Tateyama Sabo Newsletter 2024

Sediment disaster prevention system
- an amazing project for build back better and coexisting with nature -

Recent activities to the registration of Tateyama Sabo as a world cultural heritage site

Tateyama Sabo (ICOMOS Japan "20 Selections of Japan's 20th Century Heritage") represents one of the great achievements and Japan's unique culture for disaster prevention/mitigation in fighting sediment disasters caused by about 200 million m^3 of unstable sediment due to the Hietsu Earthquake in 1858, in Tateyama Caldera for approximately 100 years in Toyama, Japan. Dorodani, Shiraiwa and Hongu Sabo dams (Dams for erosion and sediment control) were designated as an important cultural property of Japan called "Joganji River Sabo facilities". Thanks to Tateyama Sabo, in the downstream area of Joganji River (about 370,000 residents), there has been no flood inundation with huge amounts of sediment since the disaster of 1969.

①Dorodani Sabo dams (Built 1930 - 1938)

②Shiraiwa Sabo dam (Built 1929 - 1939)

③Hongu Sabo dam (Built 1935 -1936)

OUV (Outstanding Universal Value): 1) Comprehensive disaster prevention technology born in disaster-prone Japan, 2) Japan's comprehensive management of water systems represents the technological apex in the modern world, and 3) A type of modern Sabo technology

1. Investigation and deepening, improvement of recognition and evaluation of the OUV

Animation "Tateyama Sabo and Its Battle Against Debris" (with English subtitle) is uploaded in YouTube. (2024/5)
https://www.youtube.com/watch?v=VRQyQGkCyi4

Picture book published by Tateyama Sabo Women's Salon Association was read in Sabo Fair (2024/6/8)

There were about 28,000 visitors to Tateyama Caldera Sabo Museum and 500 attendees for excursions and Youth Program to Tateyama Sabo in FY 2023.
(Because Tolley train was closed due to falling rocks, All excursions in 2024 are conducted on bus)

Youth Program

Ken-ei Sabo, Stone-pile check dam (Built 1906- 1926)

2. Investigation and research based on the advice of academic experts (Changes in Sabo technology and its dissemination overseas etc.)

3. Establish rules and methods for protection of Sabo facilities

TPG members have joined the committee to establish rules and methods for protection of "Joganji River Sabo facilities" organized by the Tateyama Mountain Area Sabo Office.

In 2026, Tateyama Sabo will celebrate the 100th anniversary of the national project and the 120th anniversary of the project by the Toyama Prefectural Government!

Dissemination of OUV in domestic and international conferences

73rd Annual Meeting, Japan Society of Erosion Control Engineering (2024/5/15-17)

INTERPREAVENT 2024 (2024/6/10-13)

Japan and Austria Intergovernmental Meeting (2024/6/14)

Ichii et al., (2024) Recent challenges to the registration of Tateyama Sabo as a world cultural heritage site, Proceedings of INTERPREAVENT2024, p.915-919

Tateyama Sabo study meeting (2024/9/4)

Submission of candidate proposal for a list of Japanese to the Agency for Cultural Affairs (2024/10/9)

Toyama Prefectural Government (TPG), JAPAN (The World Heritage and Hometown Education Promotion Division, the Lifelong Learning and Cultural Assets Office, and SABO-sediment Control Division, Tateyama Caldera Sabo Museum) 2024/12/10

Potential OUV (Outstanding Universal Value) of Tateyama Sabo

1) Comprehensive disaster prevention technology born in disaster-prone Japan

Sabo (erosion and sediment control) is a comprehensive technology for disaster prevention that was born in disaster-prone Japan, which has the harshest natural environments in the world and a small amount of inhabitable area. Sabo has played a major role in the country's development.

2) Japan's comprehensive management of water systems represents the technological apex in the modern world

Japanese Sabo technology, including Tateyama Sabo, is at the highest level in the modern era in terms of disaster prevention technology and this technology has been transferred to Southeast Asia and Central and South America, contributing to disaster prevention and development in countries around the world.

3) A type of modern Sabo technology

Tateyama Sabo is a typical example of modern Sabo technology. To deal with the discharge of approximately 200 million ㎥ of unstable sediment deposited in the Tateyama Caldera, a number of state-of-the-art large construction machines were used from the Taisho period (1912-1926) to the early Showa period (1926-1989), which was unprecedented Sabo project in the world. Tateyama Sabo also established Japan's first technology "Comprehensive Sediment Management System of Water System" by integrating Sabo and flood control facilities to ensure the safety of downstream areas, such as the Dorodani Sabo Dams to control sediment production and reforestation in upstream areas, the Shiraiwa Sabo Dam to fix unstable sediment, and the Hongu Sabo Dam to store sediment in the middle reaches of the Joganji River. Tateyama Sabo has representative and well-preserved Sabo facilities in the days, the birth of the "Comprehensive Sediment Management System of Water System". Even today, for approximately 100 years, the Tateyama Sabo facilities is still fully functional as active disaster prevention facilities and continue to protect the safety and security of the Toyama Plain.

Birth of “Comprehensive Sediment Management System of Water System” in Tateyama Sabo

Upper stream

Downstream

Joganji River

Property ①

Dorodani Sabo Dams (22 dams)
Built from 1930 until 1938
Major function:
- Spillway on unstable sediment
- Erosion prevention
- Reforestation

Property ②

Shiraiwa Sabo Dam
(Tallest Sabo dam in Japan : 108m)
Built from 1929 until 1939
Major function:
- Fixing unstable sediment

Property ③

Hongu Sabo Dam
(Largest sediment storage volume :
5 million m^3)
Built from 1935 until 1936
Major function:
- Temporal storage of sediment

3 core properties and 4 stages in Tateyama Sabo

1858
The Hietsu Earthquake twice landslide dam breaks and debris flows

1906
Start of “Ken-ei Sabo”
(Ken-ei Sabo : the Sabo Project by the Toyama Prefectural Government)

1926～
Start of the Sabo project by the National Government

Stage I
Measures by the native Japanese Sabo technology

Stage II
Introduction Sabo technology From Europe

Stage III Start of the Sabo Project by the National Government (based on the plan made by Masao Akagi)

Stage IV
Start of the Flood Control Project by the National Government (based on the plan made by Makoto Kaba etc.)

1938 the Ministry of Home Affairs published and disseminated “Sabo Koji” (Constriction technology for Sabo)

Birth of “Comprehensive Sediment Management System of Water System”

Property① Dorodani Sabo Dams

1906-1916
Construction of Doridani Sabo Dams by Ken-ei Sabo

1916-1921
Construction of Sabo Dams in Yukawa River

1919 Destroyed
1921 Restored

1922 Destroyed

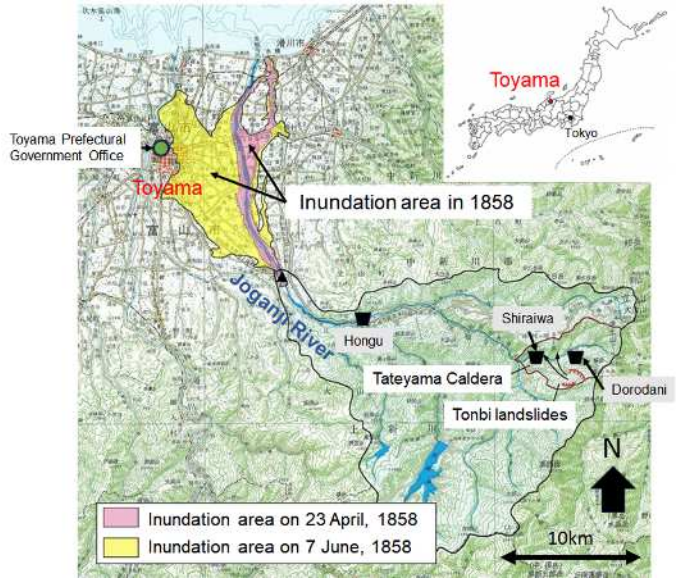
1929 Destroyed

1930-1933
Recovery of Dorodani Sabo Dams by the National Government

Property② Shiraiwa Sabo dam

1929-1939
Construction of Shiraiwa Sabo Dam

Property③ Hongu Sabo dam



1934
Revision of the renovation plan in the Joganji River

1935-1937
Construction of Hongu Sabo Dam

The four stages leading up to the completion of “Comprehensive Sediment Management System of Water System” in Tateyama Sabo

Stage I

Measures by the native Japanese Sabo technology (1906-1926)

The Toyama prefectural government carried out the Sabo project “Ken-ei Sabo” for construction of stone-pile (drystone) check dams, spillways, hillside foundation works and and planting trees, which were native and traditional Japanese Sabo technology, in the area directly below the Tonbi Landslide. From 1906 to 1916, the Dorodani Sabo Dams was constructed to prevent the expansion of erosion of unstable sediment in upstream area, but it was destroyed by debris flows in 1929.

Stage II

Introduction Sabo technology From Europe (1916-)

After the flood of 1914, a high Sabo dam was constructed in the Yukawa River (at the same location as the Shiraiwa Sabo Dam) that is thought to have characteristics of European check dams, using stone-pile with concrete and with a steep front slope for the water channel part of Sabo Dam. It was destroyed by debris flows in 1919, but was rebuilt in 1921. It was destroyed again by debris flows in 1922.

Stage III

Start of the Sabo Project by the National Government (based on the plan made by Masao Akagi) (1926-)

In 1926, the Sabo Project by the National Government was began. Based on the plans and guidance of Masao Akagi, who emphasized measures to control sediment production in the upstream area.

・the Shiraiwa Sabo Dam, a key Sabo Dam to fix unstable sediment, was constructed.
The dam has unique hybrid structure of European check dams and two types of water storage dam.

・the Dorodani Sabo Dams was restored.
The dam has the typical function of the native Japanese Sabo technology.

・Construction of the Shiraiwa Sabo dam was completed using the latest construction technology of the time, with a concentrated investment of budgets and materials.

Stage IV

Start of the Flood Control Project by the National Government (based on the plan made by Makoto Kaba etc.) (1934-)

Based on the plan by Makoto Kaba and other engineers, which emphasized measures to control sediment discharge in the middle reaches of the Joganji River, the Hongu Sabo Dam was constructed.
The dam has the function for sediment storage in the middle reaches of the river .

・Construction of the Hongu Sabo dam was completed using the latest construction technology of the time, with a concentrated investment of budgets and materials.

1938 The Ministry of Home Affairs published and disseminated “Sabo Koji” (Constriction technology for Sabo)
The concepts of Stage III and IV are written together as a measure against debris flows.
Birth of “Comprehensive Sediment Management System of Water System”

Conformity the value of Tateyama Sabo with the "World Cultural Heritage" Criteria

Criteria (i) Represent a masterpiece of human creative genius
(Special mention) Response to severe natural threats by the wisdom of mankind

Criteria (ii) Exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town planning or landscape design
(Special mention) Global exchange and influence of Sabo technology

Criteria (iv) Be an outstanding example of a type of building, architectural or technological be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history ensemble or landscape which illustrates (a) significant stage(s) in human history
(Special mention) Outstanding civil engineering technology

Criteria (v) Be an outstanding example of a traditional human settlement, land-use, or sea-use, which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change
(Special mention) Realization of disaster prevention and restoration of the natural environment