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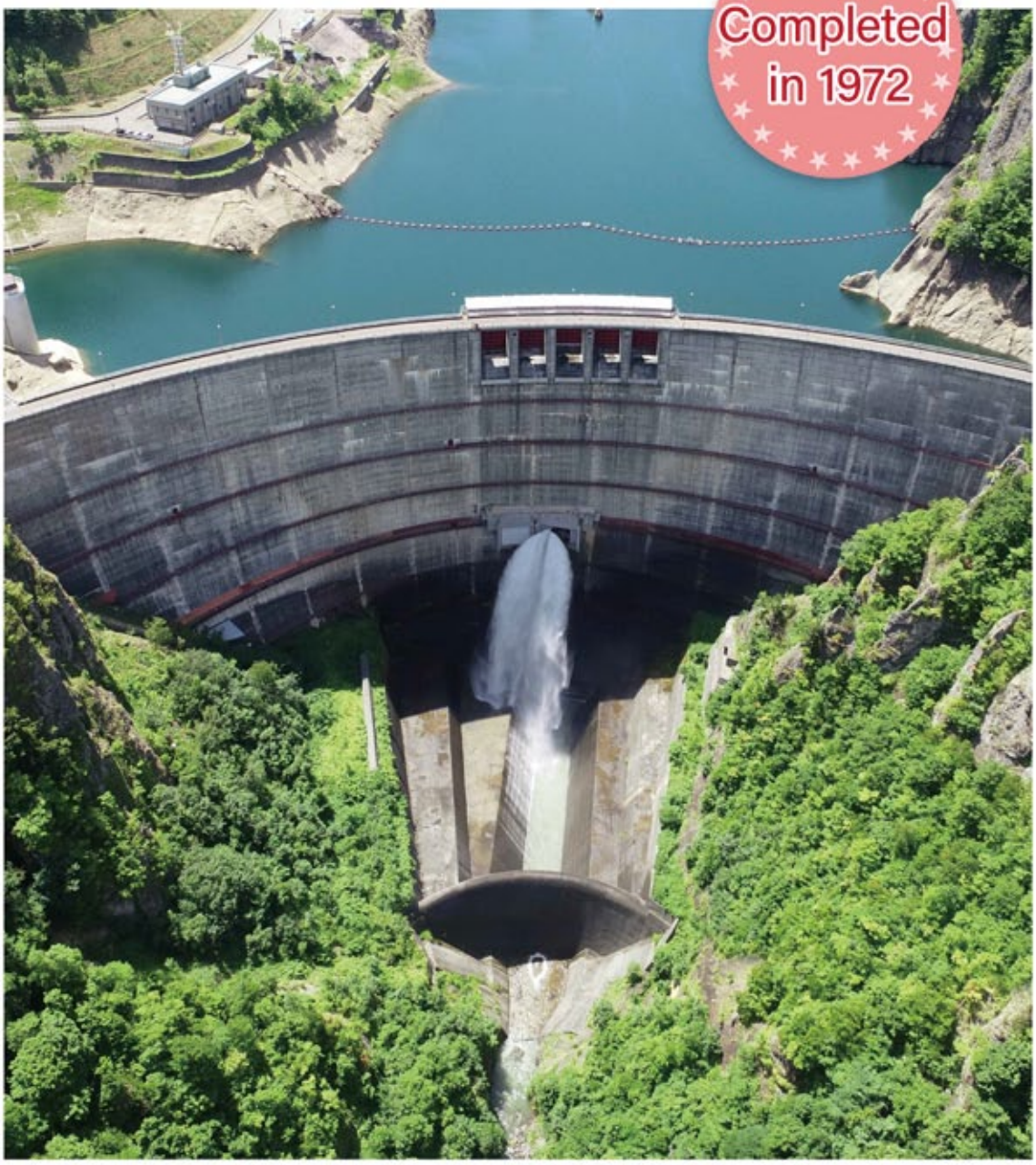
Introduction to Hoheikyo Dam



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Toyohira river basin

The Toyohira River, a tributary of the Ishikari River, runs through downtown Sapporo. Bridges, subway lines and other facilities cross the Toyohira River.

The Toyohira River and downtown Sapporo

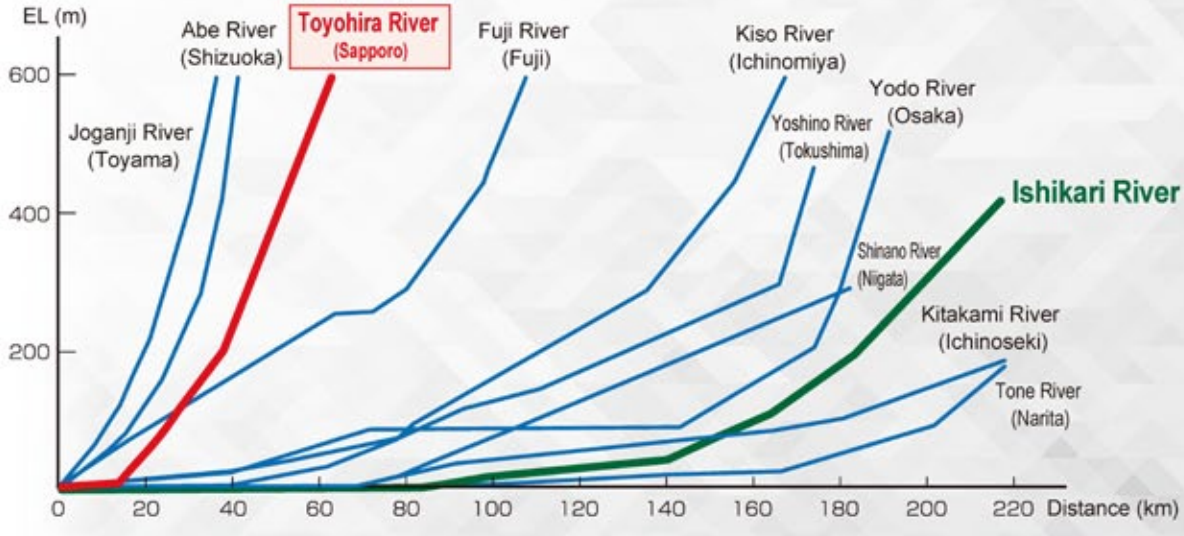
Catchment area: 902.4 km²
Trunk river channel length: 72.5 km
River basin population: approx. 1.517 million
Flood-susceptible area: 247 km²
Population in the flood-susceptible area: approx. 1.04 million
Related municipalities: 4 cities and 1 town
Sapporo, Ebetsu, Kitahiroshima, Ishikari and Tobetsu

*The river basin population, flood-susceptible area and population in the flood-susceptible area include those in the Fushiko river basin.

The Toyohira River is one of the steepest urban rivers in Japan. If a levee were to fail, flood water might paralyze urban functions.

▪ Riverbed slope of the Toyohira River*

*The inclination of the river bottom in the flow direction is called the riverbed slope.



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Major floods on the Toyohira River

before and after the completion of Hoheikyo Dam

In the Meiji and Taisho eras, levee failure from flooding occurred frequently. Large floods continued to occur in the Showa era, leading to the development and revision of flood control plans.

1898 Flood (typhoon) in September
Flow rate: unknown (levee breach), inundation area: 1,500 km²

1904 Flood (typhoon/front) in July
Flow rate: unknown, inundation area: 1,300 km²

1913 Flood in August
Flow rate: unknown (levee breach), inundation area: unknown

Levee breach on the Toyohira River (Nakajima area)


Inundation in the Higashi Yonesen area (Shiroishi Ward, Sapporo)

1961 Flood (low pressure/front) in July
Flow rate (Kariki): 874 m³/s, inundation area: 523 km²

Incidents that prompted the construction of Hoheikyo Dam

1962 Flood (typhoon/front) in August
Flow rate (Kariki): 1,358 m³/s, inundation area: 661 km²

1972 Completion of Hoheikyo Dam in September

1975 Flood (typhoon/front) in August
Flow rate (Kariki): 1,241 m³/s, inundation area: 292 km²


Inundation on the Sosei River (Sakato/Shinoro area, Sakato River)

1981 Flood (low pressure/front/typhoon) in early August
Flow rate (Kariki): 647 m³/s, inundation area: 614 km²

Flood (front/typhoon) in late August
Flow rate (Kariki): 1,417 m³/s, inundation area: 57 km²

Triangular wave on the Toyohira River (near the river's confluence with the Yamahana River)
The swollen Toyohira River near Minami 14-jo Ohdori, Chuo-ku

1989 Completion of Jozankei Dam in October

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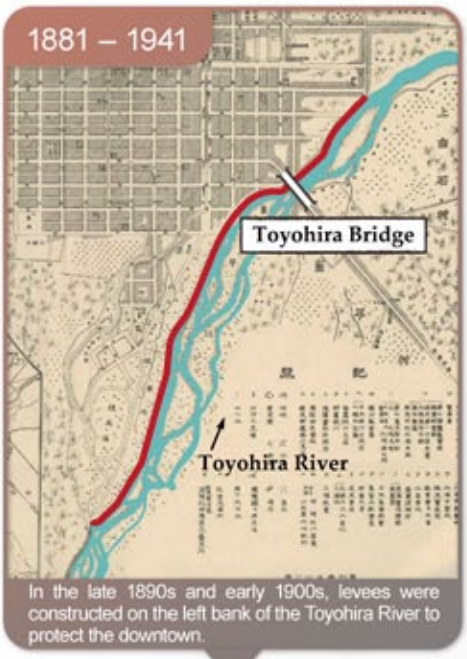
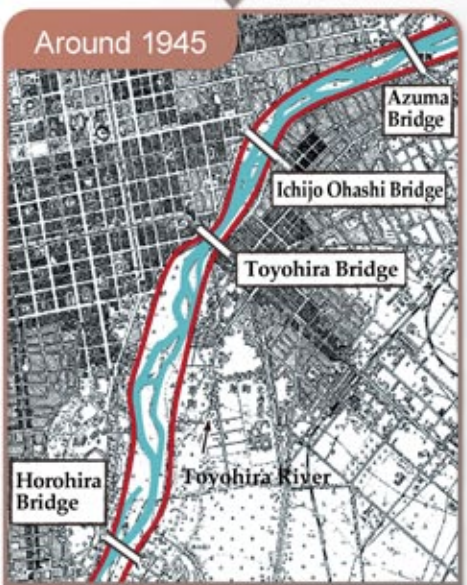
Flood control projects for the Toyohira River

Flood control projects for the Toyohira River have been conducted since the Meiji era, with the development of downtown Sapporo. In addition to river improvement works that included the construction of levees and the excavation of new channels, Hoheikyo Dam was completed in 1972, followed by Jozankei Dam in 1989.

▪ Levee construction



In the late 1890s and early 1900s, levees were constructed on the left bank of the Toyohira River to protect the downtown.



The right-bank levees were connected in response to the expansion of the downtown on the right-bank side.

▪ New channel

Construction of the Toyohira River New Channel to move the Toyohira's confluence with the Ishikari River downstream began in 1932, and water began to be passed through it in 1941.

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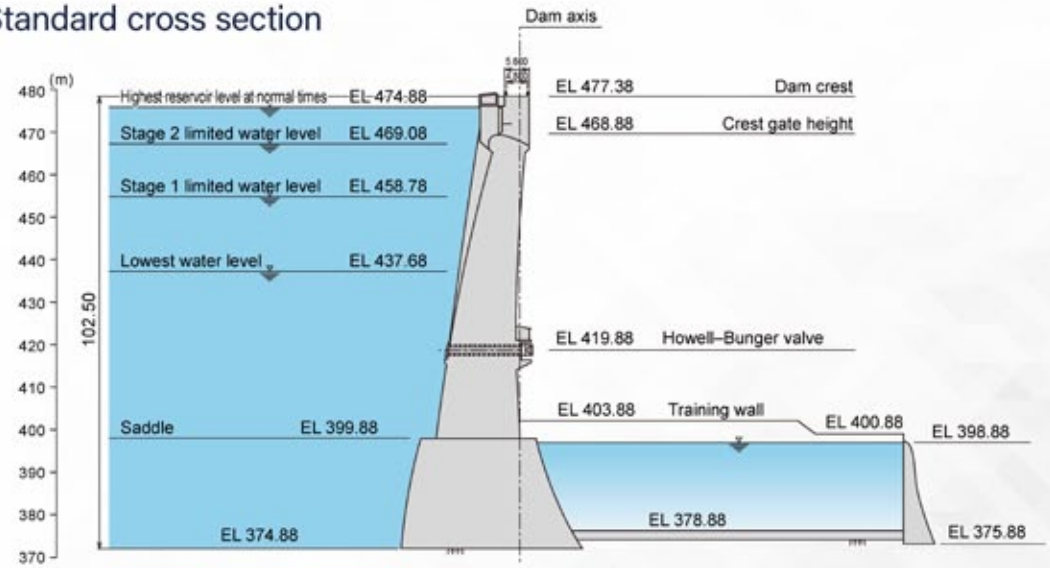
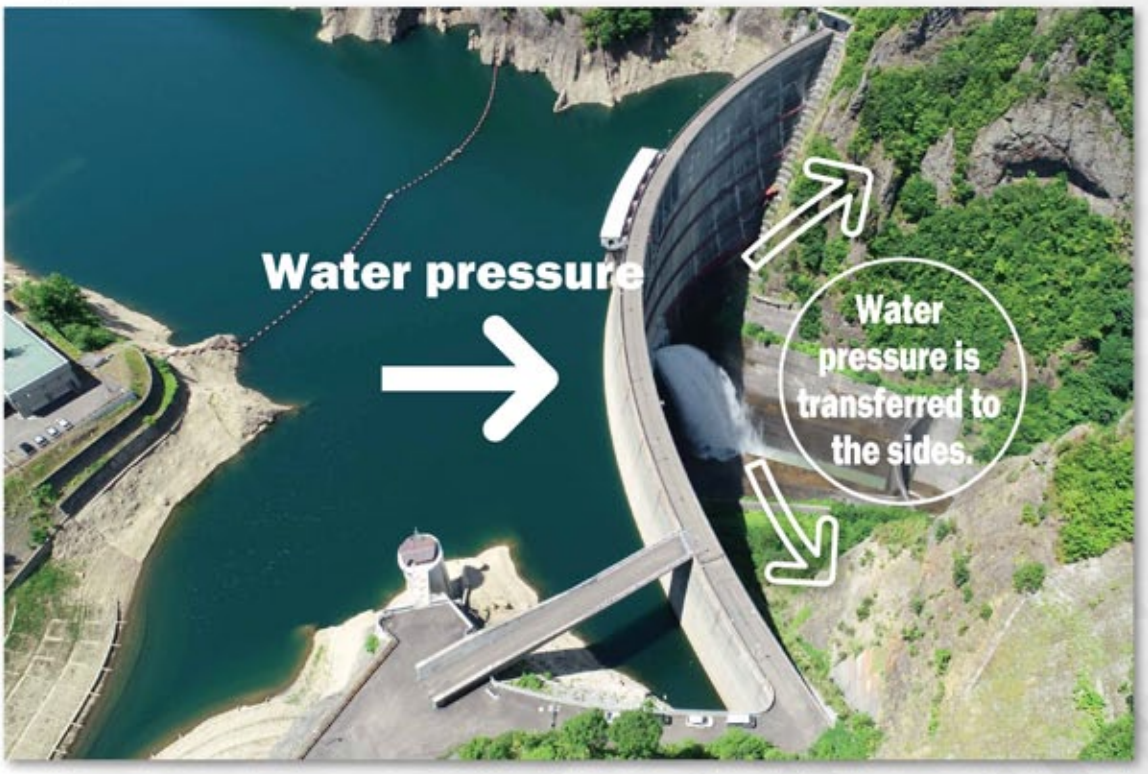
Concrete arch dam

Hoheikyo Dam is a concrete arch dam 102.5 m in height and 305 m in length. The dam, which is distinguished by its graceful curve, attracts many visitors as a tourist spot.

▪ Standard cross section



A concrete arch dam disperses water pressure from the reservoir and supports it with the bedrock on either side.



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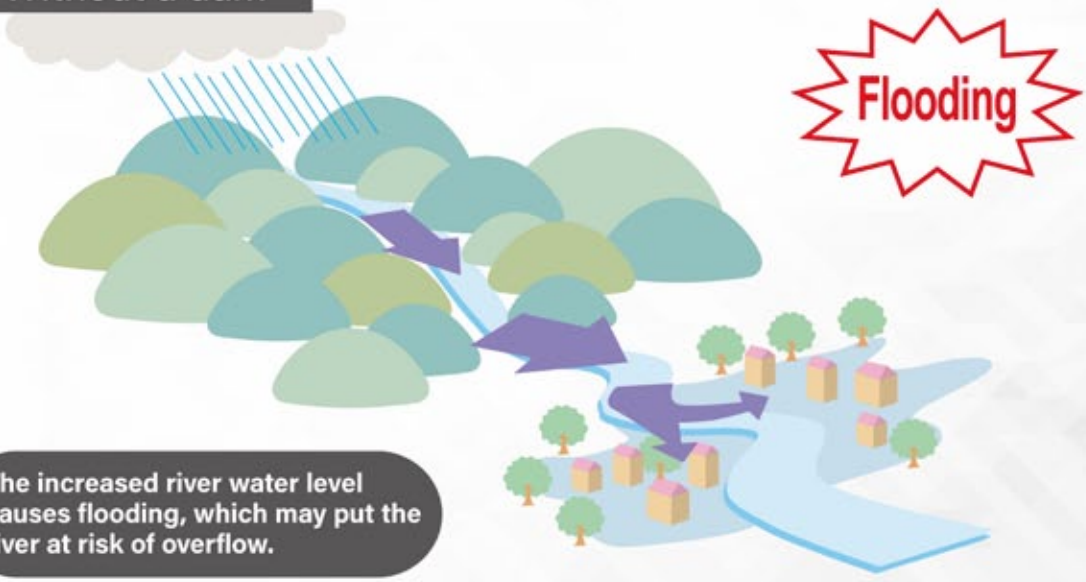
Flood control with a dam

The water volume of the river is at risk of increasing and overflow may occur with heavy rainfall in the basin.

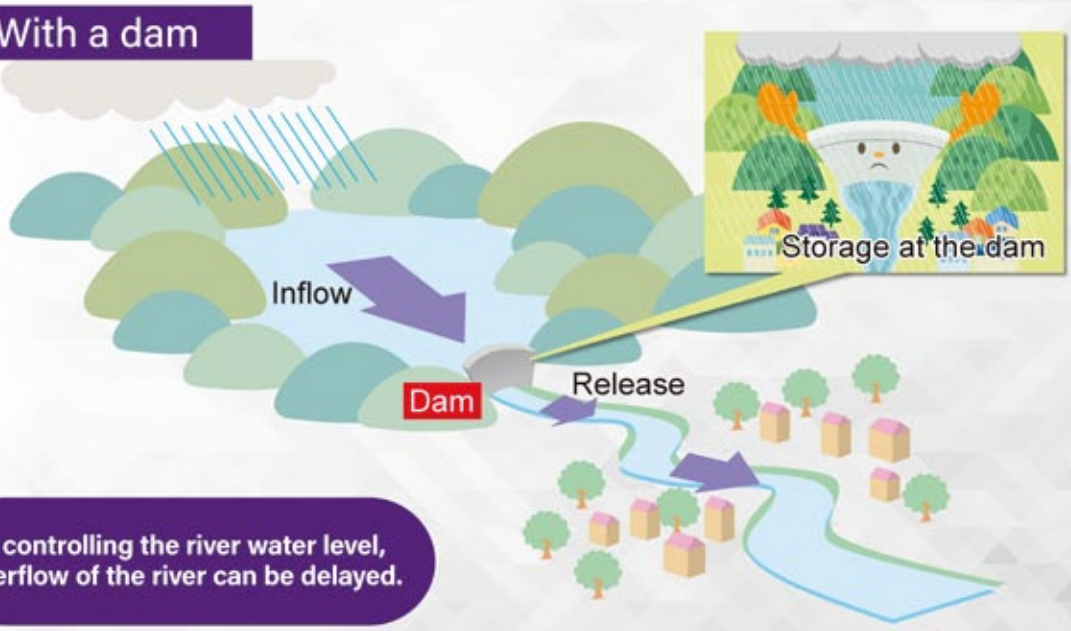
Without a dam



The increased river water level causes flooding, which may put the river at risk of overflow.

When the water volume of the river upstream of the dam increases, water is temporarily stored in the dam reservoir to control the volume and reduce the water level downstream of the dam.

With a dam



By controlling the river water level, overflow of the river can be delayed.

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Use of water of Hoheikyo Dam

Water stored in the Hoheikyo Dam reservoir is used for city water supply and power generation.
Hoheikyo and Jozankei dams supply more than 80% of Sapporo's water.

City water

Water essential for people's lives is supplied.

Hoheikyo Dam can supply **528,000 m³** of water per day.

Hydropower generation

Water stored in the dam reservoir is used effectively for power generation.

Hoheikyo Power Station can generate **51,900 kW** of electricity.

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Dam management

For the efficient and effective operation of Hoheikyo and Jozankei dams, the two dams are managed in an integrated manner by the Toyohira River Integrated Dam and Reservoir Group Management Office.


Patrol


Reservoir management


Discharge facility inspection


Driftwood treatment


Discharge facility operation room


Discharge warning facility


Rainfall/water level observation facility


Water quality survey

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Dam use status

Hoheikyo Dam provides opportunities for walking on nature trails, reading in its library room and participating in special events held here.

Dam tour day

This event is held every July during the Campaign to Familiarize People with Forests, Lakes and Dams. Visitors can see the dam discharge up close by walking through a passage that is usually open only to authorized personnel.

"The tour was useful for me, as I study dams at school."
[Feedback from a participant]

"The dam was spectacular and interesting."
[Feedback from a participant]

"My children became interested in the dam mechanism."
[Feedback from a participant]

Storage experiment

As part of efforts to promote the region, an experiment on the storage of wine and Japanese tea leaves is under way in a work tunnel.

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Natural environment around the dam

Hoheikyo Dam is located in Shikotsu-Toya National Park. The area around the dam abounds in a rich variety of flora and fauna.

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Facilities around the dam

Around the dam are nature trails and observatories from which to enjoy seasonal natural views, in addition to a library and a rest house.