



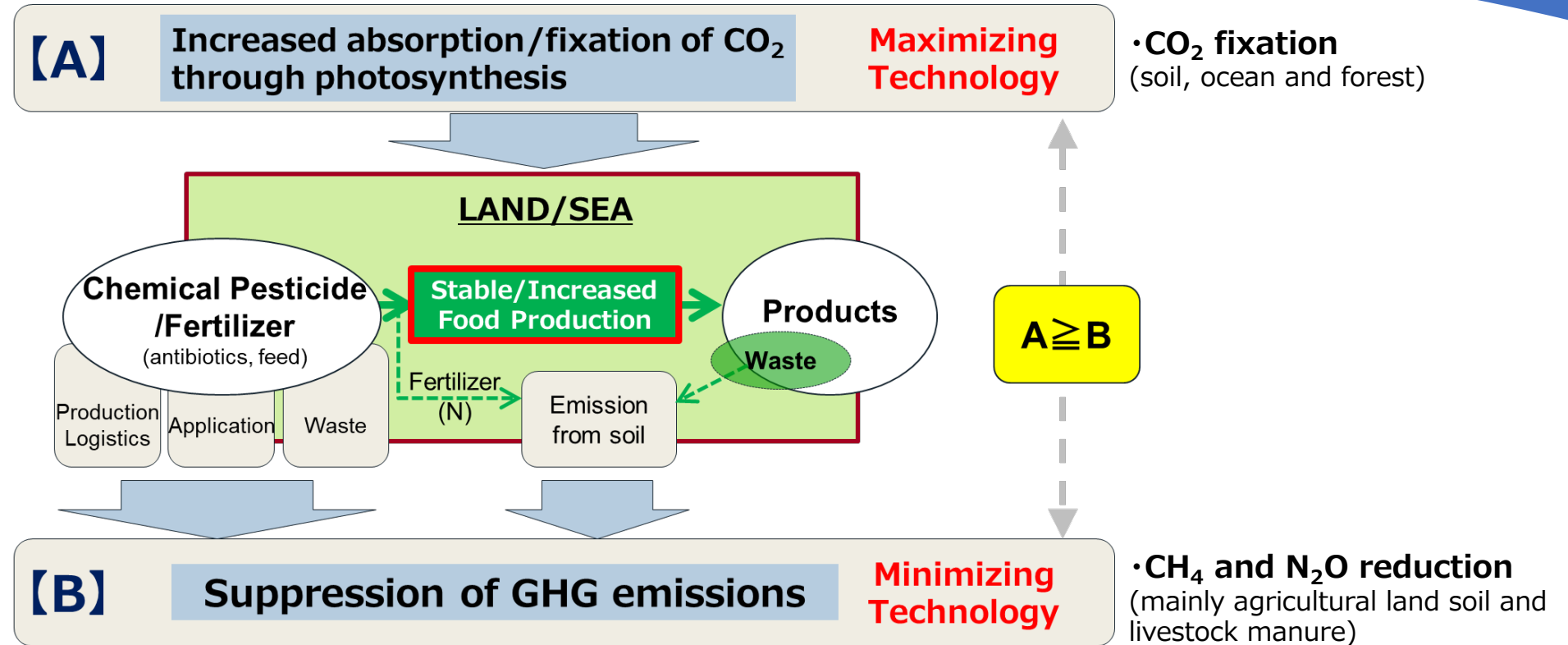
Smart Cultivation Subcommittee

Continuous Primary Production System

~maximizing the use of biotechnology~

- Leadership organization: Yanmar Holdings Co., Ltd.
- Subcommittee head: Eiji MICHIGAMI
- Leaders: Hideki TAKAHASHI, Atsumi KONISHI

Target: Realize Smart Cultivation that sustainably balances Stable Food Production and Carbon Neutrality by making the most of biological functions



GOAL

by maximizing bio-functions; ● Stable/increased food production in preparation for population growth and climate change
 ● GHG suppression generated from food production

Basic Framework of the Smart Cultivation Subcommittee

Social issue: Realize sustainable primary industry

[A] Increased absorption/fixation of CO₂ through photosynthesis

[B] Suppression of GHG emissions



Utilization of CO₂-fixed biomass

- 1) Utilization as alternative fossil fuel energy
- 2) CN biomass (bio-char)

Blue Carbon fixation to the ocean

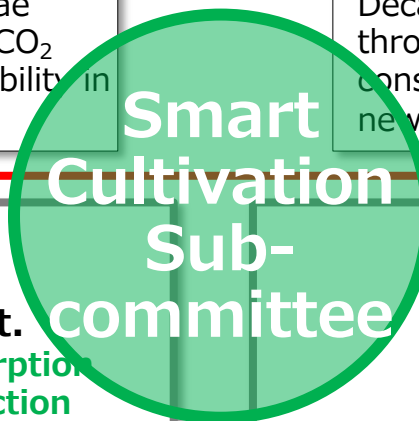
Seaweed & microalgae
Utilization with high CO₂ absorption/fixation ability in sea, river and lake

Sophisticated Urban Agriculture

Decarbonized production through not only energy conservation but urban renewable energy & recycling

GHG reduction from paddy fields

Suppressing the generation of N₂O and CH₄ through soil microbes and soil mgmt., and exporting technology



Common Base Technology

- Visualization
 - Data-driven
 - Process mgmt.
 - Next Gen. Breeding
 - Super Plants
 - Rapid breeding technology
 - Genome editing tools
- ➔
- Enhanced CO₂ absorption
 - GHG emission reduction
 - Enhanced environmental resistance (dry land, climate change)





Common Social Infrastructure

- Demonstration field
(Collaboration with local bio-communities)
- Link with J-Credit
(GHG visualization and incentives)

By combining Yanmar's solutions (HW/SW) for primary-industry producers, the industry/academia/government members will continue to practice a sustainable primary industry

Proposed schedule



	Major item	Effort area	2021	2022	2023	2024	2025	2026
[A] Increased absorption/fixation of CO ₂ through photosynthesis	 Utilization of CO₂-fixed biomass	1) Utilization as alternative fossil fuel energy 2) CN biomass (bio-char)	Consortium building Partner interview ↔	F.S. partner selection ↔	Social implementation demonstration →			
	 Blue Carbon fixation to the ocean	Seaweed & microalgae Utilization with high CO ₂ absorption/fixation ability in sea, river and lake		Consortium building Partner interview ↔ F.S. partner selection ↔	Social implementation demonstration →			
[B] Suppression of GHG emissions	 Sophisticated Urban Agriculture	Decarbonized production through not only energy conservation but urban renewable energy & recycling	Consortium building Partner interview ↔	F.S. partner selection ↔	Social implementation demonstration →			
	 GHG reduction from paddy fields	Suppressing the generation of N ₂ O and CH ₄ through soil microbes and soil mgmt., and exporting technology	Consortium building Partner interview ↔	F.S. partner selection ↔	Social implementation demonstration →			