

# 森林の防災機能とその保全対策

How Forests Mitigate Natural Disasters and Ways to Protect Them

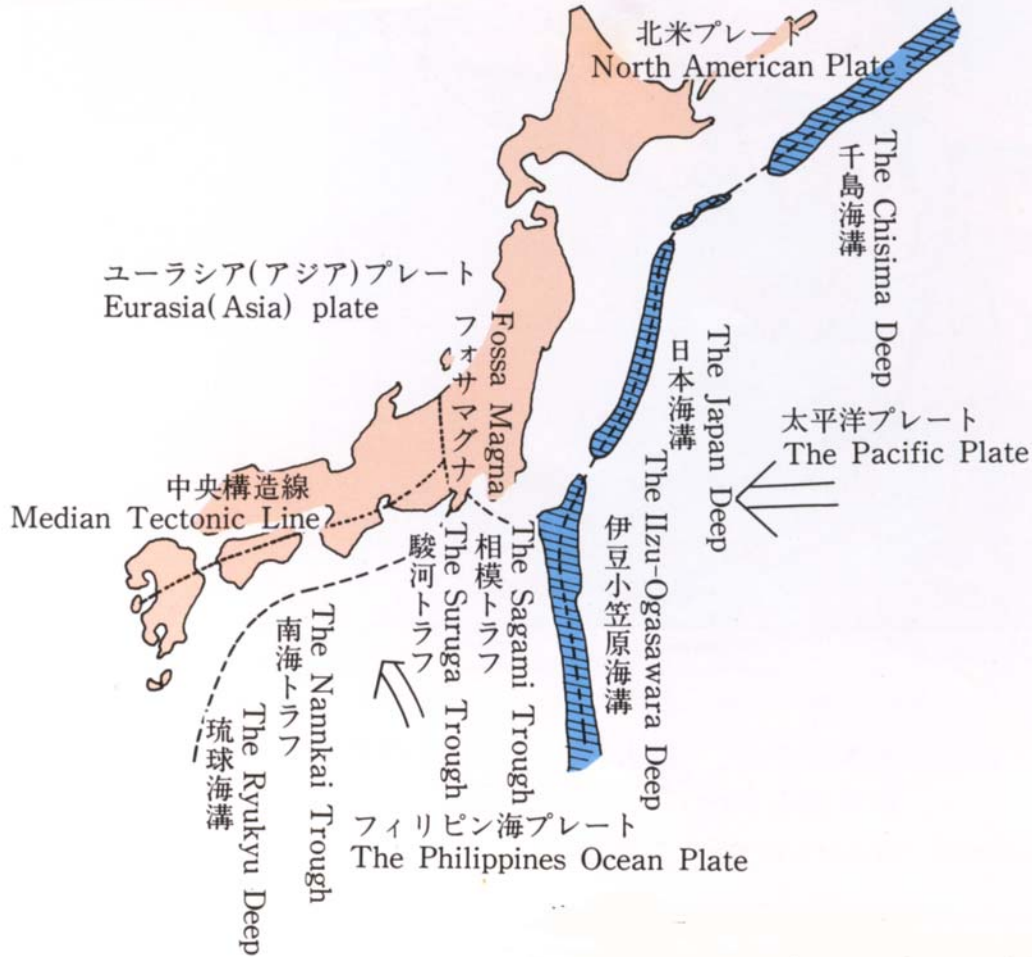
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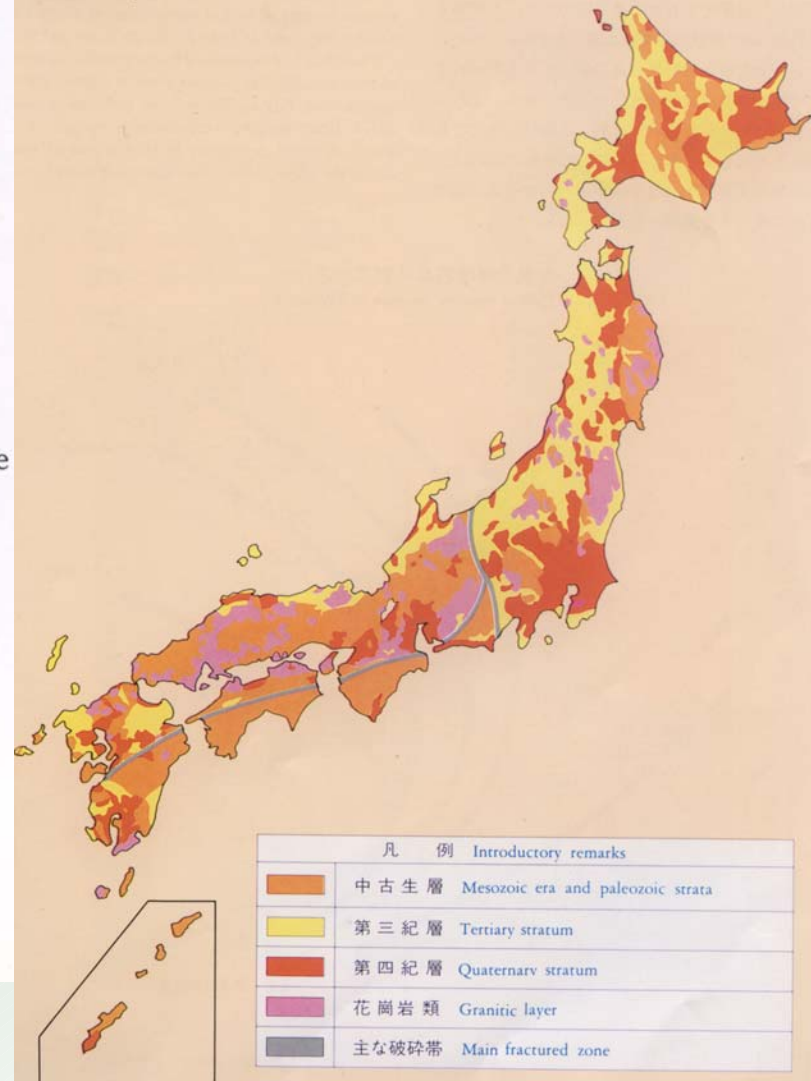
Professor, Tokyo University of Agriculture

# Natural Conditions in Japan ( 1 )

## Ocean deep and major tectonic line



## Geological map



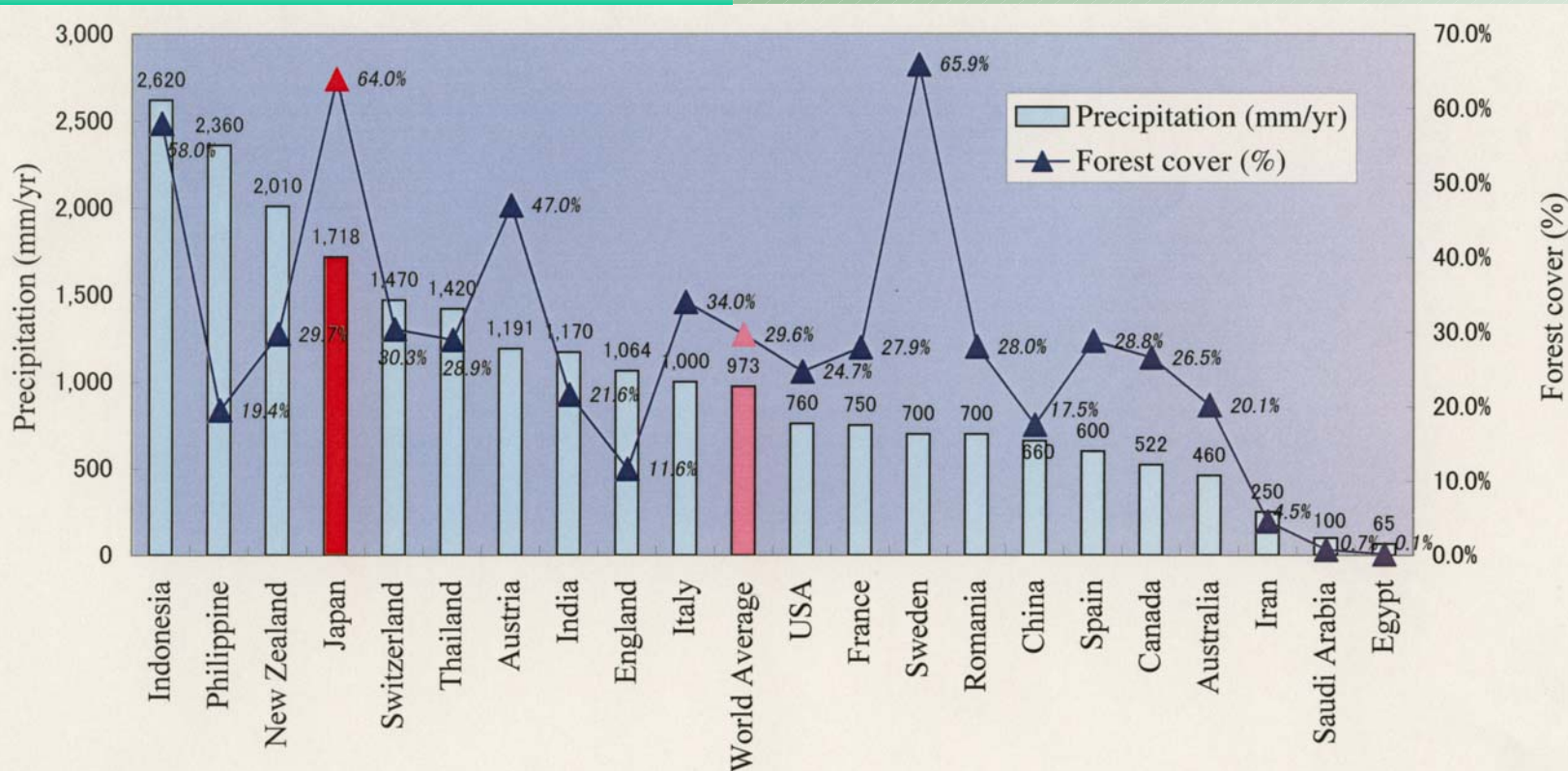
資料：日本経済教育センター

# Natural Condition in Japan ( 2 )

## Forest Area in Japan

- Forest : 25.1mil ha (67%) (Private Forest : 17.3mil ha, National Forest 7.8mil ha)
- Others (Cities, Arable land etc) : 12.7mil ha (33%)

## Precipitation / Forest Cover

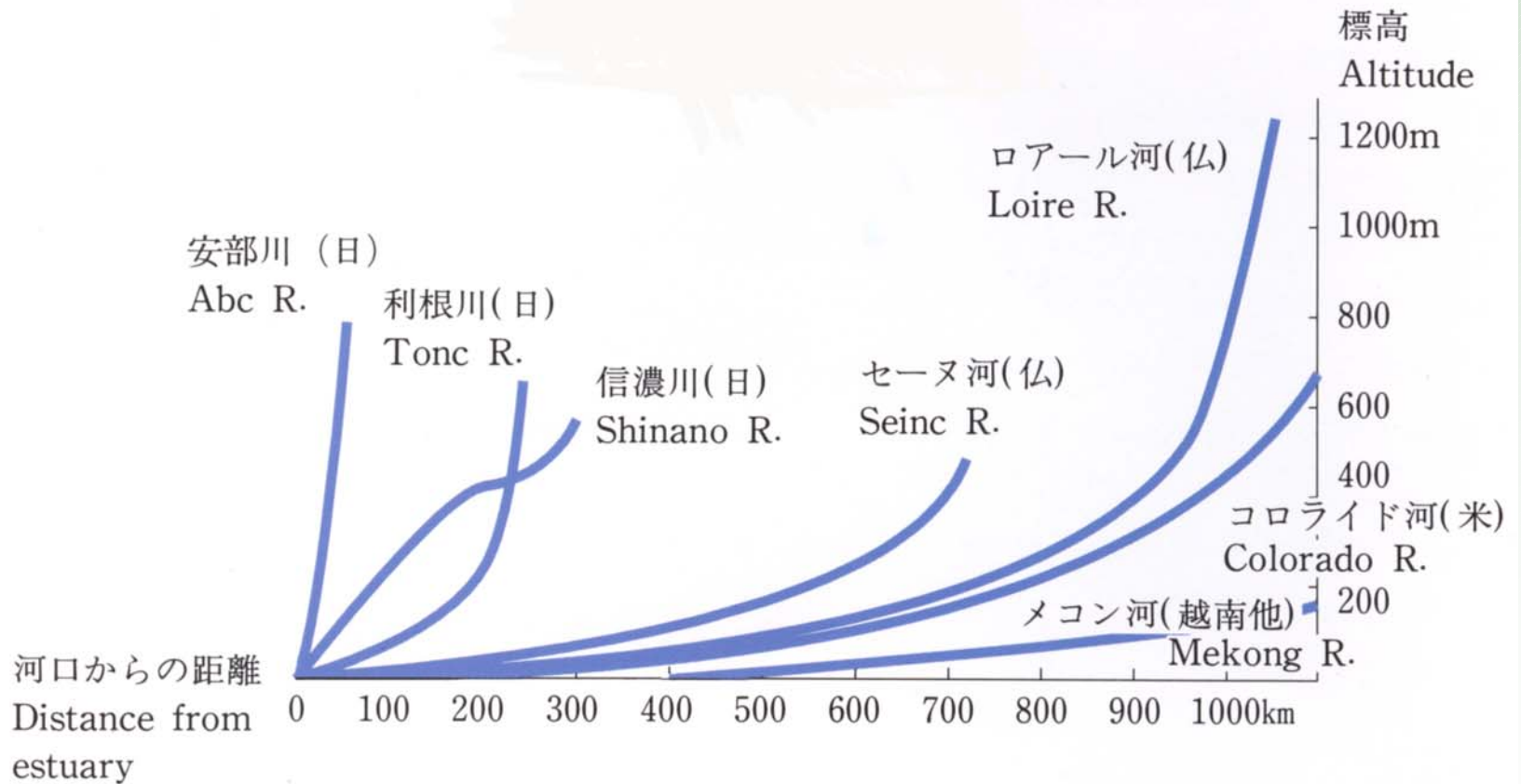


資料：国土交通省水資源部、FAO資料より作成

注：なお、日本の森林率64%はFAO資料によるため、農林水産省等で公表している数値67%と異なる

# Natural Condition in Japan ( 3 )

## Slop of main river in the world



資料：旧国土庁資料より作成

# Function of Forest ( 1 )

## The Montreal Process

- Criterion 1: Conservation of biological diversity
- Criterion 2: Maintenance of productive capacity of forest ecosystems
- Criterion 3: Maintenance of forest ecosystem health and vitality
- **Criterion 4: Conservation and maintenance of soil and water resources**
- Criterion 5: Maintenance of forest contribution to global carbon cycles
- Criterion 6: Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies
- Criterion 7: Legal, institutional and economic framework for forest conservation and sustainable management

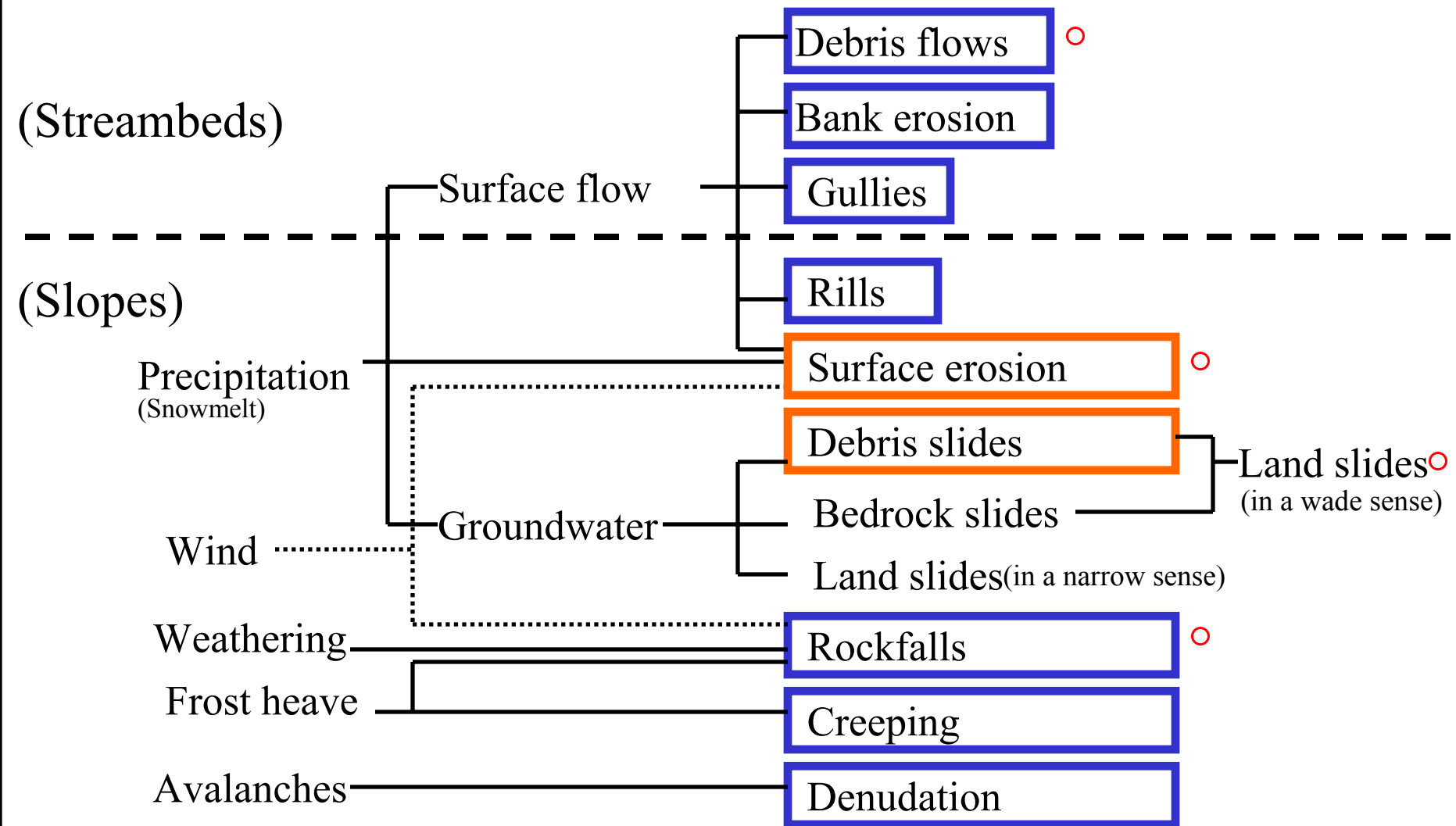
## Multi-function of Forest

( The Science Council of Japan )

- Conservation of biodiversity
- Conservation of the global environmental (preventing global warming, stabilizing climate systems)
- **Prevention of natural disasters and conservation of soil in mountain areas**
- **Conservation of headwater (controlling flooding , retaining water resource, improving water quality)**
- Creation of a pleasing environment
- Health and recreation
- Culture
- Production of material resources

# Types of sediment related disasters in mountain regions and how forests can prevent them

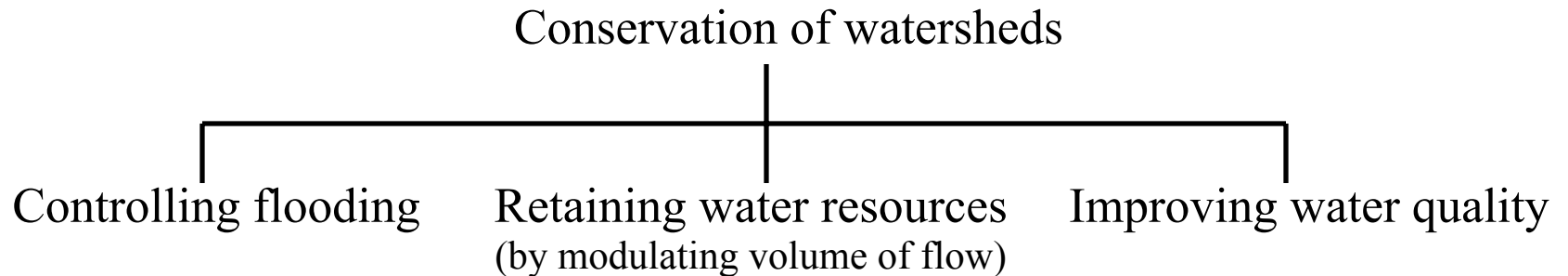
<Primary cause > <Type of sediment disasters damage>



- Forests are highly effective in preventing sediment movement
- ▣ Forests may be effective in preventing sediment movement under certain conditions
- Forests may be effective in helping stop sediment movement under certain conditions

# Function of Forest ( 2 )

## Functions of Conservation of Watersheds



## Other Functions in Mitigating Natural Disasters

- Reducing of mitigating wind speed
- Capturing moisture from the atmosphere
- Acting as a protective fence
- Acting as a barrier

# Destruction and Restoration of Forests in Japan

## History of forest exploitation and other forms of land use in Japan

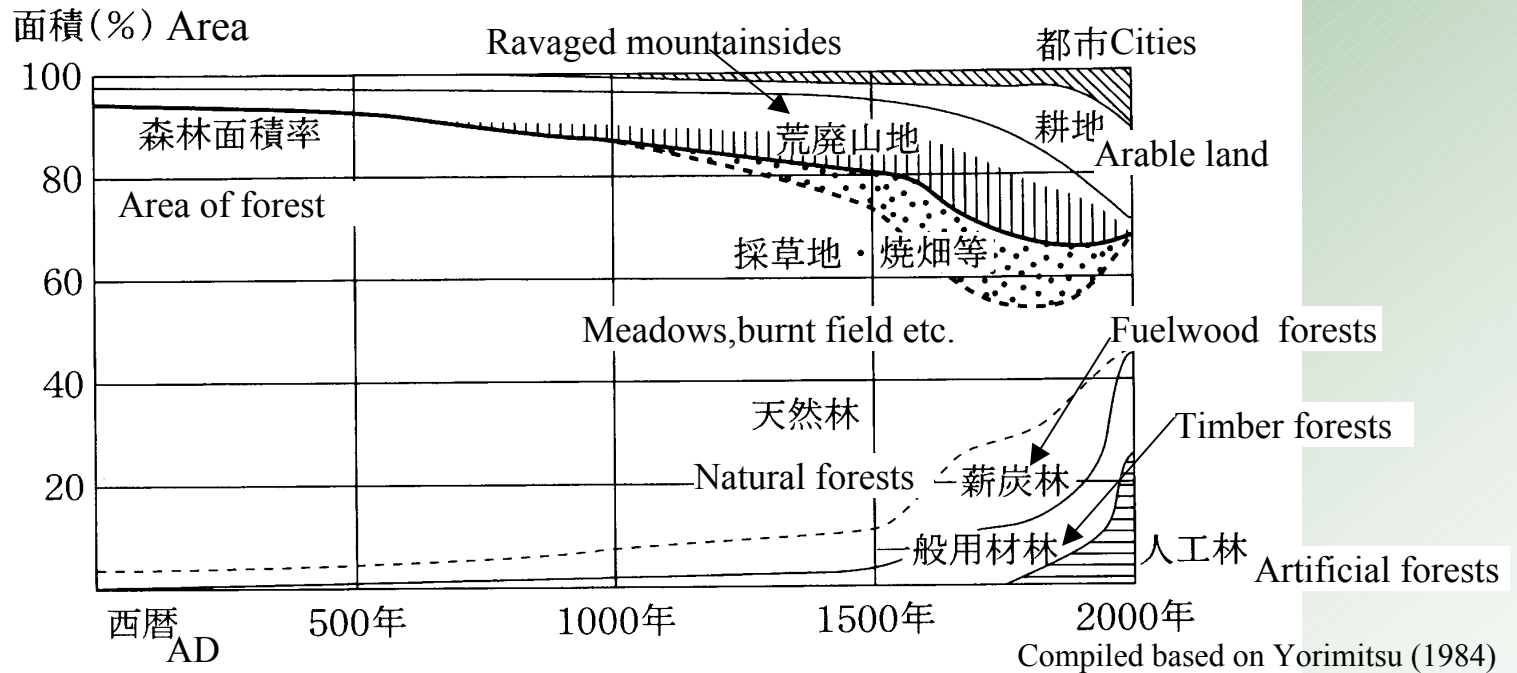
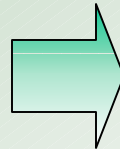


Photo of Kobe taken mid-Meiji era (late 1880s)



Restored forest today by forest conservation efforts



# The Protection Forest System in Japan

## Area of Protection forest by type (as of the end of FY 2003)

In tens of thousands of hectares

Type of protection forest	Total area	Amount state-owned
Headwaters conservation forests	744	423
Soil discharge prevention forests	234	94
Landslide prevention forests	6	2
Other types of protection forests	105	46
Total area	1,089	564

## Framework of Protection Forest System

The Protection Forest System is by the Forest Law.

There are 3 major components of the system.

- Designation : Specific forests, expected to maintain and improve public benefit functions, are designated by the Minister of MAFF or the local prefectural governor.
- Incentives : a Various incentives are prepared depending on degrees of restrictions.  
Restrictions: Certain activities are restricted to maintain the public benefit function of the forests.
- Improvement of functions: Implementation of Forest Conservation Project etc

# Forest Conservation Project

## Forest Conservation Project

- Rehabilitation and conservation of devastated forest and torrent
- Establishment of disaster prevention forest
- Protection forest improvement work
- Land slides prevention work



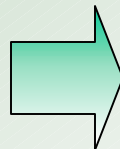
Before construction



Immediately after construction



3 years after construction  
before construction



12 years after construction  
before construction