Annual Report on Forest and Forestry in Japan

Fiscal Year 2020

(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) 2020.

Table of Contents

Note: The maps of Japan included in this summary report do not necessarily represent the territory of Japan comprehensively.

Forests and Forestry Topics for FY2020

Topic 1: 10th Anniversary of Act for Promotion of Use of Wood in Public Buildings

Ten years have passed since the Act for Promotion of Use of Wood in Public Buildings was enacted and enforced in 2010.

Over the last decade, the percentage of wooden construction of public buildings has increased, especially for low-rise public buildings.

With the technological progress of fire-resistant wooden materials and the rationalization of the the building standard, the momentum to use wood in private buildings has also increased, and mid-to-high-rise wooden buildings have started to be constructed.

Various companies and organizations have established networks to expand wood use in the private sector.

Shirataka Town Complex Facility
(Yamagata Prefecture)
(Prime Minister's Award in “Reiwa 2nd Year the Excellent Wood-Using Facility Contest”)

The Hanno Chamber of Commerce and Industry
(Saitama Prefecture)
(Japan Wood Design Award 2020)

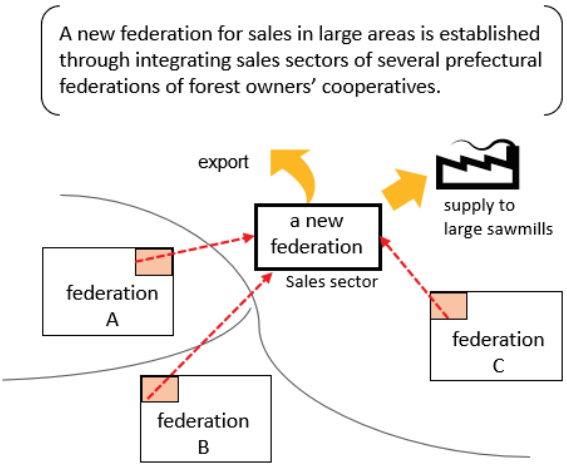
Topic 2: Revision of Forest Owners' Cooperative Associations Act aiming to Strengthen the Management Base of Forest Owner’s Cooperatives

Forest owner’s cooperatives, the main players in foresty are expected to promote sustainable forest management in each region through the forest management system and timber sales. On the other hand, some cooperatives need to strengthen their management base.

In May 2020, in order to strengthen the management base of the cooperatives and improve the management efficiency, the Forest Owners' Cooperative Associations Act was revised (enforced on April 1st, 2021) with the following three main matters.

1. Introducing various cooperation methods among cooperatives
2. Expanding the scope of the qualification for regular membership
3. Strengthening the business execution system

It is expected that cooperatives will revitaize forest and forestry by promoting these matters and the efficiency of operations.



Example of cooperation methods among cooperatives

Topic 3: Initiatives based on Forest Environment Transfer Tax

In September 2019, the distribution of the Forest Environment Transfer Tax to local governments started. Municipalities have utilized it for various initiatives.

In FY2019, half of the municipalities carried out forest management such as intention surveys of forest owners (conducted in 125,000 ha) and thinning (conducted in 3,600 ha).

In addition, some municipalities have launched other initiatives such as training of forestry engineers and forest volunteers, depending on their conditions. About 6,500 people nationwide participated in various trainings and courses.
In urban areas, municipalities conducted forest environmental education and other activities in collaboration with other municipalities which own forests.

Forest conducted thinning

Afforestation activities in collaboration with urban areas and mountainous areas

Topic 4: Improvement of Smart Forestry through Developing Machineries utilizing Cutting-edge Technologies

Cutting-edge technologies are adopted to smart forestry, which is expected to reduce labor load, improve productivity, and ensure worker safety.

Riding forestry machineries that can be used for ground preparation and weeding even on slopes of 30 ° have been developed and commercialized. Drones are widely utilized in forestry such as transportation of seedlings. Remote cable-yarding systems will be commercialezed soon, and automatic systems by AI are under development.
In addition, some municipalities are striving to build communication networks in forests with LPWA (Low Power Wide Area) for safety of forestry workers.

Weeding by riding forestry machinery

LPWA handset

Relay device

Automatic cable-yarding systems using AI image analysis technology

Topic 5: Responses to Mountainous Disasters from Torrential Rains in July 2020

Torrential rains in July 2020 hurt 43 prefectures mainly in the Kyushu region, resulting in forest damage totaling about 97 billion yen.

The Forestry Agency dispatches technical staff (MAFF-SAT) to grasp the damage and provide technical support for the disaster recovery. Futhermore, the Forestry Agency investigated these damaged areas through helicopter surveys and aerial laser measurements, and provided the information to the affected prefectures.

In the Ashikita district of Kumamoto Prefecture, which was particularly severely damaged, the restoration project for forest land and disaster control facilities was carried out by the Kyushu Regional Forest Office on behalf of the prefecture.

The forest disaster in Ashikita district

Topic 6: Restoration of Coastal Forests Damaged by the Great East Japan Earthquake

Ten years have passed since the Great East Japan Earthquake occurred. In most of the coastal disaster-prevention forests damaged by the tsunami, planting of seedlings had been completed by the end of FY2020 with the cooperation of local residents, NPOs and companies.

The coastal disaster-prevention forests along Sendai Bay were particularly severely damaged. The Tohoku Regional Forest Office had restored both national and private forests in this area. Since the restoration project was completed at the end of FY2020, Miyagi Prefecture has started to manage the growth of the private forests.
Projects for growing the seedlings will be continued in order to fully enhance a disaster prevention function of the coastal disaster-prevention forests.

Just after the tsunami
(March 2011)
(©Tohoku Community Development Association)

After planting of seedlings was completed
(October 2020)

Costal disaster-prevention forests along Sendai Bay

Special Topic 1: Sustainable Forestry Management that Leverages the Potential of Forests

1. Current State of Forestry Management in Japan

(1) Importance of Forestry Management Entities

Forests have various multiple functions. It is important to properly manage forests such as thinning and reforestation and to expand wood use, which contribute to carbon neutrality by 2050.

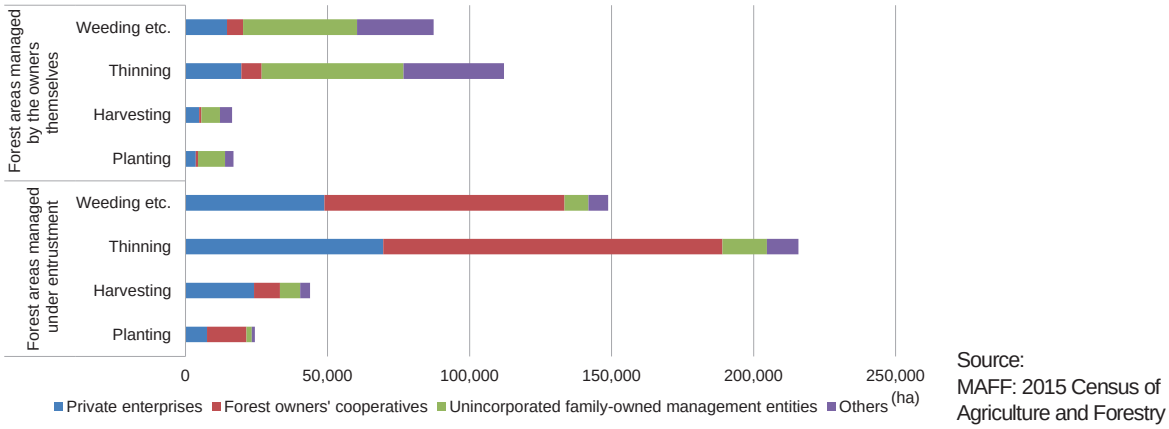
In Japan, the area of planted forests aged more than 50 years, the general harvesting period, has increased 2.4 times in this decade. It is vital to utilize the planted forest resources effectively, which revitalizes hilly and mountainous rural communities.

Some logging sites, which are suitable for forestry, have been left without planting after harvesting. Forestry management entities have a role to manage forests appropriately not only for increasing their own profits but also for returning profits to forest owners.

(2) Current State of Forestry Management Entities

“Forestry management entities” refers to forest owners who perform forest management by themselves or by entrusting, and entities which perform forest management and wood production by entrustment and purchase of trees.

There are around 34 thousand forestry management entities in Japan. About half of the forest areas managed by the owners themselves are managed by unincorporated family-owned management entities. On the other hand, most of the forest areas managed under entrustment are managed by private enterprises and forest owners’ cooperatives. Mainly, harvesting is carried out by private enterprises and afforestation is by forest owners’ cooperatives.



Source:
MAFF: 2015 Census of Agriculture and Forestry

Fig. 1 Managed forest area categorized by the type of forestry organizations

Business Conditions of Forestry Management Entities

The amount of wood production per forestry management entity is increasing. The proportion of forestry management entities which produce more than 10 thousand m^3 woods annually is also increasing.

However, forestry income of family-owned management entities is decreasing. Even those which have 100-500 ha of forests cannot make enough profits by forestry itself, on average.

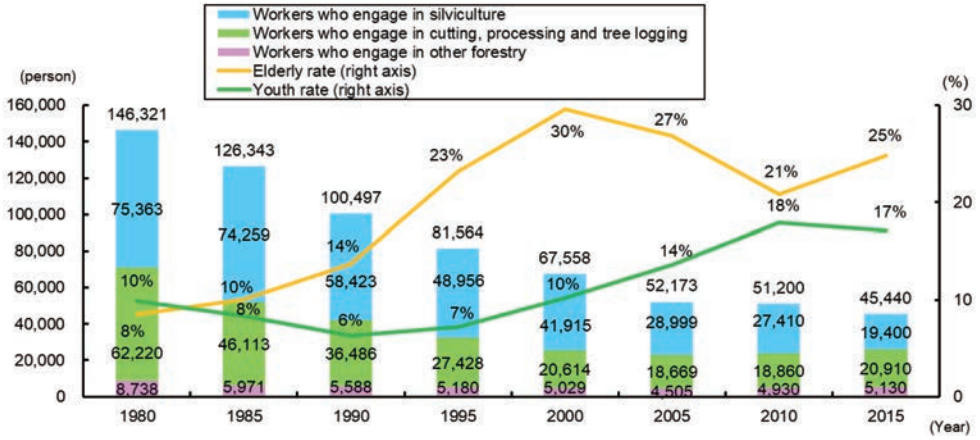
The national average business profits for forestry companies was 2.7 million yen in 2018. As the sales profits increase, the recurring profit margins increase, and the management becomes stable.

Sales-Size	Wood Production (m^3)	The areas of planting and nurturing trees (ha)	The number of Employees	The number of advanced forestry machineries	Recurring profits (1,000 yen)	Recurring profit margins
Under 50 million yen	2,529	28.6	5.3	2.3	-1,958	-4.1%
50-100 million yen	5,073	57.4	9.3	2.8	3,739	3.6%
100-300 million yen	19,403	39.1	13.4	5.9	12,617	3.6%
Over 300 million yen	36,541	131.9	29.2	12.5	29,870	5.8%

Source: MAFF: 2018 “Forestry management statistical research”

Fig. 2 Business conditions of forestry companies

Although the number of forestry workers tends to decline, the proportion of young forestry workers is on a growing trend. It is important to attract and retain workers in the long term. The average annual income of forestry workers grew from 3.05 million yen in 2013 to 3.43 million yen in 2017, but it is lower than the average income for all industries. Therefore, it is necessary to improve the profitability and support the career development. In addition, since the forestry work accident rate is higher than other industries, safer working environments should be ensured.



Source: Ministry of Internal Affairs and Communications: Population Census

Notes1: “Elderly rate” reflects the rate of people aged 65 and over

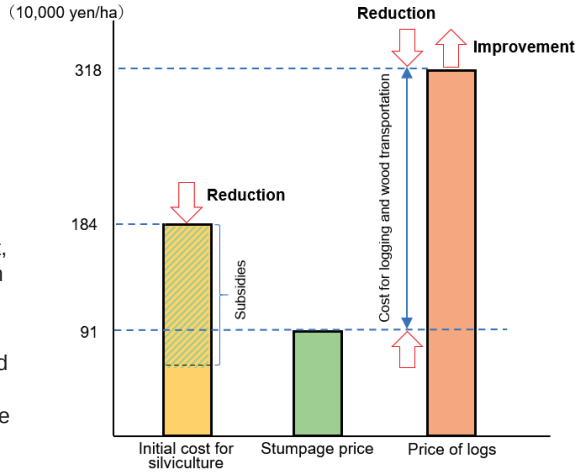
2: “Youth rate” reflects the rate of people under 35

Fig. 3 Changes in the number of forestry workers

(3) For the Purpose of Sustainable Forest Management

According to a trial calculation of harvesting of a 50-year-old Sugi (Japanese Cedar) plantation, the current stumpage price is not enough to motivate forest owners to reforest. For this reason, it is vital to improve wood sales and to reduce the cost for logging, wood transportation and reforestation.

It is necessary to secure profits and return them to forest owners and forestry workers, which will lead to forest and business sustainability.



Sources: MAFF: 2020 Wood Supply and Demand Report, Japan Real Estate Institute: Survey of Mountain forest base & stumpage price, Forestry Agency: State of Forest Resources (March 31,2017)

Notes1: The provisional calculation is about 50 years old Sugi planted forest per ha.
2: The cost for wildlife control can make silviculture cost higher.

Fig. 4 Image of balance of payments in wood production

2. Improving the Profitability of Forestry Management Entities

(1) Sales Enhancement

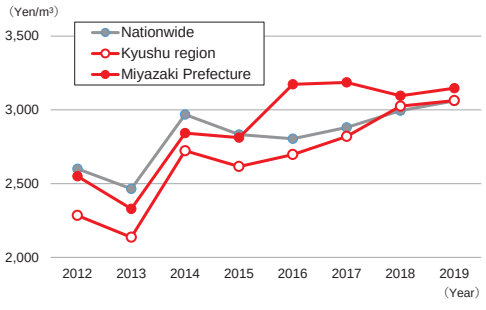
<u>Sales Growth through Stable Supply of Wood</u>

Forestry management entities can stabilize transaction prices through a stable wood supply under the cooperation and the sales agreement. These efforts can also improve their price negotiating power.

They can also sell woods in higher price through logging and sorting wood according to customer needs.

The revision of Forest Owners' Cooperative Associations Act has introduced various cooperation methods between cooperatives, which is expected to strengthen their marketing functions.

Miyazaki Prefecture federation forest owners' cooperative association established a council on stable supply of wood with forest owners' cooperatives and log production enterprises in the prefecture. The council regularly holds discussion with large sawmills and reflects the result in the wood collection. As a result, the stumpage price of Sugi (Japanese Cedar) in Miyazaki Prefecture has grown to top class in Japan.



The change in stumpage price of Sugi in Miyazaki Prefecture

Sales of Various Woods

Even when forestry management entities produce high-quality wood or perform long-term management in order to sell wood to small and medium-sized construction shops or carpenters, it is important for entities to catch customer needs directly. Some entities select high-quality hardwoods and sell them for furniture at a higher price than that for chips.

Diversification of Income for Stable Management

One option for small-scale entities is to stabilize their income through supplement income with other business such as agriculture and outdoor guides, taking advantage of their locations and environments. Some entities stabilize the income through utilizing forests in various ways like recreational use.

(2) Saving Costs for Wood Production and Reforestation

It is important for the forestry management entities to take the initiative in saving costs of re-planting and weeding by themselves, since the sales price of wood may be influenced by the demand.

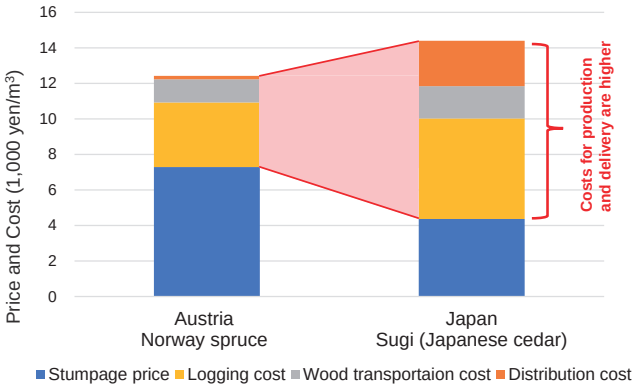
Saving Costs for Wood Production and Distribution

The costs of logging, shipping and distribution in Japan are higher than those in Austria, which has similar terrain to Japan.

It is necessary to improve the operating rate of advanced forestry machineries for saving production costs. Therefore, it is vital to systematically secure and consolidate the operation areas, select work systems, manage the processes, and improve the forestry road system.

For small-scale entities, it is difficult to increase the operating rate even if they introduce advanced forestry machineries. It is rational to select a system with a small capital investment that matches the amount of wood production.

The costs for distribution can be reduced through simplifying sales channels and increasing the size of trucks and trailers.



Source: Forest Research and Management Organization

Fig. 5 Cost comparison of wood prices

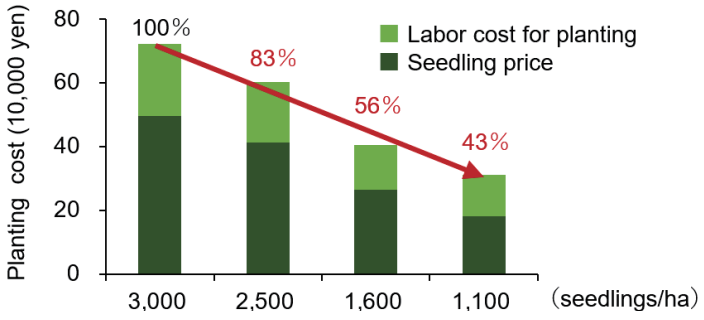
Fig. 6 Processing in use of an advanced machinery

Saving Costs for Reforestation

Initiatives for saving cost and labor have been developed in each process of ground preparation, planting, and weeding. Since costs depend on the afforestation method, it is important to save costs through looking ahead to future wood use and customers.

Although the Forestry Agency promotes to introduce an integrated harvesting and planting system to use forestry machine for simultaneously or sequentially implementing harvesting, land preparation and planting, the system has been introduced in less than 10% of all afforestation. The cooperation between harvesting entities and planting entities is important.

The “elite tree” species with excellent growth is expected to spread in Japan in the future.



Source: Forestry Agency

Notes1: It is an example of Ibaraki Prefecture.

2: The cost is calculated by165 yen per containerized seedling.

Fig. 7 Example of cost reduction by low density planting

Innovation for Forestry Efficiency

The GOJ promotes initiatives that use information and communications technologies for collecting forest resources data and improving efficiency in wood production and distribution stages.

The GOJ supports machine development for automation and remote control of logging, conveying, weeding for safety and saving labor.

Fig. 8 Aeronautical laser measurement results

3. Improvement of Human Resources and Working Conditions in Forestry

(1) Maintenance and Development of Human Resources in Forestry

Forestry workers are important for improving productivity. It is necessary to recruit forestry workers, train their technical skills and develop them. Forestry management entities are expected to motivate forestry workers through introducing systems such as a capacity evaluation system.

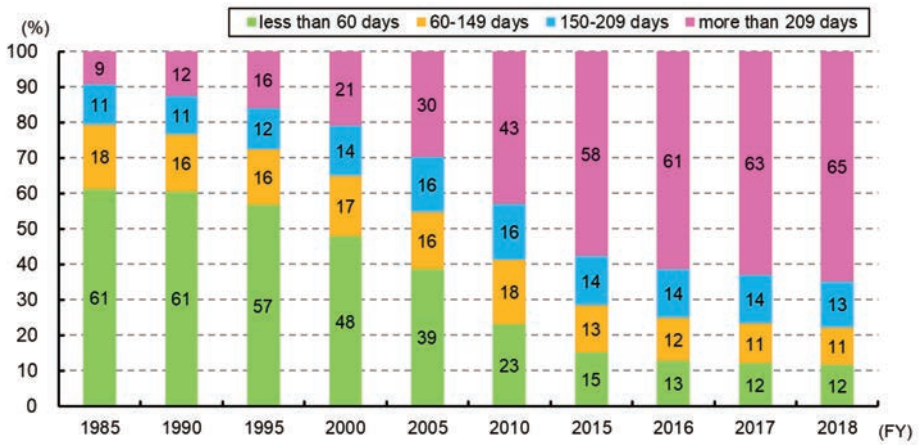
The GOJ supports events such as employment counseling and trial employment and conducts training through the Green Employment Program so that entities can recruit and develop new workers. Some local governments have College of forestry.

(2) Improvement of Working Conditions in Forestry

Safe workplaces are essential to protect forestry workers and to retain workers continuously. Forestry management entities and workers are required to comply with health and safety regulations and guidelines for logging. It is vital to take safety patrol guidance and training, and to introduce and use safety equipment and devices.

A stable employment is also important. In forest owners' cooperatives, the proportion of full-time employment workers who work all year round, workers with social insurance and monthly salary workers are increasing.

The number of female forestry workers who engage in harvesting, processing and logging is increasing. Creating an environment where women can work comfortably contributes to "work style reform" for all forestry workers.



Source: Forestry Agency: Statistics on Forest Owners' Cooperatives

Note: Due to rounding, some percentages may not total 100.

Fig. 9 Annual working days of employees in forestry owners' cooperatives

4. Development of Human Resources and Systems for Sustainable Forestry

(1) Development of Human Resources for Sustainable Forestry

It is vital to retain forestry sites and retain customers so that forestry workers can focus on the job and fully demonstrate their abilities. The GOJ has developed Forest Practice Planners who will conduct proposal-based coordination with forest owners and consolidation of forestry operations. In addition, the GOJ has developed Forest Management Planners who will engage in selling woods strategically since 2020.

(2) System Development for Forest and Business Sustainability

Forestry management entities can make a long-term plan, anticipate future harvesting, and develop permanent road networks by owning the forest and acquiring the right to operate it in the long term. The Collecting Forest Management Plan System and the Forest Management System support coordination and consolidation of forestry operations and long-term entrustments.

Forestry management entities are expected to plant after harvesting by themselves or under cooperation. It is vital to coordinate reforestation with forest owners when planning harvesting.

Some sawmills and wood markets start to manage forest and subsidize afforestation and seedling production, for sustainable wood production.

5. The Future of Forestry Business

The bar chart below illustrates a trial calculation about how productivity would be improved and how much afforestation costs would be reduced by the initiatives.

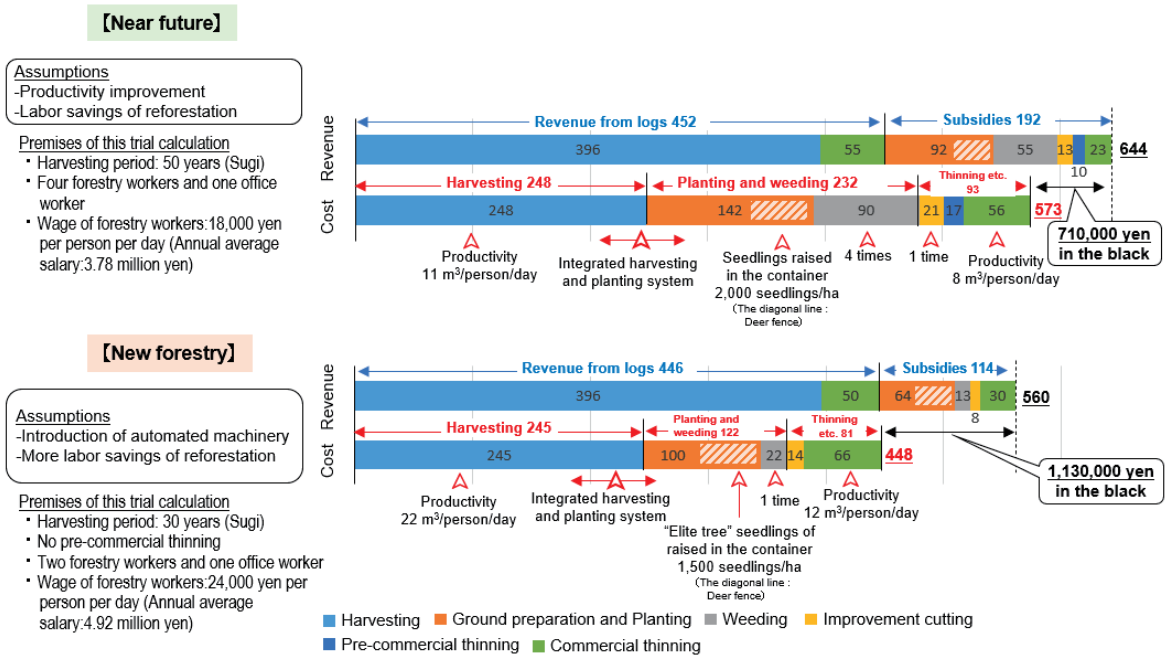
Assuming general wood price, the income and expenditure per ha would be 710,000 yen in the black after improving the worker wages by 10% or more through improving productivity and reducing costs such as planting with 2,000 seedlings per ha in the near future. Furthermore, planting the “elite tree” species in the density of 1,500 per ha and introducing automation machineries could increase the surplus.

Since this estimate doesn’t take account of the sales price increase, there is a possibility of further improvement in profits through market development and cooperation among forestry sectors.

These surpluses are expected to increase the motivation for reforestation because entities distribute them to not only executive remuneration and capital investment but also return to forest owners who decide reforestation.

It is noted that this estimate is based on the premise that the forestry area is large enough to operate advanced forestry machineries efficiently. It is rational that small-scale entities select a simple work system that matches a small amount of wood production, reduce logging cost and secure profits.

In the future, it is expected that each forestry management entity will grow with its creativity and ingenuity, enhancing forest and business sustainability.



Notes: The wage of forestry workers includes social insurance.
Due to rounding, some totals may not correspond with the sum of the separate figures.

Fig. 10 A trial calculation about balance of payments of forestry in the future (per ha)

Special Topic 2: Impact of and Responses to the Covid-19 Pandemic in the Forestry and Wood Industry

1. Impact of the Covid-19 Pandemic

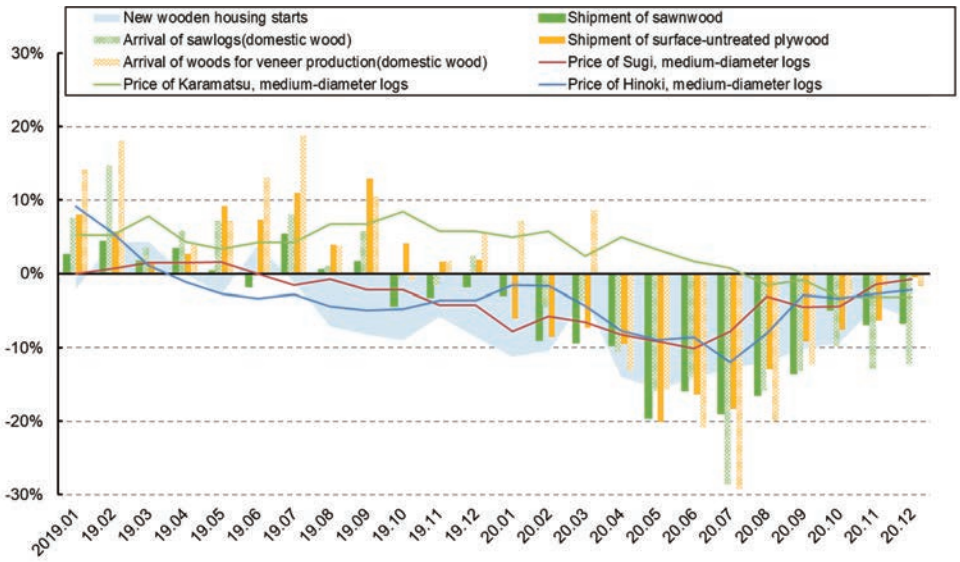
(1) Impact on Economy and Society in Japan

The global pandemic of the Covid-19 has had serious effects on the Japanese economy and society.

(2) Impact on Supply and Demand in Wood Industry

Log exports from Japan to China plummeted from January to March in 2020, but recovered after April and remained solid.

The number of new housing starts in 2020 decreased by 10% from the previous year to 820,000, of which 470,000 were wooden houses.
As of April 2020, 40 % of sawmills and 60% of plywood mills had reduced production, due to delays and decreases in housing construction. The amount of log input and that of product output at sawmills and plywood mills bottomed out in July and August, and have since been gradually recovering. However, the rate of recovery varies among regions: it has been slow in Hokkaido due to sluggish demand for packaging materials.



Sources: MAFF: ”Statistical Survey on Wood” “Statistical survey on the Price of Wood”, Ministry of Land, Infrastructure, Transport and Tourism :"Housing Starts"

Fig.1 Changes in forestry and wood industry related figures from 2019 to 2020

(3) State of Forestry

From January to March 2020, log exports to China stagnated and logs piled up in ports and stockyards, especially in the main log exporting region of Kyushu, which

negatively affected log production. Forest management entities reduced log production after April 2020 and some shifted to other forest management practices in order to maintain employment, as sawmills and plywood mills reduced production and restricted the input of logs.

The prices of medium-diameter logs of Sugi (Japanese Cedar) fell by 10% year-on-year in June 2020 due to decreasing wood demand. The prices later recovered in some areas as the result of the shortage of log supply caused by the torrential rains of July and preceding adjustment in log production, as well as the reduced supply of North American and European wood for Japan since autumn.

As for non-wood forest products, the demand for mushrooms provided in school lunch and restaurants declined.

2. Responses in the Forestry and Wood Industry

(1) Japanese Government Responses

The GOJ has implemented various measures for the forestry and wood industry to continue operation and mitigate the impact of the pandemic.
The GOJ held national and regional forums, involving all stakeholders, to share information and the understanding of the current situation and to inform them of its various support measures.

(2) Business Management under the Covid-19 Pandemic

Business entities are seeking new business opportunities to adapt to the Covid-19 pandemic. For example, some entities have commercialized wooden-framed partitions used to reduce the risk of infection. The use of remote meetings for sales promotion and online bidding systems may become more widely adopted in the forestry and wood industry in the coming future. Some facilities for remote working have been constructed in areas with abundant forests.

Forestry can provide employment opportunities for those who move out of cities to live in rural areas. In 2020, a total of 2,744 people, which was more than in the previous year, participated in the “Forest Work Guidance Events” held in the main metropolitan areas and online.

(3) For the Future Response

According to a survey by the National Federation of Forest Owners’ Co-operative Associations, 70% of forestry management entities answered that their sales had decreased since January 2020, while 98% maintained employment by utilizing support measures or other means.

The Forestry Agency will continue to monitor the situation and respond appropriately in cooperation with Prefectures.

1. Promoting Appropriate Management and Conservation of Forests

(1) Current State of Forests and Multiple Functions

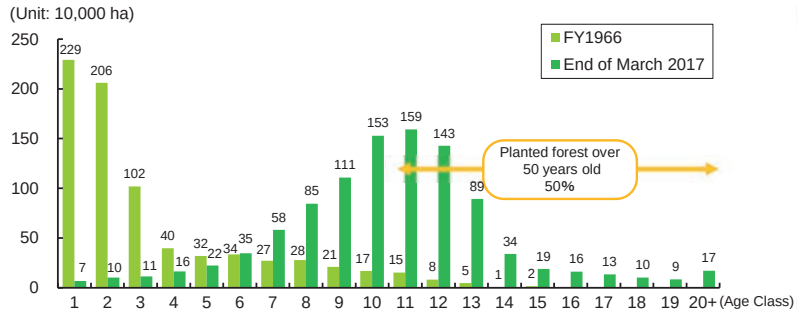
Forests contribute to the people's lives and economies through their multiple functions including land conservation, water resource conservation, and mitigating global warming.

The part of forests' multiple functions that can be monetarily evaluated is estimated at 70 trillion yen a year.

Forests cover about 25 million hectares, which accounts for 2/3 of the national land. About 40% of forests are planted forests. Half of the planted forests are more than 50 years old and entering their period of use (Fig. I-1, 2).

The growing stock is steadily expanding mainly on planted forests, reaching about 5.2 billion m^3 by the end of March 2017.

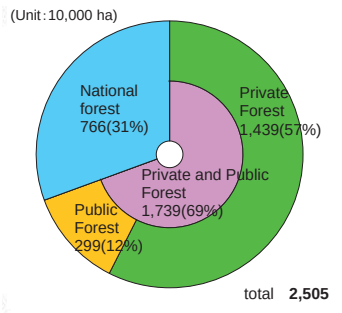
Forests contribute to the achievement of SDGs and carbon neutrality by 2050 through their multiple functions and the economic and social benefits of forestry and wood industry.



Sources: Forestry Agency: State of Forest Resources (March 31, 2017), Forestry Agency: Forest Resources of Japan (April 1968)

Notes: 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 Changing forest age class configuration of planted forests



Source: Forestry Agency: State of Forest Resources (March 31, 2017)

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 formulated the Basic Plan for Forest and Forestry (revised in May 2016) in accordance with the Forest and Forestry Basic Act as well as the National Forest Plan formulated under the Forest Act.

(3) Research and Development

The GOJ, prefectural governments, the Forestry and Forest Products Research Institute (FFPRI), universities and private sectors jointly conduct research and technology development in order to secure the fulfillment of the multiple functions of forests and to develop forestry, to ensure the supply and use of forest products, and to lower the cost of planting after harvesting. The achievements of research and technology development are spread by forestry extension agents.

The GOJ develops Foresters who support municipal governments' forest administration and management.

2. Forest Management

(1) Promotion of Forest Management

In order to sustainably secure the fulfillment of the multiple functions of forests, it is necessary to appropriately use forest resources and work steadily on thinning and planting after harvesting. It is also necessary to lead the way to diverse and sound forests by promoting the creation of multi-layered forests, long-term management, creating mixed forests of conifers and broadleaf trees, and forming broad-leafed forests, depending on natural conditions. For those reasons, the GOJ promotes systematic and appropriate forest management based on the Forest Planning System under the Forest Act.

Furthermore, it is vital to enhance carbon absorption of forests through thinning and reforestation for the Paris Agreement and the carbon neutrality by 2050. The GOJ has promoted thinning and production of the "specified mother tree" with excellent growth, based on the Thinning Promotion Special Law. In March 2021, this law was revised to prompt reforestation using saplings grown from the "specified mother tree" with excellent growth.

To encourage planting after harvesting, it is increasingly important to reduce planting costs and to stably supply seedlings. About 65 million seedlings for planting were produced in FY2019, and about 30% was for seedlings raised in the container (Fig. I-3, 4).

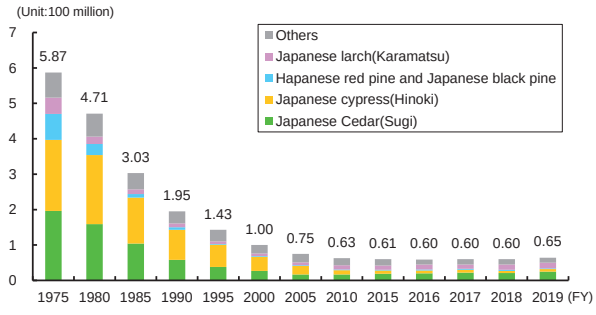
(Unit:10,000 ha)

	Type of work	Private and public forest	National forest	Total
Regeneration	Planted	2.3	1.1	3.3
	Underplanted	0.2	0.3	0.6
Post Establishment Treatments		36	14	50
	Thinned	27	10	37

Source: Survey by Forestry Agency

Note: Thinned area for promotion of forest sink activities

Fig. I-3 Forest management area (FY2019)



Source: Forestry Agency "Forests and Forestry Statistical Manual"

Note: Excluding state-owned

Fig. I-4 Annual production of seedlings for planting

(2) Forest Management System and Forest Environment Tax

The Forest Management System, based on the Forest Management Act was enforced in April 2019.

The Forest Management System is a new scheme that differs from any past systems in Japan. In this scheme, municipalities are entrusted with the management of forests which their owners are not able to manage appropriately. Then the municipalities re-entrust the forests suitable for forestry to forestry practitioners who manage forests sustainably through certain proceedings.

In FY2019, a quarter of municipalities conducted intention surveys on about 150,000 ha of forest. Approximately 70% of municipalities worked on or prepared for the forest management system.

And in 2019, the Forest Environment Tax and Forest Environment Transfer Tax were created with the idea that all citizens equally support Japan's forests. As Forest Environment Tax will be imposed as a national tax at a rate of 1,000 yen per capita per year, utilizing the tax collection system of the individual inhabitant tax from FY2024.

The Forest Environment Transfer Tax is earmarked for municipalities' expenses related to forest management. In 2019, half of the municipalities used the tax for forest management.

(3) People's Participation in Forest Management

Forest management activities by NPOs and companies, etc. are expanding. The number of planting groups in Japan topped 3,303 in FY2018, nearly six-fold from FY2000. In recent years, more companies are willing to get involved in forest management with increasing interest in SDGs and ESG investment.

3. Forest Conservation

(1) Management and Conservation of Protection Forests

"Protection forest" 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 FY2019, 12.2 million ha of forests were designated as protection forests. Additionally, even when a forest, except a protection forest, is diverted, the Forest Land Development Permission System secures public benefits.

(2) Disaster Control

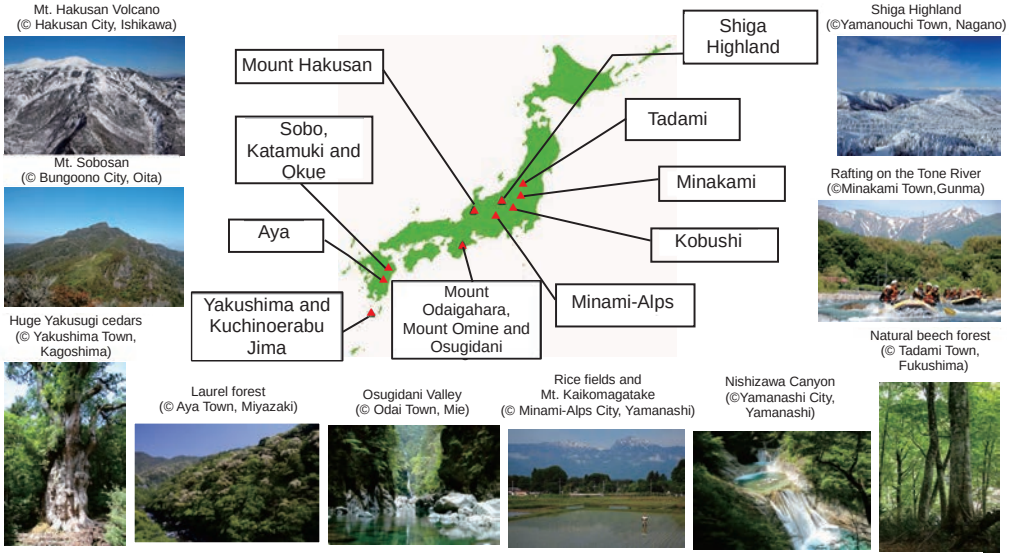
The GOJ promotes integrated forest conservation projects including accurately clarifying mountain disaster hazard regions, restoration of devastated forests, and development of coastal forests. When natural disasters occur in mountainous areas,

the Forestry Agency conducts immediate surveys and elaborates recovery works.

(3) Conservation of Forest Biodiversity

Based on the National Biodiversity Strategy of Japan 2012-2020 (adopted in September 2012), the Forestry Agency promotes appropriate thinning and diverse forest creation and the protection and management of primeval forest ecosystems.

The Forestry Agency promotes the strict protection and management of forests in World Heritage sites and Biosphere Reserve sites (Fig. I-5). The GOJ is promoting efforts to inscribe “Amami-Oshima Island, Tokunoshima Island, Northern part of Okinawa Island and Iriomote Island” on the World Heritage List as Natural Property in 2021.



Source: Prepared by Forestry Agency based on Ministry of Education, Culture, Sports, Science and Technology’ Figures

Fig. I-5 UNESCO Biosphere Reserve sites in Japan

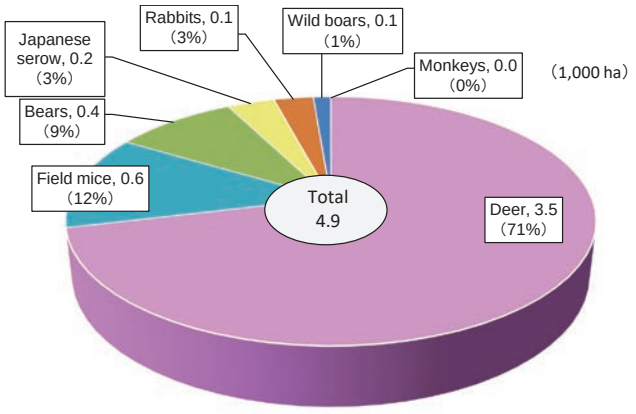
(4) Forest Damage by Wildlife, Pests and Forest Fire

Forest damaged by wildlife is serious. In FY2019, about 4,900 ha of forests were damaged by wildlife, about 70% of which was caused by deer (Fig. I-6). To prevent the damage, the GOJ promotes comprehensive measures including subsidies for barrier fences and population control through capturing wildlife.

Damage by pinewood nematode (*Bursaphelenchus xylophilus*) is also declining; it remains the worst forest pest in Japan. In FY2019, pinewood nematode damaged about 0.30 million m^3 of wood. 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 increasing. In FY2019, this pest damaged 61 thousand m^3 of wood. 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 2019, 1,391 forest fires occurred, burning down 837 ha of forest. The number of forest fires are declining in the long term. Forest fires intensively occur in winter and spring, with most of the cases caused by people carelessly using fire.



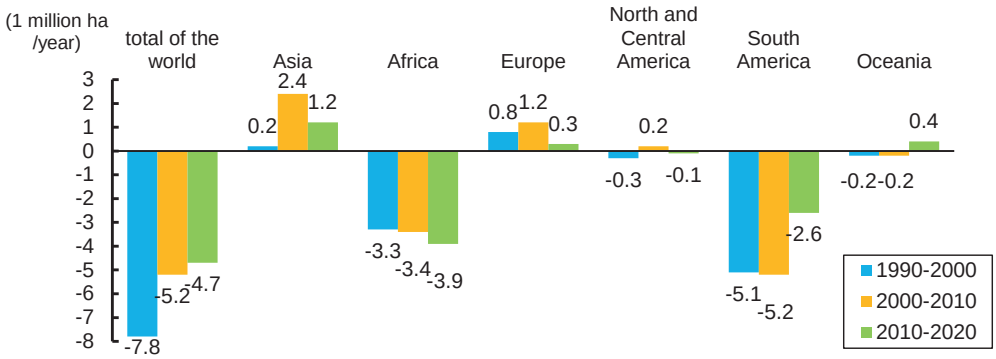
Source: Survey by Forestry Agency

Fig. I-6 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 at 4.06 billion ha, which is 31 percent of the total land area. The world's forest area declined by about 178 million ha in the 30 years from 1990 to 2020.The rate of forest loss has decreased since 1990, a result of reduced deforestation in some countries and forest gains in others (Fig. I-7).



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

Fig. I-7 Changes in global forest area

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), the Montreal Process, etc.

Since illegal logging is one of the factors obstructing global environment conservation and sustainable forest management, the international community is making efforts to combat illegal logging through various international frameworks. The GOJ supports the establishment of legal and sustainable supply chain in producing countries through the contribution to the International Tropical Timber Organization (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.

In Japan, two forest certification schemes have been widely 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 the 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 0.41 million ha) and/or SGEC (about 2.16 million ha).

(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.

In the Paris Agreement, it is stipulated to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases (GHGs) in the second half of this century.

In order to achieve greenhouse gas (GHG) reduction targets stipulated in the Plan for Global Warming Countermeasures (May 2016), Japan enhances the steady implementation of forest sink measures, including forest management through thinning and use of wood.
In response to the declaration of carbon neutrality by 2050, i.e. achieving net-zero GHG emissions by 2050, the plan will be reviewed.

The GOJ has taken initiatives in “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 has promoted adaptation measures based on the Climate Change Adaptation Plan (formulated in November 2018, by GOJ).

(3) International Discussions on Biodiversity

As of December 2020, the Convention on Biological Diversity (CBD) has been signed by 194 countries, the European Union (EU) and the State of Palestine. A total

of 129 countries and regions including Japan have ratified the Nagoya Protocol on access to genetic resources and sharing of benefits arising from their utilization.

(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.

Approximately $1,340 million was provided into official development assistance (ODA) for the forestry sector worldwide in 2019, of which $33 million was from Japan. Japan was the fourth largest donor following Germany, France, and the United Kingdom.

Japan's technical cooperation is conducted as technical cooperation projects, which optimally combine the "dispatch of experts", "acceptance of training participants" and "provision of equipment", training, etc. through the Japan International Cooperation Agency (JICA). At the end of December 2020, in the forestry sector, Japan was conducting 16 technical cooperation projects through JICA. The Forestry Agency dispatched 7 experts to 6 countries through 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.

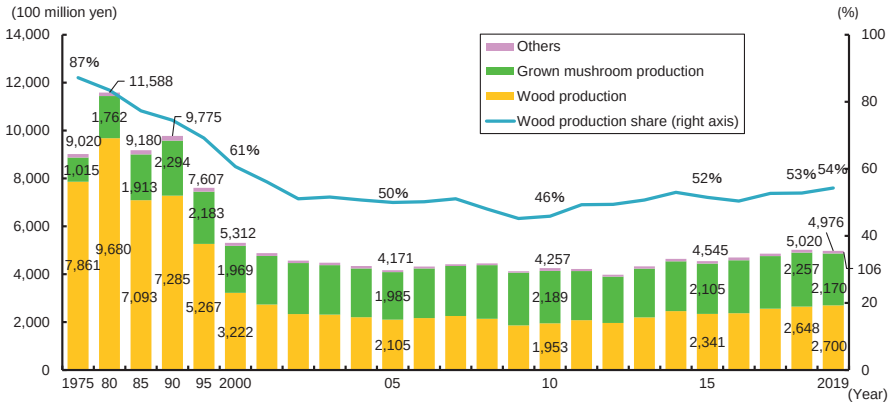
The GOJ also provides financial support to projects conducted by ITTO and FAO. In the projects, ITTO establishes traceability system and timber legality framework in producing countries, and FAO promotes afforestation and reforestation efforts to maximize forest carbon stock and enforces knowledge and understanding of national legal frameworks governing forestry and timber supply chains.

1. Forestry

(1) Forestry Production

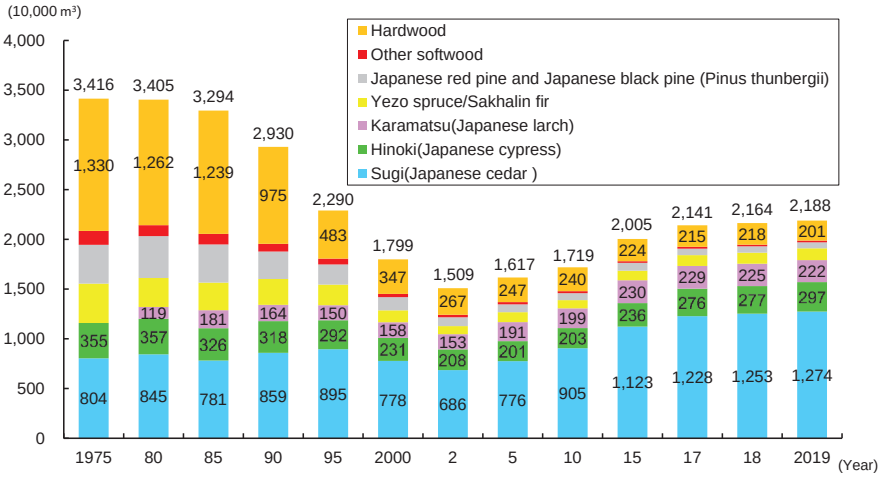
Total forestry output in 2019 was 498 billion yen, which was an decrease of 1% over the previous year. Wood production accounted for 50% of forestry output and reached 270 billion yen in 2019, which was an increase of 2% over the previous year (Fig. II-1).

Supply of domestic wood totaled 31.0 million m^3 in 2019. Of the supply, logs for sawn lumber, plywood and chips accounted for 21.9 million m^3, maintaining an uptrend from 2002. By tree species, the volume of Sugi (Japanese cedar) production was 58%, Hinoki (Japanese cypress) 14%, Japanese larch 10%, and hardwood 9% (Fig. II-2).



Source: MAFF: Forestry output

Fig. II-1 Gross forestry output



Source: MAFF: Report on supply and demand of lumber

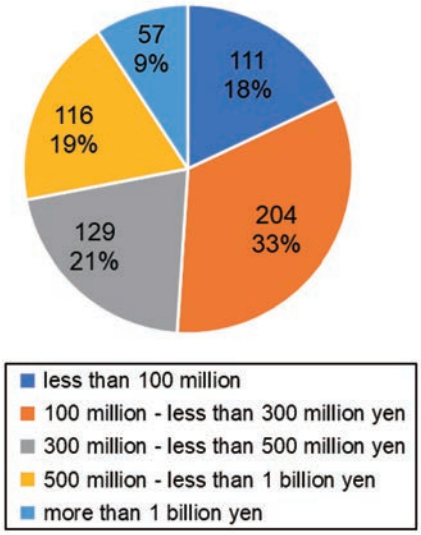
Fig. II-2 Volume of domestic roundwood

(2) Forestry Management

The 2015 Census of Agriculture and Forestry shows that the number of forestry households was 830 thousand, 88% of which owned less than 10 ha of forest area. Small-scaled forest ownership remains dominant (Fig. II-3).

It is necessary to strengthen the management base of forestry owners' cooperatives in terms of increasing profit return to forest owners and forestry workers.

In May 2020, the Forest Owners' Cooperative Associations Act was revised in order to introduce various cooperation methods between cooperatives, expand regular membership qualifications and strengthen their business execution systems.



Source: Forest Agency "Statistics on forest owners' cooperative"

Fig. II-3 Number and percentage of forest owners' cooperatives by the amount of transactions

The Yazu Chuo Forestry owners' cooperative in Tottori Prefecture sets on a president, who has practical experience in sales. Under his leadership, the employees manage their sales results and financial status on a daily basis and set individual goals. They are energetically holding briefing sessions to conclude long-term management entrustment contracts and to promote coordination and consolidation of forestry operations. As a result, the wood production rose dramatically from 600 m^3 in 2007 to 44 thousand m^3 in 2018.

A briefing session for forest owners

(3) Forestry Workforce

According to the 2015 national census, the number of forestry workers was 45,440, tending to decline in the long-term.

On the other hand, permanent employment rate of forestry workers is on growing trend. In addition, the proportion of young forestry workers remains stable while the proportion of young workers in all industries is tending to decline.

Female forestry workers and female prefectural staffs of forestry have established various voluntary groups in Japan. In 2020, the online network "Forest Women's Meeting" was launched with the aim of gathering, learning, and exchanging ideas among women involved in forestry, beyond the boundaries of voluntary groups.

(4) Improvement of Forest Productivity

Consolidating Forestry Operation

The Forestry Agency and prefectures are consolidating forestry operations by developing Forest Management Planners who will conduct proposal-based coordination with forest owners and consolidation of forestry operations.

Municipalities launched the forest area register system in April 2019 to unitarily compile information on forest owners and ownership boundaries and to provide part of such information for forestry management entities.

The Forestry Agency supports to introduce Forest Cloud to prefectures for sharing forest GIS and the forest area register system efficiently.

Development of Forestry Road System

Although Japan has steep terrain and diverse geology, forestry road system has been developed and the total length reached at 383 thousand km in FY2019. The Forestry Agency promotes to develop forestry road system, which contribute to forestry and mountain village life (Fig. II-4).

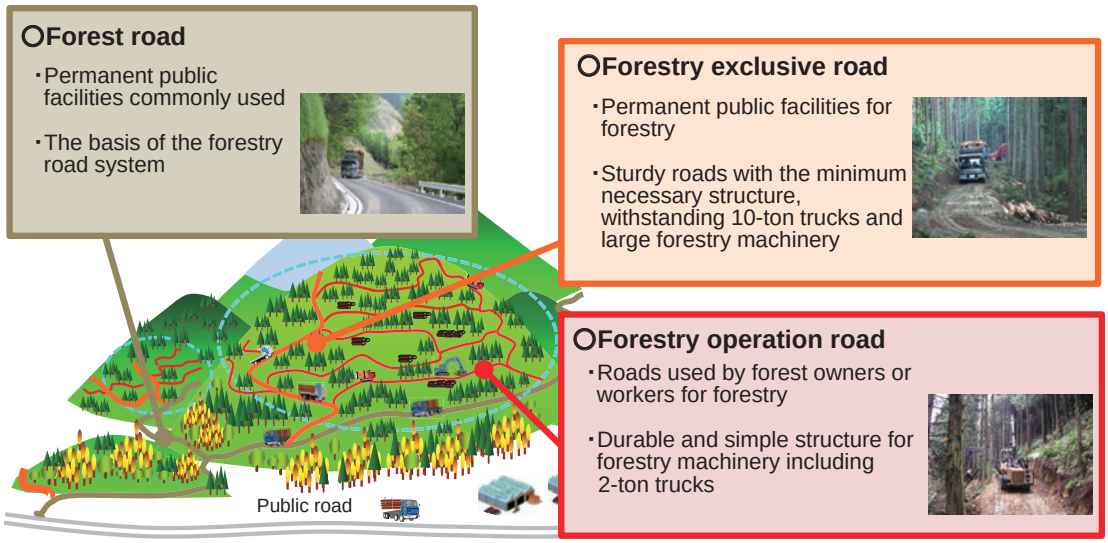


Fig. II-4 Classification and roles of forestry road system

2. Non-wood Forest Products

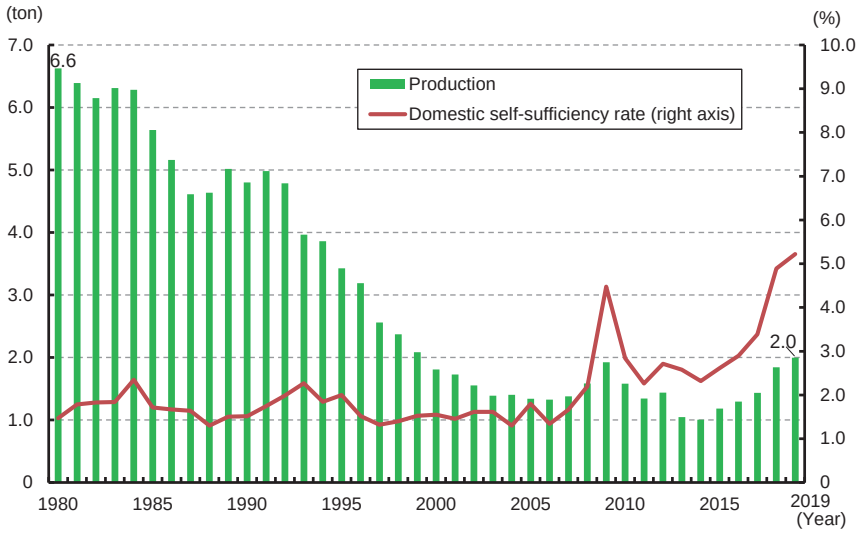
Non-wood forest products include variety of products such as mushrooms, edible nuts, wild vegetables, Japanese lacquer, bamboo, charcoal and firewood. Non-wood forest products account for about half of the forestry output and play key roles in stimulating rural economies and ensuring employment. The value of non-wood forest products in 2018 was 278.4 billion yen, a decrease of 2% over the previous year.

(1) Mushrooms

Mushrooms earned more than 80% of the value of non-wood forest products in 2019. Production of mushrooms has been flat in recent years, reaching 456,000 tons in 2019.

(2) Other Non-wood Forest Products

Total production of charcoal has been decreasing over the long term, reaching 21,000 tons in 2019. Total fuelwood production was 46,000 m^3 in 2019, and it has remained at approximately 50,000 m^3 in recent years (converted to logs). Bamboo material had been on growing trend since 2010, but fell to 32,000 tons in 2019, with a decrease of 6% over the previous year. Japanese lacquer production has been increasing in recent years as Japanese lacquer has been adopted in principle for preserving and repairing national treasure and important cultural property buildings (Fig. II-5).



Source: Forestry Agency “Non-wood Forest Products Data”

Fig. II-5 Japanese lacquer production

Marukin Co., Ltd. in Nagano Prefecture makes sawdust medium from thinned Sugi (Japanese Cedar) woods for cultivating enokitake mushrooms. Their mushrooms received a high evaluation for using local woods, good texture and flavor, which were used in Michelin-starred restaurants and luxury inns. In addition, the recycle utilization of sawdust medium as organic fertilizer after harvesting is also highly appreciated. They received the Japan Wood Design Award 2020 (social design category) for the first time in the non-wood products sector.

Mushrooms provided on woody sawdust medium made from thinned woods

3. Hilly and Mountainous Rural Communities

(1) Current State of Hilly and Mountainous Rural Communities

Hilly and mountainous rural communities, where people engage in forestry, 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 the total land area, accounting for approximately 60% of the total forest area. There are problems such as a decrease in job opportunities and an increase in abandoned farmland due to continuing depopulation and the aging population in such communities.

(2) Revitalization of Hilly and Mountainous Rural Communities

In recent years, there are new movements to use forest spaces in diverse fields such as health promotion, tourism, and education as the people change their lifestyles and diversify their values (Fig. II-6).

The Forestry Agency implements model projects in 16 regions to promote “Forest-related Service Industry” and sharing these results on online forums.
In addition, the Forestry Agency is attempting to use forest including “Recreation Forests” in national forest as tourism resources and field of environmental education and other experiences in order to promote connection between hilly and mountainous rural communities and cities and to increase people who related to these communities.

Fig. II-6 Forest therapy walks

1. Forestry

(1) Global Wood Supply and Demand

In 2019, the global consumption of industrial roundwood decreased by 2% from the previous year to 2,031 million m^3.

The total volume of industrial roundwood imports in the world increased by 0.3% from the previous year to 144 million m^3. China was the world's largest industrial roundwood importer in 2019, accounting for 44% of global imports of industrial roundwood.

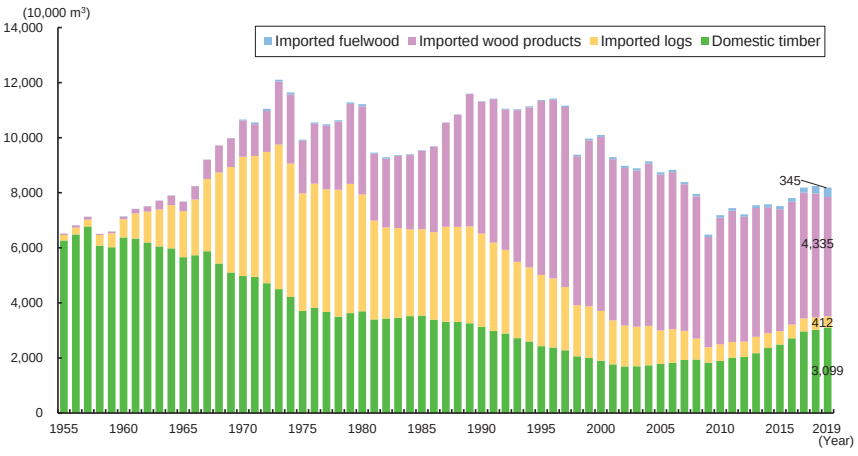
In 2019, the global consumption of sawn wood was 482 million m^3, the same level as the previous year. The total volume of sawn wood imports in the world decreased by 1% to 149 million m^3. China was also the world's largest sawn wood importer in 2019, accounting for 26% of global imports of sawn wood.

(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 2019 was 81.91 million m^3 (roundwood equivalent), which was a 0.7% decrease from the previous year (Fig. III-1).

The domestic wood supply bottomed out in 2002 and has since recovered. It was 30.99 million m^3 in 2019, which was a 2.6% increase from the previous year (Fig. III-1).

The volume of imported wood in 2019 was 50.92 million m^3, which was a 2.6% decrease from the previous year, due to a decrease in the imports of wood products (Fig. III-1).



Source: Forestry Agency "Wood Supply and Demand Chart"

Fig. III-1 Changes in wood supply

(3) Wood Prices

The prices of domestic roundwood and sawn wood products have remained almost flat in recent years. Domestic wood chip prices have slightly increased.

(4) Illegal Logging Countermeasures

The Clean Wood Act came into force in May 2017. The Act stipulates that all businesses 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 appropriately and reliably take steps to confirm the legality of wood and wood products may apply to a registration body (there are six such bodies in operation) to obtain registration as a “registered Wood-related Business Entities”. As of March 2021, 536 companies had completed this registration process.

(5) Wood Exports

The value of wood exports has been on a rising trend since 2013. In 2020, it rose by 3% from the previous year and reached 35.7 billion yen.

In December 2020, the GOJ established the Action Strategy for Expanding the Export of Agricultural, Forestry and Fishery Products and Foods. In this strategy, lumber and plywood are selected as priority items for exports. In addition, it announces a policy for working on marketing and expansion of overseas sales channels for building materials and highly durable woods, targeting China, the United States, South Korea, Taiwan, etc. The export production areas have been listed, including four lumber producing areas and eight plywood producing areas.

2. Wood Use

(1) Importance of Wood Use

Wood use can contribute to sustainable fulfillment of multiple functions of forests, as well as vitalization of local economies. Wood provides comfortable and healthy living conditions, through showing excellent properties of humidity conditioning and heat insulation, as well as the relaxing and stress-reducing effect of its scent.

In addition, wood use will contribute to achieving carbon neutrality by 2050, because wood stores carbon, processing of wood emits low levels of carbon dioxide, and wood can be used as a substitute for fossil fuels.

(2) Wood Use in Housing and Construction

In Japan, about 80% of low-rise (up to three stories) residential buildings are wooden. However, wooden buildings account for less than 10% of mid-to-high-rise (four

stories and above) buildings and non-residential ones.

Developments are ongoing for fire-resistant wooden materials, cross-laminated timber (CLT) and other technologies and products to use wood for mid-to-high-rise buildings and non-residential ones.

Across Japan, wooden structures, both interior and exterior, have been promoted in the construction of mid-to-high-rise and non-residential buildings. Various companies and organizations have been working collaboratively towards expansion of wood use.

The seven-story "Takaso Wooden Building" was constructed in front of Sendai Station, using structural members made of bundled lumber. This construction method is expected to expand the possibilities of using wood for mid-to-high-rise buildings.

A pillar bundled with Cedar lumber

(3) Wood Use for Public Buildings

The proportion of wooden structured buildings was 13.8% of all public buildings (based on floor area) whose construction started in FY2019. It was 28.5% among low-rise buildings.

(4) Use of Woody Biomass

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 2019 increased by 15% from the previous year to 10.38 million m^3.

While the increased use of woody biomass is mainly caused by a boom in woody biomass power plants, the Forestry Agency is also encouraging heat-use, which has higher energy conversion efficiency.

High value-added products including lightweight, high-strength cellulose nanofibers (CNF) and heat-resistant, processible glycol lignin are being developed as ways to utilize woody biomass for materials. As for CNF, manufacturing facilities are under operation in various places, and some products using CNF have been put into practical use, including athletic shoes and building materials. A speaker using glycol lignin for the diaphragm has also been commercialized.

(5) 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 bottomed out in 2009 and has since recovered. In 2018, the value rose to 840 billion yen, which was an increase of 2.5% over the previous year.

(2) Response to Consumer Needs and the Creation of New Demand

Precut lumber using kiln-dried lumber is becoming popular in response to consumer needs for the quality and capability of wooden buildings. As large-scale wooden buildings are expected to create new demand for wood, it is necessary to establish a stable supply system for the JAS products.

Various efforts are being made in order to ensure a stable supply of wooden products that meet the needs of home builders, for example: (I) expanding further the capacity of large-scale mills; (II) improving production efficiency by collaboration among multiple mills; and (III) providing distinctive housing through collaboration among local timber producers, sawmills and home builders. The Forestry Agency supports collaborative supply chain management efforts of all stakeholders, including in efficient distribution of timber and sharing of supply and demand information.

(3) Each Sector of the Wood Industry

Sawmilling Industry

Shipments of sawn wood products have remained flat since the beginning of 2010. In 2019, shipments rose to 9.03 million m^3, which was a decrease of 1.8% from the previous year. The quantity of industrial wood received by sawmills was 16.64 million m^3 in 2019.

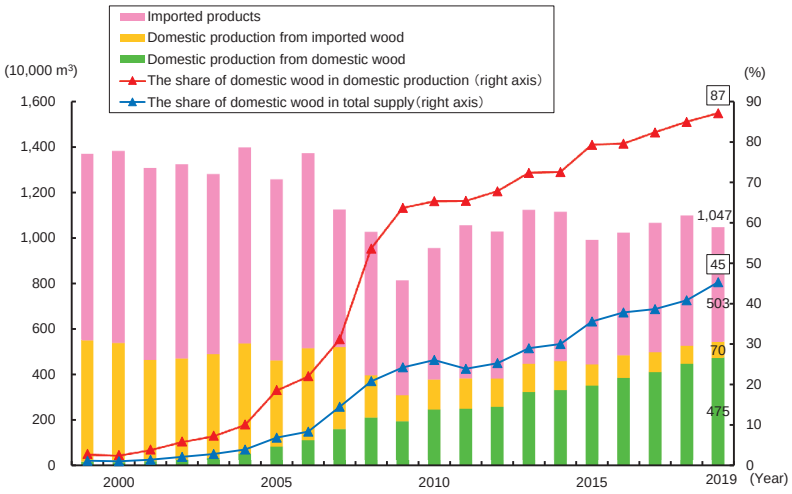
Glued Laminated Timber Manufacturing Industry

Glued laminated timber production in 2019 totaled 1.92 million m^3 of which structural use accounted for 1.83million m^3. Japan's import of glued laminated timber products in 2019 stood at 0.97 million m^3.

Plywood Industry

Production of plywood in 2019 was 3.34 million m^3, which was an increase of 1.2% over the previous year. Most of this - 2.95 million m^3 - was for structural use, while 50 thousand m^3 was used as concrete formwork.

The share of domestic wood in domestic plywood production in 2019 rose to 87% (4.75 million m^3). In 2019, the total wood demand for plywood, including imported products, was 10.47 million m^3. Domestic wood accounted for 45% of total wood demand for plywood in Japan (Fig. III-2).



Source: Forestry Agency “Wood Supply and Demand Chart”

Fig. III-2 Changes in supply of wood for plywood

Wood Chip Manufacturing Industry

Production of wood chips (excluding fuel use chips) in 2019 was 5.27 million tons, which was a decrease of 8% from the previous year.

Japan’s import of wood chips in 2019 totaled 12.17 million tons, accounting for about 70% of wood chip consumption in Japan.

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 93% in 2019.

Wood Distribution Industry

In the distribution of domestic timber in 2018, 40% was distributed through the timber market, while 41% was transported directly from logging sites to mills. The share of direct delivery has been increasing.

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, almost 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, watershed conservation, etc.

National forests which have diverse ecosystems, are important for the conservation of biodiversity, and 95% of the land designated as World Natural Heritage sites in Japan (Shiretoko, Shirakami-Sanchi, Yakushima and Ogasawara Islands) is located in national 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.

Since FY2013, this program has been executed under the General Account Budget with a view to further promoting the sound management of national forests aiming to enhance public benefits and to contribute to revitalization of Japan's forests and forestry.

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 "landslide prevention", "natural conservation", "recreational use", "comfortable environment development", and "watershed conservation".

Ninety percent of national forests are conservation forests such as watershed conservation. The Forestry Agency improves devastated land and conservation forests through forest conservation projects in order to ensure the people safe and worry-free lives.

The Forestry Agency designates and manages "Protected Forests" and "Green Corridors" in order to conserve biodiversity. As of April 2020, Protected Forests were designated at 661 locations covering 978,000 ha of land, which accounted for 13% of national forest area. "Green Corridors" were formed as of April 2020 at 24 locations, covering 584,000 ha of land, and accounting for 8% of national forest area. The Forestry Agency takes measures to protect rare species of wildlife, and prevents

deer and other wildlife from damaging forests.

In Shiretoko, a World Natural Heritage Site, feeding damage on vegetation by Yezo sika deer has a significant impact on the ecosystem and biodiversity of the heritage area.
Since 2006, the GOJ and the local government have been collaborating to implement conservation and management measures for Yezo sika deer with advice of academic experts.
The Hokkaido Regional Forest Office used traps to capture Yezo sika deer, and investigated the effects of feeding damage on vegetation and the status of vegetation recovery. Using captured Yezo sika deer for gibiers (game meat) contributes to effective utilization of local resources.

As of 2012

As of 2020

Vegetation recovery in Shiretoko

(2) Contribution to Transforming Forestry into a Growth Industry

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

(3) National Forests as “Forests for People”

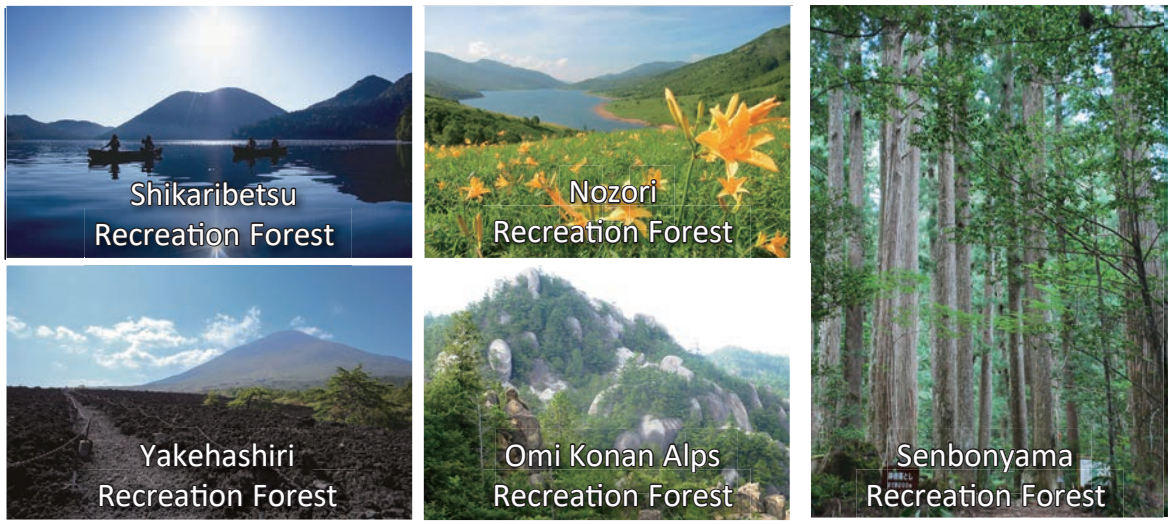
The Forestry Agency provides various organizations (e.g. schools, voluntary groups, corporations, traditional woodworkers) with places for field activities such as forest environmental education and forest management practices, by designating forests for such activities within national forests. The Forestry 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 FY2019, a total of 130 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 Forest Agency has improved facilities and promotes these by posting multilingual signs, provides information on web sites in two languages.

Recreation Forests of JAPAN

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



Source: Forestry Agency

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

1. Recovery of Forests, Forestry and the Wood Industry

(1) The Grate 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 disaster control facilities and forest roads in 15 prefectures. By January 2021, 99% of the recovery works had been completed.

Approximately 164 km of coastal disaster-prevention forests damaged by the tsunami required restoration work. Restoration works were completed on about 145 km of them at the end of March 2021 (Fig. V-1). It is necessary to continue the project for growing the seedlings.

Since coastal disaster-prevention forests mitigated the tsunami damage in the Earthquake, the GOJ promotes to develop coastal disaster-prevention forests in other coasts.

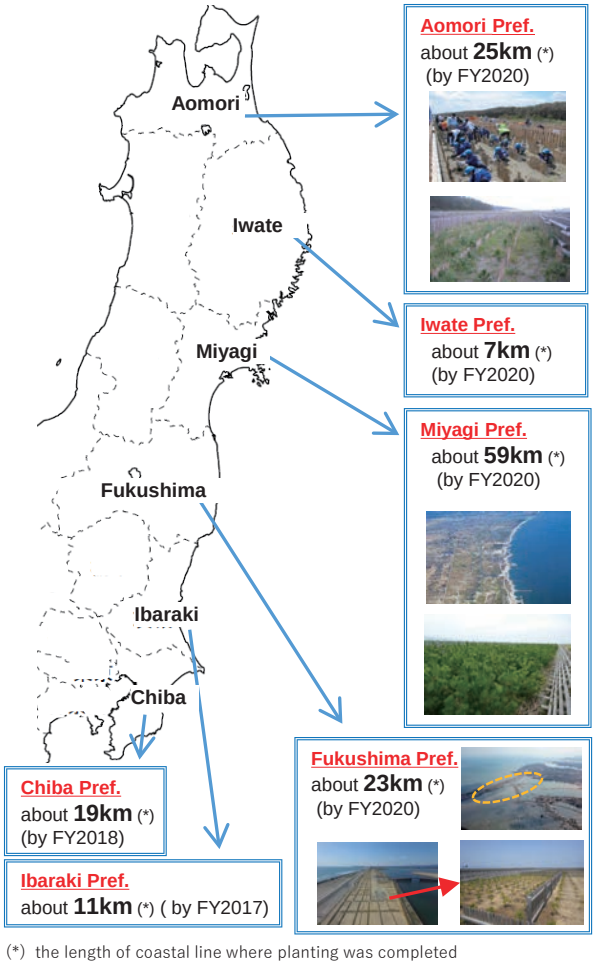


Fig. V-1 Recovery of coastal disaster-prevention forests

(3) Recovery of Forestry and the Wood Industry

The Great East Japan Earthquake damaged 115 wood processing/distribution facilities and 476 non-wood 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 Forestry Agency supported disposal, restoration, and improvement of wood processing and distribution facilities.

The distribution recovered within FY2011. As of April 2020, operations had restarted at 98 facilities and production of logs and wooden products have 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 of wood. The temporary wooden houses are highly evaluated for their convenience and comfort.

Disaster agreements are increasingly being concluded by local governments to ensure promptly supply of wooden emergency temporary houses in case of large-scale disasters. Some wooden emergency temporary houses built in Fukushima Prefecture were rebuilt and reused in another disaster-affected area in 2018.

Approximately 30% (approximately 7,800) of public houses for disaster victims (reconstruction houses) are planned to be constructed with wooden structures, and 99% have been completed by the end of December 2020.

The initiatives to utilize wood in reconstruction of public buildings and civil engineering have been promoted. Furthermore, wood biomass facilities such as power plants have been introduced in each prefecture, which contribute to reconstruction.

2. Reconstruction after the Nuclear Accident

(1) Nuclear Disaster and Response to Radioactive Materials

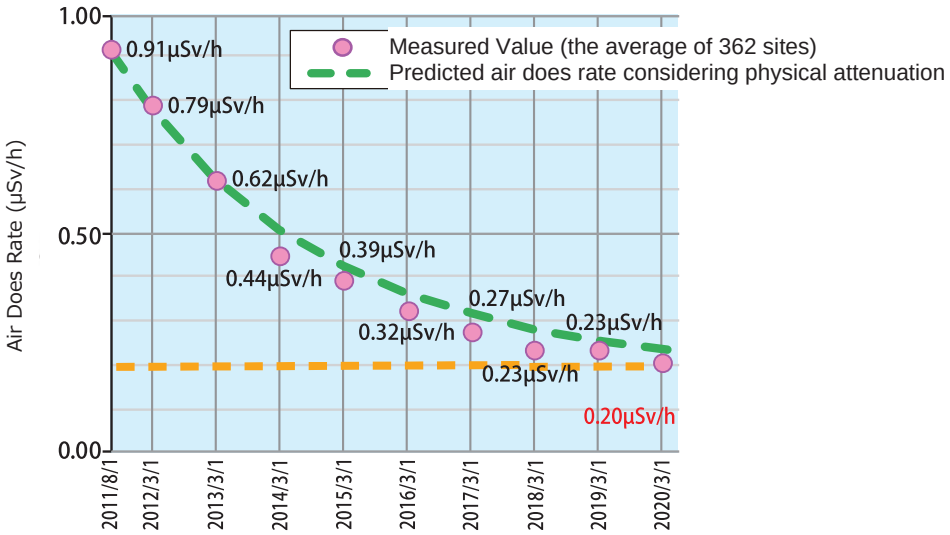
On March 11, 2011, the Fukushima Daiichi Nuclear Power Stations of the Tokyo Electric Power Company (TEPCO) automatically shut down following the Great East Japan Earthquake. As a result of explosions presumably caused by hydrogen, a substantial amount of radioactive material was discharged into the atmosphere.

The GOJ designated the areas of evacuation and has rearranged them one by one. By March 2020, the evacuation orders were lifted in all the areas except areas where returning is difficult.

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 GOJ is undertaking efforts to restore "satoyama forests" around residential areas, to regenerate forestry and to disseminate information.

Air dose rate in forests in Fukushima Prefecture has been declining year by year (Fig. V-2).



Source: Forest planning division of Fukushima prefectural government,
the current state and prediction of radioactive materials in forests (FY 2019)

Fig. V-2 Changes of Air Dose Rate in forests in Fukushima

(2) Measures against Radioactive Substances in Forests

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

In order to maintain and promote the multiple functions of forests and to regenerate forestry industry, the Forestry Agency has promoted forest management such as thinning and pilot initiatives against radioactive substances since FY2013.

For ensuring safety and security against radiation for forest workers, the Forestry Agency summarized the points during work and researched the exposure reduction method. In 2016, a guidebook for forest workers was published.

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.

(3) Supply Safe Forest Products

The GOJ set standard limits for radioactive substances in foods at 100 Bq/kg for general foods. As of March 26, 2021, 22 items of non-wood forest products have shipping restrictions.

The Forestry Agency has developed Guidelines Concerning Management of Bed-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. Although the production of shiitake mushrooms on logs has not recovered even now, the production of shiitake mushrooms on sawdust medium has recovered to almost the level before the Great East Japan Earthquake.

Some shipment restrictions for wild mushrooms have been gradually lifted through the appropriate efforts of inspection and shipment management, while other restrictions remain.

The Forestry Agency promptly publishes the results of inspections on radioactivity levels in the products in order to dispel harmful rumors. In addition, the agency promotes the restoration of satoyama hardwood forest for shiitake logs.

Iwaki Shiitake Blocks Growers Cooperation, which produces shiitake mushrooms in Fukushima Prefecture, was forced to suspend shipments for a while after the Great East Japan Earthquake, but it has succeeded in expanding production and sales channels thorough safety management and branding.

Shiitake mushrooms and Shochu produced under safety management

By disclosing all the facilities, the production processes, and the inspection results, the association has earned the trust from their business partners. It has been also working on creating their hit products such as Shochu (Japanese distilled spirits) using shiitake mushrooms as one of their sixth industrialization activities.

Appendix

1. Forestry-related Fundamental Figures

Item	Unit	2000	2005	2010	2015	2016	2017	2018	2019
i Nominal gross domestic product (GDP)	billion yen	535,418	532,516	505,531	538,032	544,365	553,073	556,190	561,267
Forestry	billion yen	176	137	196	234	239	243	249	250
Forestry / GDP	%	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04
ii Total number of workers	million	64.46	63.56	62.57	64.01	64.65	65.30	66.64	67.24
Forestry	million	0.07	0.06	0.08	0.07	0.06	0.06	0.07	0.08
Forestry / Total # of workers	%	0.11	0.09	0.13	0.11	0.09	0.09	0.11	0.12
iii Land area of Japan	million ha	37.79	37.79	37.80	37.80	37.80	37.80	37.80	37.80
iv Forest	million ha	25.15	25.12	25.10	25.08	25.08	25.05	25.05	25.05
Forest / Land area	%	67.5	67.4	67.3	67.3	67.3	67.2	67.2	67.2
v Protection forest	million ha	8.93	11.65	12.02	12.17	12.18	12.20	12.21	12.23
Protection forest / Forest	%	35.5	46.4	47.9	48.5	48.6	48.7	48.7	48.8
vi Growing stock of forest	billion m^3	3.5	4.0	4.4	4.9	4.9	5.2	5.2	5.2
vii Total wood supply/demand	million m^3	101.01	87.42	71.88	75.16	78.08	81.85	82.48	81.91
Domestic production	million m^3	19.06	17.90	18.92	24.92	27.14	29.66	30.20	30.99
Import	million m^3	81.95	69.52	52.96	50.24	50.94	52.19	52.28	50.92
Self-sufficiency rate	%	18.9	20.5	26.3	33.2	34.8	36.2	36.6	37.8
viii New housing starts	million units	1.23	1.24	0.81	0.91	0.97	0.96	0.94	0.91
Ratio of wooden structure	%	45.2	43.9	56.6	55.5	56.5	56.5	57.2	57.8

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

Sources: i: Cabinet Office "SNA (System of National Accounts)"
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"

2. Forestry Output

(Unit: billion yen)

Item	2000	2005	2010	2015	2016	2017	2018	2019
Forestry output	531.15	417.05	425.70	454.47	470.26	486.34	502.03	497.63
Wood production	322.18	210.50	195.29	234.08	237.00	256.09	264.83	270.00
Softwood	265.33	177.41	170.16	198.19	195.39	206.06	209.99	213.01
Sugi (Japanese Cedar)	123.78	87.53	93.50	118.09	116.74	122.68	126.44	127.43
Hardwood	54.72	31.71	23.76	19.51	19.06	18.40	18.42	16.95
Fuelwood and charcoal production	6.16	6.09	5.08	5.31	5.49	5.44	5.54	5.81
Grown mushroom production	196.89	198.50	218.91	210.52	221.39	220.08	225.66	217.02
Minor forestry products production	5.92	1.96	6.42	4.55	6.38	4.74	5.99	4.80
Forestry income produced	351.91	245.78	229.22	251.02	260.11	269.54	266.59	264.52

Notes 1: Due to rounding, some totals may not correspond with the sum of the separate figures.
2: "Wood production" includes the output of wood chips for fuel since 2011.
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.

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

3. Current State of Forest Resources

(Unit: 1,000ha, million m^3)

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
Total			25,048	5,241.50	10,204	3,308.42	13,481	1,932.45	1,197	0.64	167
National forest	Subtotal		7,659	1,225.93	2,288	513.04	4,733	712.45	637	0.44	0
	Under the Forestry Agency's jurisdiction	Subtotal	7,593	1,220.72	2,282	512.03	4,682	708.24	629	0.44	0
		State-owned	7,508	1,201.28	2,208	492.83	4,680	708.01	620	0.44	0
		Government reforestation	85	19.44	73	19.21	2	0.23	10	0	-
		Others	0	0	-	-	-	-	0	0	-
	Under other Agency's jurisdiction		65	5.21	7	1.00	51	4.20	8	-	0
Private and public forest	Subtotal		17,389	4,015.57	7,916	2,795.38	8,747	1,220.00	560	0.19	167
	Public forest	Subtotal	2,995	615.56	1,334	397.05	1,531	218.36	124	0.15	6
		Prefecture	1,292	252.69	529	145.59	709	107.01	53	0.09	1
		Municipality/Property ward	1,702	362.87	804	251.47	822	111.35	71	0.06	5
	Private forest		14,347	3,394.33	6,569	2,395.55	7,188	998.74	431	0.04	158
	Others		48	5.68	13	2.78	28	2.90	5	0	3

Notes 1: Data cover the forests defined in Article 2 of the Forest Act.
2: "Others" refer 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, 2017.
4: Due to rounding, some totals may not correspond with the sum of the separate figures.

Source: Forestry Agency

4. Planted Area by Tree Species

(Unit: ha)

	Total	Softwood					Hardwood
		Sugi (Japanese cedar)	Hinoki (Japanese cypress)	Matsu (Pine)	Karamatsu (Japanese larch)	Others	
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
2016	(21,106)	(6,766)	(1,972)	(291)	(5,017)	(4,983)	(2,077)
	18,390	6,570	1,852	253	4,552	3,383	1,781
2017	(22,069)	(7,102)	(1,979)	(406)	(5,388)	(5,423)	(1,771)
	19,866	6,845	1,874	388	5,179	4,110	1,471
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

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.

Source: Forestry Agency

5. Planted Forest Area by Age Classes

(Unit: 1,000ha)

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX
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

Notes 1: Figures are as the end of each fiscal year.
2: For the year 1985, the class XV contains forests older than that class. For the years 1989 and 1994, the class XVII contains forests older than that class. For the years 2001, 2006 and 2011, the class XIX contains forests older than that class. For the year 2016, the class XX contains forests older than that class.
3: Data cover the forests defined in Article 5 or Article 7-2 of the Forest Act.

Source: Forestry Agency

6. Thinned Area and Use of Thinnings

(FY)	Thinned area (1,000ha)			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
2011	552	437	115	7.11	4.86	2.88	0.40	1.58	2.25
2012	488	368	121	7.59	5.21	3.00	0.36	1.86	2.38
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

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" means 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.

Source: Forestry Agency

7. Forest Area by Owners

	2015		2020	
	Forest area (ha)	Ratio to total area	Forest area (ha)	Ratio to total area
Total	17,626,761	100.0%	17,616,828	100.0%
Private	13,563,827	77.0%	13,560,059	77.0%
Public	3,370,380	19.1%	3,408,740	19.3%
Prefecture	1,271,571	7.2%	1,310,110	7.4%
Public corporation	391,189	2.2%	351,481	2.0%
Municipality	1,406,063	8.0%	1,435,718	8.1%
Property ward	301,557	1.7%	311,431	1.8%
Incorporated Administrative Agencies	692,554	3.9%	648,029	3.7%

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.

Source: MAFF "Census of Agriculture and Forestry"

8. Number of Forestry Management Entities and their Forest Area

(Unit: #, ha)

	Total		-3ha		3-5ha		5-20ha		20-50ha		50-100ha		100ha-	
	Number	Area	Number	Area	Number	Area	Number	Area	Number	Area	Number	Area	Number	Area
Total	87,284	4,373,374	2,247	1,170	23,767	85,988	41,885	389,986	12,193	348,521	3,572	235,747	3,620	3,311,962
Corporation	5,599	1,470,626	1,065	237	397	1,495	1,315	14,029	894	27,849	658	45,473	1,270	1,381,544
Private company	2,456	774,282	707	144	193	706	538	5,481	333	9,838	196	12,829	489	745,285
Cooperative	2,337	497,968	304	85	109	425	480	5,559	448	14,529	379	26,598	617	450,772
Agricultural cooperative	87	19,669	-	-	4	16	9	101	21	779	14	1,041	39	17,732
Forestry cooperative	1,819	304,008	263	83	74	287	342	4,083	341	11,085	317	22,336	482	266,135
Other cooperatives	431	174,291	41	2	31	123	129	1,376	86	2,665	48	3,221	96	166,905
Other corporations	806	198,376	54	8	95	364	297	2,989	113	3,482	83	6,046	164	185,487
Non-corporation	80,396	1,349,519	1,181	933	23,329	84,334	40,417	374,113	11,129	315,103	2,768	180,050	1,572	394,985
Individual	77,692	1,215,213	1,073	901	22,922	82,773	39,327	362,792	10,575	298,201	2,494	160,726	1,301	309,821
Public	1,289	1,553,229	1	-	41	159	153	1,844	170	5,570	146	10,224	778	1,535,432

Notes 1: Symbol of "-" 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 m^3 of logs for the past one year through the entrustment and the purchase of standing trees.

Source: MAFF "2015 Census of Agriculture and Forestry"

9. Roundwood Production

(Unit: 1,000m^3, %)

			2000	2005	2010	2015	2016	2017	2018	2019	Relative change from the previous year (%)
Total			17,034	16,166	17,193	20,049	20,660	21,408	21,640	21,883	1.1
By tree species	Softwood	Subtotal	13,707 (80)	13,695 (85)	14,789 (86)	17,815 (89)	18,470 (89)	19,258 (90)	19,462 (90)	19,876 (91)	2.1
		Sugi (Japanese cedar)	7,671	7,756	9,049	11,226	11,848	12,276	12,532	12,736	1.6
		for sawnwood	7,258 <57>	6,737 <58>	6,695 <63>	7,869 <66>	8,095 <66>	8,200 <65>	8,237 <66>	8,582 <67>	4.2
		Hinoki (Japanese cypress)	2,273	2,014	2,029	2,364	2,460	2,762	2,771	2,966	7.0
		Akamatsu (Japanese red pine), Kuromatsu (Japanese black pine)	1,034	783	694	779	678	641	628	601	▲ 4.3
		Karamatsu (Japanese larch), Ezomatsu (Yezo spruce), Todomatsu (Sakhalin fir)	2,410	2,910	2,816	3,268	3,325	3,380	3,366	3,405	1.2
		Others	319	232	201	170	153	198	165	168	1.8
	Hardwood		3,327 (20)	2,471 (15)	2,404 (14)	2,236 (11)	2,188 (11)	2,153 (10)	2,178 (10)	2,007 (9)	▲ 7.9
By use	Sawnwood		12,798 (75)	11,571 (72)	10,582 (62)	12,004 (60)	12,182 (59)	12,632 (59)	12,563 (58)	12,875 (59)	2.5
	Plywood		138 (1)	863 (5)	2,490 (14)	3,356 (17)	3,682 (18)	4,122 (19)	4,492 (21)	4,745 (22)	5.6
	Chips		4,098 (24)	3,732 (23)	4,121 (24)	4,689 (23)	4,796 (23)	4,654 (22)	4,585 (21)	4,263 (19)	▲ 7.0

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.

Source: MAFF "Wood Supply and Demand Report"

10. Wood Supply and Demand Chart (roundwood equivalent)

(Unit: 1,000m^3)

Supply \ Demand			Demand								Domestic consumption										Export										
			Total	Industrial use					Wood for mushroom production	Fuel wood	Total	Industrial use					Wood for mushroom production	Fuel wood				Total	Industrial use						Fuel wood			
				Subtotal	Sawnwood	Pulp and chips	Plywood	Others				Subtotal	Sawnwood	Pulp and chips	Plywood	Others		Subtotal	Charcoal	Firewood	Wood chips for fuel		Subtotal	Roundwood	Sawnwood	Pulp and chips	Plywood	Others	Subtotal	Charcoal	Firewood	Wood chips for fuel
Supply	Total		(19,085)	(6,258)		(6,258)				(12,827)	(19,085)	(6,258)		(6,258)				(12,827)			(12,827)										
			81,905	71,269	25,270	31,061	10,474	4,464	251	10,386	79,190	68,558	25,037	29,932	10,280	3,309	251	10,382	902	47	9,433	2,715	2,711	1,130	232	1,129	194	25	4	3	0	0
	Industrial use	Roundwood	(6,258)	(6,258)		(6,258)					(6,258)	(6,258)		(6,258)																	
			27,804	27,804	16,274	4,532	5,448	1,550			25,093	25,093	16,042	3,403	5,254	395						2,711	2,711	1,130	232	1,129	194	25				
		Forest residue	119	119		119					119	119		119																	
		Import	43,346	43,346	8,996	26,410	5,026	2,915			43,346	43,346	8,996	26,410	5,026	2,915															
	Wood for mushroom production		251						251		251						251														
	Fuel wood		(12,827)							(12,827)	(12,827)							(12,827)			(12,827)										
			10,386							10,386	10,382							10,382	902	47	9,433	4							4	3	0	0
Domestic production	Total		30,988	23,805	12,875	4,651	4,745	1,534	251	6,932	28,279	21,101	12,644	3,522	4,556	378	251	6,928	59	46	6,824	2,709	2,705	1,130	231	1,129	189	25	4	3	0	0
	Industrial use	Roundwood	23,686	23,686	12,875	4,532	4,745	1,534			20,982	20,982	12,644	3,403	4,556	378						2,705	2,705	1,130	231	1,129	189	25				
		Forest residue	119	119		119					119	119		119																	
	Wood for mushroom production		251						251		251						251														
	Fuel wood		6,932							6,932	6,928							6,928	59	46	6,824	4							4	3	0	0
Import	Total		50,917	47,464	12,395	26,410	5,729	2,931		3,454	50,911	47,458	12,393	26,410	5,724	2,931		3,454	843	1	2,609	6	6		1		5					
	Industrial use	Roundwood	4,118	4,118	3,399	0	703	16			4,112	4,112	3,398	0	698	16						6	6		1		5					
		Wood products Subtotal	43,346	43,346	8,996	26,410	5,026	2,915			43,346	43,346	8,996	26,410	5,026	2,915															
		Wood products Sawnwood	8,996	8,996	8,996						8,996	8,996	8,996																		
		Wood products Pulp	5,580	5,580		5,580					5,580	5,580		5,580																	
		Wood products Chips	20,829	20,829		20,829					20,829	20,829		20,829																	
		Wood products Plywood	5,026	5,026			5,026				5,026	5,026			5,026																
		Wood products Others	2,915	2,915				2,915			2,915	2,915				2,915															
	Fuel wood		3,454							3,454	3,454							3,454	843	1	2,609										

Notes 1: Figures in parentheses refer to the volume of pulp and chips from mill residue or construction waste, which are already included in the volume of sawnwood, plywood, or others. Therefore these figures are excluded from "total" and "subtotal".

2: "Forest residue" refers to branches or roots carried into mills for use.

3: Wood pellets produced domestically are included in "Fuel wood" of Domestic production.

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

Source: Forestry Agency "Wood Supply and Demand Chart", 2019

11. Wood Supply/Demand (roundwood equivalent)

(Unit: 1,000m^3)

	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	Pulp and chips	Plywood	Others	Domestic production	Import (roundwood and wood products)
1955	65,206	45,278	19,928	...	30,295	8,285	2,297	4,401	42,794	2,484
1960	71,467	56,547	14,920	...	37,789	10,189	3,178	5,391	49,006	7,541
1965	76,798	70,530	6,268	...	47,084	14,335	5,187	3,924	50,375	20,155
1970	106,601	102,679	2,348	1,574	62,009	24,887	13,059	2,724	46,241	56,438
1975	99,303	96,369	1,132	1,802	55,341	27,298	11,173	2,557	34,577	61,792
1980	112,211	108,964	1,200	2,047	56,713	35,868	12,840	3,543	34,557	74,407
1985	95,447	92,901	572	1,974	44,539	32,915	11,217	4,230	33,074	59,827
1990	113,242	111,162	517	1,563	53,887	41,344	14,546	1,385	29,369	81,793
1995	113,698	111,922	721	1,055	50,384	44,922	14,314	2,302	22,916	89,006
2000	101,006	99,263	940	803	40,946	42,186	13,825	2,306	18,022	81,241
2005	87,423	85,857	1,001	565	32,901	37,608	12,586	2,763	17,176	68,681
2010	71,884	70,253	1,099	532	25,379	32,350	9,556	2,968	18,236	52,018
2015	75,160	70,883	3,962	315	25,358	31,783	9,914	3,829	21,797	49,086
2016	78,077	71,942	5,807	328	26,150	31,619	10,248	3,925	22,355	49,586
2017	81,854	73,742	7,800	311	26,370	32,302	10,667	4,403	23,312	50,430
2018	82,478	73,184	9,020	274	25,708	32,009	11,003	4,465	23,680	49,505
2019	81,905	71,269	10,386	251	25,270	31,061	10,474	4,464	23,805	47,464

Notes 1: "Others" include items such as roundwood for export.
2: Due to rounding, some totals may not correspond with the sum of the separate figures.
3: "Fuel wood" includes wood chip for fuel utilized by woody biomass power plants since 2014.
Source: Forestry Agency "Wood Supply and Demand Chart"

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

(Unit: 1,000m^3)

			2000	2005	2010	2015	2016	2017	2018	2019	Relaltive change from the previous year (%)
Total wood supply/demand			101,006	87,423	71,884	75,160	78,077	81,854	82,478	81,905	▲ 0.7
Industrial use			99,263	85,857	70,253	70,883	71,942	73,742	73,184	71,269	▲ 2.6
Fuel wood			940	1,001	1,099	3,962	5,807	7,800	9,020	10,386	15.1
Wood for mushroom production			803	565	532	315	328	311	274	251	▲ 8.4
Domestic production			19,058	17,899	18,923	24,918	27,141	29,660	30,201	30,988	2.6
Import			81,948	69,523	52,961	50,242	50,936	52,194	52,277	50,917	▲ 2.6
Self-sufficiency rate (%)			18.9	20.5	26.3	33.2	34.8	36.2	36.6	37.8	1.2
Wood demand for industrial use by sector	Total	Total	99,263	85,857	70,253	70,883	71,942	73,742	73,184	71,269	▲ 2.6
		Domestic production	18,022	17,176	18,236	21,797	22,355	23,312	23,680	23,805	0.5
		Import	81,241	68,681	52,018	49,086	49,586	50,430	49,505	47,464	▲ 4.1
		Self-sufficiency rate (%)	18.2	20.0	26.0	30.8	31.1	31.6	32.4	33.4	1.0
	Sawnwood	Subtotal	40,946	32,901	25,379	25,358	26,150	26,370	25,708	25,270	▲ 1.7
		Domestic production	12,798	11,571	10,582	12,004	12,182	12,632	12,563	12,875	2.5
		Import	28,148	21,330	14,797	13,354	13,968	13,738	13,145	12,395	▲ 5.7
		Self-sufficiency rate (%)	31.3	35.2	41.7	47.3	46.6	47.9	48.9	51.0	2.1
	Pulp and chips		(6,537)	(7,974)	(6,192)	(6,667)	(6,853)	(7,107)	(6,792)	(6,258)	
		Subtotal	42,186	37,608	32,350	31,783	31,619	32,302	32,009	31,061	▲ 3.0
		Domestic production	4,749	4,426	4,785	5,202	5,266	5,193	5,089	4,651	▲ 8.6
		Import	37,437	33,181	27,565	26,581	26,353	27,110	26,920	26,410	▲ 1.9
		Self-sufficiency rate (%)	11.3	11.8	14.8	16.4	16.7	16.1	15.9	15.0	▲ 0.9
	Plywood	Subtotal	13,825	12,586	9,556	9,914	10,248	10,667	11,003	10,474	▲ 4.8
		Domestic production	138	863	2,490	3,530	3,876	4,122	4,492	4,745	5.6
		Import	13,687	11,723	7,066	6,384	6,372	6,545	6,511	5,729	▲ 12.0
		Self-sufficiency rate (%)	1.0	6.9	26.1	35.6	37.8	38.6	40.8	45.3	4.5
	Others	Subtotal	2,306	2,763	2,968	3,829	3,925	4,403	4,465	4,464	▲ 0.0
		Domestic production	337	316	379	1,061	1,031	1,365	1,536	1,534	▲ 0.1
		Import	1,969	2,447	2,589	2,767	2,894	3,038	2,930	2,931	0.0
		Self-sufficiency rate (%)	14.6	11.4	12.8	27.7	26.3	31.0	34.4	34.4	0.0

Notes 1: Self-sufficiency rate is calculated by domestic production divided by total or subtotal in each category.
2: "Others" include items such as roundwood for export.
3: Figures in parentheses refer to the volume of wood chip from mill residue or construction waste, which are already included in the volume of sawnwood, plywood, or others. Therefore, these figures are excluded from "total" and "subtotal".
4: Due to rounding, some totals may not correspond with the sum of the separate figures.
5 : "Fuel wood" includes wood chip for fuel utilized by woody biomass power plants since 2014.
6: Among "relative change from the previous year", "self-sufficiency rate" field is the difference from the previous year.
Source: Forestry Agency "Wood Supply and Demand Chart"

13. Wood Supply by Country (roundwood equivalent)

(Unit: 1,000m^3, %)

			2000	2005	2010	2015	2016	2017	2018	2019
Imported wood	North America	Subtotal	(28.9) 28,700	(18.8) 16,129	(19.2) 13,506	(17.5) 12,415	(17.2) 12,377	(16.8) 12,352	(16.3) 11,898	(15.3) 10,893
		U.S.A	14,460	6,844	5,838	6,057	6,083	6,233	6,273	5,754
		Canada	14,240	9,285	7,668	6,359	6,294	6,119	5,625	5,139
	Southeast Asia	Subtotal	(13.7) 13,569	(12.2) 10,511	(8.9) 6,287	(8.3) 5,848	(7.7) 5,525	(7.8) 5,751	(7.4) 5,421	(6.9) 4,949
		Malaysia	6,690	5,888	3,773	2,917	2,709	2,778	2,514	2,213
		Indonesia	5,858	4,137	2,304	2,804	2,698	2,887	2,759	2,548
		Others	1,021	486	209	127	117	85	148	187
	Russia Federation		(7.5) 7,429	(8.6) 7,411	(3.3) 2,343	(2.9) 2,081	(3.3) 2,366	(3.3) 2,398	(3.3) 2,411	(3.5) 2,459
	Europe		(4.7) 4,675	(6.9) 5,937	(7.1) 4,967	(7.6) 5,374	(8.5) 6,135	(8.7) 6,450	(8.0) 5,880	(8.4) 5,974
	Others	New Zealand	(4.4) 4,374	(3.4) 2,878	(3.9) 2,720	(2.3) 1,638	(2.4) 1,749	(2.1) 1,545	(2.0) 1,484	(2.0) 1,393
		Chile	(3.8) 3,795	(4.6) 3,952	(6.7) 4,726	(5.6) 3,987	(5.9) 4,234	(5.7) 4,236	(5.5) 4,055	(4.9) 3,479
		Australia	(8.7) 8,604	(10.2) 8,729	(11.0) 7,722	(6.6) 4,662	(5.7) 4,067	(6.4) 4,684	(6.3) 4,604	(6.0) 4,271
		China	(2.5) 2,445	(3.0) 2,544	(3.0) 2,084	(2.8) 1,967	(2.7) 1,912	(2.7) 1,982	(2.6) 1,901	(2.5) 1,777
		Viet Nam				(7.6) 5,418	(6.9) 4,946	(6.7) 4,917	(8.1) 5,939	(9.0) 6,446
		Others	(7.7) 7,651	(12.3) 10,591	(10.9) 7,663	(8.0) 5,696	(8.7) 6,275	(8.3) 6,116	(8.1) 5,911	(8.2) 5,823
	Subtotal		(81.8) 81,241	(80.0) 68,681	(74.0) 52,018	(69.2) 49,086	(68.9) 49,586	(68.4) 50,430	(67.6) 49,505	(66.6) 47,464
Domestic wood			(18.2) 18,022	(20.0) 17,176	(26.0) 18,236	(30.8) 21,797	(31.1) 22,355	(31.6) 23,312	(32.4) 23,680	(33.4) 23,805
Total			(100.0) 99,263	(100.0) 85,857	(100.0) 70,253	(100.0) 70,883	(100.0) 71,942	(100.0) 73,742	(100.0) 73,184	(100.0) 71,269

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" include Philippines, Singapore, Brunei, Papua New Guinea, and Solomon.
3: "Others" of "Others" include African countries.
4: "Others" of "Others" include 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.

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

14. Number of Mills/Factories and Production Volume

		Unit	2000	2005	2010	2015	2016	2017	2018	2019
Sawnwood	Number of mills	mills	11,692	9,011	6,569	5,206	4,934	4,814	4,582	4,382
	Arrival of logs	1,000m^3	26,526	20,540	15,762	16,182	16,590	16,802	16,672	16,637
	Shipment	1,000m^3	17,231	12,825	9,415	9,231	9,293	9,457	9,202	9,032
Plywood	Number of mills	mills	354	271	192	185	183	181	180	176
	Arrival of logs	1,000m^3	5,401	4,636	3,811	4,218	4,638	5,004	5,287	5,448
	Surface-untreated plywood production	1,000m^3	3,218	3,212	2,645	2,756	3,063	3,287	3,298	3,337
	Surface-treated plywood production	1,000m^3	1,534	1,037	647	524	642	623	580	562
Glued laminated timber	Number of factories	factories	281	259	182	157	150	165	165	162
	Production	1,000m^3	892	1,512	1,455	1,485	1,549	1,971	1,923	1,920
Cross Laminated Timber	Number of factories	factories	-	-	-	-	-	7	9	9
	Production	1,000m^3	-	-	-	-	-	14	14	13
Wood chips	Number of mills	mills	2,657	2,040	1,577	1,424	1,393	1,364	1,303	1,250
	Production	1,000tons	-	6,005	5,407	5,745	5,826	5,954	5,706	5,266
		(1,000m^3)	10,851	-	-	-	-	-	-	-

Notes 1: "Sawnwood" excludes sawmills with output power less than 7.5kW.
2: Figures of LVL is 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: "-" means "figures not available".

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

Full text (in Japanese) of the “Annual Report on Forest and Forestry for FY2020” is available on the website of the Forestry Agency:
https://www.rinya.maff.go.jp/j/kikaku/hakusyo/R2hakusyo/index.html

Please refer to those texts for further information on the issues contained in this brochure, or ask the Annual Report Group of the Forestry Agency:

Annual Report Group
Policy Planning Division, Forest Policy Planning Department,
Forestry Agency
Ministry of Agriculture, Forestry, and Fisheries (MAFF)
1-2-1 Kasumigaseki, Chiyoda-ku, TOKYO 100-8952
JAPAN
Contact of the Ministry of Agriculture, Forestry and Fisheries
https://www.contactus.maff.go.jp/rinya/form/rinsei/inquiry_rinya_160801.html