



National Research and Development Agency
Forest Research and Management Organization

Forestry and Forest Products Research Institute



Message from the Director General

Forest Research for Achieving Sustainable Development Goals

Sustainable Development Goals (SDGs) address issues affecting the entire planet while attempting to realize a sustainable society. Goal 15 outlines the “sustainable use of terrestrial ecosystems” and is an important goal for the Forestry and Forest Products Research Institute (FFPRI). However, because forests provide a wide variety of ecosystem services, we are concerned with a wide range of objectives in addition to goal 15. Indeed, the FFPRI conducts comprehensive researches on all aspects of forests to realize a sustainable society.

In the current era, our lives considerably depend on non-renewable and depleting resources such as fossil fuels and minerals. In contrast, the services and resources provided by forests are renewable. However, if mishandled, such resources can also deplete. Therefore, forests and other renewable resources will play a vital role in creating sustainable societies in the future. Forest researchers are vital to this process, as they conduct key research necessary to realize SDGs by the target year of 2030 as well as 2050, the target year for achieving zero carbon emissions.

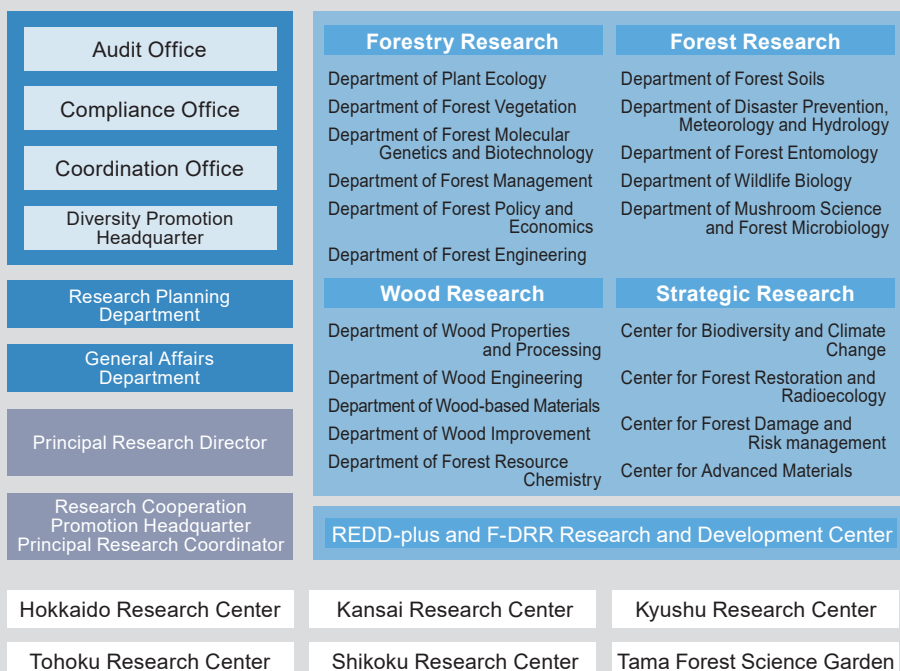
During its history of over 110 years, the FFPRI has been conducting interdisciplinary research on forests, forestry, the timber industry, and tree breeding. We have paved the way for transdisciplinary research with existing stakeholders. Going forward, I hope the FFPRI can co-design and collaborate more diverse stakeholders (international organizations, government officials, industry leaders, educational institutions, forest owners, beneficiaries of ecosystem services, and future generations) on forest-related research. We look forward to collaborating with you in the future in a variety of ways.

Tohru Nakashizuka (Toru Asano)
Director General of FFPRI

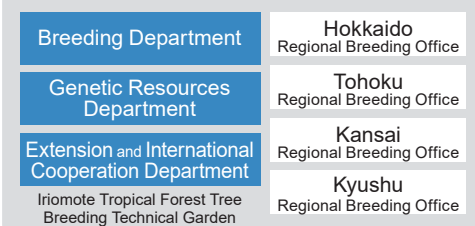


Organization

Forestry and Forest Products Research Institute



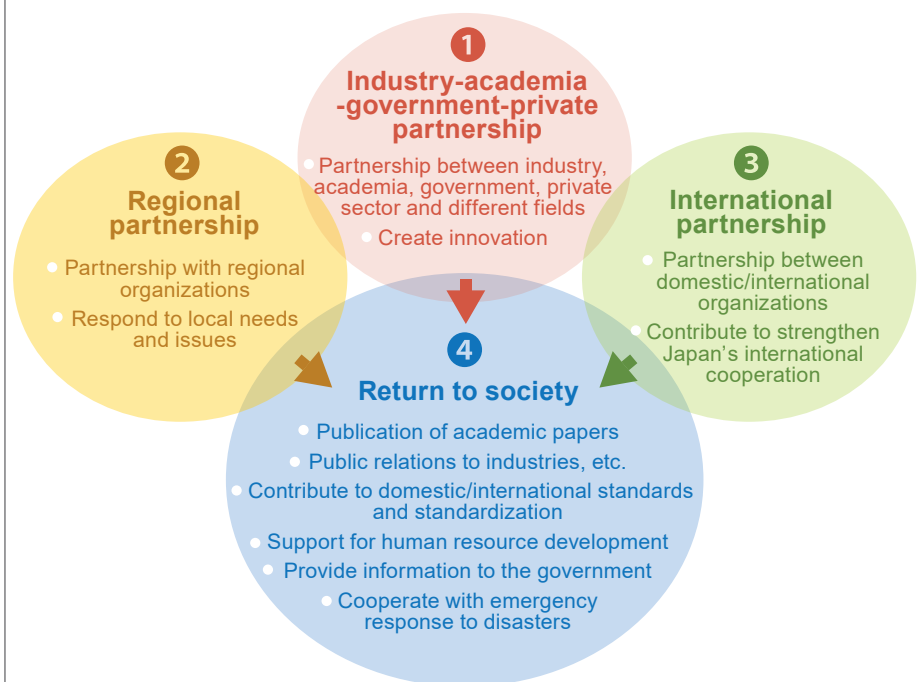
Forestry and Forest Products Research Institute Forest Tree Breeding Center



Forestry and Forest Products Research Institute Forest Bio-Research Center

What FFPRI aims for

Maximization of Research and Development Achievements and Return to Society



- 1** Create innovation by promoting collaboration between industry, academia, government and different fields in order to maximize research and development achievements in response to social conditions, technological changes and new needs in forests, forestry and wood industry.
- 2** Respond to local needs and issues by promoting collaboration between public research institutes, corporations and national forests through utilization of local councils and networks.
- 3** Promote Japan's international contribution by seeking solutions to international issues through collaboration with domestic/international research institutions and organizations.
- 4** Return research and development achievements to society through publication of academic papers, public relations to industry, contribution to domestic/international standards and standardization, support for human resource development, provision of information to the government and cooperation with emergency response to disasters.

History

1905

Inaugurated as a forest experiment unit of the Forest Bureau in the Ministry of Agriculture and Commerce at Meguro in Tokyo

1910

Renamed the Forest Experiment Station, Forest Bureau, Ministry of Agriculture and Commerce

1947

Reorganized as the Forest Experiment Station, Forest Bureau, Ministry of Agriculture by unifying the forestry experiment organizations under an integrated Forestry Administration

1978

Moved from Meguro Ward in Tokyo to Tsukuba Science City

1988

Reorganized and renamed the Forestry and Forest Products Research Institute (FFPRI)

2006

Started the second midterm plan (2006-2010)

2007

Integrated with the Forest Tree Breeding Center

2001

Established as an incorporated administrative agency, and, as part of Administrative reform, started the first midterm plan (2001-2005)

2011

Started the third midterm plan (2011-2015)

2015

Started as the National Research and Development Agency

2016

Started the 4th midterm Plan (2016-2020)

2021

Started the 5th midterm Plan (2021-2025)

2017

Renamed the Forestry and Forest Products Research Institute of the Forestry Research and Management Organization

Budget

Fiscal Year 2023 Budget

(Unit: million Yen)

Operational grants-in-aid	10,225
Facilities maintenance subsidies	314
Trust revenue	806
Miscellaneous revenue	31
Total	11,376

Number of Staff

as of 1 April 2023

Researchers	494 (86)
Officers	275 (71)
Total	769 (157)

Numbers in parentheses indicate those of women.

Employees who are temporary, on administrative leave, or re-employed are included.

Research and Development

Three Key Challenges

1. Research and development for the fulfilment of the multiple functions of forests in a changing environment

We will develop forest management technology that ensures forests perform their multiple functions to contribute to national resilience and solutions to environmental issues related to domestic and overseas forests.



Research and development for mitigation and adaptation to climate change impacts

We will improve monitoring and accounting methods in order to more accurately determine the amount of greenhouse gas absorption and emission by forests. We will also develop methods to evaluate and predict the effects of climate change on forests and forestry by enhancing in various climate zones ranging from the boreal to the tropics and by understanding the actual conditions of forest growth and the effects of environmental change. Furthermore, we will develop forest management methods aiming to mitigate the effects of climate change, and conduct research and development to adapt to climate change by utilizing and enhancing the multifunctional role of forests.



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③

- ① Observing the carbon balance of a natural forest from an observation tower
- ② Observing the soil greenhouse gas emission and uptake
- ③ Converting a tropical forest to farmland

Research and development for sustainability based on biological diversity and functions of forests

We will gather information about forest ecosystem dynamics and the genome sequences of the main tree species as underlying information for forest biodiversity, and use it to project changes in the biodiversity. We will also develop technology to reduce risks to biodiversity from invasive alien species (e.g. Pallas's squirrel) and emerging zoonotic diseases derived from forest life (e.g. ticks). Furthermore, we will present methods of forest management that sustain the biodiversity-delivering benefits of forest ecosystems.



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- ① A survey of ticks that mediate zoonotic diseases. Tick can be sampled by flagging using a white flannel cloth. The upper-left photo is an adult female tick of *Ixodes ovatus*.
- ② A multifaceted survey on the impact of forest management on forest biodiversity



②

Research and development for forest conservation and disaster risk reduction

We will develop and advance technology for evaluating and projecting the impact of forest management and climate change on the water resource conservation function and material cycles of forests, technology for making projections based on clear understandings of the dynamics of radioactive cesium through material cycles in forests, and technology for evaluating the sediment or avalanche disaster risks in mountainous area and forest damages by extreme weather events. We will also observe and publish data on the quantity and quality of runoff from forest basins, forest microclimates, and snow pack for preventing disasters by snow as the foundational long-term data needed to evaluate the forest functions of environmental conservation.



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②

- ① A cedar forest damaged caused by strong winds
- ② Taking bark and wood samples in a survey of radioactive pollution in a forest

Development of techniques for biological damage control, mushroom cultivation and microorganism application

We will develop technologies to efficiently reduce damages on forests, forest trees and other forest products including mushrooms caused by wild animals, insects, and diseases, in order to respond to the increased risks of these biological damages due to climate change, invasive species and other events in recent years. We will also develop methods concerning to cultivation of edible mushrooms and effective utilization of forest microorganisms for consistent availability of forest resources, thereby facilitating reinvigorate rural mountain villages. Furthermore, we will operate the Microbial Genetic Resources of FFPRI Genebank and the Wildlife Information Collection System.



- ① A red-necked longhorn beetle (an invasive alien species)
- ② Asian black truffles, a truffle species distributed in Japan

Research and development for the advancement of wood use technology and the expansion of demand

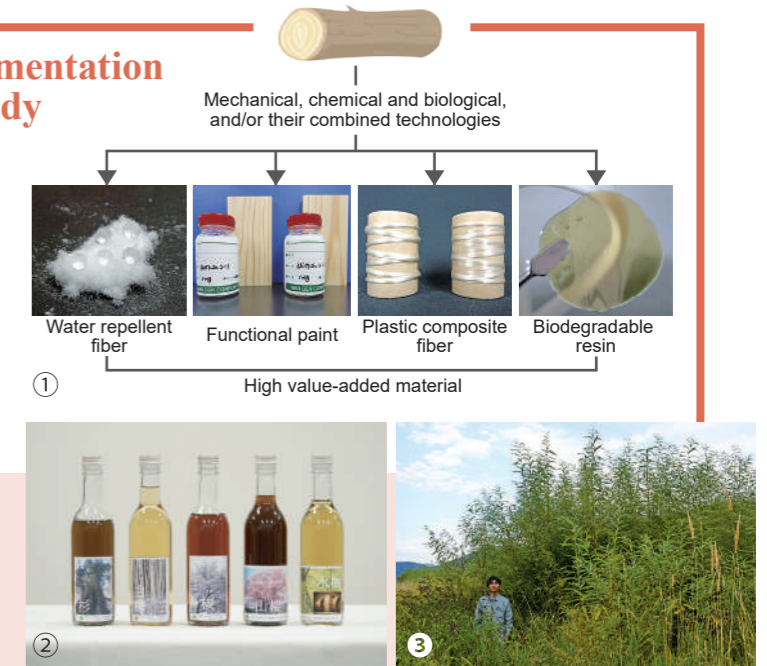
With the aim of increasing demand for lumber and wood while using forest resources sustainably, we will research and develop technology to make contributions in many areas, including adding value to large-diameter logs and fast-growing trees sourced in Japan; developing and promoting the use of cross-laminated timber (CLT) and other new wood-based materials; advancing the durability and safety, and maintaining the performance of wood-based materials and structures; and creating the distinct comfort of wood. We will also gather wood samples—mainly of valuable species grown in Japan—to establish a database for uses such as identifying wood species.



- ① Examining methods of sawing large-diameter timber
- ② Evaluating the performance of full-scale construction members

Research and development for the expansion of social implementation of new woody materials and woody biomass energy

We develop functional materials from wood components such as cellulose, hemicellulose, lignin, and extracts by using mechanical, chemical, and biological, and/or their combined technologies. Especially, we develop the value added and versatile materials to meet the social needs, and the efficient technologies to produce them. To produce electricity and heat from wood biomass in small scale facilities which is suitable for local area, we also develop the technologies to supply low cost wood biomass, to stabilize fuel quality and to evaluate economic efficiency.



- ① Development of functional materials from wood components
- ② "Wood liquor" expected as a novel use of wood biomass
- ③ "Willows" expected as a low-cost wood biomass

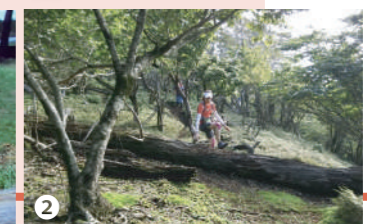
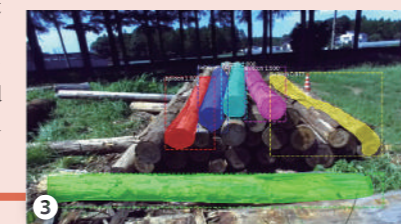
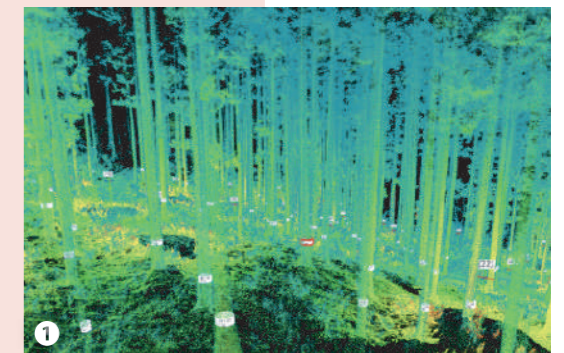
2. Research and development for the realization of a recycling-oriented society and the promotion of mountain villages through the use of forest resources

We will help create a safe, secure, prosperous recycling society by developing technology for revitalizing rural mountain villages and the integrated development of forest-related industries from upstream to downstream through the sustainable use of wood resources and forest spaces.



Research and development for the sustainable supply of forest products and the promotion of multiple uses of forest landscape

It is necessary to support the development of rural mountain villages by establishing sound forest management under which wood and forest products are consistently supplied and allocated and the value of the products is distributed fairly, all while forests are used sustainably. Toward that end, we will develop technology that leverages new measuring and data processing techniques to evaluate, plan, and manage forest resources; technology for using diverse forest spaces; and safe forest management techniques based on artificial intelligence and various forms of sensing. We will also conduct research to present strategies for using lumber sustainably and creating new demand for wood.



- ① Digitalizing forests using LiDAR
- ② Diverse usage of forest space (trail running)
- ③ Identifying logs using AI

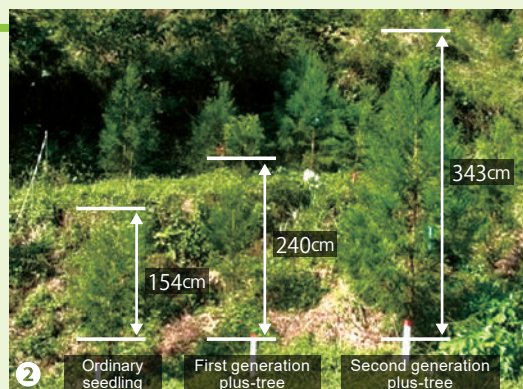
3. Forest tree breeding for the creation and conservation of diverse forests and the sustainable resource uses

We will make efforts for genetic improvement (forest tree breeding) for producing superior seedlings which will contribute to future forest enhancement and sustainable development of forestry. We also endeavor for developing technology for genetic diversity conservation of forest tree species.



Development of various superior varieties by improving the forest tree breeding bases

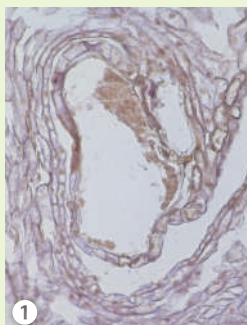
We will develop the second generation plus-trees with superior growth and wood quality, superior varieties such as less-pollen cedar and pine wilt nematode tolerant pines, to respond various economic and social needs including reduction of reforestation cost, reducing pollen dispersal from forests, preventing global warming and conserving biodiversity. We will also make efforts to collect and preserve forest tree genetic resources including endangered species and future breeding materials for the aforementioned purposes, and to collect genome information as a base for advancing breeding technologies.



- ① A pine variety tolerant against pine wilt nematode
- ② The second generation plus-trees with superior growth
- ③ Cutting propagation of fast-growing Chinese fir

Advancement and extension of forest tree breeding techniques and promoting the deployment of specified mother trees

We will develop technologies to conduct forest tree breeding more efficiently and in a shorter period and technologies enabling long-term preservation of seeds, pollen and other genetic resources of forest trees for future use. Additionally, for the sake of making the outcomes of forest tree breeding available to society, we will produce and distribute the clonal foundation stock seedlings of specified mother trees originated from the second generation plus-trees or various superior varieties, provide technical guidance domestically or cooperate with countries around the world in the field of forest tree breeding and distribute genetic resources of forest trees as materials for various scientific research disciplines.

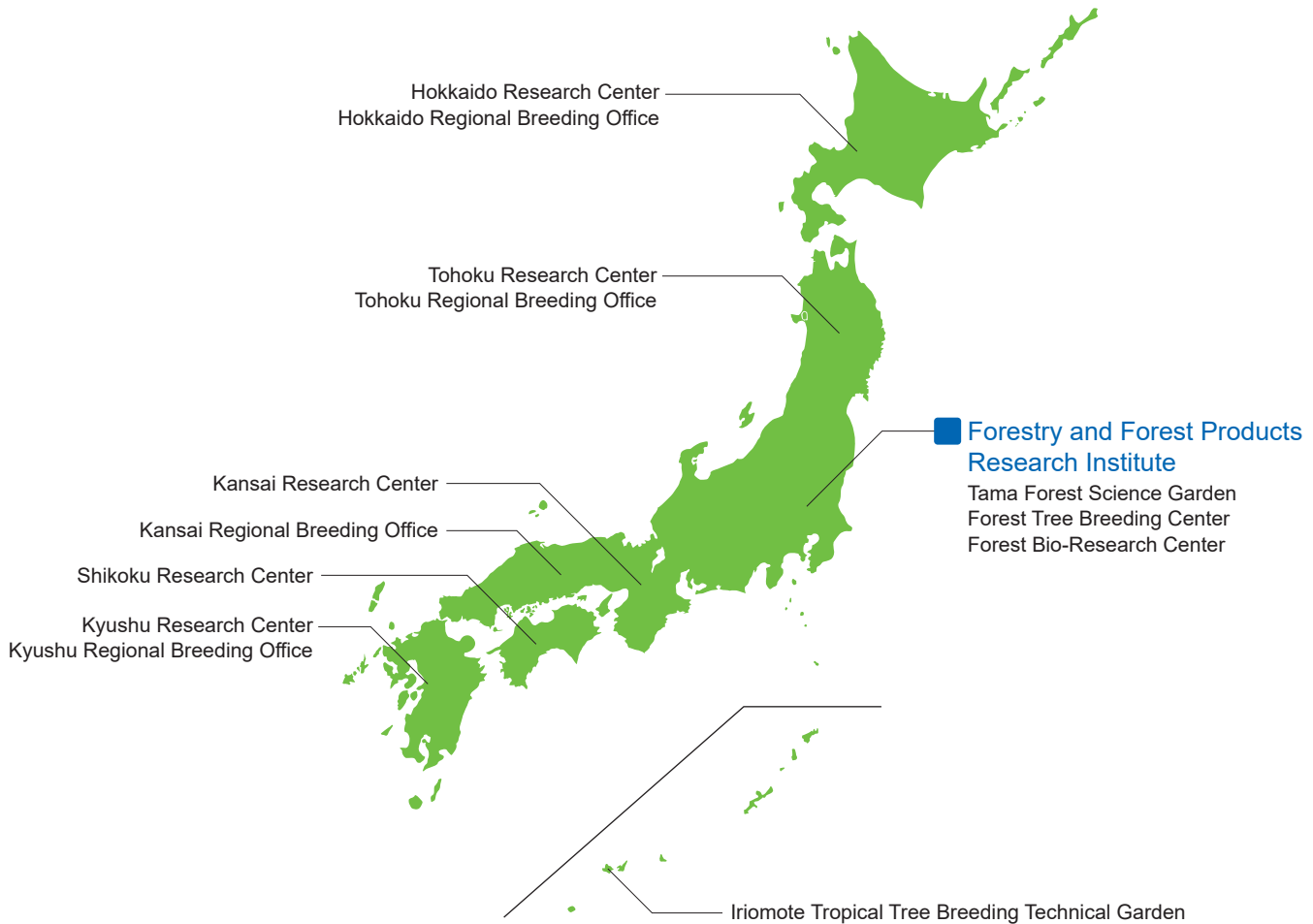


- ① Pollen sac, where pollens are not formed normally, of male strobilus of Japanese cedar modified into male sterile by genome editing
- ② The production and distribution of clonal foundation stock seedlings of the specified mother trees and superior varieties based on the needs from relevant organizations such as prefectural governments
- ③ Breeding of *Melia volkensii*, an indigenous tree species in Kenya adapting to semi-arid regions

Contribution to the UN Sustainable Development Goals

The 2030 Agenda, which was adopted by all United Nations Member States in 2015, listed “Sustainable Development Goals (SDGs)” consisting of 17 goals and 169 targets in order to achieve a better and more sustainable future for all by 2030. SDGs pledge “No One is Left Behind” through the implementation process.

In this overview, SDG icons are used to illustrate how our research contributes to the achievement of these goals.



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