

Key Learnings Report

TEAM BIOBUBBLE



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INDONESIA



UNDIP | UNIVERSITAS
DIPONEGORO

becomes an excellent research university



Luthfiah Putri Nur'aini
Chemistry

- Scientific journals review
- Product formulations
- Laboratory tests
- Financial management



Muhammad Alka Taufiq Q.
Chemical Engineering

- Develop efficient and effective manufacturing processes
- Monitor the product quality
- Explore into ways to improve product formulation
- Obtain user and business owner testimonials



Ahmad Aldi Muhadir
Chemistry

- Problem validation survey
- Engage with business generated banana peel waste
- Scientific journals review
- Product formulations

Circular Innovation Overview



PROBLEM

Non-biodegradable Bubble Wrap Waste



SOLUTION

Utilization Banana Peel Waste into Eco-friendly and Robust Bubble Wrap



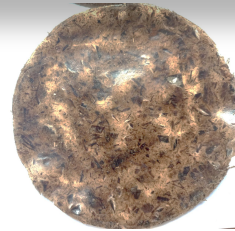
CUSTOMER SEGMENTS

- E-commerce merchants
- Commercial plastic seller
- Package delivery services



CURRENT PROGRESS

Biodegradation test to the MVP



Project Goals

Short Goals

Creation and MVP Evaluation

- Designing the requirements for MVP 1, focusing on the production of bioplastic sheets.
- Evaluating the shortcomings of the bioplastic created until the required specifications are achieved.
- Obtaining MVP 1 with a prototype resembling conventional bubble wrap (inflated with air).

Building and Strengthening the Network

- Collaborating with various communities that share sustainable issues.
- Conducting market fit and MVP publication to customers.
- Running various online campaigns to reduce plastic waste.
- The primary goal of forming this network is to establish a sustainable product market.

Collaboration with E-commerce

- The first long-term goal is to collaborate with one of the e-commerce platforms.
- Carrying out a one-week project using biobubble products in online buying and selling packaging to reduce plastic waste.
- Being the pioneering breakthrough in introducing biobubble products widely to the public.

Long Term Goals

Competitive Product Development

- Continuously developing the biobubble product to achieve the most effective and cost-efficient production conditions.
- The main objective is for us to sell biobubble based on its functionality and no longer be perceived as having a higher eco-friendly product value.

Scaling Up Production Capacity

- With ongoing research development, we aim to increase production capacity to reduce plastic waste even further.

Impact & Result



Collecting banana peel waste for FREE from fried banana store in Tembalang, Semarang City (near UNDIP Campus)

Prototyping

50% 50%



- Textured plastic-like (+)
- Strong enough (+)
- Different thickness & wrinkled (-)
- Can't be converted into bubble wrap (-)

- Not textured plastic-like, crumbly, weak (-)
- Can't be converted into bubble wrap (-)



50% 45% 40% 50%

Banana peel paste composition on the formula

- Textured plastic-like (+)
- Strong enough (+)
- Can't be sealed and converted into bubble wrap (-)



Asking Testimony to Business Owner & Casual Users



Degradation Test

Based on the results from 4 weeks of degradation test, using data in the form of linear regression, the sample will be degraded 100% in the 11th week

Tensile Strength

Sample	Force		Tensile Strength (MPa)	Elongation at break (%)
	gram	newton		
Formula of 40% Banana Peel Waste	801,0	7,85	1,15	36,0
Formula of 50% Banana Peel Waste with Hot Water	515,0	5,05	0,47	17,6
Formula of 50% Banana Peel Waste	291,0	2,85	1,00	14,8
Formula of 45% Banana Peel Waste	180,0	1,76	0,26	10,4

The optimum formula is formula



with 40% banana peel paste

Incubation Funding

Survey and Problem Validation

Validate the environmental issues associated with traditional bubble wrap through research and user feedback.

Operational Costs, Equipment, and Materials

Outline operational costs, including salaries, and utilities. Purchasing materials in making biodegradable materials and the cost of equipment and machines required for production.

Prototyping/MVP Development

Develop a formulation for the biodegradable material, considering environmental impact, strength, and other relevant factors.

Trial & Error Formulation

Experiment with different ratios and combinations of biodegradable materials. Analyze the results to refine the formulation for improved strength, flexibility, and biodegradability.

Validation Tests

Conduct tests for tensile strength, elongation, and degradation test. Ensure the material is safe and non-toxic.

Lessons Learnt

Find out how to create a high-performing company pitch deck

Learn how to build a good MVP

Recognize how to do effective market validation

Comprehend how to solve difficulties during the development of a minimum viable product (MVP)

Discover about all of the variables that must be considered while scaling up production

Stories

This learning and experience were undoubtedly acquired through our participation in the Circular Cities Asia incubation program. We are immensely grateful for being given the opportunity to be part of a team that gained such significant experience and knowledge. Hopefully, this can serve as the foundation for our efforts to make a positive impact on the surrounding environment.

Experience in Building a Circular Business

From this incubation program, we gained valuable insights into the fundamentals of creating a sustainable business idea. We learned about key components such as a company pitch deck, customer discovery, unique value proposition, fundraising tips, constructing an OKR framework, and various other strategies. This was a fresh experience and knowledge for us, undoubtedly aiding in shaping our foundational understanding and experience in initiating a sustainable circular business.

Experience in Designing an MVP

During the MVP design research, we encountered several technical challenges, which required us to make improvements and be more receptive to advice from our mentors. The difficulties and obstacles we faced in MVP design also made us realize the need to lower our product's perfection expectations. An MVP is essentially the minimum viable product that can be accepted by customers, so as long as our product is customer-acceptable, it's ready for market entry after achieving market fit testimonials.

Market Fit Testimonial Experience

Engaging in market fit testimonials was a novel experience for us as well. We conducted them directly with customers (considering B2C scenarios) and also with other business owners (considering B2B scenarios). Through these testimonials, we could differentiate between the perspectives of customers and business owners in their response to our product. During these market fit testimonials, we also made new connections and gained insights from other circular business owners, facilitating knowledge sharing and receiving valuable advice.

Next Steps

1 st Year (MVP Development)	2 nd Year (MVP Development)	3 rd Year (Product-Market Fit)	4 rd Year (Growth Stage)	5 th Year (Maturity)
<ul style="list-style-type: none"> Product Development for MVP 1 (1st – 6th Month) 	<ul style="list-style-type: none"> Evaluation of MVP 1 and start of MVP 2 development 	<ul style="list-style-type: none"> Evaluate the MVP 2 and start of MVP 3 development 	<ul style="list-style-type: none"> Increase production capacity 	<ul style="list-style-type: none"> Bio Bubble products are ready to compete with the general market
<ul style="list-style-type: none"> MVP 1 Market Test (7th – 12th Month) 	<ul style="list-style-type: none"> Product Development (varied by product types and raw material types) 	<ul style="list-style-type: none"> Try to expand sales by taking part in product and process test certification 	<ul style="list-style-type: none"> Networking with e-commerce 	<ul style="list-style-type: none"> Collaborate with E-Commerce
<ul style="list-style-type: none"> Networking with organizations in Semarang 	<ul style="list-style-type: none"> Expand the network of raw material suppliers 	<ul style="list-style-type: none"> Gather with other organizations in Semarang, try to initiate a sustainable product market 		<ul style="list-style-type: none"> Carry out circular integration of Bio Bubble products
<ul style="list-style-type: none"> Networking with suppliers 	<ul style="list-style-type: none"> Collaborate with other communities 			