



A World Without Harmful Plastics: **Bio-based and Bio-degradable Packaging Solutions**

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Greenhope employees during the 2024 Employee Gathering in Ancol, North Jakarta
Photo credit: Greenhope

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CASE STUDY

A World Without Harmful Plastics:
Bio-based and Bio-degradable Packaging Solutions

AT A GLANCE

Company	Greenhope (PT Harapan Interaksi Swadaya)
Social theme(s)	Agriculture/Food Security/Rural Development; Energy/Climate Change/Environment
Geography	Based in Indonesia, currently serving 15 countries globally
Year founded	2017 (research began in 2005)
Revenues	USD 20 million annually
Legal structure	For-profit org as a legal entity, social enterprise as a mission and business model
Clients	Plastic converters, brands, and retailers globally
Business model	Sales revenue from resin production, finished products (e.g. biodegradable bags, utensils, trays, straws, seedling bags, packaging), and own-brand fast-moving consumer goods packaged in biodegradable packaging
Product/services	Greenhope produces biodegradable resins from bio-based, renewable raw materials sourced from farmer cooperatives operating under fair trade schemes
Impact reach	Greenhope works with >150 plastic converters and brands worldwide; cumulatively their biodegradable plastics have replaced 150K tons of conventional plastic, the equivalent of 12.7 billion plastic bags

Background

Production of global plastic packaging has grown exponentially, reaching nearly 460 million tons of plastic in 2019.¹ While plastic has many useful characteristics, most single-use plastic is produced from fossil fuels, contributing to greenhouse emissions and climate change. A large portion of this plastic is used for food packaging, including food wrappers, plastic bottles, grocery bags and straws.

Many plastic types are recyclable, but there are significant barriers to recycling.² Currently, less than 10% of plastics generated globally have been recycled. Many of these plastics are lost to the environment where they do not degrade, but rather break down into smaller pieces which degrade soil health, pollute oceans and waterways, and are ingested by animals and humans.

¹ <https://ourworldindata.org/plastic-pollution>

² <https://www.unep.org/interactives/beat-plastic-pollution/>

About the Company

Greenhope was co-founded by **Sugianto Tandio** and **Tommy Tjiptadjaja**. Tandio worked for 3M in the United States before returning to Indonesia to run his family's traditional packaging company. After successfully growing the family business by several multiples, he devoted ten years to develop and patent a biodegradable resin made from cassava starch. Tjiptadjaja came from a background in corporate and management consulting with The Boston Consulting Group. Together, they co-founded Greenhope as a dedicated green social enterprise to achieve its mission with scale and profitability, developing the partnerships necessary to shift the value chain of plastic packaging production to be sustainable along with positive social impact (SDG 12, 1).



President Joko Widodo visits Greenhope's booth during BUMN Day, meeting Tommy Tjiptadjaja, CEO of Greenhope
Photo credit: Greenhope

Sources of Impact

Customers: Who is served?

Greenhope is mainly a sustainable polymer R&D and manufacturer, selling resins to **plastic converters** who supply packaging to **consumer brands**. Brands are often the 'decision-makers' in the value chain. Greenhope also buys finished products from its customers and resells them to brands and retailers in generic, custom, and/or own-brand models.

Workforce: Who is employed?

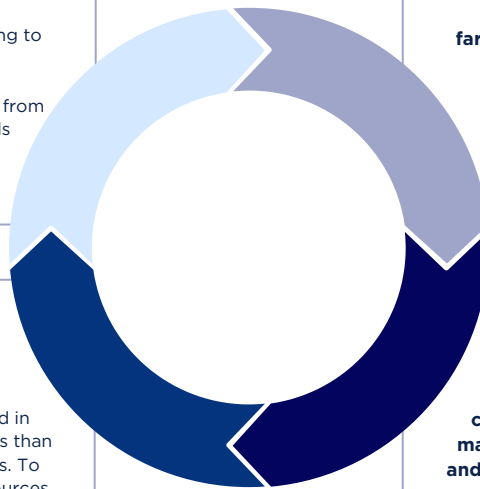
Greenhope has a team **>80 employees** and also contracts with **400+ cassava farmers** and beneficiaries in a Fair for Life cooperation scheme that increases the purchase price and improves the profitability and builds capabilities of farmers

Product/Service: What is delivered?

Greenhope supplies **plastic resins developed from cassava starch** and used in 40+ applications that decompose in less than one year when exposed to soil microbes. To create a market pull, Greenhope also sources finished products (cassava-based shopping bags, polymailer bags) from its customers and resells them to brands & retailers.

Eco-System: What relationships are developed?

Greenhope brings together **brands, converters, farmer cooperatives, waste management companies, NGOs, national and local governments, and consumers** to create an eco-system for sustainability



Innovation Activities

Greenhope engages in several activities that drive innovation, both in the communities they serve as well as the larger eco-system:

INNOVATION ACTIVITIES



Protecting intellectual property with patents: Greenhope co-founder Sugianto Tandio spent 15+ years developing the resin technologies and filing for patents in multiple countries to protect this work



Building relationships with brands further along the value chain: Although Greenhope's direct customers are plastics converters, the customer influences brands that are downstream in the value chain in order to create the market for their products



Attracting the right talent and building a sustainable ecosystem: Greenhope identifies and attracts team members with an innovation mindset into the manufacturing industry, and also invests in building collaboration and coalitions among like-minded parties such as educational institutions, research institutions, NGOs, local and national governments, international institutions (e.g. WEF, UNDP) to affect system change

Key Innovation Challenges & Learnings

Greenhope takes a holistic view on the plastic packaging industry, based on deep expertise and applying complementary skillsets. Through this process, they have encountered challenges and learnings:

- **Taking patents to the market with multiple skillsets:** Winning a patent is just the first step in the social innovation process, which requires multiple skillsets. Co-founder Sugianto Tandio describes this: *"Tommy joined me seven years ago to launch Greenhope and we are a very good complement. We have similar idealism but very different skillsets. I know packaging and plastics very well. And Tommy is on the business process. Together we form a good team. It's not easy because the innovation ecosystem is not very developed in Indonesia. There are hardly any companies with US patents (in Indonesia). So far, we have six patents (US, Singapore, Indonesia)."*
- **Telling the impact story as part of a changing system:** When innovating in a changing market, it is often difficult to understand how emerging solutions are linked together. Greenhope co-founder Tommy Tjiptadjaja explains why this is important for Greenhope: *"What's unique about us is how we tell the story. We quickly realised that nobody owns the entire market for next generation materials. We support reduction, reusable, and recycling. But we still need alternative solutions that are truly biodegradable. What we do is try to paint the big picture. Sometimes people approach it as if their solution is the only one for everything. But we conclude that everybody is just a piece of the puzzle and we need to work together. Understanding which applications most suitable for our technologies is key."*

Featured Product: Ecoplas

Ecoplas is a starch-based biodegradable bio plastic resin made from cassava starch grown by fair trade farmers in Indonesia. It can be used on existing machinery to make applications such as polymailers, trash bags, poly bags, seedling bags, straw, landfill covers, and shopping bags.

Patented in the US, Singapore, and Indonesia, Ecoplas is food grade and non-toxic and is proven to emit 30% less greenhouse gases than conventional plastics. Ecoplas will biodegrade in landfills and soil within 7-12 months without special equipment and without damage to soil health.



Ecoplas Large Seedling Bag for Istiqlal Mosque Project
Photo credit: Greenhope