

Annual Report on Trends in Forest and Forestry in Japan

Fiscal Year 2009

(Summary)

Forestry Agency

Ministry of Agriculture, Forestry and Fisheries, Japan

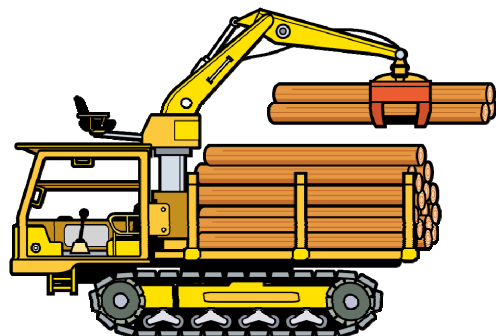


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Topics

1. Forest and Forestry Revitalization Plan

In December 2009, the Ministry of Agriculture, Forestry and Fisheries developed the “Forest and Forestry Revitalization Plan.”

Under three fundamental principles: a) to provide and sustain multifunctional roles of forest, b) to revitalize forestry and wood products industry fully utilizing regional natural resources, and c) to contribute to the realization of the “low-carbon society” through expanding wood use for both material and energy, the Plan intends to convert Japan’s society from “concrete society” into “wood society” which will fully utilize forest resource to contribute to employment and environment.

The Plan intends to develop the foundation for the efficient and stable forest management, through i) construction of forest road networks, ii) coordination and consolidation of forestry practices, and iii) development of skilled forestry workforce, aiming to realize the target of wood self-sufficiency rate as “more than 50%” through developing reliable domestic wood supply/use system (Fig 1-1).

The MAFF sets up the Promotion Unit to materialize the Plan in January 2010. Five consultation committees under the Unit have been reviewing current forest policies including forest planning system, forest road networks, logging system, and human resource development.

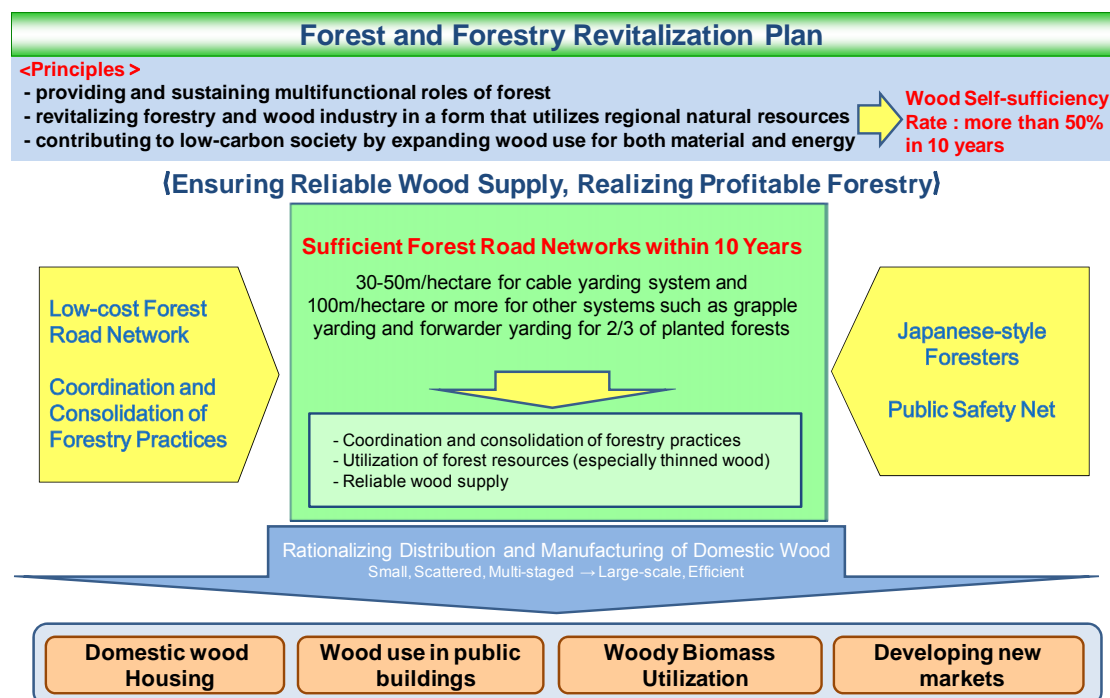


Fig 1-1: Forest and Forestry Revitalization Plan

For implementing the core concept of the Plan, the Forestry Agency started an experimental project. Currently, “Experimental Implementation of Forest and Forestry Industry Revitalization” projects are conducted in five areas in Japan, where efficient forestry production systems are to be introduced on experimental basis. The Project will develop and demonstrate efficient logging system through introducing advanced foreign

forestry machines with necessary modification suitable for testing areas. Education of forest machine operators for planning and construction of forest road networks will also be conducted.

2. Young People and Forestry

Young people are now becoming aware of the forestry sector as their potential carriers. For example, the average age of trainees of the vocational training project “Green employment” dropped from 43.4 years old in 2003 to 35.2 in 2008.

Further, there are other indications that young people are getting interested in forestry: i.e. participating in forestry practices voluntarily, engaging in forest conservation activities, moving to rural area, and obtaining a job in the Forest Owners’ Cooperative. Forestry sector is expected to attract more attention from young people.

3. Promotion of Wood Use

Recently, wood is becoming to be used in various areas where not used previously. For example, wood is increasingly used as structural and interior materials in public buildings, including schools, local government offices, and public housings. Moreover, a railway company developed railcars with wooden interior and exterior. A mobile phone provider developed a cellular phone with wooden shell. Such wood use would make it possible for the people to understand the wide variety of wood use and the appeal of wood as material.



1	2	3
4	5	

1. University Library in Akita
2. Town Office in Kochi
3. Wooden cowhouse in Hokkaido
4. Railcars with wooden interior and exterior
5. A Cellular phone with wooden shell

Photo: Characteristic Wood Use in Japan

Chapter I Productivity Improvement for Revitalizing Forestry

1. Challenges of Japan's Forestry

(1) Expectation toward Forestry

In Japan, Large part of 10 million hectares of planted forests, mainly planted in 1950-60's, has been reaching their maturing ages. Planted forests are now shifting from “resource development stage” to “resource use stage.” Given such resource condition, large-scale sawmills and plywood mills are shifting their procurement from the imported logs to the domestic logs, in response to the uncertainty of international market, caused by the growing demand of wood in emerging economies such as China and India, as well as drastic increase of export tax on log in Russia. Under such circumstances, the forestry sector is now strongly expected to supply raw materials from planted forests to wood mills sustainably, contribute to the mitigation of global warming, and create jobs in mountainous areas.

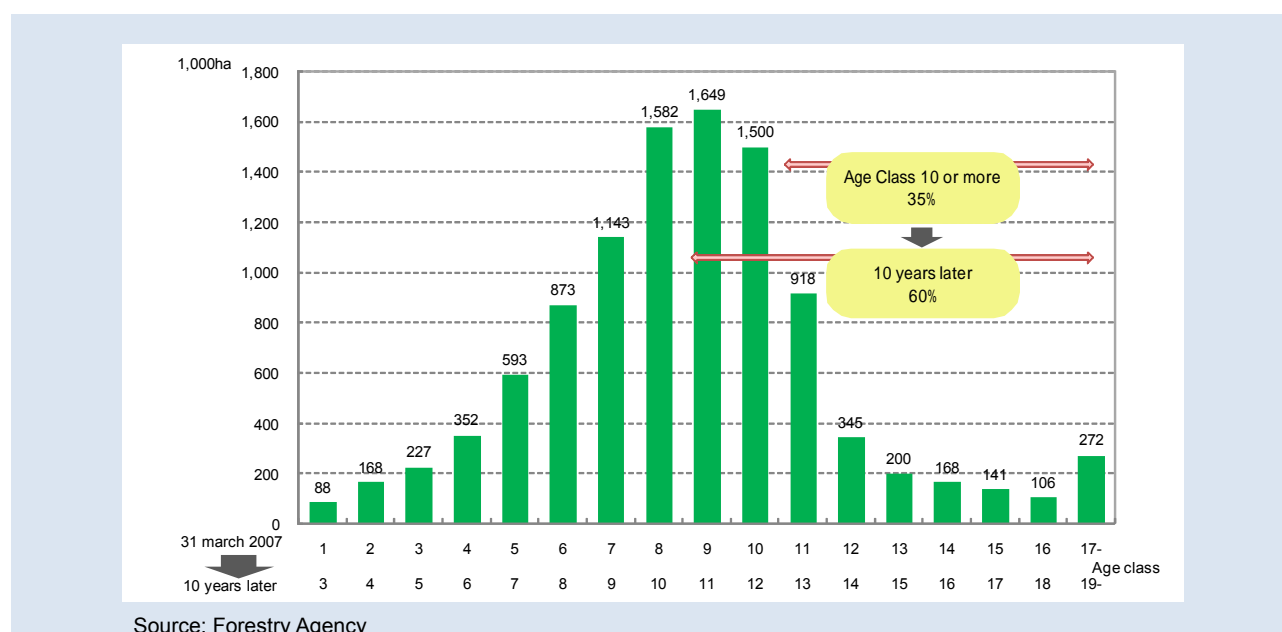
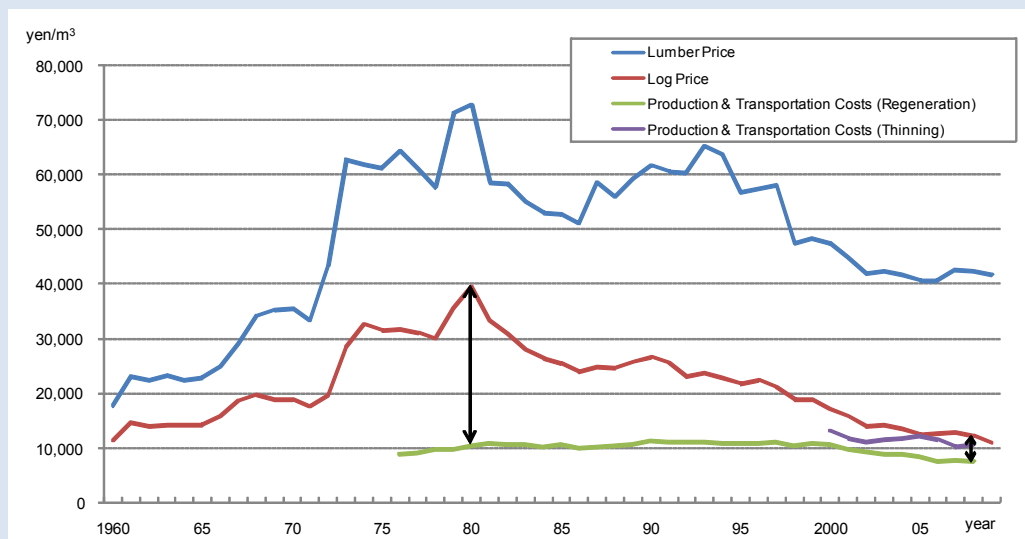


Fig 1-2: Area Distribution of Planted Forest by Age in Japan

(2) Realities of Current Forestry

In spite of the growing expectation toward forestry, Japan's forestry faces some difficulties. One of the most serious and typical weaknesses is the profitability of log production (log sales revenue minus production costs). In fact, the gross profit of log production dropped to only 20% of its highest record in 1980 in the case of Sugi (*cryptmeria japonica*). While the log price of Sugi in 2008 was 12,200yen/m³, the costs for log production and transportation required 7,699yen/m³ for clear-cutting and 10,659yen/m³ for thinning, resulting in gross profit of only 4,500ye/m³ and 1,500yen/m³ respectively (Fig 1-3).

Improvement of profitability is necessary in order to revitalize forestry from its long-lasting stagnation and fulfill various expectations of the society toward forestry.



Source: MAFF "Wood Price," Forestry Agency

Fig 1-3: Price and Costs of Sugi

(3) Direction of Forestry Revitalization

Forestry profitability is heavily influenced by log prices. However, since wood is an international commodity, it is unrealistic that the log price in the domestic market would be far higher than that in the international market. In fact, the prices of domestic wood in recent years are almost at the same level of those in the European market, even though the prices of domestic wood have dropped significantly since 1980's. Given such conditions, the prices of domestic wood are not expected to rise in the near future. In this context, the reduction of the log production costs through improving productivity is necessary for the better profitability of Japan's forestry (Table 1-1).

	Saw Log		Year
	Species	Price(Yen/m ³)	
Germany	Spruce	13,000	2007
	Pine	9,400	
Austria	Spruce	11,000	2008
Sweden	Spruce	7,000	2008
	Pine	7,800	
Japan	Sugi	10,900	2009
	Hinoki	21,300	
	Pine	13,200	

Source: METLA "Finnish Statistical Yearbook of Forestry 2008,"
BMLFUW "Austrian Forest Report 2008,"
Skogsstyrelsen "Swedish Statistical Yearbook of Forestry 2009,"
MAFF "Wood Price"

Notes: 161.17yen/EUR(2007), 151.40yen/EUR(2008), 5.68yen/SEK(2008),
(IMF annual average rates)

Table 1-1: Wood Price in Europe and Japan

(4) Potential of Productivity Improvement

Improvement

Labor productivity of Japan's log production has been improving since 1970's, reaching 4.00m³/person-day in clear-cutting and 3.45 m³/person-day in thinning in 2008. These figures are much lower than those in Europe, such as Sweden, where the labor productivity of forestry is approximately 24m³/person-day.

However, some forestry contractors in Japan have already achieved the productivity level almost equal to the one in Europe by improving their production systems. It suggests that there is a room to improve the productivity of log production in Japan, as the mean volume per tree increases with the shift of the age distribution of planted forests toward maturing stage.

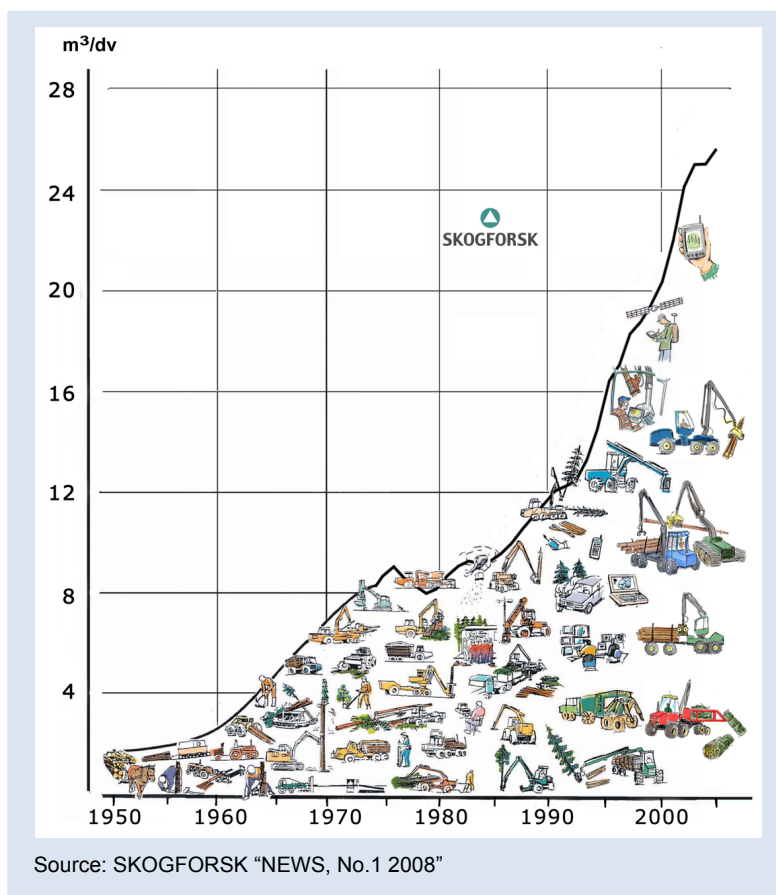


Fig 1-4: Labor Productivity in Swedish Forestry

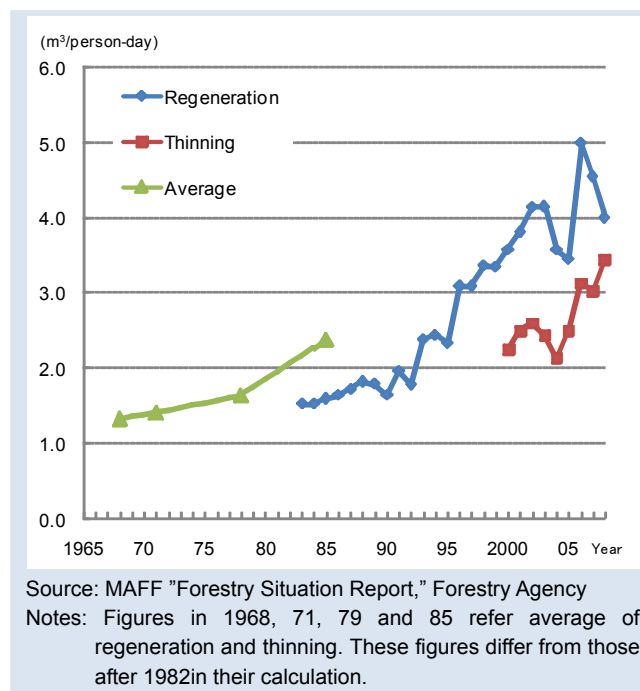


Fig 1-5: Labor Productivity in Log Production in Japan

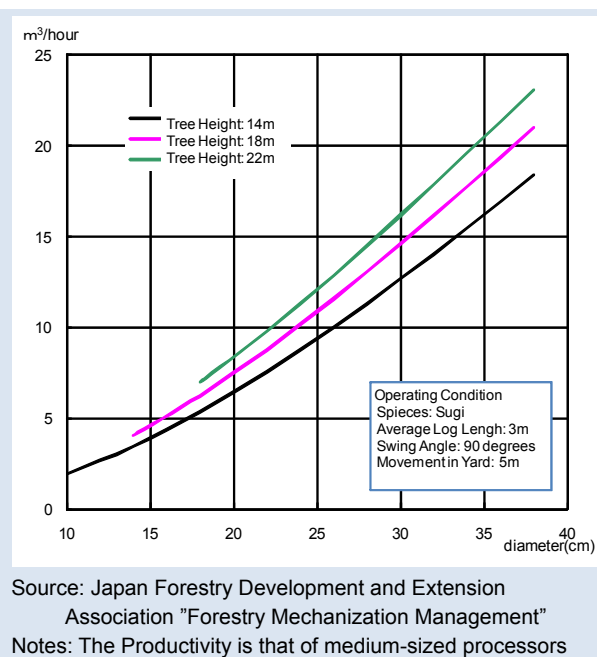


Fig 1-6: Productivity of Processor

2. Measures for Productivity Improvement

(1) Planting and Tending

It is crucial for sustainable management of planted forest to ensure the cost for regeneration is affordable in accordance with log sales revenue at the final harvest. Currently, the total cost for regeneration and tending practices is estimated at approximately 1.5 million yen/ha for the first 10 years (Table 1-2).

Age Class	I	II	III	IV	V	VI	VII	VII	IX	X
Costs (1,000yen/hectare)	1,016	488	167	274	104	120	110	88	60	48

Source: MAFF "Forestry Management Statistics in 2006" (December 2009)

Table 1-2: Regeneration and Tending Costs

In addition to the traditional techniques to reduce regeneration costs, such as reducing planting density and minimizing weeding area, more advanced techniques are applied by some active firms. Among such techniques, land preparation for planting with heavy machinery and "multi-cavity containers" for seedling production have been showing good performances (Column 1-1). These techniques are expected to contribute to the reduction of regeneration costs significantly.

Column 1-1: Seedling Production with "Multi-cavity container"

"Multi-cavity containers" enable seeding producers to expand the capacity and efficient planting with specialized tools.

Left: Multi-cavity container

Right: Seedlings raised in the container



(2) Thinning

“Thinning” is a practice to control the density of standing trees and enhance the growth of remaining trees by selective cutting. Thinning also contributes to the enhancement of multifunctional roles of forest, including conservation of soil and water resources as well as forest environment through improving the light condition of forest floor. In order to improve the total profitability of forestry, it is essential to reduce the cost for thinning and to earn as much revenue as possible by maximizing the utilization of thinned trees, while much felled trees are left in forest currently due to unaffordable cost for extraction. For the improvement of forestry profitability, it is essential to earn as much revenue as possible by transporting and selling unused thinned wood.

In Japan, thinning is generally conducted by “qualitative thinning” under which thinned trees are chosen on one-by-one basis, depending on their shape, quality, or condition surrounding the trees. This method allows forest owners to take care of their forests cautiously and intensively, but requires experienced technical skills to choose, cut down, and transport thinned trees. With the decreasing and aging of forest workers, such traditional method of thinning may not be always appropriate or possible.

In response to such circumstances, “line thinning” has been introduced in Japan. The “line thinning” chooses thinned standing trees in “line.” Line thinning has advantages in productivity improvement, cost reduction, and prevention of damages on remaining trees, but disadvantages in quality control of remaining trees or light capture efficiency. Given these advantages and disadvantages, line thinning can be an option of efficient thinning (Fig 1-7).

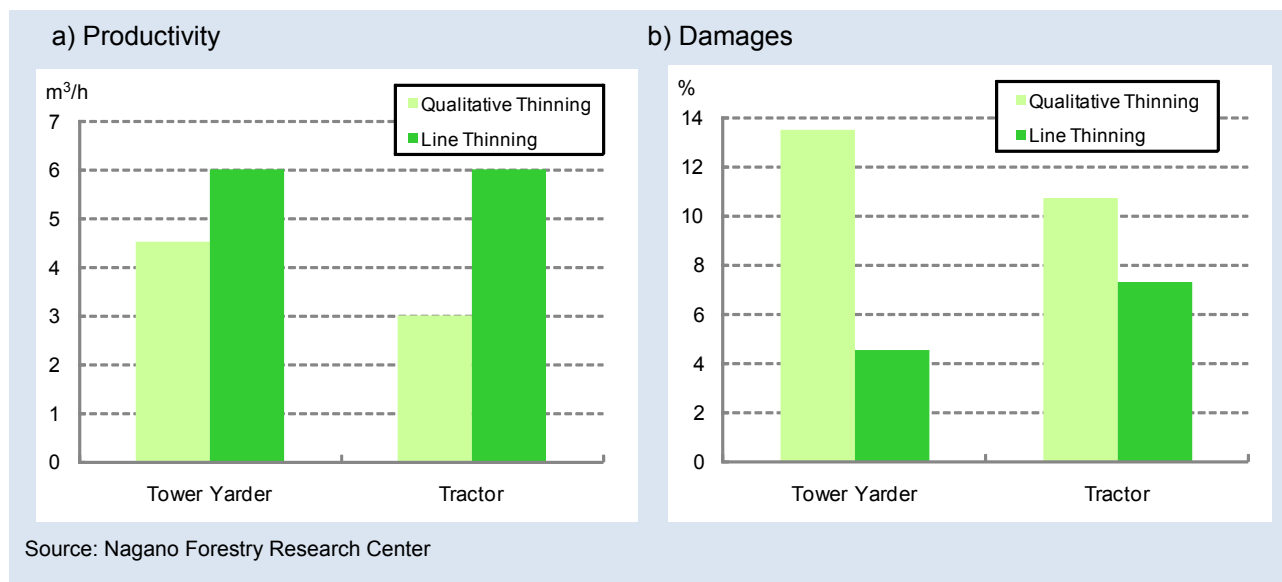


Fig 1-7: Differences of Productivity and Damages

(3) Log Production

a) Machineries

Since logs are bulky and heavy, and thus difficult to handle, efficient use of machinery is crucial for the improvement of productivity in each stage of log production, such as felling, yarding, limbing, bucking, loading, forwarding, and unloading. In Japan, the number of forestry machineries (feller buncher, harvester, processor, skidder, forwarder, tower yarder, and swing yarder) has been steadily increasing since 1988, reaching 3,802 in 2008 (Fig 1-8).

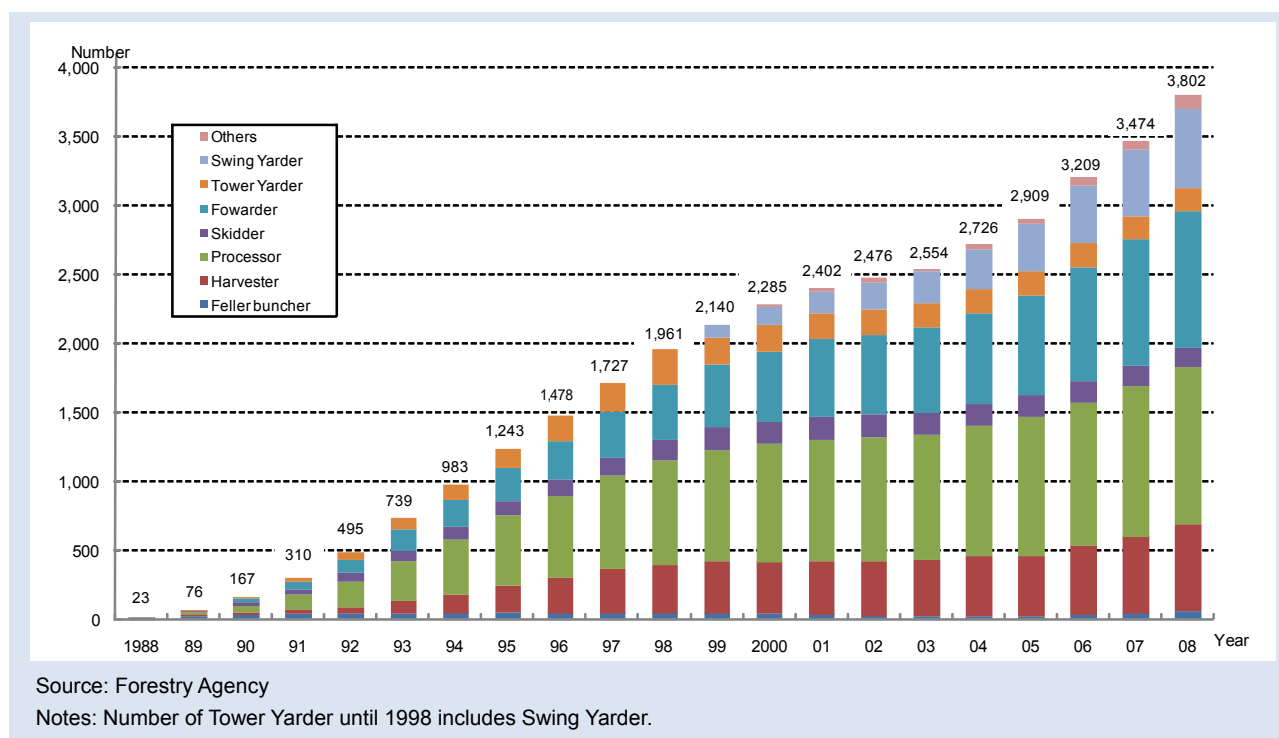


Fig 1-8: Number of Forestry Machineries

b) Productivity

Some firms have already achieved 10m³/person-day or more of the productivity, while many others are still at the level of 2-3 m³/person-day, although they are equipped with heavy forestry machineries (Table 1-3). This fact suggests that the productivity improvement cannot be achieved only by the introduction of heavy machineries, but it depends heavily on the effective use of forestry machineries.

Felling	Pre-yarding	Limbing, bucking	Yarding	Productivity (m ³ /person-day)
Harvester	Harvester /Grapple	Harvester /Processor /Chainsaw	Grapple /Crawler-dump	9.0 -10.6
Chainsaw	Harvester /Processor	Harvester /Processor	Forwarder	5.5 - 8.0
Chainsaw	Grapple	Harvester /Processor	Forwarder /Crawler-tractor etc	3.5 - 15.0

Source: Forestry Agency "Case Study on Low-cost Log Production System Development Project" (March 2007)

Table 1-3: Productivity of Log Production (Thinning in gently inclined forests)

c) Combination of forest machines

Since the capacity of forest machines widely differs depending on their type and size, appropriate combination of forest machines is prerequisite for high productivity in log production (Table 1-4). Such combination of machinery must have a streamlined set of processes from felling to trucking, with minimum number of operators.



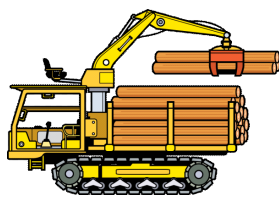
Typical combinations of forestry machineries in Japan are divided into two categories by the main machine; a) cable yarding systems with a swing yarder (excavator with winches for extraction) or a tower yarder, and b) non-cable yarding systems, such as grapple yarding and skidding (Fig 1-9). Since past experiences have shown that the productivity of non-cable yarding system is better in many cases than those of cable yarding systems in thinning operation, one of the non-cable systems should be the first choice, and a cable yarding system would be an option only when the density of the forest road network is scarce due to steep slope or other conditions.

In addition, it is important to take into account the performance and maneuverability of the machine cautiously, because these factors substantially differ depending on makers, types, and specifications.

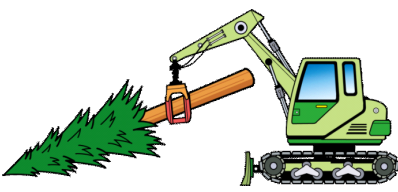

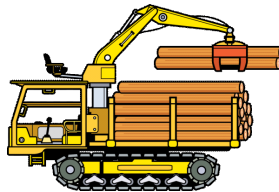
	Machines	Machine Weight	Capacity
Felling	Chainsaw	-	3m ³ /hour
	Harvester	12.7t	8m ³ / hour
		7.5t	5m ³ / hour
Limbing Bucking	Processor	11.9t	10m ³ / hour
		6.5t	6m ³ / hour
Yarding	Forwarder	9.0t	4m ³ / hour
		4.9t	3m ³ / hour
Pre-Yarding Loading	Grapple	12.8t	20m ³ / hour
		6.4t	15m ³ / hour

Source: Japan Forestry Development and Extension Association "Forestry Mechanization Management"



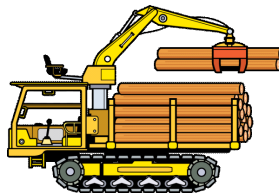
Table 1-4: Capacity of Forestry Machineries

		
Harvester /Chainsaw	Harvester	Forwarder

Trees are felled, limbed, bucked by a harvester within the reach of its arm. Other trees are felled by chainsaw, then limbed and bucked by harvester.

Chainsaw			
	Grapple	Processor (or Harvester)	Forwarder

A grapple is added to the above system so that processor (or harvester) can concentrate on limbing and bucking.

Chainsaw			
	Swing Yarder	Processor (or Harvester)	Forwarder

A swing yarder is used for pre-yarding. This system is common in steep forests where the road network is relatively scarce.

Fig 1-9: Typical Combination of Forestry Machineries in Japan

d) Optimization of operation

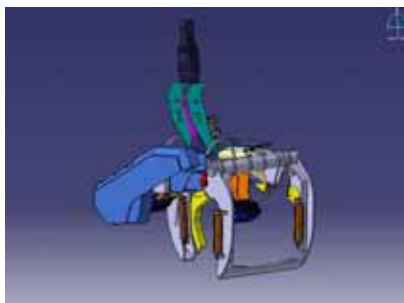
Even if forestry machineries are properly chosen, high productivity is not necessarily guaranteed. For the realization of high productivity, acceleration of operating speed in each process, and optimized connection between processes are essential so that harvested logs are smoothly passed from forests to log yards. Specifically, the harvesting system needs to be optimized through: a) analyzing the cycle time of each process, b) identifying a “bottleneck” among the processes that have less productivity than the others and thus hinder the improvement of total productivity, and c) improving the efficiency of the “bottleneck” processes to reduce latency time of other processes with higher productivities.

e) Maximizing the actual operating hours of machineries

Since the costs for the introduction of forestry machineries and the associated fixed costs such as depreciation and maintenance are expensive, effective use of the machineries is indispensable so that the costs per time period or per production are to be reduced. In Japan, the operating time of forestry machineries still remain only 1,000 hours/year or fewer, while it often ranges from 1,500-2,000 hours/year in the European countries. It is also crucial to secure greater production volume per annum and per site to reduce the fixed costs, through the coordination of small forest owners and consolidation of forestry practices.

f) Development of innovative forestry machines

Heavy machineries with crawlers, typically excavators, are commonly used as base machines with attachments for forestry. Such crawler-based machines are advantageous in price of the machines, which are less expensive than that of specialized base machines for forestry, and the maintenance services are well offered due to its popularity in the market of the civil engineering. However, crawler-based machines have a weakness in their mobility in and out of forests with their slow speed. The Forestry Agency has been developing innovative forestry machineries including a harvester head adapted for large-diameter logs with grapple function, a high-speed crawler truck and a forwarder for logging residue collection, reflecting the local needs and local conditions in Japan (Photo).



Harvester head for large-diameter logs



Crawler-Truck



Forwarder for logging residue collection

Photo: New Forestry Machineries under Development

(4) Forest Road Network

Forest road network, which consists of “forest roads”, “spur roads”, and “yarding trails”, are the most important infrastructure for forestry practices (Fig 1-10). The forest road network enables efficient forestry practices through improving the access to forest, including rapid access to the site for the emergency response.

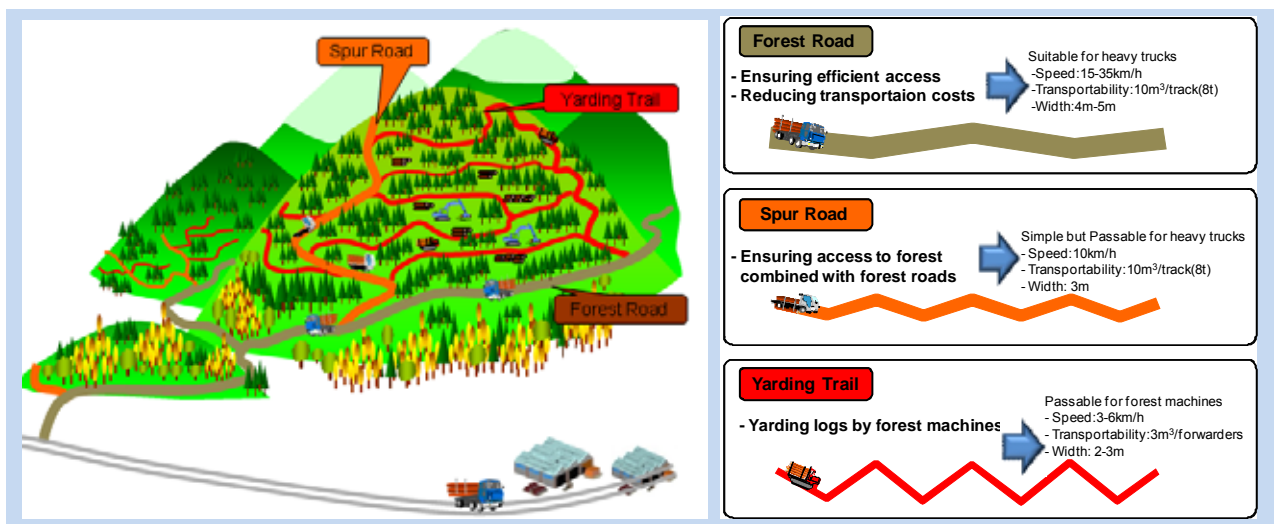
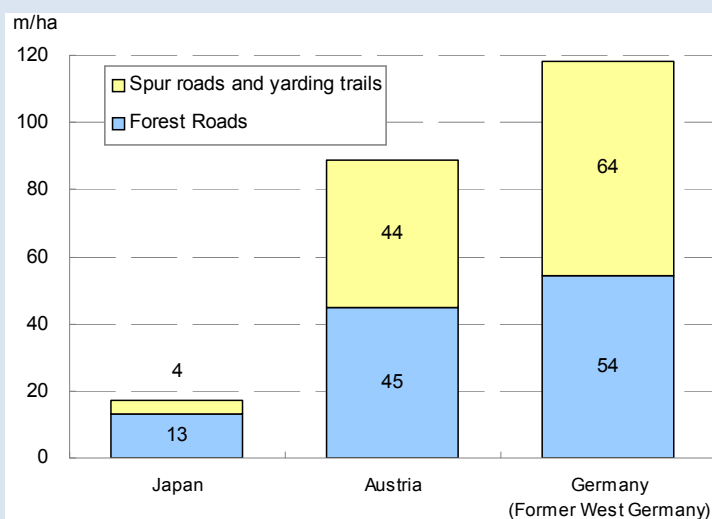


Fig 1-10: Forest Road Network

Forest road network should be properly constructed in accordance with the field condition and the forestry machineries to be used in the area. The ideal density of forest road is generally 30-50m/hectare for cable yarding system and 100m/hectare or more for non-cable yarding. European countries had invested heavily on forest road network in 1960-70's and achieved the densities of 89m/hectare in Austria and 118m/hectare in Germany. However, the density of roads in Japan is only 17m/hectare due to steep inclination and severe geological conditions (Fig 1-11). In this light, the construction of forest road network is a key challenge for better utilization of the machineries and higher labor productivity.



Source: BFW “Österreichische Waldinventur,”
BMELV| “Bundeswaldinventur(BWI),
”Forestry Agency

Notes: Figures are of Österreichische Waldinventur 1992/96 for Austria, of Bundeswaldinventur 1986/1989 for Germany and of accumulating total in 2007 of prefectural report for Japan.

Fig 1-11: Forest Road Network in Europe and Japan

Recently, simple and durable construction technique is emerging that reduces earthwork quantities by flexible planning of route and road width (Fig 1-12). With this technique, forest roads are already constructed in steep forests with gradient of 30°- 40°. In Japan, the gradient is less than 30° for 59% of planted forests and 30° to 40° for 31%, this simple and durable construction technique can be applied in most of the planted forests in Japan (Table 1-5).

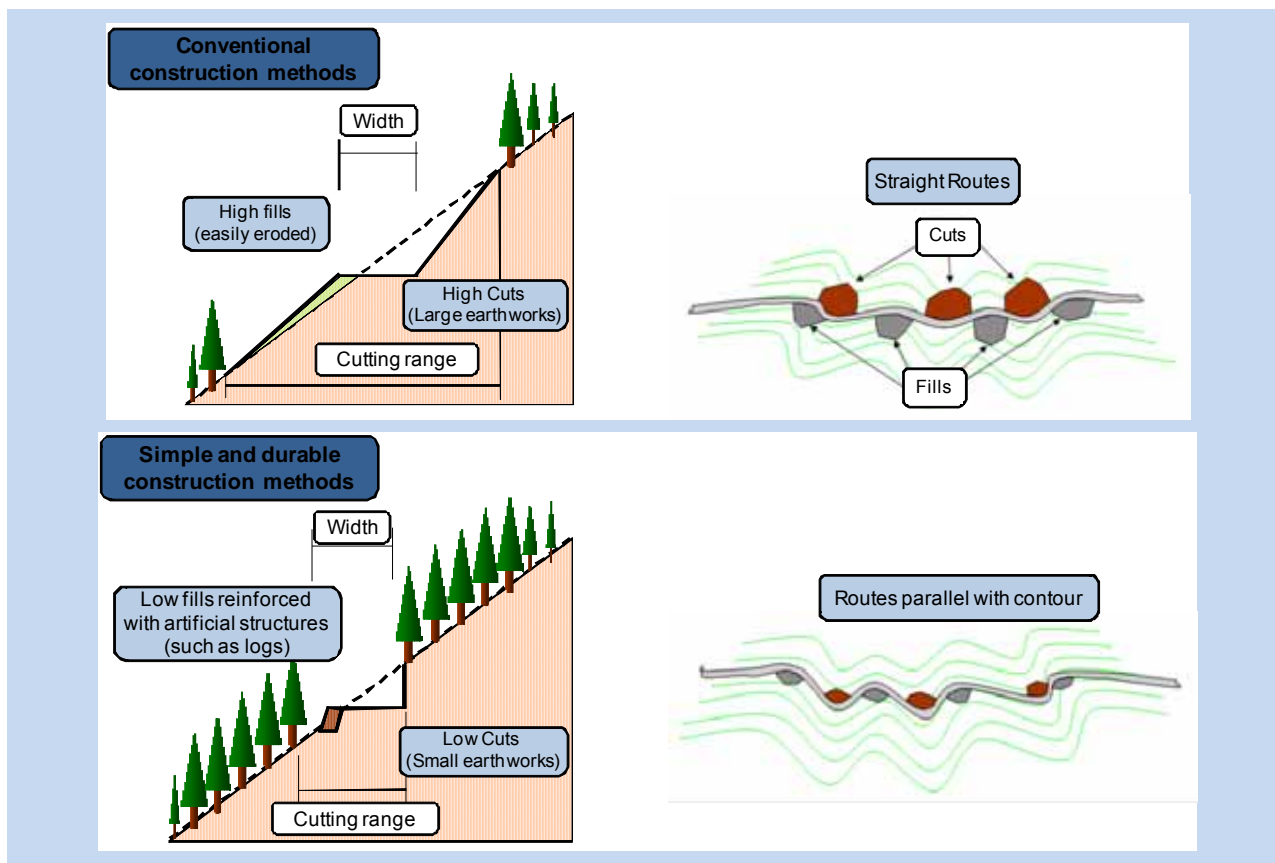


Fig 1-12: Simple and Durable Construction Technique

(Unit: %)

	0°- 20°	20°- 30°	30°- 40°	40°- 45°	45°-
Planted Forest	33	26	31	8	3
Natural Forest	30	26	31	9	3
Total Forest	32	26	31	8	3

Source: Forestry Agency "Forest Resource Monitoring Survey (2nd period, 2004-08)"

Table 1-5: Gradient Distribution of Forest in Japan

3. Other Measures and Citizen's Supports

In addition to above mentioned measures, following measures need to be accompanied for the improvement of forestry productivity.

a) Coordination and consolidation of forestry practices.

Since Japan's forest ownership is small, fragmented, and scattered, it is impractical for each forest owner to conduct forestry practices individually. The Forestry Agency promotes the coordination and consolidation of each forest owners' forestry practices to realize economically feasible scale. For this purpose, it is suggested for logging contractors including forest cooperatives to develop and propose a consolidated harvesting plan to forest owners who lost interests towards forest management.

b) Human resource development

For the improvement of forestry productivity, sufficient number of competent persons needs to be developed, who have specific and advanced knowledge and skills on forestry machineries, planning, construction of forest road network, and promotion of coordination and consolidation of forestry practices. In this regard, Forestry Agency is going to make a "master plan for human resource development", for the development of human resources needed for fulfillment of multi-functional role of forest and efficient forest management.

c) Steady wood supply and wood use promotion

Since forestry depends principally on the revenue from log production, ensuring sufficient demand of wood is crucial to enhance the cycle of forestry practices such as harvesting, planting, and tending. Upstream industry should play a vital role for steady supply of raw log, while downstream industry should efficiently process and distribute wood products through rationalized channels. It is also important to expand the demand of wood through, among others, promotion of wood use in housing and public building projects, mixed combustion of woody biomass in coal-fired electric power plant, and research and development for developing new material use of wood.

The challenges mentioned so far are expected to be tackled with the efforts of every stakeholder in the forest and forestry sector including forest owners, and thereby Japan's forestry would be revitalized through provoking the new businesses with the utilization of forest resources, and improving the profitability of forestry. In light of broad benefits of forest on citizens in Japan, the revitalization of forestry and the sustainable provision of multi-functionality of forest should be seriously pursued, while building consensus on how the forest should be utilized and conserved and how the forest should be.

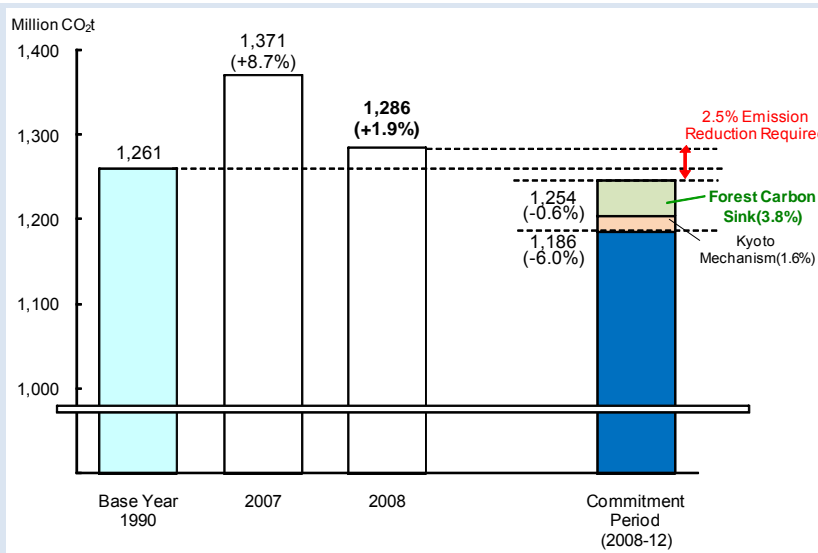
Chapter II Global Warming and Forest

1. Global Warming and Forest

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 of greenhouse gas emission reduction by at least 5% for developed countries during the first commitment period 2008-2012. Japan's emission reduction commitment is 6%.

Japan's greenhouse gas emissions were 1.29 billion CO₂-ton in 2008. This value was 6.8% decrease from the previous year, but still 1.9% increase compared with the base year of 1990 (Fig 2-1).



Source: Ministry of Environment

Fig 2-1: Japan's Greenhouse Gas Emissions for FY2008

2. Action toward Achieving the Kyoto Protocol (emission reduction) Commitment through Forest Carbon Sink

Greenhouse gas removals by sink resulting from "afforestation", "reforestation", and "forest management" may be accounted for to meet the emission reduction commitment. Japan sets the domestic target of removal by forest at 13Mt-C/year (47.67 Mt- CO₂/year; 3.8% of the total emission in the base year).

To meet the removal target of 13 Mt-C/year through forest carbon sink, Japan has been implementing 550 thousand hectares of thinning annually since FY 2007.

3. Emissions Trading and Carbon Offset

Under the “Integrated Domestic Market for Emissions Trading,” which was experimentally introduced in October 2008, approximately 77 thousand CO₂-ton of Domestic Credits were issued by March 2010 based on the woody biomass use projects, including “Boiler Fuel Conversion Project” under which the fuel is converted from fossil fuel to woody biomass.

Roughly 40 thousand CO₂-ton of Offsetting Credits (J-VER: Japan Verified Emission Reduction) were generated from projects of six positive lists relating to emission reductions or removals, including “Boiler Fuel Conversion from Fossil Fuel to Unused Woody biomass” and “Forest Management to Increase CO₂ Removal.”

Column 2-1: Domestic Credit with Woody Biomass

A pisciculture company “T” in Kagoshima Prefecture converted its boiler fuel from heavy oil to woody biomass with financial support from other companies in Tokyo. Approximately 1.2 thousand CO₂-ton is to be reduced annually and the Domestic Credit will be issued accordingly.



Column 2-2: Offsetting Credits (J-VER) with Forest Management

A housing and affiliated business company “S” applied for Offsetting Credits (J-VER) regarding the project of “Forest Management to Increase CO₂ Removal” in the company’s forests, with the aim to invest the revenue into forest management and to increase the value of its forests. Some Credits have already been traded with another company.



4. International Initiatives

Currently, negotiations on the framework of the post first commitment period of the Kyoto Protocol are underway. Although there was no final agreement in the COP15 in Copenhagen, Denmark in December 2009, the Conference of the Parties “takes note” of the “Copenhagen Accord” which was drafted by approximately 30 countries including major emitting countries such as US and China. The negotiation will continue toward the COP16 that will be held in Mexico from November to December in 2010.

In the COP15, the following forest related issues were discussed.

a) Forest Sink

Countries basically agreed to account the greenhouse gas removals by forest sink to meet the emission reduction commitment. One of the main remaining issues is forest carbon accounting rules. Currently, there are three options for accounting; i) Gross-Net, ii) Net-Net and iii) the Reference level (the bar) (Fig 2-2). Another issue is the treatment of harvested wood products (HWP). Under the Kyoto Protocol, only forest carbon sink by standing forest can be accounted to meet the commitment, based on the assumption that carbon stored in forest is released when forest is harvested. But, in reality, wood continue to store sequestered carbon as HWP. There is a discussion whether such carbon stored in HWPs are to be accounted in the framework of the post first commitment period of the Kyoto Protocol, and, if so, what rules should be applied to accounting.

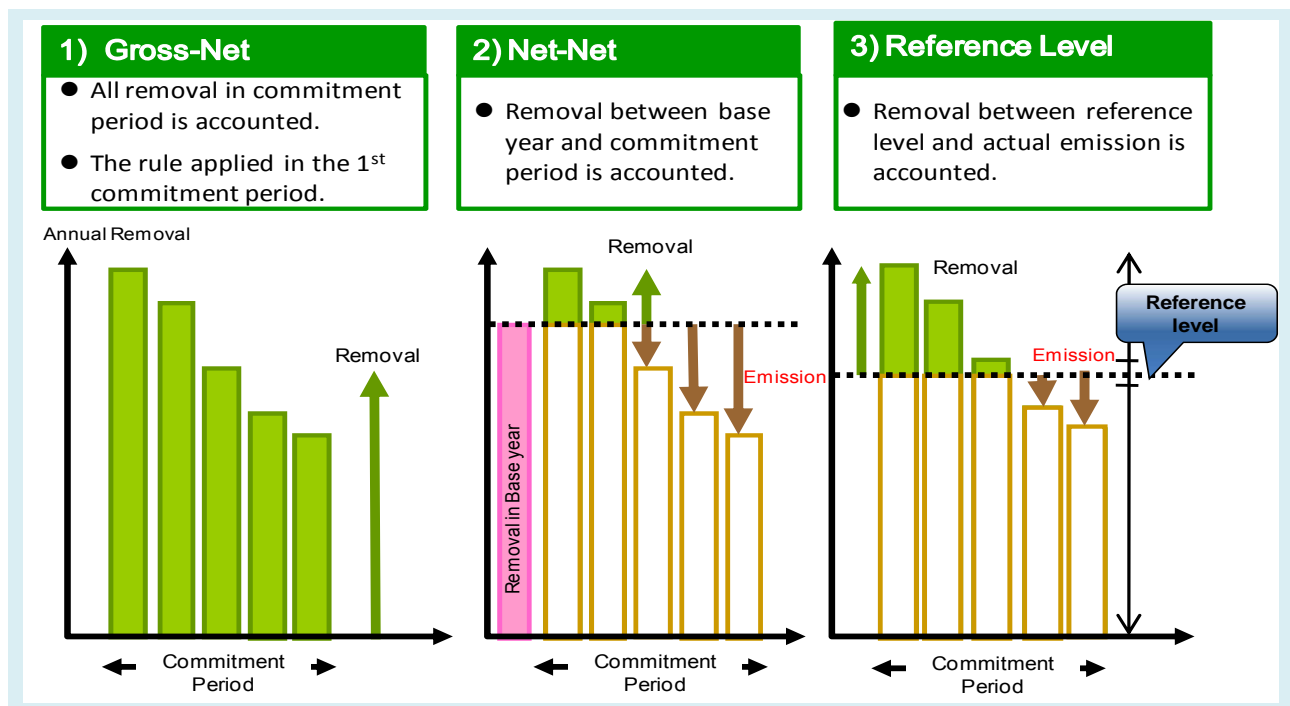


Fig 2-2: Accounting Approach of Forest Sink

b) REDD

Emissions originating from deforestation and forest degradation account approximately 20% of total greenhouse gas emissions in the world. In order to reduce such emissions, negotiations are under way on the possible measures to provide positive incentives to “reducing emissions from deforestation and forest degradation in developing countries (REDD)”, in accordance with the results in related activities.

Chapter III Forest Management

1. Promoting the Health and Diversity of Forests

(1) Promoting the Appropriate Forest Management

Promoting the health and diversity of forests is important for the fulfillment of the multi functional roles of forests, including carbon sequestration and biodiversity conservation.

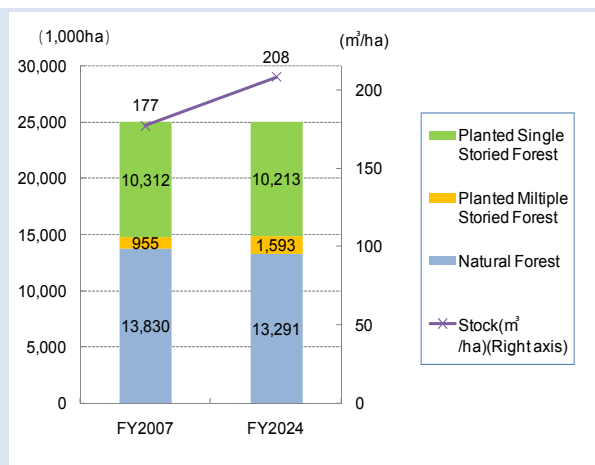
Planted forests in Japan have been reaching their maturing ages for use as resources. Promotion of diverse forest management is also important, such as mixed broadleaf forests and long-term management forests. Considering the current situation surrounding forests in Japan, the five-year “Forest Management Plan” was updated in April 2009 to achieve the nationwide forest management target (Fig 3-1).

The volume of forest stock in Japan has grown to 4.4 billion m³, more than double of the volume in 1940s (Fig 3-2). Large part of planted forests, mainly planted in 1950-1960's, has been reaching their maturing ages.

At this stage, implementation of proper forest management such as thinning is important.

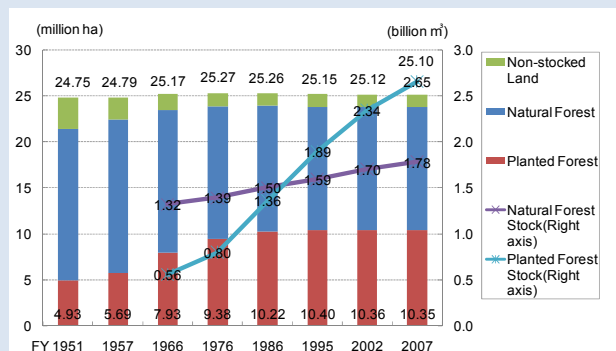
The Forestry Agency is promoting thinning through assistance for joint thinning projects among forest owners, construction of forest road, and use of thinned wood for public works.

In order to increase the removal by forest accounted under the Kyoto Protocol, 550 thousand hectares of forest was thinned through additional financial measures from the government in FY 2008 (Fig 3-3).



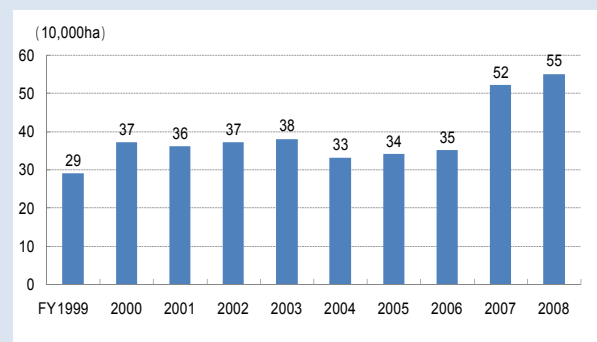
Source: Nationwide Forest Plan (Oct.21, 2009)

Fig 3-1: Nationwide Forest Management Target



Source: Forestry Agency

Fig 3-2: Forest Area and Stock



Source: Forestry Agency

Fig 3-3: Thinned Area

(2) Japanese Cedar Pollinosis

In Japan, the “Japanese cedar pollinosis” has been increasingly acknowledged as a nationwide problem. To address this problem, the Forestry Agency promoted the conversion of cedar forest into less-pollen cedar forests through the development and expansion of less-pollen Japanese cedar varieties (Fig 3-4).

(3) Forest Biodiversity

The year 2010 is the “International Year of Biodiversity” proclaimed by the United Nations, and COP10 of the Convention of Biological Diversity (CBO) is to be held in Nagoya, Japan. In December 2008, the Forestry Agency established the “Forest Biodiversity Working Group” composed of external experts, and the Working Group proposed the forest management direction for the conservation of forest biodiversity.

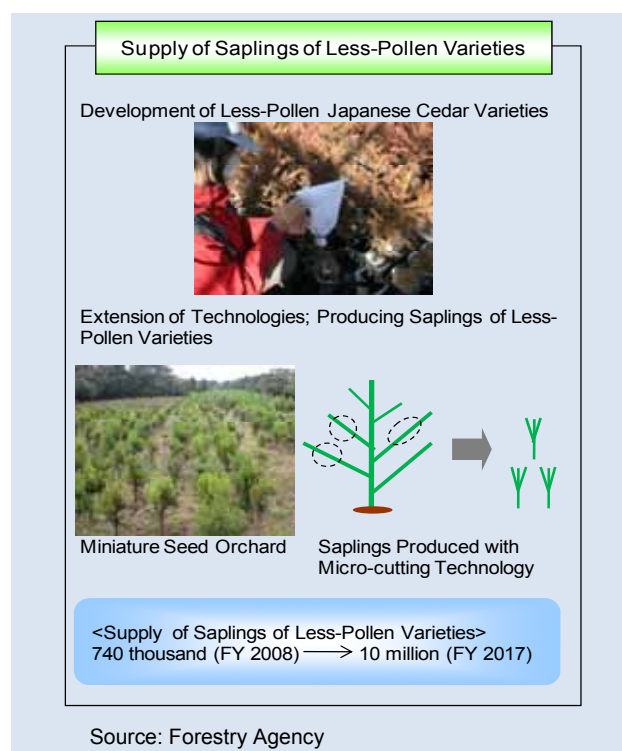


Fig 3-4: Project for Less Pollen Forests

(4) People’s Participation in Forest Management

The number of the groups of “forest volunteers,” who have willingness to participate in voluntary forestry activities, reached as many as 2,357 in FY 2008 (Fig 3-5). Many private companies are also interested in forest management and conservation as part of their corporate social responsibility (CSR) activities. The government continues to stimulate the “National Campaign for Beautiful Forest” led by private sectors toward the target of 1) thinning of 3.3 million hectares of forests during 2007-2012, and 2) promotion of forest management looking forward to 100 years ahead.

Prefectural governments have introduced local taxation schemes exclusively used for the finance of forest management and conservation activities. Kochi prefecture introduced a tax imposition system for the first time in FY 2003, and as of FY 2009, 30 prefectures out of 47 have already introduced similar systems (Fig 3-6).

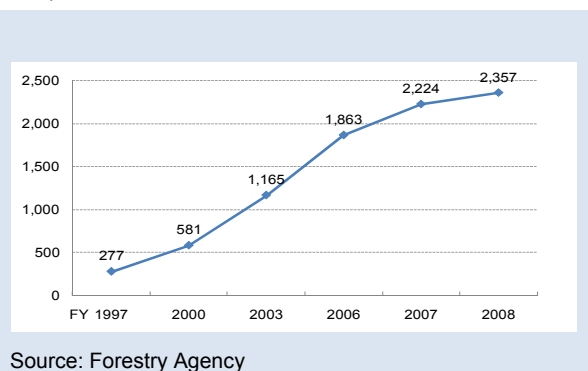


Fig 3-5: Number of Forest Volunteer Groups

Use	Number of Prefecture
Forest Management (mountainous area)	30
Forest Familiarization Activity	27
Assistance for Studying about Forest	22
Assistance for Forest Volunteer Groups	22
Forest Management (<i>satoyama</i> area)	19
Forest Management (publicly-offered)	16
Promotion of Wood Use	13
Assistance for Thinning	10
Research and Development	6

Source: Forestry Agency

Fig 3-6: Use of Prefectural Local Taxation

2. Forest Conservation and Disaster Control

(1) Conservation Forest

Under the “Forest Act”, the “conservation forest” is designated for the forests that are particularly important for providing public benefits, such as securing water resource and preventing disasters. The total area of the conservation forests increased from 2.5 million hectares in FY 1995 to 11.9 million hectares in FY 2008 (i.e. 48% of total forest area, 32% of total land area in Japan) (Fig 3-7).

(2) Disaster Control

In 2009, large-scale natural disasters in mountainous areas are caused by heavy rain such as “Chugoku Kyusyu-Hokubu Heavy Rain.” In response to these disasters, the Forestry Agency conducted forest conservation works in cooperation with local governments.

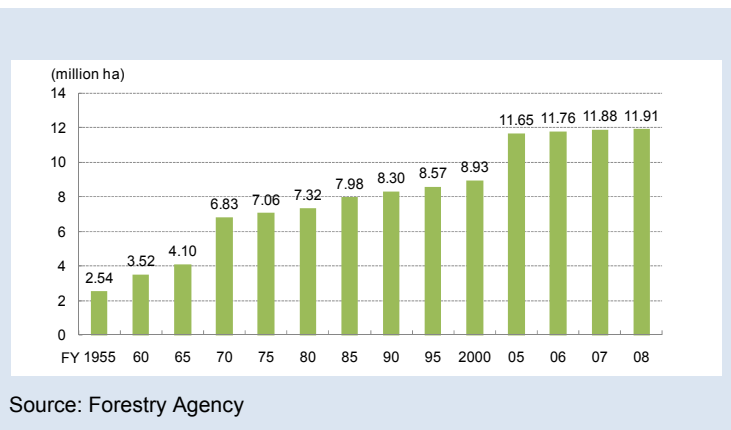


Fig 3-7: Conservation Forest



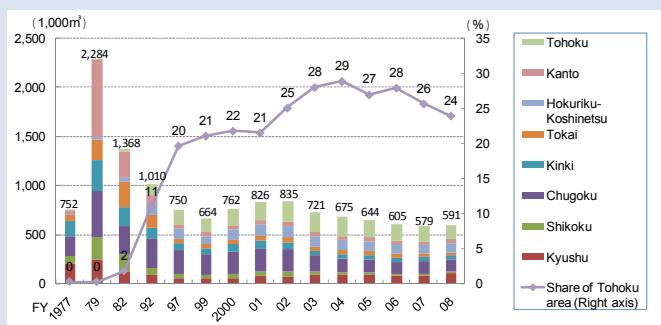
Photo: Disaster in Mountainous Area

(3) Pest, Disease, and Wildlife Control

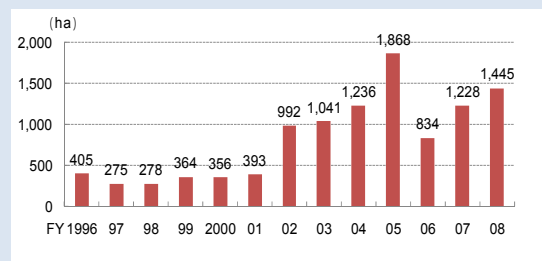
Recently, damages of pine forests caused by pine wood nematode (*Bursaphelenchus xylophilus*) have been decreasing to approximately one-fourth of its peak year in 1979, but are still the worst among all forest pests and diseases in Japan (Fig 3-8). Forestry Agency has been conducting various measures to combat the nematode including the introduction of natural enemy microbe against the nematode.

Damages of deciduous oak trees (*Quercus crispula*) caused by oak platypodid beetle (*Platypus quercivorus*) were newly found in Osaka, Okayama, and Miyagi prefectures in FY 2009, and the number of the damage-found prefecture increased to 27 prefectures in total. Forestry Agency is addressing the beetle by means of communicating the information about the beetle and promoting the removal of damaged trees (Fig 3-9).

Almost 60% of forest damages by wildlife are caused by deer in Japan. The Forestry Agency is addressing deer by installing wildlife fences and controlling wildlife population.



Source: Forestry Agency



Source: Forestry Agency

Fig 3-8: Wood Amount Damaged by Pinewood Nematode

Fig 3-9: Forest Area Damaged by Oak Platypodid Beetle

3. International Cooperation

(1) States of the World's Forest

During 2000-2005, forest area declined by four million hectares per year in Africa and South America, while increased by one million hectares per year in Asia and increased in Europe continuously. In total, forest area in the world declined by 7.3 million hectares per year during 2000-2005.

(2) International Initiatives

Reducing emissions from deforestation and forest degradation in developing Countries (REDD) is an important issue. The Forestry Agency held an international seminar for discussing on this issue. Japan is also leading the initiative to combat illegal logging for the promotion of the sustainable forest management in the world (Fig 3-10).

(3) Japan's Cooperation Initiatives

Japan is promoting international cooperation, such as technical assistance and financial assistance, for the sustainable forest management in developing countries through bilateral and multilateral schemes (Fig 3-11).

"Illegal logging" generally means the forest cutting that violates the laws in each country.

【Background】

- Law enforcement system weakened by political or economic disorder.
 - Large Profit from illegally harvested timber with low cost.
- (It is said that more than 50% of timber from Indonesia and around 20% of timber from Russia are illegally harvested.)

effect

- Disturbing the sustainable forest management.
- Encouraging deforestation and forest degradation.
- Illegally harvested timber or its products with low cost flow over international market and disturb the sustainable forest management in importing countries.
- Degradation of reliability of timber, and conversion to other materials.

action

- Promote the domestic legislation in Japan.
- Assistance for developing countries.

Source: Forestry Agency

Fig 3-10: Illegal Logging Issue

Region	Number of countries	Number of finished projects	Number of ongoing projects	Total number of projects
Asia and Oceania	14	52	11	63
Center and South America	11	18	7	25
Africa	8	13	3	16
Total	33	83	21	104

Source: Forestry Agency

Notes: The number of finished projects is total during FY 1976-2009.

Fig 3-11: International Cooperation Projects through JICA

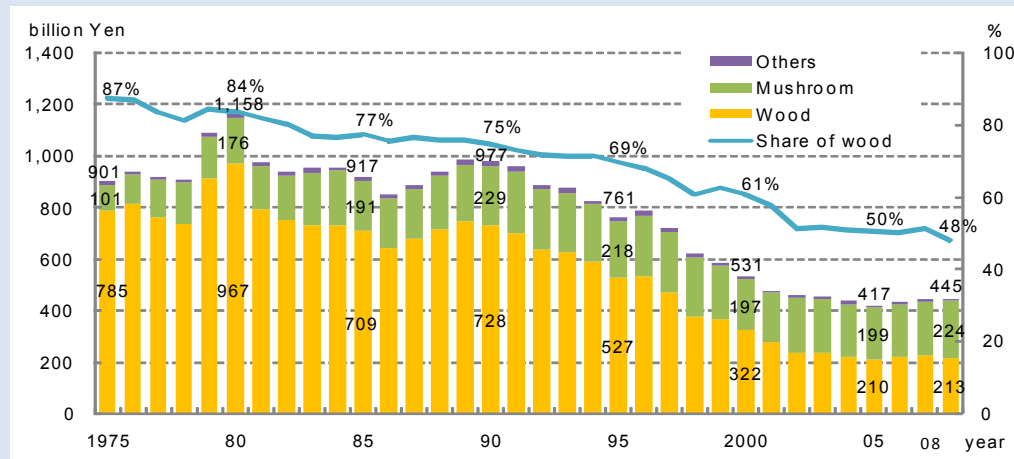
Chapter IV Forestry and Mountainous Areas

1. Forestry

(1) Forestry Economy

In 2008, the gross forestry output was 444.9 billion yen, approximately 38% of its record high in 1980.

Among the gross output, output derived from wood production was 213.3 billion yen, 5.4% decrease from the previous year, mainly due to the decline of production and lower prices in Sugi and Hinoki (Fig 4-1).

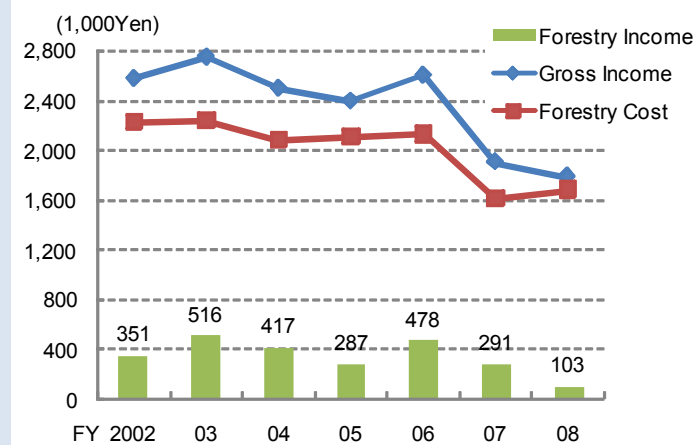


Source: MAFF "Report of Statistics on Forestry Income Produced"

Fig 4-1: Gross Forestry Output

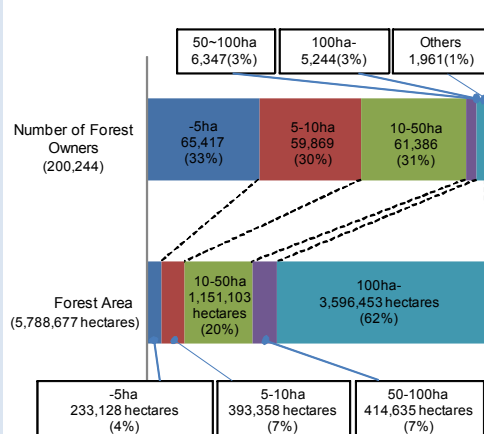
Average forestry income of forest owners decreased from 291 thousand yen in 2007 to 103 thousand yen in 2008. Forest owners whose forestry income has the largest share in total family income are just 1.7% of all the forest owners (Fig 4-2).

Forest ownership in Japan is characterized by a large number of small, fragmented, and scattered forest owners; almost 90% of forest owners own less than 10 hectares of forests. These forest owners tend to be reluctant in forestry practices due to low profitability (Fig 4-3).



Source: MAFF "Forestry Management Statistics"

Fig 4-2: Forestry Income



Source: MAFF "2005 Census of Agriculture and Forestry"

Fig 4-3: Forest Ownership

(2) Forestry Contractors

Forestry contractors in Japan are roughly divided into the Forest Owners' Cooperatives and private forestry contractors including harvesting companies.

The Forest Owners' Cooperatives are major forestry contractors in Japan, conducting more than 60% of forestry practices in Japan. As many forest owners move to urban areas and become older, they are no longer able to manage their forests by themselves. Under such conditions, there are growing demands for the Forest Owners' Cooperatives to play an active role in forest management activities in each region (Fig 4-4).

Private forestry contractors conduct almost 60% of harvesting and log production activities. 87% of them are small corporations with annual log production volume of less than 5,000m³, while 60% of total log production is conducted by relatively large corporations producing more than 5,000m³ a year (Fig 4-5).

In 2009, there were emerging movements that forestry contractors and civil engineering companies jointly start to conduct forestry practices and construct forest road networks. It is expected that these movements would contribute to ensure forestry workers and to revitalize economy in mountainous areas (Column 4-1).

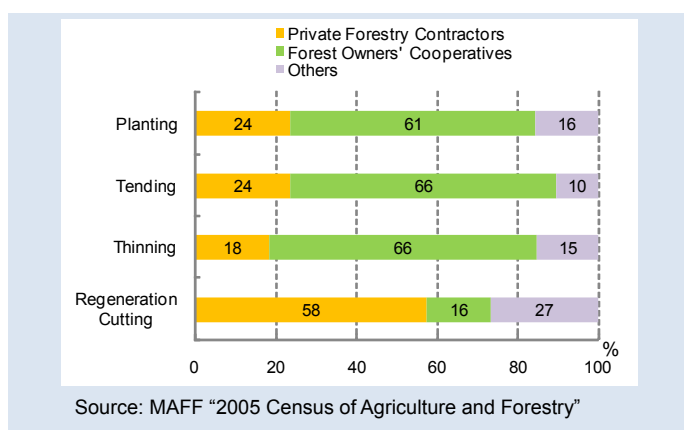


Fig 4-4: Forestry Practices by Type of Forestry Contractors

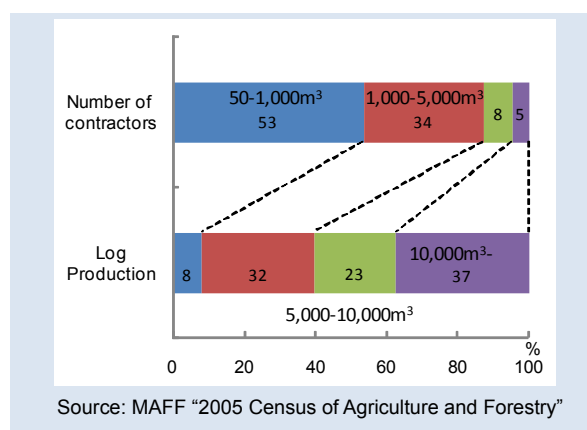


Fig 4-5: Forestry Contractors and Log Production

Column 4-1: Cooperation between forestry contractors and civil engineering companies

In May 2008, a council was set up by the Forest Owners' Cooperatives, civil engineering companies, and local governments in Gifu Prefecture. The council aims to ensure sustainable forest management and create jobs in mountainous areas through mutual exchanges of skills and machines. Various workshops were organized by the council and attracted many participants.



(3) Forestry Workers

The number of forestry workers has been decreasing for the long time period, reaching 47,000 in 2005. Although the aging rate (the share of those who are aged 65 or older) is as high as 26%, the ratio of young workers is increasing.

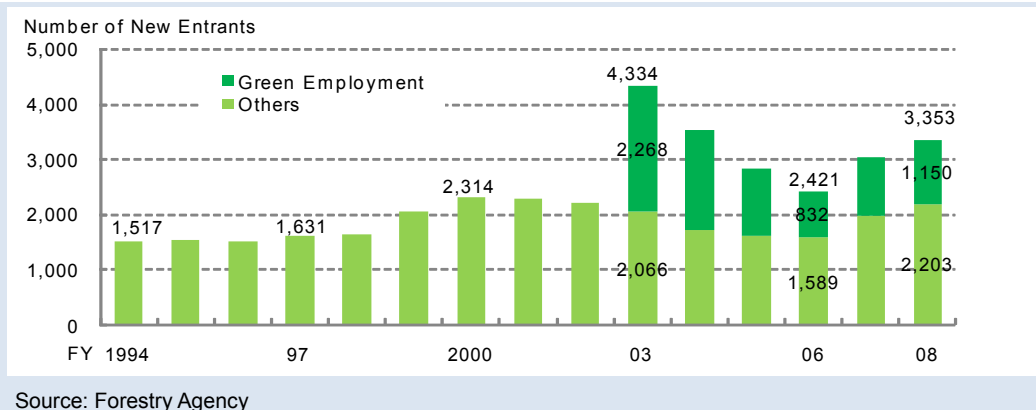


Fig 4-6: New Entrants and “Green Employment”

The number of new entrants in the forestry industry was 3,353 in 2008, thanks to the vocational training project named as the “Green Employment,” where new entrants learn introductory skills and knowledge of forestry (Fig 4-6). The Forestry Agency revised the “Fundamental Policy for Ensuring Forestry Workers” in 2010 with a view to support career development of forestry workers.

(4) Coordination and Consolidation of Forestry Practices

As mentioned in Chapter I, coordination and consolidation of forestry practices is necessary in order to reduce log production costs and thereby to regain profitability of forestry. In particular, the “proposal-based coordination and consolidation” needs be pursued under which forestry contractors encourage forest owners in forestry practices by proposing a “forestry practice proposal” containing information on forest condition, management policy, road network plan, ways of thinning, expected revenue of wood sales, and its associated costs and other relevant data (Fig 4-7).

Since 2007, the Forest Owners’ Cooperatives has been engaged in training programs to develop “Forestry Practice Planners” who has enough skills to compile a “forestry practice proposal.” By 2009, 660 staffs from 340 forestry contractors including the Forest Owners’ Cooperatives participated in the training programs and started the proposal-based coordination and consolidation of forestry practices in each region.

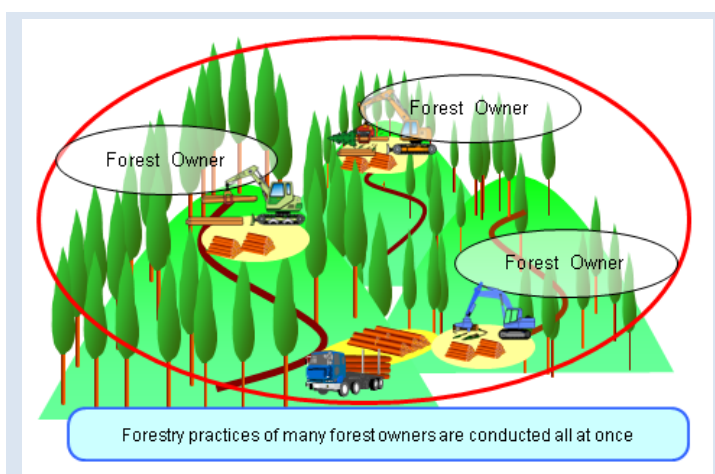


Fig 4-7: Coordination and Consolidation of Forestry Practices

2. Mountainous Areas

(1) Current Situation

The mountainous areas cover 60% of total forest area, or 50% of total land area in Japan. In the mountainous area, living infrastructures such as roads, water supply and sewage system, medical institutions, and schools are still inferior to urban areas. Moreover, due to the decline of agriculture and forestry that are the key industries in mountainous areas, the population in the mountainous areas continues to decrease and become older (Fig 4-8,9).

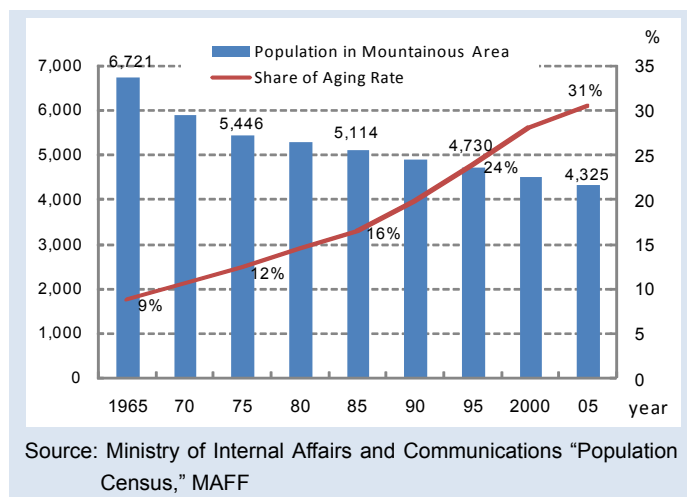


Fig 4-8: Population and Aging Rate in Mountainous Area

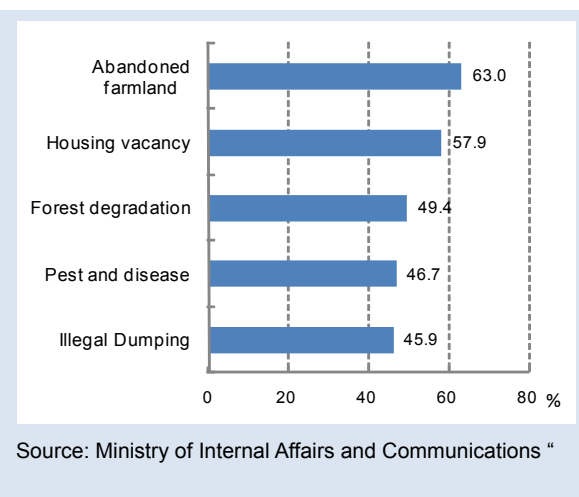


Fig 4-9: Difficulties in Mountainous Area

If such trend continues, public benefits of forests might be adversely affected due to the lack of proper forest management. Therefore, mountainous areas need to be maintained so that forestry activities could be sustained for the fulfillment of multi functional roles of forest.

(2) Revitalizing Mountainous Areas

The Forestry Agency is committed to the promotion of settlement in mountainous areas through the improvement of living conditions, invitation of tourists and visitors from urban cities, increase of employment in forestry sector, and creation of business opportunities utilizing indigenous resources; nature, culture, and tradition.

In May 2009, the "Center for Mountainous Area Revitalization" was established, with the aim to tie mountainous communities to urban business enterprises and also to support endogenous initiatives to develop and utilize forest resources in mountainous areas.

Column 4-2: Exchange between City and Village

Kawaba Village in Gunma prefecture and Setagaya Ward in Tokyo continue mutual exchanges on forest management and conservation activities since 1981.



Chapter V Wood Supply/Demand and Wood Products Industry

1. Wood Supply/Demand

(1) Trend of Wood Supply/Demand

Industrial wood demand in Japan fell to 78 million m³ in 2008, 5.3% decrease compared to the previous year, due to the decrease of new housing starts and economic downturn since autumn in 2008. It was the first time in 42 years that the volume of wood demand went under 80 million m³ in Japan.

Domestic wood supply, particularly for pulp, chip and plywood use, increased slightly, while imported wood supply decreased considerably. As a result, the self-sufficiency rate of wood reached as high as 24.0% in 2008 (Fig 5-1).

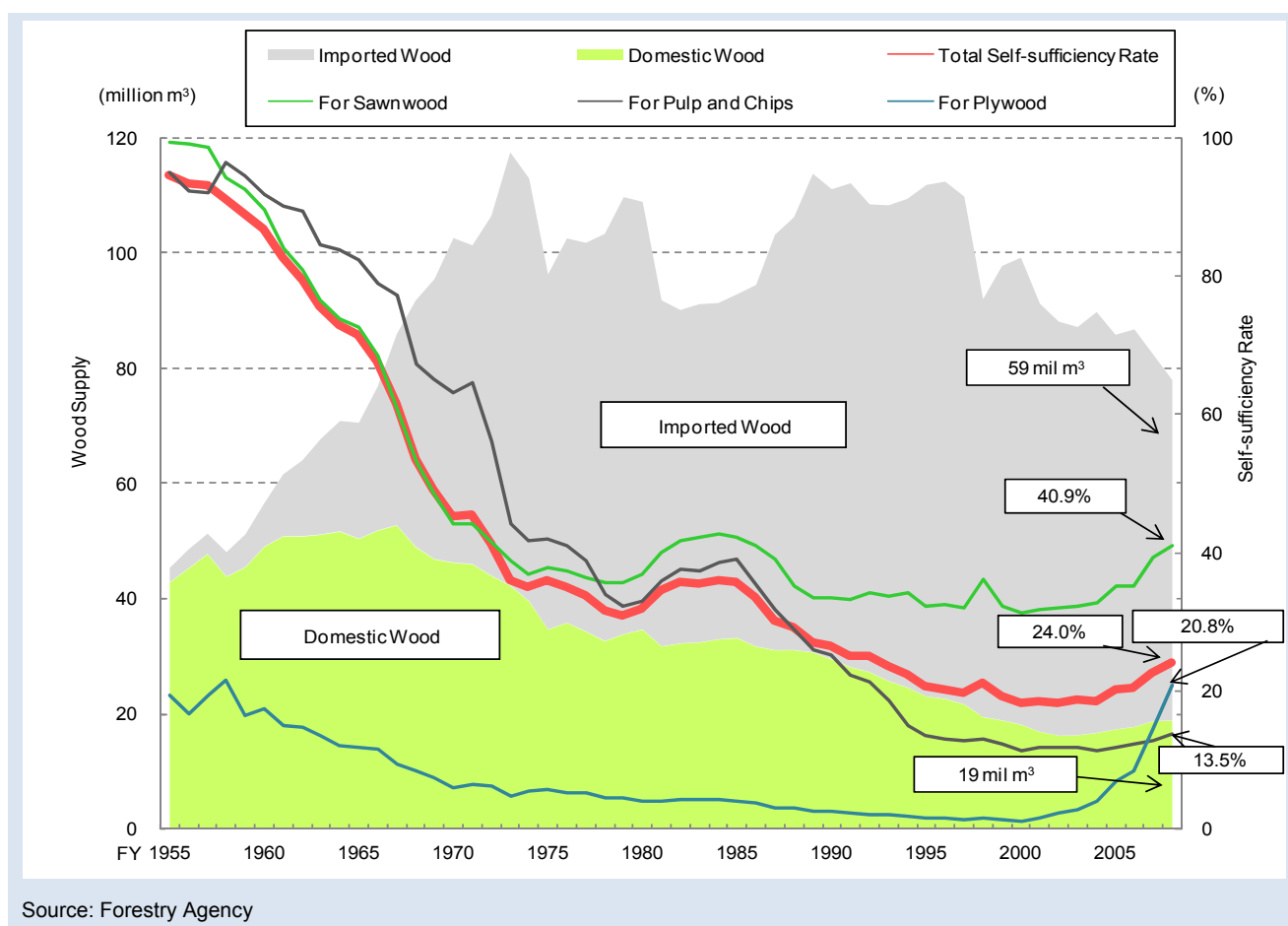


Fig 5-1: Industrial Wood Supply and Self-sufficiency Rate

(2) World Wood Trade

According to FAO statistics, world industrial roundwood consumption was 1.56 billion m³ in 2008, 4% increase from ten year before. World wood demand has been growing over the long term. Import of industrial roundwood and export of plywood of China have been increasing. Export of industrial roundwood and

sawnwood from Russia has also been increasing. Import/export of these two countries would substantially influence world wood supply/demand (Fig 5-2,3).

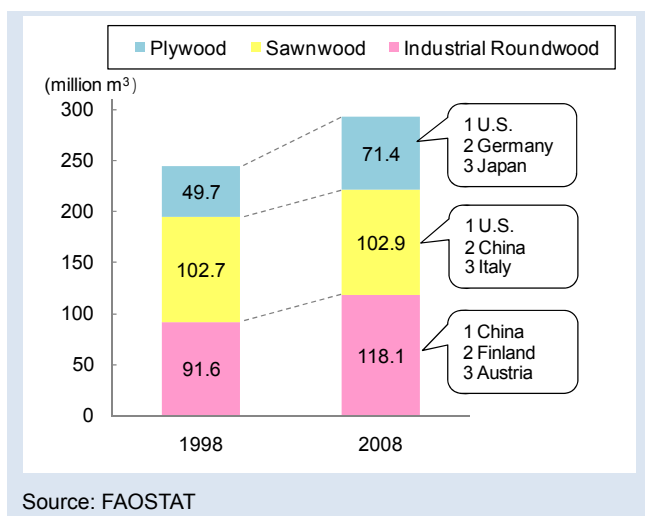


Fig 5-2: World Wood Import

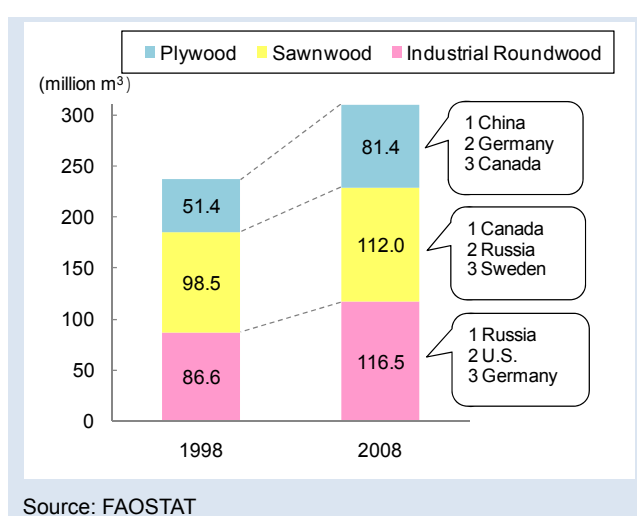


Fig 5-3: World Wood Export

(3) Wood Use from Responsible Forestry

More and more people in Japan tend to use legally harvested wood as a contribution to sustainable forest management. Forest area certificated by FSC and SGECC is increasing year by year (Fig 5-4).

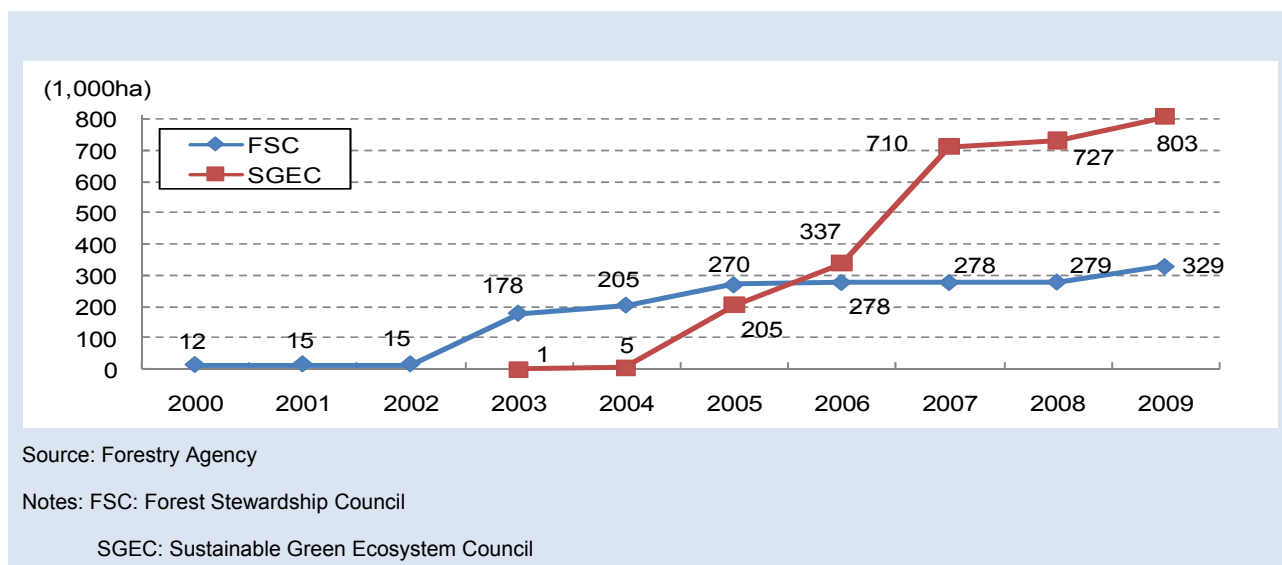


Fig 5-4: Certificated Forest Area

(4) Wood Price

Wood price decreased in 2009 due to the decline of demand caused by the worldwide economic crisis since autumn in 2008. The price of domestically-produced roundwood and wood products has been declining over the long term (Fig 5-5,6).

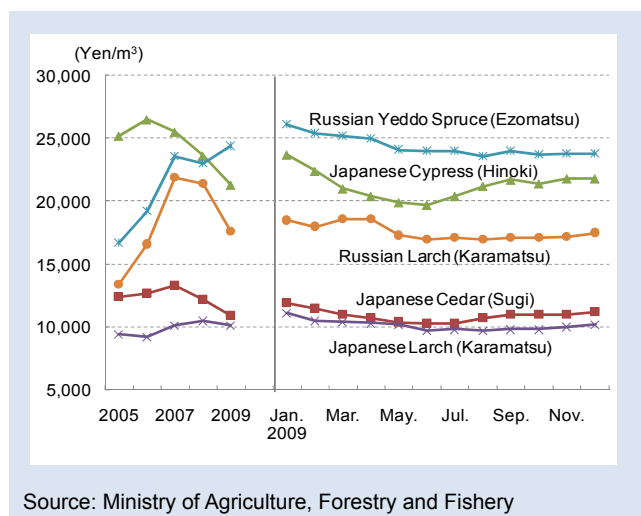


Fig 5-5: Price of Roundwood

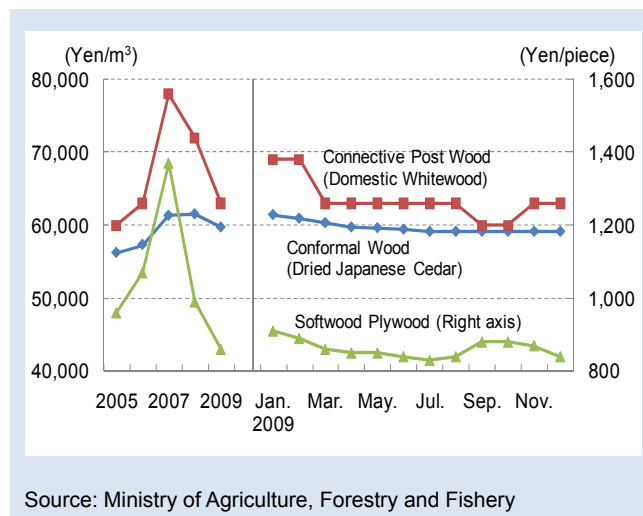


Fig 5-6: Price of Wood Products

(5) Non-wood Forest Products

Non-wood forest products, including mushrooms, wild vegetables, edible nuts, and charcoals, are important for stimulating economy and ensuring job opportunity in mountainous areas. The production of non-wood forest products was valued as 303 billion yen in 2008, 90% of which account for mushrooms (Fig 5-7).

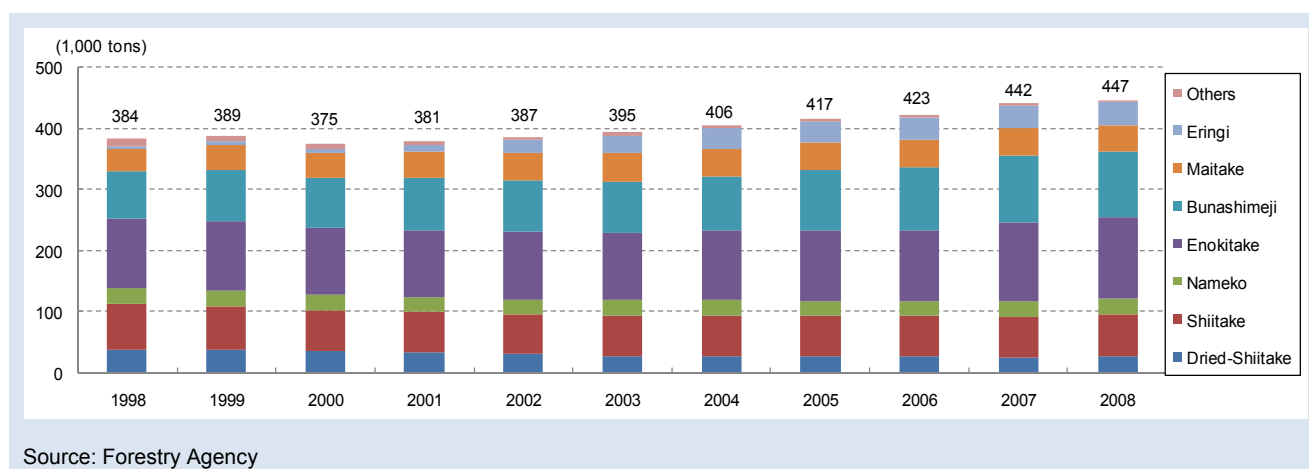


Fig 5-7: Production of Mushrooms

2. Wood Products Industry and Domestic Wood Use

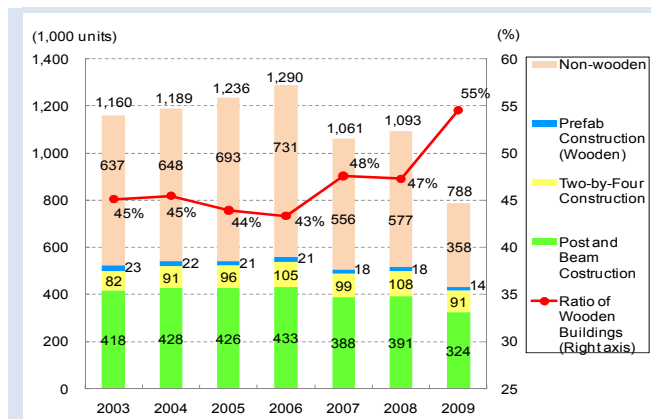
(1) Wood Products Industry

The number of new housing starts in Japan fell to 790 thousand units in 2009, 28% decrease compared to the previous year, due to economic downturn since autumn in 2008. It was the first time in 45 years that the number went under 800 thousand units. The share of wooden structure increased to 55% (Fig 5-8).

While the number of small-scale sawmills has been substantially decreasing, large-scale sawmills, which account for only 6% of total number of mills, use 57% of the total material input (Fig 5-9).

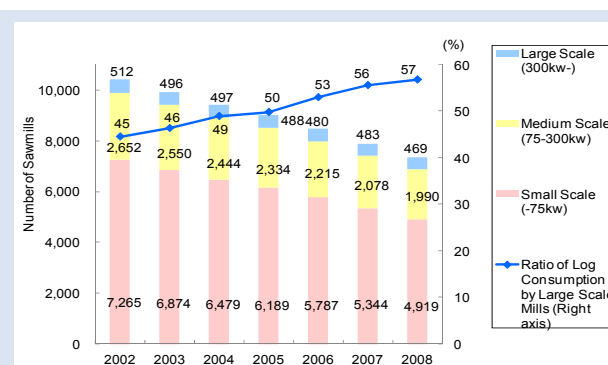
Demand for structural plywood and kiln-dried wood is growing, due to the consumer's needs for wood

products with high quality and performance. In plywood mills, the share of domestic wood in material input reached as high as 54% in 2008.



Source: Ministry of Land, Infrastructure, Transport and Tourism

Fig 5-8: New Housing Starts and Ratio of Wooden Buildings



Source: Ministry of Agriculture, Forestry and Fishery

Fig 5-9: Number of Sawmills by Scale and Log Consumption

(2) Domestic Wood Use

Sawmills and plywood mills are converting their input materials from imported wood to domestic wood, in response to the uncertain situation of wood imports and the improvement of domestic log processing technologies. The situation surrounding domestic wood is drastically changing.

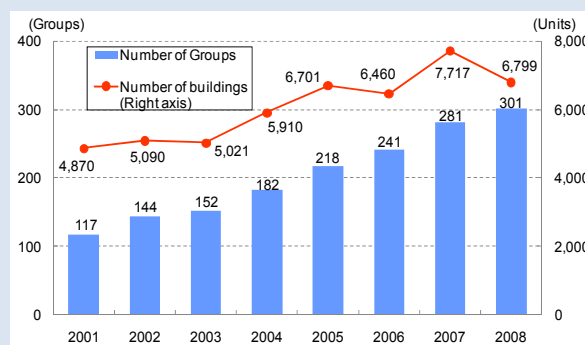
For the expansion of domestic wood use, such efforts are widely spreading which streamlines the distribution system of wood and wood products, ensures reliable supply of domestic wood products that meet consumer's needs, or builds houses with local wood (Column 5-1, Fig 5-10).

Column 5-1: Cooperation of Cooperative Association and Small-Scale Mills

A cooperative association in Miyazaki prefecture gathers Sugi lumber from five local small-scale mills and kiln-dries them.



The association also stocks these products in large storage for large volume orders. The association and the small-scale mills improve the wood supply capacity in the region.



Source: Forestry Agency

Fig 5-10: Number of Groups of "House Building with Local Wood"

3. Promotion of Wood Use

(1) Wood Use for Housing

The Forestry Agency is promoting reliable supply of wood products that meet consumer's needs, for the expansion of wood use in the housing sector. Housing makers are using more domestic wood for structural materials than before.

Wood use in public buildings such as schools is important to help people understand the importance and advantage of wood use, because these buildings are symbolic and familiar to people (Fig 5-2).

Column 5-2: Wood Use for School

Motegi town in Tochigi prefecture constructed junior high school buildings with local wood. Small pieces of lumber are used for desks and chairs and sawdust are also used for compost.



(2) Familiarization of Wood Use

For the expansion of wood use, the Forestry Agency is promoting 1) "Wood Use Campaign" that familiarizes people with the importance of wood use, and 2) "Wood Education (Mokuiku)" that informs people about wood and wood use (Column 5-3).

Column 5-3: Promotion of "Wood Education"

Hokkaido prefectural government researched about wood education at kindergartens and supermarkets. In response, some institutes started considering installation of wooden play equipment.



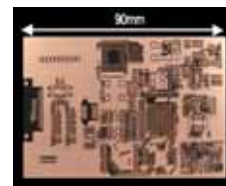
(3) Promotion of Woody Biomass

Woody biomass can be categorized into three categories: forest residues, sawmill residues, and construction waste wood. Although the introduction of wood-fired boilers and generators and mixed combustion with woods at coal-fired power plant have been steadily increasing in recent years, large amount of woody biomass still remains unused.

Developing new uses of woody biomass is also important for the expansion of wood use. Some private corporations developed new technologies to use wood as material, especially "lignin" (component of wood) (Column 5-4).

Column 5-4: Development of the Epoxy Resin Dissolvable in Organic Solvent

Electric Manufacturer "H" in Ibaraki prefecture developed the epoxy rosin from lignin in woody biomass, in cooperation with two universities. The epoxy rosin is dissolvable in organic solvent and transformable to various figures. It also can be used for insulation that is required high thermostability and insulation properties.



Prototype of printed circuit board made with lignin-based epoxy resin.

Chapter VI National Forest Management

1. Roles of the National Forests

The National Forests, which cover 30% of total forest area in Japan, are the national asset with vital roles for people's safety and security such as prevention of erosion, alleviation of flood, and mitigation of global warming.

2. Management as “Forest for the People”

(1) Category of the National Forests

The National Forests are categorized into three functional types by their expected functions (Table 6-1). The Forestry Agency conducts forest management in the National Forests for the fulfillment of multi functional roles of forest, including long-term wood production management, multiple storied forest management, or broadleaf forest management.

Functional Type		Target Forest Ideal
Forest for Water and Soil Conservation 5.15 million ha (68%)	National Land Protection Type 1.50 million ha (20%)	Forests with strong tree root networks, plant litter and healthy underbrush.
	Watershed Protection Type 3.65 million ha (48%)	Forests with porous soil that easily absorbs water, diverse tree compositions, root networks and healthy underbrush.
Forest for Symbiosis with People 2.11 million ha (28%)	Nature Conservation Type 1.53 million ha (20%)	Forests with prime ecosystem and habitats for rare wildlife.
	Recreation Type 0.57 million ha (8%)	Forests with outstanding natural beauty, historic sites and unique landscapes.
Forest for Cyclic Use of Resources 0.32 million ha (4%)		Forests with road networks that are suited for producing good timber.

Source: Forestry Agency

Table 6-1: National Forest Functional Types

(2) Forest Management

Almost 90% of National Forests are designated as “conservation forest”, in order to provide public benefits such as land conservation or water resource conservation. The Forestry Agency conducts forest conservation works, such as restoring the devastated forests to ensure people's safety and security.

The Forestry Agency also promotes forest management in cooperation with private sector. Recently, the Forestry Agency and private entities are jointly establishing “Cooperative Forest Management Area,” where national forests and private forests are managed cooperatively (Column 6-1,2).

Column 6-1: Cooperation Management Area

The Kumamoto Nanbu District National Forest Office established the largest scale 3,935 ha of the “Cooperative Forest Management Area” in Kumamoto prefecture in September 2009, in cooperation with private companies. The Office is going to promote efficient forest thinning and road construction in the area.

Column 6-2 Restoration from the “Iwate-Miyagi Nairiku Earthquake”

Large-scale disasters and landslides were caused by the “Iwate-Miyagi Nairiku Earthquake” on 14th June 2008. The Tohoku Regional National Forest Office is conducting forest restoration projects.



After Restoration



Previous Condition

For the promotion of the idea: “Forest for the People”, the Forestry Agency provides the National Forests as “Forests for Students”, “Forests for Voluntary Groups” or “Forests for Corporations”. In order to inherit the “Japan’s Wood Culture” to the next generation, the Forestry Agency also promotes “Forest Management for the Wood Culture” which grows local species used for local cultural ceremonies or historical wooden buildings in the long term.

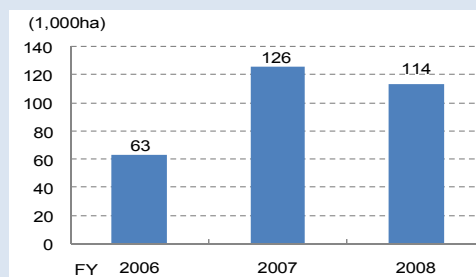
To meet the removal target under the Kyoto Protocol, the Forestry Agency conducted 114 thousand hectares of thinning in the National Forests in FY 2008, and actively used thinned wood for forest civil engineering works (Fig 6-1).

Column 6-3: Forest Management for Fish

The Kamikawa Nanbu District National Forest Office in Hokkaido planted trees for fish habitat, in cooperation with a local fisheries cooperative association and people living in the Mukawa river watershed.



Tree-Planting Activity



Source: Forestry Agency

Fig 6-1: Thinned Area in the National Forests

(3) Forest Biodiversity

For the conservation of biodiversity, the Forestry Agency designates the National Forests with diversified forest ecosystem as “Protected Forest,” or “Green Corridor” which connects several protected forests (Column 6-4).

(4) Wood Supply

The National Forest plays a vital role in reliable supply of domestic wood, in particular, highly-valued wood which is especially used for interior decorations of houses (Column 6-5). The Forestry Agency conducted the control of wood supply from the National Forests in FY2009, reflecting sharp depression of wood demand.

Column 6-4: Forest Management for Biodiversity

The Kanto Regional National Forest Office conserves forests with various ages and types of trees for the habitat of northern goshawks.



Column 6-5: Wood Supply for the Local Culture

The Kiso District National Forest Office in Nagano Prefecture supplies *nezuko* woods (*Thuja standishii*) for local traditional crafts.



Nezuko Wood



Traditional Craftsman

3. Reform of the National Forest Management

The National Forest Management has been making efforts to restore fiscal stability by ensuring income from sales of wood and other properties and implementing effective forest management through private consignment. As a result, the National Forest Management has succeeded in keeping financial balance without new borrowing since FY 2004.

“The Act for Promotion of Administrative Reform to Achieve Simple and Efficient Government” in 2006 stipulates the National Forest Management to examine transforming from the Special Account to the General Account and partially transforming into an independent administrative corporation by the end of FY 2010. However, “The Resolution for Fundamental Review of Independent Administrative Corporations” is approved at the Cabinet meeting in December 2009, and partial transform to an independent administrative corporation has been suspended by the Cabinet resolution.

Appendix

1. Forestry-related Fundamental Figures

Items	Unit	1980	1990	1995	2000	2004	2005	2006	2007	2008
i Gross domestic product (GDP)	billion yen	242,838.7	442,781.0	495,165.5	502,989.9	498,328.4	501,734.4	507,364.8	515,520.4	505,111.9
Forestry	billion yen	826.0	661.2	695.8	886.5	526.5	446.4	477.5	497.3	434.4
Forestry / GDP	%	0.34	0.15	0.14	0.18	0.11	0.09	0.09	0.10	0.09
ii Total number of workers	million	55.36	62.49	64.57	64.46	63.29	63.56	63.82	64.12	63.85
Forestry	million	0.19	0.11	0.09	0.07	0.06	0.06	0.06	0.05	0.06
Forestry / Total No. of workers	%	0.34	0.18	0.14	0.11	0.09	0.09	0.09	0.08	0.09
iii Area of national land of Japan	million ha	37.77	37.77	37.78	37.79	37.79	37.79	37.79	37.79	37.79
iv Forest area	million ha	25.28	25.21	25.15	25.15	25.12	25.12	25.12	25.10	25.10
Forest / National land	%	67.8	67.6	67.5	67.5	67.4	67.4	67.4	67.3	67.3
v Conservation forest area	million ha	7.32	8.30	8.57	8.93	11.33	11.65	11.76	11.88	11.91
Conservation forest / Forest	%	29.0	32.9	34.1	35.5	45.1	46.4	46.8	47.3	47.5
vi Growing stock of forest	billion m ³	2.5	3.1	3.5	3.5	4.0	4.0	4.0	4.4	4.4
vii Industrial wood supply/consumption	million m ³	108.96	111.16	111.92	99.26	89.80	85.86	86.79	82.36	77.97
Domestic production	million m ³	34.56	29.37	22.92	18.02	16.56	17.18	17.62	18.63	18.73
Import	million m ³	74.41	81.79	89.01	81.24	73.25	68.68	69.17	63.74	59.23
Self-sufficiency rate	%	31.7	26.4	20.5	18.2	18.4	20.0	20.3	22.6	24.0
viii New housing starts	million units	1.27	1.71	1.47	1.23	1.19	1.24	1.29	1.06	1.09
Wooden structure rate	%	59.2	42.6	45.3	45.2	45.5	43.9	43.3	47.6	47.3

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 "Statistics reports of Administratives"

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

Notes 1: "Protection forest area" in "v" refers to the actual area measurement.

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

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

Items	1990	1995	2000	2004	2005	2006	2007	2008
Gross domestic product	442,781	495,166	502,990	498,328	501,734	507,365	515,520	505,112
Industries	416,272	463,956	468,062	460,259	465,356	467,176	471,953	456,846
Agriculture, forestry and fishing	10,916	9,346	8,896	8,053	7,628	7,437	7,326	7,372
Forestry	661	696	887	527	446	478	497	434
Mining	1,121	861	627	481	488	435	348	408
Manufacturing	117,316	114,669	111,439	105,410	107,877	107,766	109,090	100,279
Pulp, paper and paper products	3,365	3,399	3,237	2,822	2,922	2,564	2,435	2,408
Wood and wooden products	1,516	1,469	1,240	993	960	890	836	768
Construction	43,439	40,850	37,130	32,954	31,861	31,849	31,444	30,924
Electricity, gas and water supply	11,232	13,329	13,576	12,727	12,051	11,565	10,280	9,008
Wholesale and retail trade	58,324	75,788	70,661	67,734	69,065	68,234	69,906	69,617
Finance and insurance	30,827	31,964	30,445	33,648	34,940	35,207	34,317	29,395
Real estate	43,051	53,757	57,864	59,841	60,100	60,465	61,292	61,806
Transport and communications	29,090	35,264	34,821	34,277	33,612	33,524	34,130	34,001
Service activities	70,955	88,129	102,604	105,135	107,733	110,695	113,822	114,036
Others	26,509	31,209	34,928	38,069	36,379	40,189	43,567	48,266

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

Note: Figures for the total may not agree with the sum of the each item due to the rounding-off in calculation.

3. Gross Forestry Output

(Billion Yen)

Item	1990	1995	2000	2004	2005	2006	2007	2008
Gross forestry output	977.14	760.55	531.10	434.61	416.77	432.16	441.44	444.87
Log production	728.14	526.61	322.13	220.48	210.23	217.08	225.58	213.30
Softwood	552.50	436.76	265.33	187.76	177.41	183.89	195.20	180.39
Japanese Cedar	215.02	187.39	123.78	92.50	87.53	92.59	102.77	94.12
Hardwood	168.70	86.02	54.72	31.58	31.71	32.19	29.38	32.05
Wood fuel production	8.26	7.93	6.16	6.49	6.09	5.60	5.48	5.05
Mushroom production	229.43	218.32	196.89	203.64	198.50	207.05	208.30	223.98
Forestry by-product	11.32	7.70	5.92	4.00	1.96	2.43	2.08	2.25
Forestry income produced	702.48	532.91	351.87	263.94	245.60	248.78	246.39	241.61

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

Note: Figures for the total may not agree with the sum of the each item due to the rounding-off in calculation.

4. Current State of Forest Resources

(1,000ha, Million m³)

Classification			Total		Standing timber area (canopy cover more than 30%)				Treeless land (canopy cover less than 30 %)		Bamboo groves
					Planted forest		Natural forest				
			Area	Growing stock	Area	Growing stock	Area	Growing stock	Area	Growing stock	
Total			25,097	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-ow ned	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
	Subtotal		17,411	3,353.47	7,983	2,227.70	8,693	1,125.59	577	0.18	159
Private and public forest	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
		Minicipality	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

Source: Forestry Agency

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: Figures for the total may not agree with the sum of the each item due to the rounding-off in calculation.

4: Figures are as of March 31, 2007.

5. Planting Area Classified by Tree Species

(ha)

	Total	Softwood					Hardwood
		Japanese Cedar	Japanese Cypress	Pine	Japanese Larch	Others	
1990	(59,030) 55,400	(18,129) 17,499	(24,646) 23,176	(784) 751	(3,931) 3,895	(6,905) 5,744	(4,635) 4,335
1995	(48,650) 45,241	(13,660) 13,196	(22,332) 20,908	(219) 199	(2,739) 2,677	(5,544) 4,577	(4,156) 3,684
2000	(31,316) 28,480	(8,223) 7,967	(11,574) 10,745	(233) 223	(2,524) 2,493	(4,954) 4,014	(3,808) 3,038
2004	(24,964) 21,270	(5,203) 4,884	(6,957) 6,017	(211) 190	(3,281) 3,162	(5,561) 4,256	(3,751) 2,761
2005	(25,584) 22,498	(5,216) 5,011	(7,096) 6,307	(226) 183	(3,534) 3,423	(5,728) 4,611	(3,784) 2,963
2006	(23,872) 21,048	(4,845) 4,579	(5,998) 5,225	(256) 229	(3,521) 3,340	(5,144) 4,327	(4,108) 3,348
2007	(25,836) 23,064	(5,546) 5,289	(6,205) 5,460	(265) 252	(3,788) 3,642	(5,647) 4,715	(4,385) 3,706
2008	(23,400) 20,865	(5,171) 4,904	(4,726) 4,079	(217) 175	(4,414) 4,260	(5,172) 4,380	(3,699) 3,067

Source: Forestry Agency

Note 1: Figures are not include National Forest.

2: Figures in parentheses refer to the total area including the planting area under trees for multiple storied forest.

6. Planted Forest Area Classified 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

Source: Forestry Agency

Note 1: Class XV contains the forests over it in 1985, class XVII contains the forests over it in 1989 and 1994, and class XIX contains the forests over it in 2001 and 2006.

2: Figures refer to the standing timber area defined in the Forest Law Article 5 and 7.2.

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	Saw mw ood	Roundw ood	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

Source: Forestry Agency

Note: Used volume is in log equivalent.

Private and public forest			1990	1995	2000	2002	2003	2004	2005	2006
	Thinned area (1,000ha)		277	215	304	314	312	277	281	282
	Used volume of thinned wood (million m³)	Total	2.34	1.83	2.74	2.79	2.83	2.84	2.84	3.24
		Saw mw ood	1.70	1.25	1.95	1.90	1.85	1.84	1.81	1.96
		Roundw ood	0.37	0.34	0.41	0.44	0.50	0.45	0.41	0.48
		Others	0.26	0.24	0.38	0.45	0.48	0.55	0.62	0.80

Source: Forestry Agency

Note: Used volume is in log equivalent.

8. Forest Area by Owners

	2005	
	ha	%
Total	17,514,627	100.0
Private	13,636,315	77.9
Public	3,335,905	19.0
Prefecture	1,218,262	7.0
Public corporation	467,909	2.7
Municipality	1,358,887	7.8
Property ward	290,847	1.7
Japan Green Resources Agency	542,407	3.1

Source: MAFF"2005 Census of Agriculture and Forestry"

Note 1: Figures for the total may not agree with the sum of the each item due to the rounding-off in calculation.

2: Japan Green Resources Agency broke up on Apr. 1, 2008, and Forestry and Forest Products Reserch Institute took over its ownership.

9. Number of Forest Owners and their Forest Area

	Total		-3ha		3-5ha		5-20ha		20-50ha		50-100ha		100ha-	
	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)
Total	200,224	5,788,677	3,036	1,365	64,342	231,763	98,326	893,233	22,929	651,229	6,347	414,635	5,244	3,596,453
Corporation	8,500	1,516,938	1,314	221	883	3,318	2,444	25,238	1,393	43,933	935	65,547	1,531	1,378,682
Private Company	3,238	822,994	837	115	288	1,061	846	8,550	422	112,856	277	18,801	568	781,610
Cooperative	3,363	406,995	449	102	222	834	807	8,933	677	21,803	495	34,818	713	340,504
Agricultural cooperative	130	31,756	-	-	5	17	22	225	27	883	15	1,041	61	29,591
Forestry cooperative	2,326	263,463	419	101	85	324	449	5,244	472	15,220	386	27,123	515	215,452
Other cooperatives	907	111,776	30	2	132	493	336	3,465	178	5,699	94	6,655	137	95,462
Other corporations	1,899	286,949	28	3	373	1,422	791	7,754	294	9,274	163	11,928	250	256,567
Non-corporation	189,466	2,652,289	1,719	1,144	63,361	228,068	95,512	863,785	21,197	596,312	5,100	326,861	2,577	636,120
Individual	177,368	2,276,615	1,100	1,026	60,592	217,652	90,136	811,115	19,352	539,871	4,265	270,541	1,923	436,411
Public	2,258	1,619,450	3	-	98	378	370	4,210	339	10,984	312	22,227	1,136	1,581,651

Source: MAFF"2005 Census of Agriculture and Forestry"

10. Log Production

(1,000ha, %)

		1990	1995	2000	2004	2005	2006	2007	2008	Year-on-year rate(%)
Total		27,145	21,242	17,034	15,615	16,166	16,609	17,650	17,709	0.3
By tree species	Subtotal	17,646 (65)	16,575 (78)	13,707 (80)	13,167 (84)	13,695 (85)	14,017 (84)	15,162 (86)	14,975 (85)	▲ 1.2
	Japanese Cedar(Sugi)			7,671	7,491	7,756	8,059	8,848	8,755	▲ 1.1
	for Saw nw ood			7,258 <57>	6,773 <59>	6,737 <58>	6,753 <58>	7,175 <60>	6,782 <61>	▲ 5.5
	Japanese Cypress(Hinoki)			2,273	2,004	2,014	1,991	1,986	1,886	▲ 5.0
	Red pine(Akamatsu), Black pine(Kuromatsu)			1,034	816	783	811	794	815	2.6
	Japanese Larch(Karamatsu), Yeddo spruce(Ezomatsu), Todomatsu(<i>Abies sachalinensis</i>)			2,410	2,668	2,910	2,952	3,295	3,286	▲ 0.3
	Others			319	188	232	204	239	233	▲ 2.5
	Hardw ood	9,499 (35)	4,667 (22)	3,327 (20)	2,448 (16)	2,471 (15)	2,592 (16)	2,488 (14)	2,734 (15)	9.9
	Saw nw ood	18,023 (66)	16,252 (77)	12,798 (75)	11,469 (73)	11,571 (72)	11,645 (70)	11,981 (68)	11,110 (63)	▲ 7.3
	Plyw ood	354 (1)	228 (1)	138 (1)	546 (3)	863 (5)	1,144 (7)	1,632 (9)	2,137 (12)	30.9
By use	Chips	8,768 (32)	4,762 (22)	4,098 (24)	3,600 (23)	3,732 (23)	3,820 (23)	4,037 (23)	4,462 (25)	10.5

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

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

2: Figures in < > refer to the percentage of the volume for Sawnw ood.

3: Figures for the total may not agree with the sum of the each item due to the rounding-off in calculation.

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

(1,000m³)

Demand Supply		Demand								Domestic consumption										Export							
		Total	Industrial use					Mushroom cultivation	Fuel	Total	Industrial use					Mushroom cultivation	Fuel			Total	Industrial use					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	(6,509)	(6,509)		(6,509)					(6,509)	(6,509)		(6,509)														
	Roundwood	79,518	77,965	27,152	37,856	10,269	2,688	548	1,005	78,706	77,164	27,083	37,221	10,244	2,616	548	994	918	76	811	801	69	635	25	72	11	
	Forest residue	208	208		208					208	208		208														
	Import of wood products	51,612	51,612	10,319	32,723	6,283	2,287			51,612	51,612	10,319	32,723	6,283	2,287												
	Mushroom cultivation	548						548		548						548											
	Fuel	1,005							1,005	994							994	918	76	11						11	
Domestic production	Total	19,424	18,731	11,110	5,113	2,137	370	548	146	18,616	17,933	11,042	4,479	2,114	298	548	135	112	22	808	797	68	635	23	72	11	
	Roundwood	18,523	18,523	11,110	4,905	2,137	370			17,725	17,725	11,042	4,271	2,114	298					797	797	68	635	23	72		
	Forest residue	208	208		208					208	208		208														
	Mushroom cultivation	548						548		548						548											
	Fuel	146							146	135							135	112	22	11						11	
Import	Total	60,094	59,234	16,042	32,743	8,132	2,317		859	60,090	59,231	16,041	32,743	8,130	2,317		859	805	54	3	3	1		2	0		
	Roundwood	7,622	7,622	5,723	20	1,849	30			7,619	7,619	5,722	20	1,847	30					3	3	1		2	0		
	Subtotal	51,612	51,612	10,319	32,723	6,283	2,287			51,612	51,612	10,319	32,723	6,283	2,287												
	Sawnwood	10,319	10,319	10,319						10,319	10,319	10,319															
	Pulp	6,526	6,526		6,526					6,526	6,526		6,526														
	Chips	26,196	26,196		26,196					26,196	26,196		26,196														
	Plywood	6,283	6,283			6,283				6,283	6,283			6,283													
	Others	2,287	2,287				2,287			2,287	2,287				2,287												
	Fuel	859							859	859							859	805	54								

Source: Forestry Agency "Wood demand and supply chart"

Note 1: Figures in parentheses refer to the volume of pulp and chips from saw mill residue or construction waste, and the volume is included in that of saw nw ood or plyw ood or others. So it isn't included in total and subtotal.

2: Forest residue refers to the branches or roots left in forests which are carried into plants for the purpose of use.

3: Figures for the total may not agree with the sum of the each item due to the rounding-off in calculation.

12. Wood Supply/Demand (in log equivalent)

(1,000m³)

	Total supply/demand of wood	Wood for industrial use	Wood for fuel	Wood for mushroom cultivation	Wood (industrial use) demand				Wood supply		Self-sufficiency rate(%)
					Sawnwood	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
2004	91,437	89,799	1,028	610	35,041	37,981	13,976	2,802	16,555	73,245	18.4
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

Source: Forestry Agency "Wood demand and supply chart"

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

2: "Self-sufficiency rate" = "Domestic Wood Supply" / "Imported Wood Supply" ×100

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

4: Figures for the total may not agree with the sum of the each item due to the rounding-off in calculation.

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

(1,000m³)

			1990	1995	2000	2004	2005	2006	2007	2008	Year-on-year rate(%)
Total wood supply/demand			113,242	113,698	101,006	91,437	87,423	88,306	83,879	79,518	▲ 5.2
Wood for industrial use			111,162	111,922	99,263	89,799	85,857	86,791	82,361	77,965	▲ 5.3
Wood for fuel			517	721	940	1,028	1,001	979	976	1,005	3.0
Wood for mushroom cultivation			1,563	1,055	803	610	565	535	542	548	1.1
Wood for industrial use	Total	Total	111,162	111,922	99,263	89,799	85,857	86,791	82,361	77,965	▲ 5.3
		Domestic Wood	29,369	22,916	18,022	16,555	17,176	17,617	18,626	18,731	0.6
		Imported Wood	81,793	89,006	81,241	73,245	68,681	69,174	63,735	59,234	▲ 7.1
		Self-sufficiency rate(%)	26.4	20.5	18.2	18.4	20.0	20.3	22.6	24.0	6.2
	Sawnwood	Subtotal	53,887	50,384	40,946	35,041	32,901	33,032	30,455	27,152	▲ 10.8
		Domestic Wood	18,023	16,252	12,798	11,469	11,571	11,645	11,981	11,110	▲ 7.3
		Imported Wood	35,864	34,132	28,148	23,572	21,330	21,387	18,474	16,042	▲ 13.2
		Self-sufficiency rate(%)	33.4	32.3	31.3	32.7	35.2	35.3	39.3	40.9	4.1
	Pulp and chips	Subtotal	(7,336)	(6,280)	(6,537)	(7,682)	(7,974)	(7,664)	(7,402)	(6,509)	▲ 12.1
		Domestic Wood	41,344	44,922	42,186	37,981	37,608	36,907	37,124	37,856	2.0
		Imported Wood	10,373	5,989	4,749	4,249	4,426	4,496	4,673	5,113	9.4
		Self-sufficiency rate(%)	30,971	38,933	37,437	33,732	33,181	32,412	32,451	32,743	0.9
	Plywood	Subtotal	14,546	14,314	13,825	13,976	12,586	13,720	11,260	10,269	▲ 8.8
		Domestic Wood	354	228	138	546	863	1,144	1,632	2,137	30.9
		Imported Wood	14,192	14,086	13,687	13,430	11,723	12,576	9,628	8,132	▲ 15.5
		Self-sufficiency rate(%)	2.4	1.6	1.0	3.9	6.9	8.3	14.5	20.8	43.4
	Others	Subtotal	1,385	2,302	2,306	2,802	2,763	3,131	3,522	2,688	▲ 23.7
		Domestic Wood	619	447	337	291	316	332	340	370	8.8
		Imported Wood	766	1,855	1,969	2,511	2,447	2,799	3,182	2,317	▲ 27.2
		Self-sufficiency rate(%)	44.7	19.4	14.6	10.4	11.4	10.6	9.7	13.8	42.3

Source: Forestry Agency "Wood Demand and Supply Chart"

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

2: "Self-sufficiency rate(%) = "Domestic Wood Supply" / "Total Wood Supply" ×100

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

4: Figures in parentheses refer to the volume of pulp and chips from saw mill residue or construction waste, and the volume is included in that of sawnwood or plywood or others. So it isn't included in total and subtotal.

5: Figures for the total may not agree with the sum of the each item due to the rounding-off in calculation.

14. Wood Supply by Country (in log equivalent)

(1,000m³, %)

			1990	1995	2000	2004	2005	2006	2007	2008
Imported wood	North America	Subtotal	(35.0) 38,862	(34.2) 38,261	(28.9) 28,700	(20.1) 18,087	(18.8) 16,129	(19.0) 16,501	(17.3) 14,221	(17.9) 13,948
		U.S.	27,479	23,273	14,460	7,355	6,844	6,747	6,318	6,291
		Canada	11,383	14,987	14,240	10,733	9,285	9,754	7,904	7,657
	Southeast Asia	Subtotal	(18.4) 20,475	(14.7) 16,418	(13.7) 13,569	(12.7) 11,424	(12.2) 10,511	(12.2) 10,606	(10.3) 8,517	(9.8) 7,632
		Malaysia	13,389	7,601	6,690	5,635	5,888	6,590	5,285	4,959
		Indonesia	5,618	6,334	5,858	5,234	4,137	3,556	2,777	2,419
		Others	1,468	2,482	1,021	554	486	460	455	253
	Russia		(6.0) 6,661	(6.4) 7,131	(7.5) 7,429	(9.5) 8,550	(8.6) 7,411	(8.9) 7,705	(8.1) 6,712	(4.9) 3,795
	Europe		(0.5) 606	(2.2) 2,411	(4.7) 4,675	(6.8) 6,123	(6.9) 5,937	(7.5) 6,480	(6.9) 5,668	(5.5) 4,324
	Others	New Zealand	(3.0) 3,286	(3.8) 4,263	(4.4) 4,374	(3.4) 3,086	(3.4) 2,878	(3.0) 2,644	(3.5) 2,851	(3.8) 2,975
		Chile	(3.2) 3,553	(4.7) 5,311	(3.8) 3,795	(4.3) 3,889	(4.6) 3,952	(4.6) 4,010	(5.5) 4,498	(6.5) 5,049
		Australia	(4.4) 4,889	(6.6) 7,428	(8.7) 8,604	(10.2) 9,134	(10.2) 8,729	(10.3) 8,908	(12.1) 9,933	(12.8) 9,986
		China	(0.6) 617	(1.8) 2,061	(2.5) 2,445	(2.8) 2,497	(3.0) 2,544	(3.3) 2,897	(2.6) 2,121	(2.8) 2,156
		Others	(2.6) 2,844	(5.1) 5,721	(7.7) 7,651	(11.6) 10,454	(12.3) 10,591	(10.9) 9,422	(11.2) 9,215	(12.0) 9,370
		Subtotal	(73.6) 81,793	(79.5) 89,006	(81.8) 81,241	(81.6) 73,244	(80.0) 68,681	(79.7) 69,174	(77.4) 63,735	(76.0) 59,234
Domestic wood		(26.4) 29,369	(20.5) 22,916	(18.2) 18,022	(18.4) 16,555	(20.0) 17,176	(20.3) 17,617	(22.6) 18,626	(24.0) 18,731	
Total		(100.0) 111,162	(100.0) 111,922	(100.0) 99,263	(100.0) 89,799	(100.0) 85,857	(100.0) 86,791	(100.0) 82,361	(100.0) 77,965	

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

Note 1: Figures refer to sum of domestic/imported roundwood and imported products (sawnwood, plywood, and pulp and chips) in 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 of total volume.

5: Figures for the total may not agree with the sum of the each item due to the rounding-off in calculation.

15. Number of Mills/Factories and Production Volumes

		Unit	1990	1995	2000	2004	2005	2006	2007	2008
Saw n w o o d	Number of saw mills	plants	16,811	14,565	11,692	9,420	9,011	8,482	7,905	7,378
	Saw n w o o d shipments	1,000m ³	30,012	24,766	17,231	13,603	12,825	12,554	11,632	10,884
Plyw o o d	Number of plyw o o d mills	plants	522	455	354	287	271	263	248	233
	Inputs for plyw o o d production	1,000m ³	9,839	7,321	5,401	5,389	4,636	5,183	5,227	3,986
	Common plyw o o d production	1,000m ³			3,218	3,149	3,212	3,314	3,073	2,586
	Special plyw o o d production	(1,000m ²) 1,000m ³ (1,000m ²)	997,693 372,326	655,799 340,687	1,534	1,100	1,037	1,102	924	825
Laminated w o o d	Number of laminated w o o d factories	plants	274	293	281	263	259	234	225	199
	Laminated w o o d production	1,000m ³	450	582	892	1,488	1,512	1,675	1,346	1,293
Wood chips	Number of wood chip mills	plants	4,494	3,535	2,657	2,106	2,040	1,971	1,857	1,744
	Wood chip production	1,000tons (1,000m ³)	16,640	11,226	10,851	5,782	6,005	5,899	5,894	5,797

Source: MAFF "Wood demand and supply report", "Timber Statistic", Japan Laminated Wood Products Association

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

16. Number of Sawmills and Sawmill Employees

	1990	1995	2000	2004	2005	2006	2007	2008
Number of saw mills	16,811	14,565	11,692	9,420	9,011	8,482	7,905	7,378
-22.5kW	2,106	1,394	1,137	906	899	862	823	790
22.5-37.5	3,791	3,317	2,635	2,144	1,919	1,814	1,660	1,501
37.5-75.0	6,203	5,472	4,406	3,429	3,371	3,111	2,861	2,628
75.0-150.0	2,853	2,596	1,991	1,630	1,552	1,461	1,372	1,309
150.0-300.0	1,325	1,233	980	814	782	754	706	681
300.0kW-	533	553	543	497	488	480	483	469
Number of saw mill employees	124,195	104,197	73,625	55,118	49,159	45,389	42,127	38,260

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

Note: Figures exclude saw mills w ith pow er output less than 7.5kW.