

26th-27th of September 2019

Innsbruck, Austria

FAO/EUSALP CONFERENCE on “Protection Function of Forests in a changing Climate”

“Role and Policy for Protective Forests in Japan”

- Japanese Perspective on Protective Forests -

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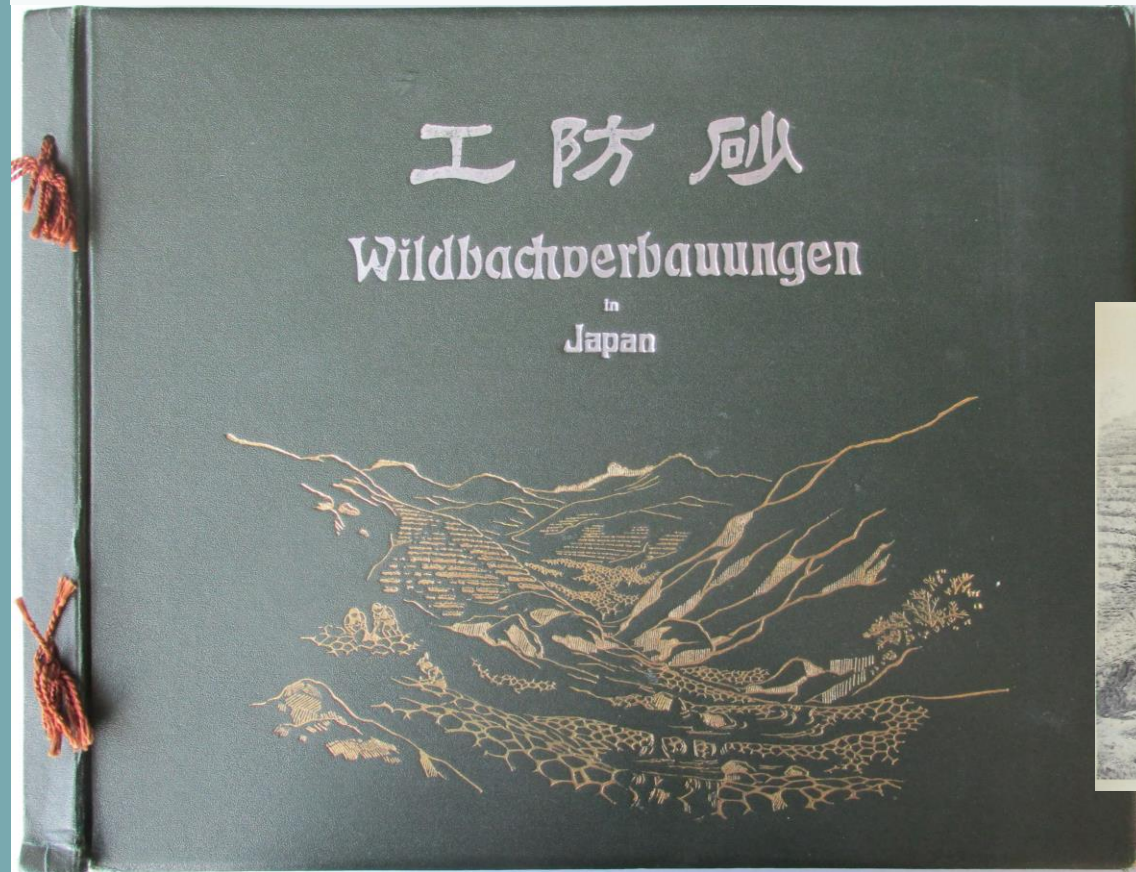
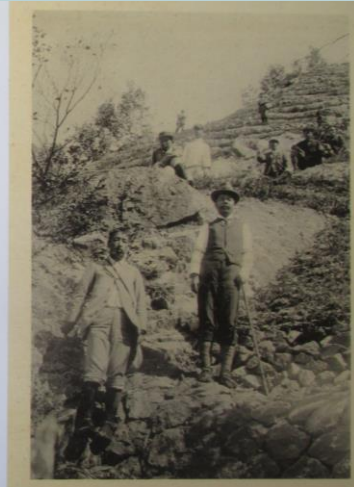
Outline

- *Brief history of hillslope works by afforestation in the framework of torrent control*
- *Two organizations responsible for mitigation of sediment-related disasters*
- *Recent trial in hillslope areas in the framework of torrent control*
- *Current status of Protective Forest*
- *Concluding remarks*

Hillslope works by afforestation were intensively carried out in early stage of the torrent control works in Japan.



Rokko Mountains in Kobe



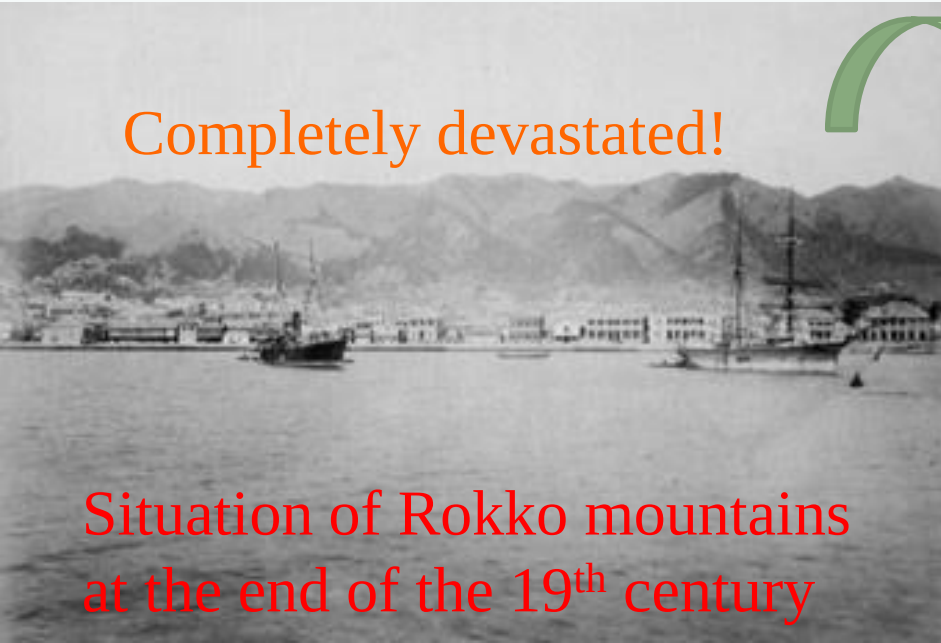
Jogajji River in Toyama Prefecture

This book was kept by Director Klaus Kloepper of Water Management Office Traunstein in 1982. Later it was given back to Japan through the International Research Society INTERPRAEVENT.

Old torrent control measures shortly after 1900 can be seen in the book.

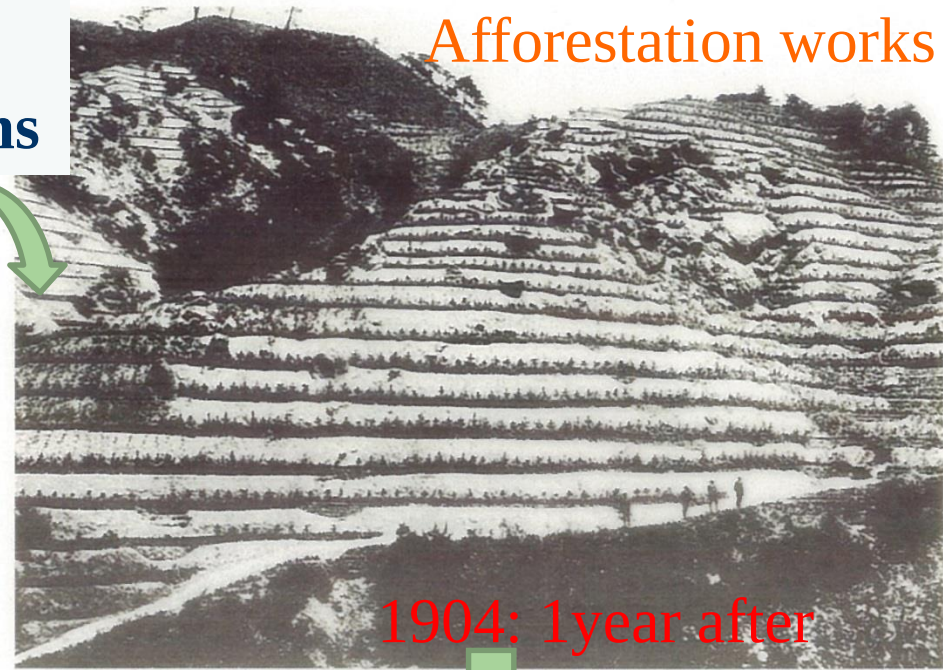
Representative example of hillslope works in Rokko Mountains

Completely devastated!



Situation of Rokko mountains at the end of the 19th century

Afforestation works



1904: 1 year after



Recent situation

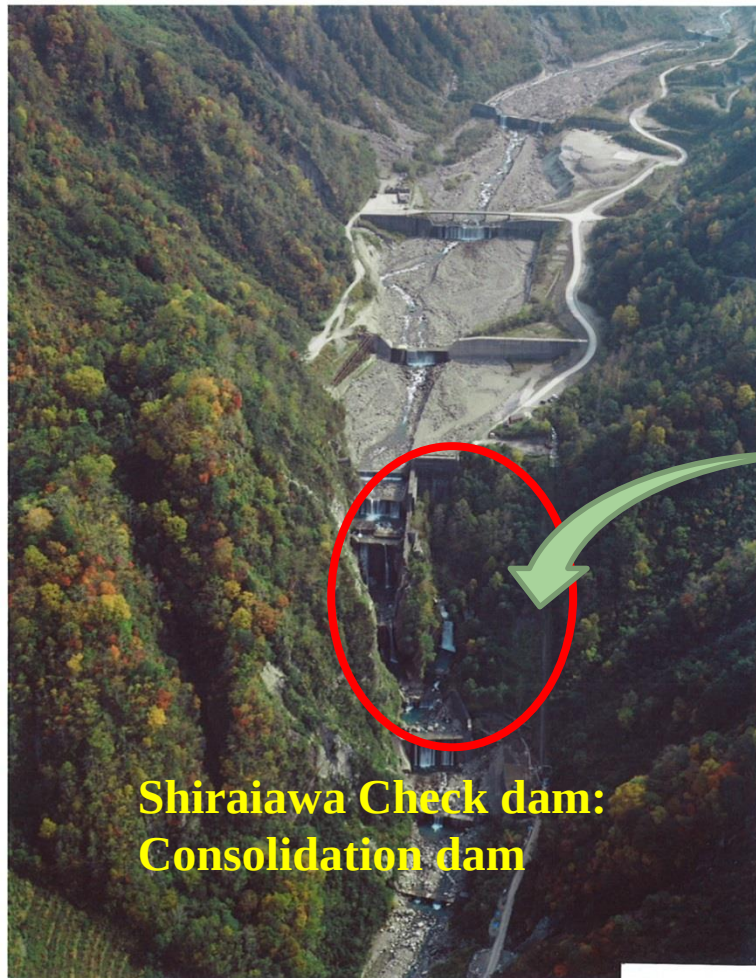


1908: 5 years later

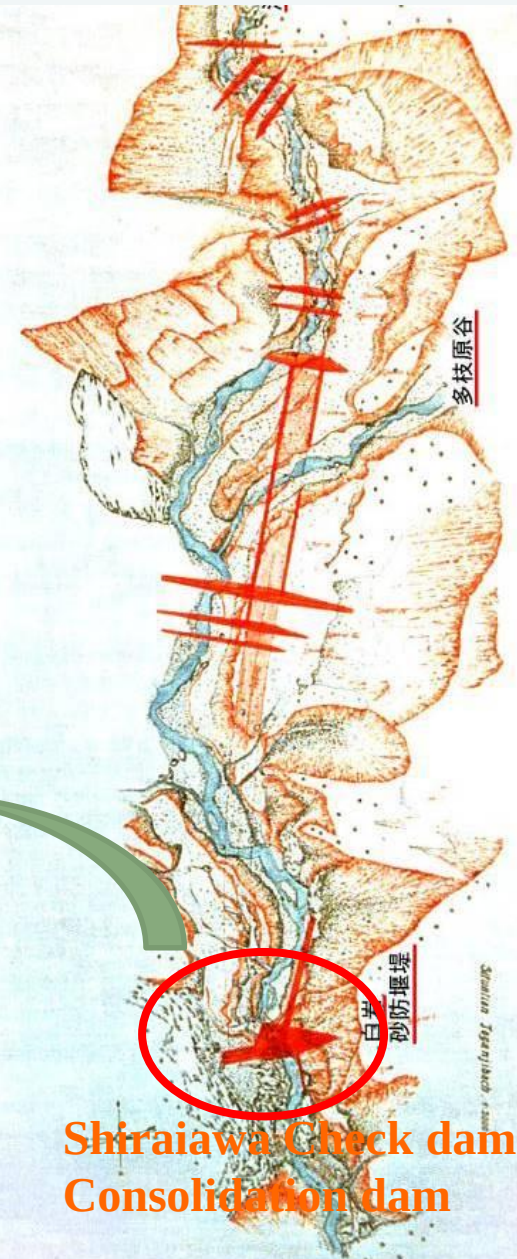
Change of main emphasis from afforestation to torrent regulation

Technology transfer from Europe

A representative example of torrent control works in Tateyama Caldera



H18-10 No. 30



Shiraiawa Check dam:
Consolidation dam

General plan by Dr. Akagi

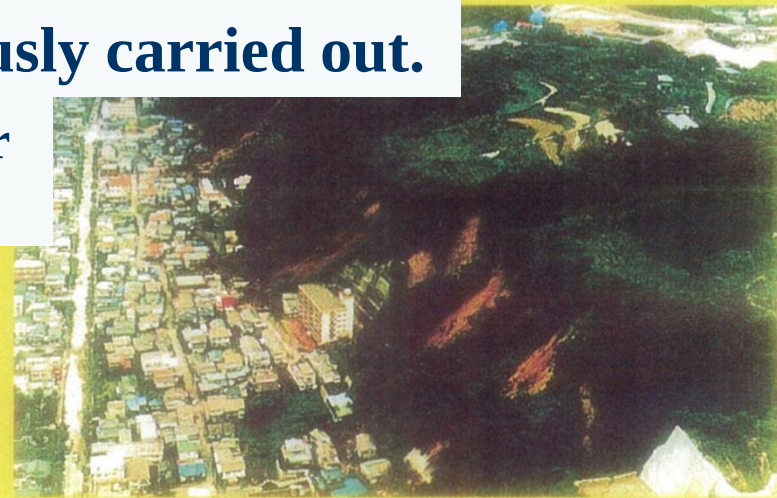
Despite the change of main emphasis from afforestation to torrent regulation

However, hillslope works were continuously carried out.

Example of hillslope works with vegetation cover in Kagoshima City

再度災害のおそれの高い災害発生箇所や崩壊の兆候のある斜面など、危険度の高い地区において、がけ崩れ対策を重点的に実施します。

Slope failure prevention works have focused on slopes highly vulnerable to disasters where there are signs of a possible slope failure and where there is a fear of re-occurrence of a slope failure in a once-disaster-stricken area.

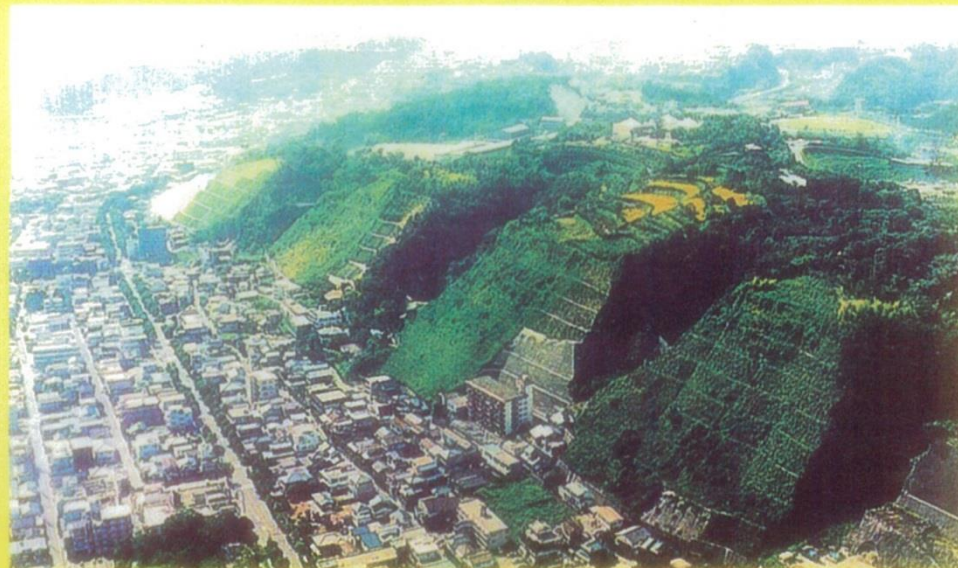


Occurrence of slope failures in 1986

カ
In
Prefecture, July 1986)



Accomplishment of hillslope works



Several years after accomplishment of hillslope works
Several years after the completion of the works

New challenge with forest conservation

Green belt project in Rokko Mountains

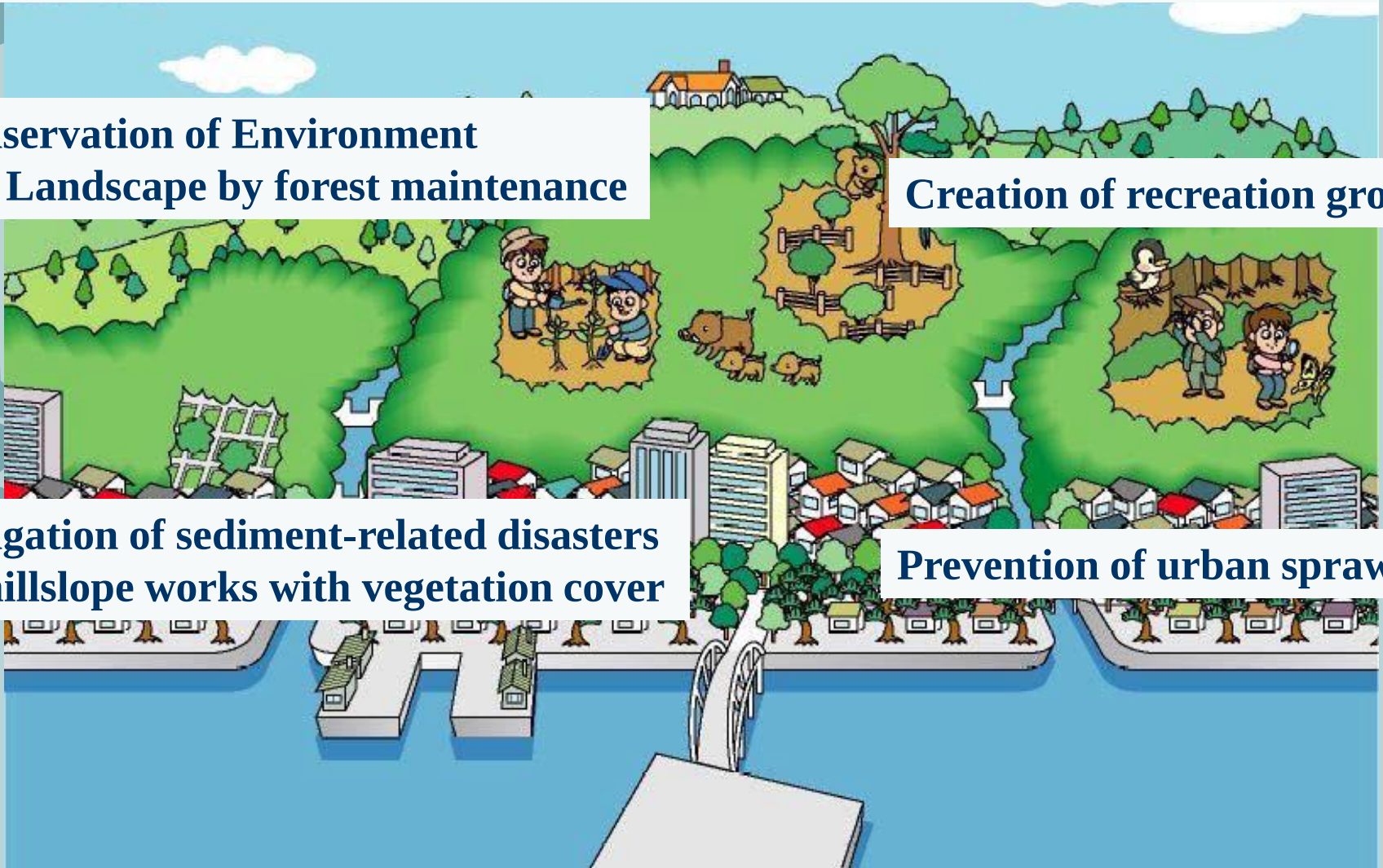
- Comprehensive mitigation measures with forest conservation -

**Conservation of Environment
and Landscape by forest maintenance**

Creation of recreation ground

**Mitigation of sediment-related disasters
by hillslope works with vegetation cover**

Prevention of urban sprawling

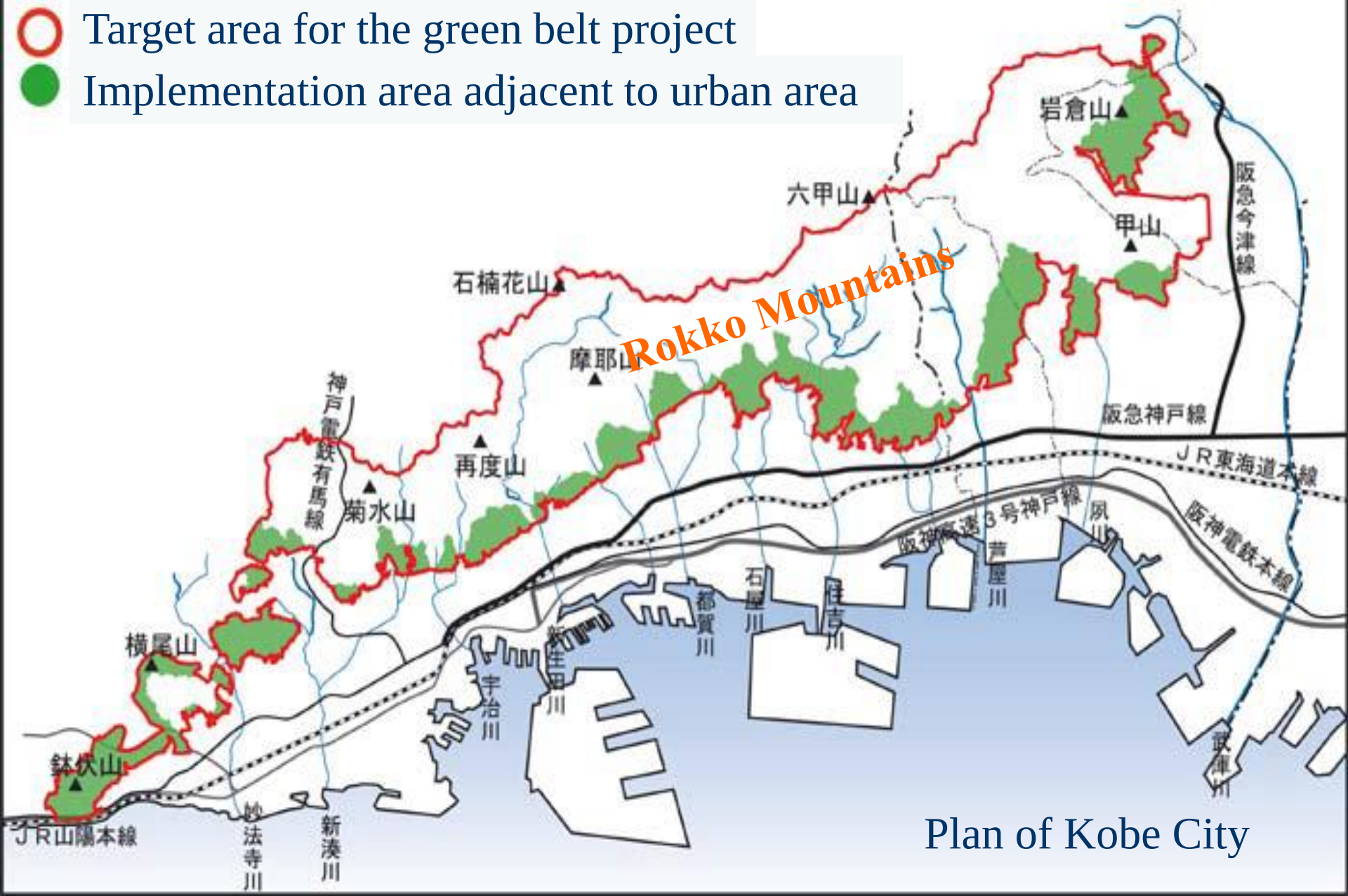




Target area for the green belt project



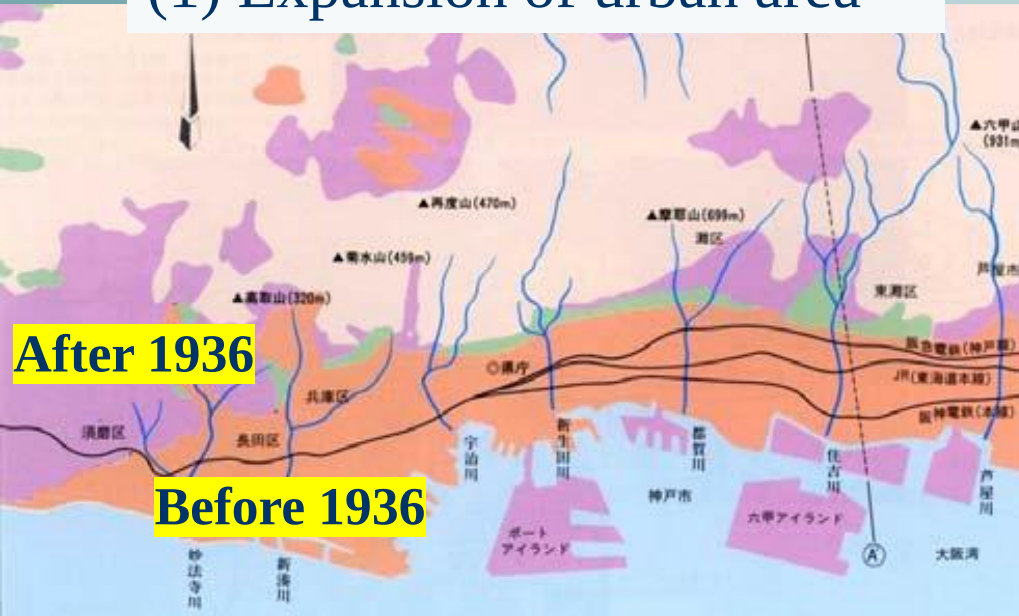
Implementation area adjacent to urban area



Plan of Kobe City

Background of the new challenge with forest conservation

(1) Expansion of urban area



(2) Slope Failures caused by Kobe Earthquake in 1995



(1955)



(1997)

Attention to the vulnerability



Necessity of green belt project

Comprehensive mitigation measures with forest conservation

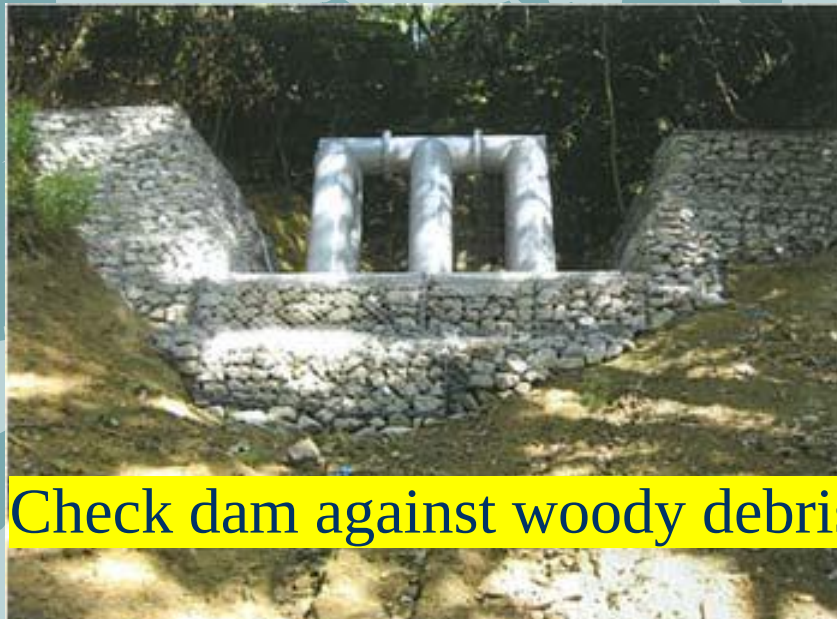
Components for comprehensive mitigation measures



Forest conservation



Rockfall barrier



Check dam against woody debris



Education

Legal basis for torrent control works and protective forest system:

Frequent Occurrences of flood and sediment-related disasters

1896: Enactment of **River law**

1897: Enactment of **Torrent Control law**

Enactment of **Forest law**  Establishment of **Protective Forest System**



- * River regulation works for flood control were carried out based on the **River law**.
- * Torrent control works were carried out based on the **Torrent Control law**.
- * Hillslope conservation works (Forest conservation) were carried out based on the **Forest law**.

Nowadays: There are two organizations for Torrent Control Works.

- 1) **Torrent Control Department** in the Ministry of Land, Transport and Infrastructure.
- 2) **Hillslope Conservation Department** in the Ministry of Agriculture and Forestry.  This Ministry is responsible for **Protective Forests**.

Protective forest / Schutzwald, Bannwald

Protective forest is a forest designated by the Minister of Agriculture and Forestry or the Prefectural Governor to specific public interest.

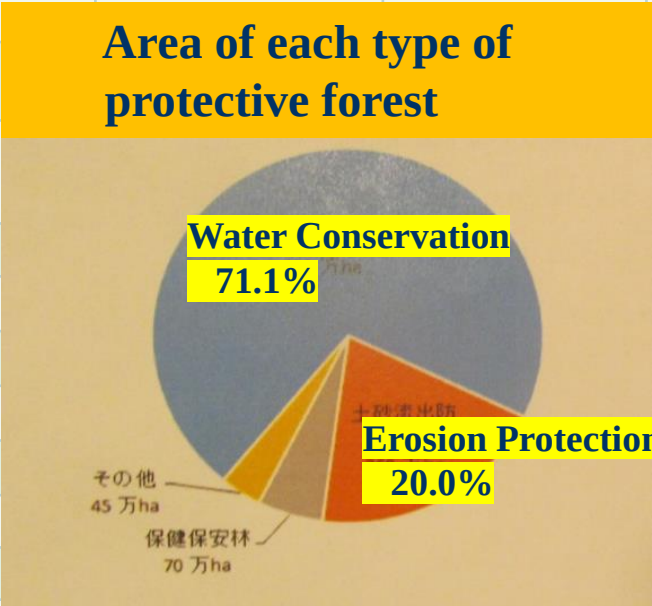
**Specific public interests: Recharge of water sources,
Prevention of sediment-related disasters,
Conservation and formation of living environment, etc.**

**In the protective forest, cutting of standing trees and
changing the character of land
are restricted in order to ensure the socially beneficial functions of
the forest according to each purpose.**

**Protective forests are classified into 11 categories and 17 types by
purpose.**

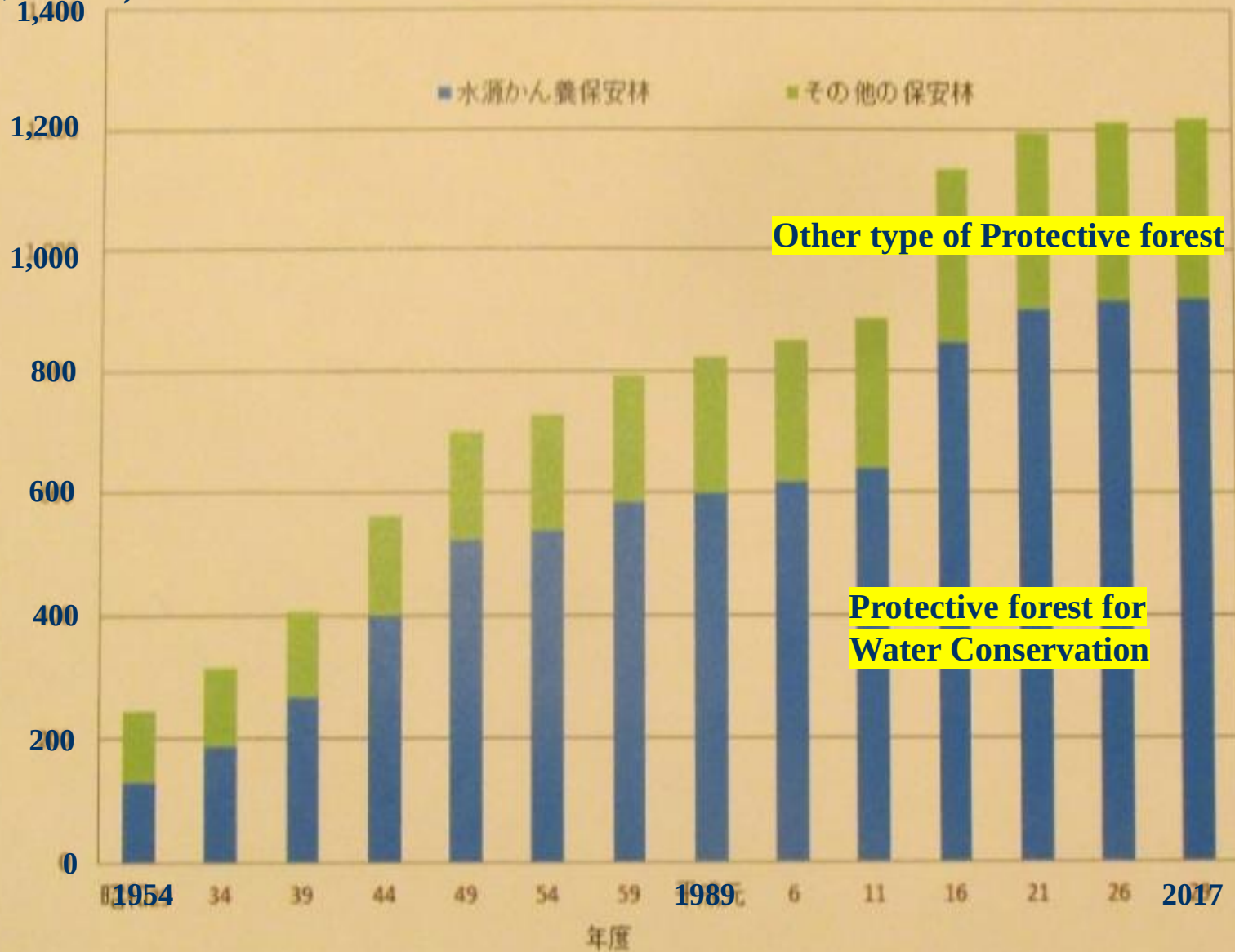
(prescribed in Article 25, paragraph (1) of the Forest Law)

Category	Type of Purpose	National Forest (1000 ha)	Private Forest (1000 ha)	Total (1000 ha)	% to the Total PF
No.1	Water Conservation	5,700	3,504	9,204	71.1
No.2	Erosion Protection	1,079	1,517	2,596	20.0
No.3	Landslide Prevention	20	40	60	0.5
	Total of No.1 to No.3	6,798	5,061	11,860	91.6
No.4	Shifting Sand Protection				0.1
No.5	Wind Break				0.4
No.5	Flood Damage Protection				0.0
No.5	Tidal Wave and salty wind Prevention				0.1
No.5	Drought Protection				1.0
No.5	Snow Drift Prevention				0.0
No.5	Fog Prevention				0.5
No.6	Avalanche Prevention				0.1
No.6	Rock Fall Prevention				0.0
No.7	Fire Prevention				0.0
No.8	For Fishery				0.5
No.9	Navigation Target				0.0
No.10	For Health				5.4
No.11	Landscape Protection				0.2
	Total Area of PF	6,918	5,280	12,197	100.0
	% to the Total Forest	27.6	21.1	48.7	



Categories and types of purpose of protective forests (State in 2018)

Area
(10,000 ha)
1,400



Increase in protection forest

Project concerning Security Facilities:

(prescribed in Article 41, paragraph (3) of the Forest Law)

An example carried out in Shizuoka City



**Devastated situation
in 1982**



**Accomplishment of
Stabilization works in 1988**



**Recovered situation
in 1999**

**Hillslope conservation service has an inseparable relationship with
protective forest system**

In recent years, abnormal heavy rainfalls that have never been experienced have occurred frequently.



Along with this, disasters caused by woody debris are striking.

Concluding Remarks:

- *Nowadays, the total area of “Protective Forests” accounts for about half of the total forest area.*
- *70 % of “Protective Forests” are for “Water conservation”.*
- *20 % of “Protective Forests” are for “Erosion Protection”.*
- *Closer coordination between two organizations responsible for torrent control works (Torrent Control Department and Hillslope Conservation Department) are to be encouraged.*
- *In order to promote comprehensive mitigation of sediment-related disasters, all stakeholders should be included.*
- *Appropriate education in schools for disaster mitigation should be systematically carried out.*
- *Appropriate management and operation are indispensable to mitigate disasters caused by woody debris.*