ECOPLAST.ID

Preliminary Case

# EHS

Ganesha Integration Case Competition 2021

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# Company Profile
# **Ecoplast Indonesia**

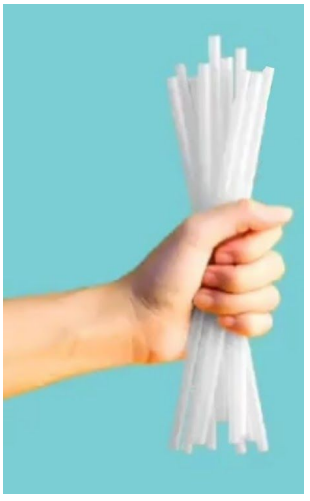
Ecoplast Indonesia or Ecoplast.ID is a startup that develops bioplastics from agro-industrial waste, from food packaging, straws, and plastic bags. Ecoplast.ID's vision is to become a solution to the problem of plastic waste by using environmentally friendly bioplastic materials. Their mission is to do research to keep on innovating to produce products that are environmentally friendly and to educate the public about the importance of preserving the environment.

The founder's background to form Ecoplast.ID because of the problems that have occurred in the world such as the amount of plastic waste produced in the world, petroleum-based plastic took a long time to decompose, and also Availability of petroleum in the world is running low.

Here is Ecoplast.ID milestone:

1. In August 2019, the idea about Palmiplast came up.
2. In 2020 the prototype of Ecoplast.ID product was formed, in April in the same year Ecoplast.ID launched and sold their first product to several restaurants in Bandung for market testing, and in December Ecoplast.ID submitted the patent for their product.
3. In 2021 Ecoplast.ID do commercialization and scale-up.
4. In 2022 Ecoplast.ID will start their mass production.

# Palmiplast

The material of the product is OPEFB (Oil Palm Empty Fruit Bunches) and Cassava peel waste. This material makes palmiplast easy to degrade and also affordable because palmiplast uses a waste product. Palmiplast is biodegradable and compostable. Biodegradable means that palmiplast can be degraded within ± 5 days in water. Compostable means that palmiplast can be degraded within 6 months in soil. With the price of 0.07 USD, Palmiplast is providing values such as:

a. Affordable: use cheap raw materials from waste
b. Not a food material: Palmiplast raw material does not disturb the balance of food in the future

c. High strength: not easy to tear and can be deadly with max capacity
d. Natural material: 100% natural material
e. Social entrepreneur: not only pursuing profit but also thinking about the impact on the environment and society

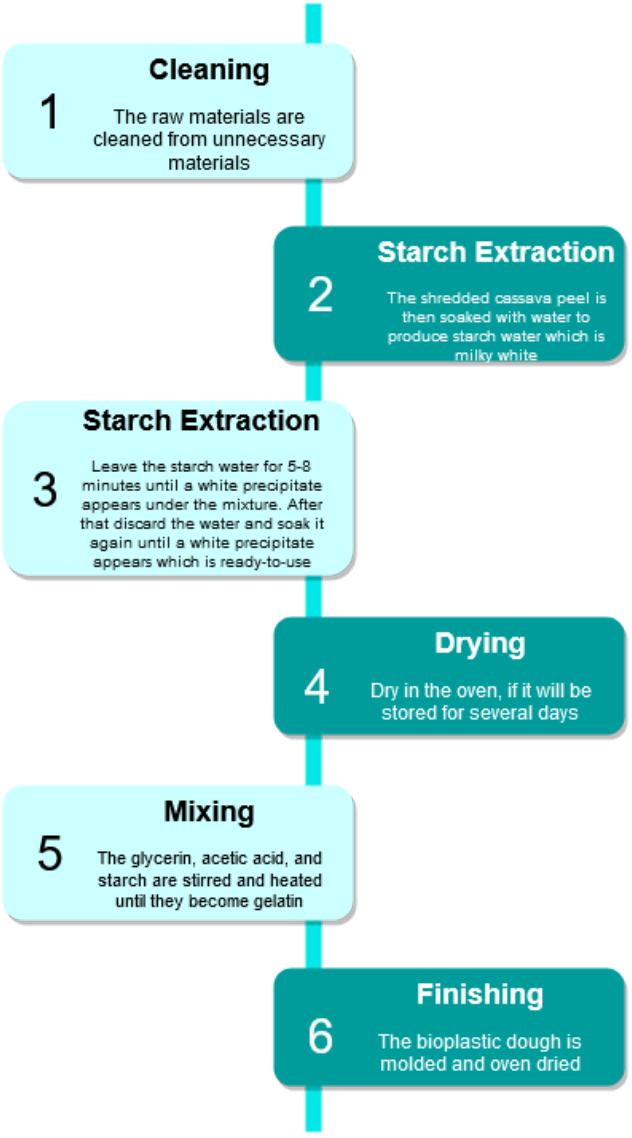
Not many bioplastics use this OPEFB material, even though it has great potential to be utilized. OPEFB is the most exported commodity in Indonesia. In 2018, Indonesian palm oil land which is recorded is 14.03 million hectares that means the supply of this products is quite abundant. OPEFB is also an underutilized waste. 1 tonne of palm oil will be able to produce waste in the form of oil palm empty bunches (OPEFB) as much as 23% or 230 kilograms. OPEFB is a raw material that can be used to be bioplastic so we do reuse waste.

## Specification of Palmiplast

| Properties | Value |
|---|---|
| Density (gr/cm$^3$) | 0.9 |
| Melt flow at 230$^0$C, 2 atm (gr/10min) | 1-3 |
| Tensile strength (psi) | 3,500-4,000 |
| Flexural modulus (psi) | 170,000-200,000 |
| Tensile elongation (%) | 6-10 |
| Notched izod impact at 73$^0$F, 2 aym (ft-lb/in) | 3-8 |
| Drop weight impact at 29$^0$C, 1 atm (ft-lb) | 30 |
| Melting point at 66 psi ($^0$C) | 120 |

## How to Produce Palmiplast?

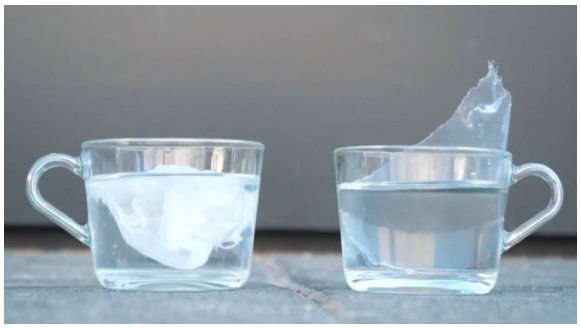
To produce Palmiplast, Ecoplast.ID utilizing suppliers from domestic farmers, namely oil palm farmers and cassava farmers in Tangerang, Banten. Then, the raw material is processed at a bioplastic factory in Tangerang. Ecoplast.ID cooperates with the factory in the processing even though it does not belong to them. Ecoplast.ID contributes knowledge and ideas which the factory then carries out for mass production. The processing process starts from cleaning the raw materials from unnecessary materials, such as clinging soil, cassava, and the hard stalks of the oil palm bunches. Then the process starts from OPEFB raw materials and cassava peels which are also assisted by supporting materials like acetate acid, water, and glycerin to become bioplastics as in the diagram below. After that, the finished bioplastic products are distributed by cargo to their point of sale (for now Bandung).



## Sustainable and Affordable Bioplastic

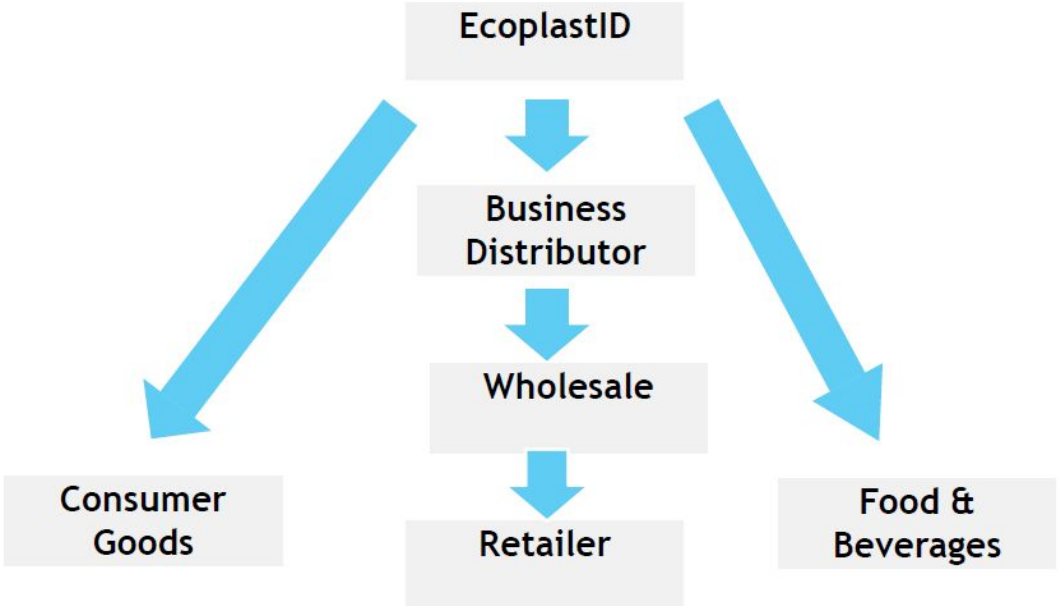
Nowadays, bioplastic products have begun to emerge and many players in this industry are trying to innovate, like Avani who makes plastic from cassava (https://www.avanieco.com/), Evoware who makes plastic from seaweed (https://rethink-plastic.com/), Cornware who makes plastic from corn and yam (https://bioplasticsnews.com/cornware/), and also Ecorasa who makes oxo-biodegradable plastic products (https://ecorasa.id/). Here, Palmiplast who makes plastics from OPEFB and cassava peel is trying to take the market at a more affordable price with sustainable materials.


Palmiplast uses cheap raw materials from waste so that it is more affordable. Although it is 100% natural material, the raw material does not disturb the balance of food in the future because it isn't a food material. And also, Palmiplast has a high strength because it is not easy to tear. It can be degraded if it is soaked in water for about 5 days with the help of sunlight (image below on the left-side) or it can be decomposed in the soil within 6 months (image below on the right-side).



# Current Condition

With the market share projection of 10%, Ecoplast.ID targets its market at bioplastic in Indonesia and will start sales in the Bandung area first. There are 3 channel distributions as illustrated in the diagram below.




Ecoplast.ID will sell its products to FMCG (Fast Moving Consumer Goods) companies as the packaging in its products. Other than that, Ecoplast.ID also wants to sell its bioplastic products to retailers as plastic bags or straw. Until now, Ecoplast.ID has sold about 50 plastic bags to the food and beverage industry, that is restaurants in Bandung.

For their promotion, Ecoplast.ID does more online marketing, namely through social media like Instagram and LinkedIn.

Instagram : @ecoplastid

LinkedIn : Ecoplast.ID

# Future Plans

In this year, Ecoplast.ID wants to scale up so they projected its sales to reach 100,000 pcs per month. With the capital expenditure of 24 billion Rupiah and operation expense 3.8 billion Rupiah per year, the COGS (Cost of Good Sold) of Palmiplast is about Rp808.

Ecoplast.ID is eager to keep innovating to give environmental impact by doing the research and development to its bioplastic products. Not only profit-oriented, Ecoplast.ID also wants to have an impact on the environment and become social-entrepreneurs. Then, in any marketing strategy, Ecoplast.ID always socializes literacy about the environment while raising public awareness until finally increasing its branding.

# Problems

In the upstream part of the Palmiplast production process, not all of the raw materials purchased by Ecoplast.ID can be used. As mentioned above, there are wastes such as clinging soil, cassava, and the hard stalks of oil palm bunches as well as the defect products. Although the percentage of defective products is quite small (<5%), those defective products that are usually caused by misprinting are just thrown away. Whereas, environmentally friendly industry should be able to carry out a circular economy in order to be sustainable. So, **what Ecoplast.ID should do to utilize existing waste to create a sustainable business and environment (increase income and zero waste) in a safe and healthy manner?**

# GANESHA INTEGRATION CASE COMPETITION

2021