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## Empowering Women in the Thematic KKN Program on Waste Management into Compost Fertilizer in Selokaton Village

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### Abstract

The Student Community Service (KKN) is a routine program of the Tri Dharma of Higher Education in Indonesia, emphasizing curricular academic activities and directly involving the community. This program aims to provide skills in the form of training on the utilization of household organic waste into compost as an alternative solution in reducing the accumulation of waste at the Pancuran TPA, Selokaton Village. The Thematic KKN program for processing compost using Berkeley Method by empowering women is carried out in two sessions: a socialization session and a practical session on processing compost from organic waste. This activity was carried out by empowering women members of the PKK RT/RW 001/008 Ngaglik Sub-Village, Selokaton, Gondangrejo, Karanganyar. The result ran smoothly, and the interest and enthusiasm of the residents were high. The results of the compost are scheduled to be ready for harvest in March 2023 (60 days after manufacture).

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## 1. Introduction

Community empowerment is a development process in which the community takes the initiative to initiate a process of social activity to improve its situation and condition. Empowerment refers to the ability of people, especially vulnerable and weak groups, they have the power or ability to (a) fulfill their basic needs so that they have freedom, in the sense that they are not only free to express opinions but are free from hunger, free from ignorance, free from pain; (b) reach productive sources that enable them to increase their income and obtain the goods they need; and (c) participate in development processes and the decisions that affect them (Purnamasari et al., 2020).

Empowering women is part of community empowerment, which is an effort to enable women to gain access to and control over economic, political, social, and cultural resources to self-regulate and increase self-confidence. Moreover, women can play a role and participate actively in solving problems and building capabilities and self-concept

(Bappeda DIY, 2017). Women's empowerment is discussed in one of the SDGs (Sustainable Developmental Goals) or TPB (Sustainable Development Goals) points. In this case, women's groups and organizations can encourage the government to improve policies and practices that have been detrimental to women and have not received attention from the government or legislators, such as child marriage and female circumcision (BPN, 2016).

The continuing increase in population, industrialization, and the people's standard of living have implications for an increase in the household waste at the Pancuran Waste Disposal (TPA), Selokaton Village. The problems in Selokaton Village, as stated by the village head, stem from an increase in population from year to year without being balanced by an adequate village waste management system. The Selokaton Village TPA began functioning in 2017, located in Pancuran Sub-Village, Selokaton Village. The land used as TPA is state-owned land that was previously planned as the area of the Selokaton Village Public Cemetery (TPU). This conversion is considered a solution to the problem of waste that was previously disposed of at the Putri Cempoko TPA, Karanganyar. The village has also launched the "Garbage Bank" program as a solution to the waste problem, but the program only lasted three months due to a lack of management of village waste management, so that waste transportation became irregular, and finally, the program stopped running until now. Recently, waste management in Selokaton Village has been limited to transporting waste per house once a week at IDR 6,000 per month.

Within five years since the Pancuran TPA, Selokaton opening, the accumulated garbage from all sub-villages in Selokaton Village has formed a 3-meter-high garbage with an area of 3 ha. From the narrative of the Head of Ngaglik Sub-Village, the mountains of garbage cause an even more unpleasant odor during the rainy season, making many residents feel uncomfortable with the smell of the garbage. In addition, the mountains of garbage become a habitat for flies and rats, which can carry dysentery, leptospirosis, typhoid fever, bubonic plague, and shigellosis (Fadli, 2019; Gagan, 2017).

Geographically, Selokaton Village has an area of 341.15 km<sup>2</sup>, with the topography of the area in the form of highlands. Demographically, this village has a population of 9,098 people, with a female population of 4537 and a male population of 4561, and a population density of 2,667 people/km<sup>2</sup> (BPS Karanganyar Regency, 2022). Following the natural conditions of the mountainous Gondangrejo District, most of the population has a livelihood in the agricultural sector (own farmers and farm laborers). Then as industrial workers/private employees, construction workers, and traders. The rest are entrepreneurs in the transportation sector, civil servants/military/police, retirees, and services (BPS Karanganyar Regency, 2019).

Environmental problems cannot be separated from the role of students as problem-solving agents for problems in society, such as through the Student Community Service (KKN). One form of students' active role in overcoming environmental problems can be through Thematic KKN activities which are a form of community service and the Tri Dharma of Higher Education in the field of education (Anwas, 2011; Sulistyaningrum & Al Hakim, 2020). The Student Community Service (KKN) is a routine program of the Tri Dharma of Higher Education in Indonesia, emphasizing curricular academic activities and directly involving the community (Sulistyaningrum & Al Hakim, 2020).

The women's empowerment program that will be carried out expects results so that women in Selokaton Village can explore and empower all their potential to reduce the accumulation of household organic waste by utilizing household organic waste to become compost. The program in this service aims for each family card can process organic waste into compost as an alternative solution to reduce the accumulation of waste at the Pancuran TPA, Selokaton Village. Empowering women through the Thematic KKN program emphasizes assistance in making compost. This women's empowerment program will provide skills in the form of training on utilizing household organic waste into compost.

## **2. Methods of Implementation**

The implementation method used in this Thematic KKN is in the form of mentoring. Systematically the stages of research are as follows:

### **2.1 TPA survey and regional permits for Thematic KKN locations**

On October 16, 2022, the Thematic KKN team conducted a survey at the Pancuran TPA and a discussion regarding organic waste processing activities.

### **2.2 Data collection and Schedule Determination**

The data collection technique is with surveys and literature studies related to the results of scientific publications related to composting methods. Determining the schedule of activities is divided into two sessions, namely the socialization session and the practice of composting.

### **2.3 Socialization and practice of composting**

Socialization and practice were carried out at the residence of the head of the Neighborhood Unit/Community Unit (RT/RW) 001/008 Ngaglik Sub-Village, Selokaton Village, with participants from Family Welfare Program (PKK) members. The socialization was carried out a week before the practice to ensure residents understood the importance of sorting and processing waste and the technique of processing organic waste into compost. After the socialization, the residents were invited to collect organic waste for a week which would be processed into compost the following week. The practice of mentoring compost processing is carried out with waste that the residents previously collected for a week using the 3-layer method, namely the brown elements in the form of soil, the elements of organic waste, and the dry elements in the form of leaves, sawdust, or straw.

### **2.4 Evaluation**

After all stages of the research have been completed, an evaluation is carried out regarding implementing compost processing practices. The things that are evaluated include; the interest and enthusiasm of the participants in participating in socialization and composting practices.

## **3. Results and Discussion**

Processing organic waste into compost is carried out by empowering members of the PKK RT/RW 001/008 Ngaglik Sub-Village. It is making compost using the Berkeley Method. This method, developed by the University of California, Berkeley, is a fast, efficient, high-temperature composting technique that will produce high-quality compost in 18 days. The requirements for hot composting with the Berkeley method are

as follows: The compost temperature is maintained between 55-65°Celsius and the C:N (carbon:nitrogen) balance in the composting material is approximately high carbon. It must be crushed first. Compost is turned inside out and vice versa so that it is evenly mixed. Compost is made by mixing the ingredients and placing them alternately between thin layers of “green” and “brown.”

Furthermore, the compost pile is moistened so that water drips from the bottom and leaves the pile for four days. At this step, no reversal is allowed. On day 5, the compost heap was turned inside out from the outside, and vice versa. At this step, it is necessary to keep the moisture constant and test it by squeezing out a handful of compostable material, which should only release a drop of water or barely a drop. The compost is then allowed to stand for four days, do not turn it over. On days 7 and 9, measure the temperature in the center of the compost heap. The compost pile should reach its maximum temperature these days. Hot composting processes should reach optimal temperatures of 55-65°C. At temperatures above 65°C, a white “fungus” will spread through the compost, a type of anaerobic thermophilic composting bacteria, often incorrectly referred to as 'smut blight.' These bacteria appear when the compost gets too hot, over 65°C, and lacks oxygen, and disappear when the temperature drops and aerobic composting bacteria take over again. The temperature peaks at 6-8 days and gradually cools down on day 18. Then turn the compost pile every second day (on day 6 and day 8) and let the composting rest for a day after turning it over. On days 11 to 17, continue turning the compost every second day (on days 11, 13, 15, and 17) and rest for a day after turning. On the 18th day, ready-to-be-harvested compost will be warm, dark brown, and smelly. When earthworms are found in the compost, that is a sign that it is done and ready.

From the evaluation carried out after the implementation of socialization and the practice of processing compost from organic waste, the Thematic KKN program for processing compost by empowering women ran smoothly, and the interest and enthusiasm of the residents were relatively high. The obstacle in implementing this program is that most of the residents, including women, work in industries around Selokaton Village and trade, where they work until the afternoon, so they cannot participate in the outreach program and organic waste processing practices. The compost results are scheduled to be ready for harvest in March 2023 (60 days after manufacture), so the success rate cannot be observed.

#### **4. Conclusion**

This community service activity is a form of assistance and training for members of the PKK group to reduce the accumulation of waste at the Pancuran TPA, Selokaton Village. This activity was carried out in two sessions: a socialization session and a practical session on processing compost from organic waste. The obstacle to implementing this program is the large number of career women in Selokaton Village who work in the manufacturing and trading industries, so they cannot participate in the socialization and practice programs. The success rate of compost processing cannot be observed because harvesting will be carried out in March 2023 (60 days after manufacture).

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