

# CATE CUP: *Areca catechu* to Reduce the Single-Use Plastic Cup Waste

## CYNOSURE

Fiodory Leuwol, Ifo Maria Way, Malvin Manaruri, Michaelia Madiowi, Revalin Meres  
Supervisor: Ria Stefani M.Psi; Azalia Herma, S.Si  
SMA GenIUS - Tangerang, Banten

### Introduction

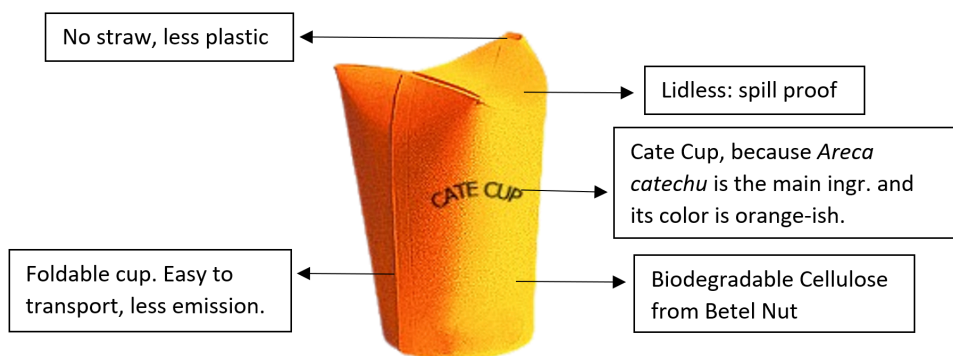
On February 22nd of 2022, Organization for Economic Co-operation and Development reported that less than 10% of plastic waste has been recycled. Global plastics production doubled from 2000 to 2019 to reach 460 million tonnes (OECD, 2022). In conclusion, joined forces are needed from all over the world to work together to solve this problem. Here, we want to partake in a global effort to make our earth healthier. In this study, we will discuss more specifically about plastic cups which are usually used commercially. Plastic cups are used on a daily basis as a container for liquid beverages all over the world. There is over 1.000.000.000 plastic cup waste in this world.

*Areca catechu*, commonly known as betel nut, is an endemic fruit of Papua which is consumed by the locals. Unfortunately, only 20% of *Areca catechu* is consumed, leaving approximately 60% fiber waste and almost 20% of other waste that will be thrown away (R. Ruslinda, 2008). When the waste has been disposed of and is no longer used, it will be burned. In the end, it will result in carbon dioxide emissions causing problems for the environment (Kencana wati dkk., 2018 dan Yusriah dkk, 2012). *Areca catechu* solid waste has a high fiber content composed of cellulose fibers which are the main structural component of the cell walls of green plants. *Areca catechu* skin waste is often discarded after the seeds from the fruit have been used, while *Areca catechu* skin contains some components such as 34.18% cellulose, 20.83% hemicellulose, and 31.6% that can be useful lignin if processed accordingly (Chandra, 2016).

Therefore, we are trying to utilize our local resources, *Areca catechu* skin waste, to make environmentally friendly single-use cups. After further inspection, we can use the cellulose content from *Areca catechu* to make cups. We call this innovation THE CATE CUP.

### Product Description

The manufacture of CATE CUP is divided into 2 processes, namely the process of extracting cellulose from the leather waste of *Areca Catechu* using aquades, NaOH, and NaOCL and the process of making bioplastics using Glycerol to form a cup.



### Marketing Target

We target to sell this product to coffee shops, restaurants, cafes, food vendors, and many more as well as at shops in villages. We will use social media to advertise CATE CUP. Estimated price: IDR 50.000/50 pcs.

### Financial Plan

Ingredient = 1 kg = 500 cups

No.	Item	Qty	Price
1	<i>Areca catechu</i>	1 kg	IDR 2.000
2	Aquades	20 L	IDR 70.000
3	NaOH	1 L	IDR 45.000

4	NaOCL	1 L	IDR 37.500
5	Glycerol	1 L	IDR 37.000
6	Aluminum foil	1	IDR 25.000
7	Filter paper	1	IDR 30.000
<b>Total</b>			<b>IDR 246.500</b>

#### Immovable Asset :

No.	Item	Qty	Unit Price	Price
1	Blender	1	IDR 210.000	IDR 210.000
2	Distillation set	1	IDR 950.000	IDR 950.000
3	Oven	1	IDR 400.000	IDR 400.000
4	Measuring cup (100 ml)	5	IDR 60.000	IDR 300.000
5	Hot plate	1	IDR 800.000	IDR 800.000
6	Erlenmeyer (100 ml)	10	IDR 22.000	IDR 220.000
7	Beaker (150 ml)	10	IDR 23.000	IDR 230.000
8	Spatula	5	IDR 33.500	IDR 167.500
9	Drop pipette	5	IDR 1.650	IDR 8.250
10	Table	1	IDR 400.000	IDR 400.000
11	Chair	5	IDR 25.000	IDR 125.000
12	Paper cup machine	1	IDR 100.000.000	IDR 100.000.000
<b>Sum</b>				<b>IDR 103.810.750</b>

#### Operasional

No.	Item	Qty	Price
1	Electricity	1 Month	IDR 3.000.000
2	Water	1 Month	IDR 200.000
3	Employee salary	3	IDR 9.000.000
<b>Sum</b>			<b>IDR 12.200.000</b>

#### Daftar Pustaka

Tamiyogi, Wahyu Ramadhani dkk. 2019. Pemanfaatan Selulosa dari Limbah Kulit Buah Pinang sebagai Filler pada Pembuatan Bioplastik. *Jurnal Rekayasa Kimia dan Lingkungan* Vol. 14, No. 1, Hlm. 63 - 71

OECD (2022). Plastic pollution is growing relentlessly as waste management and recycling fall short, says OECD, Paris.

Fandy, Tjiptono dan Greforius, Chandra. (2016). *Pemasaran Jasa (Prinsip, Penerapan, dan Penelitian)*, Yogyakarta: Andi.

R. Ruslinda. 2008. *Kandungan Serat Buah Pinang*. ITB, Bandung.

Kencanawati, C. I. P. K., Sugita, I. K. G., Suardana, N. P. G., Suyasa, I. W. B. (2018) Pengaruh Perlakuan Alkali terhadap Sifat Fisik dan Mekanik Serat Kulit Buah Pinang. *Jurnal Energi dan Manufaktur*. 11(1), 6-10.