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A brief review of forest resources and forestry sector in Japan

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1. Background: Overview on Japan

Nature of the nation (1)

Ecological conditions

- An island country (5 major islands)
- Around 380,000km^2 (world's rank 62nd)
- Around 70% of the territory is mountainous (cities develop only in plain areas)
- The temperate zone largely; four seasons with a rainy season in June and July
- Annual rainfall ranges from 1,000mm (north) to 2,500mm (south)

Economic conditions

- Nominal GDP as of 2011: US$ 5.9 trillion (world's rank 3rd)
- GDP per capita as of 2011: US$ 45,920 (world's rank 17th)
- A decline in world economic ranking has been appearing.

Nature of the nation (2)

Social conditions

- Around 128 million people in 2010 (world's rank 10^{th})
- Population density 343 persons/km^2 in 2010 (world's rank 8^{th})
- High homogeneity in ethnicity and language

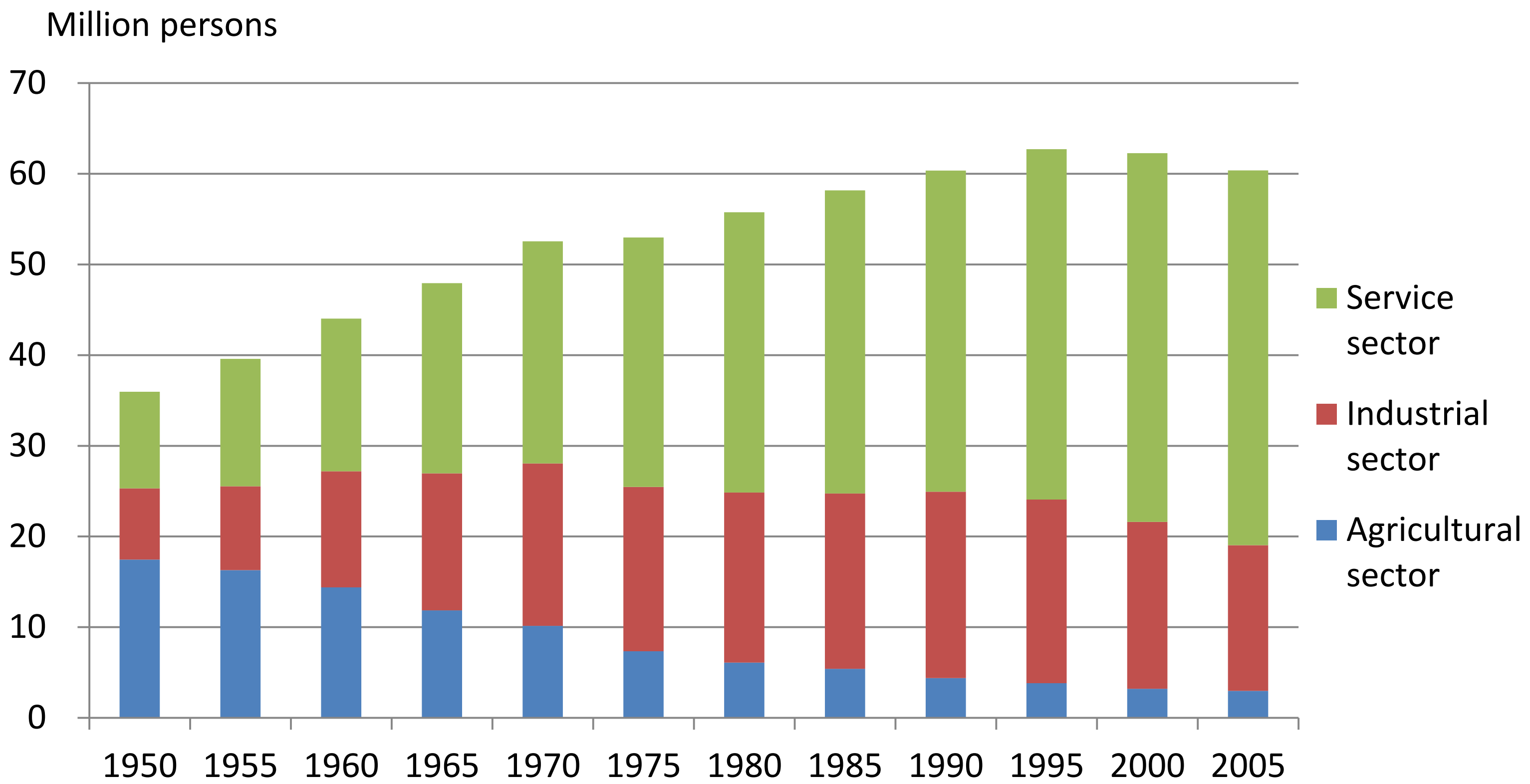
- A village or community has been the principal unit in which peasants live together.
- Current trends: depopulation of rural areas, aging of society with a decreasing birth ratio, ...

Nature of the nation (3)

Governance conditions:

- Popular sovereignty under the Constitution (Emperor as a national symbol)
- Legislative power is vested in the Diet.
- The cabinet consists of Prime Minister and Ministers of state, being responsible to the Diet.
- Local governments: 47 prefectures and 1,727 municipals as of 2012

Change of employees by sector

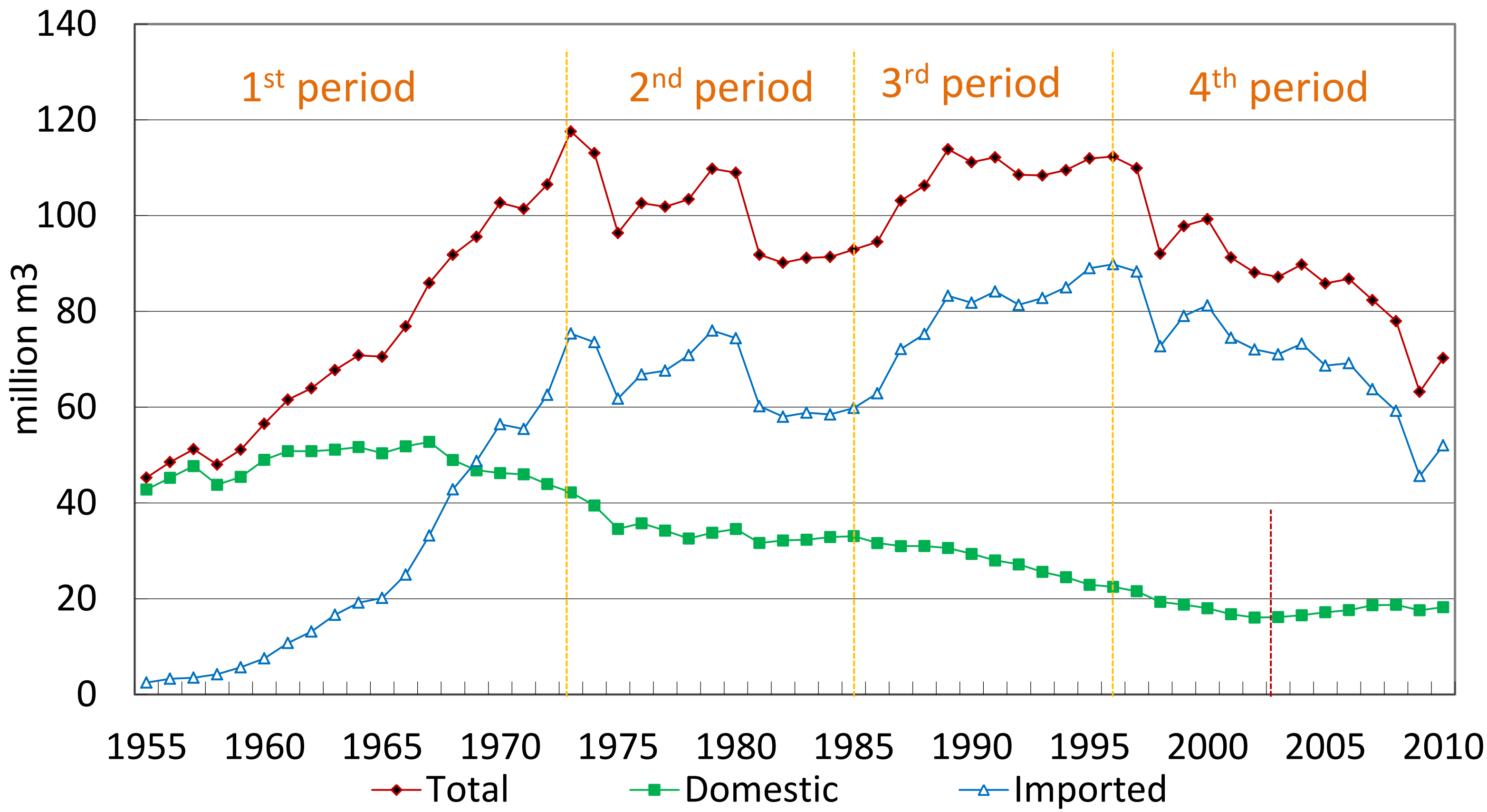


Source: Statistics from Ministry of Internal Affairs and Communications

- Trend: growing employment in the service sector rapidly
- Agricultural sector: shrinking employment since 1950s

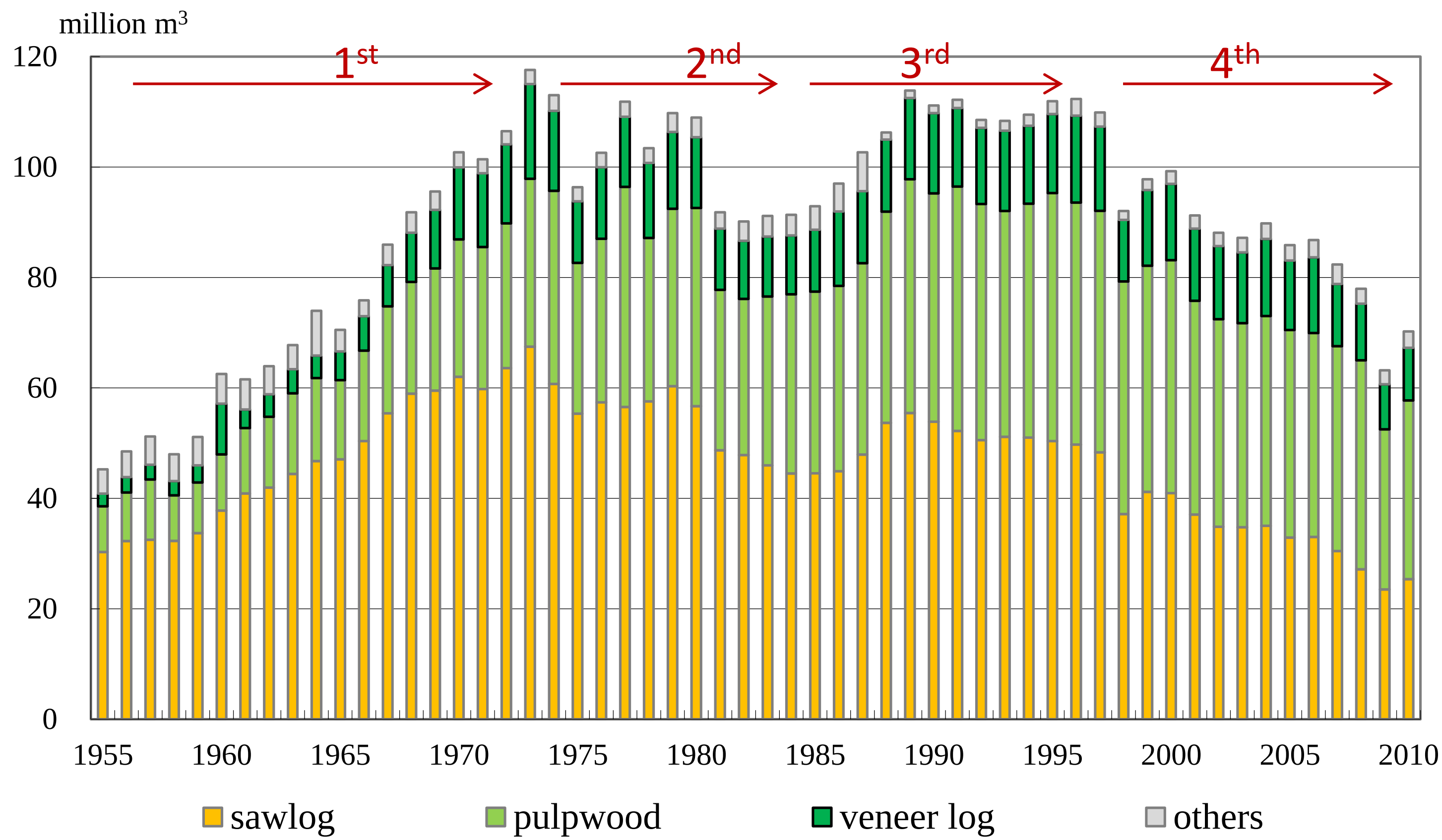
2. Forestry and Wood Utilization

Overview of Japanese wood market (1)



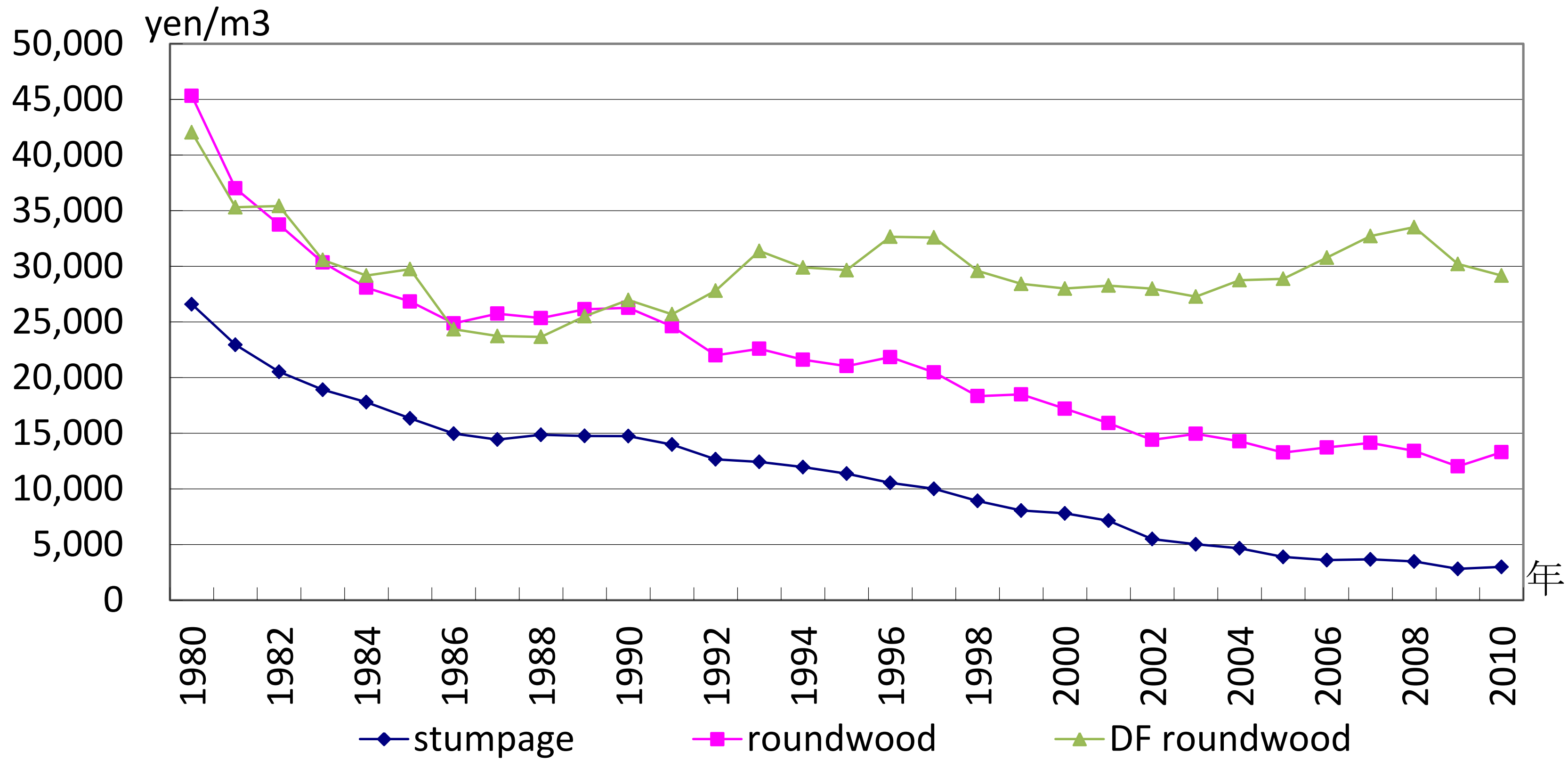
- Domestic wood supply had been gradually decreasing up to 2002, and since 2003 the trend has reversed slowly.
- Import of wood has been decreasing since the end of 1990's.

Overview of Japanese wood market (2)



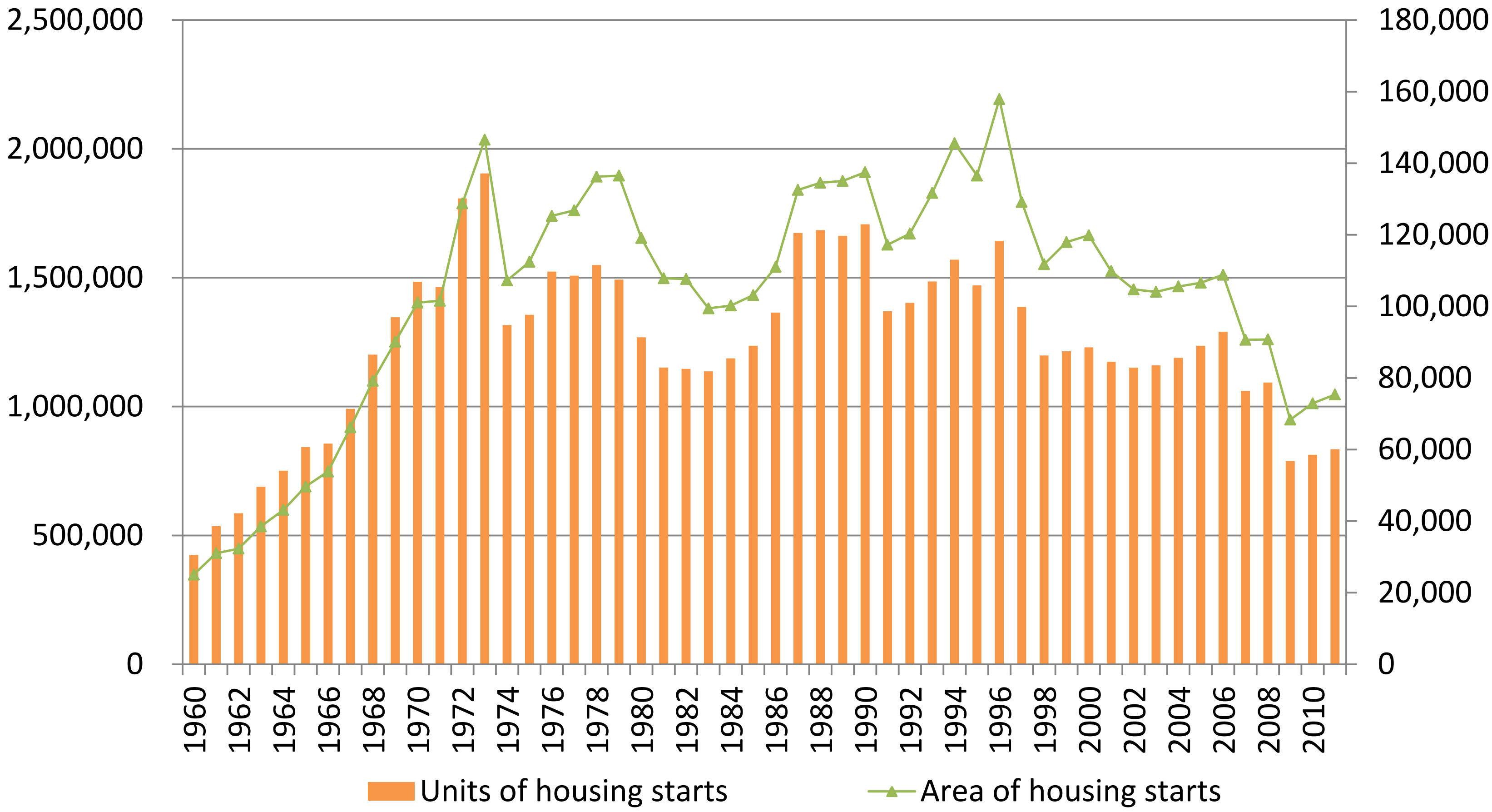
- Sawlog: increase in the 1st period, decrease since 1990s
- Pulpwood: increase up to 1980s, stable since 1990s
- Veneer log: stable demand (new plywood products)

Real price of J Cedar in calendar year 2000



- Prices of stumpage and roundwood of Japanese Cedar has been declining since 1980s.
- Price of DF roundwood has been stable for this decades.

Housing stars



- Housing starts have been decreasing since 1990s, especially the middle of 1990s.

↑ Sawnwood of Japanese cedar of Sawmill in Akita Prefecture（September 2004）

↓ Laminated lumber of Japanese cedar in Akita Prefecture（September 2004）

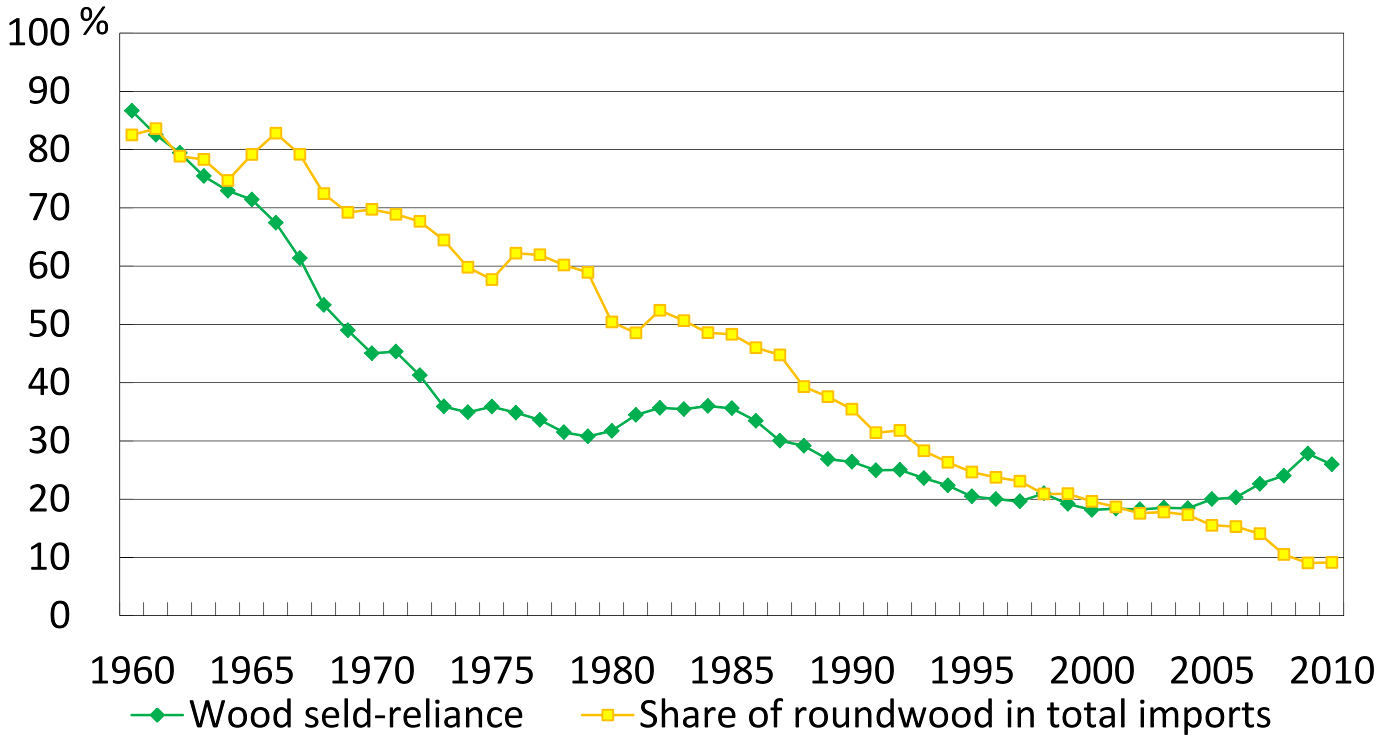
↑ Veneer products of Japanese cedar（September 2004）

↓ Plywood of Japanese cedar（September 2004）

↑ Conventional housing construction in Akita Prefecture （September 2007）

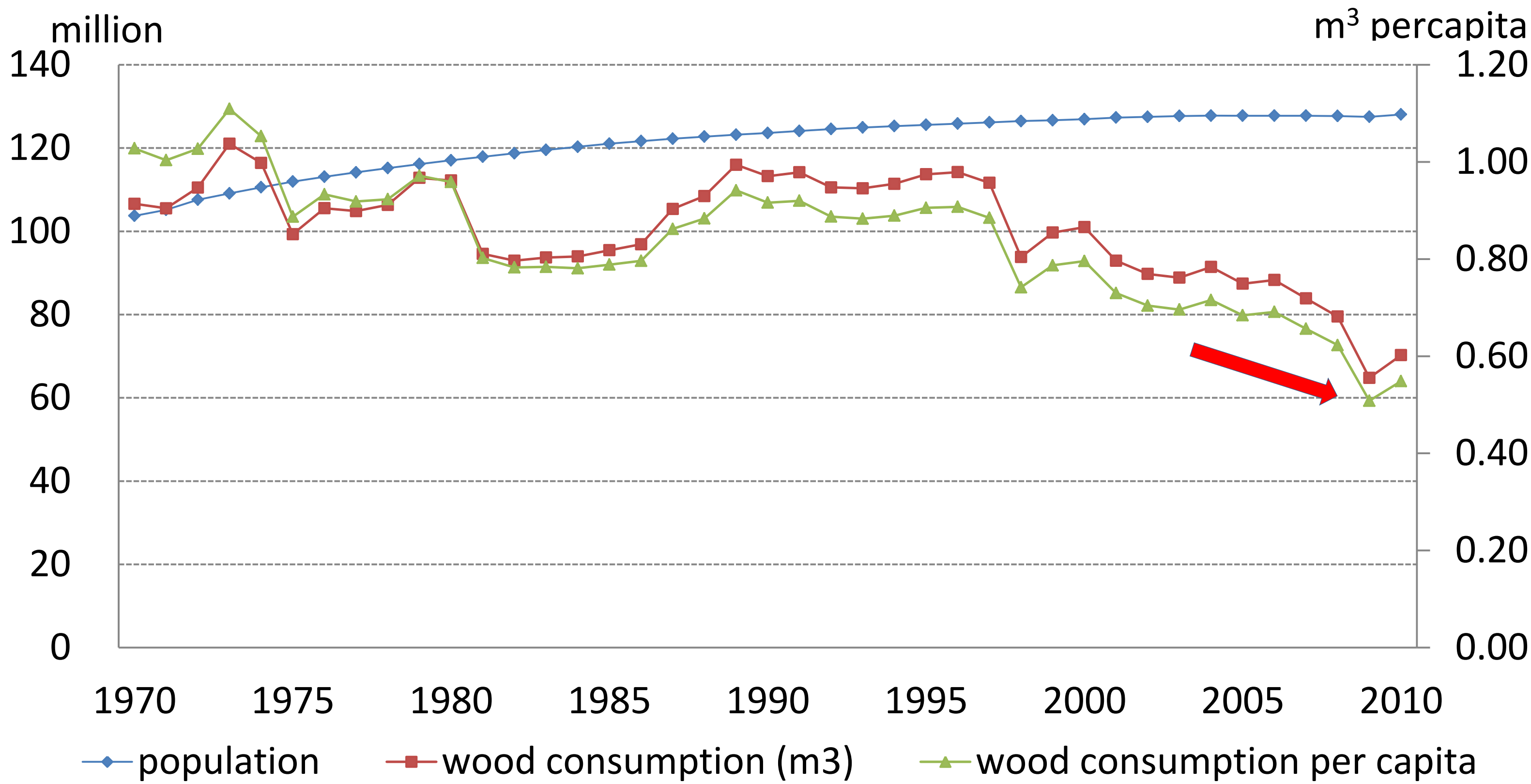
↓ New house in Akita Prefecture （September 2007）

Overview of Japanese wood market (3)



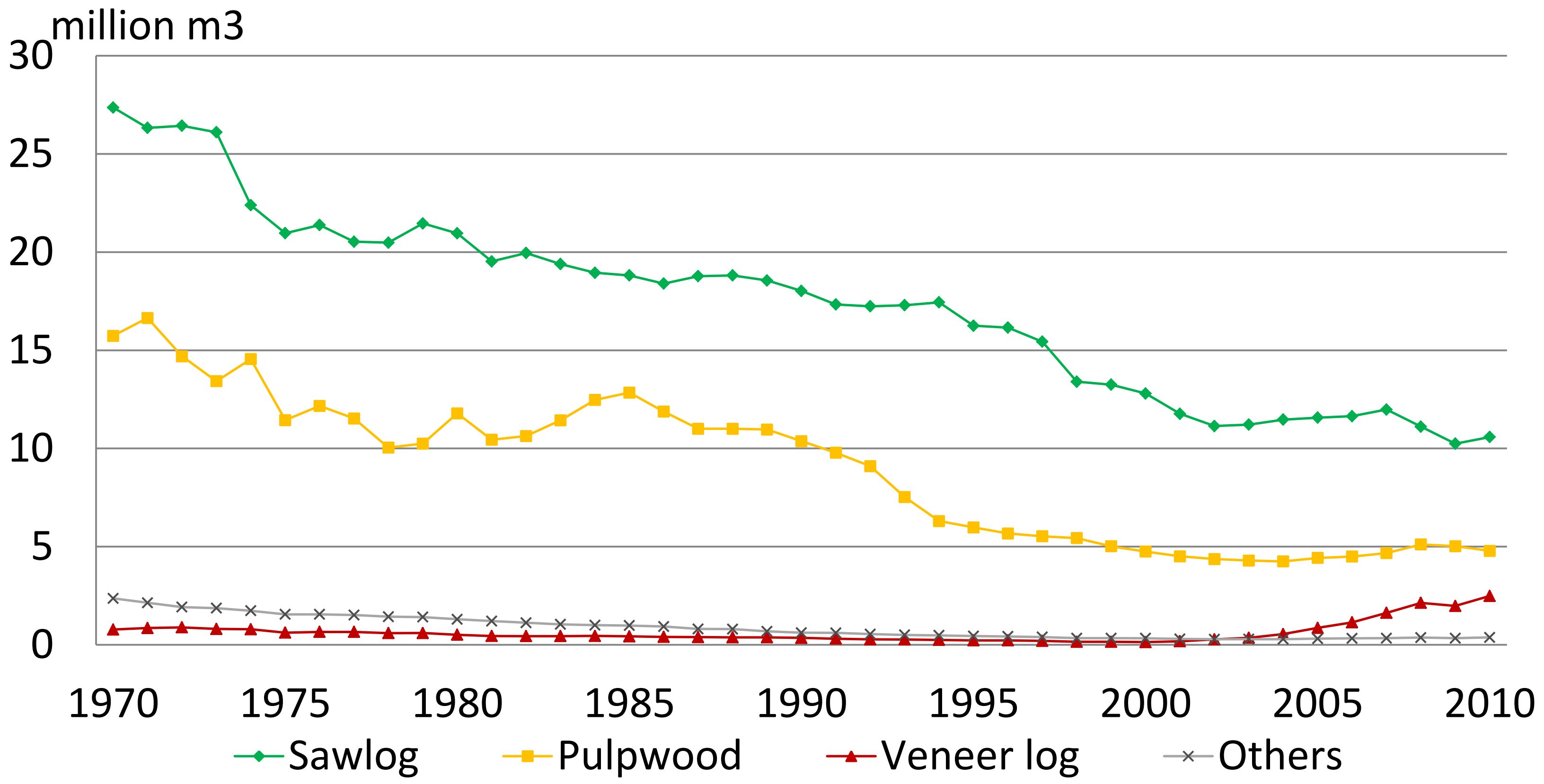
- Japanese wood self-reliance
  - had declined rapidly for 1960s, and also from the mid of 1980s to 1990s.
  - has increased for 2000s.
- A share of roundwood in total imports has been declining continuously since the end of 1960s.

Wood consumption per capita



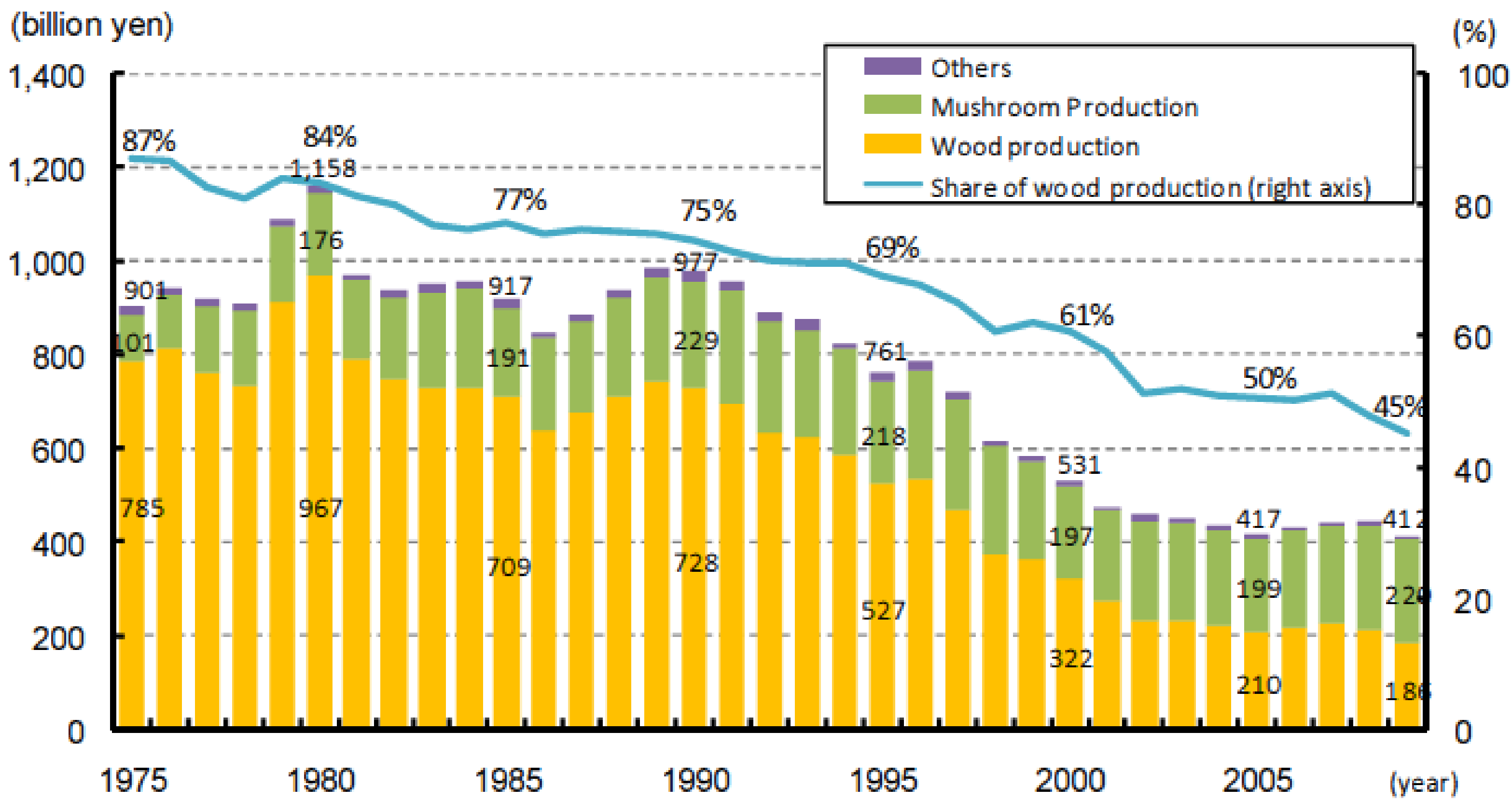
- Population: increasing slowly since 1970s, but entering a diminution stage in recent years
- Annual wood consumption per capita: decreasing from 1.0m³ to 0.5m³ for this four decades

Consumption of domestic roundwood



- Sawmill: major sector of wood manufacturing industry
- Plywood mill: developing in 2000s

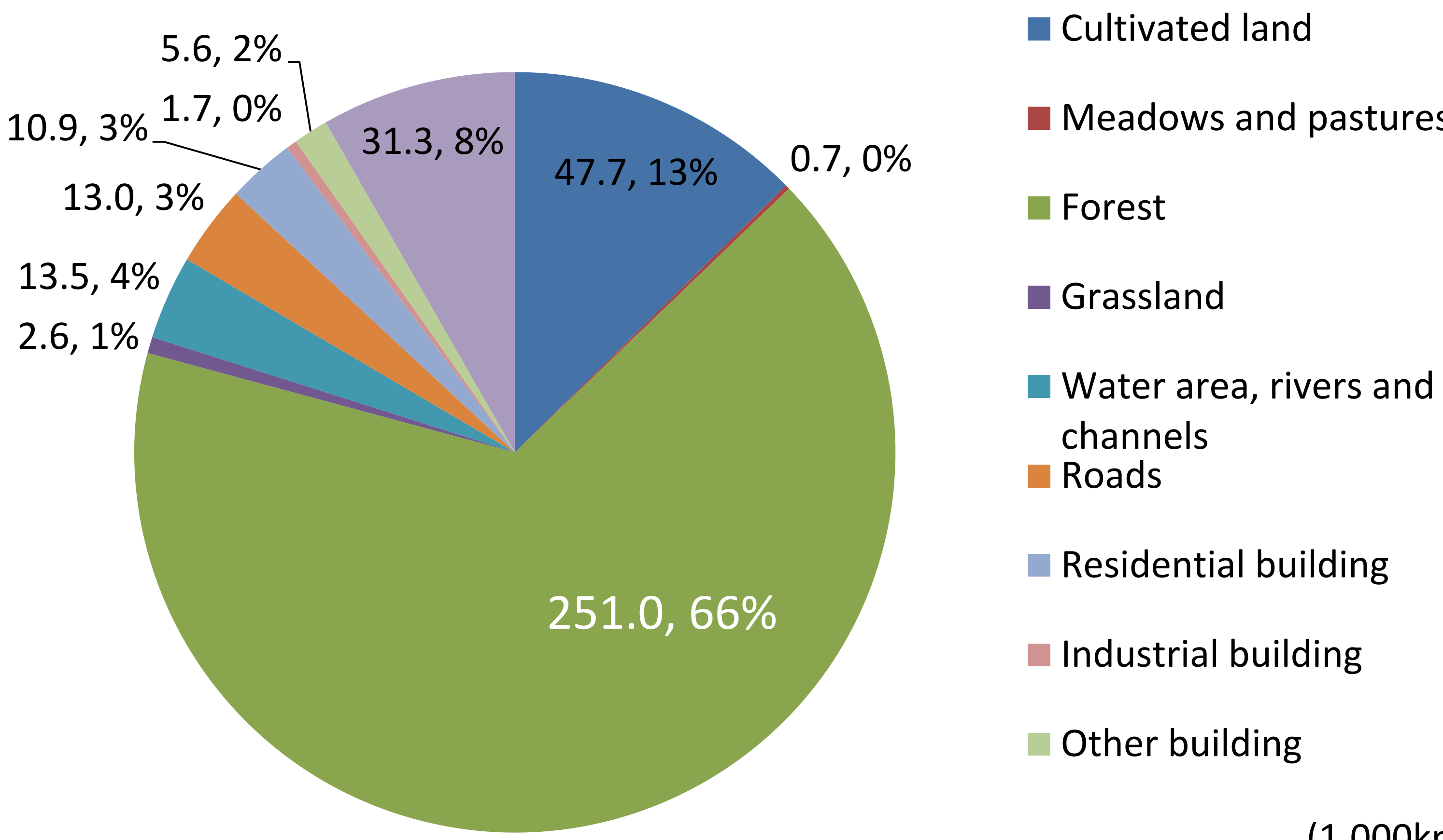
Value of Gross Forestry Production



- Gross forestry production: decreasing since 1990s
- Share of wood production: declining since the mid 1970s
- Mushroom production: consistent

3. Historical review of the change of forest area and stock

Land use as of 2002

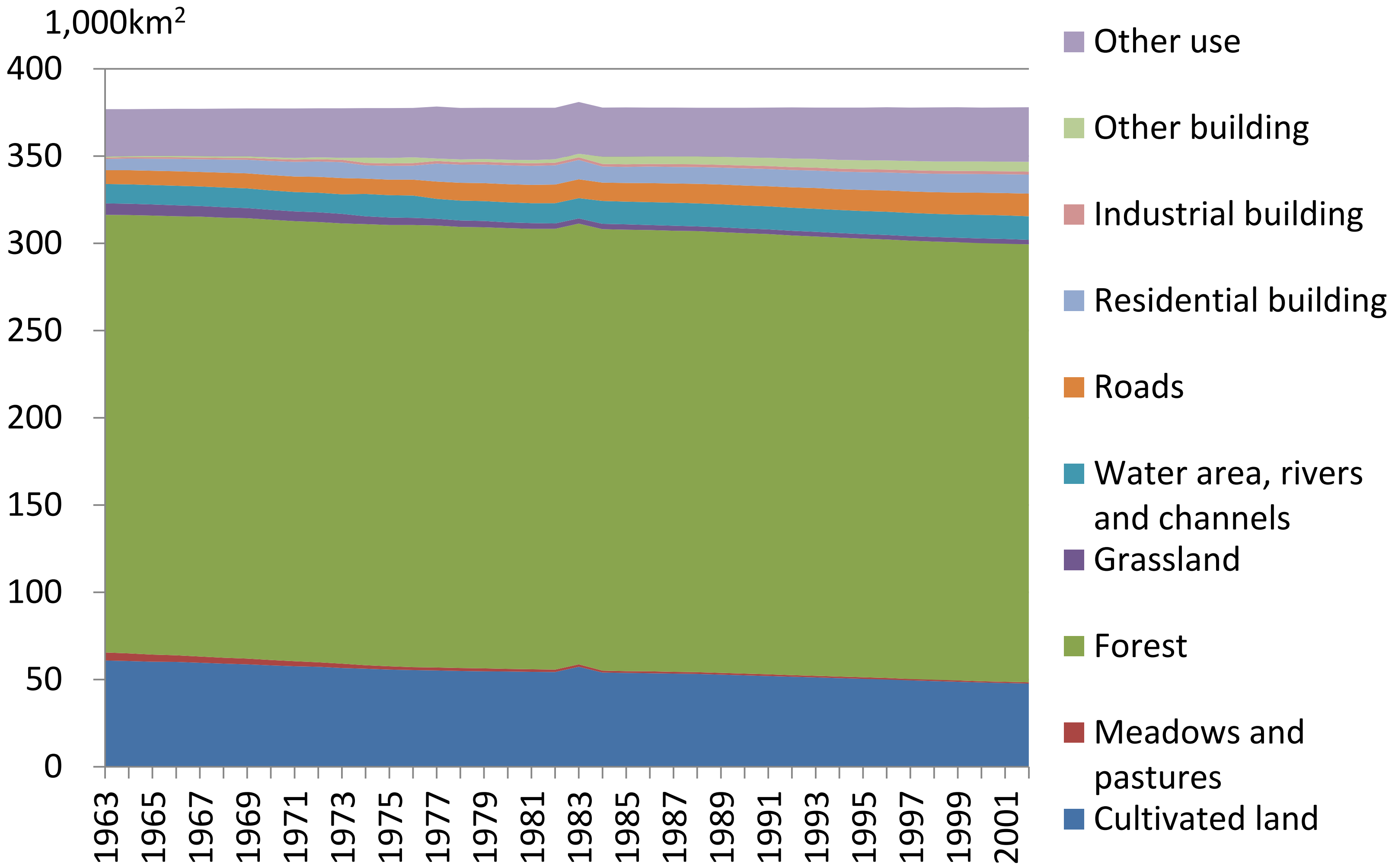


(1,000km^2 and %)

(Statistics from Ministry of Land, Infrastructure, Transport and Tourism)

- 66% of the area is covered by forest.

Historical change of land use



(Statistics from Ministry of Land, Infrastructure, Transport and Tourism)

Forest area and stock by ownership

		30%	70%			
		National forests	Private forests		Total	
			Publicly-owned forests	Privately-owned forests		
Area (1,000ha)		7,686	2,830	14,535	25,097	
Stock (1,000m^3)	Coniferous	606,887	337,057	2,131,341	3,078,921	70%
	Broad-leaved	471,385	147,269	732,171	1,352,816	30%
	Total	1,078,272	484,326	2,863,512	4,431,737	

‘Publicly-owned forests’ refer to the forests owned by prefectures and municipals mainly.

Regional (less) differences

Prefectures where the percentage of forests to the total geographical area above 60%

Equidistant conic projection

↑ Natural Forest in Hokkaido (May 2008)

↓ Planted Forest of Larch in Hokkaido（August 2008）

↑ Natural mushrooms of "*Nameko*" in the natural forest in Hokkaido （October 2009）

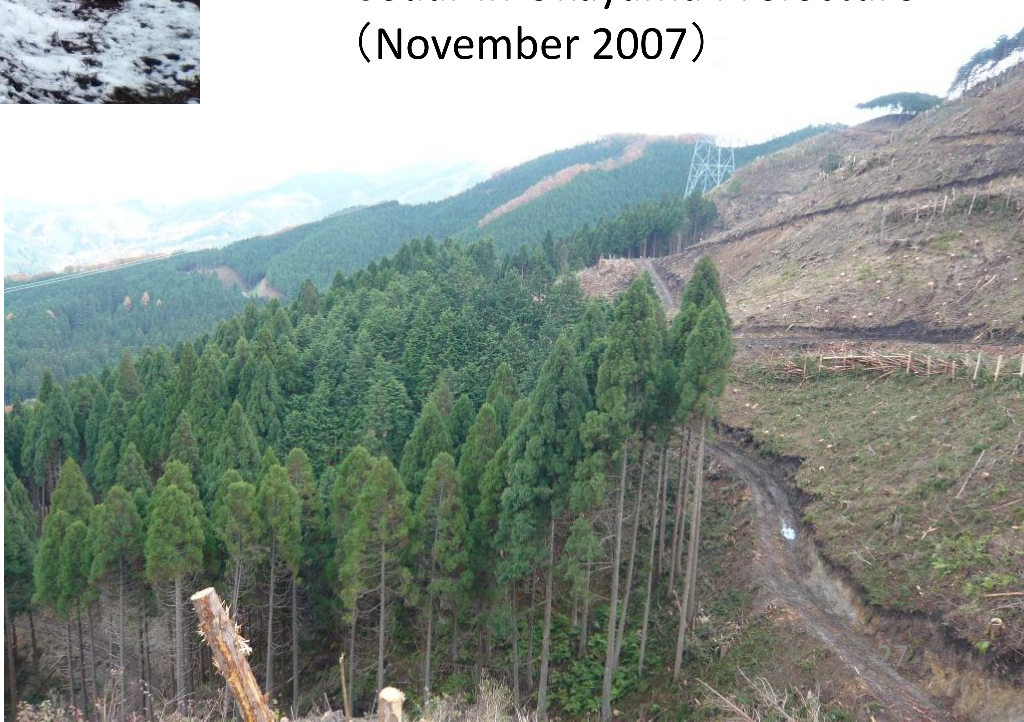
↓ Naturally regeneration of Japanese Spruce on fallen trees （May 2008）

←Planted forest of Japanese Cedar aged 45 years in Gunma Prefecture (July 2005)

↓ Planted forest of Japanese Cedar aged 45 years in Ibaraki Prefecture (April 2007)

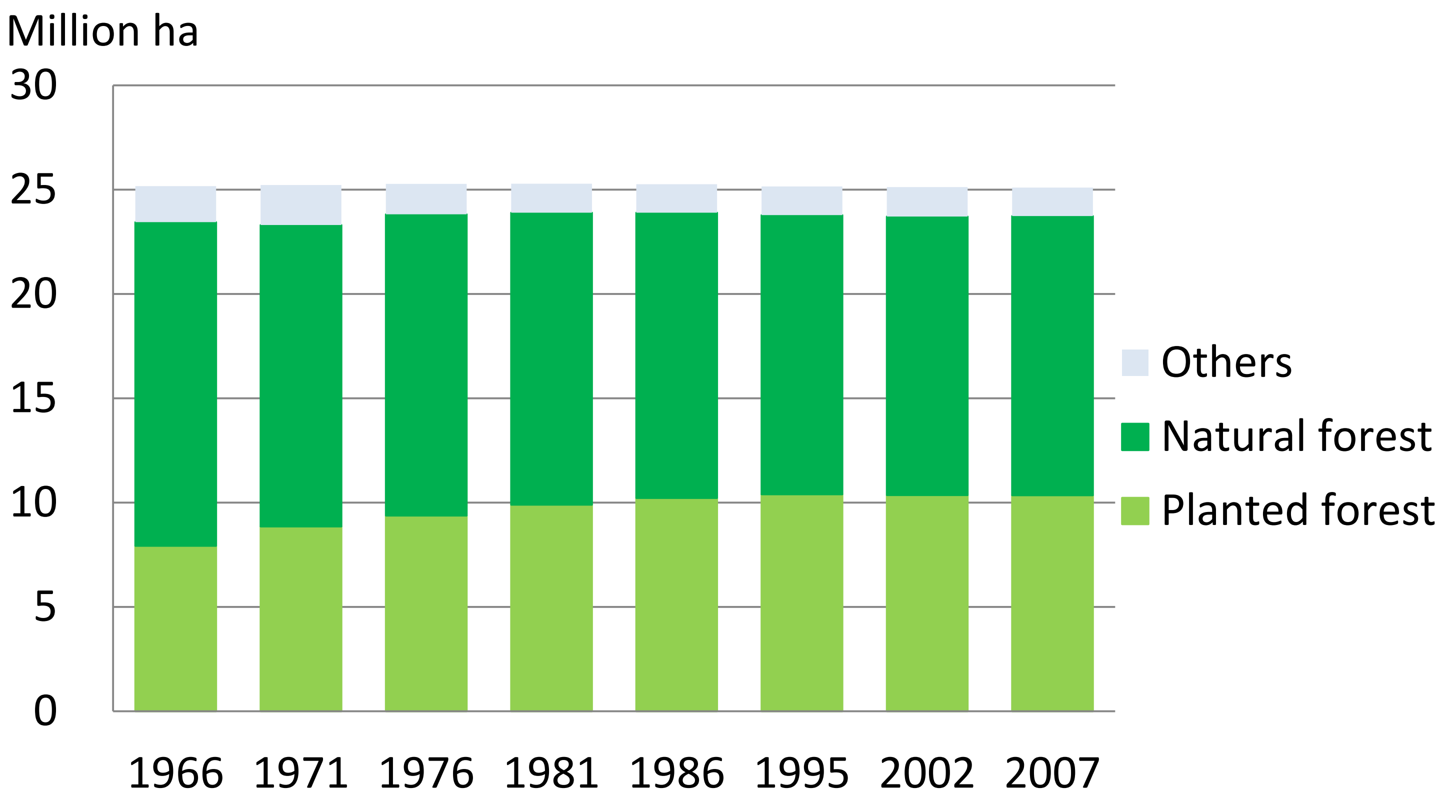
↑ Planted forest of Japanese Cypress aged 37 years in Okayama Prefecture (February 2009）

↓ Mixed planted forest of Japanese Cypress and Japanese Cedar in Okayama Prefecture （November 2007）



Mixed forest of planted cedar and broadleaf trees “mosaic forest” in Miyazaki Prefecture（December 2000）

Historical change of forest area by type



- Forest area: stable at 25 million ha
- Natural forest: decreased from 1960s to 1980s
- Planted forest: increased from 1960s to 1980s

‘Expansive afforestation’

Scarcity in timber supply after World War II

- Forests had been depleted by the end of World War II. Meanwhile, for the recovery from the scratch, a lot of timber were needed.
- Japan was importing timber before 1940s, but from 1940s to 1960s, import was limited. Thus, during this period, timber could be obtained only within the current territory of Japan.

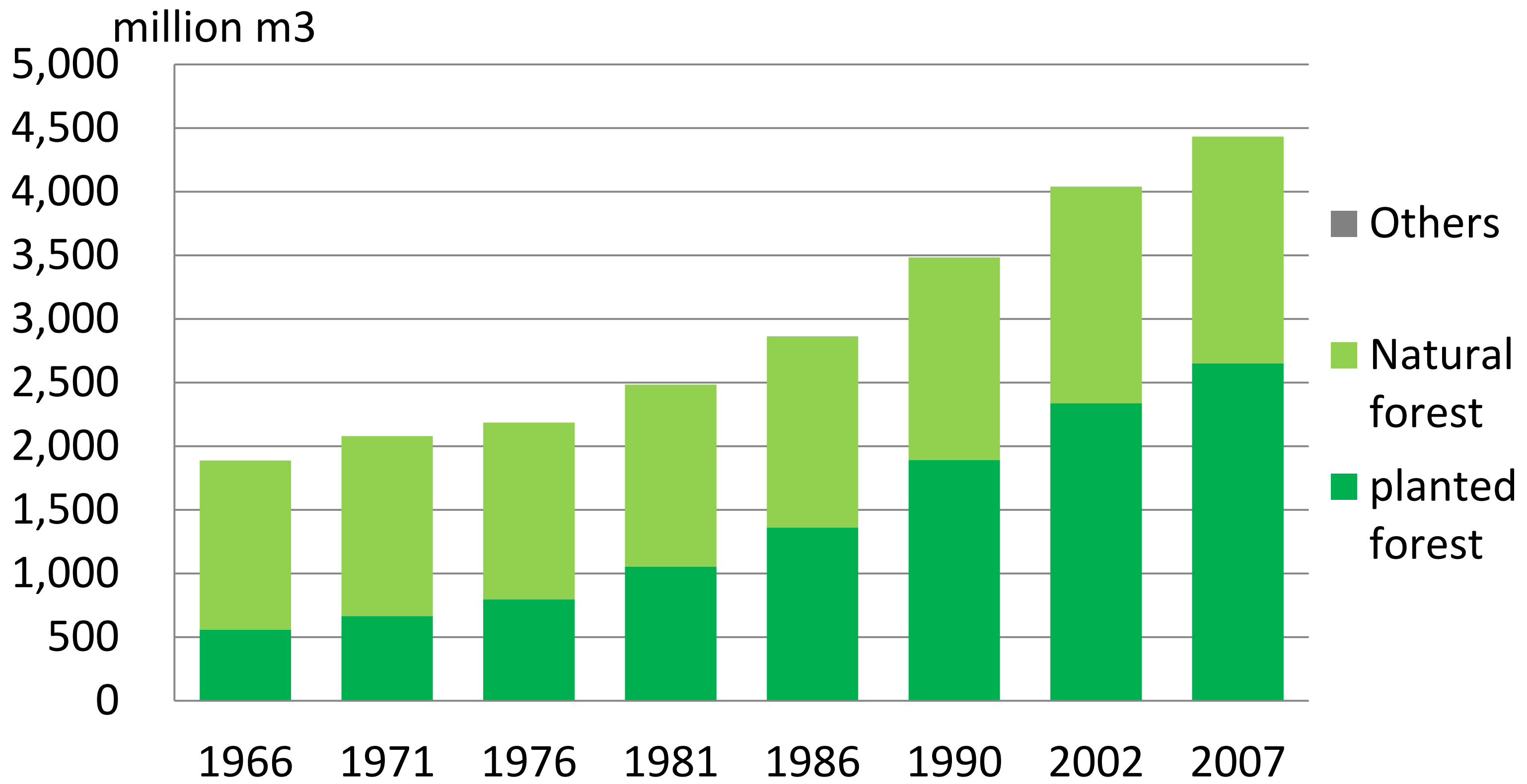
↓

1. ‘Expansive afforestation (planting of coniferous trees instead of broad-leaved trees)’ from the latter half of 1950s to 1970s mainly
2. Resumption of timber import from 1960

Why ‘expansive afforestation’ so succeeded?

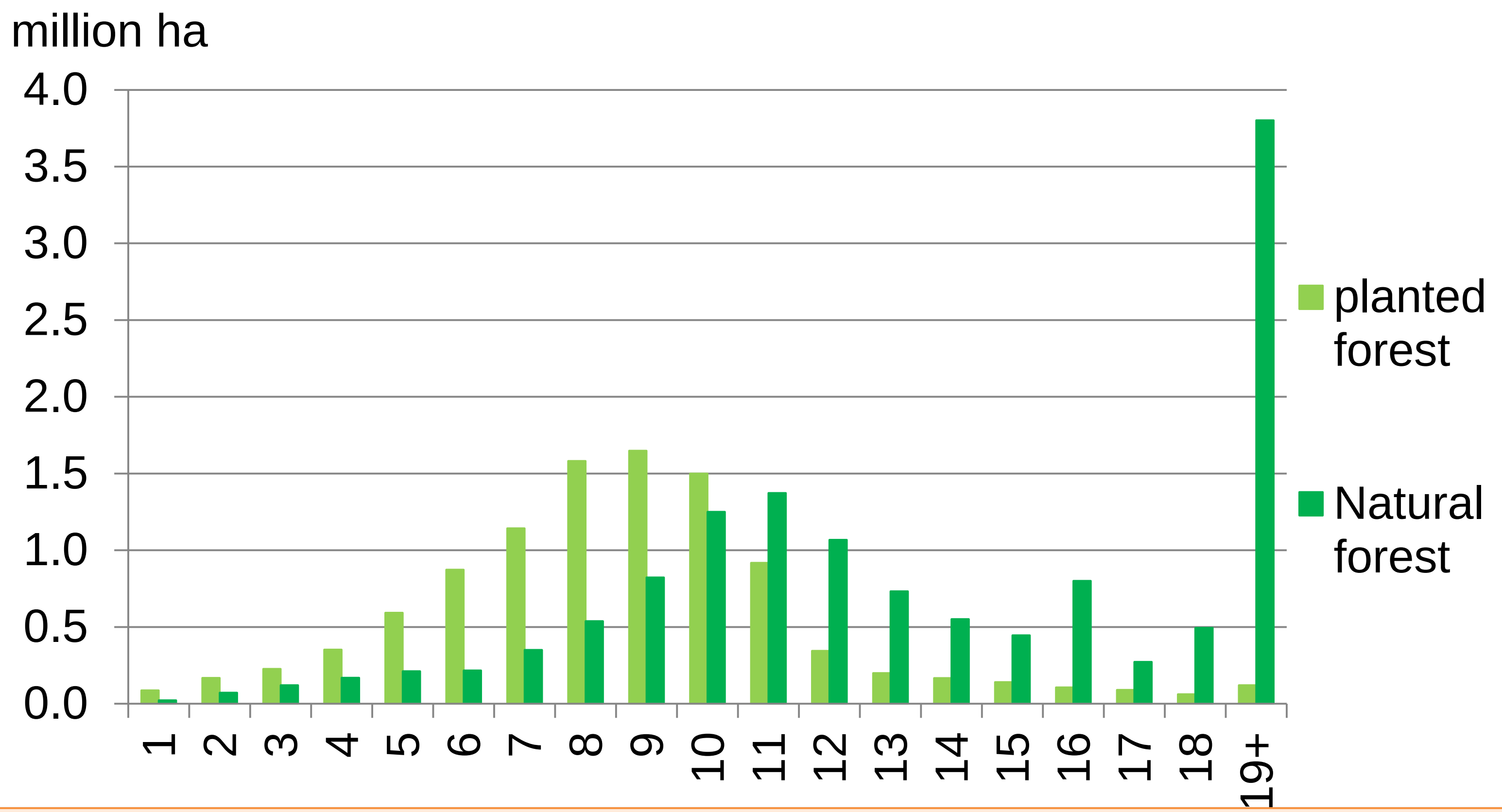
- Subsidies from the central and local governments
- High timber prices between 1950s and 1970s, and forest owners’ conviction that such a situation would continue
- Associated with the gradually decreasing importance of firewood from secondary broad-leaved forests due to the change of energy sources

Historical change of forest stock by type



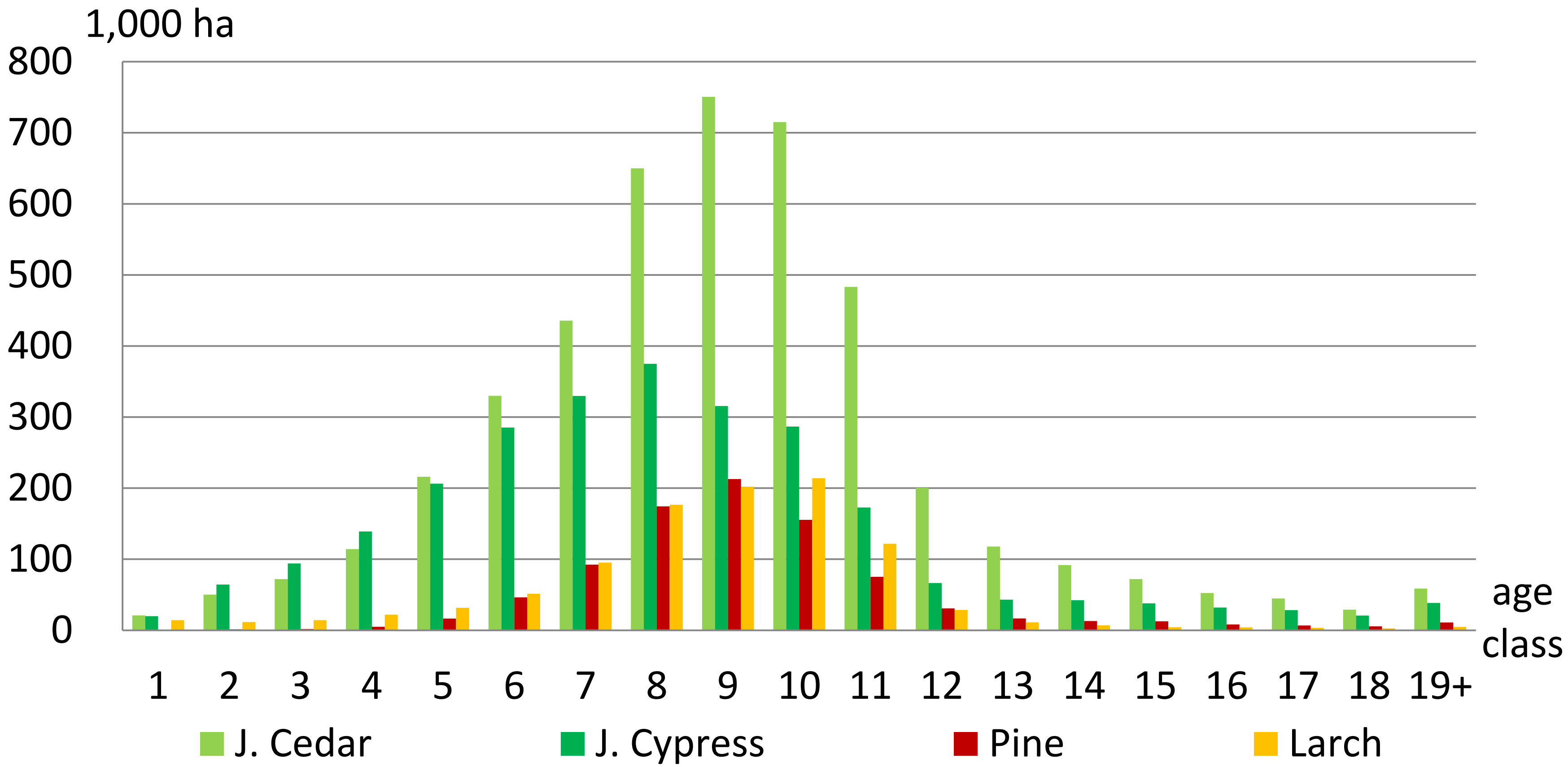
- Forest stock: increasing since 1960s
- Natural forest: steady in a half century
- Planted forest: growing significantly since 1970s

Age class of forest resources in 2007



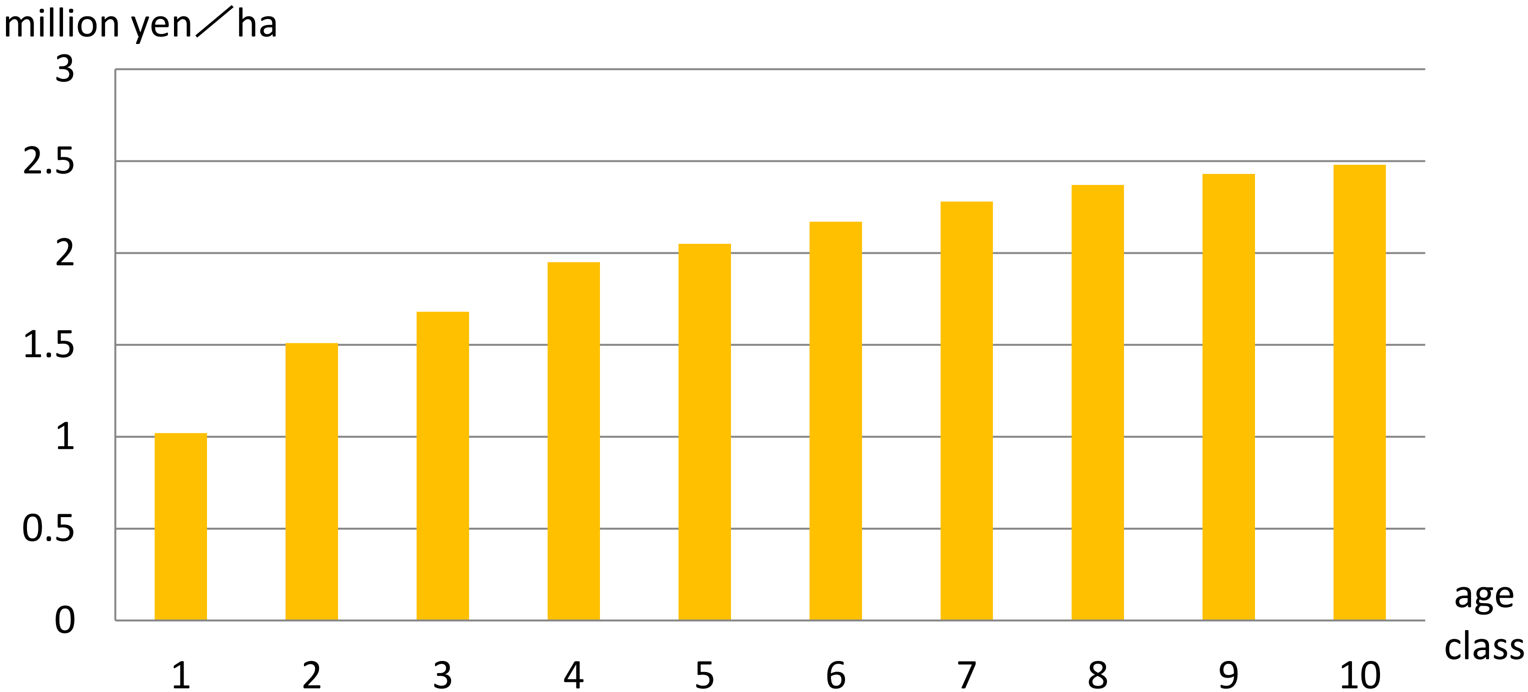
- **Disproportionate** in age class distribution
  - Natural forest: high proportion of the age class 10-12 (46-60 years)
  - Planted forest: high proportion of the age class 8-10 (36-50 years)

Area of major planted species as of 2007



- Large area of planted forests has been meeting harvesting age.
- All species have uneven distribution in age class caused by expansive afforestation.

Management Cost of Planted J. Cedar



Source： Forestry Agency "Current State of Forestry in Japan 2010"

- High initial cost with around 1 million yen/ha
- Total management cost up to age 50 is 2.5 million yen/ha
- Average cost is approximately 6,000-8,000 yen/m^3

Supplementary information on the conditions before 1960s

	Agricultural land	Wasteland	Forests					Residential land	Others
			Broad-leaved	Coniferous	Mixed	Bamboo	Forests total		
Around 1850	14.9	11.1	30.2	11.8	25.5	1.5	69	1.7	3.3
Around 1900	16.8	10.7	26.5	11.9	26.3	0.8	65.5	1.7	5.3

(Nishikawa and Himiyama 1992)

- Not very different from the current situation of forest cover
- From 1850 to 1990, broad-leaved forests were converted to agricultural land. However, unlike after 1960s, residential land did not increase.
- By the time World War II ended, forest resources had been extensively depleted (ibid).

Forest area has been stable since the middle of 19c. The expansive afforestation caused the contents of forest resources in Japan.

Thinning activity in Hokkaido
（August 2010）

Clear Cutting in Akita Prefecture
（September 2005）

4. Major forces to drive the forest transition

Direct causes and underlying causes

Outcomes

- Increase of resource amounts
- Reduction of the pressure on resources

Direct causes

- Promotion of ‘expansive afforestation’ from 1950s
- Increased dependence on imported timber from 1960s
- Change of rural energy sources in 1960s
- Depopulation of rural society from 1960s

Underlying causes

- Scarcity in timber supply
- Transformation of rural society and rural-urban relations

Macro-level situation

- Forest depletion due to the war
- Wood demand for the recovery after the war
- Limitation of timber trade in 1940s

Rapid and significant economic growth between 1960s

Change of rural energy sources

- Most of peasants were dependent on natural forest close to villages for collecting firewood or fodder for domestic fuel or agriculture up to the first oil crisis.
- Charcoal production was also active at the same time.

↓

- Rural energy sources gradually changed from such natural forest to coal, electricity, or petroleum in 1960s.
- Economic importance of such natural forest decreased; this was one of the conditions that enabled the extensive planting of coniferous trees replacing broad-leaved forests.

Further Topics

- The new “Fundamental Plan of Forest and Forestry”
- Recovery of forest resources, forestry, and wood manufacturing industry

- For case study
  - To act against deducing reforestation
  - To realize lower cost in forestry activity
  - To promote forest certification

Thank you!

Definition of the forest in the Forest Act 1951

The Forest Act (No. 249 of 1951)

1. Land where wood or bamboo grows collectively or the wood or bamboo *per se* existing on such land
2. Other than the land specified above, land to be served for collective growth of wood or bamboo

Provided, however, that agricultural or residential land, any land to be served for such purposes, and the wood or bamboo *per se* existing on such land are excluded.

→ Thresholds are not provided in the Forest Act.

Definition of the forest in the current FAO reports

表 1　我が国が FAO の報告に用いている森林区分及び定義

区分		定義
森林		木竹が集団して生育している土地及びその土地の上にある立木竹、もしくは木竹の集団的な生育に供される、0.3 ヘクタール以上の土地。ただし、主として農地又は住宅地若しくはこれに準ずる土地として使用される土地及びこれらの上にある立木竹を除く。
	立木地	森林のうち、樹冠疎密度 0.3 以上の林分（幼齢林を含む）。
	無立木地	森林のうち、立木地と竹林以外の林分。
	竹林	立木地以外の森林のうち、竹（笹類を除く）が生立する林分。

Definition	Forest with standing trees	Forest that has canopy cover of 30 percent or higher. Young stands with the degree of stocking of 0.3 or higher are included.
	Bamboo forest	Forest that does not fall under "forest with standing tree" and is dominated by bamboo (excluding bamboo grass).
	Forest without standing trees	Forest that does not fall under "forest with standing tree" or "bamboo forest". This category includes areas that are temporarily under-stocked and are expected to regenerate.
	Cut-over land	Forest without standing trees that has gone through final harvest.
	Under-stocked land	Forest without standing trees that does not fall under "Cut-over land".

Depopulation and aging of rural society

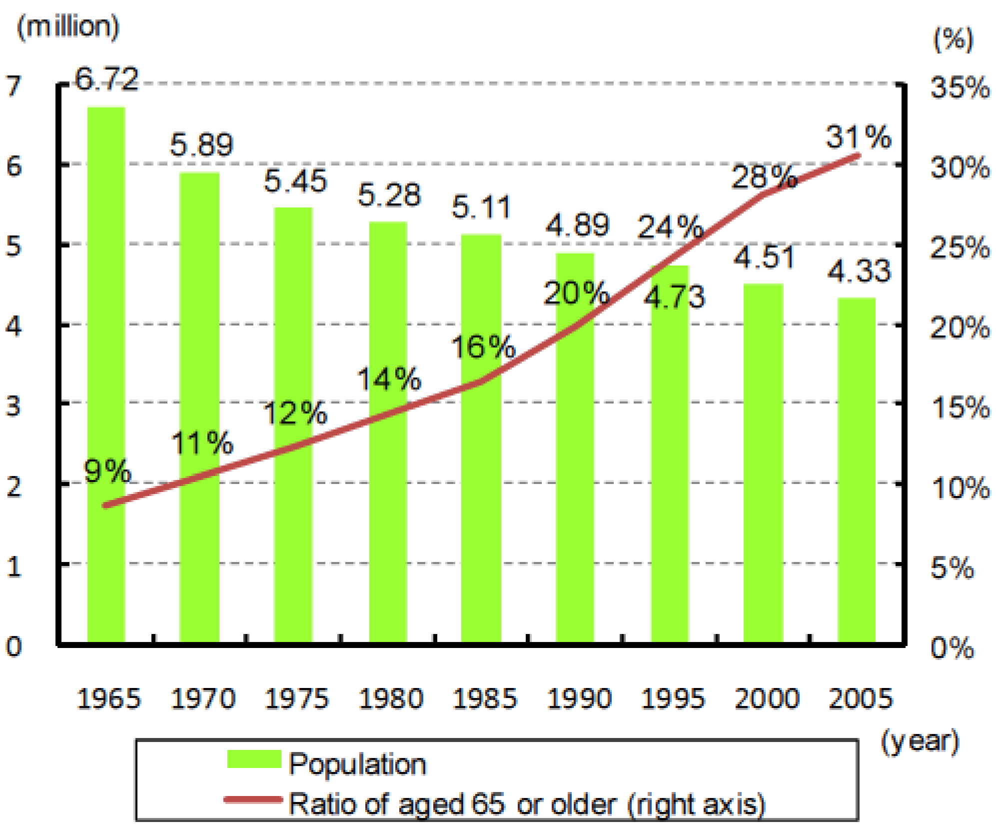


Fig.4-6: Population of mountainous areas and ratio of elderly people

Mountainous area: % of forest area above 75% and population density below 1.17 persons per ha for each municipal