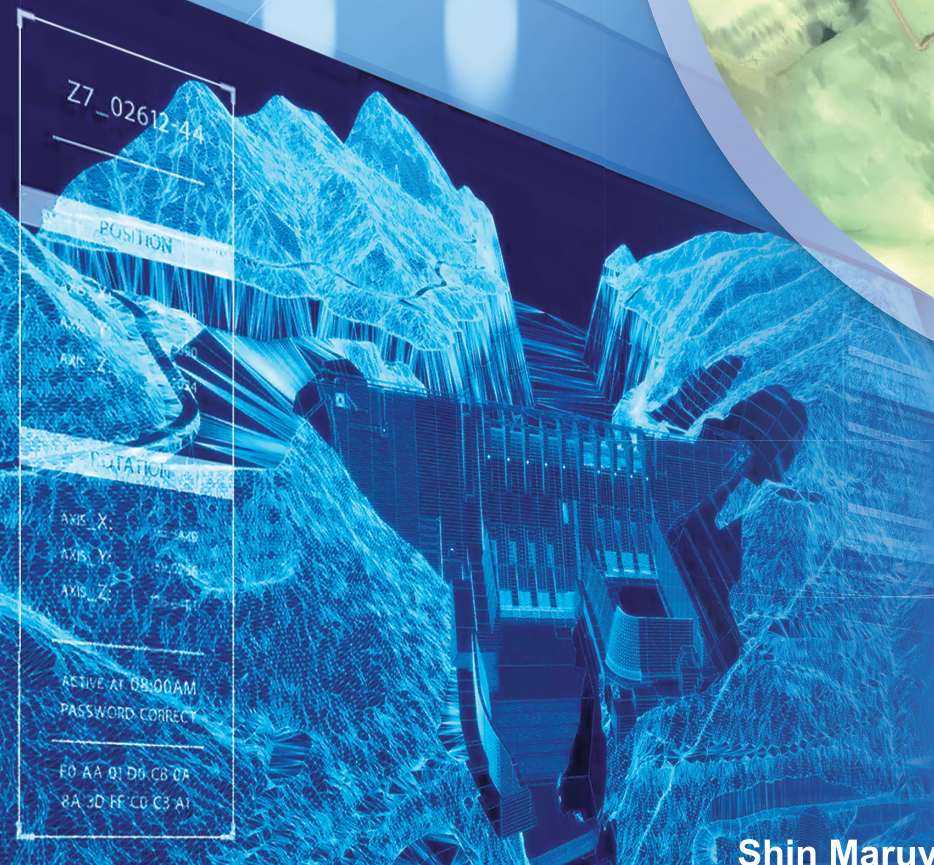
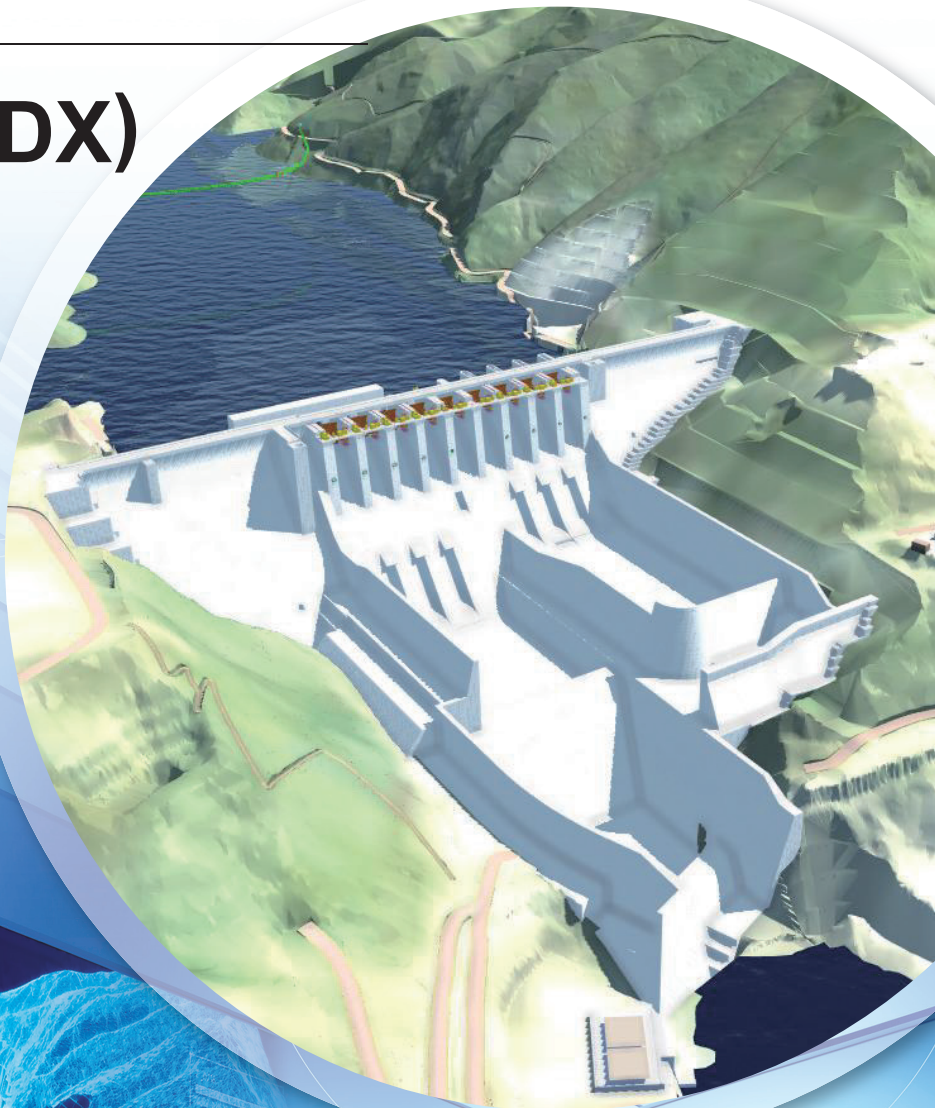


Building the Shin-Maruyama Dam

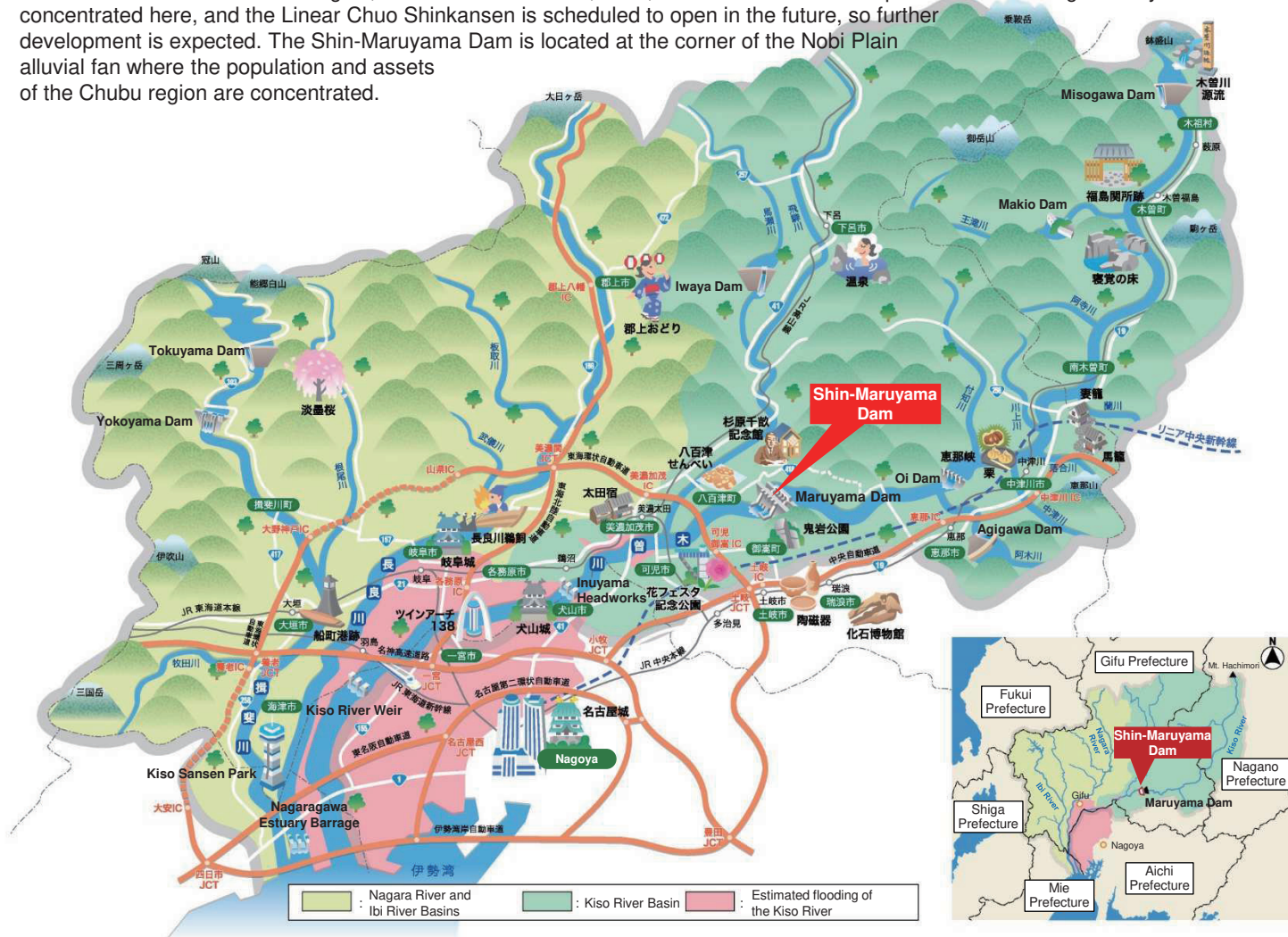
Making full use of
digital transformation **(DX)**
in dam rehabilitation



Shin Maruyama Dam Work Office
Chubu Regional Development Bureau
Ministry of Land, Infrastructure, Transport and Tourism

Overview of the Kiso River Basin

The Kiso River is a river in the Kiso River system that originates from Mt. Hachimori (2,446 meters above sea level) in Kiso Village, Kiso County, Nagano Prefecture, and flows south-southwest along the historic Nakasendo trail through a valley called the Kiso Valley. Along the way, it joins several tributaries and enters the Nobi Plain, where it flows into Ise Bay. It is a first-class river with a length of 229 kilometers (seventh largest in Japan) and a catchment area of 5,275 square kilometers (fifth largest in Japan, accounting for the entire Kiso River system including the Nagara and Ibi Rivers, with an area of 9,100 square kilometers). It flows through the four prefectures of Nagano, Gifu, Aichi, and Mie. The upper reaches are blessed with rich nature, while the lower reaches run through the economic center of the Chubu region, which consists of Gifu, Aichi, and Mie Prefectures. Japan's manufacturing industry is concentrated here, and the Linear Chuo Shinkansen is scheduled to open in the future, so further development is expected. The Shin-Maruyama Dam is located at the corner of the Nobi Plain alluvial fan where the population and assets of the Chubu region are concentrated.



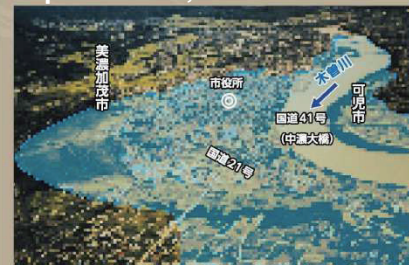
Major floods in the past

In September 1983, Typhoon Forrest (No. 10) and an autumnal rain front caused the largest flooding of the Kiso River since World War II, with the highest water levels recorded in Inuyama City and Kasamatsu City. In addition, the levees of the Kiso River overflowed in various places in Gifu Prefecture, including Minokamo City, Sakahogi Town, Yaotsu Town, and Kani City. 4,588 homes in these areas were flooded and devastated. Triggered by this disaster, there was a strong desire to strengthen the area's flood control capacity through the construction of the Shin-Maruyama Dam.

Date	Cause	Damage
July 1884	Low-pressure system	Levee failure at 192 locations, 158 houses washed away, and 1,135 houses damaged.
July 1896	Low-pressure system	Levee failure at 2,228 locations (with levee breaks about 110 km in length), 919 houses washed away, 4,064 houses collapsed, and 11,200 houses flooded.
July 1938	Rain front	A typhoon and the rainy season front caused flooding in three rivers of the Kiso River system, with the Kiso River itself suffering extensive damage. 6 houses totally destroyed, 7 houses washed away, and 3,802 houses flooded.
June 1961	Rain front	456 houses flooded in the Kiso River Basin, extensive damage in Akutami, upstream of the Nagara River. 29,200 houses flooded in the Nagara River Basin, 13,366 houses flooded in the Ibi River Basin.
September 1983	Typhoon Forrest and rain front	Heavy rainfall from Typhoon Forrest and an autumnal rain front. Breaching occurred in various places including Minokamo City, Sakahogi Town, Yaotsu Town, and Kani City, with 4,588 houses damaged.
September 2011	Typhoon Roke and rain front	Record rainfall occurred along the Kiso River. 143 houses flooded (including 19 flooded inside the levee).

Source: Kiso River Improvement Project

Torrential rain damage on September 28, 1983

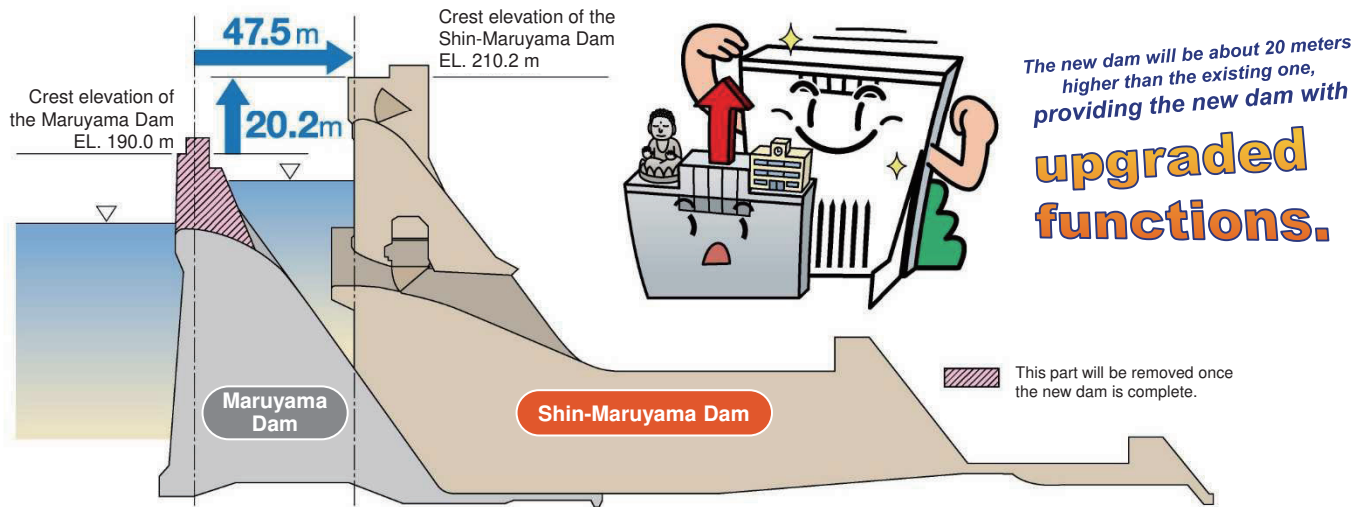


4 dead
1 missing
4,588 houses damaged



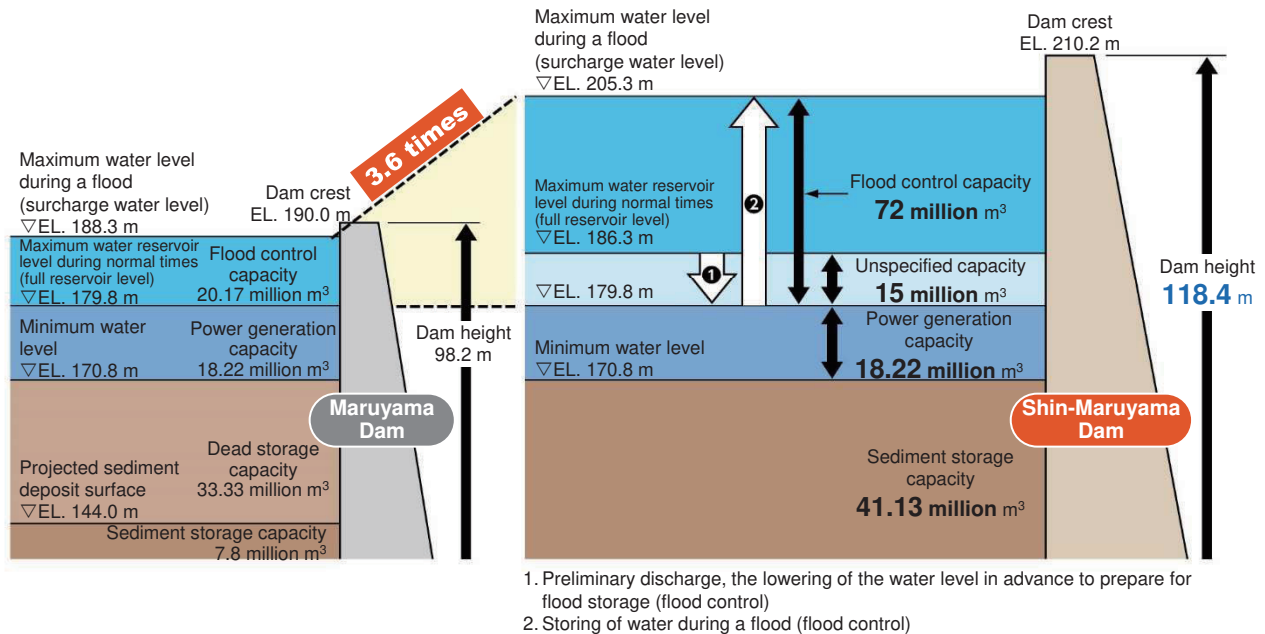
Upgraded to the Shin-Maruyama Dam

The Shin-Maruyama Dam Construction Project is a dam rehabilitation project intended to raise the Maruyama Dam, located about 90 kilometers from the mouth of the Kiso River, by 20.2 meters to improve its function. The new dam, higher in elevation, is to be built 47.5 meters downstream from the existing structure and will partially overlap it. When the body of the new dam is completed, the upper part of the existing dam will be partially demolished to ensure smooth release of water from the dam.



Allocation of reservoir capacity

The Shin-Maruyama Dam can store 3.6 times more water than the Maruyama Dam during floods. Of the 72 million cubic meters of flood control capacity, 15 million cubic meters will be effectively used as flood control capacity by preliminary discharge of an unspecified capacity set up to preserve the river environment during droughts and stabilize water for use.



Dam details

	Maruyama Dam	Shin-Maruyama Dam
Location	Right bank: Yaotsu, Yaotsu Town, Kamo County, Gifu Prefecture Left bank: Kowasawa, Mitake Town, Kani County, Gifu Prefecture	
Type	Concrete gravity dam	
Dam height	98.2 m	118.4 m
Crest length	260.0 m	340.6 m
Elevation of non-overflow section	EL. 190.0 m	EL. 210.2 m

Reservoir details

	Maruyama Dam	Shin-Maruyama Dam
Catchment area	2,409 km ²	2,409 km ²
Reservoir area	2.63 km ²	3.68 km ²
Total storage capacity	79.52 million m ³	131.35 million m ³
Effective storage capacity	38.39 million m ³	90.22 million m ³
Flood control capacity	20.17 million m ³	72 million m ³
Unspecified capacity	0 m ³	15 million m ³
Power generation capacity	18.22 million m ³	18.22 million m ³
Normal water level	EL. 179.8 m	EL. 186.3 m
Surcharge water level	EL. 188.3 m	EL. 205.3 m

Objectives and Benefits of the Shin-Maruyama Dam Construction Project

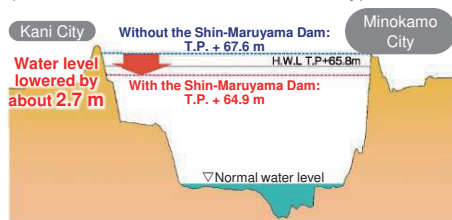
The Shin-Maruyama Dam will support safer and more comfortable lives by adding a new purpose of preserving the downstream river environment to the existing Maruyama Dam's two purposes of flood control and power generation.

Objective 1 Strengthen flood control: Protect areas from disasters such as floods

POWER UP

The Shin-Maruyama Dam is a dam that can safely discharge floodwaters even on a scale comparable to the flood in September 1983, the largest flood on the Kiso River since World War II. Due to this dam, it is expected that the water level at Imawatari—close to Minokamo City and Kani City, which were severely damaged by the flood in 1983—will drop by about 2.7 meters (assuming the floodways after the completion of the new dam). This will eliminate flood damage caused by the overflow of the river.

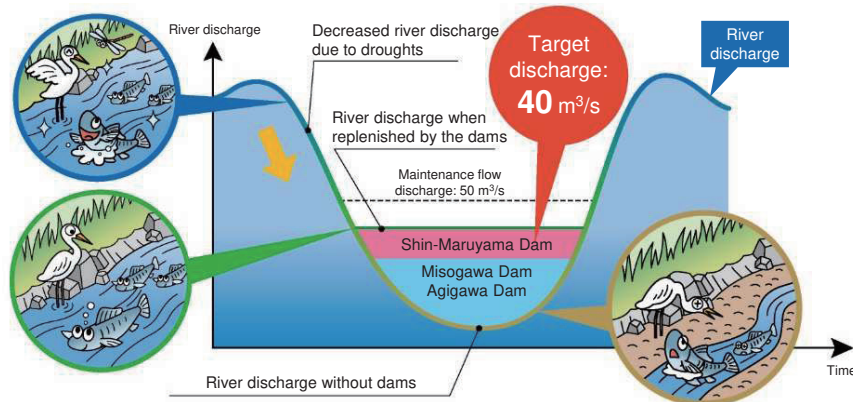
● **Downstream of the Imawatari point** (about 67.0 km from the river estuary)



Objective 2 Maintain the normal function of water flow: Protect the river environment against droughts and endeavor to achieve clear flows

NEW

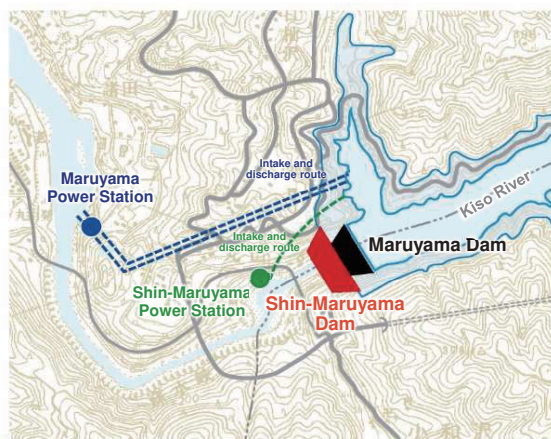
When the flow of rivers decreases, the habitats of river animals and plants are narrowed, and seawater runs up rivers, affecting water use. Other impacts include changes in river water quality. For this reason, during times of drought, part of the river discharge (40 cubic meters per second at the Kiso-Naruto point in Kaizu City, Gifu Prefecture) necessary for maintaining the river environment and stabilizing the existing water intake volume will be supplied by the Agigawa Dam, Misogawa Dam, and Shin-Maruyama Dam.



Objective 3 Increase power generation: Produce environmentally friendly clean energy

POWER UP

Construction of the Shin-Maruyama Dam will raise the water level of the dam reservoir, increasing the maximum output of the Maruyama Power Station and the Shin-Maruyama Power Station from 188,000 kilowatts to 210,500 kilowatts.



Maruyama Power Station

(Currently) 125,000 kW → **143,000 kW**



Shin-Maruyama Power Station

(Currently) 63,000 kW → **67,500 kW**



Dam Body Construction Procedure

The construction of the Shin-Maruyama Dam is a construction project that faces a high degree of difficulty. Consequently, it requires advanced technology to maintain the flood control function of the existing Maruyama Dam, which is located on the Kiso River, one of Japan's most important rivers, while raising the new dam.

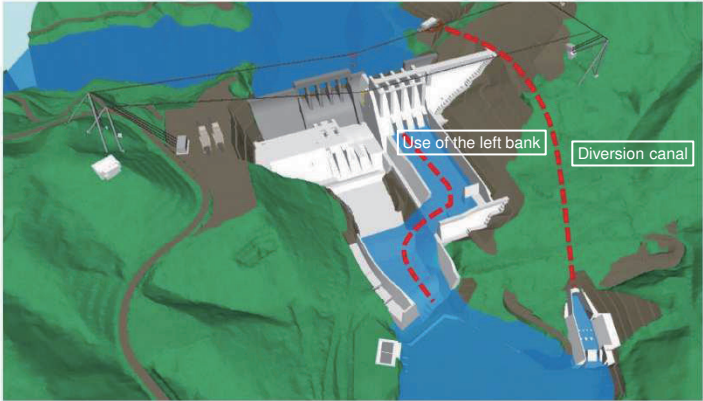
Construction steps

Step 1 Current situation



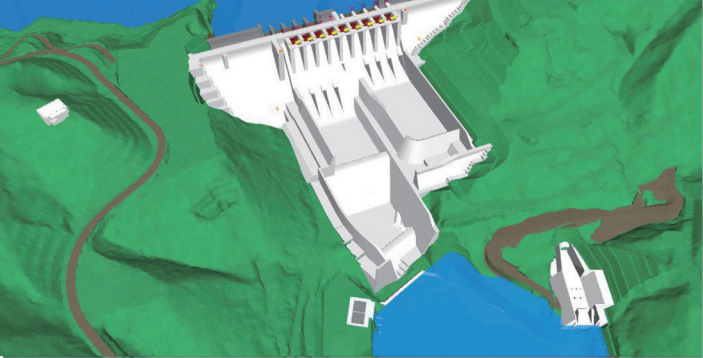
- To ensure safe construction, a diversion canal (temporary drainage tunnel) will be built on the left side of the dam (left side when viewed from upstream) to divert floodwaters.
- To reach the solid bedrock that will serve as the foundation to support the new dam, the foundation will be excavated to the extent that doing so will not affect the existing dam's discharge.

Step 3 After starting use of the left bank



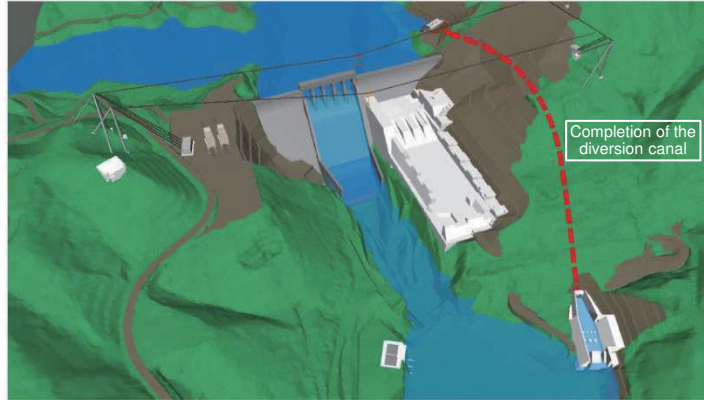
- Work will proceed on the central part and right-bank side of the dam.
- When major flooding occurs, water will be released from the Maruyama Dam. As such, we will carry out construction work safely while checking weather information and flood forecasts daily.

Completed new dam



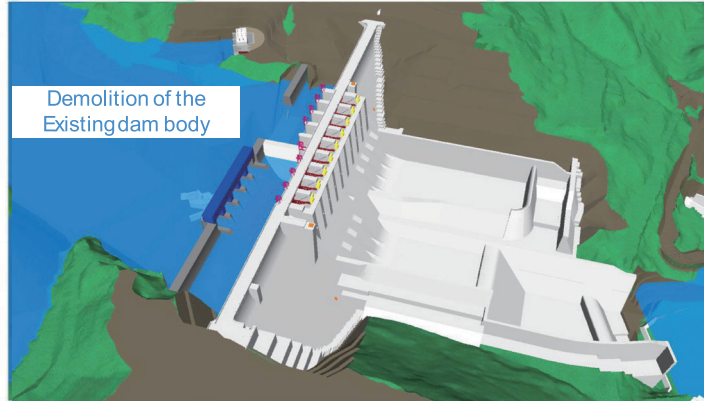
- After all construction work is completed, initial impoundment will take place to check the soundness of the dam body that holds back water and that of the slopes around the reservoir. Once this is done, the dam will be complete.

Step 2 Start of diversion



- The main body of the Shin-Maruyama Dam will be constructed first on the left bank of the Maruyama Dam, where the discharge of the existing dam will not be affected.
- Once the left-bank side of the new dam is completed, the dam operators will be able to discharge water from the spillway and the Shin-Maruyama Dam's diversion canal during flooding, enabling work on the central part of the dam and the right-bank side to proceed more safely.

Step 4 Demolition of the existing dam body



- Once the body of the Shin-Maruyama Dam is completed, the upper part of the existing Maruyama Dam will be partially demolished to allow for the smooth flow of discharge from the dam.

Current progress

Site acquisition 99% (117ha) 118ha	House relocation 100% (49 houses) 49 houses	Replacement road construction* 92% (13.3km) 14.4km	Access road construction 91% (19.6km) 21.6km
--	---	--	--

*This is the percentage of progress in terms of construction length for road construction work that has been started.

Dam body work and related work

Diversion canal Left and right banks: Foundation excavation Left bank: Concrete pouring	Riverbed section: Foundation excavation	Riverbed and right-bank sections: Concrete pouring	Initial impoundment
--	--	---	--------------------------------

(As of March 2025)

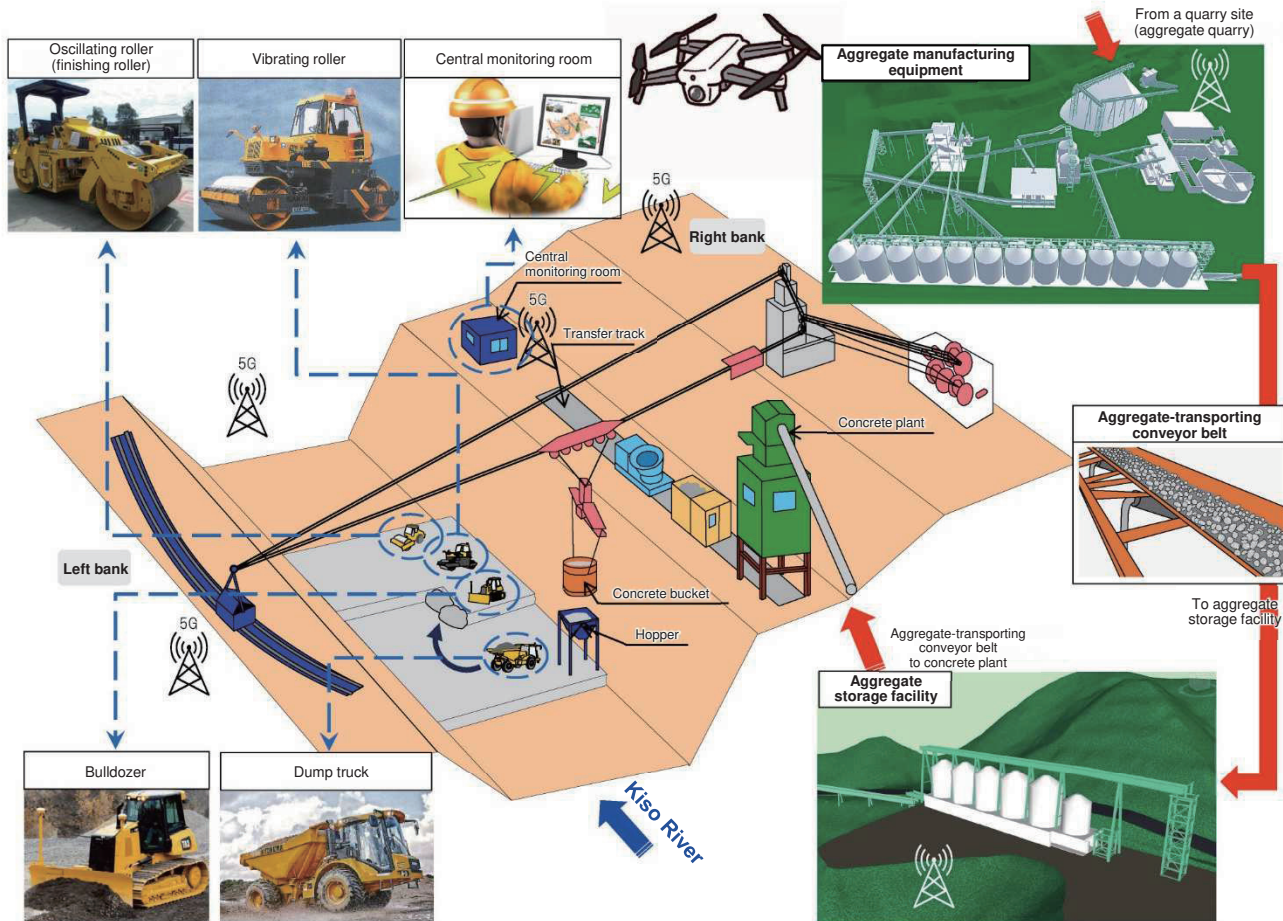
Promotion of Digital Transformation (DX)

“DX” is a concept that uses data and digital technology to transform work styles and realize safe, secure, and prosperous lives.

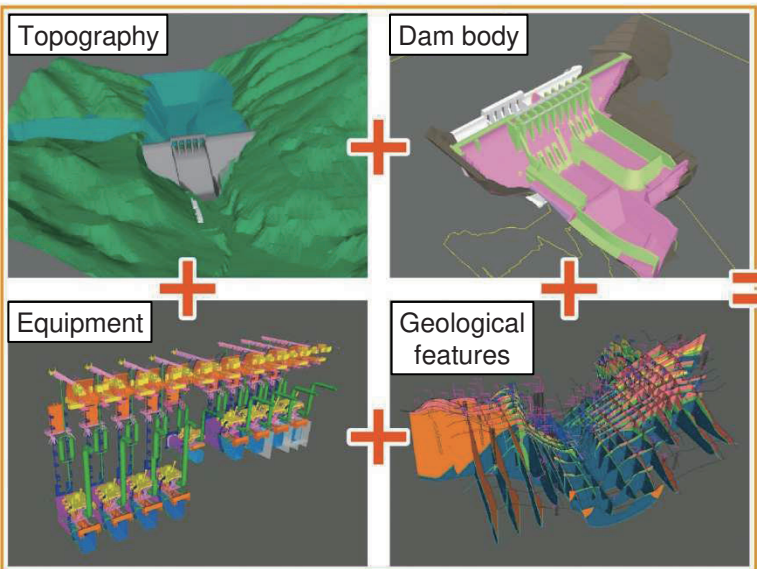
The Shin-Maruyama Dam Construction Project, which aims to rehabilitate the Maruyama Dam—a pioneer in the introduction of large construction machinery after World War II—was selected as a 3D Information Utilization Model Project (with a total of 15 projects nationwide). We will make the most of our advanced technological capabilities and DX to play a leading role in taking on various challenges and growing from them as part of one of Japan’s largest dam rehabilitation projects.

Striving for an autonomous concrete pouring system for dam rehabilitation

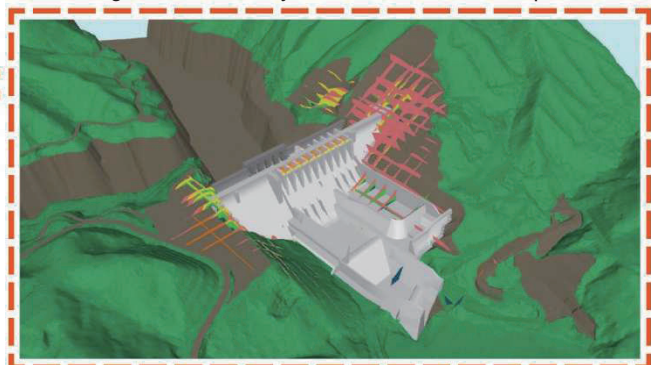
The aim is to introduce an autonomous concrete pouring system that controls a series of operations, from production of aggregate used in concrete to concrete pouring, in a central monitoring room. This will improve productivity at construction sites, reduce the burden on construction workers, and improve safety, thereby creating an attractive work environment.



Using the integrated version of the Construction Information Modeling, Management (CIM) model



The integrated CIM model helps in reviewing design and construction procedures by preparing detailed 3D models of various factors such as the topography and geological features around the dam, the dam body, and spillway for visualization. It will be useful not only during construction but also for maintaining the Shin-Maruyama Dam after its completion.



Community Revitalization Efforts

Using the dam to revitalize the community

Maruyama Dam's "Marutto Terrace" observation deck

The new Marutto Terrace is an observation deck that offers a direct frontal view of the Maruyama Dam and a panoramic view of the Shin-Maruyama Dam construction work.

Visitors can take commemorative photos using a dam card photo frame situated on the deck. They can also see the completed form of the Shin-Maruyama Dam in 3D by scanning a 2D barcode with their smartphone. The observation deck is free to visit.

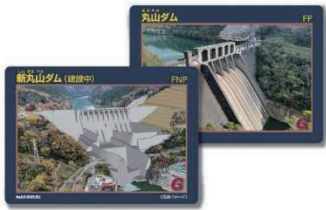


← Scan here for a map showing directions to Marutto Terrace.



Dam cards

Dam cards are given out to visitors to the dam.



Sake in storage

Sake is stored inside the body of the Maruyama Dam. The stored sake's label is designed so that the five gates of the Maruyama Dam are seemingly connected when two bottles are placed side by side.



Shin-Maruyama Dam Curry

Dam Curry is available at local restaurants in Yaotsu Town.



Yaotsu senbei (wheat cracker)

The Maruyama Dam and the Shin-Maruyama Dam are depicted on "Yaotsu senbei," a famous snack from the town.



Gifu Bungy

A bungee jump site was set up in 2020 on the Shin-Tabisoko Bridge, which was constructed in conjunction with the Shin-Maruyama Dam Construction Project. The 215-meter drop is the greatest in Japan (as of 2025).



Road maintenance due to the dam project

We are proceeding with the replacement of National Route 418, which will be submerged when the water level of the reservoir rises, and the construction of roads necessary for transporting materials and equipment used for construction.

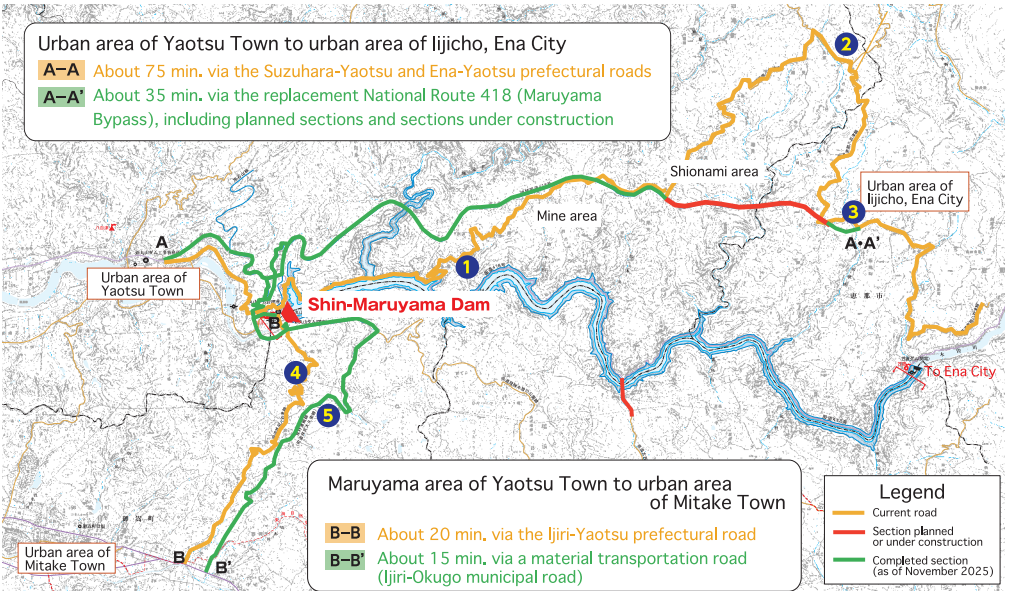
Effects of the construction of a replacement National Route 418 and material/equipment transportation roads

Significant improvement in road safety

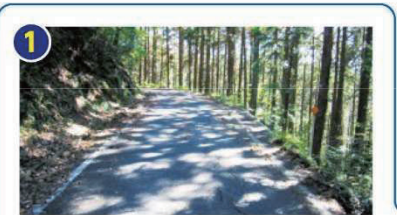
Road widening and reduction of winding road sections enable safer driving.

Improved access

The time required to drive between Yaotsu Town and Iijicho, Ena City, on National Route 418 will be shortened significantly from about 75 minutes to about 35 minutes.



This map is based on Digital Map 25000 (map image), published by the Geospatial Information Authority of Japan.



Ena-Yaotsu prefectural road



Ijiri-Yaotsu prefectural road



Replacement National Route 418

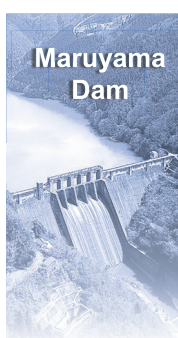


Material transportation road

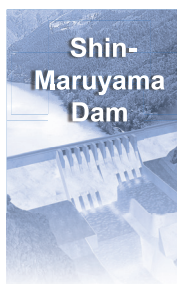
History of Shin-Maruyama Dam Construction

Construction of the Maruyama Dam began in 1943 to meet the power demand before and during World War II. The dam was completed in 1956, with construction having been suspended during the Pacific Theater.

The Shin-Maruyama Dam Construction Project began in 1986 with the aim of raising the height of the Maruyama Dam, which was completed more than 60 years ago, and strengthening its flood control functions. Construction of the dam body began in 2021.



- October 1943 ● Construction by the Japan Electric Generation and Transmission Company begins
- May 1944 ● Construction suspended due to the Pacific Theater of World War II
- September 1951 ● The Kansai Electric Power Co., Inc. takes over the project and resumes construction
- December 1953 ● The Ministry of Construction joins the project
- March 1956 ● Maruyama Dam completed and jointly managed by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and Kansai Electric Power
- September 1983 ● Largest flood since World War II on the Kiso River



- April 1986 ● Shin-Maruyama Dam Construction Project begins
- May 1990 ● Notification "Basic Plan for the Construction of the Shin-Maruyama Dam," based on the Act on Specified Multipurpose Dams, published
- March 1992 ● Agreement on standards for compensation for loss signed
- January 1994 ● Water source area development plan, based on the Act on Special Measures for Water Source Areas, determined
- June 2005 ● Notification "Basic Plan for the Construction of the Shin-Maruyama Dam (1st revision)" published
- November 2007 ● Basic Policy for Kiso River Improvement formulated
- March 2008 ● Kiso River Improvement Project formulated
- September 2010 ● MLIT gives instructions to examine dam projects
- July 2013 ● MLIT determines that its policy regarding examination of the Shin-Maruyama Dam Construction Project is for the project "to continue"
- January 2015 ● Kiso River Improvement Project revised
- July 2015 ● Notification "Basic Plan for the Construction of the Shin-Maruyama Dam (2nd revision)" published
- September 2016 ● Diversion canal work begins
- January 2020 ● Maruyama Dam Management Office relocated
- March 2020 ● Kiso River Improvement Project revised
- December 2021 ● Construction of the main body of the Shin-Maruyama Dam begins
- August 2024 ● Notification "Basic Plan for the Construction of the Shin-Maruyama Dam (3rd revision)" published
- March 2025 ● Initial concrete for the main body of the Shin-Maruyama Dam poured
- November 2025 ● Cornerstone for the Shin-Maruyama Dam laid

