

Sustainable Bio-Business in ASEAN:

Introduction to CHITOSE Group

16th February 2017

Chitose Bio Evolution Pte. Ltd.

About CHITOSE Group



April 2016



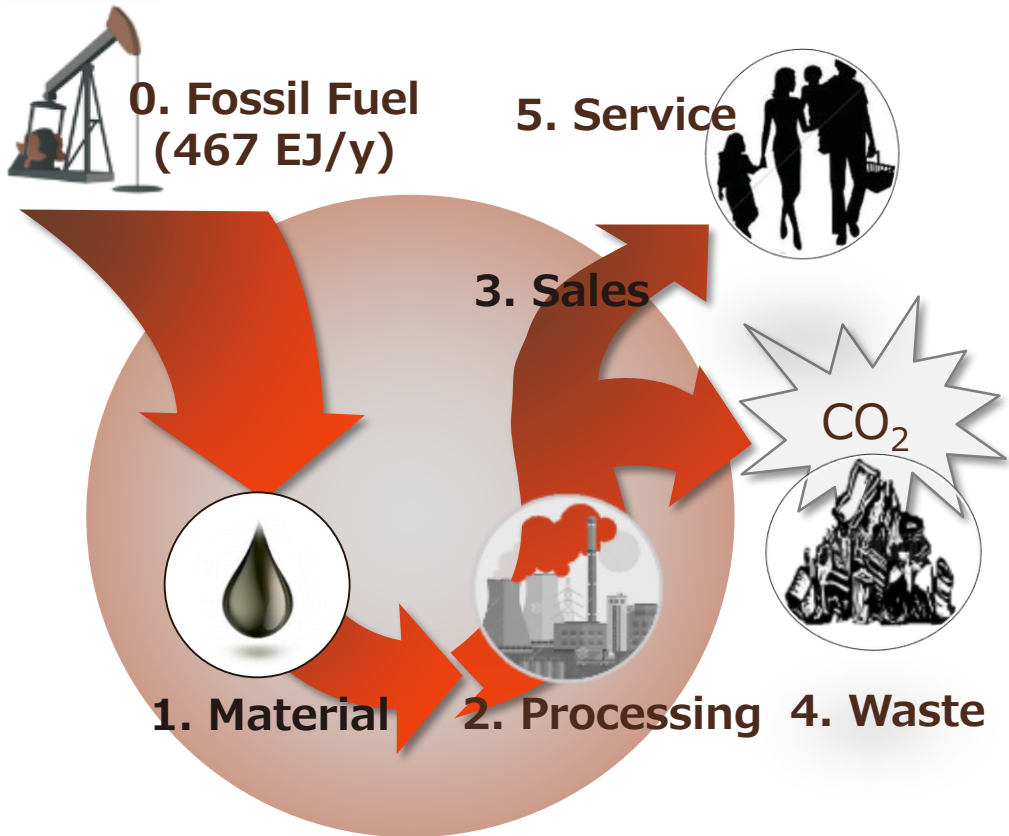
Rep.	Founder & CEO Tomohiro Fujita			
Est.	Oct. 2011			
Capital	724,015 SGD (Market Cap.: 140M SGD as of 2015)			
Share Holder	T. FUJITA	62.8%	Employee	14.6%
	Angel Investors	18.3%	IHI Corp.	4.3%
Employee	No. of Employee: 93 (incl. executives, advisors, & part-time) No. of Employees w/ science educational bg: 90% No. of Ph.Ds: 21 Nationality (JP, TW, MY, SG, PH, CN)			

History	2011	Establishment of Chitose Bio Evolution Pte.Ltd (CBE) as a holding company. Neo-Morgan Laboratory Inc. became a subsidiary of CBE.
	2012	Establishment of Chitose Agri Laboratory Sdn.Bhd.
	2013	Acquisition of Nihon Biodata Corp.
	2014	Establishment of Tavelmout Corp.
	2015	Strategic Investment from IHI corporation
	2015	Establishment of Chitose Agriculture Initiative Pte.Ltd.
Location	10 Offices & Labs (JP 5, SG, MY 3, TH)	

Our Mission

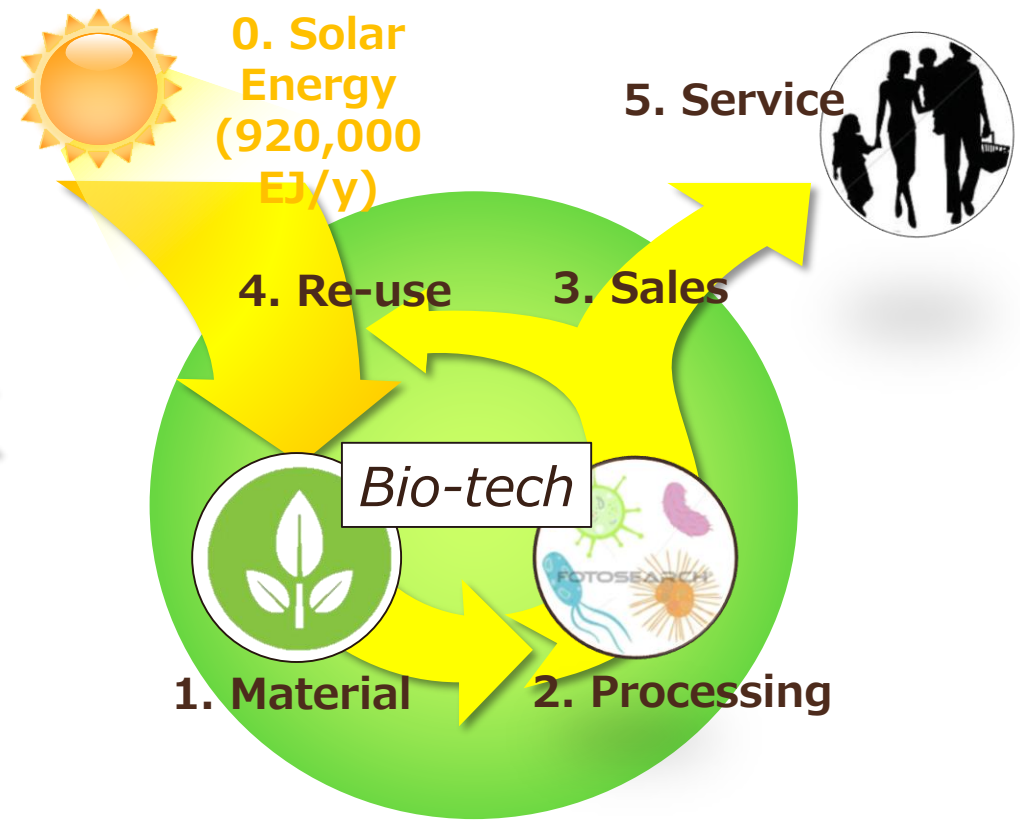
- Transferring our society from “Fossil-Fuel based” to “Solar-Energy based” through biotechnology.

Fossil-Fuel Based Society



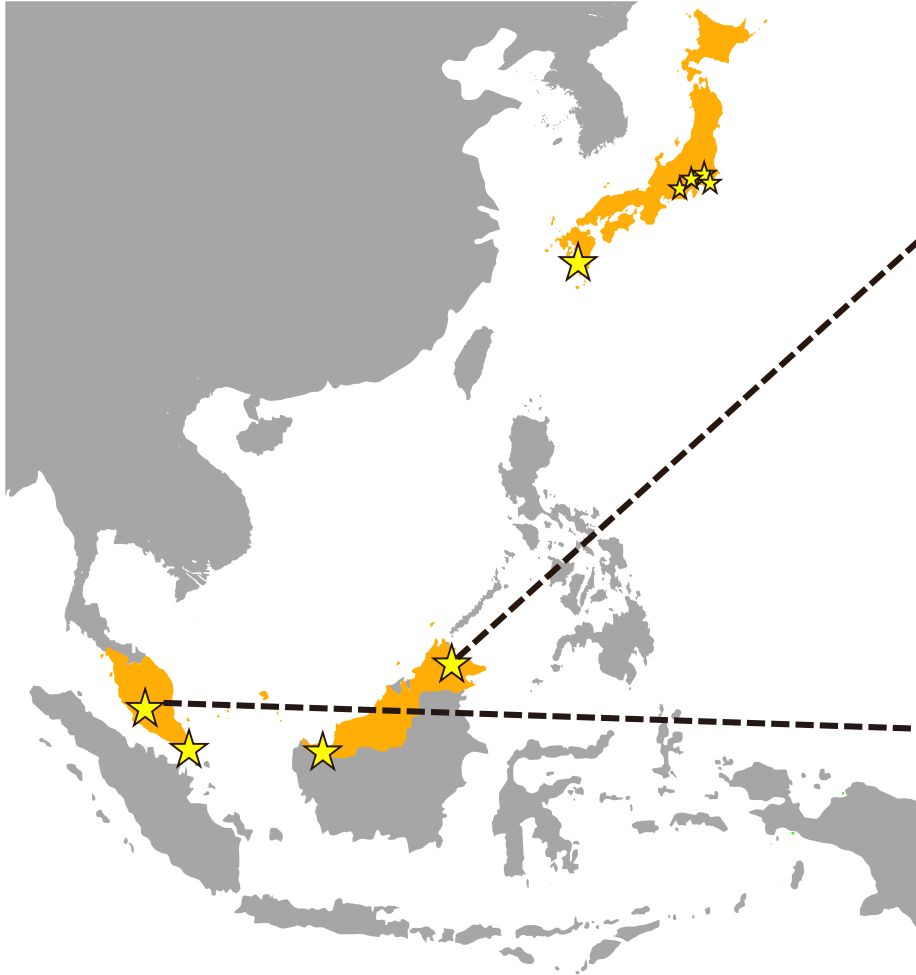
One-Way Wasting

Solar-Energy Based Society



Recycling

- We have more than ten on-going projects domestically and internationally to achieve our mission. Today, we introduce two projects we currently conduct in Malaysia.



① Utilization of Palm plantation effluent

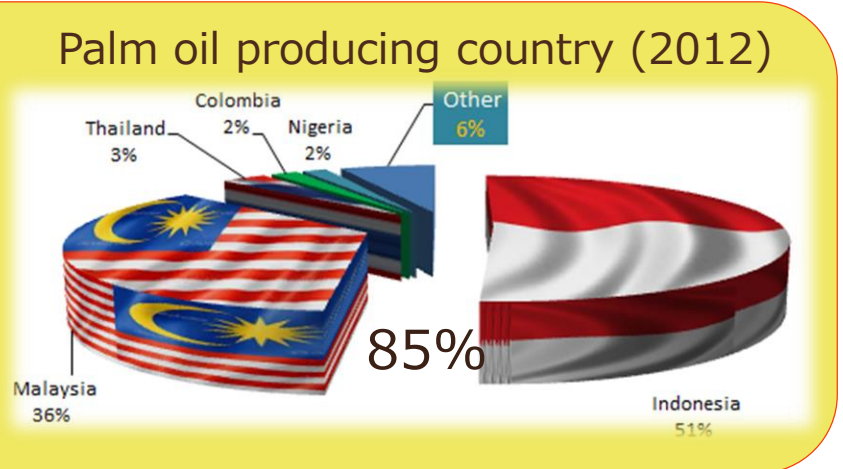
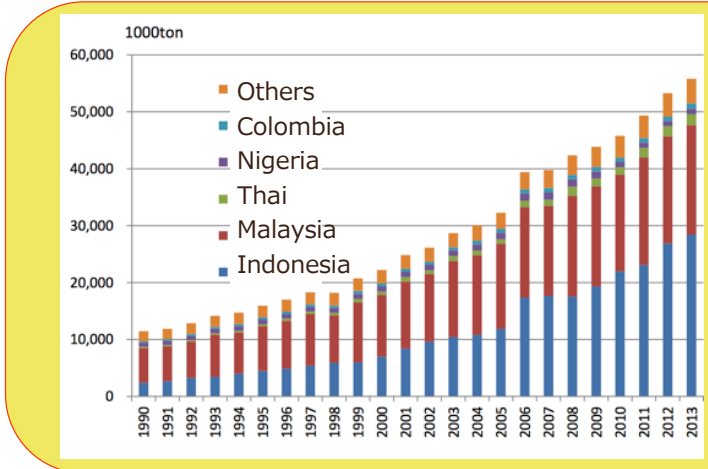


② Transferring Japanese sustainable Ag-technology



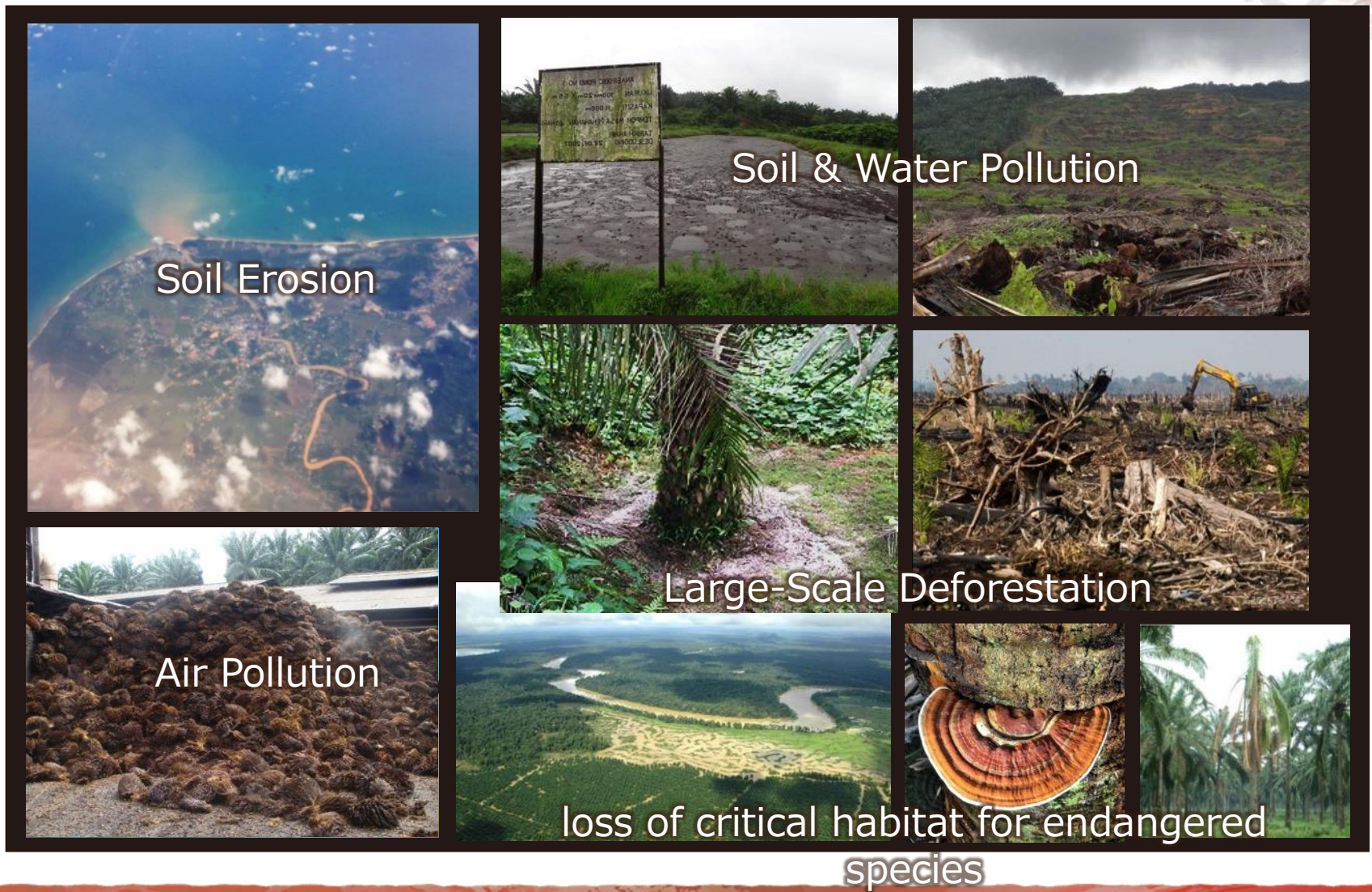
Palm Oil Industry

■ Global market size of palm oil industry is over 70 billion USD. "Oil palm belt" lies around the equator ± 10-15 degrees of latitude. Indonesia and Malaysia contribute 85% of global Palm oil production.



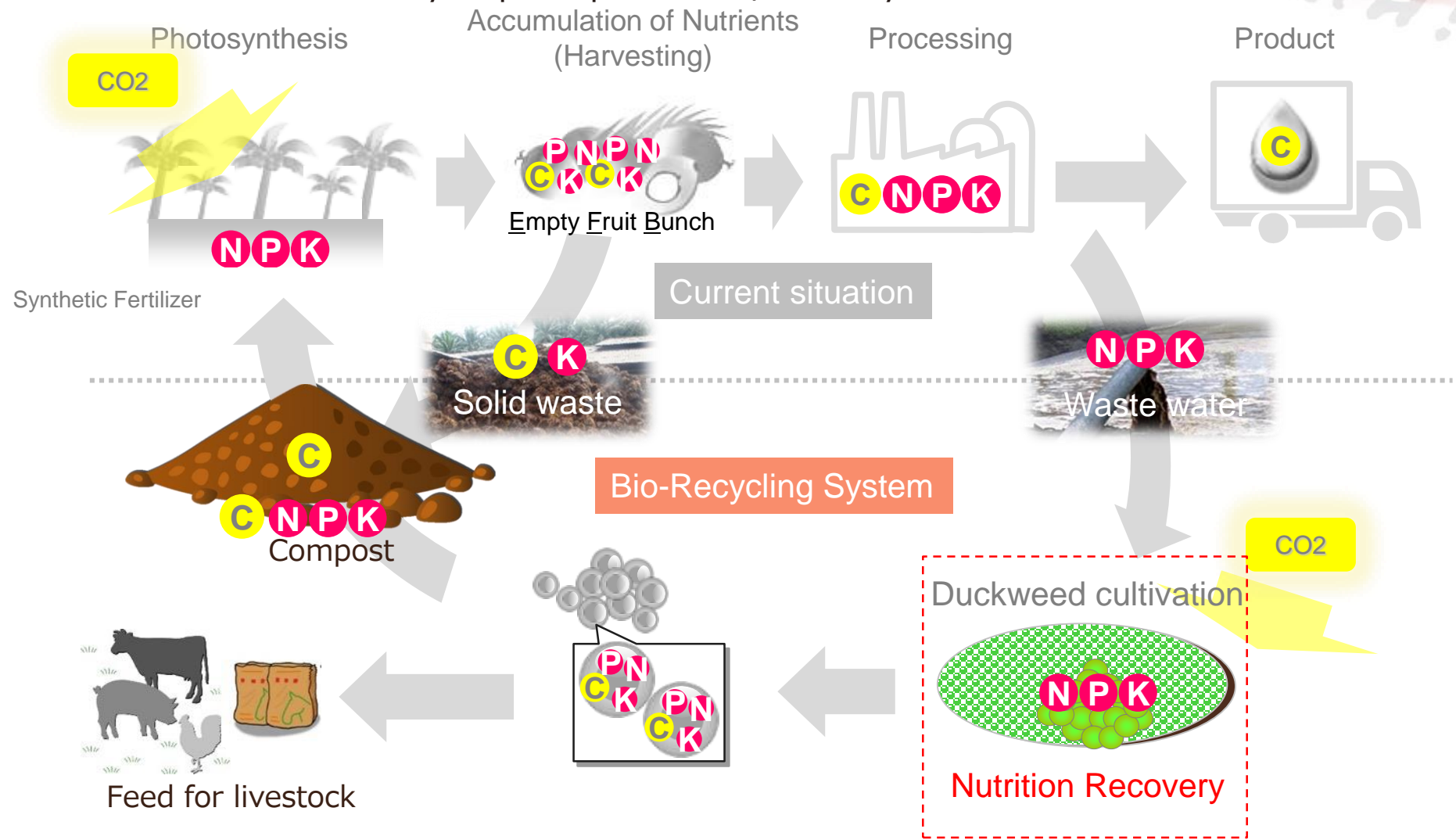
Problems Associated with Palm Plantation

- Various environmental problems associated with the establishment of huge palm plantation have been increasingly reported recently.



Bio-Recycling System

■ Palm plantation consumes huge quantity of fertilizers, Nitrogen(N), Phosphorus(P) and Potassium(K). We are implementing a nutrient recycling system aiming to improve environmental sustainability in palm plantation/industry.



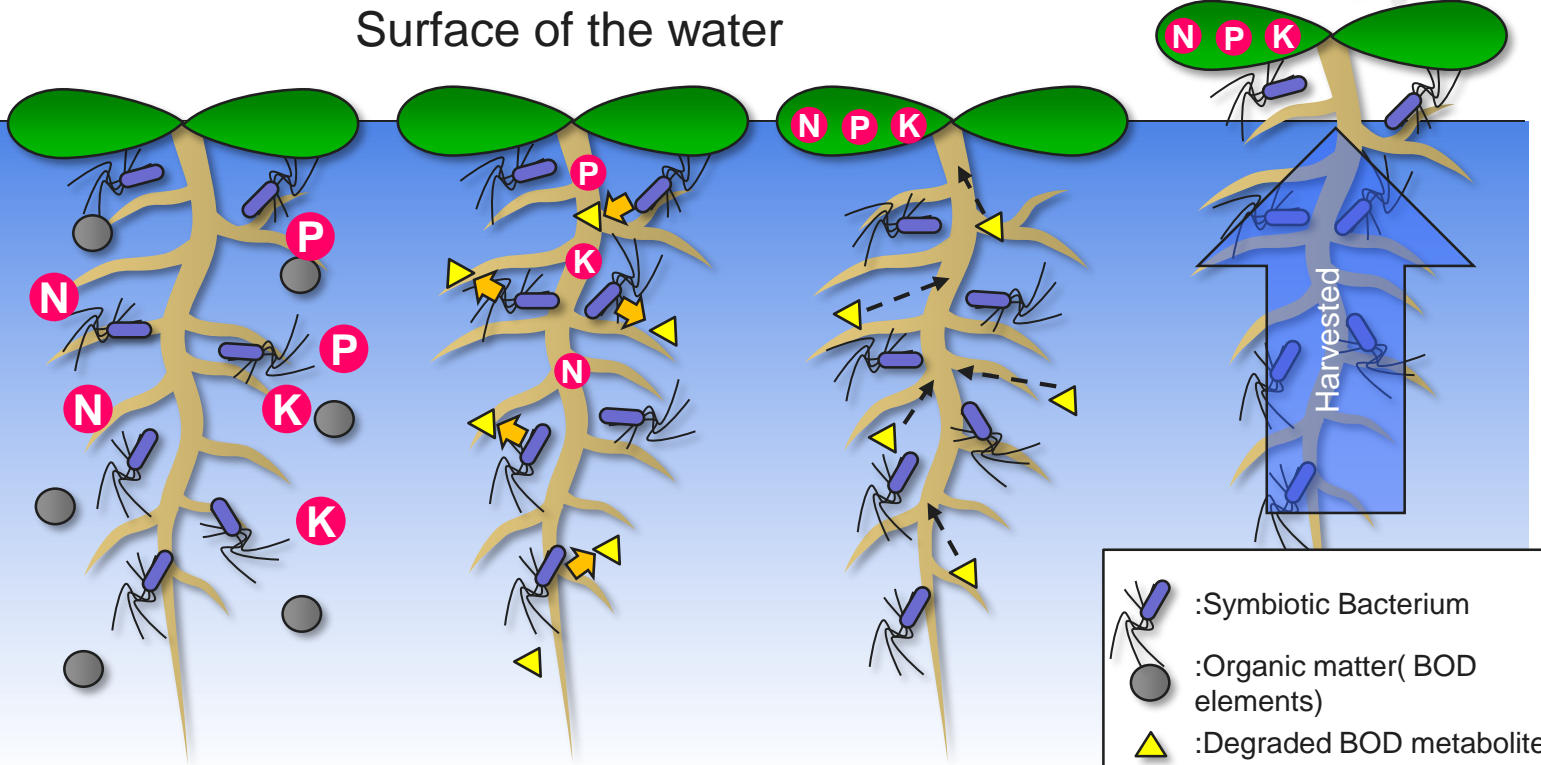
Nutrition Uptake by Duckweed

- Duckweed absorbs N,P,K in effluent and synthesizes biomass.
- Not only Duckweed itself, but also symbiotic microbial activities around Duckweed under water, contribute to decrease nutrient in the water, and thus, BOD.

Surface of the water



Duckweed



Water contains various elements including the bacterium which lives symbiotically on the surface of the duckweeds roots

Those bacterium will assimilate the organic matter(BOD elements). At the same time all the nutrient in the water will be absorbed by the duckweed for the growth.

But then duckweed will absorb the material as a nutrient source.

	:Symbiotic Bacterium
	:Organic matter(BOD elements)
	:Degraded BOD metabolite

All of these material will be removed out from the water with the harvesting of the duckweed.

Demonstration

■ We demonstrated 1-ha Bio-Recycling system.



Harvest process

Composting Duckweed Biomass

■ Duckweed and solid wastes from Palm oil mills were mixed and composted to produce bio-fertilizer.

Before operation

1st week

4th week

7th week



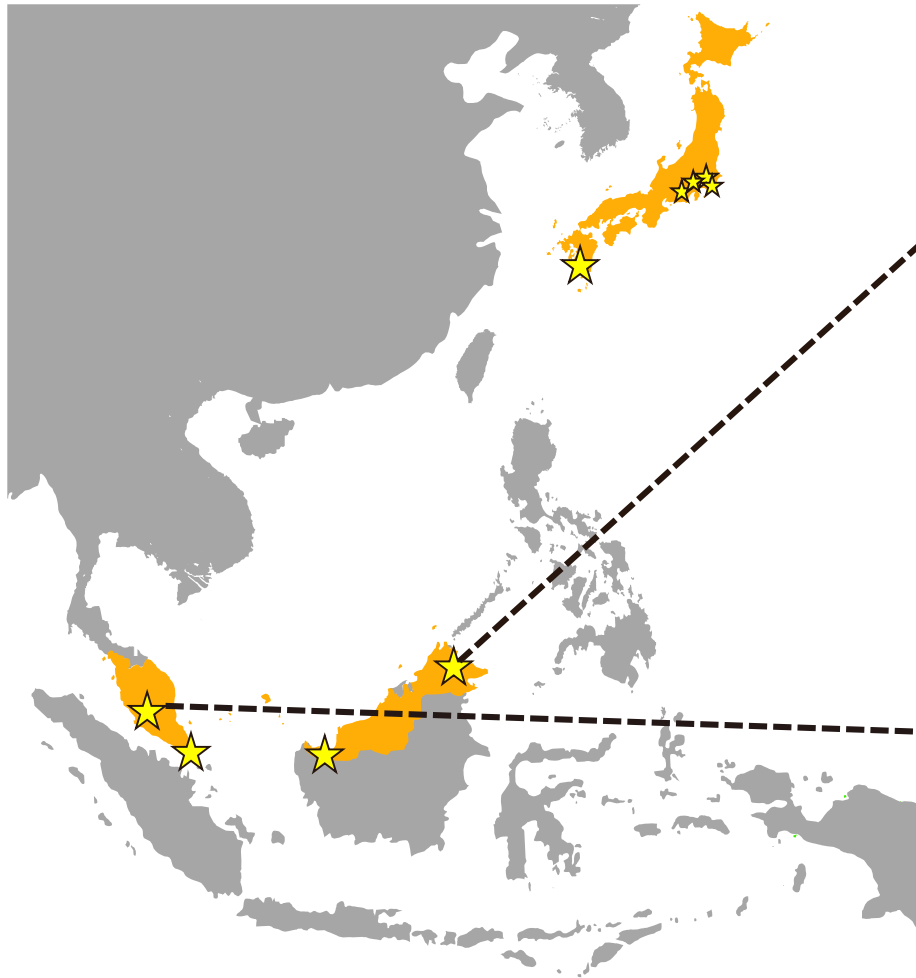
Start with Fresh EFB and solid palm waste with duckweed.

- C/N Ratio control
- Moisture control
- Activation of the NML Microbe

Maintenance of the optimum fermentation condition

Filtrate in 5mm filter. (Still hammer mill is necessary for the pelletize.)

- We have more than ten on-going projects domestically and internationally to achieve our mission. Today, we introduce two projects we currently conduct in Malaysia.



① Utilization of Palm plantation effluent




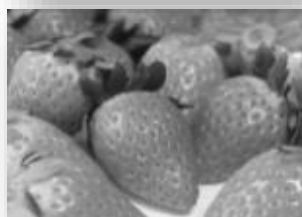


② Transferring Japanese sustainable Ag-technology



Strawberry in South-East Asia

■ “Authentic strawberries” are rarely available at local grocery stores in ASEAN countries. We planed to produce Japanese high-quality strawberry on site, and deliver them to ASEAN countries at a reasonable price.

Grade	Quality	Differences	Market share in Singapore
Prime		Japanese sweetest species × Locally produced	0%
A		Japanese sweet species × Imported	0.3% (10t/year)
B		Less sweet species × Locally produced	19.7% (600t/year)
C		Less sweet species × Imported	80.0% (2,400t/year)



Majority of commercially available strawberries at local stores are actually “Grade C”!

■ We provided advanced ag-technology from Japan, set up well-designed production system, and introduced efficient management system.

Conventional system

- Excess use of pest/herb-icides
- Low productivity
- Inefficient energy use



Inefficient piping system



Vulnerable to pests and disease due to inadequate shielding of green houses

High Environmental Impact



Stacked strawberries With inefficient sunlight usage

Our system

- **Minimized use of pest/herb-icides**
- **High productivity**
- **Efficient energy use**



Low Environmental Impact



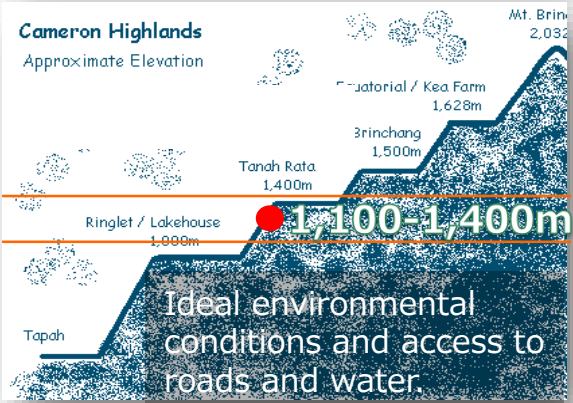
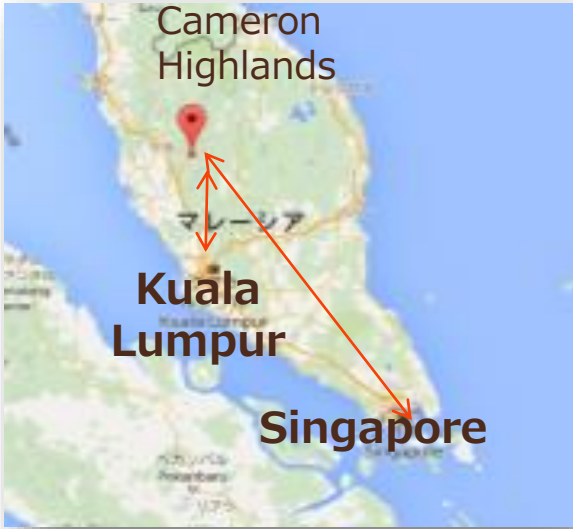
Local Production System

■ We first acquired the most suitable area, Cameron highlands, for growing strawberries. Then, we obtained the import permit of Japanese Strawberry seedling from the Dept. of Agriculture in Malaysia. Finally today, our professional farmers reside at the site and produce the Authentic strawberries..

1. Select suitable environment

2. First formal importer

3. Japanese professional farmer



CHITOSE's Whole Supply Chain

- Owning the whole supply chain allows us, CHITOSE Group, to be flexible and quick in responding to customers' requests, in optimizing processes to assure the quality of our prime strawberries.

Production
/quality control



Packing with functional
film



Functional packaging
materials to preserve the
freshness of strawberries.

Delivery to our
customers by staff,
strawberry expert!



*Chitose Agri Laboratory is the subsidiary or Chitose Bio Evolution. Ptd. Ltd, or CHITOSE Group.

Market Reaction

CULTURE THE EAST

■ Our strawberries have gained a good reputation.



-Emmanuel Stroobent, the chief executive chef of Saint Pierre

"The sweetest softest strawberry I've ever eaten. Maybe sweeter than the imported strawberry from Japan"

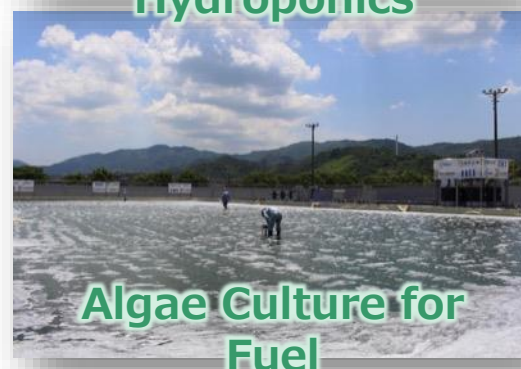
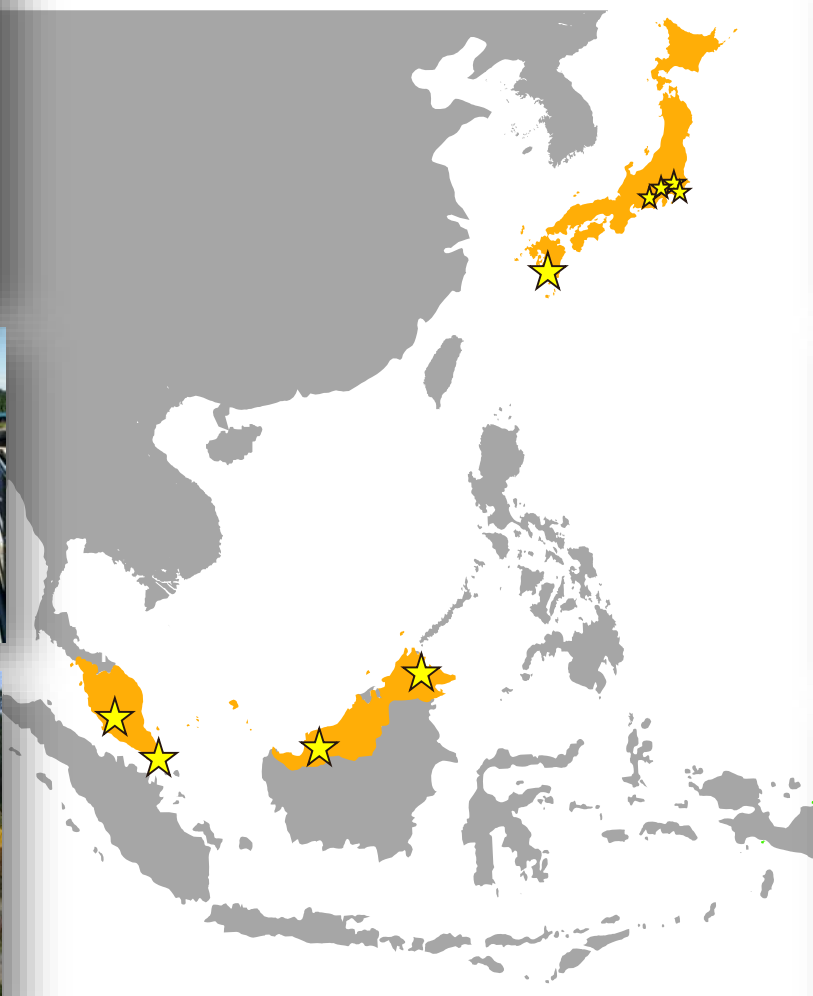


-Tomoharu Morita, the patissiere of Pantlar



Other Businesses

- We are accelerating to set up several Bio-Recycling business in ASEAN countries through biotechnologies.



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 CHITOSE

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