

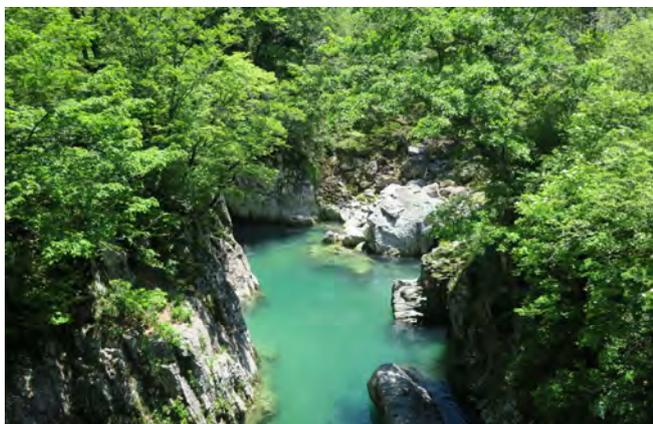
Annual Report on Forest and Forestry in Japan

Fiscal Year 2023

(Summary)

Forestry Agency

Ministry of Agriculture, Forestry and Fisheries, Japan



The Annual Report on Forest and Forestry is a report which the Government of Japan (GOJ) submits to the Diet every year, in accordance with article 10 of the Forest and Forestry Basic Act. This document is a summary of the annual report for fiscal year (FY) 2023.

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Summary

Planted forests account for about 40% of forests in Japan, many of which have now grown into well-developed forests, providing a variety of values to society. Major species of planted forests in Japan is Sugi, known as Japanese cedar (*Cryptomeria japonica*, hereinafter referred to as cedar), due to its broad adaptability to various locations and high growth rate.

On the other hand, pollen allergy has become a serious issue in Japan, with cedar pollen being the most common cause. About 40% of the population suffers from cedar pollen allergy every spring. Japanese society demands that people's health be taken into consideration in the management of planted forests.

The Government of Japan (GOJ) decided to strengthen measures to reduce pollen dispersal in 2024. These measures include improving forestry efficiency, motivating forest owners to engage in forestry and increasing seedling production, as well as improving wood utilization techniques and disseminating the significance of wood use to consumers to promote wood use.

These efforts are expected to advance the transformation of forest structure and to reduce the social problems caused by planted forests, also to enhance the forest functions, thereby providing a basis for society to take a greater interest in and be involved actively in forest benefits.

Comprehensive societal efforts by the whole society are required to aim for a more harmonious relationship between people and forests.

1. History of the Use and Development of Forest Resources

(1) Expansion of Forest Resource Use and Development of Reforestation Techniques

In prehistoric times, the Japanese archipelago was estimated to be covered widely with forests consisting of conifers such as cedar and Hinoki, known as Japanese cypress (*Chamaecyparis obtusa*, hereinafter referred to as cypress), as well as deciduous or evergreen broadleaf trees such as those in the beech family (Fig. 1). From the 7th century onwards, the use of cedar and cypress, which have excellent characteristics as building materials, increased due to large-scale national construction projects. The area of logging activities gradually expanded from ones near the capitals (Nara and Kyoto).



Jisho-zan protected forests
(Osaki City, Miyagi Prefecture)



Kasuga-yama Primeval forests
(Nara City, Nara Prefecture)

Fig. 1 Primeval natural cedar forests in Japan

As natural resources of cedar and cypress decreased, forestry work involving planting of cedar and other trees began to take place in various regions around the 16th century. Subsequently, forestry regions were formed to meet urban demand in areas where timber could be transported by river (Fig. 2).

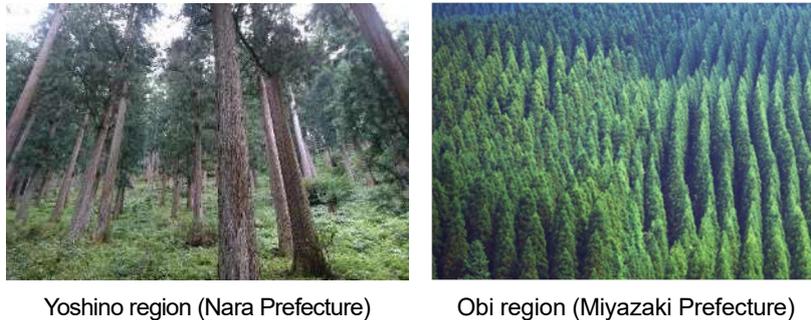


Fig. 2 Traditional cedar forestry areas in Japan

Cedar, in particular, has advantages in terms of management: being able to grow in a wide range of locations due to the wide variety of cultivars available, its fast growth, and its high yield per area, as well as its straight and easy-to-process timber that can be used for various purposes including buildings, ships, and daily utensils. As a result, reforestation techniques for cedar have developed throughout the country.

From the Meiji period in the 19th century onwards, the demand for timber as a material for modern industry increased further, leading to expansion of forestry areas.



Pollen analysis has revealed that Japan's forests have undergone many changes over the past 500,000 years. During cold glacial periods, subarctic conifers from the pine family increased, while temperate conifers such as cedars and broadleaf trees were confined to a small area in the south. During warm interglacial periods, temperate conifers and broadleaf trees became dominant.

MIS	10,000 years ago	Glacial/Interglacial periods	Climate	Vegetation (Kamiyoshi Basin, Lake Biwa)
1	Present~1	Postglacial	Warm	Temperate conifers and evergreen broad-leaved trees
2	1~3	Last Glacial Maximum	Cold	Pine family conifers
3	3~6	Subinterglacial	Slightly warm	Temperate conifers
4	6~7	Subglacial	Cold	Pine family conifers
5a-5d	7~11	Subinterglacial	Slightly warm	Temperate conifers
5e	11~12	Last interglacial	Warm	Temperate conifers and evergreen broad-leaved trees
6	12~19	Glacial	Cold	Pine family conifers
7	19~24	Interglacial	Warm	Temperate conifers
8	24~30	Glacial	Cold	Pine family conifers
9	30~34	Interglacial	Warm	Temperate conifers
10	34~37	Glacial	Cold	Pine family conifers
11	37~42	Interglacial	Warm	Temperate conifers and evergreen broad-leaved trees
12	42~48	Glacial	Cold	Pine family conifers

Source: Yumoto, Takakazu (2011) *35,000 Years of the Japanese Archipelago; An Environmental History between Humanity and Nature*, 6, *Technique for environmental history*, Bun-ichi Sogo Shuppan

Vegetation change in Western Japan (Kamiyoshi Basin, Lake Biwa)

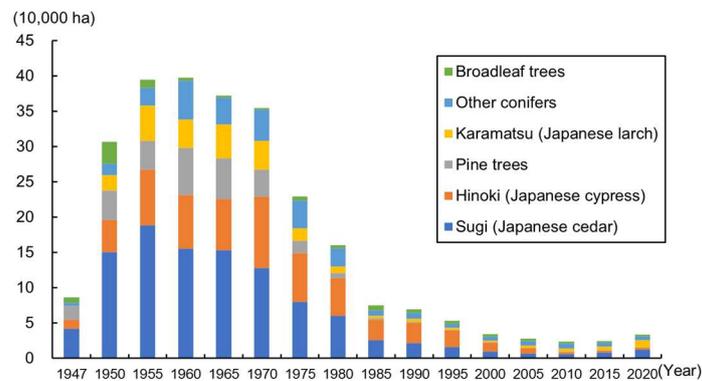
(2) Expansion of Planted Forests After World War II

Large amounts of timber were needed for military supplies during World War II and for reconstruction materials after the war, which led to extensive logging.

A strong social demand for rapid forest recovery in logged areas led to the progress of reforestation with conifers such as cedar, for which reforestation techniques were well established. Abandoned logged areas were almost reforested within about 10 years after the war.

Furthermore, rapid economic growth rose the demand for building timber and its prices. Broadleaf forests were converted into coniferous plantation due to decrease of the demand of broadleaf trees as fuel and fertilizer. Later, the conversion rate decreased due to a shortage of suitable areas for forestry and uncertainties about the future of wood prices caused by reduced tariffs.

Thus, planted forests such as cedar forests were intensively established from the 1950s to the 1970s (Fig. 3). As a result, the area of planted forests increased from about 5 million hectares in 1949 to about 10 million hectares at present, with cedar becoming the main forestry species, accounting for 40% of that total.



Source: Survey by Forestry Agency

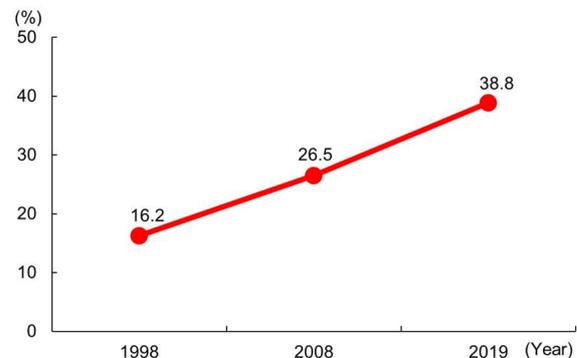
Fig. 3 Area of forestation by species after World War II

2. Emergence of Pollen Allergy Caused by Japanese Cedar and Policy Responses

(1) Emergence of Hay Fever Caused by Cedar and Others

In the 19th century, hay fever caused by grass in the UK and by ragweed in the US were known, but there were no reports in Japan.

Cedar pollen allergy in Japan was first reported in 1964. Subsequent nationwide epidemiological surveys estimated that the prevalence rate increased from 16% in 1998 to 39% in 2019 (Fig. 4). The primary reason for this long-term increase in prevalence is that symptoms rarely disappear naturally once hay fever develops and the number of sufferers accumulates. Other factors that are pointed out include an increase in pollen



Source: Matsubara, Atsushi, et al. (2019) "Epidemiological Survey of Allergic Rhinitis in Japan 2019" *Nippon Jibiinkoka Gakkai Kaiho*, 123(6)

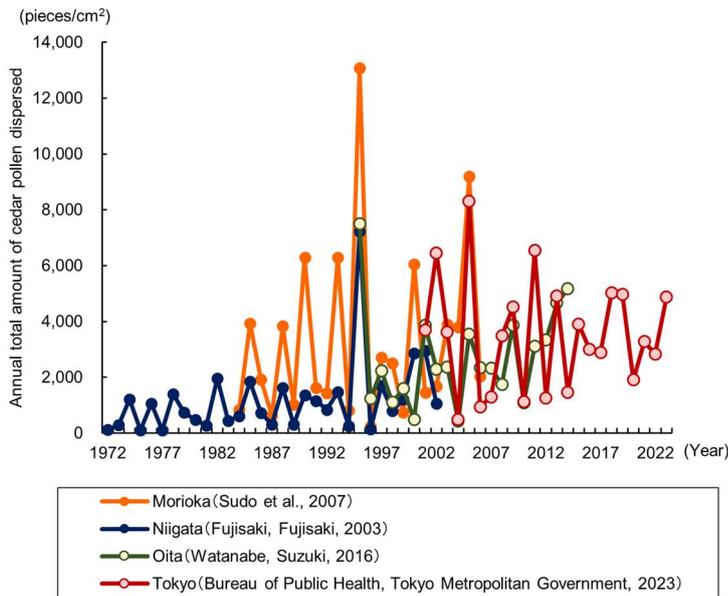
Fig. 4 Prevalence of cedar pollen allergy

dispersion during this period (Fig. 5), changes in diet, and a decrease in infectious diseases. Additionally, factors that may worsen symptoms include air pollutants, stress, and dry circumstances in urban areas.

One possible reason for the increase in pollen dispersion is that the area of cedar forests aged 20 years and above, which start producing male cone, has been increasing with the growth of planted cedar forests since 1970 (Fig. 6).

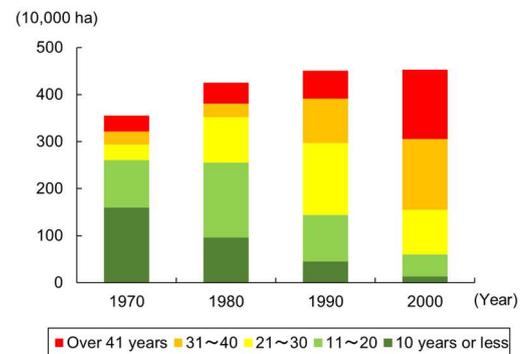
Cypress often causes cypress pollen allergies to occur alongside cedar pollen allergies because both species are in the same family and their pollen has similar allergens. Cypress is commonly planted in western Japan.

In Hokkaido, many people suffer from pollen allergy caused by birch and grass as there are few cedar trees due to the cold climate.



Source: Kuramoto, Shigeo (2017) "Climate Change and Pollinosis" *Environmental information science*, 50 (1)

Fig. 5 Total number of cedar pollen dispersal



Source: FAO "The FAO World Programme for the Census of Agriculture"

Fig. 6 Area of planted cedar forests by forest age

(2) Previous Measures Against Hay Fever and Pollen Sources

The Forestry Agency has been surveying the male cone formation status in cedar forests across the country since FY1987.

In 1990, a liaison meeting of relevant ministries and agencies was established.

In 1991, the Forestry Agency began investigating the selection of cedars with lower pollen production, which have been made available for practical use since 1996. These cedar varieties were developed from first generation plus-trees and include varieties with low amounts of male cones (low-pollen cedar varieties) (Fig. 7), and varieties that produce male cones with no pollen due to genetic mutations (pollen-free cedar varieties) (Fig. 8). The Ministry of Agriculture, Forestry and Fisheries (MAFF) requires low pollen production as a condition when designating mother trees that should be especially promoted from the second generation plus-trees (elite trees).

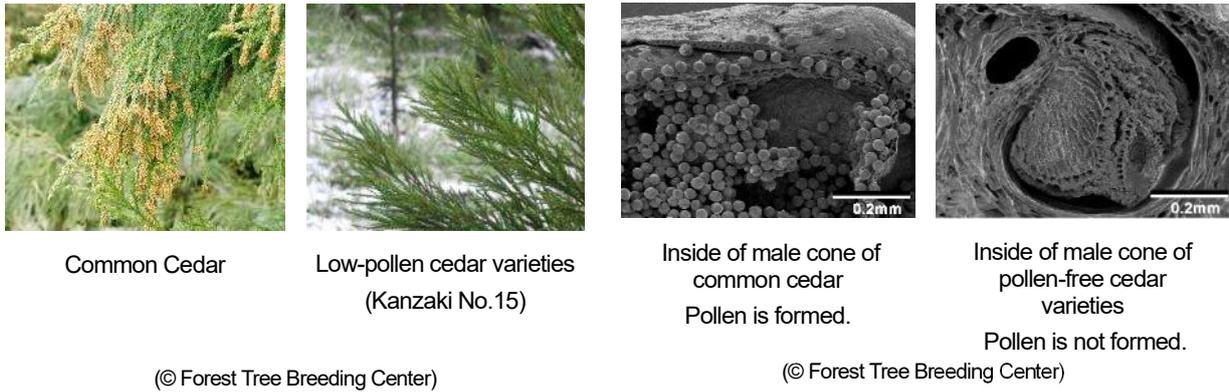


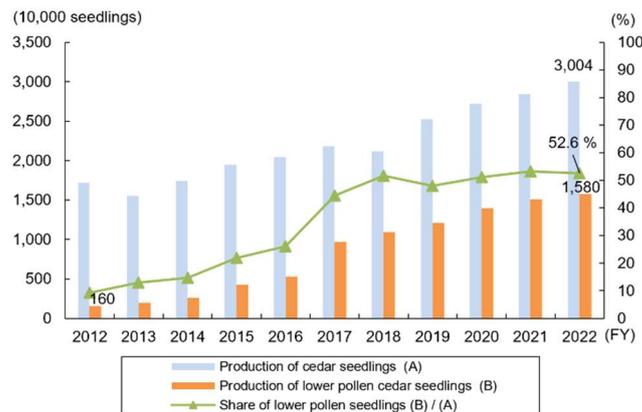
Fig. 7 Examples of low-pollen cedar varieties **Fig. 8 Examples of pollen-free cedar varieties**

In 2001, the GOJ clearly stated the promotion of measures against pollen allergy in the Basic Plan for Forest and Forestry, which was launched in that year under a new law.

The GOJ has supported efforts by log producers to encourage forest owners to replant with lower-pollen trees since 2016.

In particular, the production of lower pollen cedar seedlings is currently progressing, reached at 50% of cedar seedlings produced being lower pollen varieties (Fig. 9).

Allergen immunotherapy has been developed, and pharmaceutical companies are using cedar pollen as raw materials for treatment drugs.



Source: Survey by Forestry Agency

Note: The production of lower pollen cedar seedlings includes the seedlings of low-pollen cedar varieties and pollen-free cedar varieties.

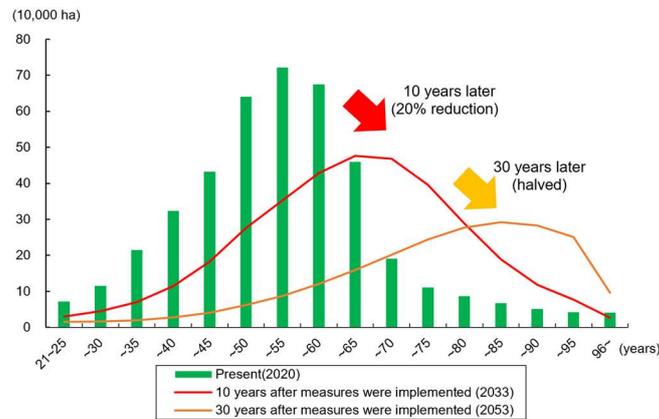
Fig. 9 Production of lower pollen cedar seedlings

3. Acceleration of Countermeasures against Pollen Sources and Challenges

(1) Future Countermeasures against Pollen Sources

As the conventional pollen allergy countermeasures have not successfully reduced the number of patients or alleviated symptoms, the GOJ established a ministerial meeting of pollen allergy in April 2023, and in May, it decided on "Overall Picture of the Measures Against Pollen Allergy" to implement more effective measures. In this plan, the GOJ set a goal of reducing the area of cedar forests which are sources of pollen, by 20% in 10 years

through measures to reduce pollen sources. Achieving this goal is expected to reduce pollen levels, even in high-pollen years, to the average level of the past decade. Additionally, the goal is to halve the pollen emission in about 30 years (Fig. 10). The following comprehensive measures will be implemented to reduce pollen sources: 1) accelerating logging and replanting, 2) expanding demand for cedar wood, 3) increasing production of lower pollen cedar seedlings, 4) improving forestry productivity and securing workforce (Fig. 11).



Source: "Overall Picture of the Measures Against Pollen Allergy" (Decision of the ministerial meeting of hay fever on May 30, 2023)

Fig. 10 Future of planted cedar forests as a source of pollen

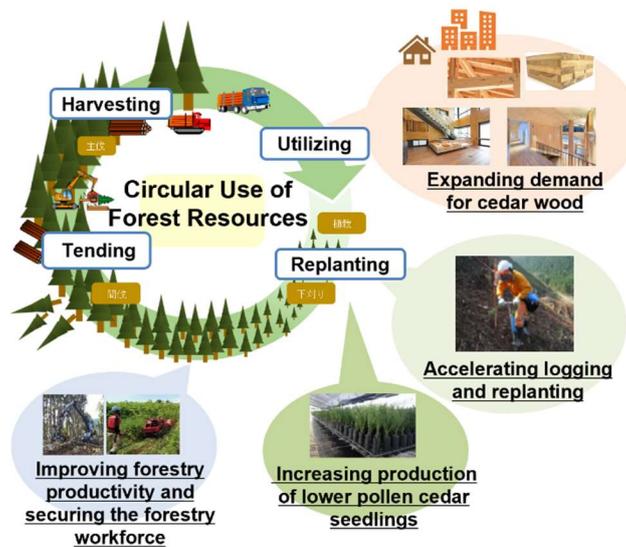


Fig. 11 Efforts to reduce pollen sources

(2) Efforts for Countermeasures against Pollen Source

1) Accelerating logging and replanting

The GOJ and prefectures will promote the consolidation of forestry operations, the development of forestry road systems and the integrated logging and replanting activities in areas with clusters of planted cedar forests near densely populated regions.

In addition, they will promote the transition of planted cedar forests, which are located in conditions unsuitable for forestry, to mixed forests.

2) Expanding demand for cedar wood

The "Overall Picture of the Measures Against Pollen Allergy" aims to expand the demand for cedar wood from the current 12.4 million m³ to 17.1 million m³ over the next 10 years by promoting a shift to cedar wood products in the wooden housing sector, which currently accounts for the majority of demand for wood products for construction, and by doubling the number of constructions for large buildings using wood.

To achieve this, the Forestry Agency supports efforts in wood industry, such as enhancing the performance of wooden materials and optimizing the production systems. Additionally, the Forestry Agency and other related ministries support the establishment of a labeling system that visualizes the amount of wood used in buildings in the housing sector to enhance appeal to home buyers.

In the large building sector, they promote the development of high-strength and fire-resistant wooden materials that meet building standards, the dissemination of the cost and time-saving advantages of wooden construction to building owners, and the display of carbon storage amounts.

Additionally, it is expected that cedar wood will see an expansion of its use in building interiors and exteriors, as well as furniture, and an increase in exports, leveraging its characteristics: lightweight, shock-absorbing, thermally insulating, moisture-regulating, and having a unique pleasant aroma (Fig. 12).



Solid cedar wood with cushioning properties for the floor of the children's play area

(© NPO Association for the Arts, Toy and Playing Activities (Tokyo Toy Museum))



Fireproof construction using thick cedar boards to realize exposed wood exterior

Horikiri House
(© TEAMSAKURA)

Fig. 12 Examples of utilizing cedar wood products for interior and exterior

3) Increasing production of lower pollen cedar seedlings

The "Overall Picture of the Measures Against Pollen Allergy" sets a goal to increase the production rate of lower pollen cedar seedlings from the current 50% to over 90% in 10 years.

The Forestry Agency is promoting the development of facilities to reproduce the original seedlings at the Forest Tree Breeding Center, seed and hedge orchards at prefectures, and containerized seedling production facilities at private seedling producers.

The development of high-growth and pollen-free cedar is expected to become easier as DNA markers to identify the presence of pollen-free genes have been developed.

4) Improving forestry productivity and securing the forestry workforce

The Forestry Agency promotes efforts over the next 10 years to improve productivity and secure the current level of the workforce in response to increase of logging and replanting.

The Agency supports the introduction of advanced forestry machinery suitable for Japan's steep terrain to improve productivity (Fig. 13). Moreover, the Agency enhances the development of new forestry workers, improvement of worker conditions by increasing the profitability of forestry contractors, improvement of worker safety, acceptance of foreign skilled workers, and the promotion of dual employment by workers in other industries to secure the workforce.



Advanced forestry machinery capable of logging to timber processing (Harvester)



Remote-controlled skyline logging cable winche

Fig. 13 Technologies contributing to the improvement of forestry productivity

4. Toward a More Harmonious Relationship Between People and Forests

(1) The Ideal State of Forests as Directed by the Basic Plan for Forest and Forestry

Forests are "Green social capital", which brings various benefits to the people. Long-term efforts are necessary to create a balanced variety of forests that prioritize functions relevant to each location to ensure the multiple functions of forests to realize the multiple functions of forests effectively and sustainably. The Basic Plan for Forest and Forestry, since its formulation in 2001, has set forth the following policy: Forests that are suitable for forestry, such as being fertile, highly productive, with gentle slopes, and close to roads, should be maintained as forests that promote the circular use of resources through logging and replanting. Planted forests in conditions unsuitable for forestry should be gradually converted to mixed forests of conifers and broadleaf trees through repeated light logging and natural regeneration to bring them closer to natural forests. Natural forests should be conserved properly (Fig. 14).

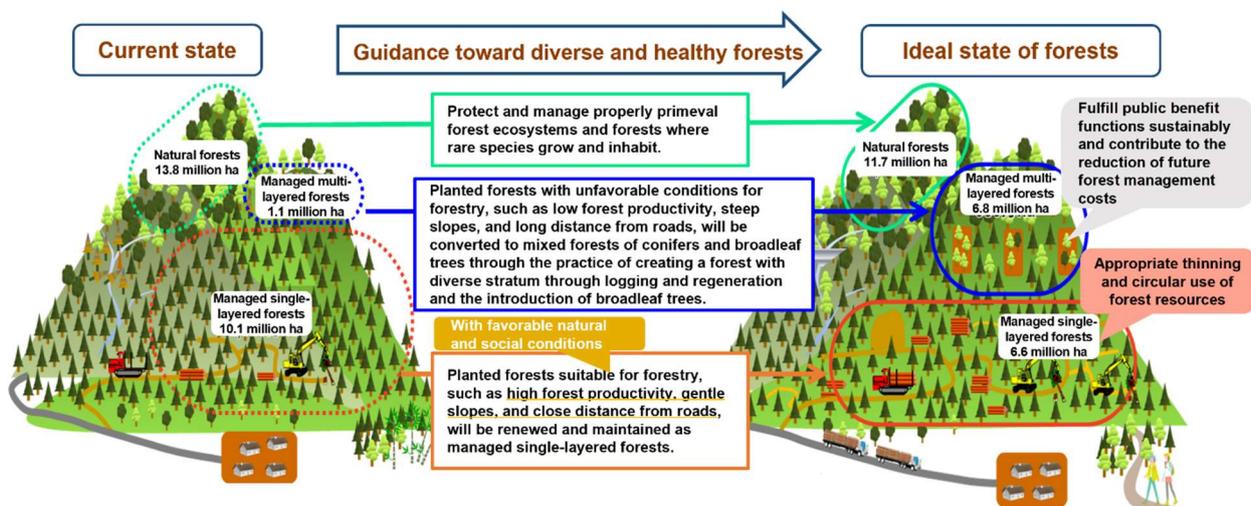


Fig. 14 Ideal state of forests as directed by the Basic Plan for Forest and Forestry

(2) Forest Management Responding to Diverse Public Needs, including Countermeasures against Pollen Sources

Countermeasures against pollen sources are consistent with the forest management envisioned by the Basic Plan for Forest and Forestry. The promotion of logging and the planting of developed seedlings, in areas where planted cedar forests are to be maintained as planted forests, contributes to reducing pollen levels and enhancing capacity of carbon sink, as well as revitalizing forestry.

For planted forests that should be converted closer to natural forests, reducing the number of cedar trees can lead to pollen reduction and the sustained realization of public benefits.

Accelerating this transformation of forest structure is expected to reduce negative impact on society caused by pollen and to enhance forest functions. This also provides a basis for the public to become more interested in and more actively involved in the benefits of forests.

These comprehensive societal efforts by the whole society are required to aim for a more harmonious relationship between people and forests.



Forests and Forestry Topics for FY2023

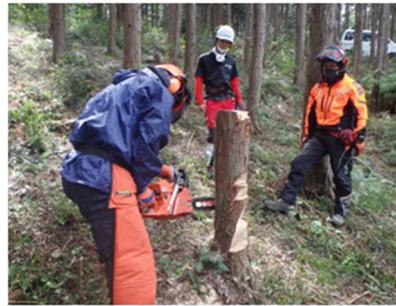
Topic 1: Every Citizen Supports Forests through Forest Environment Tax ~ Starts of the Forest Environment Tax and Status of the Forest Environment Transfer Tax Efforts ~

To sufficiently secure forest functions, it is necessary to promote public management of unmanaged forests. On the other hand, municipalities in mountainous areas are facing severe financial conditions. Therefore, the Forest Environment Tax and the Forest Environment Transfer Tax were established in FY2019 to secure stable local funding needed for forest management as a mechanism for each citizen who benefits from forests to share the burden and support forests. The Forest Environment Transfer Tax has been allocated to municipalities and prefectures since FY2019, and efforts such as forest management through the Private Forest Management Entrustment System, securing forestry workers, wood use and public awareness are implemented.

In FY2024, the Forest Environment Tax, which is the source of funds for the Forest Environment Transfer Tax, will begin to be levied, and the allocation ratio of the Forest Environment Transfer Tax will be reviewed. The Forestry Agency will continue to support municipalities and prefectures and will further disseminate the results to promote forest management and other efforts using tax.



Thinning of unmanaged forests through the Private Forest Management Entrustment System (Oyama Town, Shizuoka Prefecture)



One-day forestry experience and practical forestry training sessions (Misaki Town, Okayama Prefecture)

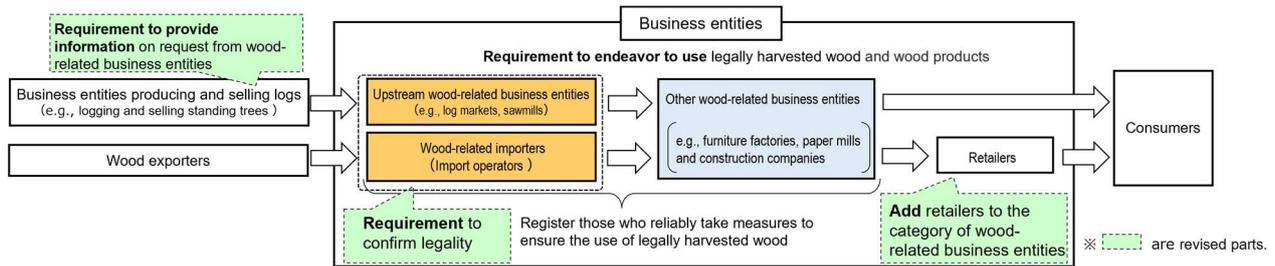
Topic 2: Revision of the Clean Wood Act to Further Expand the Use of Legally Harvested Wood and Wood Products

The GOJ aims to curb illegal logging by increasing the distribution of wood confirmed to be legally logged through the Act on Promoting the Distribution and Use of Legally Harvested Wood and Wood Products (the Clean Wood Act). At the same time, it is expected that the demand for wood will increase by creating an environment where people can use wood with confidence.

The revised Clean Wood Act was passed at the 211th ordinary Diet session and is scheduled to take effect on April 1, 2025.

The main revisions include requiring upstream wood-related business entities/wood-related importers to confirm legality, and requiring business entities producing and selling logs to provide the entities information such as copies of logging and afforestation notification documents. Additionally, retailers will be added to the category of wood-related business entities to ensure that information on legality reaches consumers.

The Forestry Agency will conduct public awareness of the system to ensure smooth implementation and promote distribution and use of legality-confirmed wood and wood products.



Topic 3: "Digital Forestry Strategy Hubs" by the Whole Community Has Started

Although the foundation for the utilization of digital technology in forestry, such as the demonstration of production management using ICT, is steadily progressing, these efforts are individual and fragmented.

Therefore, since FY2023, the Forestry Agency has been promoting the establishment of "Digital Forestry Strategy Hubs", where related parties work together to advance comprehensive efforts to utilize digital technology in forestry activities as the whole community. The effort has started in three regions: Hokkaido, Shizuoka Prefecture, and Tottori Prefecture.

In September 2023, the "MORI-HUB Platform" was established as a place for gathering organizations, human resources, and information necessary to promote forestry innovation. In November 2023, a kickoff event was held, initiating efforts to match members and encourage new entrants from other fields into the forestry sector.

Hokkaido Region ICT Harvester Data Smart Forestry EZO Model Construction Council

Efforts

- Accumulation of log production information obtained from ICT harvesters in the cloud
- Utilization of date for the distribution from log production → transportation of logs → sawmills
- Labor-saving for detection of logs at each stage
- Labor-saving for weeding using remote-controlled machinery

Shizuoka Region Wood SCM System* Shizuoka Prefecture Eastern Region Digital Forestry Promotion Consortium

Efforts

- Accumulation of log information from the yard acquired through an app in the system
- Utilization of date for the distribution from log yards → transportation of logs → plywood mills
- Labor-saving for detection of logs at each stage and delivery management at plywood mills
- Labor-saving for forest surveys by GNSS surveying of logging areas

*Supply Chain Management

Tottori Region Traceability System Tottori Prefecture Digital Forestry Consortium

Efforts

- Accumulation and sharing of supply and demand data for logs and products
- Utilization of date for the distribution from log production → log markets → sawmills → precut factories → builders
- Digitalization of forestry workers' practice plans and daily work reports

Traceability (Confirmation of each stage of sales management slip)
Electronic application
Electronic issuance of certificate

Topic 4: Recognition of sustainable forest management and wood use at G7 Hiroshima Summit

The production and use of wood, a renewable resource, through sustainable forest management contributes to achieving carbon neutrality and a circular economy significantly.

The G7 Ministers' Meeting on Climate, Energy and Environment in Sapporo recognized the importance of "promoting sustainable forest management and wood use including by combating illegal logging" and "improved use of wood in the construction of buildings". The G7 Sustainable Urban Development Ministers' Meeting in Takamatsu, Kagawa emphasized the need for "the use of wood in buildings".

The Ministry of Agriculture, Forestry and Fisheries (MAFF) held a side event seminar "Toward Net zero and Circular economy with Sustainable Wood Use" at the G7 Agriculture Ministers' Meeting in Miyazaki to confirm and disseminate the significance of sustainable forest management and wood use.

It is noteworthy that "promoting sustainable forest management and use of wood" was clearly stated in the summit outcome documents for the first time at the G7 Hiroshima Summit held in May 2023.

The GOJ will continue to promote wood use domestically and will also continue to communicate and share the importance and necessity of sustainable wood use internationally.



Desks and chairs made of Japanese cypress were used at the G7 Hiroshima Summit.



Architect and Yale University professor Mr. Organschi spoke at a side event seminar of the G7 Agriculture Ministers' Meeting in Miyazaki.

Topic 5: Response to mountain disasters caused by the Noto Peninsula earthquake in 2024

On January 1, 2024, an earthquake centered in the Noto region of Ishikawa Prefecture caused large-scale hillside failures and damaged forest roads, wood processing and distribution facilities, and non-timber forest products facilities, with the total damage amounting to approximately 22.6 billion yen. 110,000 houses were damaged.

The Forestry Agency conducted helicopter investigations of the damage by the National Forest Regional Office and dispatched the Ministry of Agriculture, Forestry and Fisheries Support and Advice Team (MAFF-SAT) from the day after the earthquake.

As support measures for the reconstruction of the lives and livelihoods of disaster victims, the Forestry Agency provided support for the restoration and maintenance of wood processing and distribution facilities and non-timber forest products facilities, and special

measures for disaster-related funds.

For emergency temporary houses, to secure housing that meets the needs of disaster victims, construction of prefabricated houses, wooden row houses that have been built during previous disasters, and detached-style wooden houses that are closer to the living environment before the disaster has occurred.

The Forestry Agency is committed to supporting early recovery and contributing to the reconstruction of the disaster-affected prefectures through the recovery and revitalization of the forestry and wood industries.



Large-scale landslide collapse (Wajima City and Suzu City, Ishikawa Prefecture)



Emergency temporary houses
(Wooden row houses)

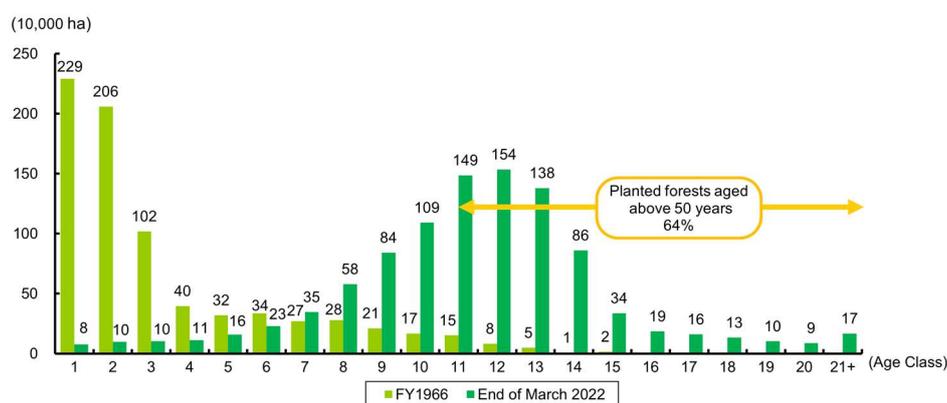
Chapter I

Forest Management and Conservation

1. Promoting Appropriate Management and Conservation of Forests

(1) Current State of Forests and Multiple Functions

Japan's forests cover about 25 million hectares, which accounts for two-thirds of the national land area. About 40% of them are planted forests. 64% of the planted forests are aged above 50 years and entering their period of use (Fig. I-1). The forest area consists of private forest, public forest, and national forest, which account for 57%, 12%, and 31%, respectively (Fig. I-2).



Sources: Forestry Agency "State of Forest Resources" (March 31, 2022) and "Forest Resources of Japan" (April 1968)

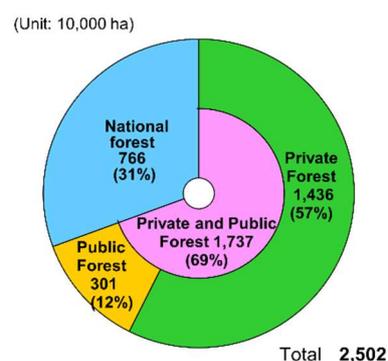
Note: Age-classes are divided by 5 year-period steps. "Age-class 1" includes the 1st to 5th year after planting with the year of planting counted as the 1st year.

Fig. I-1 Area of planted forest age class

The stock of forest is steadily expanding mainly on planted forests, reaching about 5.6 billion m³ by the end of March 2022.

Forests contribute to the stability of people's lives and development of sustainable economy through their multiple functions including land conservation, water resource conservation, mitigating global warming, wood production and biodiversity conservation.

Through these multiple functions, forests also contribute to the achievement of SDGs and net-zero by 2050 and to the economic and social benefits of forestry and wood industry.



Source: Forestry Agency "State of Forest Resources" (March 31, 2022)

Fig. I-2 Forest area by owners

(2) The Fundamental Framework of Forest Plans for Appropriate Management and Conservation

To make sure forests perform their multiple functions sustainably, the GOJ formulates the Basic Plan for Forest and Forestry (latest revision in June 2021) in accordance with the Forest and Forestry Basic Act. The Basic Plan sets targets for the state of forests and the supply of forest products, and specifies measures to be taken by the GOJ.

The Minister of Agriculture, Forestry and Fisheries formulates the National Forest Plan under the Forest Act. The National Forest Plan sets targets for forest management and conservation, the amount of logging, and reforestation areas to align with the Basic Plan for Forest and Forestry. Prefectural governors formulate Regional Forest Plans based on the National Forest Plan. Mayors of municipalities formulate Municipality Forest Plans, in accordance with the Regional Forest Plans, that indicate zoning and forestry road system plans according to the functions of forests to be emphasized.

(3) Research and Development

In the “Strategy for Research and Technology Development in Forest, Forestry, and Wood Industry” revised in March 2022, the Forestry Agency has stated a policy to promote the following development; (1) prediction of the impact of climate change on domestic and foreign forests and forestry; (2) sophistication of monitoring technology to calculate forest removals with high accuracy; (3) cost reduction of afforestation and silviculture technology; (4) development of cross-laminated timber (CLT) utilization technology; and (5) development of superior seedlings, and so on. Furthermore, the Forestry Agency updated the “Forestry Innovation Field Implementation Promotion Program” in July 2022 to accelerate innovation in the forestry sector.

The GOJ has stated policies of working on zero emissions by smart forestry and the establishment of technology for long-term and large-scale carbon storage by forests and wood in the "Green Growth Strategy Through Achieving Carbon Neutrality in 2050," published in December 2022. The Forestry Agency is promoting related development using the Green Innovation Fund created based on this strategy. In addition, the Ministry of Agriculture, Forestry, and Fisheries (MAFF) has developed a “Strategy for Sustainable Food Systems” to promote innovation for reducing environmental impact in a medium- to long-term perspective. In the forest and forestry sector, the strategy promotes the development and dissemination of superior seedlings, the development of automated forestry machinery, the utilization of ICT, the construction of wooden high-rise buildings and the development of wood-based chemical materials such as glycol lignin.

Forestry promotion instructors assigned in each prefecture disseminate and instruct forestry technology to forest owners, forestry workers, municipal officials, and other related people. Furthermore, the Forestry Agency develops Foresters who support municipal governments’ forest administration and management.

2. Forest Management

(1) Promotion of Forest Management

In order to secure the multiple functions of forests for future, appropriate forest management is required. It is achieved by appropriate and adequate forestry practice on planted forests, such as thinning and replanting after harvesting, and establishment of diverse forests depending on its natural conditions, such as diversification of logging age and inducement of coniferous planted forests into multi-layered forests or mixed forests.

Furthermore, it is vital to enhance carbon dioxide removals by forests through thinning

(Unit: 10,000 ha)

Type of work	Private and public forest	National forest	Total
Tree planting	2.4	0.9	3.3
Post establishment nurturing	33	14	47
Thinning	24	9	33

Source: Survey by Forestry Agency

Note: Area of Thinning represents a result of the forest sink measures.

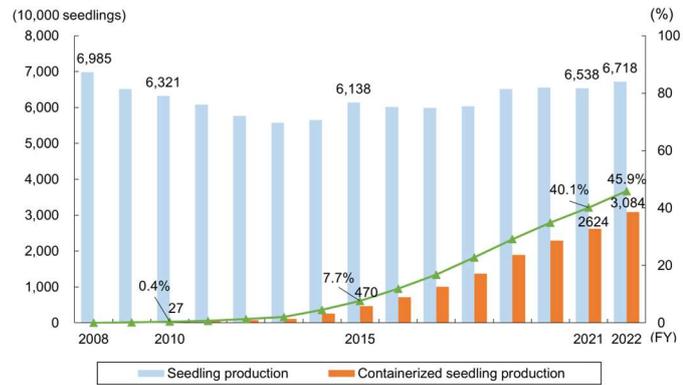
Table I-1 Forest management area (FY2022)

and reforestation to achieve the forest removals target of approximately 38 million ton-CO₂ in FY2030 (equivalent to approximately 2.7% of Japan's total emissions in FY2013) as set out under the Paris Agreement and also to contribute to net-zero by 2050.

To respond to these issues, the Forestry Agency supports forest management activities by private and public forest owners through forest management projects, while steadily promoting forest management in national forests (Table I-1).

(2) A Stable Supply of Superior Seeds and Seedlings

It is essential to improve the supply capacity of seedlings for reforestation due to the expected increase in harvesting of planted forests. In particular, the production proportion of containerized seedlings, which allow a longer planting period, should be increased to help reduce reforestation costs. About 67 million seedlings were produced for planting in FY2022, about 50% of which was raised using containers (Fig. I-3).



Source: Survey by Forestry Agency

Fig. I-3 Production of seedlings for afforestation

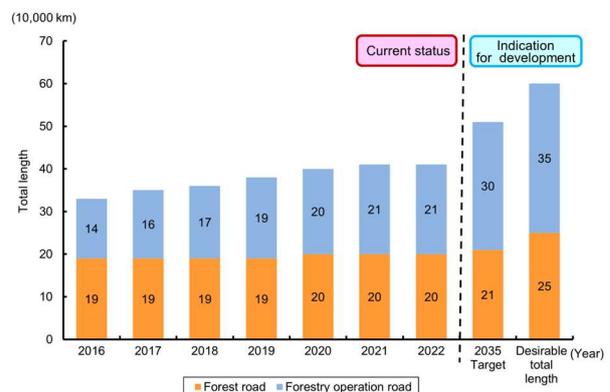
Furthermore, it is crucial to develop and supply varieties with superior growth aiming at the increase in carbon dioxide removals and forestry yield and the efficiency of afforestation and nurturing. The Forest Research and Management Organization has been developing the "elite trees" which are selected varieties with faster initial growth and good wood quality through crossbreeding and selection. The MAFF designates trees that meet criteria such as superior growth as the "specified mother trees" and promotes especially the designation of the "elite trees" in recent years. As of March 2024, 538 varieties have been designated as "specified mother trees" with superior growth, of which 368 are the "elite trees." The Forestry Agency is promoting the development of seed and hedge orchards to increase the seedlings derived from "specified mother trees".

(3) Development of Forestry Road Systems

The Forestry Agency promotes to develop forestry road systems, which are essential infrastructure for forestry and livelihood of rural communities in hilly and mountainous areas. Forestry road systems have been developed to reach the total length of 410 thousand km in FY2022 (Fig. I-4).

(4) Private Forest Management Entrustment System and Forest Environment Tax

Since small-scale forest ownership accounts for most private forests in Japan, consolidation is vital for promoting forest management. The Forestry Agency had



Source: Forestry Agency

Note: Forestry roads include "operation roads used mainly by timber transport trucks".

Fig. I-4 Current status of forestry road systems and the indication for development

promoted consolidation effort of forestry management entities, such as forest owners' cooperatives. The Private Forest Management Entrustment System was enforced in April 2019 through the Private Forest Management Entrustment Act, as forestry management entities faced difficulties in consolidating efforts. This was due to difficulties in tracking forest owners caused by generation changes and the declining interest in forest management.

Under the Private Forest Management Entrustment System, local municipalities can be entrusted with the management of forests whose owners are unable to manage appropriately. The municipalities can re-entrust the management of those forests that are suitable for forestry activities to private forestry operators who authorized by prefectural governments. For the forests which are not suitable for forestry activities and are required to fulfill multiple functions, the municipalities manage those entrusted forest by themselves.

By FY2022, 1,070 municipalities conducted the “questionnaires of forest owners' intention”, the first step of the entrustment process, for approximately 810,000 ha of private forest.

Also in 2019, the Forest Environment Tax and Forest Environment Transfer Tax were introduced for the funding of forest management activities by local municipalities. While the Forest Environment Tax will be imposed on each individual as a national tax at a rate of 1,000 yen per capita per year from FY2024, the Forest Environment Transfer Tax has been transferred to all the municipalities in Japan for the expenses of their forest management activities since FY2019.

The utilization of the Forest Environment Transfer Tax is increasing yearly. The total amount of the utilization plan for FY2023 is 53.7 billion yen. The efforts are steadily progressing. For example, the area of forest management using this tax, such as thinning, is about seven times in FY2022 as large as the first year of FY2019.

(5) Social Support and Participation in Forest Management

An increasing number of organizations, such as private companies and NPOs, are engaging in forest management activities in recent years with 3,671 organizations conducted in 2021. Active involvement of the private sector in forest management activities is driven by their growing interest in SDGs and ESG investment.

The J-Credit scheme operated by the MAFF, the Ministry of Economy, Trade and Industry, and the Ministry of the Environment certifies the amount of greenhouse gas emissions reductions and removals and embraces forest-based carbon removals methodologies since its inception in 2013. The total issuance of credits certified through the forest methodologies up to FY2023 amounts to about 626,000 ton-CO₂. The rapid increase of validated forest projects signals further expansion of removals credits in the years to come.

3. Forest Conservation

(1) Management and Conservation of Protection Forests

“Protection forests” are designated in accordance with the Forest Act when it is considered particularly necessary that they provide important public benefits. Felling and forest development are regulated in them. At the end of FY2022, 12.27 million ha of forests were designated as protection forests. Even when a forest except a protection forest will be diverted, the Forest Land Development Control System secures public benefits. In addition, Dangerous embankments are comprehensively regulated under nationwide uniform standards regardless of land use, including residential land, forestland, and cropland, according to the Act on Regulation of Residential Land Development and Specific Embankments enforced in May 2023.

(2) Disaster Control

The Forestry Agency promotes integrated forest conservation projects including accurate clarification of mountain disaster hazard zones, restoration of devastated forests, and development of coastal forests. When natural disasters occur in mountainous areas, the Forestry Agency conducts immediate surveys and elaborates recovery works.

(3) Conservation of Forest Biodiversity

The Forestry Agency promotes establishment of diverse forests depending on its natural conditions, and protection and management of primeval forest ecosystems. The Forestry Agency implements the appropriate protection and management of forests in areas such as World Heritage sites and Biosphere Reserves.

In 2024, the Forestry Agency compiled the "Guidelines for forestry management to enhance forest biodiversity", targeting forestry contractors and forest holders to promote nature-positive activities in the forestry sector.

(4) Forest Damage by Wildlife, Pests and Forest Fire

Forest damage by wildlife is still serious though it is decreasing. In FY2022, about 4,600 ha of forests were damaged by wildlife, about 70% of which was caused by deer (Fig. I-5). The MAFF and Ministry of the Environment promote comprehensive measures including barrier fences installation and population control through capturing wildlife to prevent the damage.

Damage by pinewood nematode (*Bursaphelenchus xylophilus*) is the worst forest pest in Japan, although it is declining. In FY2022, pinewood nematode damaged about 250 thousand m³ of trees. To prevent the spread of this pest, the Forestry Agency propagates pest-resistant seedlings, implements prevention measures with chemicals, and eradicates the nematode and mediating insects by logging and fumigation of affected trees.

In addition, damage by Japanese Oak Wilt, which is transmitted by *Platypus quercivorus*, is spreading. In FY2022, this pest damaged 148 thousand m³ of trees in 41 prefectures. To prevent the spread of this pest, the Forestry Agency promotes the extermination of insects by fumigation of damaged trees and the prevention of insect invasion by applying adhesives to and covering with vinyl sheets on healthy trees.

In 2022, 1,239 forest fires occurred, burning down 605 ha of forest. Forest fires intensively occur in winter and spring, with most of the cases caused by people carelessly using fire.

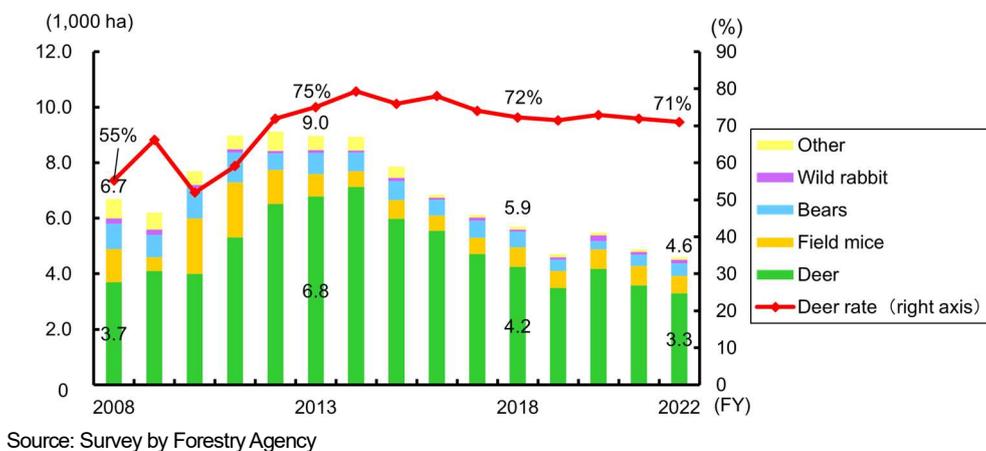


Fig. I-5 Area of forests damaged by major wildlife species

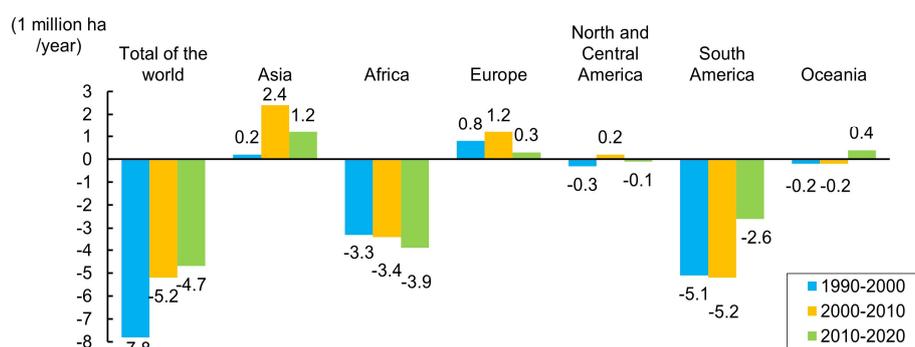
4. Addressing Global Policy Agenda

(1) Promotion of Sustainable Forest Management

According to the Food and Agriculture Organization of the United Nations (FAO), the global forest area in 2020 is estimated to be 4.06 billion ha, which is 31 % of the total land area. The global forest area is still decreasing worldwide, especially in tropical forests in Africa and South America. The annual rate of net forest loss in 2010-2020 is estimated at 4.7 million ha/year, however if the increases due to afforestation and forest expansion are not taken into account, the annual rate of forest loss would be 10.2 million ha/year in 2015-2020 (Fig. I-6).

The GOJ promotes efforts toward sustainable forest management through participating in international dialogues on forests such as the United Nations Forum on Forests (UNFF), the FAO Committee on Forestry (COFO) and the Montréal Process.

In Japan, two forest certification schemes have been in place, one of which is run by the Forest Stewardship Council (FSC), an international organization, and the other is run by the Sustainable Green Ecosystem Council endorsed by Programme for the Endorsement of Forest Certification schemes (SGEC/PEFC-J), which had been established as a domestic certification scheme in Japan, and was endorsed by the Programme for the Endorsement of Forest Certification (PEFC) in 2016. About 10% of forests in Japan are certified by FSC (about 0.42 million ha) and/or SGEC (about 2.21 million ha).



Source: Prepared by the Forestry Agency based on Global Forest Resources Assessment 2020 (FAO)

Fig. I-6 Annual forest area net change by decade and region, 1990–2020

(2) Global Warming and Forests

Global warming is one of the most serious environmental problems. Adverse impacts caused by the rising global average temperature are causing concern.

To realize net-zero by 2050, the GOJ revised the Plan for Global Warming Countermeasures in October 2021, with Japan's aim to reduce its GHG emissions by 46% in FY2030 compared to FY2013 levels, of which approximately 2.7% is to be met by forest carbon removals.

Measures for the enhancement of forest carbon sinks are essential to achieve the targets, which include the implementation of forest management practices such as thinning and reforestation using the "elite trees" as well as promoting wood use.

The GOJ has promoted "Reducing Emissions from Deforestation and Forest Degradation and the role of conservation, sustainable management of forests and enhancement of

carbon stocks in developing countries” (REDD+), and adaptation measures based on the Climate Change Adaptation Plan (revised in May 2023, by the GOJ).

(3) International Discussions on Biodiversity

The Kunming-Montreal Global Biodiversity Framework, new global goals for 2050 and global targets for 2030, was adopted at the second part of COP15 to the Convention on Biological Diversity (CBD) held in December 2022.

(4) International Cooperation

The GOJ contributes to the promotion of sustainable forest management in developing countries by providing technical cooperation and financial assistance by bilateral cooperation and multilateral cooperation through international bodies.

Japan’s technical cooperation is conducted as projects which optimally combine the “dispatch of experts”, “acceptance of training participants” and “provision of equipment”, and policy/technical training courses through the Japan International Cooperation Agency (JICA). Also, the GOJ provides financial support such as loans and grants through JICA: loans for promoting afforestation and reforestation projects and developing human resources, and grants for procurement of machinery and materials for forest management.

The GOJ also provides financial support to projects conducted by the International Tropical Timber Organization (ITTO) and FAO. In the projects, ITTO promotes sustainable wood use in Viet Nam, Indonesia, Thailand and Malaysia, and establishes timber legality framework in wood producing countries, and FAO promotes conservation and utilization of forests for enhancing community resilience to climate change in mountain watersheds of developing countries and balancing conservation of forest and agriculture for halting deforestation.



In the Republic of Kenya in East Africa, 80% of the land is arid or semi-arid and afforestation has not progressed. Japan International Forestry Promotion and Cooperation Center (JIFPRO) is developing and promoting long-rooted seedling technology, working with the Kenya Forest Research Institute, under a subsidized project by the Forestry Agency. Since FY 2022, Komatsu Ltd., a Japanese company, has provided machinery for efficiently digging deep planting holes, and technical demonstrations of afforestation with long-rooted seedlings have been conducted on the land of over 70 farmers.



Planting long-rooted seedlings by President of Kenya

(©Kenya Forest Research Institute)



Excavation of planting holes using construction machinery

(©JIFPRO)

Chapter II

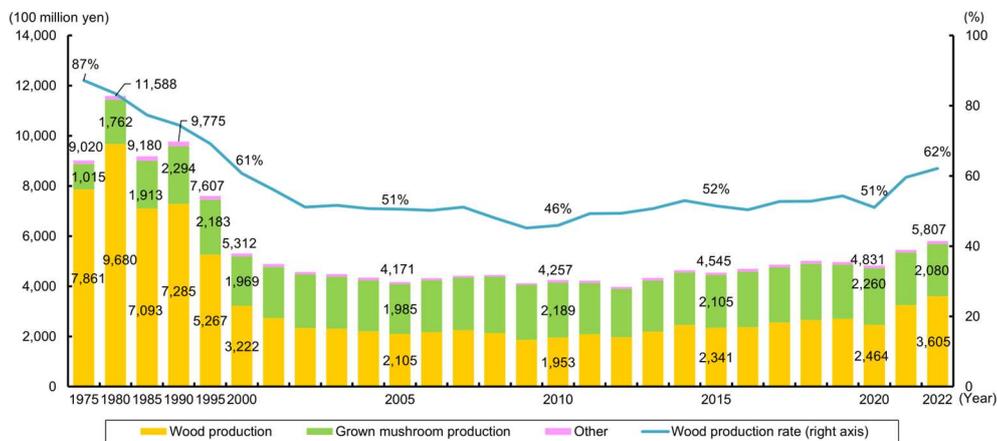
Forestry and Rural Communities in Hilly and Mountainous Areas

1. Forestry

(1) Forestry Production

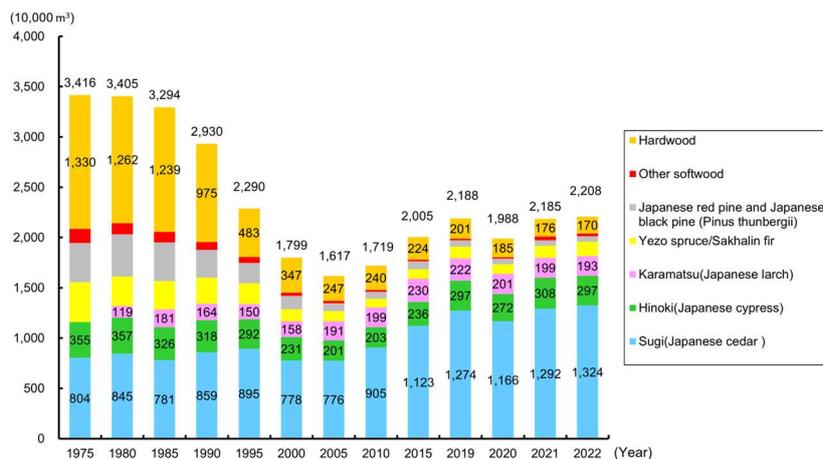
Total forestry output in 2022 was 580.7 billion yen, an increase of 6.4% from the previous year. Wood production accounted for about 60% of forestry output and reached 360.5 billion yen in 2022, which was an increase of 10.8% from the previous year (Fig. II-1).

Supply of domestic wood totaled 34.62 million m³ in 2022. Of the supply, logs for sawn lumber, plywood and chips accounted for 22.08 million m³. By tree species, the volume of Sugi (Japanese cedar) production was 59.9%, Hinoki (Japanese cypress) 13.5%, Japanese larch 8.7%, and hardwood 7.7%, respectively (Fig. II-2).



Source: MAFF "Forestry output"

Fig. II-1 Gross forestry output



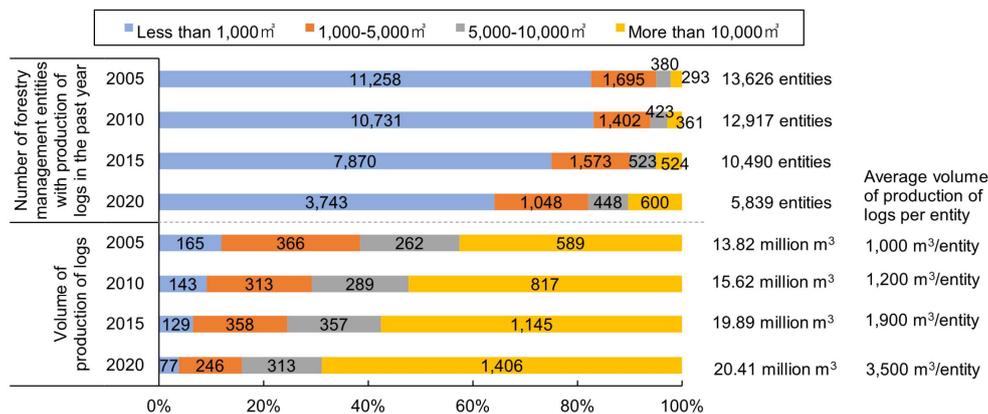
Source: MAFF "Report on supply and demand of lumber"

Fig. II-2 Domestic roundwood production

(2) Forestry Management

The number of forestry households in 2020 was 690 thousand, 88% of which owned less than 10 ha of forest area. Small-scale forest ownership remains dominant.

The number of forestry management entities is about 34,000, significantly decreasing from about 200,000 in 2005. On the other hand, the average volume of log production per forestry management entity has increased. In addition, the proportion of log volume by entities with the annual log production of more than 10,000 m³ has increased to 70%, indicating that the scale of entities is expanding (Fig. II-3).



Source: MAFF "Census of Agriculture and Forestry" (aggregate calculation after reclassification)

Fig. II-3 Number of forestry management entities by the scale of log production

Forest owners' cooperatives are the main players in forest management. Thus, it is necessary to strengthen their management base in terms of increasing profit return to forest owners and forestry workers.

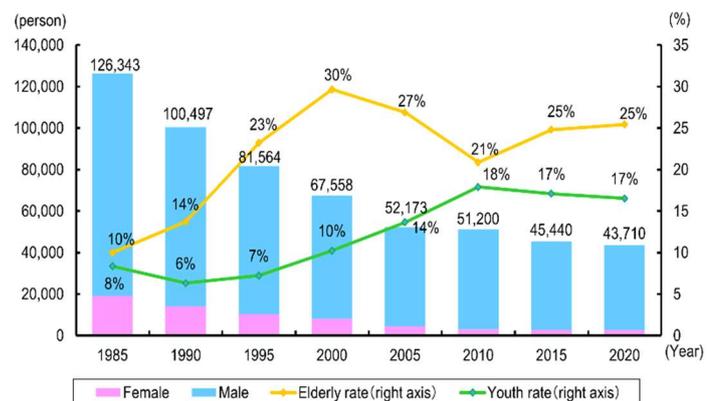
To strengthen the management skills of forestry management entities, the Forestry Agency has supported the development of "Forest Management Planners" who engage in selling woods strategically and sustainable forest management.

(3) Forestry Workforce

The number of forestry workers in 2020 was 43,710, which leveled off after a long-term declining trend.

The proportion of young workers in forestry remains stable while that in all industries is on a declining trend (Fig. II-4).

Since the rate of occupational accidents in forestry is higher than in other industries, the Forestry Agency promotes safety patrol guidance to forestry management entities, and offers various training programs for forestry workers (Fig. II-5).

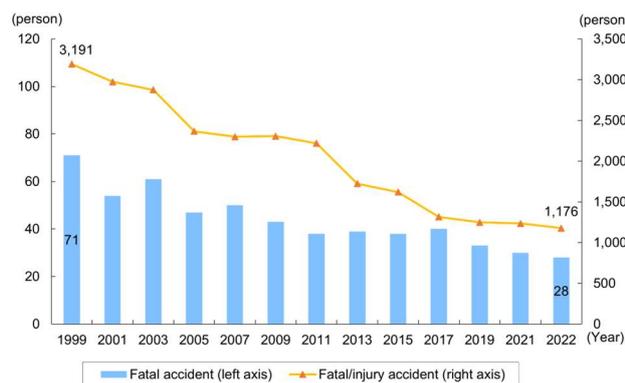


Source: Ministry of Internal Affairs and Communications "National Census"

Notes: 1. "Elderly rate" reflects the rate of people aged 65 or over.
2. "Youth rate" reflects the rate of people aged under 35.

Fig. II-4 Number of forestry workers

Permanent year-round employment rate of forestry workers is on a growing trend. On the other hand, the average annual salary for forestry workers is lower than in other industries. Therefore, the Forestry Agency is making efforts to improve their salary levels. Although the proportion of females engaged in forestry is lower than that of males (Fig. II-4), the opportunities that women play an active role such as the log production and forest surveys have increased due to the progress of the mechanization of forestry in recent years. In addition, some entities have developed the environments where women can work comfortably.



Source: Ministry of Health, Labour and Welfare "Report on Fatal Accidents" and "Report on occupational casualties"

Fig. II-5 Number of occupational accidents in forestry

(4) Improvement of the Efficiency of Forestry Management

Consolidating Forestry Operations

Consolidation of forestry operations is necessary to improve productivity since most of the private forests in Japan consist of small-scale forest owners.

The Forestry Agency encourages such operations through the Collective Forest Management Plan System, the Private Forest Management Entrustment System and the development of Forest Practice Planners.

It is also promoted to provide forestry entities with forest information necessary for consolidating operations through forest land ledgers, in which each municipality consolidates ownership and boundary information, and “Forest Cloud Systems” introduced by prefectures for efficient information sharing among stakeholders.

Development of the New Forestry

Based on the revised Basic Plan for Forest and Forestry, the Forestry Agency is promoting initiatives for the “New forestry” that utilizes new technologies to improve productivity and safety, which makes it possible to significantly improve profitability of forestry, from logging to reforestation and silviculture processes. Introducing of the “elite trees” and “Smart forestry”, which utilize ICT and new technologies such as remotely operated machinery, is considered to be the key to realizing the “New forestry”.

2. Non-timber Forest Products

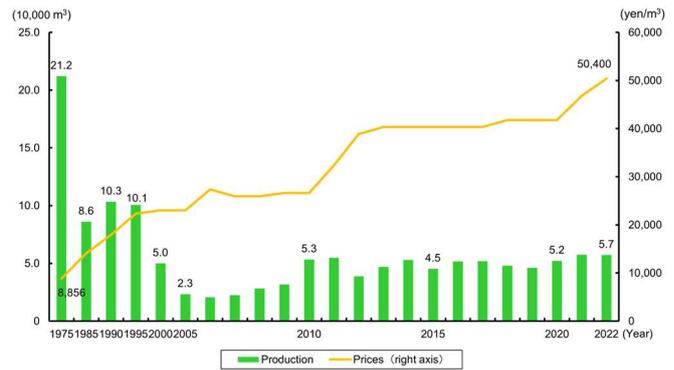
Non-timber forest products include variety of products such as mushrooms, edible nuts, wild vegetables, Japanese lacquer, bamboo, charcoal, and firewood. Non-timber forest products account for about 40% of the forestry output and play key roles in stimulating rural economies and increasing in income. The value of non-timber forest products in 2022 was 265.8 billion yen, an increase of 1.9% from the previous year.

(1) Mushrooms

Mushrooms earned more than 80% of the value of non-timber forest products in 2022. Production of mushrooms has been flat in recent years, reaching 461,000 tons in 2022.

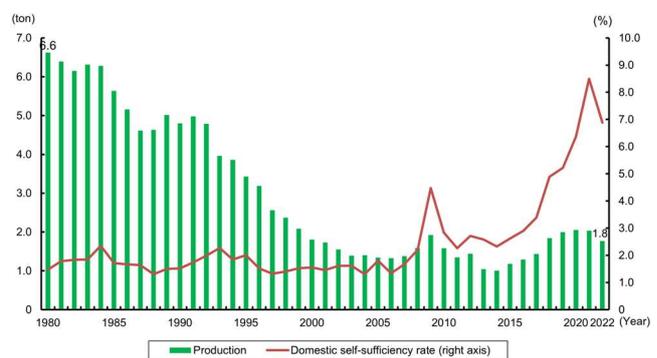
(2) Other Non-timber Forest Products

Total production of charcoal has been decreasing over the long term and amounted to 17,000 tons in 2022. On the other hand, reflecting continued popularity of camping, total production of firewood for sale was almost the same as the previous year and amounted to 57,000 m³ (Fig. II-6). Production of bamboo material was 25,000 tons in 2022, a decrease of 9.6% from the previous year. Production of domestically produced lacquer has been increasing in recent years since the Agency for Cultural Affairs announced a policy to use domestically produced lacquer in principle for the preservation and restoration of national treasure and important cultural property buildings in 2015. Domestic production in 2022 was 1.8 tons (Fig. II-7).



Source: MAFF “Non-timber Forest Products Data”

Fig. II-6 Production and prices of firewood for sale



Source: MAFF “Non-timber Forest Products Data”

Fig. II-7 Production of Japanese lacquer

3. Rural Communities in Hilly and Mountainous Areas

(1) Current State of Rural Communities in Hilly and Mountainous Areas

Rural communities in hilly and mountainous areas, where many people engage in forestry and other activities based on forest, play a significant role in securing the multiple functions of forests. “Mountain Village Areas Due for Development”, designated pursuant to the Mountain Villages Development Act, cover about half of Japan’s total land area, accounting for approximately 60% of the total forest area. These communities face several problems such as a decrease in job opportunities and an increase in abandoned farmland due to continuing depopulation and the aging population.

On the other hand, there has been increasing interest by urban residents and foreign tourists in abundant forests, clear water, landscape and culture in rural communities in hilly and mountainous areas.

(2) Revitalization of Rural Communities in Hilly and Mountainous Areas

The MAFF has supported to discover local resources such as non-timber forest products, hardwood and *gibiers* (game meat) and to improve the added value of the resource, in addition to develop the forestry and wood industry by utilizing forest resources.

In recent years, there are new movements to use forest spaces in diverse fields such as health promotion, tourism, and education as people change their lifestyles and diversify their values. The Forestry Agency has worked to create and promote the “Forest-related Service Industry” in these fields.

Ueno Village in Gunma Prefecture is a region rich in forest resources, with 95% of the area covered by forests, and woodworking products are a specialty of the area. Aiming to further utilize the forest resources and revitalize the woodworking industry, the village's forest owners' cooperatives and woodworking artists have established a project team "Uenomuramokko", working to develop new products and secure workers.

As a result of these efforts, which have been joined by I-turners, the village has become better known as a woodworking village. This has also led to further I-turns to the region, 12 people have settled and are working in the area as of 2023.



Development of woodworking products utilizing forest resources



Woodworking artists at work



Chapter III

Wood Product Demand, Wood Use and Wood Industry

1. Supply and Demand for Wood

(1) Global Wood Supply and Demand

In 2022, the global consumption of industrial roundwood decreased by 2% from the previous year to 2,026 million m³.

The global imports of industrial roundwood decreased by 17% from the previous year to 119 million m³. China was the world's largest industrial roundwood importer in 2022, accounting for 37% of global imports of industrial roundwood.

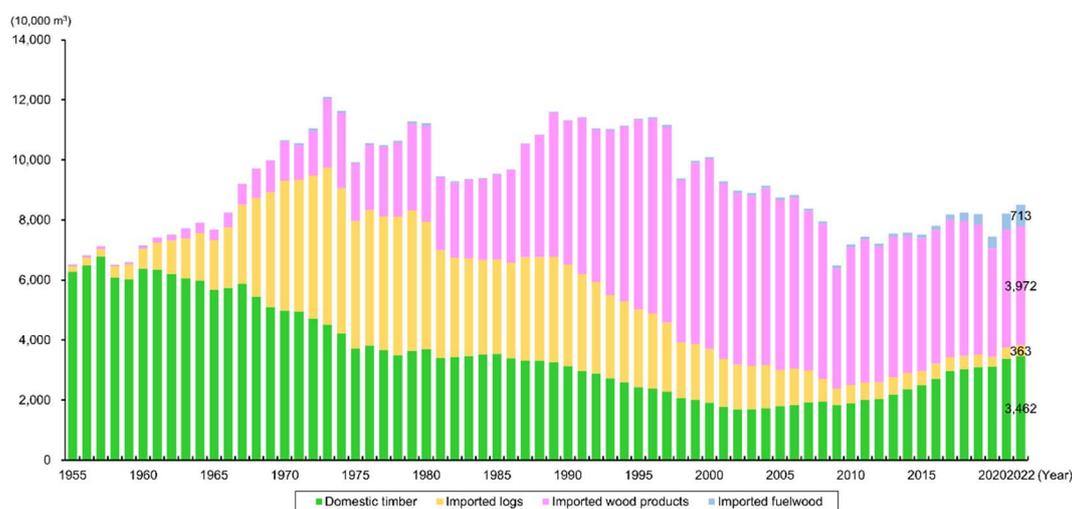
In 2022, the global production of sawn wood decreased by 2% from the previous year to 481 million m³. The global imports of sawn wood decreased by 7% to 137 million m³. The United States was the world's largest sawn wood importer in 2022.

(2) Wood Supply and Demand in Japan

Japan's wood demand bottomed out in 2009 and has since recovered. The total wood product demand in Japan in 2022 was 85.09 million m³ (roundwood equivalent), which was an increase of 3.6% from the previous year.

The domestic wood supply bottomed out in 2002 and has since recovered. It was 34.62 million m³ in 2022, which was an increase of 2.7% from the previous year (Fig. III-1).

The volume of imported wood in 2022 was 50.48 million m³, which was an increase of 4.3% from the previous year, due to an increase in the imports of wood products (Fig. III-1).



Source: Forestry Agency "Wood Supply and Demand Chart"

Fig. III-1 Wood supply in Japan

(3) Wood Prices

The prices of domestic roundwood and sawn wood products increased significantly in 2021 due to a shortage of imported materials as the demand recovered with the post-COVID-19 economic recovery. The prices have been declining since 2022, but the prices in 2023 remain at higher levels than in 2020 before the price increase.

(4) Addressing Illegal Logging

The Clean Wood Act, enforced in 2017, stipulates that all business entities must endeavor to use legally harvested wood and wood products, and that Wood-related Business Entities in particular shall confirm the legality of the wood and wood products they handle.

Wood-related business entities that properly and reliably take measures for ensuring the use of legally harvested wood and wood products may apply to a registering organization to obtain registration as a “Registered Wood-related Business Entities”. As of March 2024, 660 entities have been registered.

To further promote the distribution of legally harvested wood, a partial revision to the Clean Wood Act, which requires wood-related business entities engaged in processing, exporting, and importing to confirm legality, was passed in the National Diet in April 2023. The GOJ supports the establishment of legal and sustainable supply chain in wood producing countries through the contribution to ITTO. Japan has joined the Experts Group on Illegal Logging and Associated Trade (EGILAT) of Asia-Pacific Economic Cooperation (APEC), which shares information and exchanges views regarding measures to combat illegal logging.

2. Wood Use

(1) Significance of Wood Use

Wood use in buildings stores carbon absorbed by forests for a long time and contributes to reducing construction-related carbon dioxide emissions since wood consumes less energy than other materials during manufacturing and processing. Wood that is not suitable for material use or wood after use in buildings can be utilized as a carbon-neutral energy source to replace fossil fuels.

In addition, wood provides a comfortable and healthy indoor environment since it has humidity control function, high thermal insulation properties, and positive physiological and psychological effects.



Ginza Takagi Building
(Chuo-ku, Tokyo)
(©SHELTER CO.,LTD.)

(2) Wood Use in Buildings

In Japan, about 80% of low-rise (up to three stories) residential buildings are wooden on the basis of new building starts floor area. However, wooden buildings account for less than 10% of mid-to-high-rise (four stories and above) buildings and non-residential ones.

In recent years, as the technical and institutional environment for the use of wood has been developed to a certain extent, there is a growing number of leading examples of mid-to-high-rise and non-residential buildings with wooden structures (Fig. III-2). The Forestry Agency has been supporting the development of fire-resistant wooden materials and CLT in collaboration with other ministries and agencies. To further expand the use of wood, the public and private sectors are collaborating in examining challenges and solutions in wood use.



Mito City Civic Center
(Mito City, Ibaraki Prefecture)
(©TAKENAKA CORPORATION)

Fig. III-2 Examples of wood use in buildings

(3) Use of Woody Biomass

Use for New Material

High value-added materials including lightweight, high-strength cellulose nanofibers (CNF) and heat-resistant, processible glycol lignin are being developed to replace fossil-based plastics with that from woody biomass. As for CNF, manufacturing facilities are under operation in various places, and some products using CNF have been put into practical use, including additives for foods and paint.

Lignin is expected to be utilized for high-value-added materials, and development for applying glycol lignin to products is underway.

Use for Energy

The quantity of woody biomass for energy use has been increasing recently. Japan's fuelwood consumption including wood chips, wood pellets, firewood, and charcoal in 2022 increased by 18.0% from the previous year to 17.39 million m³. The increase was mainly caused by a boom in woody biomass power plants.

The Forestry Agency is promoting the transportation and utilization of low-quality wood that has not been utilized. It is also encouraging heat-use and cogeneration, which has higher energy conversion efficiency.

(4) Spread of the Use of Wood among Consumers

The Forestry Agency has been promoting the Kizukai Undo (attention to wood use) initiative to disseminate the importance of wood use among consumers, including through the Japan Wood Design Award which acknowledges outstanding wood products and related activities that contribute to the re-discovery of the excellence and value of wood from the consumers' viewpoints.

The Forestry Agency has also been promoting "Mokuiku" (wood use education) activities to disseminate the excellence and significance of wood use among both adults and children.

3. Wood Industry

(1) State of the Wood Industry

The added value amount of lumber and the wood industry has been increasing in recent years. In 2021, the value rose to 1,049 billion yen.

(2) Strengthening the Competitiveness of the Wood Industry

The scaling-up and consolidation of sawmills and plywood mills are progressing to stabilize the supply of products with reliable quality and performance at low cost in order to strengthen global competitiveness of wood industry in Japan.

In order to strengthen local competitiveness of small and medium-sized sawmills, the Forestry Agency promotes their initiatives to produce a wide range of products, as well as to collaborate with local log producers, local builders, and other stakeholders to meet the needs of local communities.

In addition, it is essential to establish a supply system for Japanese Agricultural Standards (JAS) products of reliable quality and performance. The MAFF is working to rationalize the classification and criteria of the JAS in line with actual usage conditions, as well as supporting demonstrative use of JAS structural wood products.

(3) Development and Dissemination of Products and Technologies toward Utilization of Japan's Forest Resources

The Forestry Agency is promoting; 1) the development and dissemination of milling and drying technologies for large-diameter logs, the supply of which is expected to increase as Japan's forest resources grow; 2) the standardization of dimensions of CLT panels and other wood materials and the technological development of fire-resistant wooden materials in order to expand the wood use in non-residential and mid-to-high-rise buildings; and 3) the development of new products, such as softwood floorboards with increased surface hardness in order to increase demand in the fields of renovation and furniture manufacturing.

(4) Each Sector of the Wood Industry

Sawmilling Industry

Shipments of sawn wood products have remained flat in recent years. In 2022, shipments rose to 8.6 million m³, which was a decrease of 5.4% from the previous year. The quantity of industrial wood received by sawmills was 16.36 million m³ in 2022.

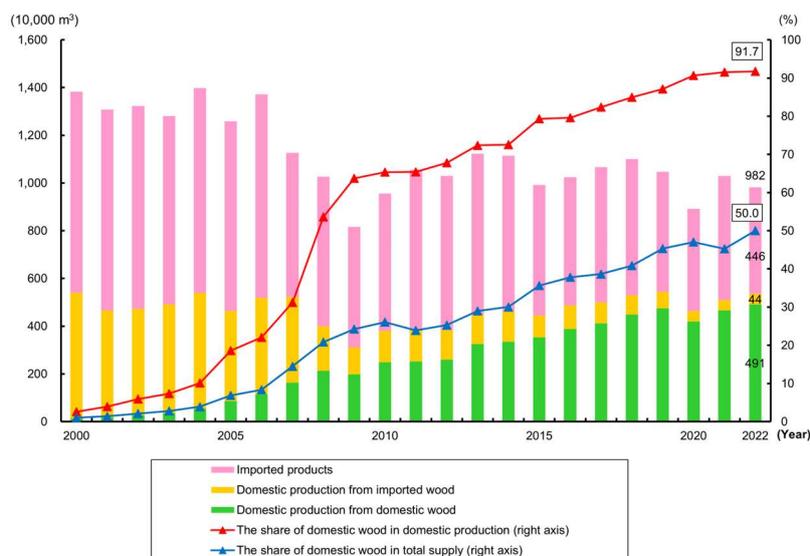
Glued Laminated Timber Manufacturing Industry

Glued laminated timber production in 2022 totaled 1.66 million m³ of which structural use accounted for 1.58 million m³. Japan's import of glued laminated timber products in 2022 stood at 1.04 million m³.

Plywood Industry

Production of plywood in 2022 was 3.06 million m³, which was a decrease of 3.6% from the previous year. Most of this – 2.66 million m³ - was for structural use, while 30 thousand m³ was used as concrete formwork.

The share of domestic wood in domestic plywood production in 2022 rose to 91.7% (4.91 million m³). In 2022, the total wood supply for plywood, including imported products, was 9.82 million m³. Domestic wood accounted for 50.0% of total wood supply for plywood in Japan (Fig. III-3).



Source: Forestry Agency "Wood Supply and Demand Chart"

Fig. III-3 Supply of wood for plywood

Wood Chip Manufacturing Industry

Production of wood chips (excluding fuel use chips) in 2022 was 5.28 million tons, which was a decrease of 13.0% from the previous year.

Japan's import of wood chips in 2022 totaled 11.31 million tons, accounting for 68.2% of wood chip supply in Japan.

Particle Board and Fiberboard Industry

Production of particle board in 2022 was 0.98 million m³, which was a decrease of 1.9% from the previous year. Production of fiberboard in 2022 was 0.72 million m³, which was a decrease of 0.4% from the previous year.

Precut Processing Industry

"Precut lumber" refers to lumber that is pre-processed into the required shapes and sizes of building components, such as posts and beams, which enables quick and easy assembling of the components onsite.

The share of precut lumber in the lumber used for the post-and-beam construction method, which is one of the main construction methods for houses in Japan, reached 94% in 2022.

Wood Distribution Industry

In the distribution of domestic logs in 2018, 41% was distributed through the timber market, 19% was sold to wood suppliers, while 40% was transported directly from logging sites to mills.



The Kagoshima Yusui Factory of MEC Industry Co., Ltd., funded by construction and real estate companies and local wood-related companies, has been fully operational since 2022 as a new wood-processing and distribution base in Yusui Town, Kagoshima Prefecture.

The factory has introduced a line that can handle large-diameter logs up to 60 cm in diameter, conducting integrated operations of log procurement, sawing, and manufacturing and sales of products and housing. The log utilization volume is expected to be 55,000 m³ in FY2024.



MEC Industry Kagoshima Yusui
Factory

Chapter IV

National Forest Management

1. Roles of National Forests

(1) Distribution and Roles of National Forests

National forests occupy 7.58 million ha of land, which account for approximately 20% of the land area of Japan and approximately 30% of the total forest area. They are widely distributed in the remote mountainous areas and headwaters areas, and they play important roles in fulfillment of the multiple functions of forests, including land conservation and watershed conservation.

National Forests, which have diverse ecosystems such as planted forests and primeval natural forests, are a place for the growth and habitat of various wildlife including rare species. They also provide fields for health and recreation in forests.

(2) National Forests Management

National forests, an important asset of the country, are managed by the Forestry Agency in an integrated manner under the National Forest Management Program.

2. Specific Initiatives under the National Forest Management Program

(1) Further Promotion of Management with Emphasis on Public Benefits

The Forestry Agency manages each national forest in accordance with the five forest types categorized based on the expected functions of “mountain disaster prevention”, “nature conservation”, “recreational use”, “comfortable environment development”, and “watershed conservation”.

Approximately 90% of national forests are protection forests such as watershed conservation. The Forestry Agency improves devastated land and protection forests through forest conservation projects in order to ensure safe and secure life.

The Forestry Agency designates and manages “Protected Forests” and “Green Corridors” in order to conserve biodiversity. As of March 2023, Protected Forests were designated at 658 locations covering approximately 1,014,000 ha of land, which accounted for 13.4% of national forest area. “Green Corridors” were formed as of March 2023 at 24 locations, covering approximately 584,000 ha of land, and accounting for 7.7% of national forest area. The Forestry Agency takes measures to protect rare species of wildlife and prevents deer and other wildlife from damaging forests.

(2) Contribution to Revitalizing Forest and Forestry

Through the organizations, technical capabilities and resources of the National Forest Management Program, the Forestry Agency is (I) developing and disseminating technologies for low-cost and effective forestry practices, such as utilization of containerized seedlings, drones and Information and Communication Technology (ICT) and an integrated harvesting and planting system; (II) establishing cooperative forest management areas to collaborate with private forests to promote development of forestry road systems and forest operations; and (III) promoting stable wood supply to lumber and plywood mills through “System Sales”.

In April 2020, the Timber Harvesting Rights System was enforced. Under this system,

forestry management entities can acquire the right to steadily harvest trees in certain designated areas of national forests for a certain period, while ensuring multiple functions of the forest.



In the Kumagawa River basin in Kumamoto Prefecture, record-breaking heavy rains from July 3rd to 4th, 2020, caused severe damage such as numerous hillside failures and river flooding.

At the request of Kumamoto Prefecture, Kyushu National Forest Regional Office carried out restoration projects for 36 damaged forest conservation facilities and forest lands in private forests in Ashikita district, where hillside failures were particularly concentrated. The project was completed in September 2023 (total project cost: approximately 3.1 billion yen).



Completion report to the Governor of Kumamoto Prefecture and presentation of a letter of appreciation from the Governor

(©2010kumamoto pref. Kumaon)

(3) National Forests as “Forests for People”

The Forestry Agency provides various organizations (e.g. schools, voluntary groups, corporations, traditional woodworkers) with places for field activities such as forest environmental education and forest management practices, by designating forests for such activities within national forests. The Forestry Agency also undertakes “model projects” to manage forests in cooperation with local parties and nature conservation groups.

The Forestry Agency leases national forests to local governments and residents.

“Recreation Forests” are managed and administered in partnership with municipalities and other stakeholders in local communities such as the tourist industry. In FY2022, a total of about 100 million people visited “Recreation Forests”.

And 93 of “Recreation Forests” that have potential attractiveness as tourism resources were selected as “Japan’s Forests with Breathtaking Views” (Fig. IV-1). To encourage more people to visit these forests, the Forestry Agency has provided information on web sites in English and has improved facilities by posting multilingual signs, and intensive environmental maintenance, such as facility repairs.



QR Code for “Japan’s Forests with Breathtaking Views” website



Poroto Recreation Forest

Tsurugisan Recreation Forest

Togakushi-Omine Recreation Forest

Kumamoto Recreation Forest

Shirakami-Sanchi - Anmon Falls Recreation Forest

Source: Forestry Agency

Fig. IV-1 Examples of “Japan’s Forests with Breathtaking Views”

Chapter V

Reconstruction after the Great East Japan Earthquake

1. Recovery of Forests, Forestry and the Wood Industry

(1) The Great East Japan Earthquake

On March 11, 2011, the Great East Japan Earthquake, the largest earthquake ever recorded in Japan, hit the eastern part of Japan. It caused a strong earth tremor over a broad area and brought a great tsunami which devastated entire coastal communities along the eastern coast of the Tohoku region.

In July 2011, the GOJ developed the fundamental reconstruction policy, titled the Basic Guidelines for Reconstruction in Response to the Great East Japan Earthquake, setting the timeframe for reconstruction at 10 years.

In March 2021, the GOJ established “Basic Guidelines for Reconstruction from the Great East Japan Earthquake After the “Reconstruction and Revitalization Period””.

(2) Recovery of Forests

The Great East Japan Earthquake caused damages to forests and forest conservation facilities and forest roads in 15 prefectures. By FY2021, the recovery works had been completed.

Approximately 164 km of coastal disaster-prevention forests damaged by the tsunami required restoration work. The restoration work was completed on about 163km of them as of the end of March 2024. It is necessary to continue the project for growing the seedlings.

Fukushima Prefecture promotes efforts in collaboration with NPOs, companies, and others as the "Fukushima Forest and Coastal Forest Regeneration Projects".

Meiwa Co., Ltd. (Minamisoma City, Fukushima Prefecture), which is engaged in the construction and management of power transmission lines, participated in the project, planting 400 Japanese black pine trees in 2020. The company has been conducting tending activities in spring and autumn since 2021.



Weeding
(© MEIWA Co.,Ltd.)



(3) Recovery of Forestry and the Wood Industry

The Great East Japan Earthquake damaged 115 wood processing/distribution facilities and 476 non-timber forest products facilities. Distribution of plywood materials and wood chips was disrupted as large-scale plywood and paper mills along the Pacific Coast were damaged.

The restoration of 98 wood processing/distribution facilities was completed by the end of March 2014, and their operations have restarted. The production of logs and wooden products has generally recovered to the respective levels before the earthquake.

(4) Promotion of Wood Use for Reconstruction and Contribution by Forests and Forestry

More than 25% (about 15,000) of “emergency temporary houses” were constructed with wood.

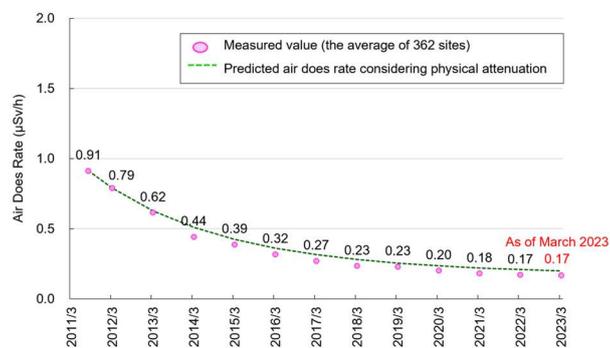
By the end of December 2020, approximately 25% of public housing built for disaster victims had been constructed with wood.

The use of wood has been promoted in the reconstruction of public buildings. Furthermore, woody biomass facilities such as power plants have been introduced in the disaster-affected prefectures, contributing to reconstruction.

2. Reconstruction after the Nuclear Accident

(1) Measures against Radioactive Substances in Forests

Air dose rate in forests in Fukushima Prefecture has been declining year by year (Fig. V-1).



Source: Forest planning division of Fukushima Prefectural Government, *the current state and prediction of radioactive materials in forests (FY 2022)*

Fig. V-1 Changes of Air Dose Rate in forests in Fukushima Prefecture

The GOJ conducts monitoring and research about trends of distribution of radioactive substances within forests.

For decontamination of the forests, the measures in the vicinity of residence had been given top priority. Based on “Comprehensive Efforts towards the Regeneration of Forests and Forestry in Fukushima” (March 2016), the Forestry Agency is undertaking comprehensive projects to implement forest management such as thinning and to deal with radioactive substances, and projects to restore "satoyama forests" around residential areas.

For ensuring safety and security against radiation for forest workers, the Forestry Agency published a guidebook for forest workers in 2016.

To supply safe wood products to consumers, the Forestry Agency supports research and analysis on radioactive materials of wood products and the relevant work environment, and initiatives to develop arrangements for certifying the safety of wood products.

The Forestry Agency has launched the “Restoration of satoyama and hardwood forest project” in cooperation with people in Fukushima Prefecture and promotes the restoration of satoyama hardwood forest for shiitake mushroom logs. Municipalities have created a plan (a restoration plan) for restoring log forests that set out the area of log forests to be regenerated, the implementation system, and other related matters. They have implemented full-scale harvesting of hardwood forests since FY2022.

(2) Supply Safe Forest Products

The GOJ set standard limits for radioactive substances in foods at 100 Bq/kg for general foods. As of March 28, 2024, 22 items of non-timber forest products have shipping restrictions.

The production of shiitake mushrooms on sawdust medium has recovered to almost the level before the Great East Japan Earthquake, but that on logs has not recovered even now.

The Forestry Agency has collected, analyzed, and provided information on the supply and demand of mushroom logs in response to the decrease in production volume in Fukushima Prefecture and other mushroom log production areas, which has affected log procurement in many prefectures.

The Forestry Agency established Guidelines Concerning Management of Log Cultivation of Mushrooms to Decrease Radioactive Cesium. Shipping restrictions on mushrooms are to be lifted when cultivation is managed based on this guideline and it has been determined that no mushrooms are produced whose radioactivity exceeds the standard limits. The Forestry Agency supports the maintenance of simple greenhouses and equipment for measuring radioactive substances, which are necessary for safe mushroom production.

Since 2021, if a system for properly managing and inspecting mushrooms and edible wild plants is developed under the shipping and inspection policy set by prefectures, it can be possible to ship the products which are confirmed not to exceed the limit for general foods by non-destructive inspection. As a result, the shipments of Matsutake mushrooms, unpeeled bamboo shoots, Nameko mushrooms, Naratake mushrooms, and Mukitake mushrooms have resumed in some restriction areas.

Appendix

1. Forestry-related Fundamental Figures

Item	Unit	2000	2005	2010	2015	2018	2019	2020	2021	2022
i Nominal gross domestic product (GDP)	billion yen	535,418	532,516	505,531	538,032	556,630	557,911	539,808	552,571	559,710
Forestry	billion yen	176	137	196	234	249	248	232	269	277
Forestry / GDP	%	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.05	0.05
ii Total number of workers	million	64.46	63.56	62.57	64.01	66.82	67.50	67.10	67.13	67.23
Forestry	million	0.07	0.06	0.08	0.07	0.07	0.08	0.06	0.06	0.07
Forestry / Total # of workers	%	0.11	0.09	0.13	0.11	0.11	0.12	0.09	0.09	0.10
iii Land area of Japan	million ha	37.79	37.79	37.80	37.80	37.80	37.80	37.80	37.80	37.80
iv Forest	million ha	25.15	25.12	25.10	25.08	25.05	25.05	25.05	25.05	25.02
Forest / Land area	%	67.5	67.4	67.3	67.3	67.2	67.2	67.2	67.2	67.1
v Protection forest	million ha	8.93	11.65	12.02	12.17	12.21	12.23	12.25	12.26	12.27
Protection forest / Forest	%	35.5	46.4	47.9	48.5	48.7	48.8	48.9	48.9	49.0
vi Growing stock of forest	billion m ³	3.5	4.0	4.4	4.9	5.2	5.2	5.2	5.2	5.6
vii Total wood supply/demand	million m ³	101.01	87.42	71.88	75.16	82.48	81.91	74.44	82.13	85.09
Domestic production	million m ³	19.06	17.90	18.92	24.92	30.20	30.99	31.15	33.72	34.62
Import	million m ³	81.95	69.52	52.96	50.24	52.28	50.92	43.29	48.41	50.48
Self-sufficiency rate	%	18.9	20.5	26.3	33.2	36.6	37.8	41.8	41.1	40.7
viii New housing starts	million units	1.23	1.24	0.81	0.91	0.94	0.91	0.82	0.86	0.86
Proportion of wooden structure	%	45.2	43.9	56.6	55.5	57.2	57.8	57.6	58.7	55.6

Sources i: Cabinet Office "Annual Report on National Accounts for 2022"

ii: Ministry of Internal Affairs and Communications "Annual Report on the Labour Force Survey"

iii: Geospatial Information Authority of Japan "The Report of Statistical reports on the land area by prefectures and municipalities in Japan"

iv, v, vi: Forestry Agency

vii: Forestry Agency "Wood Supply and Demand Chart"

viii: Ministry of Land, Infrastructure, Transport and Tourism "Housing Starts"

Note "Total wood supply/demand", "Domestic production" and "Import" in "vii" refer to the volume in roundwood equivalent.

2. Forestry Output

(Unit: billion yen)

Item	2000	2005	2010	2015	2018	2019	2020	2021	2022
Forestry output	531.15	417.05	425.70	454.47	501.73	497.28	483.06	545.66	580.66
Wood production	322.18	210.50	195.29	234.08	264.83	270.00	246.43	325.41	360.46
Softwood	265.33	177.41	170.16	198.19	209.99	213.01	179.02	251.70	278.78
Sugi (Japanese cedar)	123.78	87.53	93.50	118.09	126.44	127.43	107.39	147.26	167.45
Hardwood	54.72	31.71	23.76	19.51	18.42	16.95	15.82	15.25	14.53
Firewood and charcoal production	6.16	6.09	5.08	5.31	5.54	5.81	5.96	6.23	6.39
Grown mushroom production	196.89	198.50	218.91	210.52	225.37	216.67	225.96	209.16	207.95
Minor forestry products production	5.92	1.96	6.42	4.55	5.99	4.80	4.71	4.86	5.86
Forestry income produced	351.91	245.78	229.22	251.02	266.45	264.35	253.57	286.45	307.00

Source Ministry of Agriculture, Forestry and Fisheries (MAFF) "Forestry Output"

Notes 1. "Wood production" includes the output of wood chips for fuel since 2011.

2. "Softwood" in wood production includes output of other softwood and wood for pulp.

3. "Fuelwood and charcoal production" includes the output of bamboo charcoal and charcoal dust since 2001.

4. "Grown mushroom production" includes the output of eryngii mushrooms and other varieties of grown mushrooms since 2001.

5. "Minor forestry products production" includes the output of Japan wax and Japanese lacquer since 2002, the output of wild grass (wild vegetables and wild herbs) since 2010 and the output of gibier since 2016.

6. Due to rounding, some totals may not correspond with the sum of the separate figures.

3. Current State of Forest Resources

(Unit: 1,000 ha, million m³)

Classification		Total		Standing timber area (canopy cover more than 30%)				Treeless land (canopy cover less than 30%)		Bamboo groves	
				Planted forest		Natural forest		Area	Growing stock		
		Area	Growing stock	Area	Growing stock	Area	Growing stock			Area	Growing stock	Area
Total		25,025	5,560.20	10,093	3,545.49	13,553	2,013.72	1,204	0.99	175	
National forest	Subtotal	7,657	1,300.55	2,247	553.73	4,756	746.21	653	0.60	0	
	Under the Forestry Agency's jurisdiction	Subtotal	7,587	1,295.37	2,243	553.32	4,696	741.44	649	0.60	0
		State-owned	7,510	1,276.54	2,176	534.72	4,693	741.22	640	0.60	0
		Government reforestation	77	18.83	66	18.61	2	0.22	8	0	-
		Other	0	0	-	-	-	-	0	0	-
Under other Agencies' jurisdiction	70	5.18	5	0.41	61	4.77	4	-	-		
Private and public forest	Subtotal	17,368	4,259.65	7,846	2,991.76	8,796	1,267.50	551	0.39	175	
	Public forest	Subtotal	3,009	659.13	1,334	427.73	1,548	231.11	121	0.30	6
		Prefecture	1,296	268.78	534	156.28	710	112.25	52	0.24	1
		Municipality/Property ward	1,713	390.36	800	271.44	838	118.86	69	0.06	5
	Private forest	14,311	3,596.71	6,500	2,562.28	7,220	1,034.34	426	0.09	165	
	Others	47	3.81	12	1.75	28	2.05	4	0	3	

Source Forestry Agency

Notes 1. Data cover the forests defined in Article 2 of the Forest Act.

2. "Others" refers to forests that are not subject to the "Regional Forest Plans" for non-national forest under Article 5 of the Forest Act, and for national forest under Article 7-2 of the Forest Act.

3. Figures are as of March 31, 2022.

4. Symbol of "-" means "not applicable".

5. Due to rounding, some totals may not correspond with the sum of the separate figures.

4. Planted Area by Tree Species

(Unit: ha)

	Total	Softwood					Hardwood
		Sugi (Japanese cedar)	Hinoki (Japanese cypress)	Matsu (Pine)	Karamatsu (Japanese larch)	Other	
2000	(31,316)	(8,223)	(11,574)	(233)	(2,524)	(4,954)	(3,808)
	28,480	7,967	10,745	223	2,493	4,014	3,038
2005	(25,584)	(5,216)	(7,096)	(226)	(3,534)	(5,728)	(3,784)
	22,498	5,011	6,307	183	3,423	4,611	2,963
2010	(18,756)	(4,132)	(2,820)	(247)	(4,604)	(4,265)	(2,688)
	16,388	3,844	2,262	237	4,418	3,381	2,246
2015	(19,429)	(5,537)	(2,039)	(185)	(4,467)	(5,250)	(1,950)
	16,607	5,390	1,930	168	4,027	3,450	1,642
2018	(21,568)	(6,899)	(1,845)	(277)	(5,486)	(5,106)	(1,956)
	19,340	6,597	1,760	272	5,165	3,799	1,747
2019	(22,788)	(7,189)	(1,821)	(311)	(6,466)	(5,046)	(1,954)
	20,562	7,005	1,745	308	6,139	3,692	1,673
2020	(22,777)	(7,571)	(1,894)	(309)	(6,681)	(4,412)	(1,910)
	20,686	7,359	1,738	294	6,198	3,445	1,653
2021	(23,015)	(8,207)	(2,230)	(249)	(6,662)	(3,760)	(1,906)
	20,266	7,477	1,798	210	6,271	2,901	1,609
2022	(24,133)	(9,127)	(2,298)	(205)	(6,732)	(3,907)	(1,864)
	20,796	8,253	1,673	168	6,153	3,033	1,516

Source Forestry Agency

Notes 1. Figures do not include national forest.

2. Figures in parentheses refer to the total area which includes area planted as lower layer of multi-layered forest.

3. Matsu includes Japanese red pine and Japanese black pine.

5. Planted Forest Area by Age Classes

(Unit: 1,000 ha)

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI
1985	604	895	1,263	1,691	1,762	1,569	947	337	240	205	178	137	111	83	148						
1989	436	700	943	1,351	1,691	1,746	1,413	777	270	224	183	151	118	93	79	52	62				
1994	278	421	699	937	1,336	1,686	1,719	1,388	735	262	213	172	139	112	86	67	105				
2001	131	226	350	589	874	1,149	1,599	1,677	1,522	946	353	204	171	144	112	89	62	52	70		
2006	88	168	227	352	593	873	1,143	1,582	1,649	1,500	918	345	200	168	141	106	90	62	120		
2011	73	114	159	231	347	584	852	1,111	1,565	1,631	1,473	921	345	194	164	138	105	87	174		
2016	68	102	114	164	224	348	582	846	1,108	1,529	1,592	1,428	893	340	190	162	135	104	86	172	
2021	77	97	103	112	159	229	346	580	842	1,092	1,487	1,535	1,380	861	337	186	161	133	103	88	168

Source Forestry Agency

Notes 1. Figures are as the end of each fiscal year.

2. The maximum age class of planted forests for each year is as follows: 1985 is age-class XV, 1989 and 1994 are age-class XVII, 2001, 2006, and 2011 are age-class XIX, 2016 is age-class XX, and 2021 is age-class XXI. Age classes beyond these are included in the respective maximum age class for each year.

3. Data cover the forests defined in Article 5 or Article 7-2 of the Forest Act.

6. Thinned Area and Use of Thinnings

(FY)	Thinned area (1,000 ha)			Volume of thinnings used (million m ³)					
	Total	Private and public forest	National forest	Total	Private and public forest				National forest
					Subtotal	Sawnwood	Roundwood	Others	
2010	556	445	110	6.65	4.43	2.70	0.42	1.31	2.22
2013	521	400	121	8.11	5.65	3.23	0.44	1.97	2.46
2014	465	339	126	7.69	5.21	2.91	0.33	1.97	2.47
2015	452	341	112	8.13	5.65	2.97	0.35	2.32	2.48
2016	440	319	121	8.23	5.76	2.95	0.30	2.51	2.47
2017	410	304	106	8.12	5.56	2.75	0.28	2.53	2.56
2018	370	269	101	7.46	4.94	2.37	0.25	2.32	2.52
2019	365	268	98	7.68	5.21	2.53	0.30	2.37	2.47
2020	357	261	96	7.29	4.79	2.26	0.28	2.25	2.50
2021	365	269	96	7.82	5.00	2.45	0.30	2.25	2.82
2022	329	236	93	7.46	4.80	2.37	0.24	2.18	2.66

Source Forestry Agency

Notes 1. Volumes are in roundwood equivalent.

2. "Sawnwood" means the wood such as wood building materials and wood packaging materials.

3. "Roundwood" means the wood such as scaffolding timber and stakes.

4. "Others" includes the wood such as wood chip and wood powder (sawdust).

5. Due to rounding, some totals may not correspond with the sum of the separate figures.

7. Forest Area by Owners

	2015		2020	
	Forest area (ha)	Proportion of total area (%)	Forest area (ha)	Proportion of total area (%)
Total	17,626,761	100.0	17,616,863	100.0
Private	13,563,827	77.0	13,560,696	77.0
Public	3,370,380	19.1	3,407,898	19.3
Prefecture	1,271,571	7.2	1,310,110	7.4
Public corporation	391,189	2.2	351,519	2.0
Municipality	1,406,063	8.0	1,434,838	8.1
Property ward	301,557	1.7	311,431	1.8
Incorporated Administrative Agencies	692,554	3.9	648,269	3.7

Source MAFF "Census of Agriculture and Forestry"

Notes 1. Due to rounding, some totals may not correspond with the sum of the separate figures.

2. "Incorporated Administrative Agencies" include Independent Administrative Agencies, National University Corporations and Special Corporations.

8. Number of Forestry Management Entities and their Forest Areas

(Unit: entity, ha)

	Total		Less than 3 ha		3-5 ha		5-20 ha		20-50 ha		50-100 ha		100 ha or more	
	Number	Area	Number	Area	Number	Area	Number	Area	Number	Area	Number	Area	Number	Area
Total	34,001	3,322,691	1,520	628	6,236	22,979	15,220	148,280	6,045	176,477	2,151	142,598	2,829	2,831,728
Corporation	4,093	1,245,256	983	210	201	757	765	8,398	611	19,542	423	29,441	1,110	1,186,908
Private company	1,994	663,822	656	114	90	322	372	3,868	270	8,221	143	9,562	463	641,736
Cooperative	1,608	314,120	271	87	65	256	268	3,229	267	8,842	229	16,117	508	285,588
Agricultural cooperative	47	15,354	-	-	1	3	4	40	8	298	4	283	30	14,730
Forest owners' cooperative	1,388	212,763	238	87	51	198	229	2,751	234	7,702	209	14,682	427	187,343
Other cooperatives	173	86,003	33	-	13	55	35	438	25	842	16	1,152	51	83,516
Other corporations	491	267,314	56	8	46	179	125	1,301	74	2,480	51	3,763	139	259,583
Non-corporation	29,080	723,038	536	417	6,031	22,207	14,399	139,244	5,374	154,949	1,648	107,263	1,092	298,959
Individual	27,776	616,223	494	398	5,883	21,634	13,940	134,299	5,093	146,131	1,484	95,694	882	218,067
Public	828	1,354,397	1	1	4	15	56	638	60	1,986	80	5,894	627	1,345,862

Source MAFF "2020 Census of Agriculture and Forestry"

Notes 1. The symbol "-" means "not applicable".

2. "Forestry management entities" corresponds to one of the followings. The entities (I) own more than 3 hectares of forest, and also have conducted forestry or have established a "Forest Management Plan" for the past five years, (II) have been entrusted with forestation or (III) have harvested more than 200 m³ of logs for the past one year through the entrustment and the purchase of standing trees.

9. Roundwood Production

(Unit: 1,000 m³)

		2000	2005	2010	2015	2018	2019	2020	2021	2022	Relative change from the previous year (%)
Total		17,034	16,166	17,193	20,049	21,640	21,883	19,882	21,847	22,082	1.1
By tree species	Subtotal	13,707 (80)	13,695 (85)	14,789 (86)	17,815 (89)	19,462 (90)	19,876 (91)	18,037 (92)	20,088 (92)	20,386 (92)	1.5
	Sugi (Japanese cedar)	7,671	7,756	9,049	11,226	12,532	12,736	11,663	12,917	13,238	2.5
	for sawnwood	7,258 <57>	6,737 <58>	6,695 <63>	7,869 <66>	8,237 <66>	8,582 <67>	7,841 <68>	8,630 <67>	8,900 <69>	3.1
	Hinoki (Japanese cypress)	2,273	2,014	2,029	2,364	2,771	2,966	2,722	3,079	2,971	▲ 3.5
	Akamatsu (Japanese red pine), Kuromatsu (Japanese black pine)	1,034	783	694	779	628	601	570	529	559	5.7
	Karamatsu (Japanese larch), Ezomatsu (Yezo spruce), Todomatsu (Sakhalin fir)	2,410	2,910	2,816	3,268	3,366	3,405	2,940	3,183	3,362	5.6
	Other	319	232	201	170	165	168	142	380	256	▲ 32.6
	Hardwood	3,327 (20)	2,471 (15)	2,404 (14)	2,236 (11)	2,178 (10)	2,007 (9)	1,845 (9)	1,759 (8)	1,696 (8)	▲ 3.6
By use	Sawnwood	12,798 (75)	11,571 (72)	10,582 (62)	12,004 (60)	12,563 (58)	12,875 (59)	11,615 (58)	12,861 (59)	12,937 (59)	0.6
	Plywood	138 (1)	863 (5)	2,490 (14)	3,356 (17)	4,492 (21)	4,745 (22)	4,195 (21)	4,661 (21)	4,912 (22)	5.4
	Chips	4,098 (24)	3,732 (23)	4,121 (24)	4,689 (23)	4,585 (21)	4,263 (19)	4,072 (20)	4,325 (20)	4,233 (19)	▲ 2.1

Source MAFF "Wood Supply and Demand Report"

- Notes 1. Figures in parentheses refer to the percentage of each to total volume.
 2. Figures in angle brackets refer to the percentage of Sugi for sawnwood to the volume for sawnwood of all species.
 3. Roundwood Production excludes forest residue.
 4. Total figures is the sum of "Sawnwood", "Plywood", and "Chips".
 5. Due to rounding, some totals may not correspond with the sum of the separate figures.
 6. Production of roundwood for LVL is added to "Plywood" since 2017.

10. Wood Supply and Demand Chart (roundwood equivalent)

(Unit: 1,000 m³)

Supply	Demand										Domestic consumption										Export															
	Total					Industrial use					Wood for mushroom production					Fuel wood					Total					Industrial use					Fuel wood					
	Subtotal	Sawnwood	Plywood	Pulp and chips	Other	Subtotal	Sawnwood	Plywood	Pulp and chips	Other	Wood for mushroom production	Subtotal	Sawnwood	Plywood	Pulp and chips	Other	Subtotal	Charcoal	Firewood	Wood chips for fuel	Subtotal	Sawnwood	Plywood	Pulp and chips	Other	Subtotal	Charcoal	Firewood	Wood chips for fuel							
	(18,855)	(6,242)	26,263	8,820	(6,242)	1,865	209	(12,613)	(18,855)	(6,242)	25,973	9,586	28,349	(6,242)	539	209	(12,613)	17,385	745	62	(12,613)	1,324	290	224	1,197	2	5	1	0	3						
Total	85,094	67,494	26,263	8,820	(6,242)	1,865	209	17,390	82,052	64,457	25,973	9,586	28,349	(6,242)	539	209	17,385	745	62	16,579	3,038	1,324	290	224	1,197	2	5	1	0	3						
Roundwood	(6,242)	(6,242)	16,105	5,355	4,472	1,746			(6,242)	24,643	15,818	5,131	3,275	419							3,035	1,324	287	224	1,197	2										
Forest residue	94	94			94				94	94																										
Import	39,723	39,723	10,158	4,465	24,980	120			39,719	39,719	10,155	4,465	24,980	120							3															
Wood for mushroom production	209						209		209								209																			
Fuel wood	(12,613)							(12,613)	(12,613)								(12,613)			(12,613)																
Total	34,617	24,144	12,937	4,912	4,563	1,732	209	10,264	31,583	21,114	12,651	4,692	3,366	405	209	10,260	49	57	10,154	3,034	1,324	286	220	1,197	2	5	1	0	3							
Roundwood	24,050	24,050	12,937	4,912	4,469	1,732			21,020	21,020	12,651	4,692	3,272	405							3,029	1,324	286	220	1,197	2										
Forest residue	94	94			94				94	94																										
Wood for mushroom production	209						209		209							209																				
Fuel wood	10,264							10,264	10,260								10,260	49	57	10,154	5															
Total	50,477	43,351	13,326	4,908	24,983	134		7,126	50,468	43,342	13,322	4,904	24,983	134			7,126	696	6	6,424	8	4	4													
Roundwood	3,628	3,628	3,168	443	3	14			3,623	3,623	3,167	439	3	14							5	5	1	4												
Subtotal	39,723	39,723	10,158	4,465	24,980	120			39,719	39,719	10,155	4,465	24,980	120							3	3	3													
Sawnwood	10,158	10,158	10,158						10,155	10,155	10,155										3	3	3													
Plywood	4,465	4,465		4,465					4,465	4,465		4,465																								
Pulp	5,055	5,055		5,055					5,055	5,055		5,055																								
Chips	19,925	19,925		19,925					19,925	19,925		19,925																								
Other	120	120				120			120	120																										
Fuel wood	7,126							7,126	7,126								7,126	696	6	6,424																
Total	7,126							7,126	7,126								7,126	696	6	6,424																

Source: Forestry Agency "Wood Supply and Demand Chart", 2022

- Notes 1. Figures in parentheses of the volume of pulp and chips and fuel wood, for example wood chips from mill residue or construction waste, are not included in the "total" and "subtotal".
 2. "Forest residue" refers to branches or roots carried into mills for use.
 3. Due to rounding, some totals may not correspond with the sum of the separate figures.

11. Wood Supply/Demand (roundwood equivalent)

(Unit: 1,000 m³)

	Wood supply/demand				Wood demand for industrial use by sector				Wood supply for industrial use by source	
	Total	Wood for industrial use	Fuel wood	Wood for mushroom production	Sawnwood	Plywood	Pulp and chips	Others	Domestic production	Import (roundwood and wood products)
1955	65,206	45,278	19,928	...	30,295	2,297	8,285	4,401	42,794	2,484
1960	71,467	56,547	14,920	...	37,789	3,178	10,189	5,391	49,006	7,541
1965	76,798	70,530	6,268	...	47,084	5,187	14,335	3,924	50,375	20,155
1970	106,601	102,679	2,348	1,574	62,009	13,059	24,887	2,724	46,241	56,438
1975	99,303	96,369	1,132	1,802	55,341	11,173	27,298	2,557	34,577	61,792
1980	112,211	108,964	1,200	2,047	56,713	12,840	35,868	3,543	34,557	74,407
1985	95,447	92,901	572	1,974	44,539	11,217	32,915	4,230	33,074	59,827
1990	113,242	111,162	517	1,563	53,887	14,546	41,344	1,385	29,369	81,793
1995	113,698	111,922	721	1,055	50,384	14,314	44,922	2,302	22,916	89,006
2000	101,006	99,263	940	803	40,946	13,825	42,186	2,306	18,022	81,241
2005	87,423	85,857	1,001	565	32,901	12,586	37,608	2,763	17,176	68,681
2010	71,884	70,253	1,099	532	25,379	9,556	32,350	2,968	18,236	52,018
2015	75,160	70,883	3,962	315	25,358	9,914	31,783	3,829	21,797	49,086
2018	82,478	73,184	9,020	274	25,708	11,003	32,009	4,465	23,680	49,505
2019	81,905	71,269	10,386	251	25,270	10,474	31,061	4,464	23,805	47,464
2020	74,439	61,392	12,805	242	24,597	8,919	26,064	1,812	21,980	39,412
2021	82,130	67,142	14,742	246	26,179	10,294	28,743	1,926	24,127	43,015
2022	85,094	67,494	17,390	209	26,263	9,820	29,547	1,865	24,144	43,351

Source: Forestry Agency "Wood Supply and Demand Chart"

Notes 1. "Others" includes items such as roundwood for export.

2. The symbol "..." means "unknown or lack of investigation".

3. Due to rounding, some totals may not correspond with the sum of the separate figures.

4. "Fuel wood" includes wood chip for fuel utilized by woody biomass power plants since 2014.

12. Trend of Domestic and Imported Wood Supply/Demand (roundwood equivalent)

(Unit: 1,000 m³)

		2000	2005	2010	2015	2018	2019	2020	2021	2022	Relative change from the previous year (%)	
Total wood supply/demand		101,006	87,423	71,884	75,160	82,478	81,905	74,439	82,130	85,094	3.6	
Wood for industrial use		99,263	85,857	70,253	70,883	73,184	71,269	61,392	67,142	67,494	0.5	
Wood for mushroom production		803	565	532	315	274	251	242	246	209	▲ 15.0	
Fuel wood		940	1,001	1,099	3,962	9,020	10,386	12,805	14,742	17,390	18.0	
Domestic production		19,058	17,899	18,923	24,918	30,201	30,988	31,149	33,721	34,617	2.7	
Import		81,948	69,523	52,961	50,242	52,277	50,917	43,290	48,409	50,477	4.3	
Self-sufficiency rate (%)		18.9	20.5	26.3	33.2	36.6	37.8	41.8	41.1	40.7	▲ 0.4	
Wood demand for industrial use by sector	Total	99,263	85,857	70,253	70,883	73,184	71,269	61,392	67,142	67,494	0.5	
	Domestic production	18,022	17,176	18,236	21,797	23,680	23,805	21,980	24,127	24,144	0.1	
	Import	81,241	68,681	52,018	49,086	49,505	47,464	39,412	43,015	43,351	0.8	
	Self-sufficiency rate (%)	18.2	20.0	26.0	30.8	32.4	33.4	35.8	35.9	35.8	▲ 0.1	
	Sawwood	Subtotal	40,946	32,901	25,379	25,358	25,708	25,270	24,597	26,179	26,263	0.3
		Domestic production	12,798	11,571	10,582	12,004	12,563	12,875	11,615	12,861	12,937	0.6
		Import	28,148	21,330	14,797	13,354	13,145	12,395	12,982	13,318	13,326	0.1
		Self-sufficiency rate (%)	31.3	35.2	41.7	47.3	48.9	51.0	47.2	49.1	49.3	0.2
	Plywood	Subtotal	13,825	12,586	9,556	9,914	11,003	10,474	8,919	10,294	9,820	▲ 4.6
		Domestic production	138	863	2,490	3,530	4,492	4,745	4,195	4,661	4,912	5.4
		Import	13,687	11,723	7,066	6,384	6,511	5,729	4,724	5,633	4,908	▲ 12.9
		Self-sufficiency rate (%)	1.0	6.9	26.1	35.6	40.8	45.3	47.0	45.3	50.0	4.7
	Pulp and chips	Subtotal	(6,537)	(7,974)	(6,192)	(6,667)	(6,792)	(6,258)	(5,634)	(7,210)	(6,242)	▲ 13.4
		Domestic production	42,186	37,608	32,350	31,783	32,009	31,061	26,064	28,743	29,547	2.8
		Import	4,749	4,426	4,785	5,202	5,089	4,651	4,420	4,744	4,563	▲ 3.8
		Self-sufficiency rate (%)	37,437	33,181	27,565	26,581	26,920	26,410	21,644	24,000	24,983	4.1
	Others	Subtotal	11.3	11.8	14.8	16.4	15.9	15.0	17.0	16.5	15.4	▲ 1.1
		Domestic production	2,306	2,763	2,968	3,829	4,465	4,464	1,812	1,926	1,865	▲ 3.2
		Import	337	316	379	1,061	1,536	1,534	1,750	1,862	1,732	▲ 7.0
		Self-sufficiency rate (%)	1,969	2,447	2,589	2,767	2,930	2,931	62	65	134	106.2
Wood for mushroom production	Subtotal	14.6	11.4	12.8	27.7	34.4	34.4	96.6	96.6	92.8	▲ 3.8	
	Domestic production	803	565	532	315	274	251	242	246	209	▲ 15.0	
	Import	803	565	532	315	274	251	242	246	209	▲ 15.0	
	Self-sufficiency rate (%)	-	-	-	-	-	-	-	-	-	-	
Fuel wood	Subtotal	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0	
	Domestic production	...	...	...	(12,473)	(12,918)	(12,827)	(13,029)	(12,887)	(12,613)	▲ 2.1
	Import	940	1,001	1,099	3,962	9,020	10,386	12,805	14,742	17,390	18.0	
	Self-sufficiency rate (%)	233	159	155	2,806	6,248	6,932	8,927	9,348	10,264	9.8	
Fuel wood	Subtotal	707	842	943	1,156	2,772	3,454	3,878	5,394	7,126	32.1	
	Domestic production	24.8	15.9	14.1	70.8	69.3	66.7	69.7	63.4	59.0	▲ 4.4	
	Import	707	842	943	1,156	2,772	3,454	3,878	5,394	7,126	32.1	
	Self-sufficiency rate (%)	24.8	15.9	14.1	70.8	69.3	66.7	69.7	63.4	59.0	▲ 4.4	

Source: Forestry Agency "Wood Supply and Demand Chart"

Notes 1. Self-sufficiency rate is calculated by domestic production divided by total or subtotal in each category.

2. "Others" includes items such as roundwood for export.

3. Figures in parentheses refer to the volume of wood chip from mill residue or construction waste. They are not included in the "total" and "subtotal".

4. Symbol of "-" means "not applicable."

5. The symbol "..." means "unknown or lack of investigation".

6. Due to rounding, some totals may not correspond with the sum of the separate figures.

7. "Fuel wood" includes wood chip for fuel utilized by woody biomass power plants since 2014.

8. Among "relative change from the previous year", "self-sufficiency rate" field is the difference from the previous year.

13. Wood Supply by Country (roundwood equivalent)

(Unit: 1,000 m³, %)

			2000	2005	2010	2015	2018	2019	2020	2021	2022
Imported wood	North America	Subtotal	(28.9) 28,700	(18.8) 16,129	(19.2) 13,506	(17.5) 12,415	(16.3) 11,898	(15.3) 10,893	(14.8) 9,068	(14.6) 9,835	(14.7) 9,937
		U.S.A	14,460	6,844	5,838	6,057	6,273	5,754	5,488	5,590	6,174
		Canada	14,240	9,285	7,668	6,359	5,625	5,139	3,580	4,245	3,763
	Southeast Asia	Subtotal	(13.7) 13,569	(12.2) 10,511	(8.9) 6,287	(8.3) 5,848	(7.4) 5,421	(6.9) 4,949	(6.9) 4,215	(6.7) 4,504	(6.7) 4,492
		Malaysia	6,690	5,888	3,773	2,917	2,514	2,213	1,771	1,820	1,730
		Indonesia	5,858	4,137	2,304	2,804	2,759	2,548	2,333	2,625	2,669
		Others	1,021	486	209	127	148	187	111	59	92
	Russia Federation		(7.5) 7,429	(8.6) 7,411	(3.3) 2,343	(2.9) 2,081	(3.3) 2,411	(3.5) 2,459	(3.3) 2,050	(3.3) 2,202	(2.4) 1,606
	Europe		(4.7) 4,675	(6.9) 5,937	(7.1) 4,967	(7.6) 5,374	(8.0) 5,880	(8.4) 5,974	(9.3) 5,695	(7.9) 5,311	(9.1) 6,139
	Others	New Zealand	(4.4) 4,374	(3.4) 2,878	(3.9) 2,720	(2.3) 1,638	(2.0) 1,484	(2.0) 1,393	(1.8) 1,086	(1.9) 1,291	(1.6) 1,083
			(3.8) 3,795	(4.6) 3,952	(6.7) 4,726	(5.6) 3,987	(5.5) 4,055	(4.9) 3,479	(4.9) 2,994	(3.7) 2,457	(3.3) 2,208
		Australia	(8.7) 8,604	(10.2) 8,729	(11.0) 7,722	(6.6) 4,662	(6.3) 4,604	(6.0) 4,271	(4.3) 2,628	(5.1) 3,432	(5.2) 3,505
		China	(2.5) 2,445	(3.0) 2,544	(3.0) 2,084	(2.8) 1,967	(2.6) 1,901	(2.5) 1,777	(2.6) 1,591	(3.2) 2,144	(2.4) 1,588
		Viet Nam	/	/	/	(7.6) 5,418	(8.1) 5,939	(9.0) 6,446	(9.5) 5,840	(11.0) 7,364	(11.3) 7,599
		Other	(7.7) 7,651	(12.3) 10,591	(10.9) 7,663	(8.0) 5,696	(8.1) 5,911	(8.2) 5,823	(6.9) 4,245	(6.7) 4,476	(7.7) 5,193
Subtotal		(81.8) 81,241	(80.0) 68,681	(74.0) 52,018	(69.2) 49,086	(67.6) 49,505	(66.6) 47,464	(64.2) 39,412	(64.1) 43,015	(64.2) 43,351	
Domestic wood		(18.2) 18,022	(20.0) 17,176	(26.0) 18,236	(30.8) 21,797	(32.4) 23,680	(33.4) 23,805	(35.8) 21,980	(35.9) 24,127	(35.8) 24,144	
Total		99,263	85,857	70,253	70,883	73,184	71,269	61,392	67,142	67,494	

Sources Ministry of Finance "Trade Statistics of Japan", Forestry Agency "Wood Supply and Demand Chart"

Notes 1. Figures refer to the sum of domestic/imported roundwood volume and imported products volume (sawnwood, plywood, and pulp and chips) converted into roundwood equivalent.

2. "Others" of "Southeast Asia" includes Philippines, Singapore, Brunei, Papua New Guinea, and Solomon.

3. "Others" of "Others" includes African countries.

4. "Others" of "Others" includes Viet Nam until 2014.

5. Figures in parentheses refer to the percentage of each volume to the "total" volume of each year.

6. Due to rounding, some totals may not correspond with the sum of the separate figures.

14. Number of Mills/Factories and Production Volume

		Unit	2000	2005	2010	2015	2018	2019	2020	2021	2022
Sawnwood	Number of mills	mill	11,692	9,011	6,569	5,206	4,582	4,382	4,115	3,948	3,804
	Arrival of logs	1,000 m ³	26,526	20,540	15,762	16,182	16,672	16,637	14,851	16,650	16,363
	Shipment	1,000 m ³	17,231	12,825	9,415	9,231	9,202	9,032	8,203	9,091	8,600
Plywood	Number of mills	mill	354	271	192	185	180	176	173	158	155
	Arrival of logs	1,000 m ³	5,401	4,636	3,811	4,218	5,287	5,448	4,626	5,093	5,355
	Surface-untreated plywood production	1,000 m ³	3,218	3,212	2,645	2,756	3,298	3,337	2,999	3,172	3,059
	Surface-treated plywood production	1,000 m ³	1,534	1,037	647	524	580	562	551	494	516
Glued laminated timber	Number of factories	factory	281	259	182	157	165	162	148	132	140
	Production	1,000 m ³	892	1,512	1,455	1,485	1,923	1,920	1,740	1,982	1,659
Cross laminated timber	Number of factories	factory	...	...	...	...	9	9	11	11	9
	Production	1,000 m ³	...	...	...	...	14	13	13	15	15
Wood chips	Number of mills	mill	2,657	2,040	1,577	1,424	1,303	1,250	1,196	1,082	1,110
	Production	1,000 tons	...	6,005	5,407	5,745	5,706	5,266	4,753	6,070	5,278
		(1,000 m ³)	10,851	...	...	...	...	...	...	...	...

Sources MAFF "Wood Supply and Demand Report", Japan Laminated Wood Products Association

Notes 1. "Sawnwood" excludes sawmills with output power less than 7.5kW.

2. Figures of LVL are added to figures of "Plywood" since 2017.

3. Figures of glued laminated timber are based on the data from Japan Laminated Wood Products Association until 2016.

4. "Wood chips" excludes chips for fuel.

5. The symbol "..." means "unknown or lack of investigation".

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