

## CIRCULAR ECONOMY BUSINESS CASE STUDIES IN SOUTHEAST ASIA



## Great Giant Foods

- Indonesia (Lampung, Sumatra)
- Manufacturing
- [www.greatgiantfoods.com](http://www.greatgiantfoods.com)
- Analysis period: 2010-2023

## Integrated Operations for Sustainable Agriculture

## Business Spotlight

Great Giant Foods (GGF) is the largest integrated canned pineapple company in the world and the largest banana producer in Indonesia. GGF has been implementing sustainability and circular economy practices since the 1980s starting with such practices as rain water harvesting and precision farming. This has gradually expanded into a GGF closed-loop system in which residue and by-products from one business unit are converted into valuable input or energy for another business unit. This circular journey is continuing with opportunities arising from innovation and digitalisation, across the

entire GGF production system, covering plantations, processing, distribution and sales.

**Keywords**

Climate resilience, Regenerative agriculture, Manufacturing circularity

**Innovation**

Manufacturing, Resource circularity, Resource efficiency, Resource substitution

## Analysis of Great Giant Food

## Context and baseline

Great Giant Foods (GGF) is part of the diversified Gunung Sewu Group and comprises Great Giant Pineapple, Great Giant Livestock, Nusantara Tropical Farm, Sewu Segar Nusantara (Sunpride), Sewu Segar Primatama - Re.juve and Great Giant Foods Japan. GGF is the largest banana producer in Indonesia and the third-largest pineapple producer globally.

Since the late 1970s GGF has developed and adopted practices for zero-waste production by using pineapple processing waste and tapioca waste as raw materials for other GGF business entities. This practice reduces the impact on the environment, and also significantly reduces production costs.

GGF's sustainability journey focuses on four pillars, as follows.

- **Climate resilience:** GGF strives to minimise environmental impact while actively protecting the health of the planet.
- **Regenerative agriculture:** GGF aims to preserve natural resources and extend sustainable agriculture to create resilient landscapes.
- **Sustainably Grow with Community:** GGF makes efforts to improve the livelihoods of the people and communities involved in its business.
- **Circularity:** GGF targets competitive advantages by implementing green practices.

GGF aspires to be a business pioneer contributing to sustainability through innovation and circular economy practices, thus contributing to the firm's strategy of becoming a global leader in the agribusiness and food processing industry with a strong commitment to sustainability. As a result, in 2022 GGF embarked on an ambitious long-term plan to establish global dominance in the processed pineapple market, becoming a leading provider of tropical fresh fruits in both domestic and international markets, diversifying its plant and fruit-based business, and developing profitable value chains for protein and plant-based products. Sustainability is essential to achieving these goals. Therefore, GGF is adopting circular economy principles; implementing regenerative farming practices, precision farming techniques and digitisation; and developing robust and sustainable supply chains.

## Innovation

GGF is committed to producing quality food products that are produced in an integrated, sustainable and farmer/breeder-friendly system with environmentally friendly technology and innovation. GGF thus supports the implementation of 'zero waste production' in its value chain through a circular economy model in farming, food processing and support operations, creating symbioses among its business units.

GGF operates on a sustainable, integrated farming model that applies the three main principles of a circular economy, namely minimising waste, maintaining the products and materials used, and regenerating natural systems. The company prioritises the utilisation of waste and leftover materials for reuse and processing into value-added products. The majority of GGF's agricultural and food products are produced in one integrated location in Lampung. In this way the resulting waste from one crop or business unit can be used beneficially in another industrial process in the company's own circular economy ecosystem. GGF also develops partnerships with local farmers to improve their harvest prospects and the welfare of the communities to which they belong.

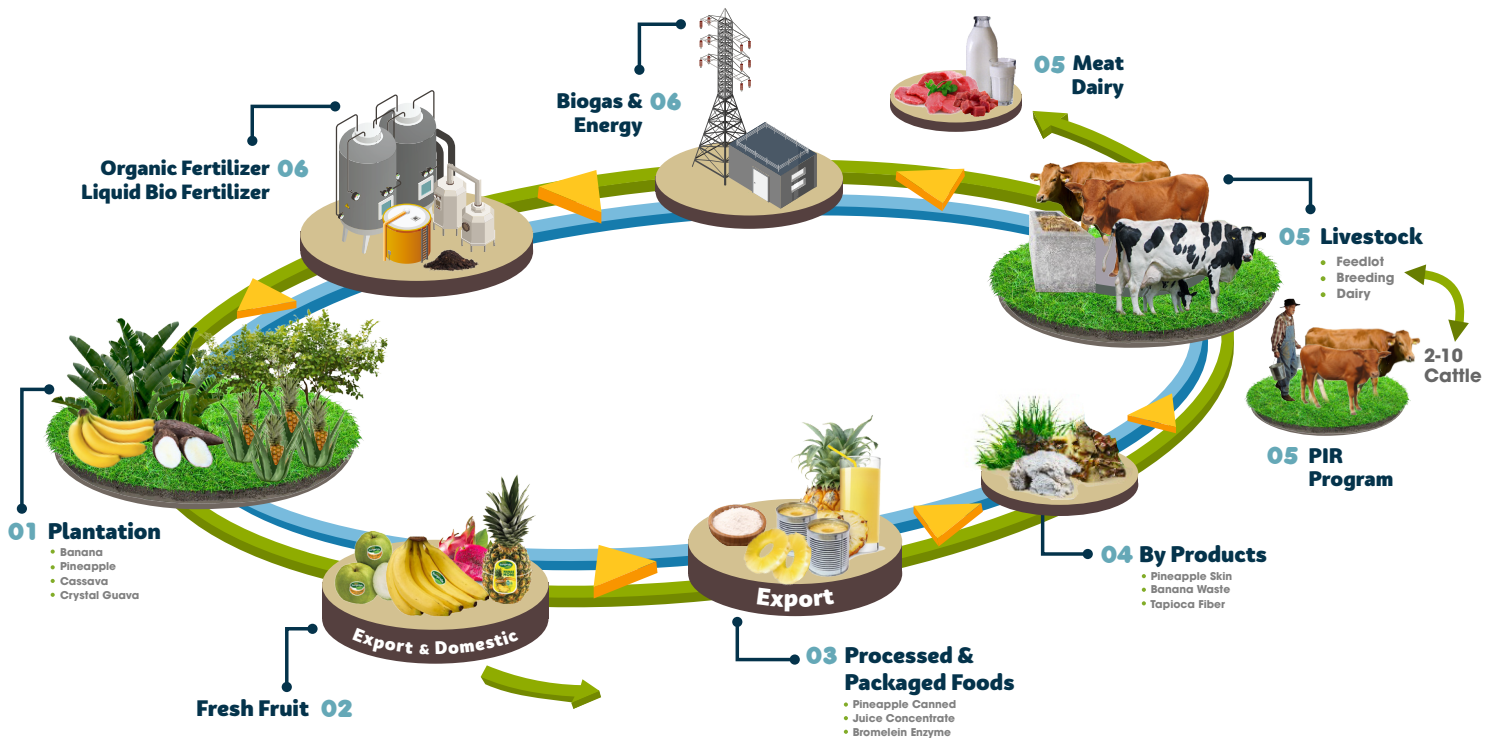
As an agriculture-based company, GGF has long implemented automation and digitalisation to increase crop productivity. The company is currently implementing a five-year digital transformation blueprint for plantation operations, and therefore digitises precision agriculture using drones, sensors and artificial intelligence in order to reduce the use of fossil fuels by 30% and the use of fertilisers by 40%, while increasing productivity per hectare by 50%. Implementing digital innovation in warehousing, sales and customer interfaces enables GGF to become more efficient and remain closer to customers. For example, GGF applies blockchain for traceability in the fresh-fruit sector, and digitally manages and tracks the fruit-packing house and the canned pineapple warehouse. To prepare for the adoption of digital technologies, GGF has been training its employees in agile methodologies since 2017. Digitalisation in the field helps GGF to make decisions more quickly, carry out analysis, and foresee developments more accurately so that it can be more responsive both in facing changes in the business landscape and in meeting customer demands.

## Circular Economy impact

The innovations implemented by GGF contribute to each of three key circular economy strategies, respectively: resource circularity (recovering and reusing materials); resource efficiency (higher efficiency of use of materials, energy and water); and resource substitution (with increased use of renewable energy and materials). These strategies synergise into GGF's ecosystem, as illustrated below.

The distinguishing feature of the company's internal ecosystem is the recovery and reuse of plantation crop residue and processing waste for cattle feed, biogas energy and organic fertiliser. These valuable by-products are renewable, and they substitute directly for traditional non-renewable energy and materials, thus contributing to resource substitution. When applied to farming, this means that biomass and nutrients are put back into soil as organic fertiliser and biochar, and through crop rotation with nitrogen-fixing legumes. GGF has been operating a 4000 m<sup>3</sup> biogas plant since 2010 that is fed with waste water from pineapple and tapioca processing. Some 30% of biogas is used to meet the needs of the tapioca plant (substituting the use of 2 million L of fuel oil annually), and 70% is used as auxiliary fuel in the coal-fired power station (substituting the use of 7000 t of coal annually). The biogas plant generated 20,000–40,000 t of certified GHG emission reductions that were traded under the Clean Development Mechanism from 2012 to 2022. GGF is planning to further expand the production and use of biogas from the remaining organic waste streams.

## The ecosystem of Great Giant Foods

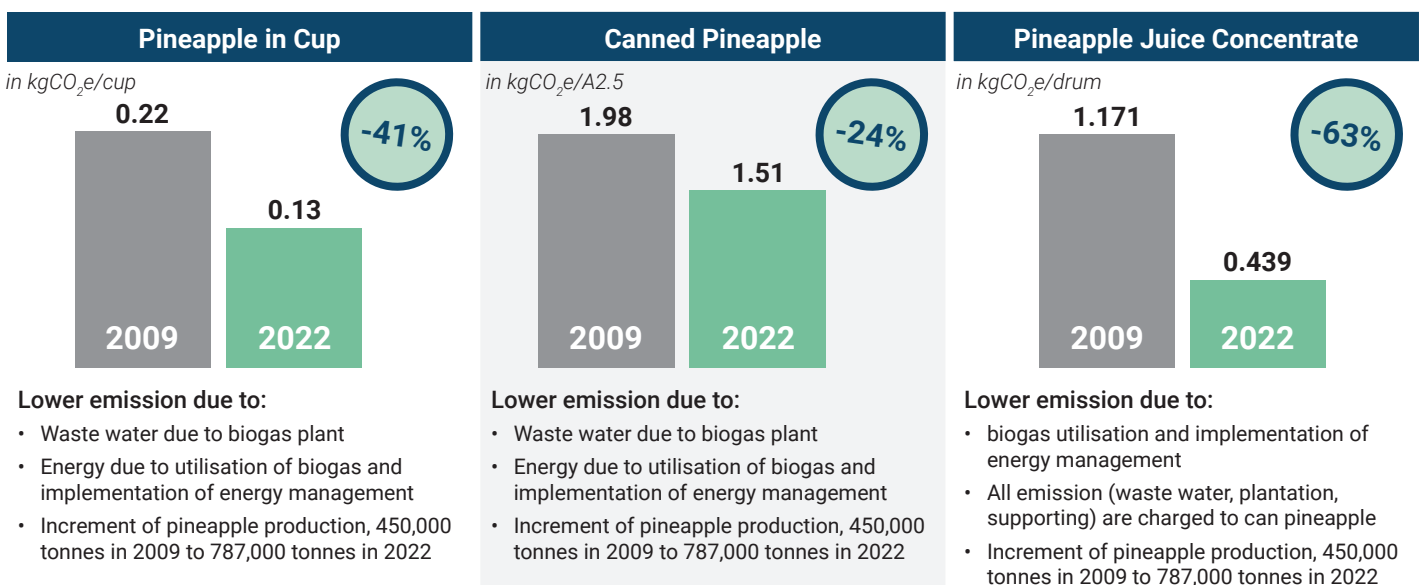


GGF has developed and implemented several further circularity initiatives. For its packaging, GGF uses 99.9% recycled steel and aluminium, and 40% recycled paper and cardboard. The company practices rainwater harvesting in reservoirs in low-lying areas for water reuse in irrigation and for processing purposes. Bromelain enzymes are extracted from pineapple stems for various value-added applications, including some in GGF's own operations. Most recently a plastics recycling facility was set up to recycle wasted foam sheets and plastic containers from plantation operations to transform them as net foam, plastic elbow, and foam sheet. This initiative is providing added value from plastic waste, which can ultimately reduce the use of virgin plastic.

Moreover, GGF is achieving resource efficiency in planting and processing. Precision agriculture enhanced with digitalisation has reduced fuel and fertiliser use per ha by 30% and 40%, respectively, while simultaneously increasing productivity by 50%. In addition, sustainable farming principles, including soil management with planting bamboo along the river to prevent erosion and sedimentation, is aiding to maintaining healthy and productive soils.

Collectively, from 2009 to 2022, these measures significantly reduced carbon the company's carbon footprint for pineapple juice concentrate (63%), pineapple in cups (41%) and canned pineapple (24%).

### Comparison of Great Giant Foods' carbon footprint in 2009 and 2022, showing significant reduction



## Business and market impact

Over the past decades, zero-waste production has become firmly established in all business processes and operations, strategies and management systems and indeed in the hearts and minds of the people at GGF. This practice has indeed become integral to the company's success, growth and financial performance. It is thus not possible to dissect the specific business impact of circularity and sustainability practices.

The company continues to transform itself through innovation, digitalisation, regenerative farming and green practices, for which the company sets itself specific short- and medium-term strategies and milestones. Figure below illustrates the continuous monitoring of progress on strategic plans and transformation.

### Strategic plans and transformation monitoring report, an example

Scope of Analysis: **GGF**  
GGP, UJA, BE, LOB, GGL

Latest Score:

70  
B

Target Score:

89  
A

ENABLERS	OUTCOMES
<b>Strategy and Planning</b> <i>Circular economy is on the company's core</i>	<b>Product and Material</b> <i>Material, product, and waste are supporting circular economy</i>
<b>Innovation</b> <i>Company are moving towards circular economy practices</i>	<b>Plant, Property, Equipment Assets</b> <i>Procure and decommission assets supporting circular economy</i>
<b>People and Skills</b> <i>Manpower are equipped with circular economy</i>	<b>Water</b> <i>Withdraw and use water in a circular way</i>
<b>Operations</b> <i>Digital system and assets are supporting company's circular economy</i>	<b>Energy</b> <i>Use and produce renewable energy</i>
<b>External Engagement</b> <i>Promote circular economy to business sphere</i>	

**Key point of improvement: documented report, digital system, circular practices**

## Stakeholders

GGF's main stakeholders are the community farmers and suppliers, and the company is committed to developing an inclusive and responsible supply chain that delivers high-quality products and ensures well-being and empowerment of all stakeholders involved. The company strives to create a value-chain ecosystem that embraces inclusivity and diversity, ensuring equal opportunity and fair treatment for all. GGF recognises the value that comes from engaging with and empowering local smallholders and suppliers in its operations.

For suppliers, GGF encourages suppliers to join its sustainability journey through compliance with company policies in the areas of quality, product safety, environmental management, respect for human rights, and work safety.

In the community, the partnership established between GGF and its growers has transformed the supply-chain model in order to prioritise the welfare of farmers and guarantee high product quality. Previously, the traditional supply chain involved growers obtaining high-interest loans and selling their produce to a series of collectors before reaching the end consumers. However, with the new arrangement instigated by GGF, the supply chain has become shorter and more streamlined. It involves key stakeholders such as GGF, the Farmer Cooperative, and Growers, enabling a more efficient process for handling and selling the produce along with a better price for growers.

## Implementation

GGF acknowledges the risks and challenges in obtaining supplies from farmers, such as crop failure, supply disruptions, inconsistent quality, price fluctuations, poor environmental management, and supplier non-compliance with regulations related to the environment and labour. Risks related to the supply of raw produce from both suppliers and farmers are included in the operational risks identified through the risk assessment process as part of the implementation of enterprise risk management (ERM). The results of the risk assessment are used as a basis for determining risk mitigation to prevent or reduce potential risks. Assessment of suppliers and farmer development programmes are some of the strategies that have been carried out by GGF to mitigate risk in the company's supply chain.

In 2023, GGF's main entity GGP conducted an assessment of risks and opportunities for climate change in accordance with the recommendations of the Task-Force on Climate Related Financial Disclosure (TCFD). The results of this assessment complemented the risk assessment that was carried out, and helped to determine plans and strategies for mitigating risks related to climate change in its supply chain.

## Takeaways

GGF's closed-loop circular economy initiative can be considered a success due to the excellent results the company achieves in planning and execution related to indicators for waste, sustainable use of resources, sustainable supply chains, and community empowerment. Waste generation from GGF's plantation operations, processing facilities and its management information are integrated and inclusive to prevent waste from ending up in landfill.



## Acknowledgements

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## Disclaimer

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