

ECOBY TECHNO SYSTEM, ORGANIC WASTE MANAGEMENT INTO ECO-ENZYME PRODUCTS TO SUPPORT ZERO WASTE INDONESIAN MARKET

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ABSTRACT

Garbage is one of the important factors that can damage the balance of the environmental ecosystem. The market is a place for the economy, but the market is one of the largest producers of waste, accounting for 24% of the total waste. Most of the markets in Indonesia are still traditional markets which are slum, muddy, with a lot of garbage scattered about and have a bad smell. This pile of garbage causes various problems, ranging from health problems, air, water and soil pollution. Garbage has the potential to contribute to increasing greenhouse gas emissions. One way to minimize this problem is to implement a community-based waste management program, especially vegetable and fruit traders, by converting market organic waste into Eco-enzyme products. Eco-enzyme is a solution of complex organic substances produced from the fermentation process of organic waste, sugar, and water. Some of the benefits of Eco-enzyme are as a multipurpose cleaning fluid, a liquid to keep fruits and vegetables fresh, air purifier, plant fertilizer, pest repellent, and preserving the environment. From the waste management problem in the market and as an effort to achieve the goals of SDGs goals 12, we came up with a solution idea, namely "Ecoby Techno System, Organic Waste Management Into Eco-enzyme Products To Support Zero Waste Indonesian Market." Ecoby Techno System is a center for managing market organic waste into Eco-enzyme products by utilizing the Internet of Things (IoT). The application of the Ecoby Techno System can save costs, time and energy so that market waste management does not burden the regional or central government budget. The implementation of this system can support the government to realize a zero waste Indonesian market.

Keyword : Eco-enzyme, Zero Waste, SDGs goals 12, Garbage, Market

1. INTRODUCTION

1.1 The Background of the Study

Garbage is one of the important factors that can damage the balance of the environmental ecosystem. In Law No. 18 of 2008 concerning waste management, waste is the residue of human daily activities or natural processes in solid form. Waste is divided into two based on its nature, namely organic waste and inorganic waste. Both of these properties are related to the constituent materials of the residual waste. This is also related to the process of decomposition of materials in nature. Based on data from the Ministry of Environment and Forestry (KLHK), in 2017 Indonesia is estimated to produce 64 million tons of waste every year, and 60% of this waste is dominated by organic waste. In its management, of the total waste produced, 41.28% of waste is disposed of in landfills (TPA), 35.59% is burned, 14.01% is thrown into rivers, 7.79% is buried and only 1.15% processed as compost.

Based on data from the population census by the Central Statistics Agency (BPS) in September 2020, it was stated that the total population of Indonesia reached 270.20 million people. The condition where the population density is relatively high causes an increase in human activities, ranging from household activities, industrial activities, economic activity in the market and changes in human life patterns from year to year which affect the quantity and quality of the waste produced. Not to mention the problem of improper management also has an impact on the increasing amount of the waste pile itself.

The market is a place for the economy, but the market is one of the largest producers of waste, accounting for 24% of the total waste. Most of the markets in Indonesia are still traditional markets. Traditional markets are often considered slum, muddy, with a lot of garbage scattered and have a bad smell. The existence of buying and selling activities between traders and buyers indirectly causes a large pile of garbage every day (Rahayu, 2013). This pile of garbage causes various problems, ranging from health problems, air, water and soil pollution. Garbage has the potential to contribute to increasing greenhouse gas emissions, the buried organic waste is decomposed anaerobically. The process produces methane gas (CH₄) and carbon dioxide gas (CO₂). CH₄ gas has the potential to damage 20 times greater than CO₂ gas (Sudarman, 2010). One way to minimize this problem is to implement a community-based waste management program, especially vegetable and vegetable traders fruit by converting market organic waste into Eco-enzyme products.

Eco-enzyme is a solution of complex organic substances produced from the fermentation process of organic waste, sugar, and water. According to Larasati (2020) the manufacture of Eco-enzymes has a broad impact on the environment globally and in terms of the economy. In terms of environmental benefits, during the fermentation process it will produce and release O₃ gas known as ozone. This ozone will work under the stratosphere to reduce greenhouse gases and heavy metals trapped in the atmosphere. In addition, Eco-enzymes also produce NO₃ and CO₃ gases which are needed by the soil as nutrients for plants. From an economic point of view, Eco-enzyme can be used as a general purpose cleaner, as a plant fertilizer, and as a repellent for various plant pests.

From the problem of waste management in the market and as an effort to achieve the goals of SDGs goals 12 regarding sustainable consumption and production patterns with the target of halving the amount of global food waste per capita and achieving environmentally friendly waste management in accordance with the agreed international framework, and To significantly reduce the release of these materials into the air, water and soil in order to minimize the adverse effects of these materials on human health and the environment, we came up with a solution idea, namely "Ecoby Techno System, Organic Waste Management Into Eco- enzyme Products To Support Zero Waste Indonesian Markets."

Ecoby Techno System is a center for managing market organic waste into Eco-enzyme products by utilizing the Internet of Things (IoT). Empowerment of traders and market managers is the main key to managing organic waste into Eco-enzymes. Eco-enzyme is made with the standard formula 10:3:1 (water: organic matter: sugar) using Smart ecodrum. This Smart ecodrum will be integrated with the Ecoby Guide application on smartphones which will provide the latest data on the fermentation process that occurs in the Smart ecodrum. Such as the date of manufacture of the Eco-enzyme, the ingredients used, the pH level, the gas content, and sending a signal if the gas level in the Smart ecodrum is too high. Besides being able to be used to provide this information, this application also has several other features such as the Eco-edu feature, this feature contains general information about Eco-enzyme education. Then the Eco-cal feature, which is a calculator to make it easier for users to calculate the formula of the ingredients in making Eco-enzyme. The Ecoby Talk feature where users can consult with Eco-enzyme experts regarding problems or obstacles in making Eco-Enzyme and finally the Ecoby official store feature, which is the online buying and selling feature of Eco-Enzyme products, making it easier for people to get these products and also providing business alternatives side to traders.

In the idea of the Ecoby Techno System, it also raises one of the cultures in Minangkabau, namely about rangkiang. Rangkiang is a rice storage barn whose ownership is not individual but belongs to the people. So that everyone can fill or take the rice contained in the rangkiang when needed. Likewise with this Ecoby Techno System, the results of Eco-enzyme products can be utilized by all elements in the market without exception.

The application of the Ecoby Techno System can save costs, time and energy so that market waste management does not burden the regional or central government budget. If this system is implemented in all traditional markets in Indonesia, this system can support the government to realize a zero waste Indonesian market.

1.2 The Formulation of the Problem

Based on the background above, the problem can be formulated namely how to manage environmentally friendly waste to achieve the goals of SDGs goals 12 sustainable consumption and production patterns.

1.3 The Purpose Of The Idea

The purpose of this idea is the target of SDGs goals 12 in reducing the amount of global food waste per capita and environmentally friendly waste management in accordance with the agreed international framework, and significantly reducing these materials into the air, air and soil in order to minimize the adverse effects of these materials on human health and the environment

1.4 The Benefits of Ideas

The expected benefits of this friendly idea are the realization of a waste management system, the environment can save costs, time and energy so that the realization of a zero waste Indonesian market is realized.

1.5 Expected Outcomes

The expected outputs are:

- a. Videos uploaded to Youtube channel with futuristic and constructive governance content to achieve sustainable development goals
- b. Progress reports,
and
- c. Final report

2. MATERIAL METHOD

The idea for this video originated from concern for the condition of traditional markets in Indonesia and concern for the environment as well as efforts to realize SDGs goals 12 which contain sustainable consumption and production patterns. As the young generation who are agents of change who bring change to the nation, it is certainly familiar, therefore the younger generation must know and understand the conditions in the surrounding environment, as we know that many people who are not disciplined in managing consumption patterns result in a lot of waste. so that the environment is polluted, especially traditional markets, this is where the role of the younger generation is needed. The premise of this video is that organic waste management solutions in the market become Eco-

enzyme products by applying Internet of Things (IoT) technology that is integrated with applications on smartphones.

At this time Indonesia occupies the 4th position with the largest population in the world, directly proportional to the large number of population, the waste produced is also a lot, the waste consists of organic waste such as vegetable and fruit waste which is basically easily biodegradable, and non-organic such as plastic waste which is easily decomposed. not easy to decompose. One of the places that produce the most waste is traditional markets, poor waste management causes the accumulation of waste in the market environment and this has a negative impact on the environment and health.

Therefore, waste management solutions, especially organic waste, were formed by processing them into Eco-enzyme products in an integrated manner through the Ecoby Techno System. In the Ecoby Techno System as previously explained, there is a Smart ecodrum which is a container for managing organic waste that has been collected at the waste management center, Smart ecodrum is also equipped with tools that are integrated with applications that can be downloaded on the user's smartphone which aims to inform Eco-friendly data. enzymes contained in the Smart ecodrum. Some of the benefits of Eco-enzyme are as a multipurpose cleaning fluid, a liquid to keep fruits and vegetables fresh, air purifier, plant fertilizer, pest repellent, and preserving the environment.

Scene	Visual	Audio
1.	BPS Indonesia : Data population in Indonesia	Narrator: Tells the data population residents in Indonesia
2.	CNN Indonesia : give data population in Indonesia	Presenter: Tells about population data in Indonesia reaching 270.2 million people
3.	SDGs goals 12: Responsible Consumption and Production	Narrator : Tells about the target of SDGs goals 12 on Responsible Consumption and Production
4.	IDN Times : Garbage emergency	Presenter : Garbage emergency
5.	Market conditions with unmanaged waste	Narrator : Tells about the market conditions which are full of waste and not managed properly
6.	Animation of the	Narrator : Tells about the dangers of organic waste that is not managed properly

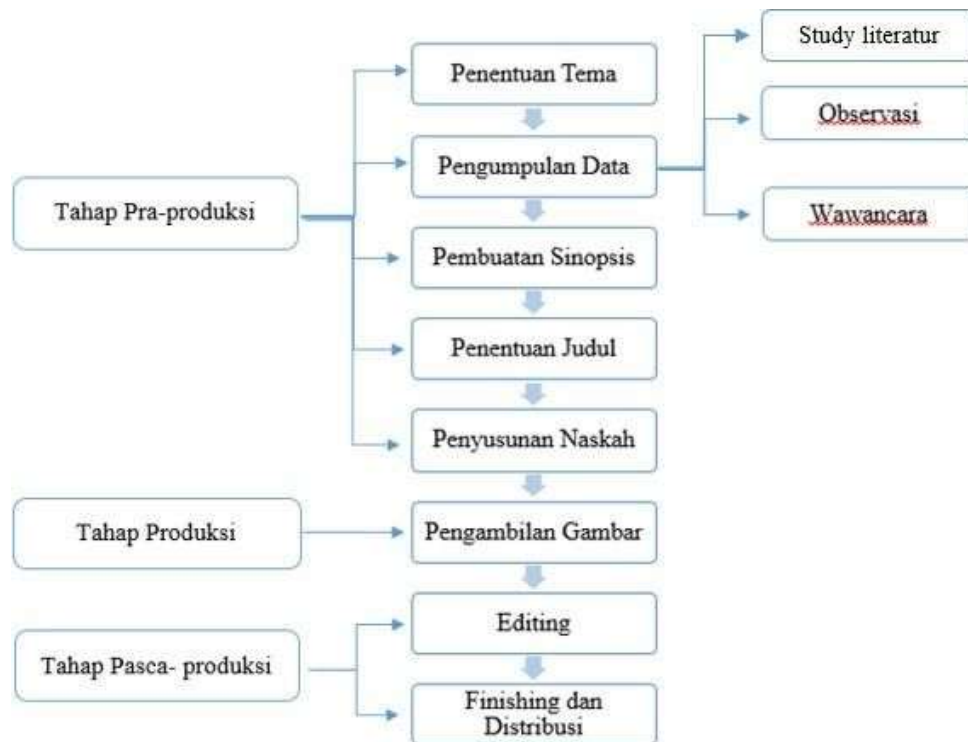
7.	Animation of the dangers of organic waste in	Narrator : Tells about the dangers of organic waste in various aspects of life
8.	Interview with TPS	Dialogue : Interviewing TPA Officers at the
9.	Ecoby Techno System introduction video	Narrator : Tells the introduction of Ecoby
10.	Videos description of Ecoby Techno	Narrator : Tells how the Ecoby Techno System works
11.	Introductory video and	Narrator : Tells the introduction of Ecoby
12.	How-to videos and benefits of the Ecoby Guide Apps	Narrator : Tells how it works, benefits and features of Ecoby Guide Apps and its uses
13.	Video: collaboration with related environmental parties	Narrator : Ecoby Techno System cooperates with related environmental parties, in an effort to create a clean and safe environment usefulness
14.	Video: The shape of the form invites the Ecoby Techno System to remain continue	Narrator : Telling the form of the form invites the Ecoby Techno System to continue, such as conducting socialization, education and training
15.	Closing statement video	Narrator : Delivering a closing statement about caring for the environment

3. IMPLEMENTATION STAGE

3.1 Time and Location

The implementation of the idea video creation is carried out from August to December 2021. The shooting activity is located at Pasar Raya Padang, Kampung Jao Village, West Padang District.

3.2 Implementation Method



1. Pre-Production Stage

In the pre-production stage, research and data collection is carried out on problems that become ideas, developing ideas, writing narratives or scenarios, determining visual or image content needed for videos, selecting backgrounds, and making time schedules and budgeting.

2. Production Stage

At the production stage or the shooting stage is done in a place that has been planned in advance. The picture is taken using a DSLR camera with Full Shoot and Long shoot shooting techniques. Full shoot technique allows to show the whole body of an object, from the head to and Long shot to show the object as well as the background. There are several equipment used to support shooting, such as a tripod as a camera foothold in order to get results that do not shake and are stable, and lighting so that there is no shortage of light when needed.

3. Post-Production Stage

At this stage the recording will be done editing, sound arrangement, adding effects, scoring music, and color grading. To carry out the editing process, it is done using Adobe Premiere Pro software with editing methods either Continuity Cutting or Dynamic Cutting. The Continuity Cutting method is a film editing method that contains the connection of two scenes that have continuity. While Dynamic Cutting is a film editing method that contains the connection of two scenes that do not have continuity. To create animations using Adobe Illustrator, Adobe Photoshop, and Adobe After Effects

software. After the post-production stage, the content will be published on the Youtube and Instagram platforms for educational media.

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