

# Annual Report on Forest and Forestry in Japan

Fiscal Year 2011

(Summary)

Forestry Agency

Ministry of Agriculture, Forestry and Fisheries, Japan



The “Annual Report on Forest and Forestry” is a report which the Japanese Government 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 FY2011.

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## Forest and Forestry Topics in FY2011

### TOPIC 1. Policy Revised for Revitalization of Forest and Forestry

In 2011, as the “first year of the revitalization of forest and forestry,” the Ministry of Agriculture, Forestry and Fisheries (MAFF) thoroughly reviewed its forest policies; that is, revised the “Forest Law,” introduced the “Forest Management and Environmental Conservation Direct Support System,” and developed the new “Fundamental Plan of Forest and Forestry” and “National Forest Plan.”

In April 2011, the “Forest Law” was revised to introduce: 1) the assurance system of proper forest management in forests whose owners are unknown, 2) the administrative order system to halt logging without permission and oblige those loggers to replant, and 3) the “Forest Management Plan” system to promote coordination and consolidation of forestry practices among groups of small forest owners.

The “Forest Management and Environmental Conservation Direct Support System” is a subsidy program which supports the costs of forest management including thinning and construction of forestry road in combination with forest management activities.

The “Fundamental Plan of Forest and Forestry” is the fundamental national policy on forest and forestry in Japan, while the “National Forest Plan” is the national guideline on forest management in Japan. The new Fundamental Plan sets the self-sufficiency rate of the domestic wood supply at 50% in ten years.

### Outline of the new “Fundamental Plan of Forest and Forestry”

#### ○ Promotion of “Forest and Forestry Revitalization Plan”

- Clarified goal and necessary measures for realization of “Forest and Forestry Revitalization Plan”
- Review of forest planning system, assurance of proper forest management, acceleration of forest road system development, development of forestry contractors and human resources, expansion of domestic wood demand, establishment of processing/distribution system of domestic wood.
- Fulfillment of multiple functional roles of forests, revitalization of rural mountain communities through provision of employment opportunities, realization of low-carbon society.



#### ○ Mitigation of Global Warming and Biodiversity Conservation

- Promote carbon sequestration through forest management and emission reduction for realization of low-carbon society, as well as achievement of Kyoto Protocol's targets.
- Clarified policy for biodiversity conservation in forests.



#### ○ Response to Domestic/International Wood Markets

- Promote wooden structure in public buildings and woody biomass use, as well as demand expansion in housing sector.
- Promote wood products exports.



#### ○ Contribution to Recovery of Domestic Economy and Revitalization of Rural Mountain Communities

- Provide employment opportunities in rural mountain communities and contribute to recovery of domestic economy, through revitalization of forest and forestry as a major industry in rural areas.



#### ○ Reconstruction from Great East Japan Earthquake

- Contribute to development of new communities with low environmental impacts which make use of forest resources through revitalization of forest and forestry.

## TOPIC 2. Many Natural Disasters Hit Mountainous Areas

In March 2011, the Great East Japan Earthquake brought severe damage to forests, forestry, and the wood products industry in Japan, with plywood mills and coastal forests being particularly hard hit.

In addition, during the summer season, a series of typhoons and heavy rains caused a number of disasters in mountain areas in Japan.

The Forestry Agency is now conducting recovery operations in the damaged areas and will promote the revitalization of forest and forestry as key industry of the region in assisting with the recovery and reconstruction of damaged areas.



Damage of plywood mill  
(Miyako, Iwate Pref.)



Damage of coastal forests  
(Noda, Iwate Pref.)



Landslide caused by 12<sup>th</sup> Typhoon  
(Gojo, Nara Pref.)

## TOPIC 3. International Year of Forests 2011

The year 2011 was the “International Year of Forests” according to a UN General Assembly resolution. During the year, many promotional activities were conducted, including conferences, symposia, and media programs, under the national theme of “Walk in Forests.”

At the closing ceremony of the Year, the United Nations Forum on Forests (UNFF) awarded the Forest Hero Award to Mr. *Shigeatsu Hatakeyama*, who have been promoting tree planting by fishermen under the theme of “Forest Love the Ocean.”

## TOPIC 4. Ogasawara Islands Registered as World Natural Heritage

In June 2011, UNESCO decided to register the *Ogasawara* Islands on the World Heritage List in the 35<sup>th</sup> World Heritage Committee as the fourth World Natural Heritage Site in Japan, following *Yakushima*, *Shirakami*, and *Shiretoko*.

More than 80% of the land area in the *Ogasawara* Islands is a National Forest managed by the Forestry Agency. The Agency has been implementing conservation measures including the protection of endangered animal and plant species, the elimination of invasive species introduced from outside of the islands, and the introduction of proper use rules within the Forest Ecosystem Protection Area.

The Agency will further strengthen policy measures to promote the conservation of the natural environment in the islands, including preventing the introduction of invasive species.

## Chapter I: Recovery and Reconstruction from the Great East Japan Earthquake

### 1. Damage of Earthquake and Initial Response

#### 1.1. Great East Japan Earthquake

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

The number of casualties resulting from the Earthquake was estimated to be approximately 19,000, including 16,000 dead and 3,000 missing. The number of damaged buildings was estimated to be more than 370,000, including almost 130,000 that were completely destroyed. A large number of refugees are still living in temporary housing and severe inconvenience.

#### 1.2. Damage to the Forest, Forestry, and Wood Products Industry

The Earthquake caused landslides, damage of soil conservation facilities, damage of forest roads, and forest fires in fifteen prefectures stretching from Aomori to Kochi (Fig.1-1). In particular, a large area of coastal forests on the Pacific Ocean was destroyed by the resulting tsunami.

As for wood products industry, a number of wood processing/distribution facilities and mushroom production facilities were damaged. In particular, six plywood mills, which accounted for approximately 30% of domestic plywood production, were also damaged by the tsunami.

Category	# of damages
Landslides	458
Soil Conservation Facilities	275
Forest Road	2,632
Forest Damage	1,065ha
Wood Processing Facilities	115
Special Forest Products Facilities	476
Total	(1,065ha) 3,956

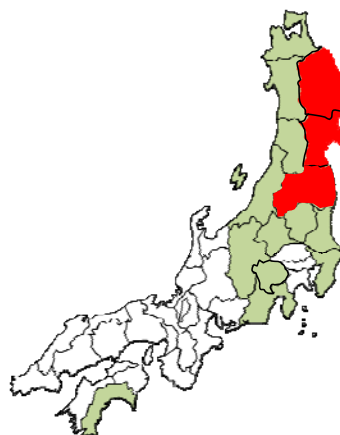


Fig. 1-1: Damages of forest sector by the Great East Japan Earthquake

(Note: Green areas are prefectures that received damage while the red areas are the prefectures that were severely damaged.)

#### 1.3. Initial Response of Forestry Agency

Immediately after the Earthquake, the Forestry Agency began conducting aerial survey by helicopter, dispatched survey teams to assist with the emergency response operation in the devastated areas, supported the transportation of emergency food to the refugee shelters, and supplied a large volume of emergency wood for the construction of emergency temporary houses.

The Forestry Agency made the National Forests available for the temporary storage of disaster debris, and allowed access to forest roads in the National Forests as detours around damaged public roads.



## 2. Forest, Forestry, and Wood Products Industry in Reconstruction Policies

### 2.1. Reconstruction Policy of Government

In June 2011, the “Reconstruction Design Council in response to the Great East Japan Earthquake” developed its report of recommendations, entitled “Towards Reconstruction- Hope Beyond the Disaster.” The report emphasized the idea of “disaster reduction” so that the damage from natural disasters could be minimized.

In July 2011, the Government developed the fundamental reconstruction policy, titled the “Basic Guidelines for Reconstruction in Response to the Great East Japan Earthquake.” The Guidelines provide an overall picture of the actions of the Government with respect to the reconstruction, focusing on “building disaster resistant and resilient regions,” “restoration of life in communities,” “revival of local economic activities,” “nation-building which incorporate lessons learnt from the Great Earthquake,” and “reconstruction from the nuclear accident,” while setting the timeframe for reconstruction at 10 years, where the first five years represent a “concentrated reconstruction period”

Regarding forest, forestry, and wood products industry, the Guidelines propose to revitalize the forestry and timber industry as an independent local key industry, promote the use of woods harvested in the disaster-affected areas for reconstruction of housing and public buildings, and establish energy supply systems centered on environmentally-friendly wood-based biomass (see BOX).

#### **BOX: Text of the “Basic Guidelines for Reconstruction” (excerpt)**

##### 5. Policies and Measures for Reconstruction- (3) Revival of Local Economic Activities- ④ Forestry

(i) Revitalize forestry and timber industry as an independent local key industry. Establish sustainable forest management by concentration of forest facilities and network building. Advance construction of efficient wood processing and distribution system including restoration of disaster-affected lumber sawing/plywood manufacturing factories and other companies and promote the use of woods made in the disaster affected areas for housing and public buildings

(ii) Promote the application of cogeneration to reconstruction housing, public buildings, common facilities such as fishery cooperative associations and horticultural facilities, as leading model utilizing wooden disaster waste. In the long run, establish sustainable forest management/energy supply systems centered on environmentally-friendly wood-based biomass by shifting to energy supply with wooden resources such as unused forest thinning in the future

### 2.2. Reconstruction Policies of Local Governments

Four disaster-affected prefectures, Aomori, Iwate, Miyagi, and Fukushima, have developed reconstruction policies since April 2011. Those policies cover reconstruction activities in the forestry and wood products industries, including the rapid recovery of the wood products industry, restoration of coastal forests, revival of forestry activities, and promotion of woody biomass use. Some of the reconstruction policies developed by disaster-affected municipalities also contain provisions to support reconstruction actions in forestry and the wood products industry.

### 3. Recovery and Reconstruction of Forest, Forestry, and Wood Products Industry

#### 3.1. Recovery of Forest, Forestry, and Wood Product Industry

##### 3.1.1. Recovery of Forest

Following the Great East Japan Earthquake, there were nearly 4,000 reports of forest-related damage in the 15 prefectures stretching from Aomori to Kochi. In particular, approximately 250 areas of coastal forests were destroyed by the great tsunami along the coastal region between Aomori and Chiba.

In response to this damage, the Forestry Agency is implementing recovery works of damaged soil conservation facilities, forest roads, and conservation forests through the supplementary budget of FY2011. The Agency also held an “Ad-hoc Committee on the Restoration of Damaged Coastal Forests” to review the resiliency of coastal forests against tsunamis and study possible strategies for restoring the damaged forests.

##### 3.1.2. Recovery of Forestry

The Earthquake and resulting tsunami damaged a number of plywood mills and paper mills, suspending distribution of roundwood for plywood production and wood chips for paper production. Some of the employees in regional Forest Owners Cooperatives lost their lives due to the great tsunami. Data collected for the promotion of consolidation in forest management were also lost in the tsunami.

In response, the Forestry Agency is promoting the redirection of roundwood distribution from damaged mills to undamaged mills in remote areas and subsidizing the additional distribution costs through the supplementary budget of FY2011. The Agency is also subsidizing the additional costs for interest payments or loan guarantees resulting from the financing of disaster recovery works, as well as for the training of new employees hired from damaged areas.

##### 3.1.3. Recovery of Wood Products Industry

The Earthquake and resulting tsunami damaged 115 wood processing mills, including six plywood mills and 71 lumber mills. Since the damaged plywood mills accounted for approximately 30% of the volume of domestic plywood production, there was a concern that there would be a plywood shortage.

In response to this damage, the Forestry Agency made efforts to stabilize the wood products market through the provision of accurate market information and expanded information exchange in consultation with representatives of the wood products industry.

Soon after the disaster, the plywood processing industry in other regions of Japan increased their production of plywood, and as a result the total volume of domestic plywood production after the disaster remained at the same level as before the disaster (Fig.1-2).

The Forestry Agency is also assisting the recovery of wood processing/distribution facilities through the supplementary budget of FY2011. As a result, production at damaged plywood and lumber mills has been gradually resuming since July 2011.

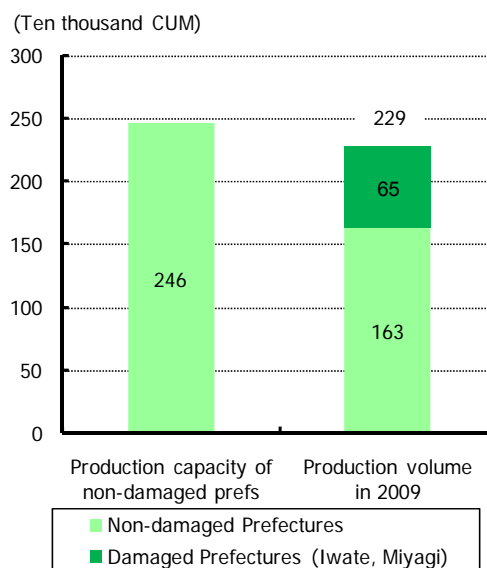


Fig. 1-2: Plywood production capacity and produced volume in FY2009



## 3.2. Contribution of Forest, Forestry, and Wood Products Industry to Reconstruction

### 3.2.1. Restoration of Coastal Forests

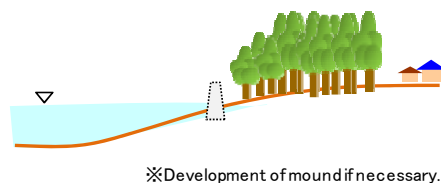
#### (Background)

Coastal forests in Japan have been developed to prevent damage from strong winds, sand storms, and salty breezes in coastal areas since the 17<sup>th</sup> century. Coastal forests with highly developed disaster prevention functions are designated as “conservation forests” under the “Forest Law.” In the Great East Japan Earthquake, 253 areas of coastal forests located between Aomori and Chiba prefectures were heavily damaged by the great tsunami.

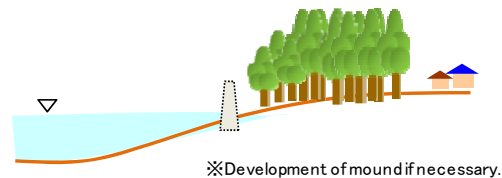
#### (Analysis)

In response to this damage, the Forestry Agency established the “Ad-hoc Committee on the Restoration of Damaged Coastal Forests” to review the effectiveness of coastal forests in protecting against tsunamis and study potential strategies to restore damaged coastal forests. In February 2012, the Committee publicized its recommendations for the restoration of coastal forests. The report concludes that, even though coastal forests do not necessarily provide complete protection against tsunamis, they can be considered as one of “multiple-prevention” measures designated to reduce the effects of tsunamis. The report proposed four possible strategies for the restoration of coastal forests: 1) “restoration as before,” 2) “reinforcement of protective facilities,” 3) “expansion of forest width,” and 4) “improvement of overall functions of coastal forests” (Fig. 1-3).

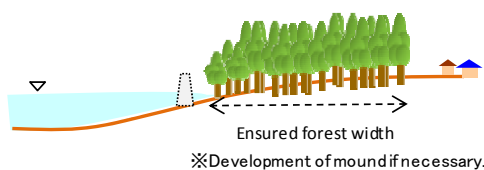
#### ① Restoration as before



#### ② Reinforcement of protective facilities



#### ③ Expansion of forest width



#### ④ Improvement of overall functions of coastal forests

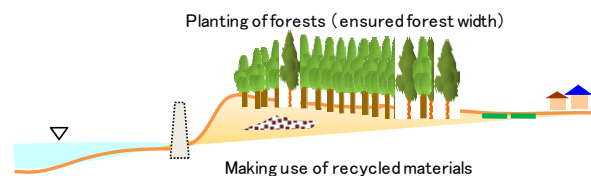
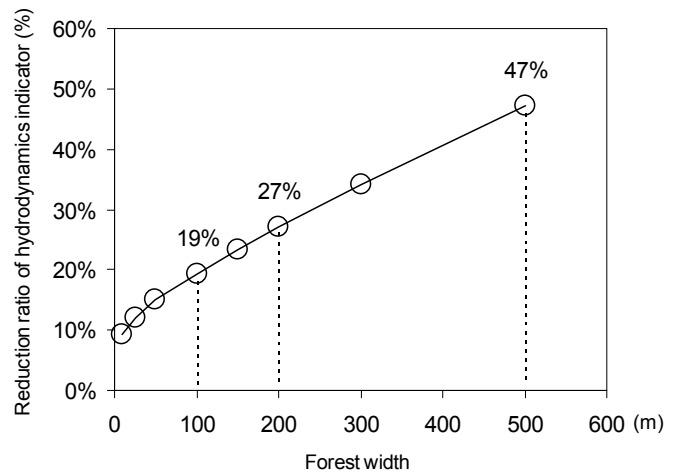


Fig. 1-3: Four strategies for restoration of coastal forests

In general, coastal forests can reduce the destructive effects of tsunamis in four ways: 1) through “mitigation of tsunami energy,” 2) by “prevention of inflow of drifting materials,” 3) by “catching of victims swept away by tsunami,” and 4) by “protection of seawater inflow with sand hills developed in front of coastal forests” (Fig. 1-4). In the Great East Japan Earthquake, the effects of “mitigation of tsunami energy” and “prevention of inflow of drifting materials,” as well as “postponing of tsunami arrival,” were observed.

In areas where the soil layer was thin and the groundwater level was shallow, many standing trees along the coast were uprooted by the tsunami due to the weakness of their root systems. In these cases, small mounds should be developed before planting trees for the restoration of coastal forests.

In order to replant all the damaged coastal forests, more than ten million seedlings will be required. To maximize disease prevention and maintain biodiversity conservation, pine species variants with high nematode resistance and non-coniferous species should be considered for replanting.



**Fig. 1-4:** Mitigation of tsunami energy by coastal forests

### (Challenges)

Based upon the analysis discussed above, the following factors should be considered for the restoration of coastal forests, taking into account the conditions in each region:

- Consistency with regional reconstruction policies
- Location of forest stands to fulfill tsunami disaster reduction functions
- Deepening of soil layer to allow strong root systems to develop
- Construction of sand hills to protect standing trees
- Use of recycled material from disaster debris
- Realization of forest stand structure with highest tsunami mitigation effect
- Development of a stable seedling supply system



Before tsunami



After tsunami

**Photo:** Damage of coastal forests by tsunami (*Takata-matsubara*, Iwate Pref.)

### 3.2.2. Promotion of Wood Use for Reconstruction of Communities

#### (Background)

Since more than 370,000 houses were destroyed in the Earthquake and resulting tsunami, the rapid provision of emergency shelters for refugees became an urgent issue. In response, local governments provided approximately 53,000 of the “emergency temporary houses.”

Initially, the temporary houses were constructed by the “Japan Prefabricated Construction Suppliers and Manufacturers Association.” Later, Iwate, Miyagi, and Fukushima prefectural governments invited local builders to help build emergency temporary houses as a way to also support the recovery of the local economy. As a result, one quarter of the emergency temporary houses were built with a wooden structure (Fig.1-5).

In December 2011, the “Public-Private Cooperative Consortium for Regional Reconstruction Houses” developed a guideline for building “reconstruction houses” with a wooden structure, where refugees will move when the emergency temporary houses are closed after two years.

Prefecture	# of Emergency Temporary Houses (A)	Wooden Structure			Ratio of wooden structure (B/A)
		Prefabricated Association	Local Builders	Total (B)	
Iwate	13,984	2,137	1,594	3,731	26.7%
Miyagi	22,042	2,734	140	2,874	13.0%
Fukushima	15,788	1,635	5,095	6,730	42.6%
Othres	315	-	-		-
Total	52,129	6,506	6,829	13,335	25.6%

Source: MLIT (as of Nov. 16, 2011)

**Fig. 1-5:** Ratio of wooden structure in emergency temporary houses

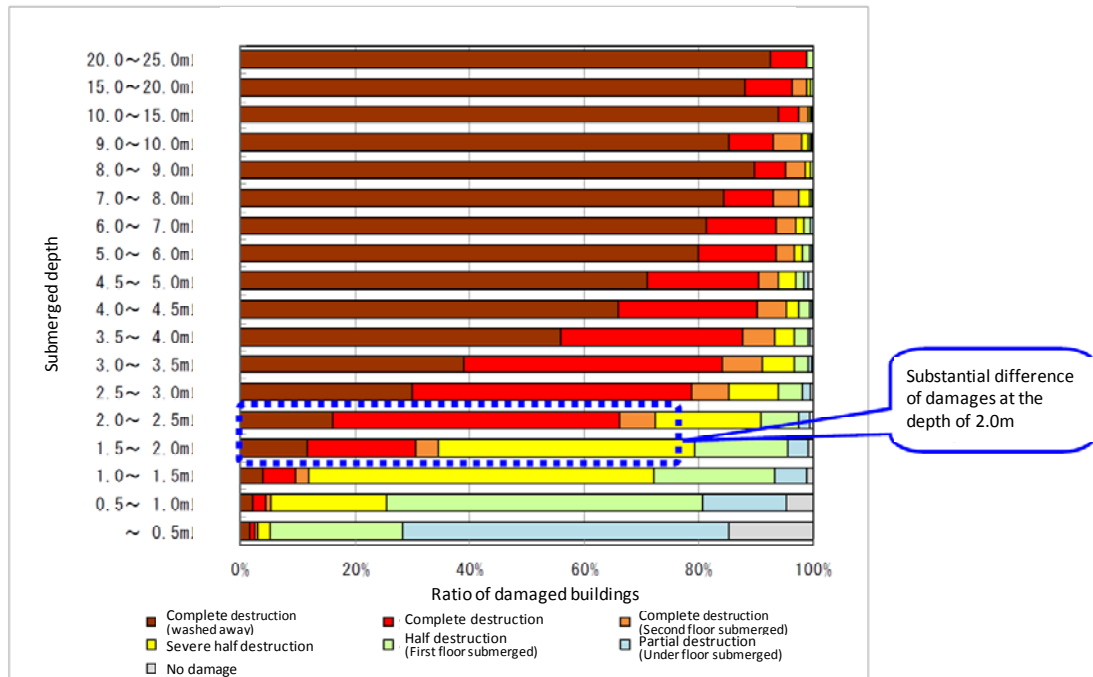
#### (Analysis)

Since many wood processing facilities in the Tohoku region are still suffering from the damage of the earthquake and tsunami, the wood products industry in the Tohoku region will be unable to meet the large wood demand for reconstruction in the region. Therefore, it is important that the nationwide wood supply system is strengthened.

The contracted local builders in the three affected prefectures aggressively made use of locally produced wood for the construction of emergency temporary houses. Wooden emergency temporary houses have a good reputation, in that they are free of condensation and have good insulation characteristics.

In September 2011, the “National Wooden Construction Project Association” was established to develop the supply system for wooden emergency temporary houses in case of natural disasters, through cooperation with all the prefectures in Japan.

The ratio of “complete destruction” among tsunami-damaged buildings was substantially lower for buildings that were submerged in less than 2 meters of water than those submerged under more than 2 meters of water, with wood buildings having the same tendency of damage as non-wood buildings (Fig.1-6).



**Fig. 1-6:** Relationship between buildings damages by Great East Japan Earthquake tsunami and their submerged depth

In the Great East Japan Earthquake, the damage of wooden buildings caused by the earthquake itself was relatively minor. This is because the earthquake-resistant performance of wooden buildings has been improved following the Great Hanshin Earthquake of 1995, with the revision of building codes and the development of advanced construction techniques. It should be also pointed out that the seismic waves with the unique period of wooden houses (1-2 seconds) were less apparent in the Great East Japan Earthquake than the Great Hanshin Earthquake.

### (Challenges)

Based upon the previous analysis, the following measures need to be implemented.

- Development of a nationwide wood supply system to meet the increased wood demand to build the wooden reconstruction houses
- Development of emergency temporary houses using locally produced wood and their supply system
- Promotion of earthquake-resistant performance of wooden houses
- Further promotion of wooden structure and wooden interior decoration in public buildings

### 3.2.3. Promotion of Woody Biomass Use for Stable Energy Supply

#### (Background)

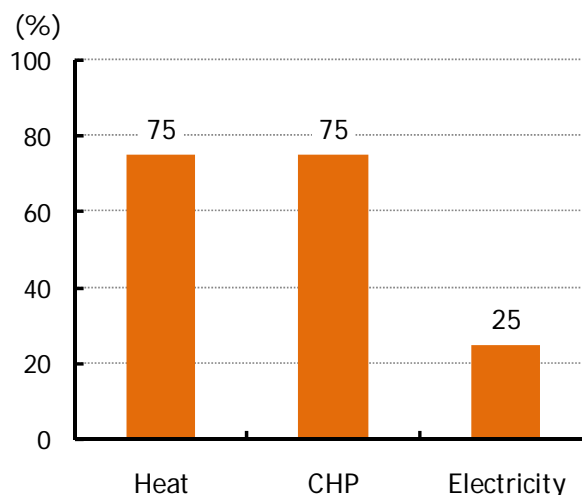
Following the Great East Japan Earthquake, the supply capacity of electricity has been reduced, because the operation of many nuclear power plants has been suspended. The reconstruction policy of the Government proposes to promote the introduction of renewable energy sources including biomass. In August 2011, the “Act on Purchase of Renewable Energy Sourced Electricity by Electric Utilities” was adopted in the Diet for the introduction of the “Feed-in Tariff Scheme for Renewable Energy” from July 2012.

As a result of the Earthquake, approximately 23 million tons of disaster debris has been piled up in Iwate, Miyagi, and Fukushima prefectures. Woody disaster debris is expected to be used for the production of wood-based panels or as a fuel input for boilers and power plants. Some wood processing facilities and biomass power plants have already begun to use wooden disaster debris as a raw material input.

#### (Analysis)

In order to use wooden disaster debris submerged under the tsunami, sea salt needs to be removed from the debris to avoid machinery malfunctions. Much of the salt can be removed by rainfall if the debris is left outside.

The energy efficiency of power generation by woody biomass is reported to be relatively low (Fig.1-7). Therefore, woody biomass should be used for heat production or cogeneration of heat and power (CHP) in principle. In Europe, woody biomass is a popular energy source for “local heat supply.” In Japan, woody biomass could be used for local heat supply in areas where a concentrated thermal demand is expected and there is sufficient volume of forest resources and woody biomass.



**Fig. 1-7:** Energy efficiency of woody biomass use  
Source: Manomet Center for Conservation Sciences (2010)

#### (Challenges)

Based upon above analysis, the following measures need to be implemented.

- Information collection on the volume and location of woody disaster debris
- Introduction of local heat supply system with woody biomass in community reconstruction policies
- Development of a stable woody biomass supply system in preparation for the end of debris disposal

## 4. Reconstruction from Nuclear Accident

### 4.1. Nuclear Accident

On March 11, 2011, the Fukushima Nuclear Power Stations of the Tokyo Electric Power Company (TEPCO) automatically shut down following the Great East Japan Earthquake. They subsequently lost all external power sources which were used to cool the reactor, resulting in a core melt. As a result of explosions presumably caused by hydrogen, a substantial amount of radioactive material was discharged into the atmosphere.

Following the nuclear accident, the Government and TEPCO made efforts for cooling, mitigation, and monitoring and decontamination of the affected nuclear power stations. As a result, a “condition equivalent to cold shutdown” was achieved in December 2011.

### 4.2. Influences of Nuclear Accident

On the day of the Earthquake, the Government announced the “Nuclear Emergency Declaration,” directing residents living around the power plant to evacuate the area. In April 2011, the Government established the “restricted area,” “deliberate evacuation area,” and “evacuation-prepared area in case of emergency,” around the affected power plants.

In April 2011, radioactive material exceeding the “provisional regulation values” was detected on *shiitake* mushrooms grown outdoors on roundwood located in Fukushima prefecture. The Government ordered “shipment restrictions” on the affected *shiitake* mushrooms. Subsequently, the Government ordered additional shipment restrictions on *shiitake* mushroom grown indoors on roundwood, *nameko* and *kuritake* mushrooms grown outdoors on roundwood, as well as on a whole range of wild mushrooms, bamboo shoots, *kogomi* wild plant shoots, and meat obtained from wild boars and bears.

MAFF also established the “temporary permission values” of radioactive cesium for fertilizers. Following the detection of radioactive cesium in tree bark, lumber mills in Fukushima and neighboring prefectures have been required to reduce their shipments of bark, a by-product of lumber production, that are used as fertilizers and as beddings for livestock. Since the affected lumber mills have to store large volumes of potentially contaminated bark inside their mills, the disposal of contaminated bark has become an urgent issue.

The Forestry Agency established the “standard values” of radioactive cesium for roundwood and sawdust blocks for mushroom production as well as for firewood and charcoal used for cooking. As a result, the production of mushrooms and roundwood used for mushroom production declined substantially in Fukushima prefecture. This has disrupted the supply of roundwood used for mushroom production, since Fukushima prefecture accounts for more than half of the supply of domestic roundwood used for mushroom production which is distributed beyond the prefectural borders.

Forests cover 62% of the land area in the municipalities where “restricted area,” “deliberate evacuation area,” or “evacuation-prepared area in case of emergency” have been designated. In these areas, forest management and logging were suspended due to the restriction. Further, the sale and distribution of wood products from these areas were cancelled because of concern about nuclear contamination.



### 4.3. Mitigation Measures to Nuclear Accident

MAFF conducted a survey of the spatial dose rate and concentration of radioactive cesium in soil layers for all over forest areas in Fukushima prefecture (Fig.1-8). MAFF also investigated the concentration and accumulation of radioactive cesium in each part of the forest stand, including the soil, fallen leaves, leaves, and trunk, at three points in Fukushima prefecture (Fig.1-9). The result showed that the concentration value of each part was different among tree species, even at the same location. MAFF further investigated the concentrations of radioactive cesium in male flowers of *sugi*, whose pollen causes hay fever, revealing that the highest internal exposure to radiation of a person who inhaled *sugi* pollens would be  $0.000192\mu\text{Sv/hr}$ .

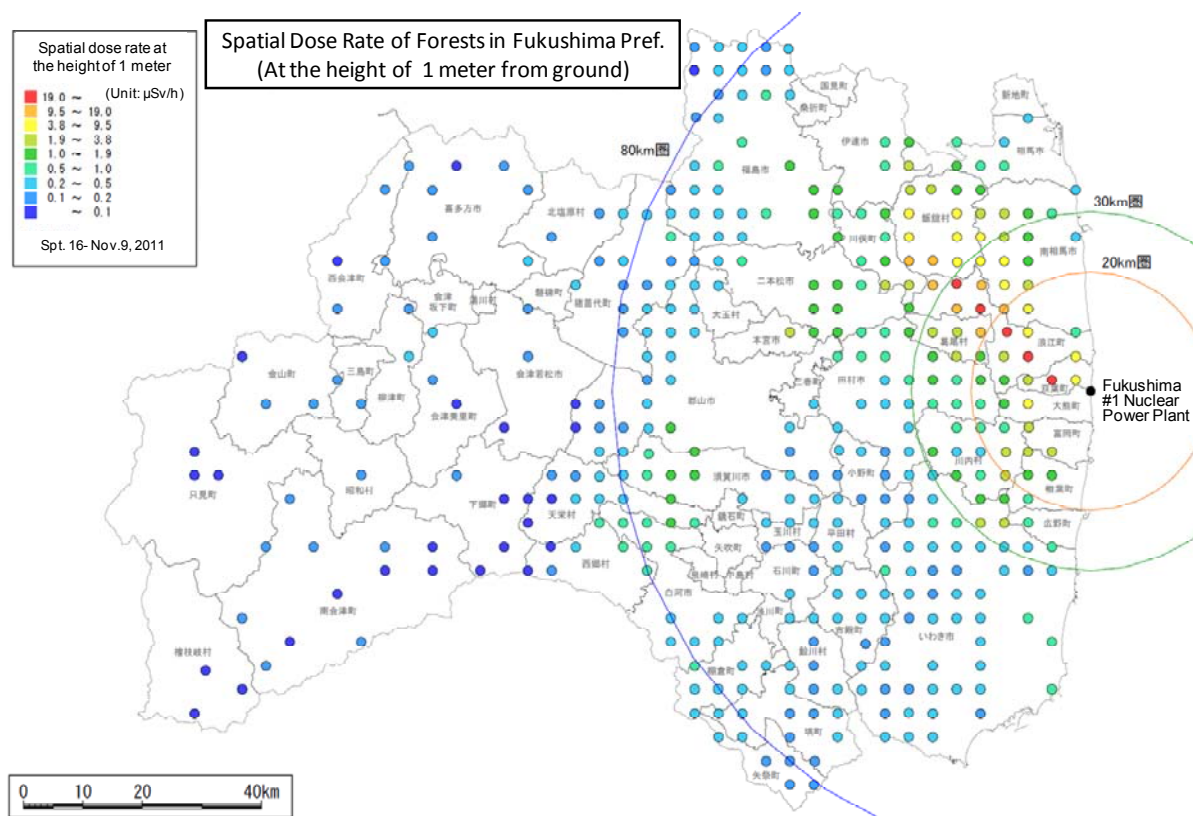


Fig. 1-8: Distribution of spatial dose rate in forests in Fukushima prefecture

The Ministry of Environment (MoE) developed the “Guidelines for Decontamination,” which provide guidance for forest decontamination activities as follows:

- Removal of fallen leaves is effective in non-coniferous forests.
- Removal of fallen leaves should be conducted for a zone extending 20 meters inside of the forest boundaries.
- Removal of fallen leaves should be continued for a long period in coniferous forests.
- When the removal of fallen leaves is not shown to be effective in reducing the level of nuclear contamination, leaves and branches of standing trees on the forest boundary should also be removed.

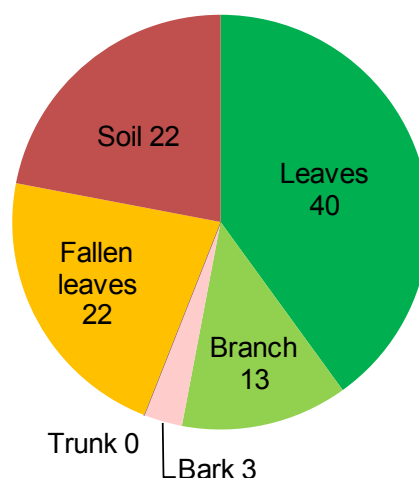
The Forestry Agency is studying the contamination situation of forests and is also developing efficient and effective decontamination methodologies. Further, the Agency will allow the National Forests to be used for the temporary storage of contaminated soil, when requested by municipalities.

In August 2011, the Nuclear Damage Compensation Dispute Examining Committee developed the “Temporary Guidelines for the Judgment of the Range of Nuclear Damage.” The Guidelines cover “reputation damage” of forest products produced in Fukushima and other prefectures for compensation. Accordingly, the Fukushima Prefecture Forest Owners Cooperatives Association requested that TEPCO provide compensation to the Association for its damage.

#### 4.4. Challenges

In order to reconstruct forest and forestry in the aftermath of the nuclear disaster, the following measures need to be implemented.

- Study of the contamination situation in forests located around the TEPCO Fukushima Nuclear Stations
- Investigation of radioactive cesium movement in forest ecosystems
- Safety assurance of forest workers from radiation
- Study of influences on wood and special forest products from contamination and introduction of necessary measures to assure the safety of those products
- Development of efficient and effective decontamination methodologies
- Smooth compensation of damages caused by the nuclear accident
- Continuation of necessary measures in the long-term



**Fig. 1-9:** Distribution of radioactive cesium in forests  
**Note:** Result of survey of *sugi* forests in *Kawauchi* village in Fukushima prefecture, conducted in August 30-31, 2011.

## 5. Recovery and Reconstruction from Earthquake and Revitalization of Forest and Forestry

For the recovery and reconstruction from the Great East Japan Earthquake, forest and forestry need to be revitalized as an independent local key industry for the supply of wood for reconstruction and energy sources.

The Forestry Agency will contribute to the recovery and reconstruction of the damaged area, through the development of a nationwide supply system of wood for reconstruction.

The Agency will also promote the revitalization of forests and forestry nationwide by using advanced projects in damaged areas as “leading models.”

## Chapter II: Global Warming and Forest

### 1. Global Warming

According to the IPCC's Fourth Assessment Report (AR4), warming of the climate system is unequivocal and very likely due to the observed increase in anthropogenic greenhouse gas concentrations. The Kyoto Protocol sets legally binding targets for greenhouse gas emissions and developed countries are bound to reduce their overall emissions of greenhouse gases by at least 5% below 1990 levels in the first commitment period which covers 2008-2012. Japan's emission reduction commitment is 6%.

In 2010, the total volume of Japan's greenhouse gas emission was 1.256 billion CO<sub>2</sub>-tons, a 3.9% increase from 2009 and a 0.4% reduction from the base year of 1990 (Fig.2-1).

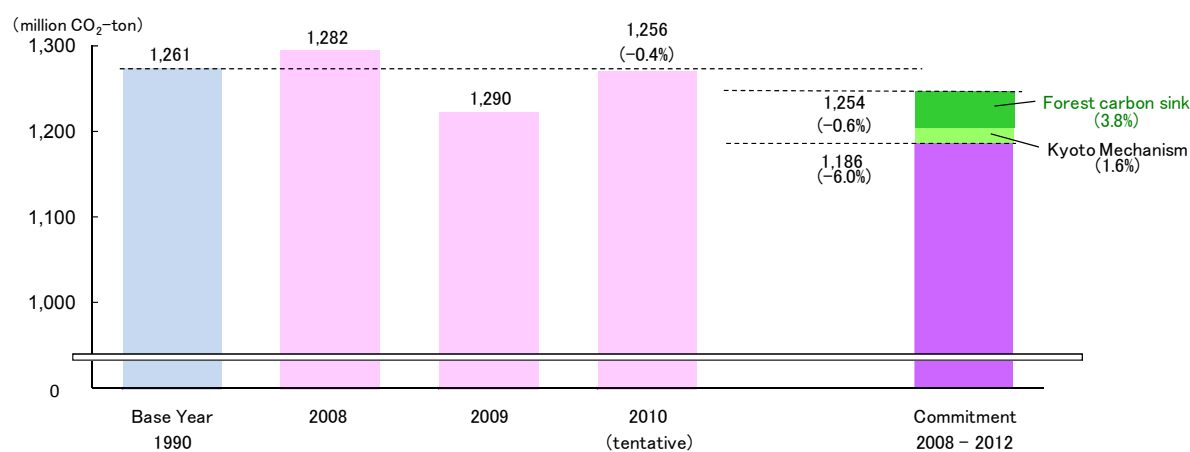


Fig. 2-1: Japan's greenhouse gas emissions for first commitment period (2008-2012)

### 2. Actions toward the Achievement of the Kyoto Protocol Commitment

#### 2.1. Promotion of Forest Sink Activities

Under the Kyoto Protocol, the net change in greenhouse gas emissions resulting from “afforestation,” “reforestation,” “deforestation,” and “forest management” can be used to meet the emission reduction commitments. Japan set a domestic target for greenhouse gas removal by forest management at 13 Mt-C/year (47.67 Mt-CO<sub>2</sub>/year, or 3.8% of the volume of total emissions in the base year).

To meet the removal target of 13 Mt-C/year, Japan has been conducting comprehensive activities including the promotion of proper forest management, stable wood supply, and aggressive wood use.

#### 2.2. Credit Systems in Forest Related Area

In Japan, several systems provide “credits” for emission reduction or carbon sink through the use of woody biomass or proper forest management.

As of December 2011, the “Domestic Credit System” has issued 101,000 tons-CO<sub>2</sub> of credits for 135 forest-related projects, including the boiler fuel transition from fossil fuel to woody biomass, while the “Offset Credit (J-VER) System” has issued 155,000 tons-CO<sub>2</sub> of credits for 70 forest-related projects, including the fuel transition and proper forest management through thinning.

## 2.3 Wood Use for Mitigation of Global Warming

Wood use contributes to mitigation of global warming. Wood products store carbon as wood fiber, require less energy for production than energy-intensive materials such as steel and concrete, and reduce carbon dioxide emissions by substituting for fossil fuels.

As tools to help quantify the contribution of wood use towards the reduction of environmental loads, systems such as the “Carbon Footprint” and “Comprehensive Assessment System for Built Environment Efficiency (CASBEE)” are becoming popular.

### 3. International Negotiations on Global Warming after 2013

The COP17 of UNFCCC, held in Durban, South Africa, in November-December 2011, made a decision that the Ad Hoc Working Group on the Durban Platform for Enhanced Action shall complete its work as early as possible but no later than 2015 in order to adopt this protocol, another legal instrument or an agreed outcome with legal force at the COP21, and for it to come into effect and be implemented from 2020.

It was also decided that the second commitment period under the Kyoto Protocol shall begin on 1 January 2013 and end either on 31 December 2017 or 31 December 2020. Japan has decided not to participate in the second commitment period, arguing that the second commitment period without other major emitting countries would be pointless for the construction of a future comprehensive framework.

In the forest area, the COP concluded that greenhouse gas removals through forest sequestration should be accounted by the “reference level system” (Fig.2-2). The COP also decided that all changes in the carbon pools of harvested wood products (HWP) could be accounted for as emissions or emission reductions of greenhouse gas (Fig.2-3). The COP also discussed the issue of “reducing emissions from deforestation and forest degradation in developing countries (REDD-plus)”.

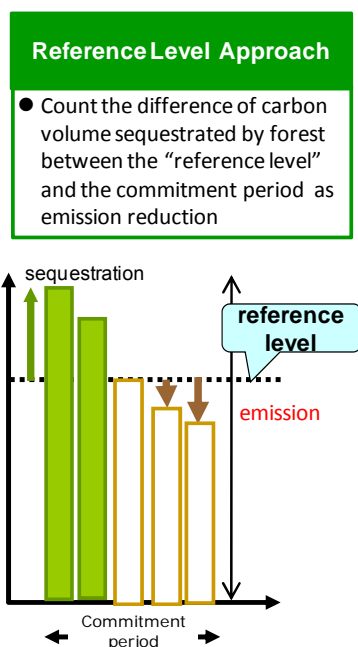


Fig. 2-2: Accounting approach of forest sequestration for the Second Commitment Period

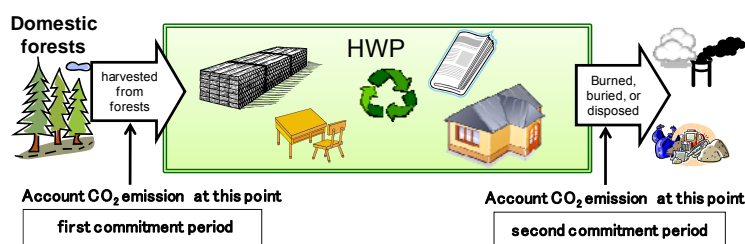


Fig. 2-3: Accounting approach of Harvested Wood Products (HWP)

## Chapter III Forest Management

### 1. Forest Management

#### 1.1. Multiple Functions of Forests

Forests have multiple functional roles, including carbon sequestration and biodiversity conservation. In order to fulfill those functions, vigorous and diversified forests need to be developed.

#### 1.2. Forest Resources

Two third of Japan's land area is covered with forests, with the total forested area being 25 million hectares. Approximately 40% of these forests are artificially planted forests and the major planted species are *sugi*, *hinoki*, and *karamatsu* (larch). Forest ownership in Japan can be divided into approximately 60% for private owners, 30% for national government, and 10% for local governments.

The total volume of the forest inventory reached 4.4 billion m<sup>3</sup> in 2007 and the share of the planted forest area exceeding 50 years in age will exceed 60% in 2017 (Fig.3-1).

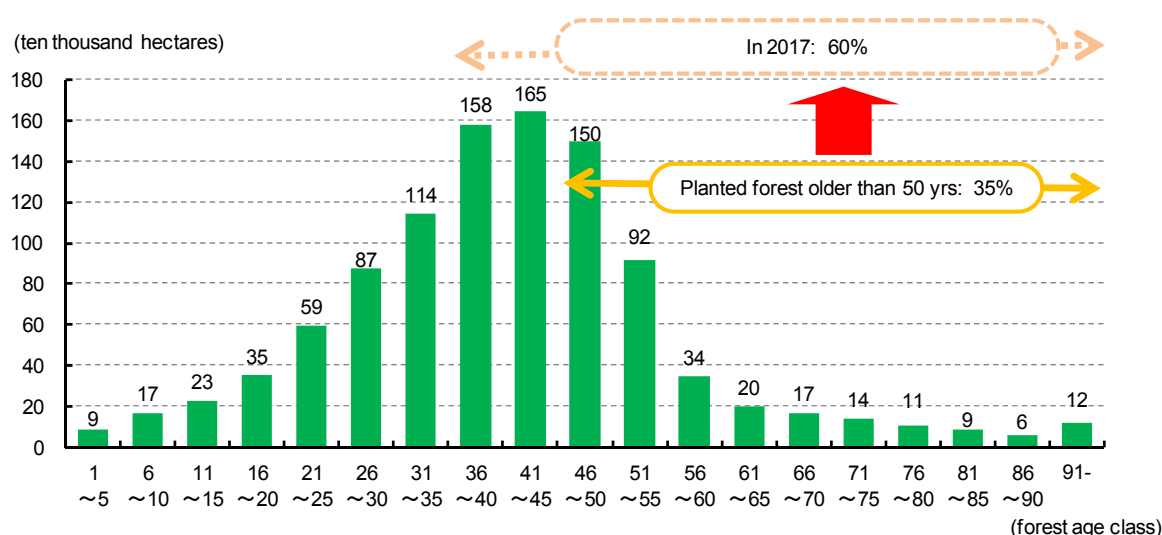


Fig. 3-1: Distribution of planted forest area by forest age class

#### 1.3. Forest Management

In order to maintain the multiple functional roles of forests, forests need to be properly managed and conserved.

The Forestry Agency is promoting “thinning” through assistance for joint thinning projects among forest owners, construction of forest roads, and use of thinned wood for public works, with the goal of achieving 3.3 million hectares of thinning between 2007-2012. In 2010, the total area of thinned forests was 560,000 hectares (Fig.3-2).

In Japan, the “Japanese cedar (*sugi*) pollinosis” is acknowledged to be a nationwide problem. The Forestry Agency is promoting the conversion of existing cedar forests to lower-pollen cedar forests, through the development and planting of lower-pollen Japanese cedar variations. The number of

lower-pollen variation seedlings grown in 2010 was 1.18 million, 13 times as many as in 2005.

#### 1.4. Conservation of Forest Biodiversity

In June 2011, UNESCO decided to register the *Ogasawara Islands* in the World Heritage List in the 35<sup>th</sup> World Heritage Committee which was held in Paris.

In January 2012, the Japanese Government submitted a recommendation to register the “Mount Fuji” in the World Heritage List to the UNESCO Heritage Centre.

#### 1.5. Progress toward the “Forest and Forestry Revitalization Plan”

In April 2011, the Forest Law was revised to introduce the “Forest Management Plan” system to promote coordination and consolidation of forestry practices among groups of small forest owners and the administrative order system to halt logging without permission and oblige those loggers to replant, in accordance with the Forest and Forestry Revitalization Plan.

In July 2011, the “Fundamental Plan of Forest and Forestry” was also revised to set the policy direction for the coordination and consolidation of forestry practices and the acceleration of forest road system development, while setting the goals of “fulfillment of multiple functional roles of forests” and “supply and demand of forest products” (Fig.3-3).

The “National Forest Plan,” a national guideline on forest management, was also revised to introduce a system to allow municipalities to set forest areas in accordance with the expected functions of each forest, while setting the objectives of forest management and conservation.

#### 1.6. People’s Participation in Forest Management

The number of organizations of “forest volunteers” who are willing to participate in voluntary forestry activities reached 2,677 in 2009. Also, many private companies are interested in participating in forest management and conservation as a part of their corporate social responsibility (CSR) activities.

The year 2011 was the “International Year of Forests.” During the year, many promotional activities were conducted, including conferences and planting ceremonies, under the national theme of “Walk in Forests.”

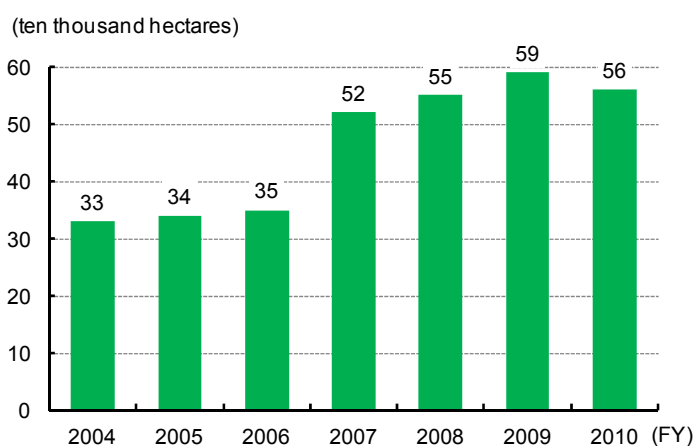


Fig. 3-2: Area of thinned forests in Japan

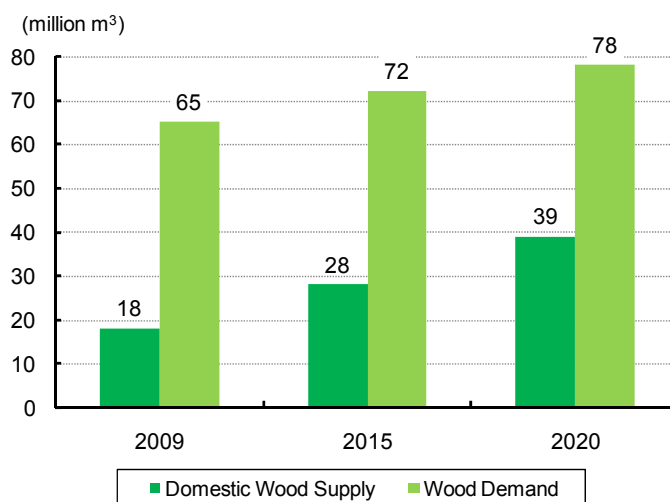


Fig. 3-3: Goal of domestic wood supply and outlook of wood demand in the “Fundamental Plan of Forest and Forestry”



## 2. Forest Conservation and Disaster Control

### 2.1. Conservation Forests

Under the Forest Law, forests providing particularly important public benefits, including securing water resources and preventing disasters, are designated as “conservation forests.” As of 2010, the total area of conservation forests reached 12.02 million hectares, or 48% of the total forest area and 32% of the total land area in Japan. In the “conservation forests,” general forest management is allowed with specific limitations for each type of conservation forest

### 2.2. Disaster Control

In 2011, a number of typhoons and local rainstorms, as well as the great tsunami of the Great East Japan Earthquake, caused many natural disasters in mountainous regions. In response to these disasters, the Forestry Agency dispatched technical staff to the damaged areas soon after the disaster and is now conducting recovery works in those areas.

### 2.3. Wildlife Control

In Japan, approximately 5,000 to 7,000 hectares of forests are damaged by wild animals every year, 70% of which is caused by deer. For the control of wild animals, comprehensive approaches through “reduction of wildlife population,” “prevention of damages,” and “proper management of habitats” is important (Fig.3-4). The Forestry Agency held a symposium on the methodologies for the protection of damage and regeneration of forests.

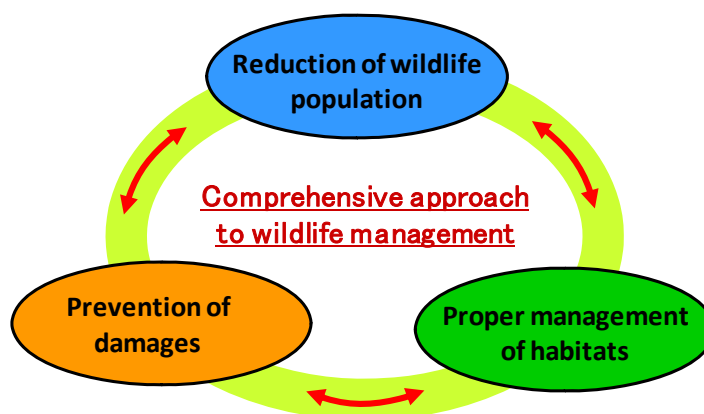


Fig. 3-4: Comprehensive approach to wildlife management

### 2.4. Pest Control

The volume of pine wood damaged by pinewood nematode (*Bursaphelenchus xylophilus*) has declined to approximately one-fourth of its peak year of 1979, but such damage is still the worst among all forest pests and diseases in Japan. The Forestry Agency is implementing “preventive measures” through the application of chemicals and “combating measures” through logging and fumigation of affected trees.

As of October 2011, the volume of damage to *Quercus* spp. trees caused by oak platypodid beetle (*Platypus quercivorus*) has declined to 160,000 m<sup>3</sup>, down by 170,000 m<sup>3</sup> from the previous year. The Forestry Agency is combating the beetle through logging and fumigating of damaged trees and the development of preventive measures including the installation of adhesives.

### 3. International Cooperation

#### 3.1. Sates of World's Forests

Between 2000-2010, the world forest area declined by 5.21 million hectares annually, according to FAO. In Africa and South America, 3.00 million hectares of forests were lost annually, while in Asia, the forest area increased by 2.24 million hectares annually.

#### 3.2. Promotion of Sustainable Forest Management

To promote sustainable forest management, the development of “criteria and indicators” has made progress in various international processes. Japan belongs to the “Montreal Process” in which developed countries other than European countries participate.

Illegal logging substantially hinders the efforts of sustainable forest management. The Japanese Government is promoting international efforts to combat illegal logging under the principle that “illegally harvested timber should not be used.”

In October 2011, Japan and China concluded an agreement titled “Memorandum of Agreements to Combat Illegal Logging and Related Trade for the Promotion of Sustainable Forest Management.”

Forest certification is a private-sector system to advocate consumers' purchase of legally produced wood products for the promotion of sustainable forest management. In Japan, the area of certified forests is increasing, although the speed of that increase has begun to moderate (Fig.3-5).

#### 3.3. Japan's Cooperation

Japan is promoting international cooperation for the promotion of sustainable forest management in developing countries, through bilateral and multilateral schemes including provision of technical and financial assistance.

The International Tropical Timber Organization is an international organization located in Yokohama. ITTO, established in 1986, celebrated its 25<sup>th</sup> anniversary in 2011.

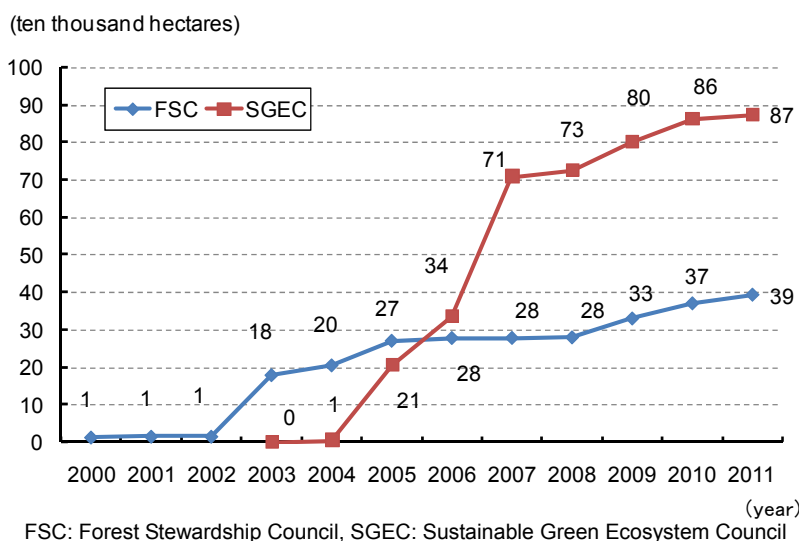


Fig. 3-5: Area of certified forests in Japan

## Chapter IV Forestry and Rural Mountain Communities

### 1. Forestry

#### 1.1. Value of Forestry Production

In 2010, the value of gross forestry production was 421.7 billion yen, a 2.3% increase over 2009.

Among the value of gross forestry production, wood production accounts for 46%, while mushroom production for 52% (Fig.4-1).

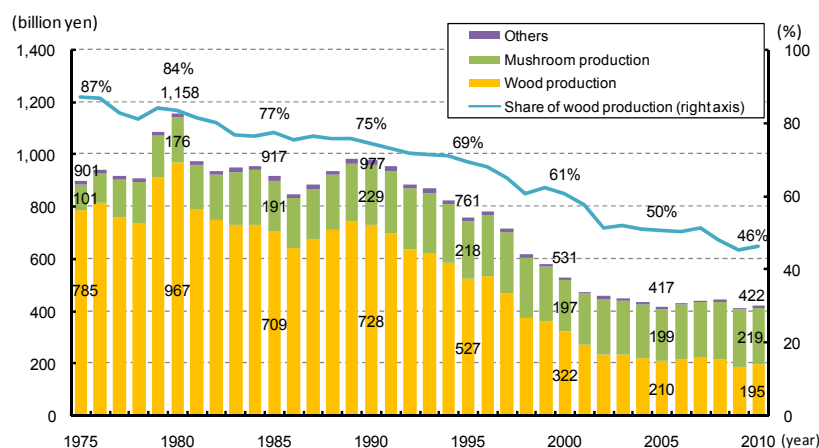


Fig. 4-1: Value of gross forestry production

#### 1.2. Forestry Management

The share of forestry management bodies with wood sales income as the major income source is as low as 5%. Most forestry management bodies depend on income from activities other than forestry.

In Japan, most forests are owned by a large number of small scale forest owners. Further, because the costs for growing forests are very high, forest owners tend to be reluctant to engage in forestry practices, including logging and planting, due to its low profitability.

In 2012, a new system to postpone the payment of inheritance tax on forests was established, following the introduction of the “Forest Management Plan” system by the revision of the Forest Law.

#### 1.3. Forestry Contractors

In Japan, forestry contractors consist of three categories: forest owners, the Forest Owners’ Cooperatives, and private forestry contractors. Among those categories, the Forest Owners’ Cooperatives are major forestry contractors, conducting more than half of forestry activities, including planting, weeding, and thinning. The National Federation of Forest Owners’ Cooperative Associations is promoting the “proposal-based coordination and consolidation of forestry practices” and the development of new “Forest Management Plans,” with the objective of consolidating all of the forests owned by its members.

In Japan, the scale of private forestry contractors is relatively small, with 54% of the private forestry contractors producing less than 1,000m<sup>3</sup> of roundwood annually. In contrast, only 8% of the private forestry contractors produced more than 10,000m<sup>3</sup> of roundwood annually, although those large contractors account for 55% of total roundwood production annually.

Recently, women have begun to increasingly contribute to the promotion of forestry activities.

## 1.4. Forestry Workforce

The size of the forestry workforce has been declining, reaching 47,000 in 2005. Although the share of the aged workforce (aged 65 or older) has reached 26%, the ratio of the young workforce (aged 35 or younger) has begun to rise.

The Forestry Agency is implementing the “Green Employment Program,” which educates introductory skills and knowledge of forestry to the new entrants to forestry. Thanks to the Program, the number of new entrants into forestry was 4,013 in 2010 (Fig.4-2).

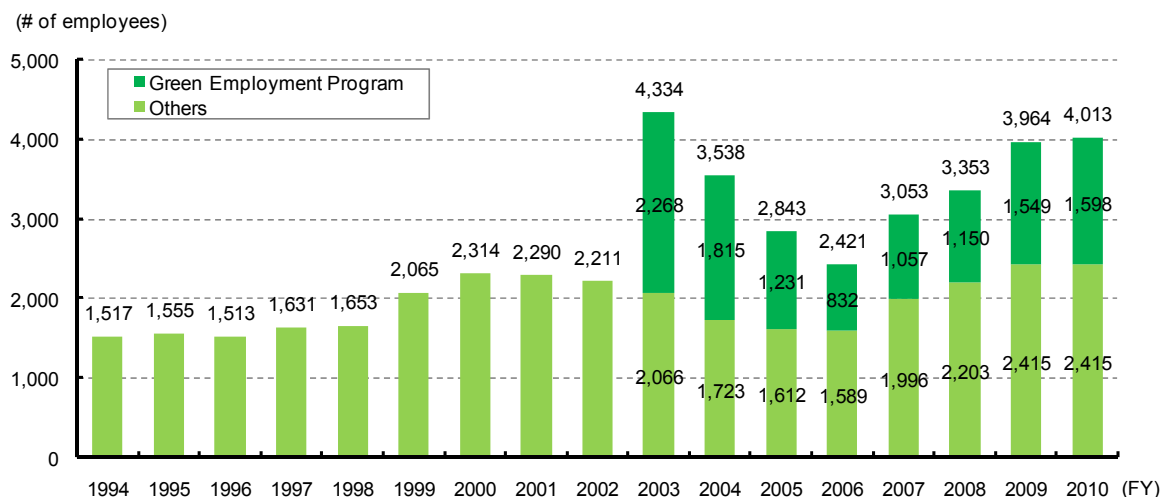


Fig. 4-2: Number of new entrants to forestry workforce

## 2. Forestry Revitalization Projects

### 2.1. Improvement of Forestry Productivity

To improve forestry productivity, the “coordination and consolidation of forestry practices” is very important. Such activities will help to coordinate multiple small forest owners and conduct forestry practices at a large scale.

In 2011, the Forestry Agency introduced the “forest management and environmental conservation direct payment system,” in order to directly support forest owners and contractors who conduct consolidated forest management at a large scale. The system also supports forestry practices, including thinning for material use and development of the forest road network.

In Japan, forest road networks are underdeveloped. The Forestry Agency will accelerate the development of such networks through the construction of “forestry roads” for vehicles and “forest work paths” for machinery (Fig.4-3).

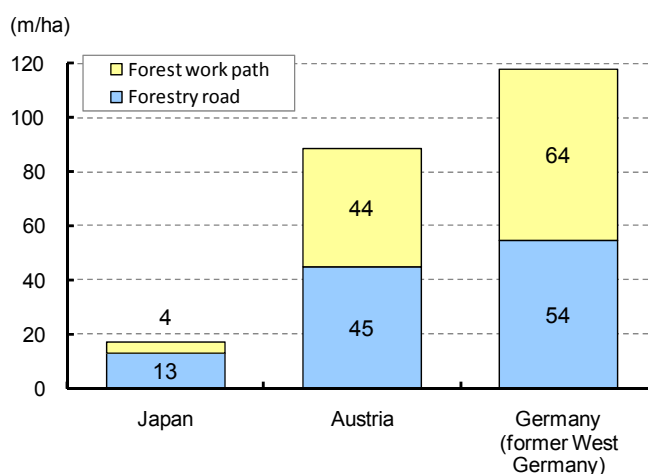


Fig. 4-3: International comparison of forest road network

In 2010, the Forestry Agency implemented the “Experimental Projects of Forest and Forestry Revitalization Plan,” which includes the development of forest road networks, the introduction of advanced forestry machinery, and thinning of forests for wood use. As a result, some forestry projects showed improvements in productivity.

## **2.2. Human Resource Development**

In 2011, the Forestry Agency initiated a training course of “Semi-foresters” and 443 technical staffs of the National Forest Management and prefectures participated in training courses held in seven locations across Japan. The training courses were designed to develop human resources with the necessary skills to provide guidance to municipalities on the development and implementation of the “Municipality Forest Management Plan” as the “master plan” for on-the-ground forest management.

In 2011, the Forestry Agency also initiated a “forest worker” training course for new entrants, and a career development training course for “forest manager” candidates. The Agency also introduced a system to register human resources who have completed these training courses.

## **3. Rural Mountain Communities**

### **3.1. Conditions surrounding Rural Mountain Communities**

In Japan, rural mountain communities cover 50% of the total land area, or 60% of the total forest area. In these areas, the living infrastructure is underdeveloped and the population continues to decline and become older. In such areas, the public benefits of forests might be adversely affected due to the lack of proper forest management.

Those areas need to be maintained through forestry production activities in order to fulfill the multi functional roles of forests.

### **3.2. Revitalization of Rural Mountain Communities**

In order to maintain the community function of rural mountain communities, the promotion of settlements from urban areas, improvement of community infrastructure, and creation of job opportunities are important. To achieve these goals, the Forestry Agency promotes communication between rural mountain communities and urban areas and supports settlement initiatives through the creation of job opportunities in new businesses utilizing forest resources.

The Forestry Agency is promoting the “sixth industry” initiative, which seeks to integrate first (agriculture, forestry and fisheries), second (manufacturing), and third (service) industries, through the integration of primary production and its processing/distribution or the invention of new industrial sectors which utilize local primary resources. The registered “voluntary planners” who have enough skills for such integration are assisting these “sixth industry” initiatives at the local level.

## Chapter V: Wood Demand/Supply and the Wood Products Industry

### 1. Wood Demand and Supply

#### 1.1. World wood demand and supply

The total volume of industrial roundwood consumption in the world has been increasing. In 2010, the total volume consumed reached 1.53 billion m<sup>3</sup>, a 7% increase over 2009 that has been attributed to the global economic recovery.

As for the world wood trade, China has increased imports of industrial roundwood and exports of plywood, while Russia has decreased exports of industrial roundwood. These two countries have strong influence on the global trade of wood products.

As of March 2012, Japan has concluded Economic Partnership Agreements (EPA) with 13 countries and regions. In November 2011, Japan declared that it would begin a consultation process with concerned parties regarding possible participation in negotiations on the Trans-Pacific Partnership (TPP).

#### 1.2. Wood demand and supply in Japan

In 2010, Japan's wood demand increased by 11% from the previous year, reaching 70.25 million m<sup>3</sup>, due to an increase in new housing starts (Fig.5-1).

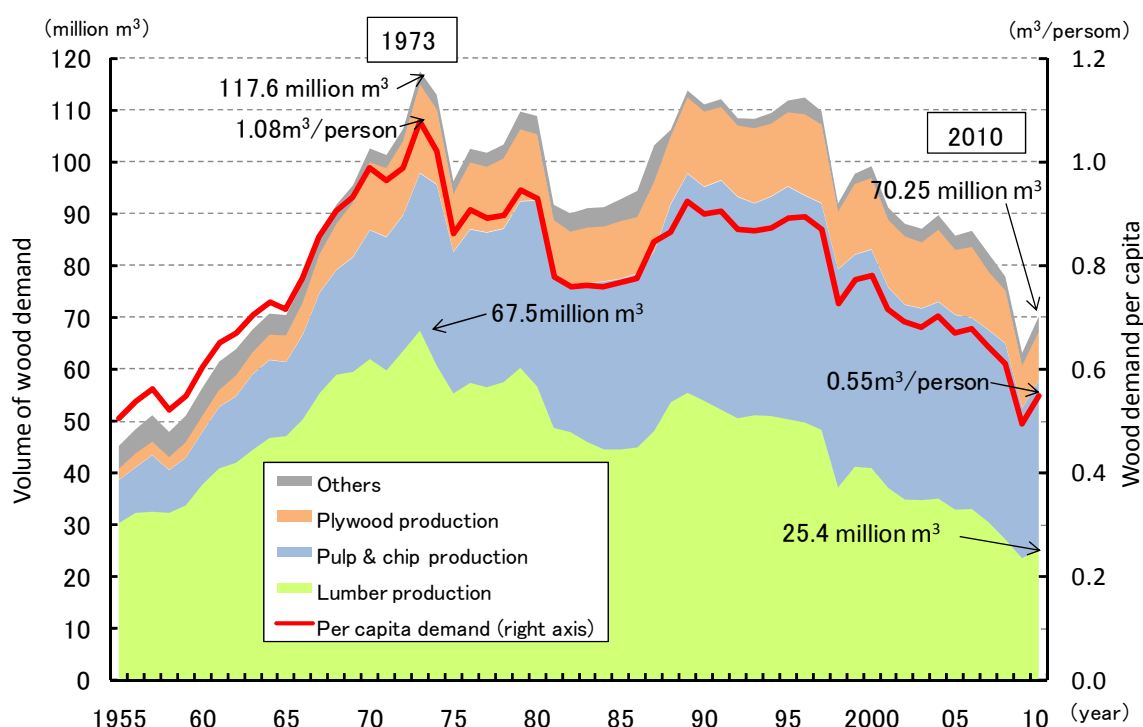


Fig.5-1: Wood demand in Japan

The size of the domestic wood supply increased by 3.7%, reaching 18.24 million m<sup>3</sup>, while that of imported wood increased by 14%, reaching 52.02 million m<sup>3</sup>. As a result, the self-sufficiency rate for wood in 2010 was 26.0%, down 1.8 % from 2009.



The volume of wood demand for lumber production dropped to one third of the peak year in 1973, due to the decline in the number of domestic housing starts.

The volume of domestic wood used for plywood production has been increasing sharply. In 2010, the supply of domestic wood for plywood production reached a record high of 2.49 million m<sup>3</sup>, resulting in a 26 % self-sufficiency rate in the roundwood supply for plywood production.

Wood demand for chip and pulp production is also on the decline due to a decrease in paper demand.

### **1.3. Wood prices**

In 2011, the price for domestic roundwood increased slightly, in spite of the long-term downward trend. Regarding processed wood products, the price of *sugi* lumber (KD) increased while that of domestically produced laminated lumber, which competes with *sugi* lumber, remained at the same level as the previous year. The price of softwood plywood increased from the previous year, due to the damage of plywood mills by the Great East Japan Earthquake and the increase in the demand for plywood as a result of the reconstruction activities.

### **1.4. Wood from responsible forest management**

For the promotion of responsible/sustainable forest management, the Government is encouraging the use of legally or sustainably produced wood, based on the “Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (Act on Promoting Green Purchasing)”.

### **1.5. Non-wood forest products**

Non-wood forest products include mushrooms, wild vegetables, edible nuts, and charcoal. In 2010, the total value of non-wood forest products production was 28.48 billion yen, 90% of which was derived from mushroom production.

A number of mushroom production facilities were damaged by the Great East Japan Earthquake. In addition, as a result of the damage to the TEPCO Fukushima Nuclear Power Stations, radioactive cesium was detected in non-wood forest products including mushrooms at levels exceeding the “provisional regulation values”. Therefore, the Government ordered “shipment restrictions” on those non-wood forest products.

The Forestry Agency is assisting in the recovery of mushroom production facilities, studying the effects of radioactive materials on non-wood forest products, developing a certification system to ensure the safety of non-wood forest products, and examining the effectiveness of methods to mitigate the influence of radioactive materials.

## 2. Wood Products Industry

### 2.1. Sectoral trend of the wood products industry

As for lumber production, large scale lumber mills are becoming dominant. In 2010, large lumber mills consumed 60% of the total raw material inputs, although they only accounted for 7% of the number of lumber mills (Fig.5-2). The share of domestic wood in material inputs for lumber mills was 67%.

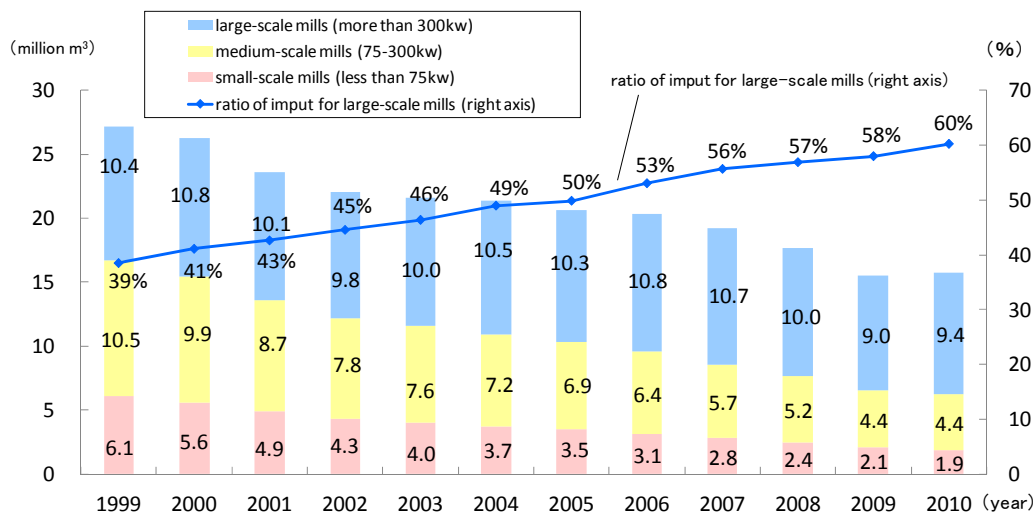


Fig. 5-2: Roundwood input in lumber mills by production scale

As for plywood production, the supply of domestic wood used for plywood production is rapidly increasing. The share of domestic wood in the raw material input for domestic plywood mills reached 65% in 2010 (Fig.5-3).

### 2.2. Reform of wood products processing/distribution system

Japan's forestry and wood products industry has been slow to develop a stable supply system for wood products with assured quality and performance with low costs, due to the small-scale, dispersed, and multi-layered system of production, distribution, and processing.

The Forestry Agency has implemented model projects for the reform of the forestry and wood products industry: "New Wood Products Distribution and Processing Project" for the laminated lumber and plywood sector and "New Wood Production Projects" for the lumber production sector. These model projects have realized cost reductions in wood production and the direct delivery of timber to lumber mills, and helped increase stumpage prices.

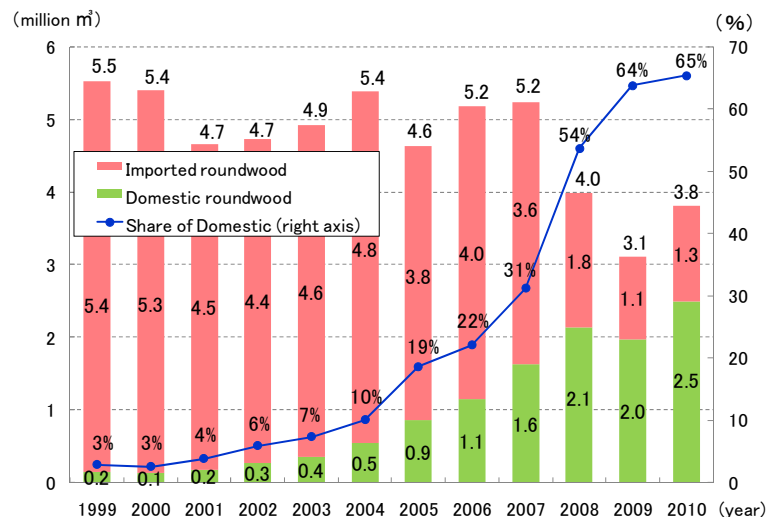


Fig. 5-3: Material inputs for plywood production and share of domestic roundwood

### **3. Promotion of Wood Use**

#### **3.1. Housing sector**

Approximately 40% of Japan's wood demand is used for building construction. In particular, the trend of new housing starts of wooden houses significantly influences wood demand as a whole.

Recently, major housing companies have begun to use domestic wood more aggressively in their business activities.

The Forestry Agency is promoting local housing projects through the cooperation among forest owners, log producers, lumber producers, and local home builders who are willing to use local wood products.

#### **3.2. Wooden public buildings**

In October 2010, new legislation to promote wood use in public building was enacted. According to the legislation, the Government is promoting wooden structures and wooden interior decorations in public buildings as long as possible. Further, the governmental ministries and local governments are developing their own policies to increase the use of wood in public buildings.

In May 2011, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) developed the "Planning and Designing Standard of Wooden Constructions" as a technical standard on the construction and repair of wooden buildings by the Government.

#### **3.3. Energy use of woody biomass**

Among the variety of woody biomasses, most of the "mill residue wood" and "construction refuse wood" is almost fully utilized. However, more than 20 million m<sup>3</sup> of "unused thinned wood," a by-product of wood production, is estimated to be left in the forests every year. Use of this "unused thinned wood" is indispensable for the promotion of energy production using woody biomass.

In August 2011, the "Act on Purchase of Renewable Energy Sourced Electricity by Electric Utilities" was adopted in the Diet. In accordance with the legislation, the "Feed-in Tariff Scheme for Renewable Energy" will be introduced in July 2012. The scheme will support power generation from biomass.

#### **3.4. Wood exports**

Wood demand in developing countries is increasing including in China. In 2011, China accounted for the largest share in the value of wood products exported from Japan.

The Government is promoting the export of wood products to China and Korea, through the exhibition of domestic housing materials in these countries. The Japan Wood Products Export Promotion Council is also participating in the revision of China's "Wooden Structure Design Standard", to ensure that Japan's domestic wood species are included in the Standard.

#### **3.5. Promotion of Wood Use**

The Forestry Agency is promoting national initiatives to promote wood use and education on wood use, such as "Kizukai" and "Mokuiku" initiatives.

In 2011, various events were held to provide opportunities to experience the comfort of wood products as a promotional activity of the "International Year of Forests 2011". A design contest on wood use was also conducted.

## Chapter VI National Forest Management

### 1. Roles of National Forests

National Forests represent approximately 30% of the total forest area, or almost 20% of the total land area in Japan (Fig.6-1). National Forests perform vital roles in the fulfillment of the multiple functions of forests, including land conservation, water resource development, and conservation of natural environment.

### 2. Management of National Forests

The Forestry Agency is managing National Forests for the maintenance and development of the multiple functions of forests. The Agency categorizes each National Forest into one of three functional types according to its primary function: “land and water conservation forests,” “forest-human co-existence forests,” and “sustainable resource use forests.”



Fig. 6-1: Location of National Forests

The Forestry Agency conducts “forest conservation projects” for the restoration of devastated forests or the proper management of “conservation forests.” Following the Great East Japan Earthquake, the Forest Agency provided human and material support to the devastated areas, while implementing restoration works within the damaged areas.

Recently, the Forest Agency has begun to promote forest management and forest road system development in cooperation with the private forest sector through the establishment of “cooperative forest management areas.”

The Forestry Agency is implementing “model projects” in which a wide range of organizations cooperatively manage National Forests. The Agency also provides access to its National Forests to various organizations for their activity fields, such as “Forests for Students,” “Forests for Voluntary Groups,” “Forests for Corporations,” or “Forests for the Wood Culture.”

The Forestry Agency is promoting thinning activities within National Forests to meet the removal target under the Kyoto Protocol. In 2010, the Forestry Agency thinned 110,000 hectares within the National Forests. The Agency is also promoting wood use in forest civil engineering works.

The Forestry Agency is conducting forest management for the conservation of biodiversity, designating National Forests with diverse forest ecosystems as “Protected Forests,” or “Green Corridors” which connect several “Protected Forests.” The Agency will strengthen its conservation works in the World Natural Heritage areas including *Ogasawara* islands.

National Forests play an important role in providing a stable supply of domestic wood, providing approximately 20% of the total domestic wood supply. The Forestry Agency is promoting a stable wood supply through agreements with major wood processing companies, such as large-scale lumber mills or plywood factories.

The Forestry Agency has designated National Forests with spectacular landscape suitable for recreational activities as “Recreational Forests.”

The Forestry Agency is contributing to the revitalization of nationwide forest and forestry, through the promotion of thinning for wood use by efficient transportation systems, and the assistance for human resource development projects such as “semi-forester” training courses.

### 3. Reform of National Forest Management Special Account

The Forestry Agency has been making efforts to restore the financial stability of the National Forest Management Special Account through ensuring income from sales of wood and other properties and implementing effective forest management through private consignment. As a result, the Special Account has succeeded in keeping financial balance without external borrowing since FY 2004. In FY2010, the Agency paid off one billion yen of debt in the Special Account.

In December 2011, the Forest Policy Council developed its recommendations on the reform of National Forest Management. In January 2012, the Cabinet decided its fundamental policy for the reform of special accounts in general. In response to these directions, the Forestry Agency proposed legislation to the Diet in March 2012 which will abolish the National Forest Management Special Account in FY2012 and conduct National Forest Management within the General Account budget for the fulfillment of the multiple functional roles of forest and contribution to the revitalization of nationwide forest and forestry (Fig.6-2).

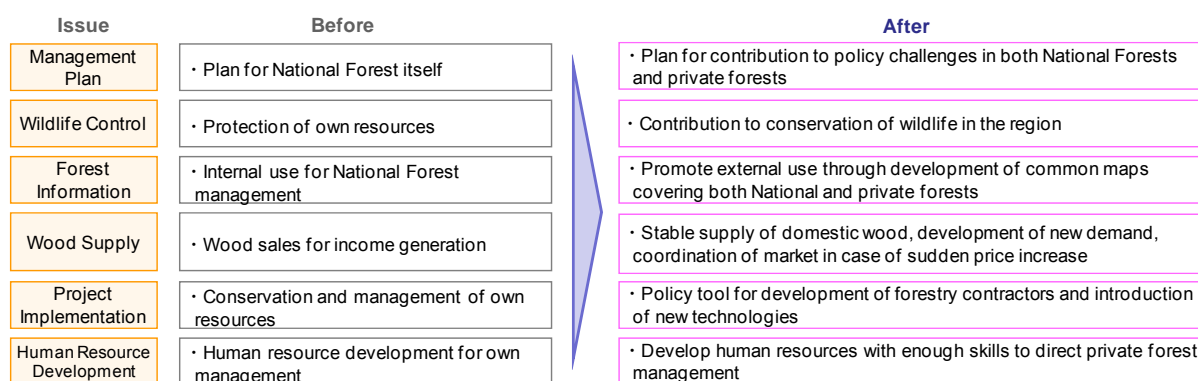


Fig. 6-2: National Forest Management under General Account budget

## Appendix

### 1. Forestry-related Fundamental Figures

Item	Unit	1980	1995	2000	2005	2006	2007	2008	2009	2010
i Gross domestic product (GDP)	billion yen	242,838.7	495,165.5	502,989.9	503,903.0	506,687.0	512,975.2	501,209.3	471,138.7	481,773.2
Forestry (A)	billion yen	826.0	695.8	886.5	446.4	477.5	497.3	437.9	387.4	• • •
Forestry / GDP	%	0.34	0.14	0.17	0.09	0.09	0.10	0.09	0.08	• • •
Forestry (B)	billion yen	• • •	• • •	• • •	142.7	160.7	170.7	167.4	146.7	156.7
Forestry / GDP	%	• • •	• • •	• • •	0.03	0.03	0.03	0.03	0.03	0.03
ii Total number of workers	million	55.36	64.57	64.46	63.56	63.82	64.12	63.85	62.82	62.57
Forestry	million	0.19	0.09	0.07	0.06	0.06	0.05	0.06	0.06	0.08
Forestry / Total No. of workers	%	0.34	0.14	0.11	0.09	0.09	0.08	0.09	0.10	0.13
iii Area of national land of Japan	million ha	37.77	37.78	37.79	37.79	37.79	37.79	37.79	37.79	37.79
iv Forest area	million ha	25.28	25.15	25.15	25.12	25.12	25.10	25.10	25.10	25.10
Forest / National land	%	67.8	67.5	67.5	67.4	67.4	67.3	67.3	67.3	67.3
v Conservation forest area	million ha	7.32	8.57	8.93	11.65	11.76	11.88	11.91	11.96	12.02
Conservation forest / Forest	%	29.0	34.1	35.5	46.4	46.8	47.3	47.5	47.7	47.9
vi Growing stock of forest	billion m <sup>3</sup>	2.5	3.5	3.5	4.0	4.0	4.4	4.4	4.4	4.4
vii Industrial wood supply/ consumption	million m <sup>3</sup>	108.96	111.92	99.26	85.86	86.79	82.36	77.97	63.21	70.25
Domestic production	million m <sup>3</sup>	34.56	22.92	18.02	17.18	17.62	18.63	18.73	17.59	18.24
Import	million m <sup>3</sup>	74.41	89.01	81.24	68.68	69.17	63.74	59.23	45.62	52.02
Self-sufficiency rate	%	31.7	20.5	18.2	20.0	20.3	22.6	24.0	27.8	26.0
viii New housing starts	million units	1.27	1.47	1.23	1.24	1.29	1.06	1.09	0.79	0.81
Wooden structure rate	%	59.2	45.3	45.2	43.9	43.3	47.6	47.3	54.6	56.6

Notes 1: Figures in "Forestry (B)" are equal to the Figures in "Forestry (A)" minus the production value of National Forest Management Special Account.

2: "Conservation forest area" in "v" refers to the area excluding duplication.

3: "Industrial wood supply/ consumption," "Domestic production" and "Import" in "vii" refer to the volume in log equivalent.

Source: i: Cabinet Office "SNA (System of National Accounts)," ii: Ministry of Internal Affairs and Communications "Labor Force Survey"

iii: Ministry of Land, Infrastructure, Transport and Tourism (MLIT) "Statistics Reports of Administratives"

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

### 2. Gross Domestic Product Classified by Economic Activities (at current prices) (billion Yen)

Item	1995	2000	2005	2006	2007	2008	2009	2010
Gross domestic product	495,166	502,990	503,903	506,687	512,975	501,209	471,139	481,773
Industries	463,956	468,062	445,662	447,674	453,695	440,946	412,615	423,509
Agriculture, forestry and fishing	9,346	8,896	6,108	5,957	5,854	5,700	5,440	5,556
Forestry (A)	696	887	446	478	497	438	387	• • •
Forestry (B)	• • •	• • •	143	161	171	167	147	157
Mining	861	627	400	397	392	353	283	287
Manufacturing	114,669	111,439	99,699	100,268	103,565	98,666	83,351	93,362
Pulp, paper and paper products	3,399	3,237	2,728	2,447	2,298	2,295	2,314	2,343
Wood and wooden products	1,469	1,240	946	880	859	813	686	671
Construction	40,850	37,130	29,018	29,547	29,385	28,091	26,948	26,656
Electricity, gas and water supply	13,329	13,576	11,712	11,259	10,423	9,661	11,132	10,972
Wholesale and retail trade	75,788	70,661	74,814	71,743	69,871	70,111	64,136	64,352
Finance and insurance	31,964	30,445	30,789	30,215	30,808	25,082	23,742	23,630
Real estate	53,757	57,864	54,042	55,365	55,721	56,013	56,879	57,005
Transport and communications	35,264	34,821	• • •	• • •	• • •	• • •	• • •	• • •
Transport	• • •	• • •	24,379	25,428	26,483	25,383	22,974	23,503
Communications	• • •	• • •	26,269	26,764	27,181	27,306	26,189	26,199
Service activities	88,129	102,604	88,433	90,731	94,012	94,580	91,541	91,988
Others	31,209	34,928	58,241	59,013	59,281	60,263	58,524	58,264

Note 1: Figures in "Forestry (B)" are equal to the Figures in "Forestry (A)" minus the production value of National Forest Management Special Account.

2: "Transport and communications" is divided into "Transport" and "Communications".

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

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

### 3. Gross Forestry Output (Billion Yen)

Item	1995	2000	2005	2006	2007	2008	2009	2010
Gross output of Forestry	760.55	531.10	416.77	431.93	441.42	444.87	412.20	421.69
Log production	526.61	322.13	210.23	216.85	225.56	213.30	186.07	194.55
Softwood	436.76	265.33	177.41	183.67	195.18	180.39	156.09	170.16
Japanese Cedar	187.39	123.78	87.53	92.56	102.88	94.12	81.60	93.50
Hardwood	86.02	54.72	31.71	32.19	29.38	32.05	29.22	23.76
Wood fuel production	7.93	6.16	6.09	5.60	5.48	5.05	4.91	5.08
Mashroom production	218.32	196.89	198.50	207.05	208.30	223.98	220.01	218.91
Forestry by-product	7.70	5.92	1.96	2.43	2.08	2.55	1.22	3.15
Value-added of Forestry	532.91	351.87	245.60	248.59	246.37	241.61	219.30	225.50

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

Source: MAFF "Report of Statistics on Forestry Income".



#### 4. Current State of Forest Resources

(1,000ha, Million m<sup>3</sup>)

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			25,097	4,431.74	10,347	2,651.31	13,383	1,779.39	1,208	1.04	159
National forest	Subtotal		7,686	1,078.27	2,364	423.61	4,691	653.81	631	0.86	0
	Under the Forestry Agency's jurisdiction	Subtotal	7,623	1,070.90	2,355	420.82	4,646	649.23	622	0.86	0
		State-owned	7,513	1,051.90	2,267	402.02	4,643	649.03	603	0.85	0
		Government reforestation	101	19.01	88	18.80	2	0.20	10	0.00	0
		Others	9	0.00	0	0.00	0	0.00	9	0.00	0
	Under other agency's jurisdiction		63	7.37	9	2.80	45	4.57	9	0.00	0
Private and public forest	Subtotal		17,411	3,353.47	7,983	2,227.70	8,693	1,125.59	577	0.18	159
	Public forest	Subtotal	2,830	484.33	1,247	294.62	1,449	189.63	128	0.08	6
		Prefecture	1,188	190.35	464	100.66	667	89.68	56	0.01	1
		Municipality	1,642	293.98	783	193.96	782	99.95	72	0.07	5
	Private forest		14,535	2,863.51	6,724	1,930.60	7,217	932.81	445	0.10	150
	Others		46	5.63	12	2.48	27	3.15	4	0.00	3

Note 1: Data cover the forests defined in the Forest Law Article 2.1.

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 the Forest Law Article 5 and for National Forest under the Forest Law Article 7.2.

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

4: Figures are as of March 31, 2007.

Source: Forestry Agency

#### 5. Planted Area by Tree Species

(ha)

	Total	Softwood					Hardwood
		Japanese Cedar	Japanese Cypress	Pine	Japanese Larch	Others	
1995	( 48,650 )	( 13,660 )	( 22,332 )	( 219 )	( 2,739 )	( 5,544 )	( 4,156 )
	45,241	13,196	20,908	199	2,677	4,577	3,684
2000	( 31,316 )	( 8,223 )	( 11,574 )	( 233 )	( 2,524 )	( 4,954 )	( 3,808 )
	28,480	7,967	10,745	223	2,493	4,014	3,038
2005	( 25,584 )	( 5,216 )	( 7,096 )	( 226 )	( 3,534 )	( 5,728 )	( 3,784 )
	22,498	5,011	6,307	183	3,423	4,611	2,963
2006	( 23,872 )	( 4,845 )	( 5,998 )	( 256 )	( 3,521 )	( 5,144 )	( 4,108 )
	21,048	4,579	5,225	229	3,340	4,327	3,348
2007	( 25,836 )	( 5,546 )	( 6,205 )	( 265 )	( 3,788 )	( 5,647 )	( 4,385 )
	23,064	5,289	5,460	252	3,642	4,715	3,706
2008	( 23,400 )	( 5,171 )	( 4,726 )	( 217 )	( 4,414 )	( 5,173 )	( 3,699 )
	20,865	4,904	4,079	175	4,260	4,380	3,067
2009	( 23,032 )	( 4,787 )	( 5,241 )	( 166 )	( 4,638 )	( 5,282 )	( 2,917 )
	20,006	4,522	4,113	150	4,435	4,490	2,296
2010	( 18,756 )	( 4,132 )	( 2,820 )	( 247 )	( 4,604 )	( 4,265 )	( 2,688 )
	16,388	3,844	2,262	237	4,418	3,381	2,246

Note 1: Figures do not include National Forest.

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

Source: Forestry Agency

#### 6. Planted Forest Area by Age Classes

(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

Note 1: For 1985, the class XV contains forests older than that class. For 1989 and 1994, the class XVII contains forests older than that class. For 2001 and 2006, the class XIX contains forests older than that class.

2: "standing tree area" refers to forests defined in the Forest Law Article 5 and 7.2.

Source: Forestry Agency

## 7. Thinned Area and Use of Thinned Wood

	Thinned area (1,000ha)			Used volume of thinned wood (million m³)					
	Total	Private and public forest	National forest	Total	Subtotal	Sawnwood	Roundwood	Others	National forest
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

Note 1: Used volumes are in log equivalent.

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

Source: Forestry Agency

Private and public forest			1990	1995	2000	2003	2004	2005	2006	2007
	Thinned area (1,000ha)		277	215	304	312	277	281	282	395
	Used volume of thinned wood (million m³)	Total	2.34	1.83	2.74	2.83	2.84	2.84	3.24	3.44
		Sawnwood	1.70	1.25	1.95	1.85	1.84	1.81	1.96	2.14
		Roundwood	0.37	0.34	0.41	0.50	0.45	0.41	0.48	0.47
		Others	0.26	0.24	0.38	0.48	0.55	0.62	0.80	0.83

Note 1: Used volumes are in log equivalent.

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

Source: Forestry Agency

## 8. Forest Area by Owners

	2010	
	ha	%
Total	17,627,335	100.0
Private	13,584,004	77.1
Public	3,395,800	19.3
Prefecture	1,248,262	7.1
Public corporation	436,296	2.5
Municipality	1,404,452	8.0
Property ward	306,790	1.7
Incorporated Administrative Agencies	647,531	3.7

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

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

Source: MAFF "2010 Census of Agriculture and Forestry"

## 9. Number of Forest Owners and their Forest Area

(Area = ha)

	Total		0ha		~3ha		3-5ha		5-20ha		20-50ha		50-100ha		100ha-	
	Number	Area	Number	Area	Number	Area	Number	Area	Number	Area	Number	Area	Number	Area	Number	Area
Total	140,186	5,177,452	1,299	-	1,343	1,650	41,049	149,366	69,250	638,990	17,871	509,510	4,892	320,798	4,482	3,557,138
Corporation	6,789	1,512,674	783	-	142	176	595	2,254	1,824	19,486	1,216	38,580	797	55,469	1,432	1,396,709
Private Company	2,534	831,262	523	-	79	100	194	714	623	6,380	382	11,601	201	13,396	532	799,071
Cooperative	3,016	483,989	240	-	61	76	169	650	711	8,228	646	21,091	478	33,720	711	420,224
Agricultural cooperative	119	45,319	-	-	1	2	5	18	17	212	28	935	16	1,185	52	42,967
Forestry cooperative	2,261	296,112	220	-	57	70	82	316	451	5,415	476	15,625	402	28,253	573	246,432
Other cooperatives	636	142,558	20	-	3	4	82	316	243	2,601	142	4,531	60	4,281	86	130,825
Other corporation	1,239	197,423	20	-	2	0	232	890	490	4,878	188	5,887	118	8,354	189	177,414
Non-corporation	131,724	2,051,347	515	-	1,200	1,472	40,400	146,904	67,194	616,812	16,430	463,576	3,873	249,485	2,112	573,098
Individual	125,136	1,759,002	345	-	1,162	1,422	39,012	141,685	64,269	588,125	15,328	429,640	3,392	216,460	1,628	381,670
Public	1,673	1,613,431	1	-	1	2	54	208	232	2,691	225	7,355	222	15,843	938	1,587,331

Source: MAFF "2010 Census of Agriculture and Forestry"

## 10. Log Production

(1,000 m<sup>3</sup>, %)

		1995	2000	2005	2006	2007	2008	2009	2010	Year-on-year rate(%)
Total		21,242	17,034	16,166	16,609	17,650	17,709	16,619	17,193	3.5
By tree species	Subtotal	16,575 (78)	13,707 (80)	13,695 (85)	14,017 (84)	15,162 (86)	14,975 (85)	13,976 (84)	14,789 (86)	5.8
	Japanese Cedar (Sugi)		7,671	7,756	8,059	8,848	8,755	8,263	9,049	9.5
	for Sawnwood		7,258 <57>	6,737 <58>	6,753 <58>	7,175 <60>	6,782 <61>	6,352 <62>	6,695 <63>	5.4
	Japanese Cypress (Hinoki)		2,273	2,014	1,991	1,986	1,886	1,957	2,029	3.7
	Red pine (Akamatsu), Black pine (Kuromatsu)		1,034	783	811	794	815	704	689	▲ 2.1
	Japanese Larch (Karamatsu), Yezo spruce (Ezomatsu), Todomatsu ( <i>Abies sachalinensis</i> )		2,410	2,910	2,952	3,295	3,286	2,821	2,821	0.0
	Others		319	232	204	239	233	231	201	▲ 13.0
	Hardwood	4,667 (22)	3,327 (20)	2,471 (15)	2,592 (16)	2,488 (14)	2,734 (15)	2,643 (16)	2,404 (14)	▲ 9.0
By use	Sawnwood	16,252 (77)	12,798 (75)	11,571 (72)	11,645 (70)	11,981 (68)	11,110 (63)	10,243 (62)	10,582 (62)	3.3
	Plywood	228 (1)	138 (1)	863 (5)	1,144 (7)	1,632 (9)	2,137 (12)	1,979 (12)	2,490 (14)	25.8
	Chips	4,762 (22)	4,098 (24)	3,732 (23)	3,820 (23)	4,037 (23)	4,462 (25)	4,397 (26)	4,121 (24)	▲ 6.3

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

2: Figures in < > refer to the percentage to the volume for Sawnwood.

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

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

## 11. Wood Supply/Demand Chart (log equivalent)

(1,000m<sup>3</sup>)

Demand  Supply		Demand								Domestic consumption												Export							
		Total	Industrial use					Mushroom cultivation	Fuel	Total	Industrial use					Mushroom cultivation	Fuel			Total	Industrial use					Others	Fuel		
			Subtotal	Sawnwood	Pulp and chips	Plywood	Others				Subtotal	Sawnwood	Pulp and chips	Plywood	Others		Subtotal	Charcoal	Firewood		Subtotal	Sawnwood	Pulp and chips	Plywood	Others				
Supply	Total	(6,192) 71,884	(6,192) 70,253	(6,192) 25,379	(6,192) 32,350	(6,192) 9,556	(6,192) 2,968	(6,192) 532	(6,192) 1,099	(6,192) 70,330	(6,192) 68,708	(6,192) 25,284	(6,192) 30,999	(6,192) 9,535	(6,192) 2,889	(6,192) 532	(6,192) 1,091	(6,192) 946	(6,192) 144	(6,192) 1,554	(6,192) 1,546	(6,192) 95	(6,192) 1,351	(6,192) 21	(6,192) 79	(6,192) 8			
	Roundwood	(6,192) 24,003	(6,192) 24,003	(6,192) 15,243	(6,192) 4,539	(6,192) 3,811	(6,192) 411	(6,192) 532	(6,192) 1,099	(6,192) 70,330	(6,192) 68,708	(6,192) 25,284	(6,192) 30,999	(6,192) 9,535	(6,192) 2,889	(6,192) 532	(6,192) 1,091	(6,192) 946	(6,192) 144	(6,192) 1,554	(6,192) 1,546	(6,192) 95	(6,192) 1,351	(6,192) 21	(6,192) 79	(6,192) 8			
	Forest residue	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276			
	Import of wood	(6,192) 45,974	(6,192) 45,974	(6,192) 10,136	(6,192) 27,535	(6,192) 5,745	(6,192) 2,558	(6,192) 532	(6,192) 1,099	(6,192) 70,330	(6,192) 68,708	(6,192) 25,284	(6,192) 30,999	(6,192) 9,535	(6,192) 2,889	(6,192) 532	(6,192) 1,091	(6,192) 946	(6,192) 144	(6,192) 1,554	(6,192) 1,546	(6,192) 95	(6,192) 1,351	(6,192) 21	(6,192) 79	(6,192) 8			
	Mushroom cultivation	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532			
	Fuel	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099	(6,192) 1,099			
Domestic production	Total	(6,192) 18,923	(6,192) 18,236	(6,192) 10,582	(6,192) 4,785	(6,192) 2,490	(6,192) 379	(6,192) 532	(6,192) 155	(6,192) 17,371	(6,192) 16,692	(6,192) 10,488	(6,192) 3,434	(6,192) 2,471	(6,192) 300	(6,192) 532	(6,192) 147	(6,192) 97	(6,192) 50	(6,192) 1,552	(6,192) 1,544	(6,192) 94	(6,192) 1,351	(6,192) 19	(6,192) 79	(6,192) 8			
	Roundwood	(6,192) 17,960	(6,192) 17,960	(6,192) 10,582	(6,192) 4,509	(6,192) 2,490	(6,192) 379	(6,192) 532	(6,192) 155	(6,192) 17,371	(6,192) 16,692	(6,192) 10,488	(6,192) 3,434	(6,192) 2,471	(6,192) 300	(6,192) 532	(6,192) 147	(6,192) 97	(6,192) 50	(6,192) 1,552	(6,192) 1,544	(6,192) 94	(6,192) 1,351	(6,192) 19	(6,192) 79	(6,192) 8			
	Forest residue	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276	(6,192) 276			
	Mushroom cultivation	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532	(6,192) 532			
Fuel	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155	(6,192) 155				
Import	Total	(6,192) 52,961	(6,192) 52,018	(6,192) 14,797	(6,192) 27,565	(6,192) 7,066	(6,192) 2,589	(6,192) 943	(6,192) 52,959	(6,192) 52,016	(6,192) 14,797	(6,192) 27,565	(6,192) 7,064	(6,192) 2,589	(6,192) 943	(6,192) 849	(6,192) 94	(6,192) 2	(6,192) 2	(6,192) 0	(6,192) 2	(6,192) 0	(6,192) 2	(6,192) 0	(6,192) 2	(6,192) 0			
	Roundwood	(6,192) 6,044	(6,192) 6,044	(6,192) 4,661	(6,192) 30	(6,192) 1,321	(6,192) 32	(6,192) 943	(6,192) 6,042	(6,192) 6,042	(6,192) 4,661	(6,192) 30	(6,192) 1,319	(6,192) 32	(6,192) 943	(6,192) 849	(6,192) 94	(6,192) 2	(6,192) 2	(6,192) 0	(6,192) 2	(6,192) 0	(6,192) 2	(6,192) 0	(6,192) 2	(6,192) 0			
	Subtotal	(6,192) 45,974	(6,192) 45,974	(6,192) 10,136	(6,192) 27,535	(6,192) 5,745	(6,192) 2,558	(6,192) 943	(6,192) 45,974	(6,192) 45,974	(6,192) 10,136	(6,192) 27,535	(6,192) 5,745	(6,192) 2,558	(6,192) 943	(6,192) 849	(6,192) 94	(6,192) 2	(6,192) 2	(6,192) 0	(6,192) 2	(6,192) 0	(6,192) 2	(6,192) 0	(6,192) 2	(6,192) 0			
	Sawnwood	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136	(6,192) 10,136			
	Pulp	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973	(6,192) 5,973			
	Chips	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562	(6,192) 21,562			
	Plywood	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745	(6,192) 5,745			
	Others	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558	(6,192) 2,558			
	Fuel	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943	(6,192) 943			

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. Therefore, these figures are excluded from "total" and "subtotal".

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

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

Source: Forestry Agency "Wood Demand and Supply Chart"

## 12. Wood Supply/Demand (log equivalent)

(1,000m<sup>3</sup>)

	Total wood supply/demand	Wood for industrial use	Wood for fuel	Wood for mushroom production	Wood demand (industrial use)				Wood supply		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	94.5
1960	71,467	56,547	14,920	-	37,789	10,189	3,178	5,391	49,006	7,541	86.7
1965	76,798	70,530	6,268	-	47,084	14,335	5,187	3,924	50,375	20,155	71.4
1970	106,601	102,679	2,348	1,574	62,009	24,887	13,059	2,724	46,241	56,438	45.0
1975	99,303	96,369	1,132	1,802	55,341	27,298	11,173	2,557	34,577	61,792	35.9
1980	112,211	108,964	1,200	2,047	56,713	35,868	12,840	3,543	34,557	74,407	31.7
1985	95,447	92,901	572	1,974	44,539	32,915	11,217	4,230	33,074	59,827	35.6
1990	113,242	111,162	517	1,563	53,887	41,344	14,546	1,385	29,369	81,793	26.4
1995	113,698	111,922	721	1,055	50,384	44,922	14,314	2,302	22,916	89,006	20.5
2000	101,006	99,263	940	803	40,946	42,186	13,825	2,306	18,022	81,241	18.2
2005	87,423	85,857	1,001	565	32,901	37,608	12,586	2,763	17,176	68,681	20.0
2006	88,306	86,791	979	535	33,032	36,907	13,720	3,131	17,617	69,174	20.3
2007	83,879	82,361	976	542	30,455	37,124	11,260	3,522	18,626	63,735	22.6
2008	79,518	77,965	1,005	548	27,152	37,856	10,269	2,688	18,731	59,234	24.0
2009	64,799	63,210	1,047	543	23,513	29,006	8,163	2,528	17,587	45,622	27.8
2010	71,884	70,253	1,099	532	25,379	32,350	9,556	2,968	18,236	52,018	26.0

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

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

3: "Self-sufficiency rate" = "Wood supply (Domestic Wood)" / "Wood for industrial use" ×100

4: Total figures may not agree with the sum of each item due to round off.

Source: Forestry Agency "Wood Demand and Supply Chart"

## 13. Domestic/Imported Wood Supply/Demand (log equivalent)

(1,000m<sup>3</sup>)

			1995	2000	2005	2006	2007	2008	2009	2010	Year-on-year rate(%)
Total wood supply/demand			113,698	101,006	87,423	88,306	83,879	79,518	64,799	71,884	10.9
Wood for industrial use			111,922	99,263	85,857	86,791	82,361	77,965	63,210	70,253	11.1
Wood for fuel			721	940	1,001	979	976	1,005	1,047	1,099	5.0
Wood for mushroom production			1,055	803	565	535	542	548	543	532	▲ 2.0
Wood for industrial use	Total	Total	111,922	99,263	85,857	86,791	82,361	77,965	63,210	70,253	11.1
		Domestic Wood	22,916	18,022	17,176	17,617	18,626	18,731	17,587	18,236	3.7
		Imported Wood	89,006	81,241	68,681	69,174	63,735	59,234	45,622	52,018	14.0
		Self-sufficiency rate (%)	20.5	18.2	20.0	20.3	22.6	24.0	27.8	26.0	▲ 1.8
	Sawnwood	Subtotal	50,384	40,946	32,901	33,032	30,455	27,152	23,513	25,379	7.9
		Domestic Wood	16,252	12,798	11,571	11,645	11,981	11,110	10,243	10,582	3.3
		Imported Wood	34,132	28,148	21,330	21,387	18,474	16,042	13,270	14,797	11.5
		Self-sufficiency rate (%)	32.3	31.3	35.2	35.3	39.3	40.9	43.6	41.7	▲ 1.9
	Pulp and chips	Subtotal	(6,280)	(6,537)	(7,974)	(7,664)	(7,402)	(6,509)	(5,662)	(6,192)	9.4
		Domestic Wood	44,922	42,186	37,608	36,907	37,124	37,856	29,006	32,350	11.5
		Imported Wood	5,989	4,749	4,426	4,496	4,673	5,113	5,025	4,785	▲ 4.8
		Self-sufficiency rate (%)	38,933	37,437	33,181	32,412	32,451	32,743	23,981	27,565	14.9
	Plywood	Subtotal	13.3	11.3	11.8	12.2	12.6	13.5	17.3	14.8	▲ 2.5
		Domestic Wood	14,314	13,825	12,586	13,720	11,260	10,269	8,163	9,556	17.1
		Imported Wood	228	138	863	1,144	1,632	2,137	1,979	2,490	25.8
		Self-sufficiency rate (%)	14,086	13,687	11,723	12,576	9,628	8,132	6,184	7,066	14.3
	Others	Subtotal	1.6	1.0	6.9	8.3	14.5	20.8	24.2	26.1	1.9
		Domestic Wood	2,302	2,306	2,763	3,131	3,522	2,688	2,528	2,968	17.4
		Imported Wood	447	337	316	332	340	370	340	379	11.5
		Self-sufficiency rate (%)	1,855	1,969	2,447	2,799	3,182	2,317	2,188	2,589	18.3
		Self-sufficiency rate (%)	19.4	14.6	11.4	10.6	9.7	13.8	13.4	12.8	▲ 0.6

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

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

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

4: 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".

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

Source: Forestry Agency "Wood Demand and Supply Chart"

## 14. Wood Supply by Country (log equivalent)

(1,000m<sup>3</sup>, %)

			1995	2000	2005	2006	2007	2008	2009	2010
Imported wood	North America	Subtotal	(34.2) 38,261	(28.9) 28,700	(18.8) 16,129	(19.0) 16,501	(17.3) 14,221	(17.9) 13,948	(18.2) 11,493	(19.2) 13,506
		U.S.	23,273	14,460	6,844	6,747	6,318	6,291	5,163	5,838
		Canada	14,987	14,240	9,285	9,754	7,904	7,657	6,330	7,668
	Southeast Asia	Subtotal	(14.7) 16,418	(13.7) 13,569	(12.2) 10,511	(12.2) 10,606	(10.3) 8,517	(9.8) 7,632	(9.6) 6,041	(8.9) 6,287
		Malaysia	7,601	6,690	5,888	6,590	5,285	4,959	3,755	3,773
		Indonesia	6,334	5,858	4,137	3,556	2,777	2,419	2,079	2,304
		Others	2,482	1,021	486	460	455	253	207	209
	Russia		(6.4) 7,131	(7.5) 7,429	(8.6) 7,411	(8.9) 7,705	(8.1) 6,712	(4.9) 3,795	(3.9) 2,449	(3.3) 2,343
	Europe		(2.2) 2,411	(4.7) 4,675	(6.9) 5,937	(7.5) 6,480	(6.9) 5,668	(5.5) 4,324	(6.9) 4,391	(7.1) 4,967
	Others	New Zealand	(3.8) 4,263	(4.4) 4,374	(3.4) 2,878	(3.0) 2,644	(3.5) 2,851	(3.8) 2,975	(3.3) 2,086	(3.9) 2,720
		Chile	(4.7) 5,311	(3.8) 3,795	(4.6) 3,952	(4.6) 4,010	(5.5) 4,498	(6.5) 5,049	(6.9) 4,389	(6.7) 4,726
		Australia	(6.6) 7,428	(8.7) 8,604	(10.2) 8,729	(10.3) 8,908	(12.1) 9,933	(12.8) 9,986	(10.6) 6,674	(11.0) 7,722
		China	(1.8) 2,061	(2.5) 2,445	(3.0) 2,544	(3.3) 2,897	(2.6) 2,121	(2.8) 2,156	(2.6) 1,647	(3.0) 2,084
		Others	(5.1) 5,721	(7.7) 7,651	(12.3) 10,591	(10.9) 9,422	(11.2) 9,215	(12.0) 9,370	(10.2) 6,451	(10.9) 7,663
		Subtotal	(79.5) 89,006	(81.8) 81,241	(80.0) 68,681	(79.7) 69,174	(77.4) 63,735	(76.0) 59,234	(72.2) 45,622	(74.0) 52,018
	Domestic wood		(20.5) 22,916	(18.2) 18,022	(20.0) 17,176	(20.3) 17,617	(22.6) 18,626	(24.0) 18,731	(27.8) 17,587	(26.0) 18,236
	Total		(100.0) 111,922	(100.0) 99,263	(100.0) 85,857	(100.0) 86,791	(100.0) 82,361	(100.0) 77,965	(100.0) 63,210	(100.0) 70,253

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

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

3: "Others" of "Others" include African countries.

4: Figures in parentheses refer to the percentage to total volume.

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

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

## 15. Number of Mills/Factories and Production Volumes

		Unit	1995	2000	2005	2006	2007	2008	2009	2010
Sawnwood	Number of sawmills	plants	14,565	11,692	9,011	8,482	7,905	7,378	6,865	6,569
	Sawnwood shipments	1,000m <sup>3</sup>	24,766	17,231	12,825	12,554	11,632	10,884	9,291	9,415
Plywood	Number of plywood mills	plants	455	354	271	263	248	233	208	192
	Inputs for plywood production	1,000m <sup>3</sup>	7,321	5,401	4,636	5,183	5,227	3,986	3,107	3,811
	General plywood production	1,000m <sup>3</sup>		3,218	3,212	3,314	3,073	2,586	2,287	2,645
	Special plywood production	(1,000m <sup>3</sup> ) (1,000m <sup>3</sup> )	655,799 340,687	1,534	1,037	1,102	924	825	636	647
Laminated wood	Number of laminated wood factories	plants	293	281	259	234	225	199	187	182
	Laminated wood production	1,000m <sup>3</sup>	582	892	1,512	1,675	1,346	1,293	1,249	1,455
Wood chips	Number of wood chip mills	plants	3,535	2,657	2,040	1,971	1,857	1,744	1,663	1,578
	Wood chip production	1,000tons (1,000m <sup>3</sup> )	11,226	10,851	6,005	5,899	5,894	5,797	5,129	5,406

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

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

## 16. Number of Sawmills and Sawmill Employees

	1995	2000	2005	2006	2007	2008	2009	2010
Number of sawmills	14,565	11,692	9,011	8,482	7,905	7,378	6,865	6,569
-22.5kW	1,394	1,137	899	862	823	790	799	784
22.5-37.5	3,317	2,635	1,919	1,814	1,660	1,501	1,413	1,333
37.5-75.0	5,472	4,406	3,371	3,111	2,861	2,628	2,309	2,165
75.0-150.0	2,596	1,991	1,552	1,461	1,372	1,309	1,241	1,196
150.0-300.0	1,233	980	782	754	706	681	649	641
300.0kW-	553	543	488	480	483	469	454	450
Number of sawmill employees	104,197	73,625	49,159	45,389	42,127	38,260	34,970	33,479

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

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



Full text (in Japanese) of the “Annual Report on Forest and Forestry for FY2011” is available on the website of the Forestry Agency:

<http://www.rinya.maff.go.jp/j/kikaku/hakusyo/23hakusyo/index.html>

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