Building the Future: Gtech's Three Pillars

MISSION
Our purpose and commitment

Building a sustainable future by harnessing microbes in agriculture and ecosystems.

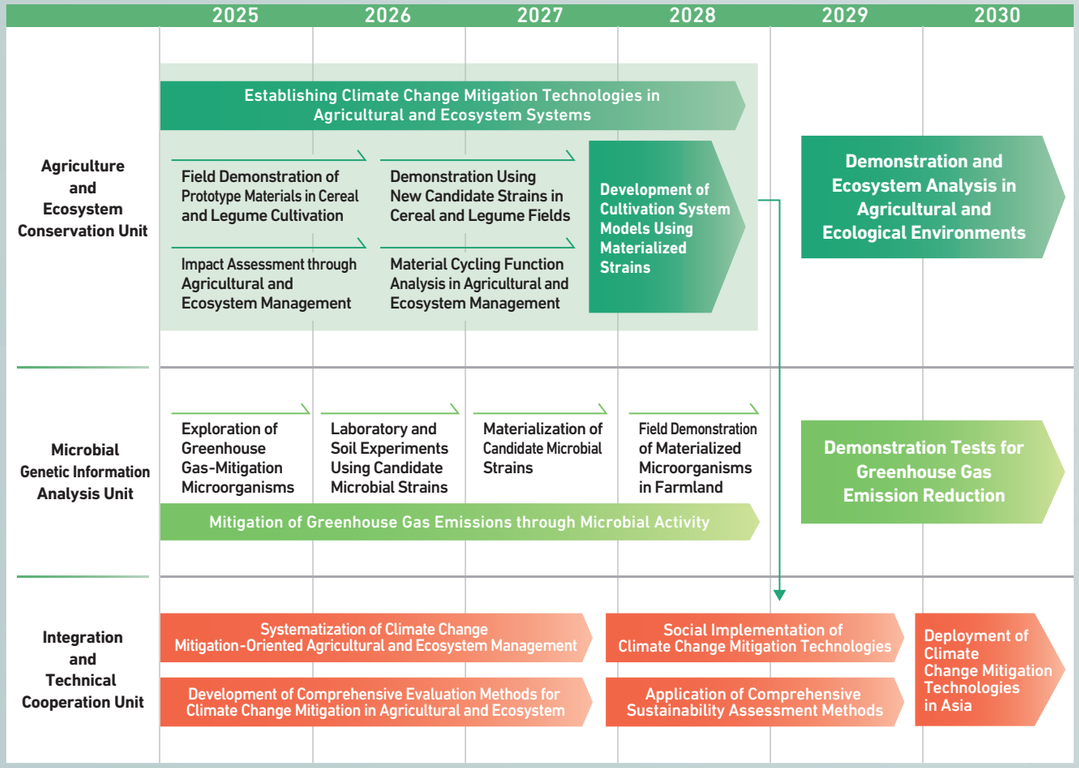
VISION
Our mid-to long-term goals

From Ibaraki to Asia, contributing to a sustainable and climate-resilient future.

VALUE
Our guiding principles

- Integrate micro and macro perspectives - from microorganisms to the planet
- Scientifically elucidate material cycles in agriculture and ecosystems and drive innovation
- Implement research outcomes in society and expand sustainable social value from the local community to the world

Roadmap



Gtech
Since 2025

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From Ibaraki to the World
Building the Future of
Climate Change Mitigation!

Are agriculture and ecosystems major contributors to anthropogenic greenhouse gas emissions?

What comes to mind when you think of the main sources of greenhouse gas emissions? Many people might picture the burning of fossil fuels or deforestation. However, agriculture and ecosystems also play a major role in greenhouse gas emissions.

Rice cultivation and livestock digestion release methane (CH_4), while crop fields emit nitrous oxide (N_2O). These emissions are the result of microbial activity. At the same time, there are also microbes that can use or break down these gases and transform them into other substances.

In other words, controlling microbial activity is key to reducing greenhouse gas emissions.

? What is Green-Bio?

"Green-Bio" at Gtech focuses on the environment ("green") and microorganisms ("bio"). This initiative uses the power of microorganisms found in agriculture and ecosystems to help control greenhouse gas emissions and contribute to climate change mitigation. We explore how these microbes function, tap into their potential, and create a society where sustainable agriculture and the environment live in harmony.

Green = Environment

Bio = Microbes

Technology = Science & Technology

Three Units Bridging Micro and Macro Perspectives to Create and Deliver Unique Technologies to Society

Gtech is advancing research not only on reducing greenhouse gas emissions through Green-Bio Technology, but also on environmentally friendly agriculture that increases soil carbon storage in farmland-such as no-till farming and cover crops (green manure).

From Ibaraki to Asia and the World.

This center conducts research on climate change mitigation in agriculture and ecosystems, contributing globally with Asia as its base.

Development of Visualization Technologies and Collaboration at Home and Abroad

Integration and Technical Cooperation Unit

Macro Perspective

Micro Perspective

Agriculture and Ecosystem Conservation Unit

Mitigating Climate Change through Smart Management of Microorganisms and Ecosystems

Microbial Genetic Information Analysis Unit

Harnessing Microorganisms to Develop Greenhouse Gas Mitigation Technologies

Methane from rice paddies!

Research for optimal management!

Methane from livestock!

Microbes that use & reduce GHGs!

Reduce GHGs through microbial control!

01 Agriculture and Ecosystem Conservation Unit

Mission

Reduction of Greenhouse Gas (GHG) Emissions in Agriculture and Ecosystems through the Use of Microorganisms

- Quantitative assessment of GHG emissions based on international standards
- Reduction of methane emissions from paddy soils using GHG-consuming and -eliminating microorganisms (communities)
- Reduction of nitrous oxide emissions from cropland soils through the use of microbial materials and optimized management of agricultural ecosystems
- Establishment of scientific evidence for biodiversity conservation and carbon sequestration in cropland soils through no-tillage cultivation

02 Microbial Genetic Information Analysis Unit

Mission

Elucidation of Microbial Material Cycling Functions through Genome Analysis

- Exploration, isolation, and identification of GHG-consuming and -eliminating microorganisms (communities) based on genetic information
- Integrated analysis of microbial genetic information, soil environmental data, and GHG emissions using bioinformatics

03 Integration and Technical Cooperation Unit

Mission

Development of Environmental Assessment and Visualization Technologies and Creation of Collaborative Networks toward Social Implementation

- Comprehensive evaluation of the economic and environmental aspects of conservation agriculture, including no-tillage cultivation and cover crops, for social implementation
- Collection of social needs and formation of industry-academia-government collaborative projects
- Creation of collaborations within and outside the center and management across units