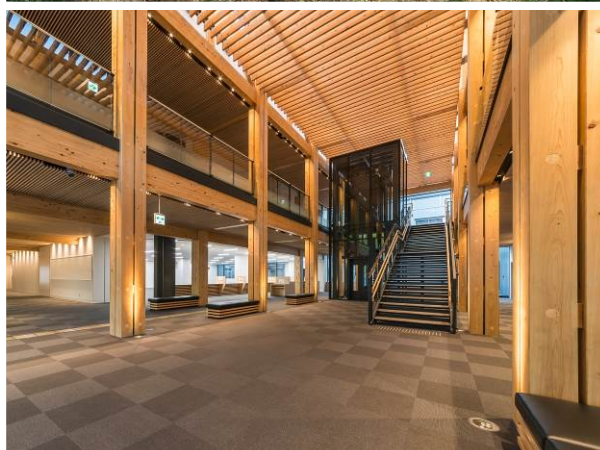


Annual Report on Forest and Forestry in Japan

Fiscal Year 2017
(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 X of the Forest and Forestry Basic Act. This document is a summary of the annual report for fiscal year (FY) 2017.

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Forest and Forestry Topics in FY2017

TOPIC 1. Creation of “Forest Environment Tax (provisional)”

According to the “Outline for the FY2018 Tax Reform,” “Forest Environment Tax (provisional)” is to be created in the FY2019 tax reform, in order that municipalities may conduct appropriate forest management.

Public benefit provided by forests are enjoyed by all citizens through fulfillment of multiple functions such as land conservation, watershed conservation, and mitigation of climate change, among others. The new Tax is established with the idea that all those citizens equally support Japan's forest.

As “Forest Environment Tax (provisional),” 1,000 yen per year will be imposed above individual inhabitant tax on per capita basis from FY2024. “Forest Environment Transfer Tax (provisional),” gifted from FY2019, will be applied to forest management-related activities such as thinning, human resources development, securement of forestry workforce, and promotion of wood use executed by municipalities.

TOPIC 2. Finalisation of Negotiations on the Japan-EU EPA

The negotiations on the Japan-European Union (EU) Economic Partnership Agreement (Japan-EU EPA) were finalised in December 2017, following a series of negotiations since its first round held in April 2013.

Tariffs on major forest products imported to Japan, including structural laminated lumber, is to be gradually reduced and finally eliminated in eight years.

TOPIC 3. Discussion toward “Intra-Regional Ecosystem”

MAFF (Ministry of Agriculture, Forestry and Fisheries) and METI (Ministry of Economy, Trade and Industry) had conducted meetings to discuss toward “Intra-Regional Ecosystem.” In such ideal “Ecosystem,” forest resources can be sustainably utilized as energy through heat use and power generation, as well as materials, while forestry workforce is adequately ensured.

In July 2017, the two ministries released a report toward “Intra-Regional Ecosystem,” concluding that woody biomass should be supplied in a scale of settlement for heat use and cogeneration, which are energy-efficient, to maximize the profit return to the local community.



Feasibility study (F/S) on a project to supply heat to complex facility was conducted in Yubari City (Hokkaido), showing that low-cost processing machine commensurate with regional fuel demand, outbound wood chip sales, and cooperation with neighboring communities are preferred.



F/S on a project to install woody biomass boiler to warm bathing facility was conducted in Seki City (Gifu), indicating that local community would play a key role in stable supply of fuel wood.

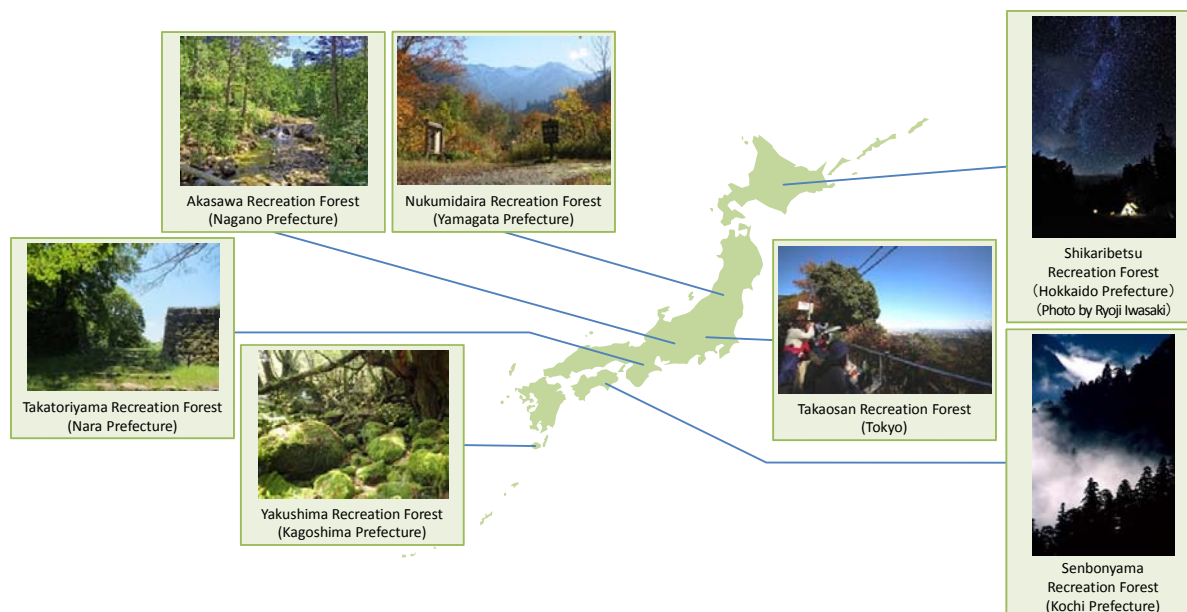


F/S on a heat supply project utilizing firewood was conducted in Chizu Town (Tottori), suggesting a possibility for collaboration with existing initiatives as well as further heat supply to medical facility.

TOPIC 4. Japan's Forests with Breathtaking Views: Selections from the Tourist Destinations in National Forest

The GOJ has set out “Recreation Forests” within national forests to provide the people with the opportunity to enjoy beautiful scenery and rich wilderness in the forest. As of April 2017, there are 983 “Recreation Forests”.

Since 2017, the GOJ has been implementing “Recreation Forests”-centered development measures in rural mountain communities, in accordance with the “Tourism Vision to Support the Future of Japan,” established in 2016. As a first step, 93 of those forests were selected as “Japan’s Forests with Breathtaking Views” which strongly attracts both foreign and domestic tourists. Activities coordinated with other initiatives such as “Countryside Stay” (Rural Tourism) are also expected.



TOPIC 5. Meiji Restoration 150th Anniversary: History of Forestry

The year 2018 marks the 150th anniversary of the Meiji Restoration, a chain of revolutionary political transformations that led to the demise of the Edo Shogunate (1603-1867) and the formation of a modern state.

During the Meiji Period (1868-1912), trees were cut down and used for various purposes associated with Japan’s industrialization and modernization. Railroad sleepers, matchwood and wood charcoal were popularly exported to acquire foreign currencies, while Camphor oil extracted from kusunoki (*Cinnamomum camphora*) was widely used as industrial material. The “Forest Act” established in 1897, including the protection forests scheme, as well as the “National Forest Act” established in 1899, founded modern forest and forestry administration. Planting in devastated areas began and afforestation expanded for the purpose of wood production.

Extraordinary efforts were made to recover forests devastated during World War II and subsequent restoration age. Those planted forest resources are getting mature and now ready for harvest.



Shipping by timber chute “Shura”
(Kochi, late Meiji Period)

Chapter I Introduction of a New Scheme of Forest Management

1. Japan's Forest Management

1.1 Challenges for Fulfillment of Multiple Functional Roles

Vigorous forests appropriately cultivated or managed widely contribute to whole national economy and people's lives, through fulfillment of multiple functional roles such as landslide prevention and soil conservation, watershed conservation, production of materials including wood, biodiversity conservation, health preservation and recreation, culture, provision of comfortable environments, and global environment conservation.

As the significance of sound forest management is commonly recognized among international society, it is important for Japan to sustainably secure the fulfillment of multiple functional roles of forests, as well as to transform forestry into a growth industry, by carrying out thinning practices and re-planting after regeneration cutting.

Approximately a third part of private planted forests are estimated to be already under sound management, where the forestry practices are adequately coordinated and consolidated among different forest owners. By introducing a new scheme of forest management to promote further coordination and consolidation of private forest management, the GOJ aims to have another third part of private planted forests sustainably managed by highly-motivated forestry practitioners in a manner of commercial forestry, and to have the other third part with harsh geographical conditions directly managed by municipalities.

1.2 Utilization of Mature Forest Resources

Japan's forests account for two-thirds of national land area and cover approximately 25 million hectares. Approximately 10 million hectares of them are planted forests, and more than half of these planted forests are over 46 years old, fully ready for harvest (Fig.I-1).

On the other hand, the volume of domestic wood supply remains much smaller than annual increase in growing stock.

Taking account of the situation above, it is necessary to implement measures for promoting an appropriate forest management cycle of "harvesting, utilizing, re-planting, and treatment" so that diverse and sound forests can be ensured and efficient and stable forestry management can be established.

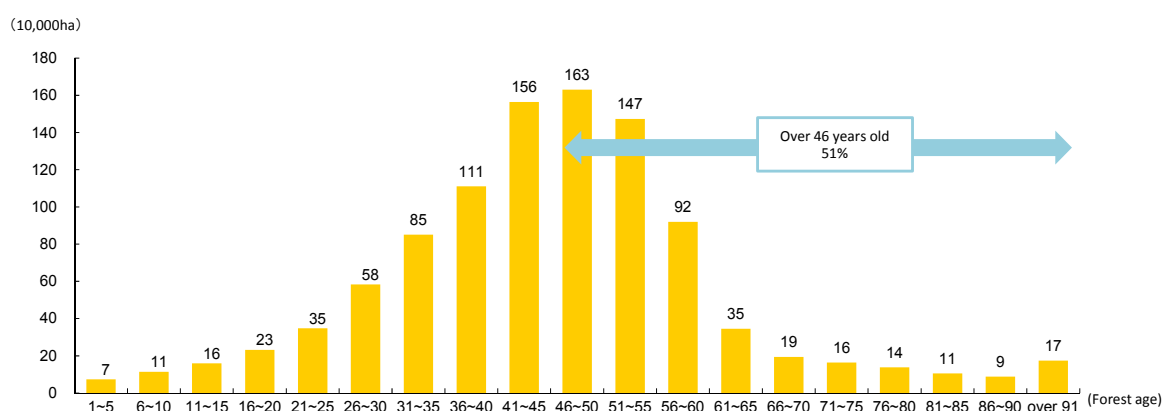


Fig.I-1: Age classification of planted forest in Japan (As of the end of FY2011)

1.3 Structural Characteristics of Japan's Forestry

Forest resources are not fully used in Japan, and some forests are even at risk of losing their ability to provide multiple environmental functions, particularly due to a mismatch situation between

expansion-oriented forestry practitioners and forest owners rather unwilling to invest in active forest management by having their forests circularly utilized through harvesting, re-planting, and treatment. Small-scaled forest ownership dominance (Fig.I-2), low level of coordination and consolidation of forestry practices, under-development of forestry road networks and inefficient log production are also responsible for insufficient utilization of those forest resources.

Austria's forest conditions are partly similar to Japan's at the point of mature forest stand, rather steep slope, rather small-scaled ownership. Since 1970s, Austria implemented coordination and consolidation of forestry practices and joint log marketing with the participation of public entities, so that log production from medium or small scale owners' forest came to be mobilized. Large scale sawmills consuming over 500 thousand m³ of logs appeared as technical development in lumber manufacturing was achieved, and promoted wood exports. In addition, dense forestry road networks and introduction of high-performance forestry machines contributed to efficient log production. It is suggested that Japan has much to learn from Austria.

Cost composition of roundwood price also differs between the two countries. The cost for log production and timber distribution constitutes large portion of log price in Japan (Fig.I-3). It is also necessary to rationalize log production and timber distribution.

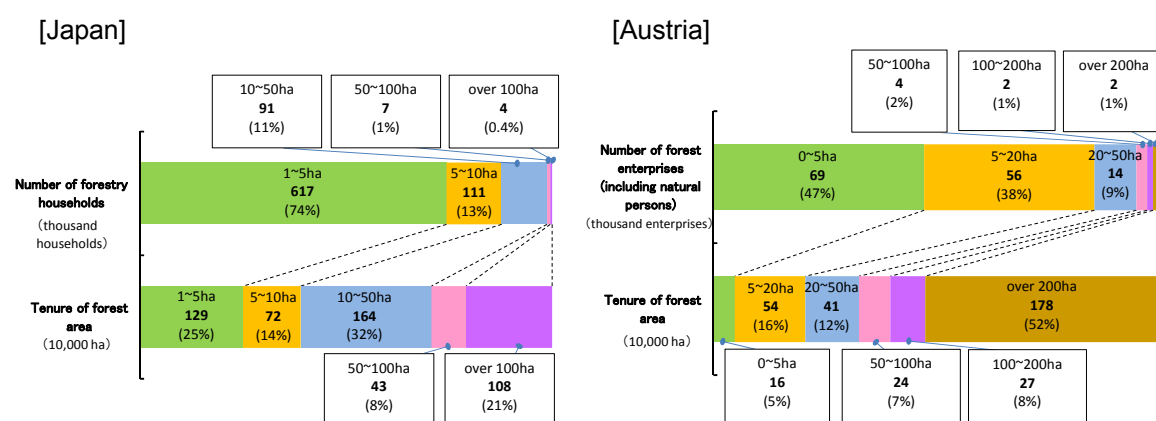


Fig.I-2: Scale of forest ownership in Japan and Austria

Source: Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management

"Sustainable Forest Management in Austria, Austrian Forest Report 2015"

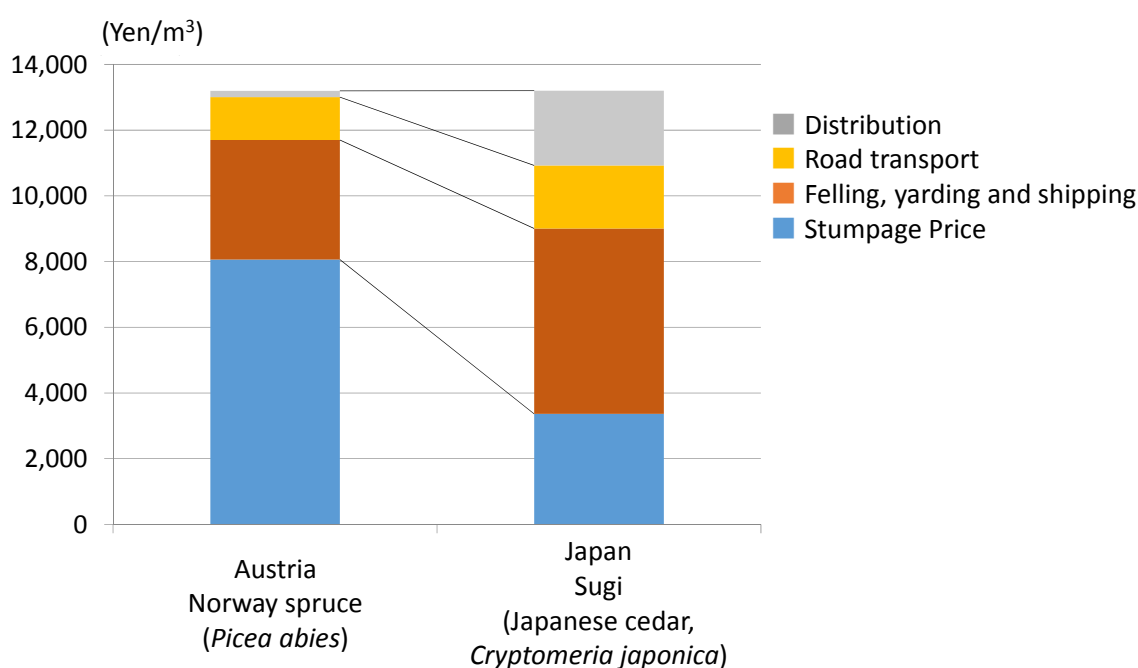


Fig.I-3: Cost composition of roundwood price in Japan and Austria

2. Current Performance of Measures Adopted to Revitalize Forest and Forestry

In recent years, the GOJ has taken policy measures to revitalize forest and forestry, focusing on the coordination and consolidation of forestry practices among others. Owing to these measures, domestic wood supply has been increasing for the seventh consecutive years in 2016 including by the development of promotion of thinning for material use.

On the other hand, the ratio of private forest properly managed under “Collective Forest Management Plan” remains at 31% in March 2017. To improve forestry productivity, it is necessary to further coordinate small scale forest owners and conduct forestry practices on a larger, more commercial, scale. Besides, it is important to implement construction of forestry road networks and human resources development.

3. Introduction of a New Scheme of Forest Management

3.1 A Growth Industry Compatible with Proper Forest Management

More than half of planted forests are fully ready for harvest. Multiple functional roles of those matured forests can be secured through efforts for circular utilization of forest resources.

Nishi-Awakura village in Okayama, mostly covered with forests, launched its forest management vision “The Forest of 100 Years” in 2008 aiming to realize high-quality rural life through appropriate forest management cycle. In line with the vision, a “Long-term Operation and Management Contract” have been increasingly made between small-scale forest owners and the municipality.



3.2 Consolidation of Forest Management to Highly-motivated and Sustainable Forestry Practitioners

To transform forestry into a growth industry in a manner compatible with proper forest management, it is necessary to introduce a new scheme summarized as follows:

- (1) Clarified forest owners’ duty to promote appropriate forest management;
- (2) In case a forest owner is not able to manage his/her forests appropriately, a municipality is entrusted with forest management with the consent of the forest owner;
- (3) And the municipality re-entrusts the forests suitable for forestry to highly-motivated forestry practitioners who manage forests sustainably with going through certain proceedings;
- (4) The municipality manages the rest of the forests until they are re-entrusted;

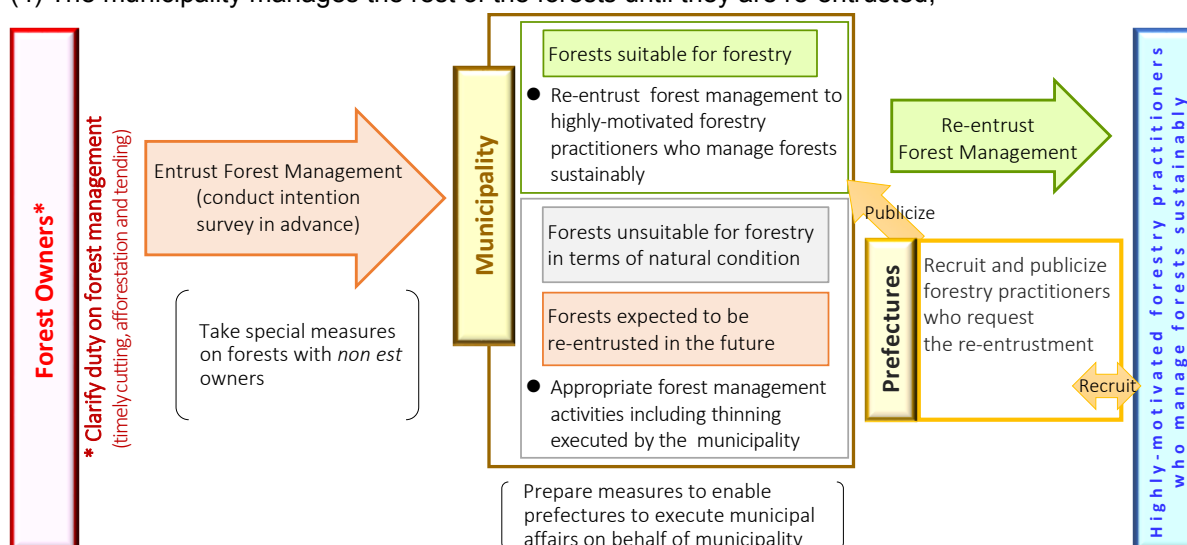


Fig.1-4: A new scheme of forest management

It is also vital to encourage highly-motivated forestry practitioners who are able to engage in reforestation after harvest and enough productivity to profit forest owners and forestry workers.

As for forests unsuitable for forestry in terms of geographical conditions, directly managed by municipalities, it is necessary to guide them toward various types of forests providing multiple environmental functions by, among other activities, promoting multiple storied forests in order to save the management cost. To finance the municipalities to execute forest management-related activities, “Forest Environment Tax (provisional)” is to be created in the FY2019 tax reform.

Joint initiative by highly-motivated forestry practitioners in Kyushu have been undertaken to reduce environmental load related to harvesting and to promote reforestation after harvest. “Certification for Responsible Logger” has been operated since 2011 focusing on environmental correctness, resource circulation, and safe working conditions. In September 2017, a meeting, where attended up to 73 practitioners from across the country, was held in Miyazaki to disseminate such responsible logging.

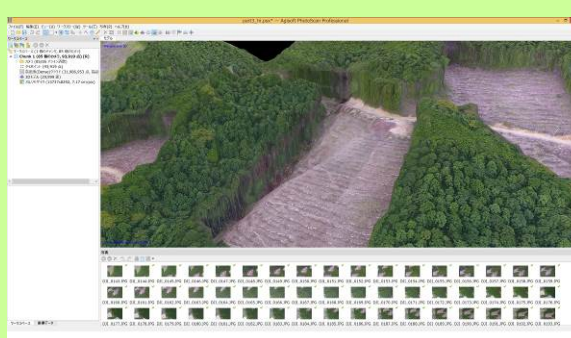


3.3 Conditions for Consolidation of Forest Management

The GOJ has been implementing various measures on forests with *non est* owners including by notification system for new forest owners. The revised Forest Act 2016 provides that municipalities shall establish their Forest Land Registers, part of whose contents shall be accessible for sharing of data on regional forest borders, ownerships, etc.

Clarification of vague forest borders has also been undertaken, while Forest GIS has been introduced to align regional forest information such as forest resources, terrains, ownerships, and forest borders.

Construction of forestry road networks is another key factor for consolidation of forest management. Furthermore, it is essential to improve municipalities' implementation system on the new forest management scheme. The GOJ is supporting municipalities to, among others, hire technical experts familiar with regional forests such as Comprehensive Forest Management Advisors (called “Foresters”).



Utilization of drone in visually confirming forest borders (Tokushima)

4. Cooperation and Coordination between Wood Supply and Demand

Transformation of forestry into a growth industry consequent on introduction of the New Scheme of Forest Management requires structural reform of log production, wood processing, and distribution. Given a wide range of stakeholders including auction markets and wholesalers engaged in wood distribution, it is necessary to promote restructuring the supply chain from market-oriented viewpoints in order to reduce the distribution cost and expand the wood demand.

It is also to be noted that, in recent years, there has been movement by large-scale sawmills and log auction markets to entry into forestry through purchase of forests or entrustment of forest management.

Chapter II Forest Management and Conservation

1. Appropriate Management and Conservation of Forests

1.1 Current State of Forests and Multiple Functions

Two-thirds of Japan's land area is covered with forests. 40% of these forests are planted forests. The total growing stock has reached approximately 4.9 billion m³ (Fig.II-1).

Forests provide a variety of goods and services indispensable for people's lives and national economy, through fulfillment of multiple functions such as land conservation, watershed conservation, and prevention of global warming (Fig.II-2).

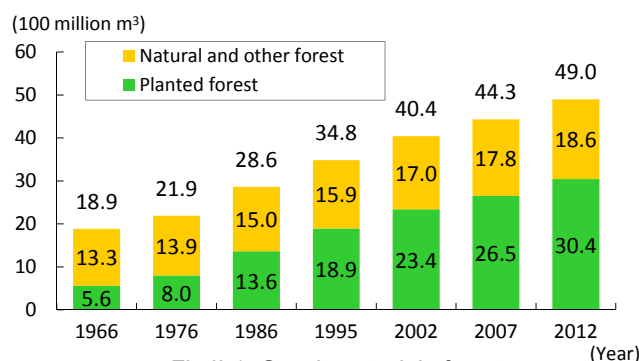


Fig.II-1: Growing stock in forest

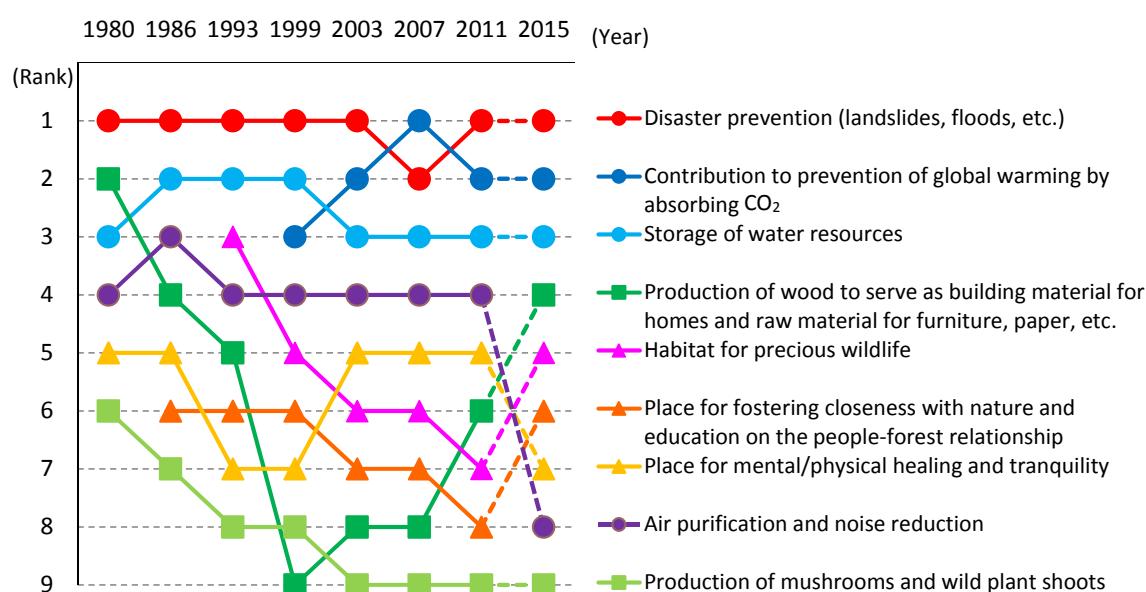


Fig.II-2: Changes in the public's expectations for the roles of forests

1.2 Fundamental Policies for Appropriate Management and Conservation of Forests

Forest management and conservation activities are being implemented based on the "Forest and Forestry Basic Plan" (revised in May 2016) formulated in accordance with the Forest and Forestry Basic Act as well as the "Nation-wide Forest Plan" (revised in May 2016) formulated in accordance with the Forest Act (Fig.II-3).

Even when the New Scheme of Forest Management is enforced, the roles of Forest Act and forest planning system is to remain significant.

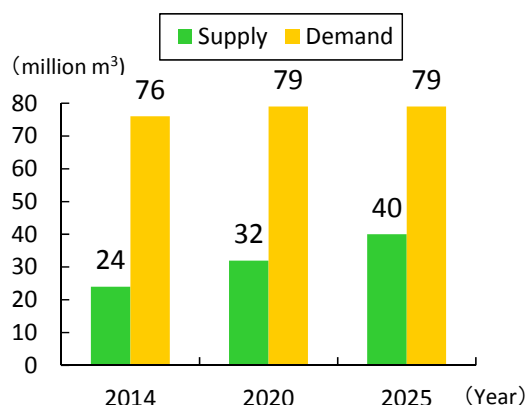


Fig.II-3: Target for wood supply and perspective of wood demand set out in "Forest and Forestry Basic Plan"

2. Forest Management

2.1 Promotion of Forest Management

In order to sustainably secure the fulfillment of multiple functional roles of forests, it is necessary to carry out re-planting after regeneration cutting and thinning practices while appropriately utilizing forest resources. It is also required to transform plantation forests to diverse and sound forests, depending on their respective geographical conditions.

As for thinning, it is necessary to carry out thinning of an annual average area of 520,000 hectares between FY2013 and FY2020 in order to ensure the carbon sequestration required for achieving Japan's greenhouse gas (GHG) emission reduction targets.

Given the conditions above, in order to promote appropriate forest management activities, the GOJ has been running mandatory reporting system of reforestation after harvesting, while conducting yearly survey on forest acquisition by foreign capital.

Stable supply of seedlings is prerequisite for re-planting after regeneration cutting. The GOJ has been promoting expansion of production of containerized seedlings which contribute to year-round adoption of “simultaneous operation of harvesting and planting” (Fig.II-4), as well as development of second-generation elite trees and introduction of fast-growing trees. Countermeasures against pollinosis such as production of seedlings of low-pollen or pollen-free excellent varieties have also been promoted, as approximately 30% of the Japanese people are suffering from pollinosis (Fig.II-5).

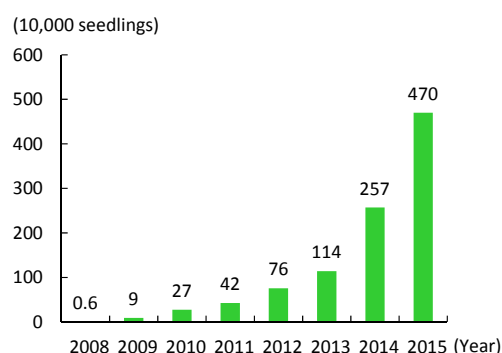


Fig.II-4: Annual production of containerized seedlings

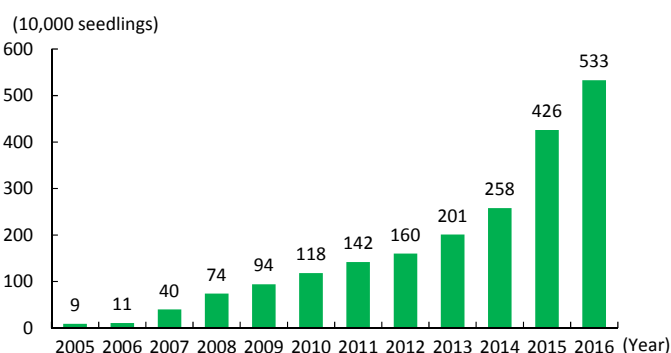


Fig.II-5: Annual production of seedlings of sugi varieties with low or no pollen production

2.2 People's Participation in Forest Management

In May 2017, the 68th National Tree Planting Ceremony was held in Toyama Prefecture, followed by the 41th National Tree Tending Ceremony held in Kagawa Prefecture in November.

In recent years, voluntary forestry activities by NPOs and private companies are expanding. Additionally, the business sector shows growing interest in revitalization of forestry and its contribution to local development.

Donations for forest management are solicited through the “Green Fund-raising Campaign” (approximately 2.1 billion yen was donated in 2016).

2.3 Research & Development

“National Research and Development Strategy in Forest, Forestry, and Wood Products Industry” was revised in March 2017 responding to the changing situation represented by the revised “Forest and Forestry Basic Plan” 2016. The GOJ, in close touch with the Forestry and Forest Products Research Institute (FFPRI), prefectural governments, colleges, and private sectors, is conducting research and development to provide solutions for changing policy challenges.

2.4 Dissemination

The number of Forestry Extension Advisors, primarily assisting private forest owners, is 1,287 in total as of April 2017. The number of those registered as Comprehensive Forest Management Advisors (called “Foresters”), providing support to local municipalities for policy planning on forests and forestry, is 1,169 as of the end of FY2017.



Collaborative initiative to disseminate containerized seedlings undertaken by prefectural research institute, seedling producers' cooperatives, and Forestry Extension Advisors (Ibaraki)

3. Forest Conservation

3.1 Protection Forests

Protection forests are designated in accordance with the Forest Act when it is considered necessary that they provide important public benefit, such as watershed conservation and erosion prevention. The area of protection forests reached 12.18 million hectares as of the end of FY2016.

3.2 Disaster Control

The GOJ and prefectural governments conduct “forest conservation projects.” These projects include installation of disaster control facilities, replanting of trees for stabilization of mountain slopes, restoration of devastated mountain streams, and development of coastal disaster-prevention forests.

When natural disasters occur in mountainous areas, the GOJ quickly conducts surveys of landslides and cracks and elaborates recovery work.

In July 2017, slope failures caused by record rainfall in northern Kyushu triggered a lot of floodwood rushing downstream. The “Working team on forest conservation against floodwood and related disasters” released its interim report in November 2017 proposing to integrally implement, among others, thinning to grow root systems and installation of floodwood-stopping disaster control facilities.



slope failures



accumulated floodwood



floodwood-stopping facility

3.3 Conservation of Forest Biodiversity

The GOJ is promoting appropriate thinning, development of ecologically diversified forests, and conservation of forest ecosystems with high wilderness value, based on the “National Biodiversity Strategy of Japan 2012-2020,” which was adopted in September 2012.

The Forestry Agency is also promoting conservation of forests, particularly those identified as World Heritage sites and Biosphere Reserve sites. In June 2017, the International Coordinating Council of UNESCO’s Man and the Biosphere Programme (MAB) approved to newly add “Sobo, Katamuki and Okue” (Oita and Miyazaki) and “Minakami” (Gunma and Niigata) to the World Network of Biosphere Reserves (Fig.II-6).

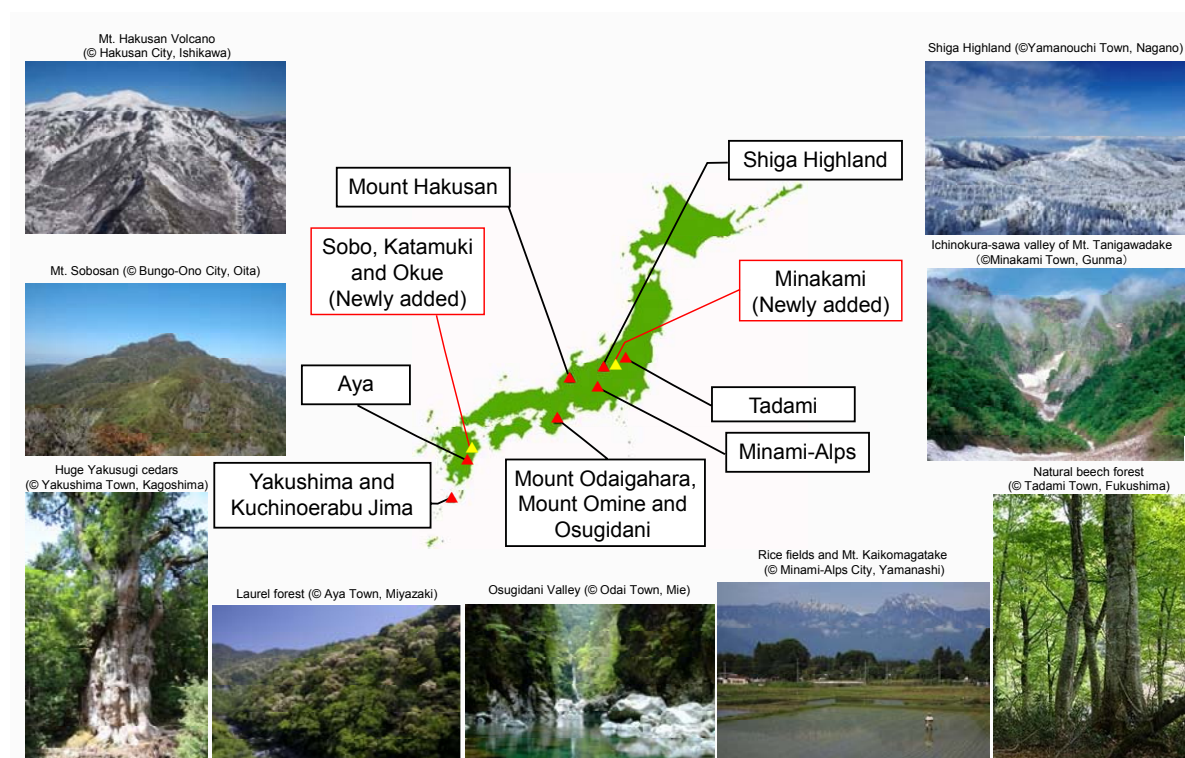


Fig.II-6: Biosphere Reserve sites in Japan as of the end of FY2017

3.4 Wildlife and Pest Control

In FY2016, approximately 7,000 hectares of forests were damaged by wild animals, 78% of which was caused by deer (Fig.II-7). This serious situation is thought to have been caused by increased population and expanded habitat of deer. The GOJ has been implementing protective measures as well as population control to mitigate animal damage. Besides, the revised Forest Act 2016 provides that municipalities shall designate “animal damage prevention forests” when establishing “Local Forest Improvement Plan.”

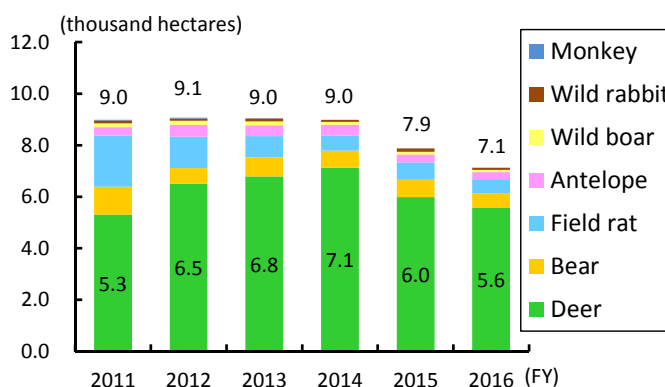


Fig.II-7: Area of forests damaged by major wild animals

Damage to pines by pinewood nematode (*Bursaphelenchus xylophilus*) is still the worst among all caused by forest pests and diseases in Japan. The GOJ is implementing preventive measures through application of chemicals as well as logging and fumigation of affected trees.

4. Addressing global policy agendas

4.1 Promotion of Sustainable Forest Management

As of 2015, the world forest area was approximately four billion hectares, or 31% of global land area according to Food and Agriculture Organization of the United Nations (FAO). During five years between 2010 and 2015, the world's forest area decreased by 3.31 million hectares annually. FAO points out that even though, globally, the extent of the world's forest continues to decline as human population continues to grow and the demand for food and land increases, the rate of net forest loss has been cut by over 50 percent over the past 25 years (Fig.II-8).

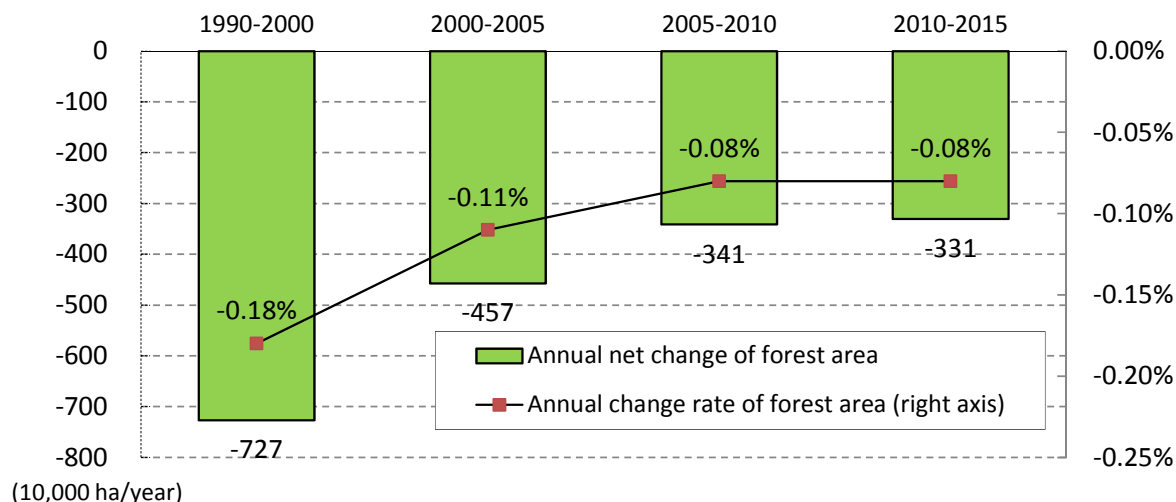


Fig.II-8: Changes in world's forest area (1990-2015)
Source: FAO's Global Forest Resources Assessment 2015

Promoting sustainable forest management is vital to achieve the Sustainable Development Goals (SDGs) listed in “2030 Agenda for Sustainable Development” adopted at the UN Sustainable Development Summit in September 2015. Based on the “SDGs Implementation Guiding Principles” adopted in December 2016, the GOJ is tackling domestic and international measures including transformation of forestry into a growth industry aiming to promote an appropriate forest management cycle, as well as promotion of “Reducing Emissions from Deforestation and Forest Degradation in developing countries and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks” (REDD+) in partnership with private sectors.

Several initiatives are being undertaken to develop international criteria and indicators (C&I) for sustainable forest management. Japan is a member of the Montreal Process for the conservation and sustainable management of temperate and boreal forests consisting of 12 Pan-Pacific countries.

Since illegal logging is one of the factors that seriously hinder global environmental conservation and sustainable forest management, the international community is making efforts to combat illegal logging and promote trade in legally-harvested timber through various frameworks.

Forest certification is a private sector's initiative aiming to promote sustainable forest management by advocating consumers' purchase of wood products produced from such forests. In Japan, two forest certification schemes, run by the Forest Stewardship Council (FSC), an international organization, and the Sustainable Green Ecosystem Council (SGEC), an independent organization solely operating in Japan, have been in place. The percentage of certificated forests in Japan is relatively low compared with those in European and North American countries. In June 2016, the mutual endorsement scheme between SGEC and the Programme for the Endorsement of Forest Certification (PEFC) was approved.

4.2 Global Warming and Forests

The “Paris Agreement” was adopted at the twenty-first session of the Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC) held in 2015, and came into effect in COP22 in November 2016 as an effective legal framework which all parties participate in.

The Plan for Global Warming Countermeasures was decided by the GOJ in May 2016. The Plan defines a path to achieve the mid-term target of 26.0% GHG emission reduction by FY2030 compared to FY2013, which includes a 2.0% GHG emission reduction by strengthening the forest carbon sink. Forest sink measures such as the thinning average of 520,000 hectares from FY2013 to FY2020 as well as 450,000 hectares from FY2021 to FY2030 need to be implemented steadily to secure the removal of carbon dioxide equivalents from Japan’s managed forests. In 2016, thinned area was 440,000 hectares and the removal from forest sink was 12.97 million ton-C which includes 0.80 million ton-C by harvested wood products (HWP).

Furthermore, the GOJ has been promoting REDD+. In this regard, the GOJ has provided not only bilateral assistance to developing countries but also a significant amount of funds to Forest Carbon Partnership Facility (FCPF) and Forest Investment Program (FIP), both established by the World Bank, UN-REDD established by the FAO, the United Nations Development Program (UNDP) and the United Nations Environment Program (UNEP), and Green Climate Fund (GCF) established under the UNFCCC. In order to arrange the opportunities for Japanese private sectors to support or invest in REDD+ activities, the GOJ has been developing the guidelines for implementation of REDD+ activities under Joint Crediting Mechanism (JCM) with developing countries such as Laos, Cambodia, Viet Nam, and Myanmar.

The GOJ has also been taking adaptation measures against climate change to reduce disaster risk from frequent stormy weather through, among others, designating protection forests and constructing disaster control facilities, based on the “National Plan for Adaptation to the Impacts of Climate Change” decided in November 2015.

4.3 International Discussions on Biodiversity

It is estimated that at least 80% of the earth’s remaining terrestrial biodiversity is found in forests. As of February 2017, the “Convention on Biological Diversity (CBD)” has been signed by 194 countries, the European Union (EU), and the State of Palestine.

In May 2017, the GOJ ratified the “Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity,” to be its 98th party in August 2017.

4.4 International Cooperation

Japan is implementing international cooperation for promotion of sustainable forest management in developing countries by providing technical and financial assistance through bilateral and multilateral schemes.

According to data from the Organization for Economic Co-operation and Development (OECD), official development assistance (ODA) provided into forestry sector in the world in 2016 amounted to 640 million US dollars, of which 36 million US dollars was from Japan. Japan was the fourth largest donor in 2016 following France, Germany, and UK.

As for bilateral assistance, there are 20 technical cooperation projects underway in 18 countries and regions conducted through the Japan International Cooperation Agency (JICA) as of the end of 2017, and the Forestry Agency dispatches eight experts to the projects in six countries. Also, the GOJ provides financial assistance as loans and grants through JICA, including loan for afforestation and grant for procurement of materials for forest management.

The GOJ provides financial support to the International Tropical Timber Organization (ITTO) and FAO.

Chapter III Forestry and Rural Mountain Communities

1. Forestry

1.1 Forestry Production

In 2016, the value of gross forestry output was 466.2 billion yen, a 3% increase from the previous year and reached the largest since 2002 (Fig.III-1).

The volume of domestic roundwood production bottomed out at 15.09 million m³ in 2002 and it has increased to 20.66 million m³ in 2016. By tree species, the volume of sugi production was the largest at 11.85 million m³ (57%), followed by hinoki (Japanese cypress, *Chamaecyparis obtusa*) at 2.46 million m³ (12%) and karamatsu (Japanese larch, *Larix kaempferi*) at 2.31 million m³ (11%) (Fig.III-2).

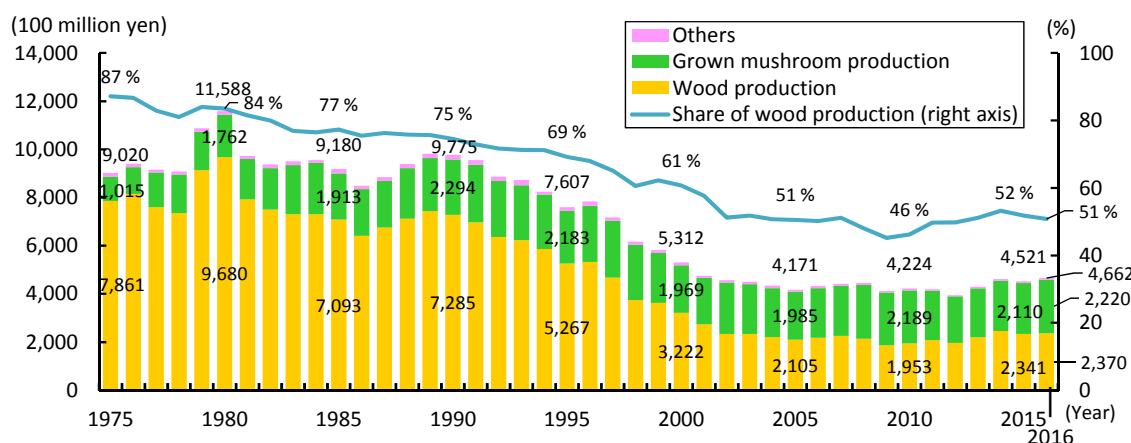


Fig.III-1: Gross forestry output

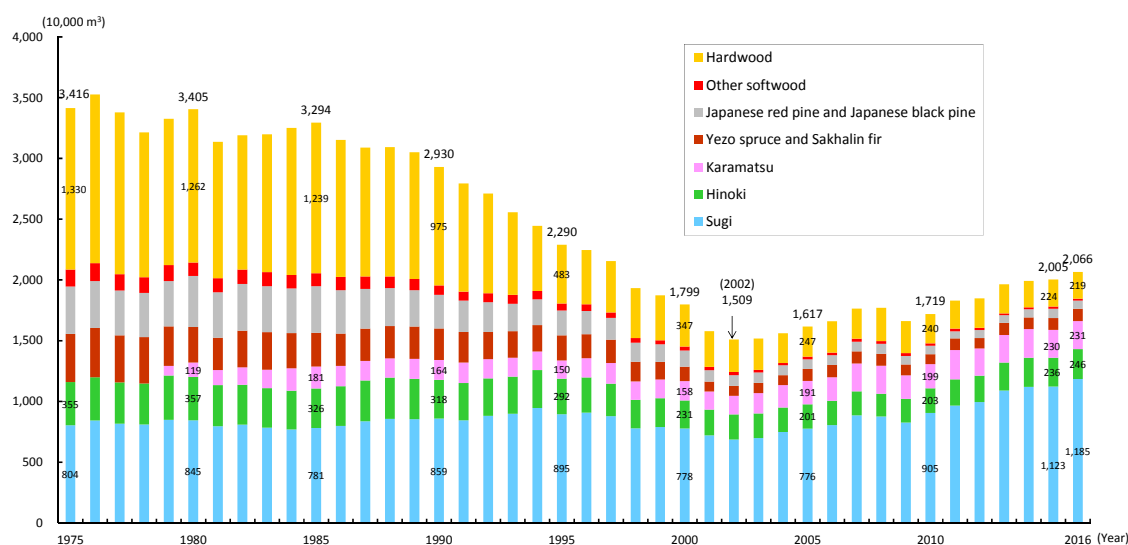


Fig.III-2: Volume of domestic roundwood production

1.2 Forestry Management

According to the Census of Agriculture and Forestry 2015, the number of forestry households was 830 thousand, 88% of which has tenure of forest area of 1 hectare or more but less than 10 hectares. Small-scaled forest ownership remains dominant, although a trend of expansion of forest tenure was observed.

As the census shows, logs produced by forestry management entities reached 19.89 million m³, a 27% increase in five years. It is also to be noted that 78% of such logs were produced through logging contracts with forest owners or purchase of standing trees from forest owners. Logs produced per forestry management entity increased by 30% in 5 years, but small-scale entities still account for the majority (Fig.III-3).

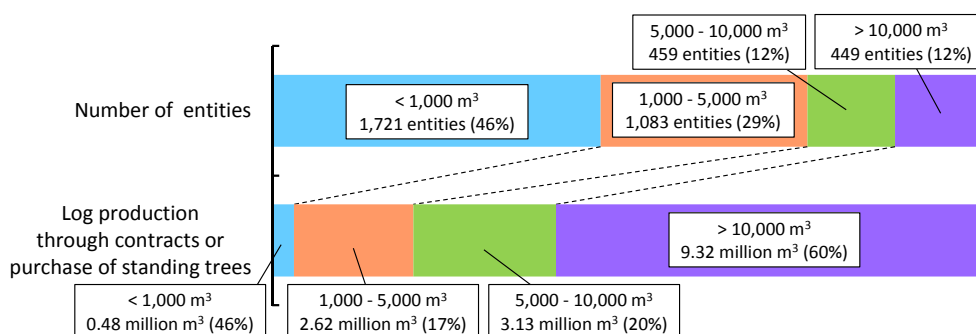


Fig.III-3: Scale of forestry management entities in terms of log production through contracts or purchase of standing trees in a year subject to investigation

1.3 Improvement of Forestry Productivity

To improve forestry productivity, coordination and consolidation of forestry practices among small-scale forest owners is necessary. To this end, the GOJ has been implementing the training program for “Forest Management Planners” who should lead proposal-based coordination with forest owners and consolidation of forestry practices, and the forest management planning system under the Forest Act in a flexible manner in accordance with on-the-ground situation. Conducting field surveys and consensus-building activities are supported for this purpose.

At the same time, it is extremely important to accelerate the development of the forestry road networks using the best applicable combination of three forest road types: the mainline “forest road” for general vehicles, the “forestry exclusive road” for truck vehicles, and the “forestry operation road” for forestry machinery.

It is also vital to promote the efficient log production system utilizing forestry machines and to develop and improve the performance of those machines that are suitable for the forest conditions in Japan (Fig.III-4). Approximately 70% of logs produced in FY2016 was those produced through work systems utilizing advanced forestry machines.

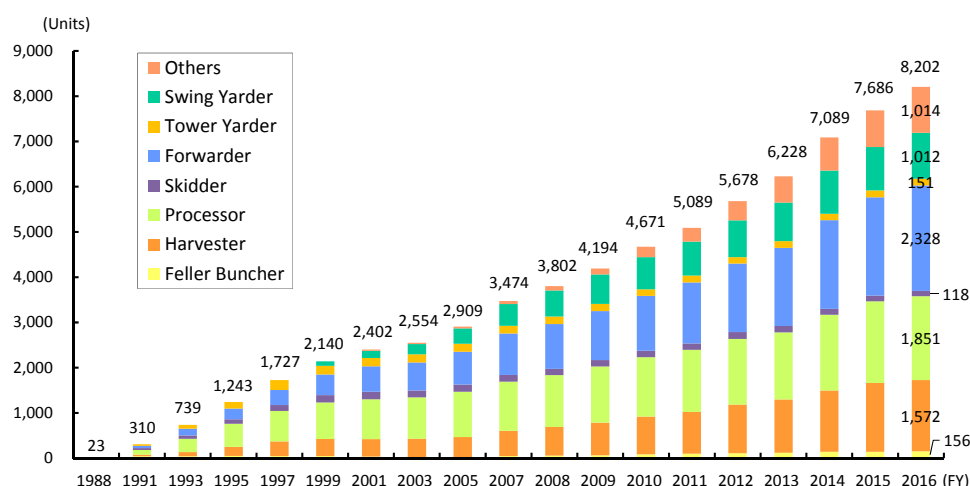


Fig.III-4 Number of advanced forestry machines

1.4 Forestry Workforce

According to the 2015 Population Census, the number of forestry workers was 45,440, a 11% decrease in five years. Those engaged in planting and weeding are on long-term declining trend, whereas those engaged in cutting, processing, yarding and shipping are recently increasing. The share of aged forestry workers (aged 65 or older) has risen up to 25%, while the share of young forestry workers (aged 35 or younger) remains largely the same level at 17% (Fig.III-5).

Since FY2003, the GOJ has been implementing “Green Employment Program” to provide young

people with opportunity to learn basic forestry skills. The outcome of the Program has led to a significant increase in the number of new forestry workers (Fig.III-6).

The occupational accident rate of forestry industry remains high, and therefore it is crucial to secure safe working conditions.

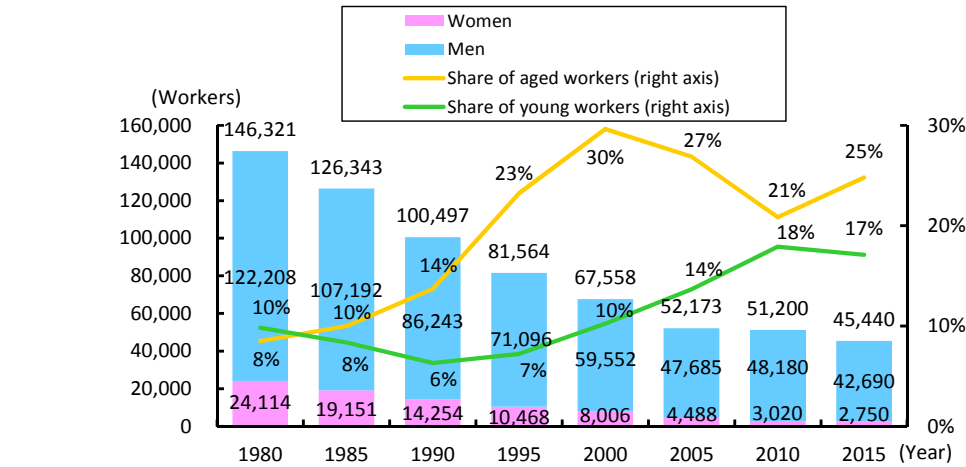


Fig.III-5 Number of forestry workers

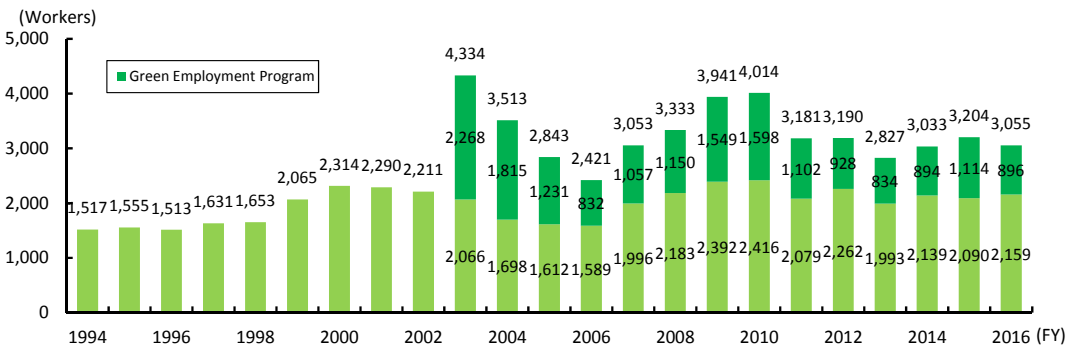


Fig.III-6 Number of new entrants to forestry workforce

2. Non-Wood Forest Products

Production of non-wood forest products (NWFP), including mushrooms, wild vegetables, edible nuts, charcoal, and Japanese lacquer, contributes to development of rural communities, while accounting for approximately 50% of gross forestry output (Fig.III-1).

Nearly 90% of NWFP was derived from mushrooms in terms of production value roughly based on wholesale prices. While the number of households producing mushrooms has a decreasing tendency, the volume of mushroom production has been leveling off in recent years (Fig.III-7). In 2016, the overall price of mushrooms went up, showing a trend of recovery (Fig.III-8).

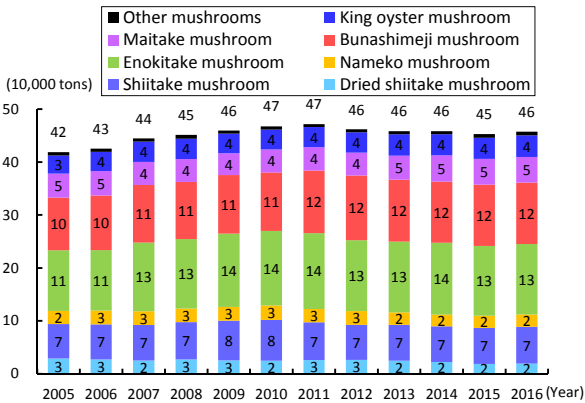


Fig.III-7: Volume of mushroom production

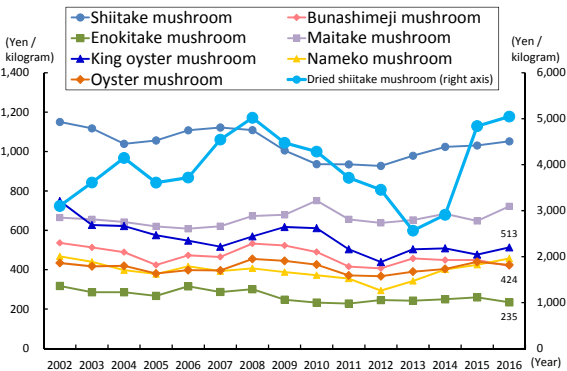


Fig.III-8: Price of mushroom

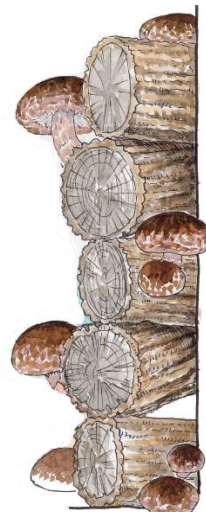
Revitalization of bed-log cultivation of Shiitake mushroom is underway in various regions through rebranding upscale products. To this end, initiatives are undertaken to exploit new distribution channels and to develop growers. Recently, some have been regularly sold in luxury department stores or served at high class restaurants.



Noto Temari (Ishikawa)



Tottori Take-Oh (Tottori)



3. Rural Mountain Communities

3.1 Current State of Rural Mountain Communities

Rural mountain communities, where people engaged in forestry are living, play a significant role in securing 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. It is becoming more difficult to maintain the management of forests due to continuing depopulation and aging population in such communities.

On the other hand, some of urban residents have come to show greater interests in the life in rural mountain communities as rich forests and water resources, beautiful landscapes, traditions, and cultures are available there.

3.2 Revitalization of Rural Mountain Communities

The GOJ is providing supports to initiatives by rural mountain communities to create job opportunities and to improve their income level, including through promoting utilization of rural resources, such as fuel wood and wild vegetables. In addition, the GOJ is promoting effective exchanges between rural mountain communities and urban societies including through hands-on activities, forest environmental education, and “Countryside Stay” (Rural Tourism) which helps tourists experience traditional Japanese lives.

The GOJ is also providing supports to initiatives by local residents, including self-harvesting forest owners (who cut their trees by themselves), to conserve satoyama forests (forests which are close to residential areas in rural communities but underutilized), to utilize forest resources as appropriate, and to conduct forest environmental education.

Recently, more and more attention has been paid to initiatives by self-harvesting forest owners, as they can play an important role in rural forestry and contribute to revitalizing rural communities.



Demonstration of traditional log shipping with wooden sleighs

A forest owners' cooperative in Gifu Prefecture has played a key role to commercially launch “Countryside Stay” (Rural Tourism) in total collaboration with the local community, aiming to attract both foreign and domestic tourists. Traditional Japanese folk houses and campsite lodges are provided for accommodations.



Woodland campsite lodges



Experience to make chopsticks of thinnings

Chapter IV Wood Products Industry and Wood Use

1. Supply and Demand for Wood

1.1 Global Wood Supply and Demand

The total volume of industrial roundwood consumption at a global level had decreased since autumn of 2008 but started to increase again from 2010.

In North America, consumption of sawn softwood showed continuing recovery trend. In Europe, production of sawn softwood has increased in nearly all major producing countries, while exports of sawn softwood to North America and China has remarkably increased. In Russian Federation, exports of sawn softwood marked a record high, with China as the largest importer. China remains the world largest importer of industrial roundwood of softwood for the 16 consecutive years.

In November 2017, an agreement at the ministerial level on the Trans-Pacific Partnership negotiations among 11 countries was confirmed, followed by signing of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (TPP11 Agreement) in March 2018. The negotiations on the Japan-EU EPA were finalised in December 2017.

1.2 Wood Supply and Demand in Japan

Japan's wood demand is showing signs of recovery after the bottom in 2009, but still a bit less than the level of 2008. The volume of wood demand was 78.08 million m³ in 2016 (roundwood equivalent).

Domestic wood supply has been increasing since the bottom in 2002. In 2016, the volume of domestic wood supply was 27.14 million m³ (roundwood equivalent).

In 2016, the volume of imported wood was 50.94 million m³ (roundwood equivalent). Approximately 90% of imported wood was processed wood products including lumber and plywood.

1.3 Wood Prices

In 2017, prices of domestic roundwood and domestic sawn lumber slightly rose (Fig.IV-1). Prices of imported wood chips declined, while those of domestic wood chips shows a rising trend.

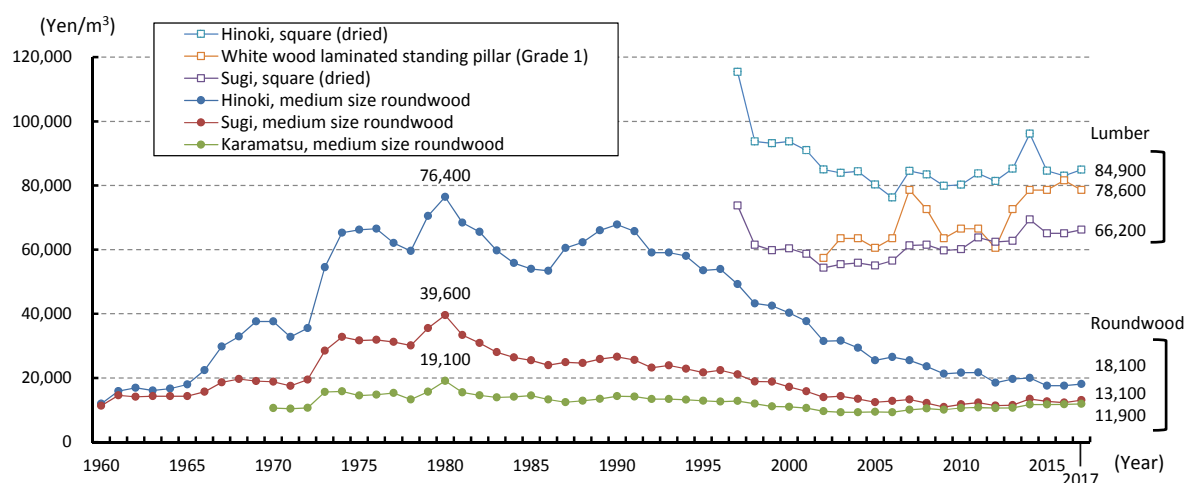


Fig.IV-1 Wood prices in Japan

1.4 Combating Illegal Logging

In May 2017, the Act on Promotion of Use and Distribution of Legally-Harvested Wood and Wood Products, commonly known as “the Clean Wood Act,” went into force. The Act stipulates that all business entities must endeavor to use legally-harvested wood and wood products, and, among others, that all Wood-related Business Entities shall check that the wood and wood products which they handle were made from trees harvested in compliance with the laws and regulations of Japan and/or the countries of harvest.

The GOJ is collecting relevant information and providing it through a website, “Clean Wood Navi,” to be referenced by the Wood-related Business Entities so that they can adequately conduct the legality checks of wood and wood products.

The GOJ also promotes the registration of Wood-related Business Entities.

1.5 Wood Exports

In 2017, the value of wood exports reached 32.6 billion yen.

In November 2017, China published the revised wooden building standards. The revised standards are to enter into force in August 2018, permitting sugi, hinoki, karamatsu to be used for structural members and newly containing wooden post and beam construction method.

In order to enhance the market recognition, “Japan Wood Station”, a showroom exhibiting Japanese wood products, was set up in Taipei in December 2017, following the one in Ho Chi Minh City opened in 2016.

Initiatives are actively undertaken to export wood products using Japan's advanced processing technologies, including initiatives to help local workers acquire construction, joinery, and carpentry skills.



Wooden post and beam structure house exported to Taiwan



Wooden temple exported to China



Wooden post and beam structure house exported to the Republic of Korea

2. Wood Products Industry

2.1 State of the Major Wood Products Manufacturing

As for lumber production, shipments from domestic lumber mills have stayed almost flat since 2009. The share of domestic wood in the raw material input was 73% in 2016. Large scale lumber mills are becoming dominant in terms of their share of total lumber production. It is crucial to supply lumber with clearly specified quality and strength performance, including kiln-dried lumber.

As for glued laminated lumber production, the share of domestic wood in material input for domestic manufacturers, has been gradually rising. However, the share of products made of domestic wood in total supply of glued laminated lumber, including imported products, remained at 15% in 2016.

As for plywood production, the share of domestic wood in material input for domestic manufacturers is on the rise, reaching 80% in 2016. The share of domestic wood in the total wood demand for plywood production, including imported plywood products, was 38% in 2016.

As for wood chip production, almost all the materials for domestic wood chip mills are domestic wood, however, the share of domestic wood chips in total wood chip consumption remained around one-third in 2016.

As for pre-cut timber production, the share of pre-cut timber in the total wood used for post and beam construction method was 92% in 2016. Also seen are moves in some pre-cut timber mills to shift their material input from imported wood to domestic wood, partly due to increasing cost for procurement of imported wood products.



Exhibition facility with wooden lattice using most-advanced pre-cut technologies (Shizuoka)

2.2 Development and Dissemination of New Products and Technology

Use of Cross Laminated Timber (CLT) is expected to contribute to promotion of high- or medium-rise wooden building construction. The GOJ is disseminating designs and execution methods for building with CLT, based on the data collected through its experiments.

Wooden fire-resistant structural member has also been developed, resulting in construction of wooden apartment house with five stories of two-hour fire-resistant structure in 2017.

The GOJ has supported initiatives to develop technologies to produce and utilize cellulose nanofiber, an innovative material with light weight and excellent strength. FFPRI has made progress in the development of technology to produce glycol-lignin with stable properties, and is developing applications as a hybrid film for electronic substrates or touch sensors, among others.



CLT manufacturing mill (Kagoshima)



CLT floor structure installed onto high-rise building (Saga)

3. Wood Use

3.1 Importance of Wood Use

Wood use could contribute to sustainable fulfillment of multiple functions of forests including prevention of global warming, as well as vitalization of local economies. Wood use is also considered to provide comfortable and healthy living conditions, through showing excellent properties of humidity conditioning, heat insulation, and shock absorption, as well as relaxing and stress-reducing effect of its scent.

3.2 Wood Use in Housing and Construction

In Japan, approximately 40% of wood demand and more than half of domestic wood demand are for building construction. About half of the new housing starts in Japan are built with wooden structures.

The GOJ has been promoting the housing projects in which forest owners, log producers, lumber producers, and local home builders cooperate, as well as the human resource development of architects with necessary knowledge and skills in wood use.

Wood-using facilities in Japan



Hotel (Kagoshima)



Commercial facility (Kyoto)



Sightseeing train (Kumamoto)

3.3 Wooden Public Buildings

The Fundamental Policies based upon the Act for Promotion of Use of Wood in Public Buildings, which set low-rise public buildings as the target for wooden structure excluding those which require special performance such as particular fire-resistance, was revised in June 2017 to further promote construction of wooden schoolhouse with three stories as well as to actively adopt innovative wooden materials including CLT and wooden fire-resistant members.

In FY2016, the GOJ constructed 62 such low-rise public buildings, out of which 42 were built with wooden structure, and renovated 189 public buildings with wooden exteriors/interiors.

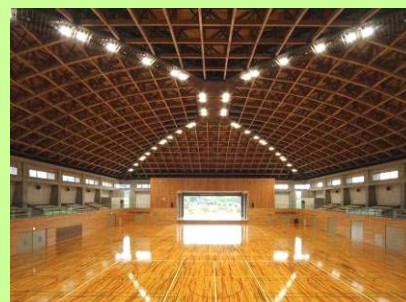
Public buildings with wooden structures



Nursery school (Tokyo)



Medical facility (Chiba)



Public gymnasium (Nara)

3.4 Energy Use of Woody Biomass

Woody biomass used for energy production, which derives from residue of lumber production, construction waste, and thinnings, is expected to contribute to vitalization of local economies. The use of woody biomass derived from thinnings is increasing (Fig.IV-2).

Woody biomass power plants have started operation at various locations, utilizing the “Feed-in Tariff (FIT) Scheme for Renewable Energy” since 2012.

Heat use or cogeneration is rather energy-efficient regardless of the size of the capital investment. Recently, many boilers and stoves fueled with woody biomass are used in public facilities, ordinary households, and horticultural facilities.

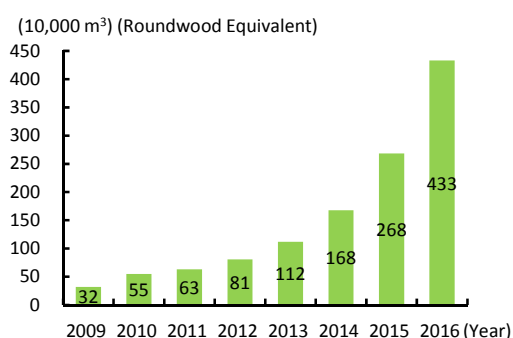


Fig.IV-2: Woody biomass for energy use derived from thinnings

3.5 Dissemination of the Importance of Wood Use to Consumers

The GOJ has been promoting the “Kizukai Undo,” an initiative to disseminate the importance of wood use to consumers, including “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 consumers’ viewpoints. The GOJ has also been promoting “Mokuiku,” educational activities to disseminate the excellence and significance of wood use to both adults and children.

Chapter V National Forest Management

1. Roles of National Forests

1.1 Distribution of National Forests and Their Expected Roles

National forests, directly managed by the GOJ, represent approximately 30% of the total forest area, or almost 20% of the total land area in Japan. Widely distributed in remote mountainous areas and headwater areas, national forests perform vital roles in fulfillment of multiple functions of forests, including land conservation, watershed conservation, and biodiversity conservation.

90% of national forests are designated as protection forests in accordance with the Forest Act. Furthermore, 95% of the land designated as “World Natural Heritage” sites in Japan (Shiretoko, Shirakami Sanchi, Ogasawara Islands, and Yakushima) is located in national forests.

1.2 National Forest 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 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

2.1 Further Promotion of Management with Emphasis on Public Benefit

National forests are managed in accordance with the five forest types categorized based on expected functions: “landslide prevention,” “natural conservation,” “recreational use,” “comfortable environment development,” and “watershed conservation.”

In managing national forests, some key thematic activities, including thinning as forest carbon sink measures and wood use in “forest conservation projects,” are also implemented.

Furthermore, in order to conserve biodiversity, the GOJ designates and manages “Protected Forests,” including Forest Ecosystem Reserves, and “Green Corridors.”

The GOJ is also dealing with damage by deer and other wild animals in national forests.

Kyushu Regional Forest Office supported implementation of prefectures’ disaster control measures against multiple slope failures caused by heavy rainfall in July 2017, including through dispatching its officials and investigating damage via helicopter and drone.

Emergency restoration measures in private forests have also been directly undertaken by Kyushu Regional Forest Office.



Kanto Regional Forest Office has switched from steel formwork to wooden one in constructing disaster control facilities, while promoting wood use in temporary works such as field offices and signboards.



Wooden signboard



Wooden remaining formwork



Erosion control dam

2.2 Contribution to Transforming Forestry into a Growth Industry

Through National Forest Management Program, The GOJ is (i) developing and disseminating technologies for low-cost forestry practices, such as utilization of containerized seedlings (Fig.V-1) and “simultaneous operation of harvesting and planting,” (ii) developing human resources including forestry contractors and technical experts (nationally certified “Foresters”), (iii) promoting development of forestry road systems and forest operations in collaboration with private forests by establishing cooperative forest management areas (Fig.V-2), and (iv) promoting stable wood supply through “System Sales” contracts with lumber and plywood mills.

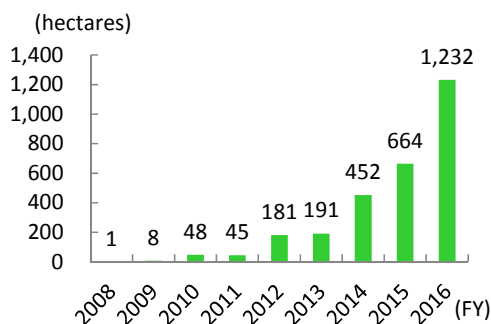


Fig.V-1: Annual area of national forests planted with containerized seedlings

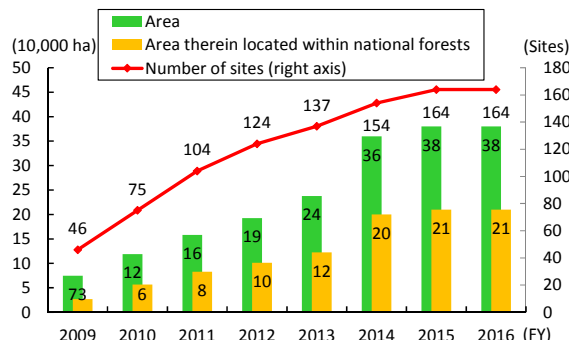


Fig.V-2: Cooperative forest management areas

Kinki-Chugoku Regional Forest Office held a workshop to disseminate techniques to reduce costs for reforestation and thinning practice, showing that “protective nets diagonally spread from standing trees” are effective to prevent deer damage and appropriate “line thinning,” an affordable method to improve productivity and mitigate damages on remaining trees, ensures sound growth of forest.



Reforestation site enclosed with diagonally spread nets



Line-thinned forest

2.3 National Forests as “Forests for People”

The GOJ provides various organizations with places for field activities such as forest environmental education and forest management practices, by designating forests for such activities within national forests. Collaborative projects with local parties and nature conservation groups are also underway.

Some national forests are being leased to local governments and residents for development of local industry and improvement of welfare. “Recreation Forests” are managed and administered in partnership with municipalities and other stakeholders in local communities like tourist industry, 93 of which are selected as “Japan’s Forests with Breathtaking Views.”



Multilingual guidepost in Shikaribetsu Recreation Forest (Hokkaido)



Well-maintained paths and steps in Shirakami-Sanchi - Anmon Falls Recreation Forest (Aomori)

Chapter VI Reconstruction from the Great East Japan Earthquake

1. Recovery of Forest, Forestry, and Wood Products Industry

1.1 Recovery of Forest, Forestry, and Wood Products Industry

In March 2011, the Great East Japan Earthquake caused damage to forests, forest conservation facilities, and forest roads in 15 prefectures, and 94% of recovery works have already been completed. 115 wood processing/distribution facilities also suffered major damage from the earthquake, 97 of which have resumed operation to date. Production of roundwood and wood products generally recovered to the respective levels before the earthquake (Fig.VI-1).

1.2 Restoration of Coastal Forests

The recovery works in the damaged coastal disaster-prevention forests are underway, with completion to be achieved within ten years from 2011. The recovery works have been commenced in a total of around 161km of coastal disaster-prevention forests, except for areas where entering is prohibited due to radioactivity, while the works have been completed in 82km.

In the course of recovery works, citizens' participation in planting and tending of trees is being promoted. Stable supply of seedlings including nematode-resistant pine variants as well as continuous treatment of planted trees needs to be secured.

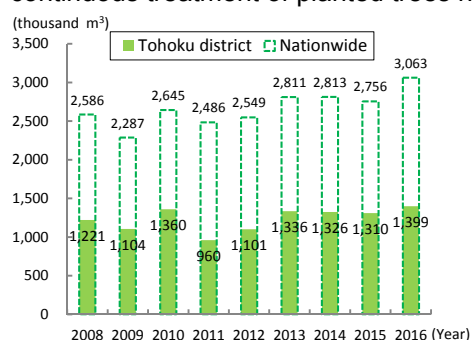


Fig.VI-1 Volume of surface-untreated plywood produced in Tohoku district

The “Infrastructure Maintenance Grand Award” was bestowed on the coastal forest restoration project coordinated by OISCA, appreciating, among others, the applicability to foreign fields.



1.3 Promotion of Wood Use for Reconstruction and Contribution by Forest and Forestry

The local governments in the disaster-affected areas have provided approximately 54,000 “emergency temporary houses,” with a quarter of those houses built with wooden structures. They have also been constructing approximately 9,000 public permanent houses for disaster victims (reconstruction houses) with wooden structures. Wood use in non-residential buildings and recovery and reconstruction works in the civil engineering sector is frequently observed.

A large amount of woody debris that occurred due to the earthquake and tsunami has been utilized for producing wood-based panels and fuel input for boilers and power plants.

Disaster-affected areas are dealing with challenges such as depopulation and the hollowing out of industries, which are shared by regions all over Japan, even before the earthquake. Forest, forestry and wood products industry are expected to contribute to rediscovery and utilization of local resources, creative revitalization of industries, and formation of local communities.



Reconstruction house built with CLT panel structure (Fukushima)



Installation of CLT panels (Fukushima)



Library built with tree-like braced wooden frame structure (Iwate)

2. Reconstruction from Nuclear Accident

2.1 Measures against Radioactive Materials in Forests

The GOJ has been conducting a monitoring and research on distribution and stability of radioactive materials in forests since 2011 (Fig.VI-2), as well as verification tests for necessary measures to carry out forestry practices since the same year.

Measures are taken in accordance with “Comprehensive Approaches towards Regeneration of Forests and Forestry in Fukushima” announced in March 2016 with an aim to ensure safe and secure living environments and prevent the outflow of radioactive materials to living areas, activities to regenerate satoyama forests and remote forests, activities to regenerate forestry including research and studies, and information dissemination.

The GOJ set up 14 model districts by the end of FY2017, including within areas to which evacuation orders had been issued, to comprehensively promote projected measures to restore satoyama forests in close cooperation with local governments (Fig.VI-3).

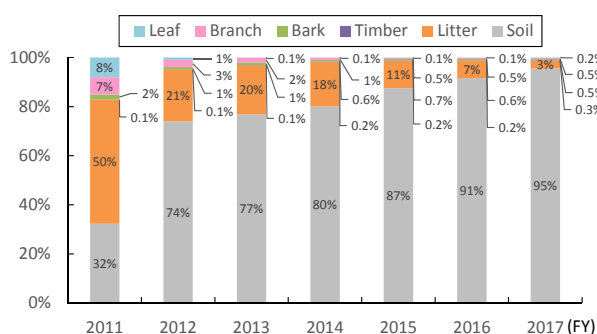


Fig.VI-2 Radioactive cesium by tree part (konara forest in Otama village, Fukushima)

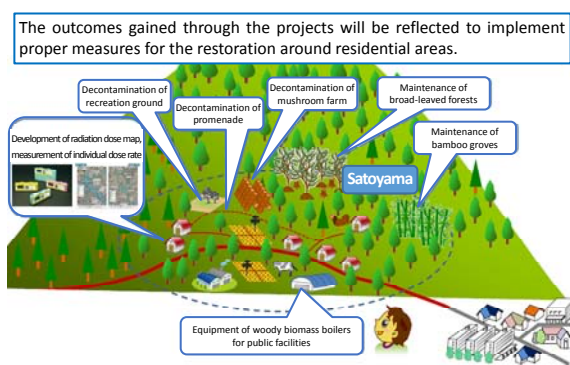


Fig.VI-3 Image of Satoyama Restoration Model Project

2.2 Supply of Safe Forest Products

Shipment restrictions on mushrooms are to be lifted when it is determined that cultivation is being practiced based on the “Guidelines Concerning Management of Bed-log Cultivation of Mushrooms to Decrease Radioactive Cesium” and that no mushrooms are produced whose radioactivity exceeds the standard value.

It is also to be noted that shipment restriction for wild mushrooms and wild vegetables have been gradually lifted through appropriate inspection and shipment management.

2.3 Disposal of Contaminated Bark and Bed log for Mushroom Production

Some of tree bark from lumber mills in Fukushima and neighboring prefectures, which had been generally used as fuel or compost before the accident, was retained in the mills due to possibility of contamination with radioactive cesium. The GOJ is providing assistance in disposal of such bark in waste disposal facilities and the amount of retained bark is decreasing. The disposal of bed log for cultivating mushrooms which can no longer be used is also carried out.

2.4 Damage Compensation

Private forestry organizations and mushroom growers in Fukushima and other prefectures have been claiming compensation for inconvenience in their business caused by evacuation orders as well as for damages and/or losses concerning shiitake mushroom production. In response to these claims, Tokyo Electric Power Company (TEPCO) has been making payment of compensation. TEPCO has also accepted applications for compensation for the loss of value in real estate pertaining to forest land within areas under evacuation orders and standing trees in Fukushima Prefecture.

Appendix

1. Forestry-related Fundamental Figures

| Item | Unit | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|--------------------------------|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| i Gross domestic product (GDP) | billion yen | 526,706 | 524,133 | 500,354 | 491,409 | 494,957 | 503,176 | 513,876 | 531,986 | 538,446 |
| Forestry | billion yen | 172 | 134 | 190 | 202 | 185 | 201 | 214 | 205 | 206 |
| Forestry / GDP | % | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| ii Total number of workers | million | 64.46 | 63.56 | 62.57 | 59.77 | 62.70 | 63.11 | 63.51 | 63.76 | 64.40 |
| Forestry | million | 0.07 | 0.06 | 0.08 | 0.07 | 0.08 | 0.08 | 0.08 | 0.07 | 0.06 |
| Forestry / Total # of workers | % | 0.11 | 0.09 | 0.13 | 0.12 | 0.13 | 0.13 | 0.13 | 0.11 | 0.09 |
| iii Land area of Japan | million ha | 37.79 | 37.79 | 37.79 | 37.79 | 37.79 | 37.79 | 37.79 | 37.80 | 37.80 |
| iv Forest | million ha | 25.15 | 25.12 | 25.10 | 25.10 | 25.08 | 25.08 | 25.08 | 25.08 | 25.08 |
| Forest / Land area | % | 67.5 | 67.4 | 67.3 | 67.3 | 67.3 | 67.3 | 67.3 | 67.3 | 67.3 |
| v Protection forest | million ha | 8.93 | 11.65 | 12.02 | 12.05 | 12.09 | 12.12 | 12.14 | 12.17 | 12.18 |
| Protection forest / Forest | % | 35.5 | 46.4 | 47.9 | 48.0 | 48.2 | 48.3 | 48.4 | 48.5 | 48.6 |
| vi Growing stock of forest | billion m ³ | 3.5 | 4.0 | 4.4 | 4.4 | 4.9 | 4.9 | 4.9 | 4.9 | 4.9 |
| vii Industrial wood supply | million m ³ | 101.01 | 87.42 | 71.88 | 74.40 | 72.19 | 75.46 | 75.80 | 75.16 | 78.08 |
| Domestic production | million m ³ | 19.06 | 17.90 | 18.92 | 20.09 | 20.32 | 21.74 | 23.65 | 24.92 | 27.14 |
| Import | million m ³ | 81.95 | 69.52 | 52.96 | 54.31 | 51.87 | 53.72 | 52.15 | 50.24 | 50.94 |
| Self-sufficiency rate | % | 18.9 | 20.5 | 26.3 | 27.0 | 28.1 | 28.8 | 31.2 | 33.2 | 34.8 |
| viii New housing starts | million units | 1.23 | 1.24 | 0.81 | 0.83 | 0.88 | 0.98 | 0.89 | 0.91 | 0.97 |
| Ratio of wooden structure | % | 45.2 | 43.9 | 56.6 | 55.7 | 55.1 | 56.1 | 54.9 | 55.5 | 56.5 |

Notes 1: "Protection forest area" in "v" refers to the area excluding duplication.

2: "Industrial wood supply," "Domestic production," and "Import" in "vii" refer to the volume in roundwood equivalent.

Source: i: Cabinet Office "SNA (System of National Accounts)," ii: Ministry of Internal Affairs and Communications "Labor Force Survey" (Iwate, Miyagi and Fukushima Prefectures are excluded from the data for 2011.)

iv, v, vi: Forestry Agency, vii: Forestry Agency "Wood Demand and Supply Chart," viii: MLIT "Statistics on Building Construction Starts"

2. Gross Domestic Product classified by Economic Activities (at current prices)

(Unit: billion yen)

| Item | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|-----------------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Gross domestic product | 526,706 | 524,133 | 500,354 | 491,409 | 494,957 | 503,176 | 513,876 | 531,986 | 538,446 |
| Agriculture, forestry, and fishing | 8,090 | 5,898 | 5,515 | 5,285 | 5,651 | 5,556 | 5,428 | 5,907 | 6,194 |
| Forestry | 172 | 134 | 190 | 202 | 185 | 201 | 214 | 205 | 206 |
| Mining | 611 | 414 | 304 | 313 | 281 | 311 | 327 | 315 | 291 |
| Manufacturing | 118,815 | 113,448 | 104,239 | 96,639 | 97,663 | 97,799 | 101,394 | 110,223 | 113,337 |
| Electricity, gas and water supply, and waste management service | 16,898 | 15,237 | 13,797 | 11,054 | 9,962 | 10,655 | 12,090 | 13,893 | 14,414 |
| Construction | 36,215 | 29,186 | 23,984 | 24,093 | 24,485 | 26,779 | 28,470 | 29,301 | 29,725 |
| Wholesale and retail trade | 68,830 | 75,313 | 69,088 | 70,580 | 72,789 | 74,271 | 73,188 | 74,201 | 73,998 |
| Transport and postal services | 25,643 | 26,573 | 25,231 | 24,497 | 25,250 | 25,366 | 26,752 | 27,122 | 26,963 |
| Accommodation and food service activities | 16,580 | 14,350 | 12,847 | 12,451 | 11,858 | 12,345 | 12,648 | 12,372 | 12,865 |
| Information and communications | 24,236 | 25,911 | 25,514 | 25,384 | 25,354 | 25,718 | 26,082 | 26,681 | 26,830 |
| Finance and insurance | 25,637 | 31,192 | 24,115 | 23,110 | 22,442 | 23,055 | 22,808 | 23,187 | 22,462 |
| Real estate | 54,138 | 54,571 | 59,531 | 59,528 | 59,372 | 59,889 | 60,128 | 60,590 | 61,168 |
| Professional, scientific and technical activities | 30,291 | 33,394 | 34,940 | 35,682 | 35,546 | 36,513 | 37,144 | 38,354 | 39,256 |
| Public administration | 27,314 | 26,930 | 26,306 | 26,423 | 26,032 | 25,759 | 26,446 | 26,572 | 26,679 |
| Education | 19,003 | 18,620 | 18,247 | 18,520 | 18,487 | 18,377 | 18,861 | 19,205 | 19,430 |
| Human health and social work activities | 27,874 | 28,916 | 32,025 | 32,496 | 34,132 | 34,818 | 34,910 | 36,229 | 37,744 |
| Other service activities | 27,353 | 25,700 | 23,454 | 22,904 | 23,056 | 22,891 | 23,251 | 23,351 | 22,937 |

Source: Cabinet Office "SNA (System of National Accounts)"

3. Gross Forestry Output

(Unit: billion yen)

| Item | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Gross forestry output | 531.15 | 417.05 | 422.43 | 419.41 | 394.99 | 430.04 | 461.82 | 452.08 | 466.24 |
| Wood production | 322.18 | 210.50 | 195.29 | 208.33 | 196.62 | 219.68 | 245.86 | 234.08 | 237.00 |
| Softwood | 265.33 | 177.41 | 170.16 | 185.05 | 171.40 | 193.66 | 215.88 | 198.19 | 195.39 |
| Sugi (Japanese Cedar) | 123.78 | 87.53 | 93.50 | 101.77 | 97.31 | 112.02 | 129.62 | 118.09 | 116.74 |
| Hardwood | 54.72 | 31.71 | 23.76 | 19.81 | 21.29 | 20.06 | 18.96 | 19.51 | 19.06 |
| Fuelwood and charcoal production | 6.16 | 6.09 | 5.08 | 5.06 | 4.39 | 5.53 | 5.66 | 5.31 | 5.49 |
| Grown mushroom production | 196.89 | 198.50 | 218.91 | 204.72 | 193.15 | 203.73 | 209.02 | 210.98 | 222.05 |
| Minor forestry products production | 5.92 | 1.96 | 3.15 | 1.29 | 0.83 | 1.10 | 1.28 | 1.71 | 1.71 |
| Forestry income produced | 351.91 | 245.78 | 225.95 | 225.47 | 211.02 | 231.35 | 250.10 | 248.40 | 255.74 |

Note: Total figures may not be equal to the sum of each item due to round off.

Source: MAFF "Forestry Output"

4. Current State of Forest Resources

(Unit: 1,000ha, million m³)

| Classification | | | Total | | Standing timber area (canopy cover more than 30%) | | | | Treeless land (canopy cover less than 30%) | | Bamboo groves |
|---------------------------|------------------------------------------|--------------------------|--------|---------------|------------------------------------------------------|---------------|----------------|---------------|-----------------------------------------------|---------------|---------------|
| | | | | | Planted forest | | Natural forest | | | | |
| | | | Area | Growing stock | Area | Growing stock | Area | Growing stock | Area | Growing stock | |
| Total | | | 25,081 | 4,900.51 | 10,289 | 3,041.87 | 13,429 | 1,858.19 | 1,201 | 0.45 | 161 |
| National forest | Subtotal | | 7,674 | 1,151.82 | 2,327 | 467.32 | 4,717 | 684.06 | 629 | 0.45 | 0 |
| | Under the Forestry Agency's jurisdiction | Subtotal | 7,610 | 1,146.20 | 2,321 | 466.03 | 4,667 | 679.72 | 623 | 0.45 | 0 |
| | | State-owned | 7,509 | 1,126.81 | 2,240 | 446.86 | 4,664 | 679.50 | 604 | 0.44 | 0 |
| | | Government reforestation | 93 | 19.39 | 81 | 19.17 | 2 | 0.22 | 9 | 0.00 | 0 |
| | | Others | 9 | 0.00 | 0 | 0.00 | 0 | 0.00 | 9 | 0.00 | 0 |
| | Under other Agency's jurisdiction | | 64 | 5.62 | 6 | 1.28 | 51 | 4.34 | 7 | 0.00 | 0 |
| Private and public forest | Subtotal | | 17,407 | 3,748.69 | 7,962 | 2,574.56 | 8,712 | 1,174.13 | 572 | 0.00 | 161 |
| | Public forest | Subtotal | 2,919 | 557.70 | 1,287 | 350.30 | 1,495 | 207.40 | 131 | 0.00 | 6 |
| | | Prefecture | 1,210 | 218.53 | 479 | 120.88 | 672 | 97.66 | 58 | 0.00 | 0 |
| | | Municipality | 1,709 | 339.16 | 808 | 229.42 | 823 | 109.75 | 73 | 0.00 | 5 |
| | Private forest | | 14,437 | 3,184.21 | 6,662 | 2,221.18 | 7,186 | 963.03 | 437 | 0.00 | 153 |
| | Others | | 51 | 6.79 | 14 | 3.09 | 30 | 3.70 | 4 | 0.00 | 3 |

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

2: "Others" and "Under other agency's jurisdiction" 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: Total figures may not be equal to the sum of each item due to round off.

4: Figures are as of March 31, 2012.

Source: Forestry Agency

5. 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) 28,480 | (8,223) 7,967 | (11,574) 10,745 | (233) 223 | (2,524) 2,493 | (4,954) 4,014 | (3,808) 3,038 |
| 2005 | (25,584) 22,498 | (5,216) 5,011 | (7,096) 6,307 | (226) 183 | (3,534) 3,423 | (5,728) 4,611 | (3,784) 2,963 |
| 2010 | (18,756) 16,388 | (4,132) 3,844 | (2,820) 2,262 | (247) 237 | (4,604) 4,418 | (4,265) 3,381 | (2,688) 2,246 |
| 2011 | (19,596) 16,697 | (4,598) 4,311 | (2,830) 2,347 | (178) 169 | (4,950) 4,713 | (4,220) 2,839 | (2,819) 2,318 |
| 2012 | (20,277) 16,992 | (4,648) 4,425 | (2,643) 2,103 | (245) 214 | (5,155) 4,821 | (4,687) 3,112 | (2,897) 2,318 |
| 2013 | (22,225) 18,906 | (5,429) 5,215 | (2,780) 2,512 | (330) 231 | (5,099) 4,620 | (5,811) 3,942 | (2,777) 2,386 |
| 2014 | (21,088) 17,720 | (5,185) 5,098 | (2,543) 2,404 | (554) 518 | (4,603) 4,128 | (5,709) 3,622 | (2,492) 1,950 |
| 2015 | (19,429) 16,607 | (5,537) 5,390 | (2,039) 1,930 | (185) 168 | (4,467) 4,027 | (5,250) 3,450 | (1,950) 1,642 |
| 2016 | (21,106) 18,390 | (6,766) 6,570 | (1,972) 1,852 | (291) 253 | (5,017) 4,552 | (4,983) 3,383 | (2,077) 1,781 |

Note 1: Figures do not include national forest.

2: Figures in parentheses refer to the total area which includes area planted as lower story of multiple storied forest.

Source: Forestry Agency

6. 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 |
|------|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|------|-----|-----|-----|------|-------|-----|
| 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 |

Note 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 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.

Source: Forestry Agency

7. Thinned Area and Use of Thinnings

| (FY) | Thinned area (1,000ha) | | | Volume of thinnings used (million m³) | | | | | |
|------|------------------------|---------------------------|-----------------|---------------------------------------|---------------------------|----------|-----------|--------|-----------------|
| | Total | Private and public forest | National forest | Total | Private and public forest | | | | National forest |
| | | | | | Subtotal | Sawnwood | Roundwood | Others | |
| 2007 | 521 | 395 | 126 | 5.37 | 3.44 | 2.14 | 0.47 | 0.83 | 1.93 |
| 2008 | 548 | 434 | 114 | 5.66 | 3.68 | 2.26 | 0.39 | 1.03 | 1.98 |
| 2009 | 585 | 446 | 140 | 6.37 | 4.23 | 2.57 | 0.48 | 1.18 | 2.14 |
| 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 |

Note 1: Volumes are in roundwood equivalent.

2: Total figures may not be equal to the sum of each item due to round off.

Source: Forestry Agency

(As for private forest including communal forest) Thinned Area and Use of Thinnings before 2007

| (FY) | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---------------------------------------|-----------|------|------|------|------|------|------|------|
| Thinned area (1,000ha) | 277 | 215 | 304 | 312 | 277 | 281 | 282 | 395 |
| Volume of thinnings used (million m³) | Total | 2.34 | 1.83 | 2.74 | 2.83 | 2.84 | 3.24 | 3.44 |
| | Sawnwood | 1.70 | 1.25 | 1.95 | 1.85 | 1.84 | 1.96 | 2.14 |
| | Roundwood | 0.37 | 0.34 | 0.41 | 0.50 | 0.45 | 0.48 | 0.47 |
| | Others | 0.26 | 0.24 | 0.38 | 0.48 | 0.55 | 0.80 | 0.83 |

Note 1: Volumes are in roundwood equivalent.

2: Total figures may not be equal to the sum of each item due to round off.

Source: Forestry Agency

8. Forest Area by Owners

| | 2015 | |
|--------------------------------------|------------------|---------------------|
| | Forest area (ha) | Ratio to total area |
| Total | 17,626,113 | 100.0% |
| Private | 13,565,022 | 77.0% |
| Public | 3,368,731 | 19.1% |
| Prefecture | 1,271,529 | 7.2% |
| Public corporation | 391,189 | 2.2% |
| Municipality | 1,404,456 | 8.0% |
| Property ward | 301,557 | 1.7% |
| Incorporated Administrative Agencies | 692,360 | 3.9% |

Note 1: Total figures may not be equal to the sum of each item due to round off.

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

Source: MAFF "2015 Census of Agriculture and Forestry"

9. Number of Forestry Management Bodies 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 |

Source: MAFF "2015 Census of Agriculture and Forestry"

10. Roundwood Production

(Unit: 1,000m³, %)

| | | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Relative change from previous year (%) |
|-----------------|------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------------------------|
| Total | | 17,034 | 16,166 | 17,193 | 18,290 | 18,479 | 19,646 | 19,916 | 20,049 | 20,660 | 3.0 |
| By tree species | Subtotal | 13,707 (80) | 13,695 (85) | 14,789 (86) | 15,986 (87) | 16,062 (87) | 17,246 (88) | 17,743 (89) | 17,815 (89) | 18,470 (89) | 3.7 |
| | Sugi (Japanese cedar) | 7,671 | 7,756 | 9,049 | 9,649 | 9,956 | 10,902 | 11,194 | 11,226 | 11,848 | 5.5 |
| | for sawnwood | 7,258 <57> | 6,737 <58> | 6,695 <63> | 7,089 <62> | 7,295 <64> | 7,825 <65> | 7,872 <64> | 7,869 <66> | 8,095 <66> | 2.9 |
| | Hinoki (Japanese cypress) | 2,273 | 2,014 | 2,029 | 2,169 | 2,165 | 2,300 | 2,395 | 2,364 | 2,460 | 4.1 |
| | Akamatsu (Japanese red pine), Kuromatsu (Japanese black pine) | 1,034 | 783 | 689 | 580 | 661 | 624 | 674 | 779 | 678 | ▲ 13.0 |
| | Karamatsu (Japanese larch), Ezomatsu (Yezo spruce), Todomatsu (Sakhalin fir) | 2,410 | 2,910 | 2,821 | 3,373 | 3,098 | 3,275 | 3,327 | 3,268 | 3,325 | 1.7 |
| | Others | 319 | 232 | 201 | 215 | 182 | 145 | 153 | 170 | 153 | ▲ 10.0 |
| | Hardwood | 3,327 (20) | 2,471 (15) | 2,404 (14) | 2,304 (13) | 2,417 (13) | 2,400 (12) | 2,173 (11) | 2,236 (11) | 2,188 (11) | ▲ 2.1 |
| By use | Sawnwood | 12,798 (75) | 11,571 (72) | 10,582 (62) | 11,492 (63) | 11,321 (61) | 12,058 (61) | 12,211 (61) | 12,004 (60) | 12,182 (59) | 1.5 |
| | Plywood | 138 (1) | 863 (6) | 2,490 (14) | 2,524 (14) | 2,602 (14) | 3,016 (15) | 3,191 (16) | 3,356 (17) | 3,682 (18) | 9.7 |
| | Chips | 4,098 (24) | 3,732 (23) | 4,121 (24) | 4,274 (23) | 4,556 (25) | 4,572 (23) | 4,514 (23) | 4,689 (23) | 4,796 (23) | 2.3 |

Note 1: Figures in parentheses refer to the percentage to total volume.

2: Figures in < > are the percentage of sugi for sawnwood to the total volume for sawnwood of all species.

3: Total figures may not be equal to the sum of each item due to round off.

Source: MAFF "Wood Supply and Demand Report," 2000-2016

11. Wood Supply and Demand Chart (roundwood equivalent)

(Unit:1,000m³)

| Demand Supply | | Demand | | | | | | | | Domestic consumption | | | | | | | | | | | | Export | | | | | | | | |
|----------------------|----------------------|--------------------|-------------------|----------|-------------------|---------|--------|----------------------|-------------------|----------------------|-------------------|------------------|-------------------|---------|--------|----------------------|-------------------|----------|----------|-------------------|---------------------|----------|----------|----------------|---------|-----------|----------|----------|----------|---------------------|
| | | Total | Industrial use | | | | | | Total | Industrial use | | | | | | Fuel wood | | | | Total | Industrial use | | | | | Fuel wood | | | | |
| | | | Subtotal | Sawnwood | Pulp and chips | Plywood | Others | Mushroom cultivation | | Fuel wood | Subtotal | Sawnwood | Pulp and chips | Plywood | Others | Mushroom cultivation | Subtotal | Charcoal | Firewood | | Wood chips for fuel | Subtotal | Sawnwood | Pulp and chips | Plywood | Others | Subtotal | Charcoal | Firewood | Wood chips for fuel |
| Supply | Total | (19,341) 78,077 | (6,853) 71,942 | 26,150 | (6,853) 31,619 | 10,248 | 3,925 | 328 | (12,488) 5,807 | (19,341) 75,960 | (6,853) 69,830 | 26,012 | (6,853) 30,480 | 10,085 | 3,253 | 328 | (12,488) 5,802 | 948 | 52 | (12,488) 4,803 | 2,117 | 2,112 | 138 | 1,139 | 163 | 672 | 5 | 5 | 0 | 0 |
| | Roundwood | (6,853) 27,194 | (6,853) 27,194 | 16,182 | (6,853) 5,091 | 4,871 | 1,051 | | (6,853) 25,083 | (6,853) 25,083 | (6,853) 16,044 | (6,853) 3,952 | 4,708 | 378 | | | | | | | 2,112 | 2,112 | 138 | 1,139 | 163 | 672 | | | | |
| | Forest residue | 180 | 180 | | 180 | | | | 180 | 180 | | 180 | | | | | | | | | | | | | | | | | | |
| | Import | 44,567 | 44,567 | 9,968 | 26,348 | 5,377 | 2,874 | | 44,567 | 44,567 | 9,968 | 26,348 | 5,377 | 2,874 | | | | | | | | | | | | | | | | |
| | Mushroom cultivation | 328 | | | | | | 328 | 328 | | | | | | | 328 | | | | | | | | | | | | | | |
| | Fuel wood | (12,488) 5,807 | | | | | | | (12,488) 5,807 | (12,488) 5,802 | | | | | | | (12,488) 5,802 | 948 | 52 | (12,488) 4,803 | 5 | | | | | | 5 | 5 | 0 | 0 |
| Domestic production | Total | 27,141 | 22,355 | 12,182 | 5,266 | 3,876 | 1,031 | 328 | 4,458 | 25,027 | 20,247 | 12,044 | 4,127 | 3,716 | 359 | 328 | 4,452 | 72 | 51 | 4,329 | 2,114 | 2,109 | 138 | 1,139 | 160 | 672 | 5 | 5 | 0 | 0 |
| | Roundwood | 22,175 | 22,175 | 12,182 | 5,086 | 3,876 | 1,031 | | | 20,067 | 20,067 | 12,044 | 3,947 | 3,716 | 359 | | | | | | 2,109 | 2,109 | 138 | 1,139 | 160 | 672 | | | | |
| | Forest residue | 180 | 180 | | 180 | | | | | 180 | 180 | | 180 | | | | | | | | | | | | | | | | | |
| | Mushroom cultivation | 328 | | | | | | 328 | 328 | | | | | | | | 328 | | | | | | | | | | | | | |
| | Fuel wood | 4,458 | | | | | | | 4,458 | 4,452 | | | | | | | | 4,452 | 72 | 51 | 4,329 | 5 | | | | | 5 | 5 | 0 | 0 |
| Import | Total | 50,936 | 49,586 | 13,968 | 26,353 | 6,372 | 2,894 | | 1,350 | 50,933 | 49,583 | 13,968 | 26,353 | 6,369 | 2,894 | | 1,350 | 875 | 1 | 474 | 3 | 3 | 0 | | 3 | | | | | |
| | Roundwood | 5,019 | 5,019 | 4,000 | 5 | 995 | 19 | | | 5,016 | 5,016 | 4,000 | 5 | 992 | 19 | | | | | | 3 | 3 | 0 | | 3 | | | | | |
| | Subtotal | 44,567 | 44,567 | 9,968 | 26,348 | 5,377 | 2,874 | | | 44,567 | 44,567 | 9,968 | 26,348 | 5,377 | 2,874 | | | | | | | | | | | | | | | |
| | Sawnwood | 9,968 | 9,968 | 9,968 | | | | | | 9,968 | 9,968 | 9,968 | | | | | | | | | | | | | | | | | | |
| | Pulp | 5,393 | 5,393 | | 5,393 | | | | | 5,393 | 5,393 | | 5,393 | | | | | | | | | | | | | | | | | |
| | Chips | 20,955 | 20,955 | | 20,955 | | | | | 20,955 | 20,955 | | 20,955 | | | | | | | | | | | | | | | | | |
| | Plywood | 5,377 | 5,377 | | | 5,377 | | | | 5,377 | 5,377 | | | 5,377 | | | | | | | | | | | | | | | | |
| | Others | 2,874 | 2,874 | | | | 2,874 | | | 2,874 | 2,874 | | | | 2,874 | | | | | | | | | | | | | | | |
| | Fuel wood | 1,350 | | | | | | | 1,350 | 1,350 | | | | | | | | 1,350 | 875 | 1 | 474 | | | | | | | | | |

Note 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.

These figures are excluded from "total" and "subtotal".

2: "Fuel wood" includes wood chips for fuel, utilized by woody biomass power plants.

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

4: "Others" refers to items such as glulam, worked wood, sleeper, utility pole, pile wood, and scaffolding wood.

5: Total figures may not be equal to the sum of each item due to round off.

Source: Forestry Agency "Wood Supply and Demand Chart," 2016

12. Wood Supply/Demand (roundwood equivalent)

(Unit: 1,000m³)

| | Total wood supply/demand | Wood for industrial use | Fuel wood | Wood for mushroom production | Wood demand for industrial use by sector | | | | Wood supply for industrial use by source | | Self-sufficiency rate (%) |
|------|--------------------------|-------------------------|-----------|------------------------------|------------------------------------------|----------------|---------|--------|------------------------------------------|---------------|---------------------------|
| | | | | | Sawn wood | Pulp and chips | Plywood | Others | Domestic wood | Imported wood | |
| 1955 | 65,206 | 45,278 | 19,928 | - | 30,295 | 8,285 | 2,297 | 4,401 | 42,794 | 2,484 | 96.1 |
| 1960 | 71,467 | 56,547 | 14,920 | - | 37,789 | 10,189 | 3,178 | 5,391 | 49,006 | 7,541 | 89.2 |
| 1965 | 76,798 | 70,530 | 6,268 | - | 47,084 | 14,335 | 5,187 | 3,924 | 50,375 | 20,155 | 73.7 |
| 1970 | 106,601 | 102,679 | 2,348 | 1,574 | 62,009 | 24,887 | 13,059 | 2,724 | 46,241 | 56,438 | 46.7 |
| 1975 | 99,303 | 96,369 | 1,132 | 1,802 | 55,341 | 27,298 | 11,173 | 2,557 | 34,577 | 61,792 | 37.4 |
| 1980 | 112,211 | 108,964 | 1,200 | 2,047 | 56,713 | 35,868 | 12,840 | 3,543 | 34,557 | 74,407 | 32.9 |
| 1985 | 95,447 | 92,901 | 572 | 1,974 | 44,539 | 32,915 | 11,217 | 4,230 | 33,074 | 59,827 | 37.1 |
| 1990 | 113,242 | 111,162 | 517 | 1,563 | 53,887 | 41,344 | 14,546 | 1,385 | 29,369 | 81,793 | 27.6 |
| 1995 | 113,698 | 111,922 | 721 | 1,055 | 50,384 | 44,922 | 14,314 | 2,302 | 22,916 | 89,006 | 21.4 |
| 2000 | 101,006 | 99,263 | 940 | 803 | 40,946 | 42,186 | 13,825 | 2,306 | 18,022 | 81,241 | 18.9 |
| 2005 | 87,423 | 85,857 | 1,001 | 565 | 32,901 | 37,608 | 12,586 | 2,763 | 17,176 | 68,681 | 20.5 |
| 2010 | 71,884 | 70,253 | 1,099 | 532 | 25,379 | 32,350 | 9,556 | 2,968 | 18,236 | 52,018 | 26.3 |
| 2011 | 74,403 | 72,725 | 1,157 | 520 | 26,634 | 32,064 | 10,563 | 3,464 | 19,367 | 53,358 | 27.0 |
| 2012 | 72,189 | 70,633 | 1,119 | 437 | 26,053 | 31,010 | 10,294 | 3,275 | 19,686 | 50,947 | 28.1 |
| 2013 | 75,459 | 73,867 | 1,204 | 388 | 28,592 | 30,353 | 11,232 | 3,690 | 21,117 | 52,750 | 28.8 |
| 2014 | 75,799 | 72,547 | 2,940 | 313 | 26,139 | 31,433 | 11,144 | 3,830 | 21,492 | 51,054 | 31.2 |
| 2015 | 75,160 | 70,883 | 3,962 | 315 | 25,358 | 31,783 | 9,914 | 3,829 | 21,797 | 49,086 | 33.2 |
| 2016 | 78,077 | 71,942 | 5,807 | 328 | 26,150 | 31,619 | 10,248 | 3,925 | 22,355 | 49,586 | 34.8 |

Note 1: "Wood supply/demand" refers to the sum of roundwood volume and imported products volume (sawnwood, plywood, and pulp and chips) converted into roundwood equivalent.

2: "Fuel wood" includes wood chips for fuel, utilized by woody biomass power plants.

3: "Others" refers to items such as glulam, worked wood, sleeper, utility pole, pile wood, and scaffolding wood.

4: "Self-sufficiency rate" = "Wood supply (Domestic Wood)" / "Total wood supply" ×100

5: Total figures may not be equal to the sum of each item due to round off.

Source: Forestry Agency "Wood Supply and Demand Chart"

13. Domestic and Imported Wood Supply/Demand (roundwood equivalent)

(Unit: 1,000m³)

| | | | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Relative change to previous year (%) |
|------------------------------|----------------|---------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------------------------|
| Total wood supply/demand | | | 101,006 | 87,423 | 71,884 | 74,403 | 72,189 | 75,459 | 75,799 | 75,160 | 78,077 | 3.9 |
| Wood for industrial use | | | 99,263 | 85,857 | 70,253 | 72,725 | 70,633 | 73,867 | 72,547 | 70,883 | 71,942 | 1.5 |
| Fuel wood | | | 940 | 1,001 | 1,099 | 1,157 | 1,119 | 1,204 | 2,940 | 3,962 | 5,807 | 46.6 |
| Wood for mushroom production | | | 803 | 565 | 532 | 520 | 437 | 388 | 313 | 315 | 328 | 4.1 |
| Wood for industrial use | Total | Total | 99,263 | 85,857 | 70,253 | 72,725 | 70,633 | 73,867 | 72,547 | 70,883 | 71,942 | 1.5 |
| | | Domestic Wood | 18,022 | 17,176 | 18,236 | 19,367 | 19,686 | 21,117 | 21,492 | 21,797 | 22,355 | 2.6 |
| | | Imported Wood | 81,241 | 68,681 | 52,018 | 53,358 | 50,947 | 52,750 | 51,054 | 49,086 | 49,586 | 1.0 |
| | | Self-sufficiency rate (%) | 18.2 | 20.0 | 26.0 | 26.6 | 27.9 | 28.6 | 29.6 | 30.8 | 31.1 | 0.3 |
| | Sawnwood | Subtotal | 40,946 | 32,901 | 25,379 | 26,634 | 26,053 | 28,592 | 26,139 | 25,358 | 26,150 | 3.1 |
| | | Domestic Wood | 12,798 | 11,571 | 10,582 | 11,492 | 11,321 | 12,058 | 12,211 | 12,004 | 12,182 | 1.5 |
| | | Imported Wood | 28,148 | 21,330 | 14,797 | 15,142 | 14,732 | 16,534 | 13,928 | 13,354 | 13,968 | 4.6 |
| | | Self-sufficiency rate (%) | 31.3 | 35.2 | 41.7 | 43.1 | 43.5 | 42.2 | 46.7 | 47.3 | 46.6 | ▲ 0.7 |
| | Pulp and chips | Subtotal | (6,537) | (7,974) | (6,192) | (6,725) | (6,708) | (7,972) | (6,922) | (6,667) | (6,853) | 2.8 |
| | | Domestic Wood | 42,186 | 37,608 | 32,350 | 32,064 | 31,010 | 30,353 | 31,433 | 31,783 | 31,619 | ▲ 0.5 |
| | | Imported Wood | 4,749 | 4,426 | 4,785 | 4,914 | 5,309 | 5,177 | 5,047 | 5,202 | 5,266 | 1.2 |
| | | Self-sufficiency rate (%) | 37,437 | 33,181 | 27,565 | 27,150 | 25,702 | 25,176 | 26,386 | 26,581 | 26,353 | ▲ 0.9 |
| | Plywood | Subtotal | 11.3 | 11.8 | 14.8 | 15.3 | 17.1 | 17.1 | 16.1 | 16.4 | 16.7 | 0.3 |
| | | Domestic Wood | 13,825 | 12,586 | 9,556 | 10,563 | 10,294 | 11,232 | 11,144 | 9,914 | 10,248 | 3.4 |
| | | Imported Wood | 138 | 863 | 2,490 | 2,524 | 2,602 | 3,255 | 3,346 | 3,530 | 3,876 | 9.8 |
| | | Self-sufficiency rate (%) | 13,687 | 11,723 | 7,066 | 8,039 | 7,692 | 7,977 | 7,798 | 6,384 | 6,372 | ▲ 0.2 |
| | Others | Subtotal | 1.0 | 6.9 | 26.1 | 23.9 | 25.3 | 29.0 | 30.0 | 35.6 | 37.8 | 2.2 |
| | | Domestic Wood | 2,306 | 2,763 | 2,968 | 3,464 | 3,275 | 3,690 | 3,830 | 3,829 | 3,925 | 2.5 |
| | | Imported Wood | 337 | 316 | 379 | 438 | 454 | 627 | 889 | 1,061 | 1,031 | ▲ 2.8 |
| | | Self-sufficiency rate (%) | 1,969 | 2,447 | 2,589 | 3,026 | 2,821 | 3,063 | 2,942 | 2,767 | 2,894 | 4.6 |
| | Others | Subtotal | 14.6 | 11.4 | 12.8 | 12.6 | 13.9 | 17.0 | 23.2 | 27.7 | 26.3 | ▲ 1.4 |
| | | Domestic Wood | | | | | | | | | | |
| | | Imported Wood | | | | | | | | | | |
| | | Self-sufficiency rate (%) | | | | | | | | | | |

Note 1: "Wood supply/demand" refers to the sum of roundwood volume and imported products volume (sawnwood, plywood, and pulp and chips) converted into roundwood equivalent.

2: "Fuel wood" includes wood chips for fuel, utilized by woody biomass power plants.

3: "Others" refers to items such as glulam, worked wood, sleeper, utility pole, pile wood and scaffolding wood.

4: "Self-sufficiency rate" = "Domestic wood supply" for each category / "total" or "subtotal" for each category ×100

5: 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".

6: Total figures may not be equal to the sum of each item due to round off.

7: Among "relative change to the previous fiscal year", "self-sufficiency rate" field is the difference from the previous year.

Source: Forestry Agency "Wood Supply and Demand Chart"

14. Wood Supply by Country (roundwood equivalent)

(Unit: 1,000m³, %)

| | | | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---------------|----------------|-------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Imported wood | North America | Subtotal | (28.9) 28,700 | (18.8) 16,129 | (19.2) 13,506 | (19.1) 13,871 | (18.6) 13,108 | (18.9) 13,942 | (17.9) 13,013 | (17.5) 12,415 | (17.2) 12,377 |
| | | U.S. | 14,460 | 6,844 | 5,838 | 5,877 | 5,560 | 6,225 | 6,153 | 6,057 | 6,083 |
| | | Canada | 14,240 | 9,285 | 7,668 | 7,993 | 7,548 | 7,717 | 6,860 | 6,359 | 6,294 |
| | Southeast Asia | Subtotal | (13.7) 13,569 | (12.2) 10,511 | (8.9) 6,287 | (9.1) 6,586 | (8.8) 6,235 | (8.7) 6,439 | (9.2) 6,718 | (8.3) 5,848 | (7.7) 5,525 |
| | | Malaysia | 6,690 | 5,888 | 3,773 | 3,701 | 3,543 | 3,518 | 3,293 | 2,917 | 2,709 |
| | | Indonesia | 5,858 | 4,137 | 2,304 | 2,622 | 2,506 | 2,787 | 3,328 | 2,804 | 2,698 |
| | | Others | 1,021 | 486 | 209 | 263 | 186 | 134 | 97 | 127 | 117 |
| | Russia | | (7.5) 7,429 | (8.6) 7,411 | (3.3) 2,343 | (3.3) 2,410 | (3.1) 2,196 | (3.2) 2,380 | (3.1) 2,221 | (2.9) 2,081 | (3.3) 2,366 |
| | Europe | | (4.7) 4,675 | (6.9) 5,937 | (7.1) 4,967 | (7.6) 5,553 | (7.8) 5,509 | (9.1) 6,754 | (7.6) 5,554 | (7.6) 5,374 | (8.5) 6,135 |
| | Others | New Zealand | (4.4) 4,374 | (3.4) 2,878 | (3.9) 2,720 | (3.8) 2,772 | (3.6) 2,570 | (3.0) 2,217 | (2.6) 1,858 | (2.3) 1,638 | (2.4) 1,749 |
| | | Chile | (3.8) 3,795 | (4.6) 3,952 | (6.7) 4,726 | (7.2) 5,210 | (7.3) 5,189 | (6.3) 4,617 | (6.2) 4,468 | (5.6) 3,987 | (5.9) 4,234 |
| | | Australia | (8.7) 8,604 | (10.2) 8,729 | (11.0) 7,722 | (7.7) 5,629 | (7.5) 5,323 | (5.6) 4,106 | (5.8) 4,203 | (6.6) 4,662 | (5.7) 4,067 |
| | | China | (2.5) 2,445 | (3.0) 2,544 | (3.0) 2,084 | (3.6) 2,633 | (3.4) 2,396 | (3.4) 2,483 | (3.4) 2,434 | (2.8) 1,967 | (2.7) 1,912 |
| | | Viet Nam | | | | | | | | (7.6) 5,418 | (6.9) 4,946 |
| | | Others | (7.7) 7,651 | (12.3) 10,591 | (10.9) 7,663 | (12.0) 8,695 | (11.9) 8,421 | (13.3) 9,810 | (14.7) 10,585 | (8.0) 5,696 | (8.7) 6,275 |
| | Subtotal | | (81.8) 81,241 | (80.0) 68,681 | (74.0) 52,018 | (73.4) 53,358 | (72.1) 50,947 | (71.4) 52,750 | (70.4) 51,054 | (69.2) 49,086 | (68.9) 49,586 |
| | Domestic wood | | (18.2) 18,022 | (20.0) 17,176 | (26.0) 18,236 | (26.6) 19,367 | (27.9) 19,686 | (28.6) 21,117 | (29.6) 21,492 | (30.8) 21,797 | (31.1) 22,355 |
| | Total | | (100.0) 99,263 | (100.0) 85,857 | (100.0) 70,253 | (100.0) 72,725 | (100.0) 70,633 | (100.0) 73,867 | (100.0) 72,547 | (100.0) 70,883 | (100.0) 71,942 |

Note 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: Total figures may not be equal to the sum of each item due to round off.

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

15. Number of Mills/Factories and Production Volumes

| | | Unit | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|------------------------|--------------------------------------|------------------------|--------|--------|-------|-------|-------|--------|-------|-------|-------|
| Sawnwood | Number of sawmills | plants | 11,692 | 9,011 | 6,569 | 6,242 | 5,927 | 5,690 | 5,469 | 5,206 | 4,934 |
| | Sawnwood shipments | 1,000m³ | 17,231 | 12,825 | 9,415 | 9,434 | 9,302 | 10,100 | 9,595 | 9,231 | 9,293 |
| Plywood | Number of plywood mills | plants | 354 | 271 | 192 | 203 | 197 | 195 | 186 | 185 | 183 |
| | Inputs for plywood production | 1,000m³ | 5,401 | 4,636 | 3,811 | 3,858 | 3,837 | 4,181 | 4,405 | 4,218 | 4,638 |
| | Surface-untreated plywood production | 1,000m³ | 3,218 | 3,212 | 2,645 | 2,486 | 2,549 | 2,811 | 2,813 | 2,756 | 3,063 |
| | Surface-treated plywood production | 1,000m³ | 1,534 | 1,037 | 647 | 703 | 640 | 654 | 584 | 524 | 642 |
| Glued laminated lumber | Number of laminated lumber factories | plants | 281 | 259 | 182 | 181 | 174 | 166 | 165 | 157 | 150 |
| | Laminated lumber production | 1,000m³ | 892 | 1,512 | 1,455 | 1,455 | 1,524 | 1,647 | 1,555 | 1,485 | 1,549 |
| Wood chips | Number of wood chip mills | plants | 2,657 | 2,040 | 1,577 | 1,545 | 1,536 | 1,510 | 1,477 | 1,424 | 1,393 |
| | Wood chip production | 1,000tons (1,000m³) | | 6,005 | 5,407 | 5,633 | 5,861 | 6,452 | 5,850 | 5,745 | 5,826 |

Note: "Number of sawmills" excludes sawmills with output power less than 7.5kW.

Source: MAFF "Wood Supply and Demand Report", "Timber Statistics", Japan Laminated Wood Products Association

16. Number of Sawmills classified by Sawing Power Output

| | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|--------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| Number of sawmills | 11,692 | 9,011 | 6,569 | 6,242 | 5,927 | 5,690 | 5,469 | 5,206 | 4,934 |
| 7.5-22.5kW | 1,137 | 899 | 784 | 757 | 716 | 716 | 692 | 635 | 619 |
| 22.5-37.5 | 2,635 | 1,919 | 1,333 | 1,286 | 1,195 | 1,140 | 1,079 | 1,033 | 953 |
| 37.5-75.0 | 4,406 | 3,371 | 2,165 | 2,015 | 1,891 | 1,759 | 1,684 | 1,571 | 1,458 |
| 75.0-150.0 | 1,991 | 1,552 | 1,196 | 1,124 | 1,082 | 1,039 | 990 | 959 | 918 |
| 150.0-300.0 | 980 | 782 | 641 | 619 | 601 | 604 | 607 | 592 | 573 |
| 300.0kW- | 543 | 488 | 450 | 441 | 442 | 432 | 417 | 416 | 413 |

Note: Figures exclude sawmills with power output less than 7.5kW.

Source: MAFF "Wood Supply and Demand Report", "Timber Statistics"

Full text (in Japanese) of the “Annual Report on Forest and Forestry for FY2017” is available on the website of the Forestry Agency:

<http://www.rinya.maff.go.jp/j/kikaku/hakusyo/29hakusyo/index.html>



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