga Remaja (BKR) in Kandang, conducted by Collaborative Students Kuliah Kerja Nyata (KKN), aims to provide a basic understanding of the importance of sorting waste and the form of processing it into something useful. This activity is carried out through presentation and demonstration methods. The presentation aims to provide the audience with an understanding of the waste paradigm in the community. Meanwhile, the demonstration was carried out through direct practice on how to process organic waste into compost. The result of this counseling is that the people who are members of BKR are able to understand the material presented, as well as understand the composting process in practice. This was proven by the enthusiasm of the public in listening to the material and asking questions during the discussion session.*

Keywords: *Bina Keluarga Remaja (BKR), Compost, Community Empowerment*

1. INTRODUCTION

The waste problem is one of the environmental problems that occur globally, so it can be related to the thesis that many experts adhere to, that environmental problems are a moral problem, a problem of human behavior. (Robi Saputra & Sueb, 2020). Waste will remain a problem if its management is still borne upstream, not the responsibility of all parties. Indonesian people tend to view waste as something that has no value, which influences the behavior of throwing waste carelessly and neglecting appropriate management. Theoretically, waste is residual material resulting from an activity both on a household, industrial and institutional scale carried out by humans. (Juli Soemirat Slamet, 2014). Judging from Law Number 18 of 2008 concerning waste management, the definition of waste more generally includes all daily human activities or natural processes in solid form. The more population, the more waste generated. (Clasissa Aulia et al., 2021)

The government has a commitment to reduce waste by 30 percent and handle waste by 70 percent by 2025 (Salam, 2023). In 2022, the amount of waste generated will decrease compared to 2020, which reached 72 million tons per year. Referring to data from the national waste management information system at the ministry of environment and forestry (KLHK) accessed on 10 August 2023, the amount of waste generated reaches 35 million tonnes per year. Waste managed 63.96% with details of waste reduction 14.51% and waste handling 49.45%. There is still 36.04% of unmanaged waste. The dominant composition of waste is food waste with a total of 40.54% of the total amount. And 17.89% for plastic waste, 13.09% for wood and twigs, and 11.29% for paper or cardboard. The rest consists of metal, glass and other rubbish (Anonim, 2023).

Garbage that is not handled properly will have a negative impact on the environment and public health. So that waste management needs to start from upstream, namely by sorting activities in the household environment. Sucipto said that in sorting, waste can be categorized into two types; organic and inorganic waste. Organic waste is that which comes from living things, both humans, animals and plants. This waste is divided into two categories, namely wet organic and dry organic. Vegetable residues and fruit peels are part of wet organic matter because they contain a high enough water content. Meanwhile, dry organic matter is organic material with a low water content such as wood, tree branches and dry leaves (Sucipto, 2012). Inorganic waste is waste made from materials that can be renewed but have the possibility of being dangerous and toxic, such as materials made from plastic or metal (Clasissa Aulia et al., 2021). These two types do not include residual waste such as baby diapers, used sanitary napkins.

Handling waste with appropriate management requires looking at the problem which consists of downstream, process and upstream. The downstream part is the continuous increase in waste disposal, while the process part lies in the limited resources in managing waste, both community and government. The upstream part lies in the still less than optimal management system in the final processing of waste (Mulasari et al., 2016). There is a need for good waste management to reduce

pollution or environmental damage. Waste management is a systematic, comprehensive and sustainable activity that includes reducing and handling waste. Waste reduction includes limiting waste generation, recycling waste and reusing waste. Waste reduction is carried out by setting targets for gradual waste reduction, using environmentally friendly technology, implementing waste recycling activities and marketing these recycled products. Meanwhile, activities that can be carried out in handling waste include sorting waste based on the type, quantity and nature of waste; collection and collection of waste from waste sources to temporary waste storage areas, then transported to final disposal sites and managed by changing the characteristics, composition and amount of waste so that the results of the processing can be returned to the environment safely. (UU No. 18 Tahun 2008).

Indonesia's population of more than 270 million people greatly influences the volume of organic waste, as well as the existence of places to eat such as restaurants, hotels, and so on. To reduce environmental pollution, organic waste can be reused, one of which is to make organic fertilizer or compost. Compost can provide multiple benefits in agroecosystems, such as increasing soil organic matter (SOM), water holding capacity, and concentration of soil nutrients. (Kelley et al., 2022; Luo et al., 2022; Raza & Ahmad, 2016). Using compost instead of raw organic matter has additional benefits, such as reduced weed seeds, increased nutrient concentrations, and lower transportation costs due to reduced moisture and carbon content in the finished product.

Research conducted by Luoa et.al. (2022) found that the addition of compost to native soil elements can increase the growth of wheat plants in the presence of microorganisms that support soil fertility. Adding fresh compost can increase grain biomass production, but the most significant positive effect is when sterile compost, especially mature compost is used. The addition of compost can affect the biotic and abiotic properties of soil in various ways. The role of fungi and bacteria and the interaction (competition for nutrients) between native and introduced soil microbes in structuring soil communities can help to further reveal the mechanisms that affect soil quality and plant growth. (Luo et al., 2022).

Similar training was also carried out by Mulyani ET. Al. (2021) concerning the Use of Organic Waste for Compost Fertilizer and Maggot Cultivation as Animal Feed. The problems faced also have similarities, namely the behavior of people who tend to burn waste, both plastic waste and organic waste. Burning waste that is carried out will have a dirty pollution effect that can pollute the air so awareness and systemic government regulations are needed in waste management.

Kandang is one of the villages in Pemalang Regency. The majority of the people work as traders, brick laborers, farmers, and tailors. What's interesting about this village is the willingness to organize which is quite high, as evidenced by the many activities of social organizations that are routinely carried out, such as Dasawisma, PKK, BKR, and so on. The power of togetherness becomes potential energy if managed well. The majority of its members are women in the village environment, so the training on making compost from household organic waste is considered

right on target. Compost contributes to the resilience of soil ecosystems by nurturing soil organisms that mediate various soil functions. Many soil functions are related to specific soil organisms that help maintain those functions (Wurff, et.al. 2016).

Bina Keluarga Remaja (BKR) is one of the many association organizations that are active every two weeks in the village scope. In the BKR with better human resources when compared to the elderly association, composting training was held. The aim is so that organic waste in the household can be managed well. Apart from that, BKR members are considered capable of seeking more information regarding compost management. This will certainly maximize training with sustainable behavior starting with yourself. This training is considered something new in the Kandang village community. Because the majority of previous service students did not highlight the issue of waste which is currently a national and even global issue.

2. METHODS

Compost Extension and Training activities are one of the flagship programs of Kuliah Kerja Nyata (KKN) Prof KH State Islamic University's and Saifuddin Zuhri Purwokerto and Sunan Kalijaga State Islamic University Yogyakarta which was held on August 1 2023 at the routine Bina Keluarga Remaja (BKR) Meeting in Kandang. This activity involved ten students from various faculties and two universities, as well as all BKR members. This research method uses the ABCD approach; ABCD (Asset Based Community Development) is an approach to sustainable community-driven development that focuses on community assets and strengths rather than problems and needs. It is concerned with how to link micro-assets to the macro-environment and emphasizes relationship building, which is the key to increasing social capital within the community and generating linkages between the micro and the macro. ABCD is a capacity-focused model that seeks to identify the already existing skills, services, and assets that exist at the local level and mobilize them to better serve the community as a whole.

The process of ABCD involves five key aspects: discovery, dream, design, delivery, and debrief. ABCD is usually called asset-based community development, but a few authors prefer asset-based community-driven development or asset-based citizen-led development to emphasize that ABCD is driven by the community, not external agencies. ABCD is a proactive approach that uses the existing strengths and abilities of a community and the supporting structures of local institutions to help facilitate change and development. By using the communities' own assets, ABCD ensures that communities can grow stronger and more resilient for the future. Research objects are people who know information from research as actors who understand the research object (Bungin, 2016). Meanwhile, the research subjects are people who are involved indirectly and indirectly through community service programs, in this case Real Work Lecture (KKN) activities which focus on organic waste management programs through composting. This research and training was carried out on members of Youth Family Development (BKR) in Kandang Village, Comal District, Pemalang Regency, Central Java.

Materials and Tools

The materials used in this compost training are as follows:

- Vegetable Leftovers: leftover vegetables obtained from traders in the market, such as kale, mustard greens, tomatoes and other vegetables that are no longer suitable for sale.
- Leftover Fruit: leftover fruit obtained from fruit sellers in the village market, by buying some fruit that is rotten or overripe and unfit for sale
- Kitchen waste: obtained from leftover vegetables, egg shells, stale rice and so on that are no longer used in the KKN kitchen environment.
- EM4: is an activator liquid containing fermenting bacteria, ranging from the genus Lactobacillus, fermenting fungi, photosynthetic bacteria Actinomycetes, phosphate solubilizing bacteria, and also yeast. The function of EM4 is to speed up decomposition.
- Granulated Sugar: is an ingredient needed to revive the bacteria in EM4.

The tools needed for this compost making training are:

- Two used buckets: function as containers for solid compost fertilizer and liquid compost fertilizer
- Soldier or nail: serves to make a hole in the bottom of one of the buckets
- Water tap: to make it easier to take liquid compost fertilizer
- Glue which functions to attach tools to one another.

Figure 1. Composter assembly from used buckets

3. RESULT AND DISSCUSION

- **Preparation**

  In the program preparation stage, it is carried out through interviews and discussions with BKR members with the aim of:

  a. Provide information regarding the aims and objectives of the work program to be implemented.
  b. Provide an explanation and understanding of the potential benefits of waste
  c. hold discussions about community empowerment and existing problems, for example waste
  d. Discuss the location and schedule for implementation related to waste management with the local community

- **Socialization and Training**

  Giving material to the audience is divided into several activities. Material that will be presented includes:

a. Socialization regarding explanation and understanding related to the potential of waste
b. Socialization regarding uses related to waste management
c. Socialization regarding training in making compost using the anaerobic method using household waste produced every day
d. The benefits of compost from an economic and environmental perspective

This activity begins with explaining material related to the practice that will be carried out such as the general public's point of view regarding waste, types of waste, how to manage waste to the benefits of waste if it has gone through the stages of processing according to its type. Apart from that, in the extension activities, materials related to the process of making compost from household waste are also included.

Figure 2. One of the stages of making compost: mixing the EM4 solution and sugar.

This counseling uses a presentation method delivered by three main presenters. The presentation lasts for approximately 20 minutes, this time includes presentation of material and questions and answers. The presentation activity is carried out as simply as possible so that it is hoped that it can be easily digested by BKR members who attend and take part in this activity. The enthusiasm of BKR members in this activity can be reflected in the answers given by the presenter to the audience. Every time the presenter asked a question, the audience immediately answered the questions responsively.

Based on the question and answer activities that have been carried out, it can be concluded that many BKR members know the benefits of

vegetable waste left over from household waste which can be used as organic fertilizer. But they are reluctant to process the waste and choose to throw it away or burn it. The activities of residents who do not always sort waste from the start is a serious obstacle that needs to be paid attention to by the government at the village level, so that the willingness to process waste in the household environment becomes increasingly high and has an impact.

Unfortunately, due to limited space, not all BKR members can witness live material displayed on the projector and only listen to the presenter's voice on the loudspeaker. In this case, the material delivered is not optimal because the audience is busy and does not focus on the material presented by the presenter. To minimize this incident, the presenter occasionally throws questions at the audience outside the room so they can still try to focus on the presentation materials.

- **The Practice of Making Compost from Household Waste**

The next activity after counseling related to organic waste and compost is a demonstration, namely the practice of making compost according to the mechanism described in the material section. The method used in this composting practice is the anaerobic method. Anaerobic is a composting method that does not require oxygen. The use of this method aims to make it easier for the audience to practice it in their respective homes. The fertilizer produced through the anaerobic composting process consists of two types, namely liquid organic fertilizer and solid organic fertilizer.

Figure 3. BKR Members' Enthusiasm in Listening to the Compost Making Presentation and Demonstration**.**

This composting is done by chopping up the vegetable remains first, then putting them in a bucket and then spraying them with EM4 liquid. The EM4 dose is in a 1:1 ratio, namely 1 dose of EM4 bottle cap mixed with one spoonful of granulated sugar and dissolved in one liter of water. To produce maximum liquid fertilizer, the top composter (bucket) must first be filled with organic waste using the same mixing method.

As previously explained, composting using the anaerobic method produces two fertilizers at once, namely solid organic fertilizer and liquid organic fertilizer. Solid organic fertilizer is located at the top of the bucket, while liquid organic fertilizer is at the bottom of the bucket. Installing the faucet at the bottom of the bucket adjusts its function, which makes it easier for liquid organic fertilizer to come out of the bucket. The rule for using liquid fertilizer is 1:10 or 1 liter of liquid fertilizer mixed with 10 liters of clean water. This fertilizer functions to improve and nourish the soil so that it can maximize plant growth. Therefore, the application of fertilizer is to the plant media or soil periodically every 7-10 days.

4. CONCLUSION

Based on the presentation of the results and discussion above, it can be concluded that previously BKR members did not have full knowledge regarding processing household waste to be used as compost. It is hoped that this training can add insight to the people of Kandang Village, Comal District, especially BKR members so that they can help minimize the amount of household waste.

The problem of waste becoming a global issue cannot be separated from the behavior of people who are not used to sorting it, so this has an impact on increasing waste generation at TPS/TPA. An important point that the government needs to pay attention to is how to create a culture of sorting waste, both in household and other environments. Waste segregation will have a major impact on sustainable waste management.

Organic waste in the form of vegetable waste or food waste in the kitchen is one of the various types of waste that can be reused. However, this will not work if the waste is mixed with residual waste or plastic waste which is difficult to decompose. Therefore, the next form of activity that needs to be emphasized to the community is not how to process waste, but how to sort waste according to its type.

The next task of the village government is to create regulations regarding the obligation to sort waste for every resident. These regulations are of course supported by the existence of facilities and systems that can be created by the village government. This can be done if the village government is serious about dealing with this waste problem. When this regulation has been formed, the authors suggest to the Kandang village government, to collaborate with companies that produce products made of plastic. So that plastic waste can be handled by both parties.

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