

Creation of the industry that enables sustainable global food supply by exploiting unused biological resources by 2050.

Program Director (PD) **CHIBA Kazuhiro** President, Tokyo University of Agriculture and Technology

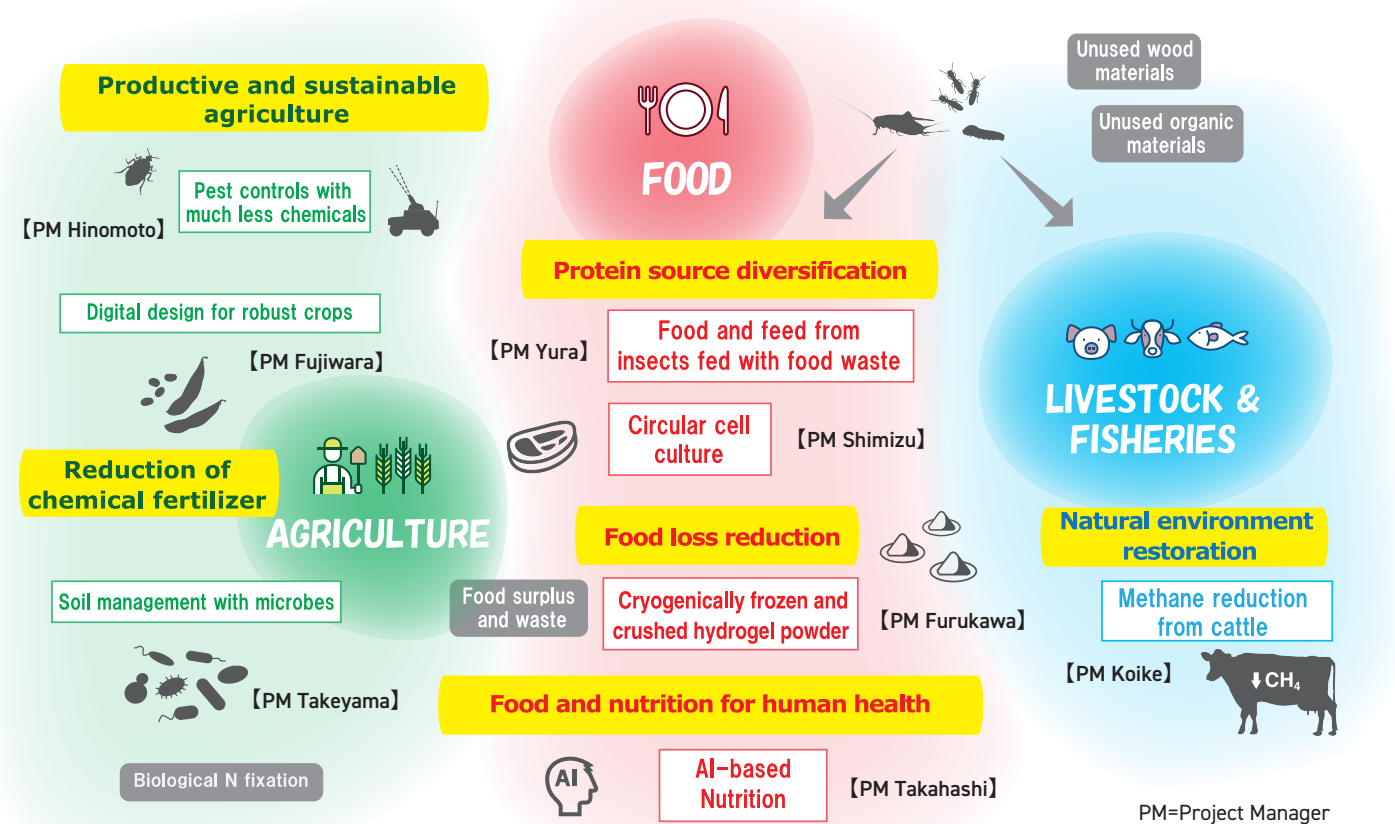
Outline

The global demand for food is estimated to increase 70% by 2050. Since excessive focus on production efficiency would hamper the cyclical function of the earth, it is essential to establish a food production system friendly to the global environment while increasing the food supply. Moonshot Goal 5 aims to address the issue with eight R&D projects, which are promoted by the Bio-oriented Technology Research Advancement Institution.

Message from PD

With the formation of agrarian societies, humankind has acquired a stable method of sustainable food supply. However, with the dramatic expansion of human activities in recent years, the sustainable supply of food, which is an inseparable part of human existence, has fallen into a situation where there is no longer any prospect for the immediate future. Overcoming this difficulty is not only a great responsibility we have for the future, but also an intellectual challenge with unexperienced problems. With a clear vision and the ability of design, we must think outside the box and solve the global-scale problems.

Sustainable food supply for 9 billion people



FUJIWARA Toru



TAKEYAMA Haruko



SHIMIZU Tatsuya



HINOMOTO Norihide



KOIKE Satoshi



YURA Kei



TAKAHASHI Shin-ichiro



FURUKAWA Hidemitsu

R&D Projects

Food Production

Developing environmentally robust crops based on a new design approach

Project Manager **FUJIWARA Toru**
Professor, The University of Tokyo

Outline The breeding process will be substantially faster with digital designing technology to develop crops which can be grown in extreme environments.

Enhancing soil microbial functions based on detailed understandings of soil ecology

Project Manager **TAKEYAMA Haruko**
Professor, Waseda University

Outline The complex interaction of soil microbiology will be analyzed in detail and controlled to allow optimal crop and soil management.

Sustainable circular food production system driven by animal cells and algae

Project Manager **SHIMIZU Tatsuya**
Director, Professor, Tokyo Women's Medical University

Outline Sustainable food will be produced through a circular animal cell culture system using algae as nutrients and recycling waste culture fluid.

Developing non chemical pest controls

Project Manager **HINOMOTO Norihide**
Professor, Kyoto University

Outline Insect pests will be managed through a combination of non chemical methods such as blue laser rays, new natural enemy strains and microbiological techniques.

Raising cows with less methane emission

Project Manager **KOIKE Satoshi**
Professor, Hokkaido University

Outline Methane emission will be substantially reduced by controlling microorganisms in cows' rumens.

Food Consumption

Producing food and feed from insects fed with food wastes

Project Manager **YURA Kei**
Professor, Waseda University

Outline Food and feed will be produced from unused resources such as food waste, with the efficient metabolism of insects such as crickets and black soldier flies.

Developing food through an AI nutrition system

Project Manager **TAKAHASHI Shin-ichiro**
Project Professor, The University of Tokyo

Outline Food and nutrition suggestion will be made with AI technology to meet personal needs and conditions.

Reducing Food Loss with "Unused Foodstuffs" × "Cold Energy of LNG"

Project Manager **FURUKAWA Hidemitsu**
Professor, Yamagata University

Outline We will manufacture hydrogel powder using unused foodstuffs and LNG cryogenic energy (cold energy generated when liquid natural gas vaporizes), establish long-term storage technology in ultra-low temperature warehouses to create added value for unused foodstuffs, and aim to build a social system that promotes ethical consumption.



https://www.naro.go.jp/laboratory/brain/english/moon_shot/

Program Director
CHIBA Kazuhiro

