



# Food Waste Management of Green-Pesantren; Experience and Strategy From Pondok Pesantren as Salafy Al Asror

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**Abstract.** The problem of waste management in educational institutions (pondok pesantren) is increasingly becoming an important concern. This study aims to reveal the experience of Pondok Pesantren As Salafy Al Asror Semarang Indonesia in managing food waste. The research method used is qualitative descriptive. Observation, documentation, and interview methods were conducted to collect the research data. Qualitative descriptive methods are used to analyze the data that has been obtained. The results showed that the Pondok Pesantren As Salafy Al Asror has made various efforts to deal with the waste problem in the cottage. Food waste also occurs as leftovers in the kitchen, leftovers in the dining room, and waste from snacks or food purchased by students. Pondok pesantren have provided temporary bins and landfills to manage food waste that occurs. The management of pondok pesantren has emphasized the importance of clean and healthy living so that the behavior of throwing garbage in its place is a habit. In addition, pondok pesantren managers will use maggot cultivation as a solution in dealing with the problem of food waste originating from the kitchen and dining room of students. Pondok pesantren have collaborated with several parties in waste management such as the Semarang City Environmental Office and Sekaran Health Center. The suggestion that can be given is that cottage managers can determine long-term strategies to realize green-pesantren apart from existing food waste management.

**Keywords:** Educational institutions, Food Waste, Waste management

## 1 Introduction

Increased waste generation has occurred in most developing countries today because of a culture of consumerism and convenience that follows a buy-use-dispose system that speeds up resource use [1]. Waste management is an increasingly formi-

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dable challenge for third world countries as their economies progress. There is an atomization of waste production because people with excess income tend to adopt consumer culture and disposable lifestyles [2]. Waste management then got more attention from various parties. The proper handling of solid waste is of utmost importance in the circular economy, a production and consumption framework that aims to minimize waste and pollution [3]. Considerable attention has been given to waste management, primarily due to the expected substantial increase in predominantly non-engineered waste [4]. There are even studies that examine how artificial intelligence (AI) can improve decision-making processes to encourage circular economy practices in waste management [5].

Educational institutions also face challenges regarding waste management. Various studies indicate that waste management is also a focal point for educational institutions, including universities [3]. Waste management strategies are implemented to promote sustainability in Thai university campuses. Integrating waste management initiatives that prioritize the 3Rs (reduce, reuse, and recycle) has resulted in a positive transformation of societal perceptions regarding resource utilization, waste management strategies, and the significance of waste avoidance. However, recycling and waste management behavior remained unaffected by the initiative [1]. Despite its significance in the campus sustainability movement, waste management has seen minimal engagement from universities in Nigeria [6]. The study of waste management as a sustainable development initiative on campus has also been conducted with discussions on the importance of the fourth bottom line [7]. Research has also been conducted to identify and assess waste management strategies that should be a priority for higher education institutions [8]. Another study aims to determine the quantity, composition and recycling potential of waste generated at several campuses in Brazil and to develop waste management strategies that comply with national legislation and sustainable global practices [9]. In addition, the next study proposes a strategic sustainable waste management model for environmental sustainability that brings circularity by closing the circle and focusing on sustainable development goals [10].

Food waste is the waste that must be managed properly by reducing the amount. Food waste can be as (1) unavoidable food waste: expired or spoiled materials, food waste such as meat waste and vegetable waste and (2) avoidable food waste: food waste such as peeling or trimming waste arising from poor food handling [11]. Food waste management is one of the important things that must be managed properly because few parties pay direct attention. Food waste management can reduce the impact on health, economy, and others [12]. Deep insights will have an impact on food waste management such as waste documentation and analysis of the causes of food waste. Thus, strategic policies can be taken to reduce food waste that is likely to occur.

The description proves that waste management has received adequate attention in universities. The problem of waste (and food waste) also occurs in pondok pesantren environment as an Islamic educational institution. The development of green pesantren proves that pondok pesantren have become greener by increasing students' knowledge and environmental awareness [13]. Waste is a complex problem and has a negative impact on environmental sustainability, especially food waste and plastic waste. The waste problem in pondok pesantren has not been resolved optimally be-

cause there is still limited knowledge of residents about waste management [14]. Performing waste management and conserving plants through making forests in pondok pesantren are indicators of eco-pesantren that must be realized [15]. The results of eco-pesantren research show that waste management can be done with different models depending on the type of waste available in the pesantren [16]. Eco-pesantren waste management that can be done includes making eco enzymes, paving blocks, bio pellets, handicrafts, wastewater filtration and plastic recycling.

This study aims to reveal the experience and strategy of Pondok As Salafy Al Asror Semarang Indonesia in managing food waste. Waste problems are also experienced because of the increasing number of students, which has an impact on the level of waste production. The wider cottage environment is also a challenge to manage a healthy and clean cottage environment to realize green-pesantren.

## **2 Method**

The research method used is qualitative descriptive to reveal the experiences and strategies that have been conducted at the Pondok Pesantren As Salafy in Semarang. This pondok pesantren has grown rapidly, as seen from the growth of students and the cottage environment. Pondok pesantren also provide formal education from PAUD to MA/SMK. The research was conducted from February to April 2024 with the object of the pondok pesantren environment. The resource persons involved in this study were students, ustadz, and caregivers (kiai).

Observation, documentation, and interview methods were conducted to collect the research data. Observation is aimed at seeing and observing the environment around the cottage related to waste management. The documentation is aimed at capturing the policies and strategies of pondok pesantren in waste management. In addition, the interview method was used to reveal the experiences and opinions of caregivers (kiai) in managing food waste in pondok pesantren. Qualitative data were analyzed descriptively and using an interactive analysis model.

## **3 Result and Analysis**

### **3.1 General Description of Waste Management at Pondok Pesantren As Salafy Al Asror Semarang**

There are many types of waste produced by residents in pondok pesantren including food waste, plastic waste, clothing waste, and infrastructure construction waste. Waste management is performed independently by parties who are given authority and duties. Parties related to waste management are janitors, temporary garbage shelter officers, and volunteer students. A janitor is a person who is given routine cottage environmental cleaning activities. Managed waste is disposed of in the trash can then be collected in a temporary landfill. Garbage temporary shelter officers are to manage all waste disposed of in temporary shelters before being transported to landfills by

officers from the Semarang city cleaning office. While volunteer students are students who help cleaners and temporary garbage shelter workers.

Pondok pesantren has provided hygiene facilities to keep the cottage environment healthier and cleaner. Garbage cans have been provided in various corners of the cottage environment. Education and socialization of clean and healthy living also continue to be performed to increase awareness of students and other cottage residents. Pondok pesantren have also provided temporary shelters in pondok putra and pondok putri so that existing waste can be managed properly. Figure 1 shows a temporary garbage shelter in the princess hut. However, waste is still not managed properly. Residents still throw or put garbage carelessly even though there is a place that has



**Figure 1.** Temporary Garbage Shelter.

been provided. Temporary waste shelter workers must work extra to sort and manage existing waste, both plastic waste, organic waste, and other types of waste.

### **3.2 Food Waste Management Strategy at Pondok Pesantren As Salafy Al Asror Semarang**

Pondok Pesantren As Salafy Al Asror Semarang has made various efforts to manage existing food waste. The following are the efforts that have been made so far.

#### **1. Education and strengthening the character of students.**

Pondok pesantren caregivers continue to make educational efforts and strengthen the character of students to behave in a healthy and clean life. Activities are given in various forms such as recitations, public lectures, appeals, circulars, cottage regulations, and other forms of education. Santri is expected to have a healthy and clean life character. Santri understands how to spend food that has been purchased or prepared by the catering staff. This behavior is under the guidance in the Qur'an and al hadith,

which are the guidelines for the daily behavior of students. One of the most popular hadiths about cleanliness is "cleanliness is part of faith". One hadith about not wasting food is "Be kind to the flakes of Allah's favours. Don't waste it. If he is almost lost from a people, he returns to them" (HR Al Baihaqi from Anas bin Malik). Thus, students should have a clean and healthy life character. In addition, Pondok pesantren regularly hold socialization of healthy and clean living with Puskesmas Sekaran, including conducting examinations and treatment if needed.

## 2. Utilization of food waste by residents and maggot cultivation

Food waste and food waste from the kitchen have been used by residents as animal feed. The residents collected the food waste that had been put together in containers without processing it first. The volume of waste is quite a lot such as vegetable waste and food waste that is not used up by students, so it must be used either directly or by processing first.

Efforts that are pioneered and can be done to manage food waste are maggot cultivation activities that can be performed by students or other cottage residents. By utilizing BSF (black soldier fly) fly larvae which function to help decompose Kitchen Processed Waste (SOD), this activity is expected to provide understanding and skills for students to process organic waste to be more economical. Maggot cultivation is a solution that is not difficult to implement by students so that kitchen waste and food waste become more ready to be used as catfish or chicken feed. In addition, this activity is expected to pioneer the maggot cultivation business so that it can be used as a medium for the formation of the entrepreneurial spirit of students. This activity will collaborate with the Semarang City Environmental Office to be more effectively and efficiently implemented.

Various studies suggest the cultivation of maggot to process kitchen waste and food waste. Previous research has shown that developing fly larvae as a bio-conservation solution can help overcome the problem of organic waste. The process of cultivating the larvae of these flies a simple activity and does not take much time [17]. Other studies have shown that using fly larvae as a local and organic alternative in animal feed can increase chicken food intake as well as potentially increase weight gain and productivity [18].

## 4 Conclusion

Food waste management is important in educational environments, including at Pondok Pesantren Al Asror in Semarang. Various efforts have been made to manage existing (food) waste. Janitors and temporary garbage shelter managers are authorized to manage the cleanliness and waste produced by cottage residents so that they can be disposed of in the final dump better. The officer was assisted by volunteer students. Food waste management strategies at Pondok Pesantren Al Asror include education and strengthening the character of students and the use of food waste through direct use by residents and maggot cultivation. Education is conducted to continue to strengthen the knowledge and understanding of students to behave clean and healthy through various educational media. The utilization of food waste is also conducted

through maggot cultivation, which is expected to add economic value to the waste and can be used as an effort to form the entrepreneurial spirit of students.

Food waste management is a small fragment to realize a green-pesantren at Pondok Pesantren Al Asror Semarang. The environment of pondok pesantren is potential to develop various green-pesantren indicators besides waste management. Therefore, the management of the pondok pesantren can take strategic steps with all interested parties so that the pondok pesantren becomes a cool, green, comfortable, and conducive place for learning and reciting facilities.

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