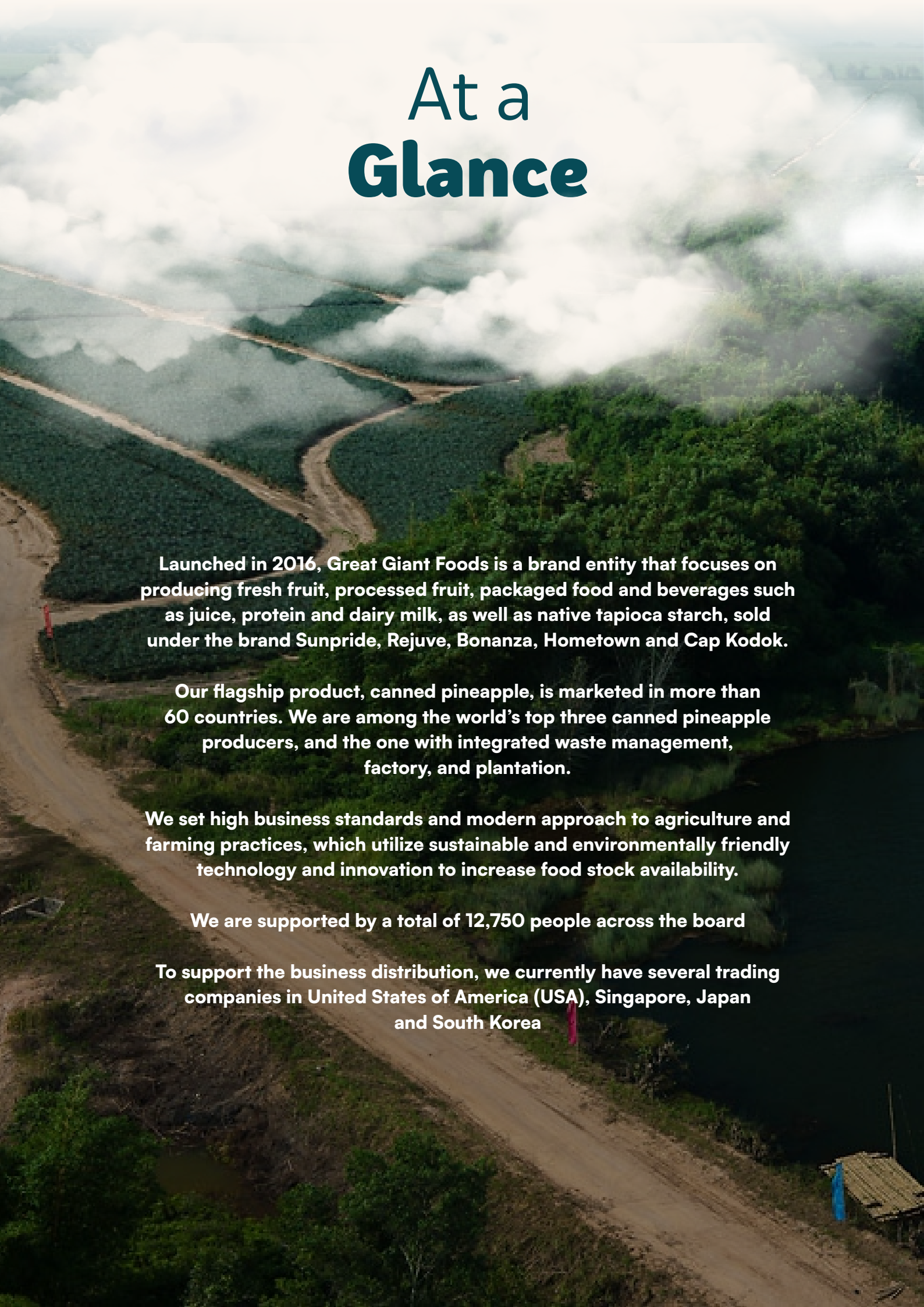
Great
Giant Foods

Regenerative Agriculture

Bringing
Nature's Best
To The Table

2022



At a **Glance**

Launched in 2016, Great Giant Foods is a brand entity that focuses on producing fresh fruit, processed fruit, packaged food and beverages such as juice, protein and dairy milk, as well as native tapioca starch, sold under the brand Sunpride, Rejuve, Bonanza, Hometown and Cap Kodok.

Our flagship product, canned pineapple, is marketed in more than 60 countries. We are among the world's top three canned pineapple producers, and the one with integrated waste management, factory, and plantation.

We set high business standards and modern approach to agriculture and farming practices, which utilize sustainable and environmentally friendly technology and innovation to increase food stock availability.

We are supported by a total of 12,750 people across the board

To support the business distribution, we currently have several trading companies in United States of America (USA), Singapore, Japan and South Korea

Bringing **Nature's Best** to the Table

Creating **Sustainable and Innovative** Products

Our **Vision**

To enrich consumers' lives by producing healthy and excellent food products.

Our **Mission**

To passionately grow quality products in innovative and sustainable ways.

Our business is recognized for its high standards and modern approach to agriculture and farming practices, which utilize sustainable and environmentally-friendly technology and innovation to increase food stock availability

GGF Priority Actions

to Support Sustainable Farming

Soil conservation & rehabilitation

Minimize soil disturbance by implementation of minimum tillage & plant ratooning, diverse crop rotation, reduce erosion by adjustment on planting pattern, and incorporation of organic matter.

Reduce chemical fertilizer & pesticide

Increasing fertilizer use efficiency, develop the use of various sustainable agriculture materials, implementation integrated pest management & biocontrols

Utilization of sustainable agriculture material

Selection of new clones with better root system, more adaptive to the environment, higher FUE, have shorter cycles, higher productivity and better fruit quality.

Superior clone selection

Conversion from deep well to surface water, minimize reservoir sedimentation, implementation irrigation technology (e.g. fertigation, soil moisture sensor) for optimizing water usage.

Optimizing water conservation & its use efficiency

Implementation of precision agriculture technology such as DSM, NDVI, sensor & IOT to optimized inputs as plant requirement, hence bring benefits for the environment.

Precision farming

Regenerative Agriculture

As Farming That Enhances

Land Productivity, Nature Conservation, Food Security And Long Term Productivity

Mindset Shifting

Degenerative Agriculture

(70-75% of global soil is degraded)

Reduce harm

Sustainable Agriculture

(Maintain Environment Productivity)

Enhance

Regenerative Agriculture

(Produce more with less)

Regenerative agriculture aims to go beyond the "do no harm" principles of sustainable agriculture

Sustainable agriculture also includes environmental enhancement, the specific focus of moving agriculture from being "non-degrading" to being "enhancing" is a particular focus of regenerative agriculture

e.g. Rhodes, 2015

Regenerative Agriculture

at Great Giant Foods

Soil

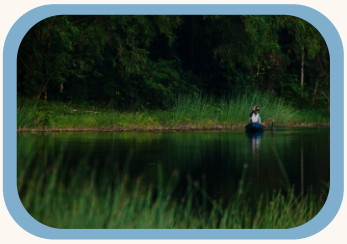
Improving soil health to ensure productivity of soil in long term use

- **The average of soil hardness**
  is in the range 150 - 225 Psi,
- **C-Organic of the soil**
  in the range of 1 — 1,5%,
- **Erosion occurred**
  in the range 11,01 — 18,00 ton/ha/year

Water

Water use efficiency and catchment area improvement to maintain water level

- **Surface water usage**
  50 - 75% of irrigation,
- **Nitrate content**
  less then 5 mg/l



Biodiversity

Development of biocontrol to converse biodiversity

- **Natural ecosystem area**
  1000-2000 Ha,
- **IPM implementation**
  25 - 50 %
- **Moderate population**
  average 1-3 individual /point sampling

Climate

Implementing farm energy efficiency to reduce GHG emission

- **Carbon emission index within processed pineapple product**
  < 0,3 kg CO2e/kg fruit

Precision Agriculture

Precision in every farming aspect

- **Planting area that use DSM data as a design basis**
  40 % - 90%,
- **Planting area that Monitored by NDVI**
  40% - 90%

Benefit of
Regenerative Agriculture

Increase C-organic until 1,5%

100% irrigation using surface water

Conserve natural ecosystem and beneficial organism

Reduce carbon emission in all products until < 0,5 kg/kg prod

RA practices may reduce chemical fertilizer and pesticide

100% area covered by Precision Agriculture practices

Great Giant Foods's
Existing Condition

Implementation of Circular Economic Model

for GGF Sustainability

Circular economy is an alternative to the traditional linear economy, where economic agents conserve resources owned and can be used for as long as possible. This is used to maximise existing resources usage. The concept of a circular economy does not only focus on zero waste, but on social factors and the provision of resources and sustainable energy as well.

As a company, GGP puts forward sustainable values, and continually attempts to implement the circular economy concept in every production process. One concrete form that we have done to realise the concept of circular economy is the implementation of Food and Energy Plantations. The application of Food and Energy Plantations is our step in achieving our main goal, which is to generate zero-waste. We will always hold on to this commitment in order to produce products that are of quality and value by not harming the environment.

Implementation of Circular Economic Model

for GGF Sustainability

1. Renewable Energy

Biogas Plant

The Waste to Energy Program

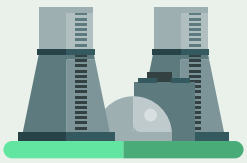
is an innovation which is a part of the GGF's Sustainable Business Strategy. It is a mitigation, a contribution to reduce GHG emission, and an adaptation to face the scarcity of fossil fuel.

Integrated with the CDM project of the UN Kyoto protocol and registered in UNFCCC.

The potential for GHG reduction
is around

20.000 - 40.000
tons CO_2 eq/year

Registered in
November 2012



UASB Reactor

Plant design capacity :
9.5 Mio Nm^3 Biogas / year

UASB efficiency :
90 — 95% of COD removal

Benefit :

1. Reduce GHG emission
2. Produce renewable energy to replace fossil fuel
3. Better waste water treatment

Implementation of Circular Economic Model

for GGF Sustainability

2. Organic Fertilizer

Liquid Organic Biofertilizer

[LOB]

is a substance which contains living microorganism, when applied to seed, plant surfaces, soil, colonizes the rhizosphere or interior of the plant and promotes growth by increasing the supply or availability of primary nutrients to the plant.

LOB production capacity around 4,2 mio lt per year, got ISO 9001 & Organic certification.The microbes in LOB has function : IAA & Cytokinin, Phospate solubilizing, N-fixing, Bio-control.

Liquid Organic Biofertilizer

is high nutrient organic fertilizer with diverse microbial communities scientifically processed and enriched by worm as its decomposer. Current production 3 ton/month, targeted 40 t/m due by 2023.

Compost Department

was established in 2012 to manage GGF's organic waste, turning it into compost and other valuable products. Compost production capacity of 3,700 ton/month. Utilize various organic waste such as pineapple stem, skin, manure, and bamboo

Black Soldier Fly

[BSF]

is a fly species which its larvae can convert organic waste into BSF Frass. The larvae itself has high protein content that can be used as animal protein source. Current production 3 ton/month, targeted 8 t/m due by 2023.

- Improve plant rooting system and shoot performance
- Improve plant productivity
- Increase water holding capacity
- They contributes to circular economy as it converts organic waste into valuable products
- BSF larvae used by LOB Production as protein source
- Increase soil biodiversity by adding microbes activities and worm cocoon into soil

Mindset Shifting From

Sustainable Farming to Regenerative Agriculture

Sustainable agriculture

defined as "**the management and conservation** of the natural resource base, and the orientation of technological change in such a manner as to ensure the attainment of continued satisfaction of human needs for present and future generations. (FAO, 2014)

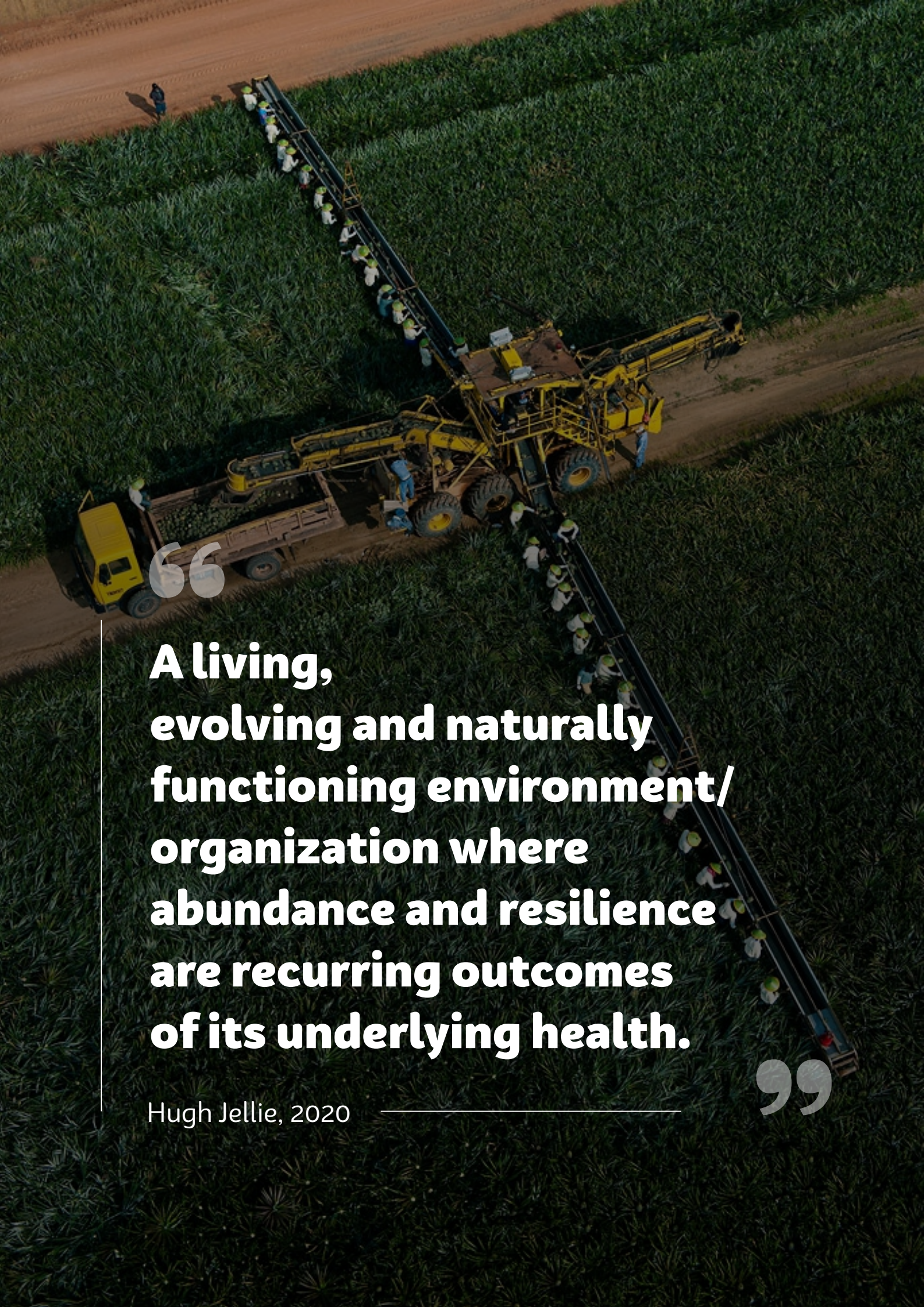
Regenerative agriculture

"**holistic farming systems that, among other benefits, improve water and air quality, enhance ecosystem biodiversity, produce nutrient-dense food, and store carbon to help mitigate the effects of climate change**". These farm systems are designed to work in harmony with nature, while also maintaining and improving economic viability. (FAO 2022)

The key difference between regenerative and sustainable agriculture is that regenerative agriculture intends to **regenerate, or renew, the productivity and growth potential.**

By definition, sustainable practices seek to maintain systems without degrading them, whereas regenerative practices apply management techniques to restore the system to improved productivity.

Regenerative is about a way of being or behavior. There is no starting or end point but a process of constant change which delivers measurable improvement in the health of the systems we work with.



A living, evolving and naturally functioning environment/ organization where abundance and resilience are recurring outcomes of its underlying health.

Hugh Jellie, 2020

Main Pillars
Regenerative Agriculture at GGF

Improvement of Soil Health

Minimize soil disturbance, improvement soil organic matter, structure, water holding capacity, rich of beneficial organism, to ensure its health in long term use with higher C sequestering capacity.

Maintaining ecosystem Biodiversity

Minimize soil disturbance, improvement soil organic matter, structure, water holding capacity, rich of beneficial organism, to ensure its health in long term use with higher C sequestering capacity.

On Farm Water Management Improvement

Minimize soil disturbance, improvement soil organic matter, structure, water holding capacity, rich of beneficial organism, to ensure its health in long term use with higher C sequestering capacity.

Effort to restore the Climate Resilience

Minimize soil disturbance, improvement soil organic matter, structure, water holding capacity, rich of beneficial organism, to ensure its health in long term use with higher C sequestering capacity.

GGF Regenerative Agriculture

Scope & Target

Issuance of **Regenerative Agriculture Guidebook** supported by independent consultant or expert

Gap self assessment and analysis of Regenerative Agriculture practices in GGF

Enhancement of compliance initiatives in Regenerative Agriculture

Self Assesment [GAP] Analysis

Pillar	Question Parameter	Level (Percent location)				Total
		0	1	2	3	
Soil	Describe level of soil hardness in plantation			✓		2
	How much C-Organic is in the soil			✓		2
	How big is the potential for erosion that occurs in the plantation			✓		2
Water	How many irrigation utilizes surface water			✓		2
	How many contaminants are found in water (Nitrate content)				✓	3
Biodiversity	How much land are conserved as natural ecosystem			✓		2
	How many soil fauna were found in the location		✓			1
	How do we implemented IPM to conserve biodiversity			✓		2
Climate	How much index of carbon emission/production				✓	3
Precision Agriculture	How many % of planting area is designed according to DSM			✓		2
	How many % of NSFC area is monitored by NDVI			✓		2

GGF Regenerative Agriculture

Scope & Target

Self Assesment Rules

Pillar	Question Parameter	Rules			
		Unit	Method	Area Observ	Time Observ
Soil	Describe level of soil hardness in plantation	Psi	Penetro-meter	20 - 40 cm	NSST
	How much C-Organic is in the soil	%	Walkey & Black	Top soil	NSST
	How big is the potential for erosion that occurs in the plantation	Ton/Ha /Yr	USLE	Location	Annual
Water	How many irrigation utilizes surface water	%	Data analisys	Location	Before irigation
	How many contaminants are found in water (Nitrate content)	Ppm	Spectrofoto-metri	Reservoar	Before irigation
Biodiversity	How much land are conserved as natural ecosystem	Ha	Data analisys	Location	Annual
	How many soil fauna were found in the location	Number	Pitt fall/ Traping	Root zone	Before harvest
	How do we implemented IPM to conserve biodiversity				
Climate	How much index of carbon emission/production (target 2030)	TCO2 / Yr	Data analisys	Total area	Annual
Precision Agriculture	How many % of planting area is designed according to DSM	%	Data analisys	Location	NSBK — NSST
	How many % of NSFC area is monitored by NDVI	%	Data analisys	Location	F-8 — F0

Assessment
Parameter

1. Soil Health

A. Soil Hardness Pineapple (0-20 cm)

Describe level of soil hardness in plantation		% Active Location in each level
0	Soil hardnes is above 300 PSi	
1	Soil hardnes is in the range 225 — 300 PSi	
2	Soil hardnes is in the range 150 — 225 PSi	
3	Soil hardnes is bellow 150 PSi	

B. Soil C- Organic General

Describes How much C-Organic is in the soil		% Active Location in each level
0	If the C-Organic of the soil is below 0,5 %	
1	If the C-Organic of the soil in the range 0,5 — 1 %	
2	If the C-Organic of the soil in the range 1 — 1,5 %	
3	If the C-Organic of the soil if above 1,5 %	

C. Soil Erosion (How big is the potential for erosion that occurs in the plantation)

Describes How much C-Organic is in the soil		% Active Location in each level
0	Erosion occurred above 25,00 ton/ha/yr	
1	Erosion occurred in the range 18,01 — 25,00 ton/ha/yr	
2	Erosion occurred in the range 11,01 — 18,00 ton/ha/yr	
3	Erosion occurred below 11,00 ton/ha/yr	

Assessment
Parameter

2. Water

A. How Many Irrigation Utilizes Surface Water

		% Active Location in each level
0	<25% of irrigation use surface water	
1	25 - 50% of irrigation use surface water	
2	50 — 75% of irrigation use surface water	
3	> 75% of irrigation use surface water	

B. How many contaminants are found in water (Nitrat content)

		% Active Location in each level
0	Nitrat content more than 15 mg/l	
1	Nitrat content in range 10 — 15 mg/l	
2	Nitrat content in range 5 — 10 mg/l	
3	Nitrat content less then 5 mg/l	

3. Biodiversity

A. How much land are conserved as natural ecosystem

		% Active Location in each level
0	No natural ecosystem area	
1	Natural ecosystem area 500-1000 Ha	
2	Natural ecosystem area 1000-2000 Ha	
3	Natural ecosystem area >2000Ha	

B. How do we implemented IPM to conserve biodiversity

		% Active Location in each level
0	<25% implemented IPM	
1	25-50% implemented IPM	
2	50-75% implemented IPM	
3	>75% implemented IPM	

Assessment
Parameter

3. Biodiversity

C. How many soil fauna were found in the location (Soil Biodiversity)

		% Active Location in each level
1	Low Population (average <1 individu/point sampling)	
2	Moderate Population (average 1-3 individu/point sampling)	
3	High Population (average 3 individu/point sampling)	

4. Climate

A. How much index of carbon emission/ production reduction (target 2030)

		% Active Location in each level
0	Index emisi karbon/ produksi >1,5	
1	Index emisi karbon/ produksi 1-1,5	
2	Index emisi karbon/ produksi 0,5-1	
3	Index emisi karbon/ produksi <0,5	

5. Precision Agriculture

A. How many % of planting area is designed according to DSM?

		% Active Location in each level
0	DSM data has not been used as a site base design	
1	1 % - 40% of planting area use DSM data as a design basis	
2	40 % - 90% of planting area use DSM data as a design basis	
3	>90% of all locations are ready to plant using DSM as the basis for site design	

B. How many % of NSFC area is monitored by NDVI?

		% Active Location in each level
0	Total NSFC area have not used NDVI monitoring	
1	1 % - 40 % of NSFC area is Monitored by NDVI	
2	40% - 90% of planting area is Monitored by NDVI	
3	>90% of all planting areas are Monitored by NDVI NSFC F-8 — F-1	

Soil Management

Soil Management

Self Assessment Checklist

Oriented Criteria	Implementation
Does GGF implement efforts to maintain and increase soil fertility in plantations?	Yes, GGF has taken steps to maintain and improve soil conditions, namely: 1. Adding organic fertilizers 2. Increasing nutrient recycling by returning plant litter to the soil 3. Fallow period 4. Crop rotation
Does GGF implement efforts to maintain and increase soil fertility in plantations using chemical methods?	Yes, GGF provides basic fertilizer before planting.
Does GGF conduct regular soil quality assessments?	Yes, GGF has conducted regular soil quality assessments to determine the condition of the soil. Measurements carried out include: 1. Chemical properties of the soil. The indicators measured were soil pH value, soil organic C, macro and micro nutrients, AL-sat and effective CEC. Land measurement is carried out when the status of the land is unloaded. 2. Land slope conditions
Is there any measurement and monitoring related to soil erosion in the plantation? Is there any effort made by GGF to reduce soil erosion?	Yes, the measurement has been done by the RnD team. GGF has implemented the following practices: 1. Making rorak in the garden. 2. Application of restoration zones around water bodies 3. Catching area 4. Location design according to contour lines.
Does the GFF employ nutrient management techniques that are implemented based on an assessment of crop requirements, regular observations of soil fertility and crop nutritional status?	Yes, the determination of plant nutrient needs is obtained from the results of soil analysis such as: soil pH requirements, C-Organic, macro and micro elements. Soil analysis was carried out before and after land clearing.
Does GGF have any efforts to reduce soil density?	Yes, plantations by substituting the use of a plow implement unit puller with a lighter unit; apply an effective random pattern; minimum tillage; compost application.
Does GGF consider nutrient inputs to plants and soil optimally and sufficient for production, but not also cause eutrophication due to overuse?	Yes, the input of nutrients is based on the results of the soil analysis.

Water
Management

Water Management

Self Assessment Checklist

Oriented Criteria	Implementation
Does GGF implement an irrigation system designed to optimize water use for crop production while minimizing wastewater, erosion, and salinity.	Yes, GGF sets the flush priority standard.
In which water use for irrigation or process does GGF develop and implement a water conservation plan to reduce water use per unit of production?	Yes, GGF documents current water use plans, evaluates water demand and future water availability, sets targets to improve water use efficiency.
Does GGF implement a liquid waste management system for all sources of liquid waste generated? And is the system periodically validated regarding the effectiveness of its management?	Yes, to ensure that the waste water is disposed of properly, in each of these operating units a Waste Water Treatment (WWT) is made to filter waste water from hazardous and toxic materials before entering the aquatic ecosystem. WWT maintenance is carried out regularly by routinely replacing the contents of the WWT tub filter and closing the drain so that it does not mix with rain water. Wastewater generated from operations in the plantation (agrochemical warehouse, dipping unit, workshop and housing) has been tested for quality standards on a regular basis. The standard used as a parameter is PP number 22 of 2021.
Is GGF aware of national regulations related to the use and maintenance of water quality? And does GGF socialize related to understanding of sustainable water management techniques	Yes, GGF designs a water management system to optimize water use for production while minimizing waste water, erosion and silinity.
Does GGF implement a water quality protection and improvement system (preventing water pollution)?	Yes, namely minimizing contamination by not using production waste water for irrigation / garden irrigation.


The Great Giant Pineapple

Bio Diversity

Bio Diversity

Self Assessment Checklist

Oriented Criteria	Implementation
Does GGF have a development plan to preserve natural ecosystems?	Yes, GGF has set a plan to maintain and preserve natural ecosystems, including: 1. No deforestation, natural trees and remaining forest trees are maintained with a ban on tree cutting in both garden areas and office and residential areas. 2. Prohibit hunting of endangered animals and plants. In addition, animals in the plantation are also not allowed to be killed, provoked, captured or traded, there are sanctions that apply to violators. 3. Prohibit the use of explosive and toxic materials to eradicate pests so as not to have an impact on the environment. 4. Preserving the ecosystem as a place to live for animals and plants that are threatened with extinction. 5. Wild animals and wildlife may not be kept or caged within the company.
Has GGS implemented methods of controlling plant pests and diseases that do not have an impact on environmental sustainability and biodiversity?	Yes, in controlling pests and diseases in the company's plantations, PT. GGP applies Integrated Pest Management (IPM), which is a pest control method that combines various control methods, with priority on the use of non-chemical, biological and physical, from seeds to plant care. If the pest threshold level is reached, agrochemicals with doses recommended by the Research team are used. The agrochemicals used consider the lowest toxicity with high selectivity, only given to the affected area and the active ingredients are rotated to avoid resistance
Does GGF care and conduct risk analysis related to the impact of using agrochemicals on biodiversity conservation? And are there controls in place?	Yes, GGF has conducted a risk analysis of the impact of using agrochemicals on the environment and implemented mitigation measures to minimize the impact of using these materials on the environment. For example, how to handle, determine the dose and how to apply.

Climate

Climate

Self Assessment Checklist

Oriented Criteria	Implementation
Is there monitoring and analyzing the flow of energy used in agricultural operations?	Yes, GGF has monitored emissions and emission sources for production activities at the plantation as well as monitoring the emission index per product.
Does GGF take steps to reduce energy intensity per unit of product by reducing or substituting the amount of non-renewable energy needed in the production process, or increasing output while maintaining the amount of energy input?	Yes, GGF implements energy management (systematic management of energy use), energy campaign programs and the use of organic fertilizers.
Does GGF have a phased plan to reduce emissions?	Yes, GGF has made short-term and long-term emission reduction targets.
Does GGF calculate and document GHG emissions? Has the company investigated the potential to be carbon neutral?	Yes, GGF has identified programs to reduce emissions to become carbon neutral. For example the use of renewable energy, fuel substitution, process optimization.
Is GGF aware of and analyzing the impact of GHG emissions at risk on climate change?	Yes, GGF is aware of this and has started making efforts to reduce energy through energy reduction programs.
Are there any efforts made by GGF to raise awareness of the sustainability of energy companies?	Yes, these efforts are through an energy campaign (an energy saving competition program between departments) and Sustainability Week (a program for GHG emission reduction campaigns for all employees at GGF in the form of seminars).

Great Giant Foods enriches people's life by producing great and healthy foods from quality and sustainable resources, in an attempt to become a great company that serves customers, the community and the country, while preserving the environment.

Great Giant Foods

Great Giant Foods
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