Moving up the food chain

Using ROBOTICS, SENSORS, BIG-DATA SIMULATIONS, MICROBES AND GENOMICS, Japan is tweaking food supply at every level to boost food security, sustainability and markets.

Currently Japan imports roughly 60% of its food. Secure access to international food supply is critical. But a growing global population and crises, such as the coronavirus pandemic, put pressure on this supply. "In the near future, we may not be able to buy food, no matter how much we pay," warns Noriaki Kobayashi, who is program director of Technologies for Smart Bio-industry and Agriculture, one of 12 initiatives in the Japanese government's Cross-ministerial Strategic Innovation Promotion Program (SIP), currently in its second phase.

The aim is to raise the food self-sufficiency rate in Japan from 37% in 2018 to 45% in 2030 on a calorie basis. This effort will centre on a new data platform that connects food from the breeding process to farming, distribution, sales, consumption and recycling, explains Kobayashi. The technology builds on the Agricultural Data Collaboration Platform (WAGRI) developed during the first phase of the SIP project.

Kobayashi says what makes SIP's five-year 'Smart Food System' project unique is its encapsulation of the whole system, including distribution and consumption. The group will be looking for significant reductions in food loss and working hours for farmers during early verification tests.

The group would like the expansion of the bioeconomy and agricultural technologies to add 240 billion yen to Japanese markets in the near future. Along with a growing the demand for Japanese cuisine and high-end fruits, the hope is that this project will also contribute to increasing the export value of agricultural, forestry and fishery products from 910 billion yen in 2019 to 5 trillion yen by 2030.

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Japan has already been a pioneer in the development of sensors, actuators and auto-navigation technologies for farming, Kobayashi points out. Driverless tractors that can be controlled remotely are crucial in a country in which 40% of the farmland is hilly or mountainous terrain. Demand for these technologies is now growing in South East Asia and regions with similar landforms.

Japan also has prowess in other areas, such as functional food research, biomass plastics, wastewater treatment and cold-chain technologies.

Kobayashi says the challenge now is translating and connecting these advances. More discussion is needed between both domestic and global research groups involved in global food markets, he adds. "With international collaboration, we should be able to revolutionize the food business model so that it's more sustainable for everyone."

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SIP
Cross-ministerial Strategic Innovation Promotion Program

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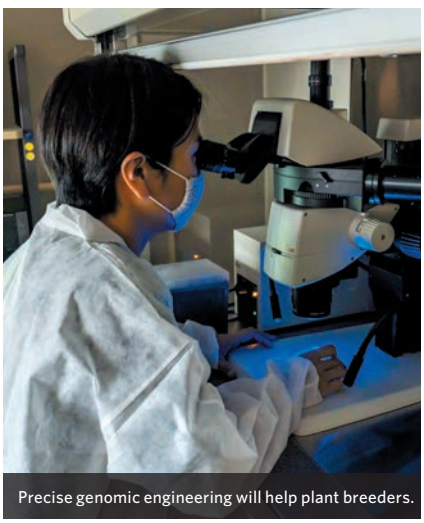
https://www8.cao.go.jp/cstp/english/sipoverview.pdf



Precise genomic engineering will help plant breeders.

Data on supply and demand will streamline markets.

Noriaki Kobayashi is the program director.