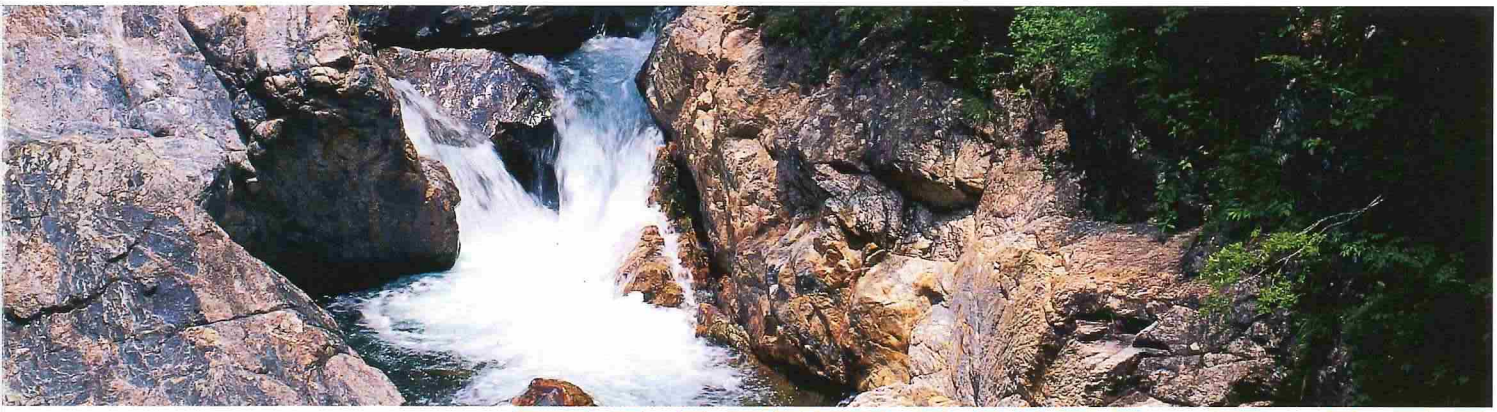
Water supports wealthy society
Seeking the grace of the turbulent river

The Ara River System



TAKIZAWA DAM

Incorporated Administrative Agency
Japan Water Agency
Arakawa Dam Integrated Management and Construction Office

The Ara River and the Ara River Basin

A "river basin" is the entire area of land from which a river gathers its water. The area of land from which the Ara River gathers its water is called the "Ara River Basin." The river basin is also the area of land that is most influenced by the river and a rise in its water.

The Ara River Basin is spread across the Tokyo metropolitan area, where one-third of the population and industries of Japan are concentrated, and spans over 19 wards, 39 cities, 24 towns and 7 villages in Tokyo and Saitama Prefectures. It has a total land area of 2,940 ㎢ on which 92 million people live, giving it a population density of about 3,100 people/㎢. The value of the total property of the basin is approximately 138 trillion yen, of which the value of the properties susceptible to flooding is about 73 trillion yen (according to river survey conducted in March 1997).

Therefore, the Ara River is a very important river in terms of flood control (flood prevention) and water utilization (water supply).

Conditions and Population of Major River Basin Areas in Japan

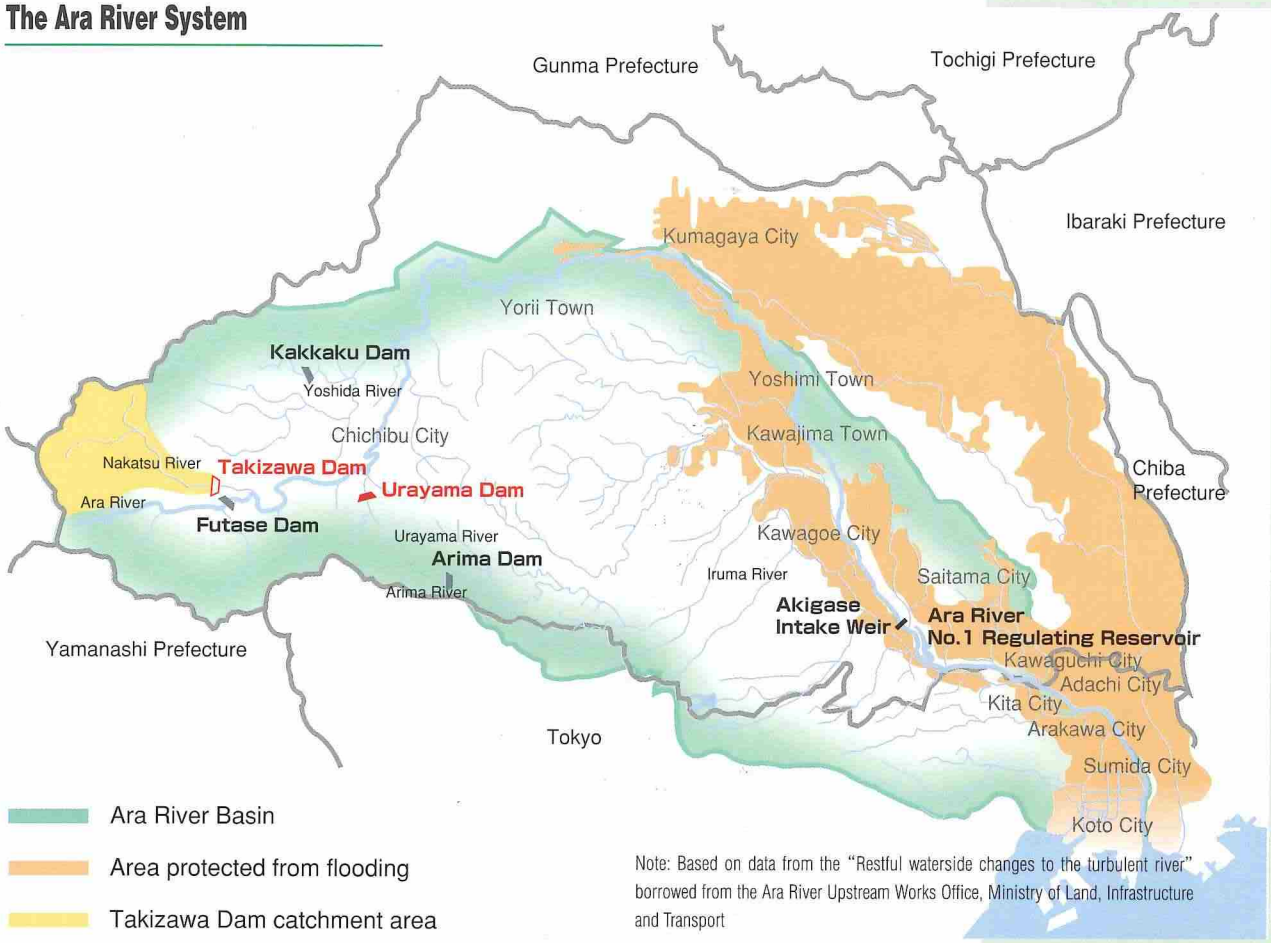
River Name	Region	River Length (km)	Basin Area (㎢)	Population	Population Density (people / ㎢)
Shinano River	Hokuriku	367	11,900	2,906,954	241.9
Tone River	Kanto	322	16,840	11,630,174	702.2
Ara river	Kanto	173	2,940	9,203,744	3,129.8
Tama River	Kanto	138	1,240	3,382,514	2,733.3
Kiso River	Chubu	227	9,100	1,895,634	212.6
Yodo River	Kinki	75	8,240	10,693,850	1,398.6
Chikugo River	Kyushu	143	2,863	1,064,048	373.5

River Length/ River Handbook 1998, Basin Area, Population and Population Density/ Survey of Current River Conditions, March 1997

What is a dam?

We are now able to use a sufficient supply of water whenever we want in our daily lives. In their natural state, however, rivers are always changing - they flood during times of heavy rainfall and run dry during long droughts. A "dam" is a facility to control and maintain the water flow in rivers. It stores up water when there are heavy rains which are then fed into the rivers in times of drought.

The Ara River System



Note: Based on data from the "Restful waterside changes to the turbulent river" borrowed from the Ara River Upstream Works Office, Ministry of Land, Infrastructure and Transport

Heavy rains due to tropical cyclones recorded the highest water level since observations were initiated at Kumagaya Point (Saitama Prefecture) and Jisuibashi Point (Saitama). In addition, the third highest water level in post-war Japan was recorded at Iwabuchi Point, Kita Ward, Tokyo. In various areas across the region, damages were caused due to the flooding.

The Ara River midstream ran dry around Kumagaya leading to a river-flow stoppage and mass loss of the waterlife. On top of other damages, water supply restrictions forbade the use of pools at elementary and junior high schools.

The Dams of the Ara River System

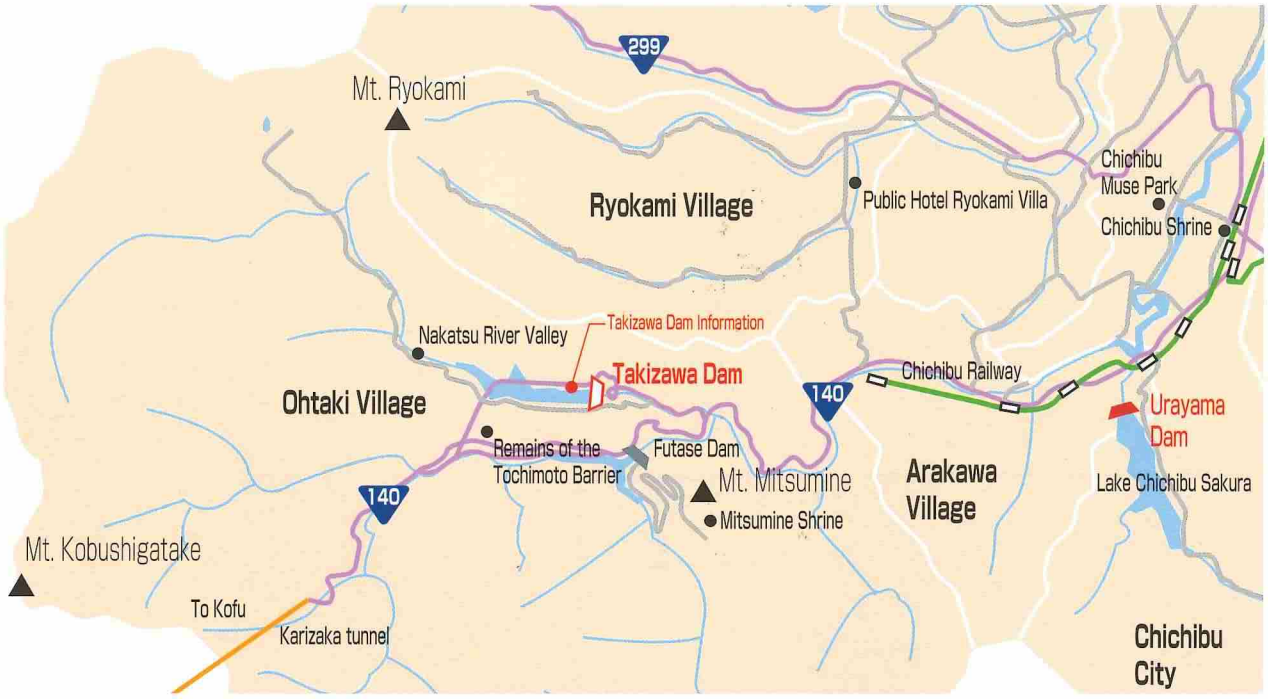
Facility	Effective storage capacity (㎥)	Developed quantity (㎥/s)	Completion year (fiscal year)	Construction body
Futase Dam	21.8 million	–	1961	Ministry of Land, Infrastructure and Transport (former Ministry of Construction)
Arima Dam	7.25 million	0.7	1986	Saitama Prefecture
Ara River No.1 Regulating Reservoir	10.6 million	3.5	1997	Ministry of Land, Infrastructure and Transport (former Ministry of Construction)
Urayama Dam	56 million	4.1	1998	Japan Water Agency (former Water Resource Development Public Corporation)
Kakkaku Dam	9.25 million	1.0	2000	Saitama Prefecture
Takizawa Dam	58 million	4.6	Under construction (scheduled completion in 2007)	Japan Water Agency (former Water Resource Development Public Corporation)

Takizawa Dam Information

Takizawa Dam Information is located above the Takizawa Dam construction site along Route 140. Panels that introduce human history and the Ara River, progress of construction work and the surrounding nature are always displayed here. This place can be used as a place to rest as well as the base where visitors obtain information on the construction of the dam.

Access by car

Tokyo	About 3 hours (Approx. 135 km)	Karizaka tunnel	About 35 minutes (Approx. 22 km)
Chichibu	About 50 minutes (Approx. 34 km)	Kofu	About one and a half hours (Approx. 64 km)




Forest Park Fureai-no-Mori

Bean-throwing festival of Mitsumine Shrine "Gomottomosama"


Chichibu Night Festival


Tochimoto

Recycling Greenery and Water for the Environment

Rain water from the roof is stored for use in rest rooms at "Ryogoku Kokugikan" (Tokyo) and "Saitama Stadium 2002" (Saitama). In a similar manner, the dam construction takes into consideration the environment and natural regeneration. As part of this effort, this brochure uses recycled-paper.

Water supports wealthy society

R100
古紙配合率100%再生紙を使用しています

Takizawa Dam Information

Oaza Otaki, Otaki, Chichibu, Saitama, 369-1872
Phone: 0494-53-2027
http://www.water.go.jp/kanto/takizawa/

Incorporated Administrative Agency Japan Water Agency
Arakawa Dam Integrated Management and Construction Office

130-1, Oaza Kami-Kagemori, Chichibu, Saitama, 369-1872
Phone: 0494-23-1431

Objectives of the Takizawa Dam

Objectives

1 Flood control

To control 1,550 ㎥/sec. of the 1,850 ㎥/sec. designed high-water discharge at the dam site and to reduce flood damage in the downstream area from the dam.

2 Stable supply of irrigation water and the preservation of the river environment

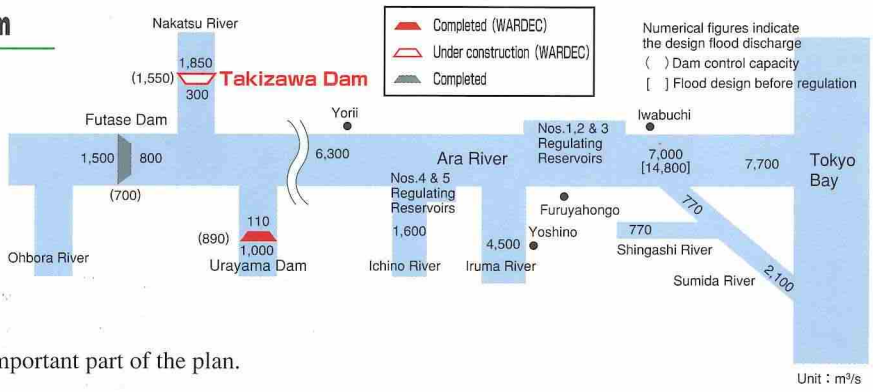
To ensure a sufficient and stable supply of water to farmers holding old water rights along the river by storing up water when the water flow of the river is abundant and supplying water when the river flow is insufficient, and to preserve the river environment by continually providing the necessary water flow.

3 New water requirements (municipal water)

To supply municipal water to Saitama and Tokyo Prefectures (maximum 3.68 and 0.86 ㎥/sec., respectively) and to the Minano and Nagatoro Water Supply Authority (maximum 0.06 ㎥/sec.). Water from the dam is used for power generation in Saitama Prefecture (maximum 3, 400 kw).

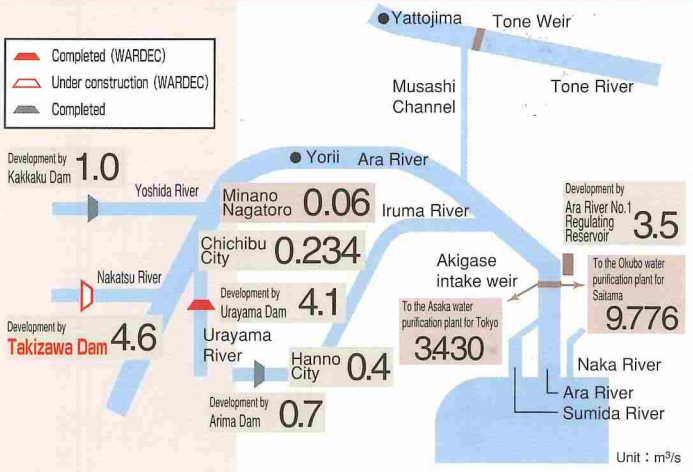
Flood Control Plan for the Ara River System

The flood control plan for the Ara River system aims to reduce the rate of discharge from 14,800 ㎥/sec., which is the figure at the Iwabuchi reference point where a flood will occur once every 200 years, to 7,000 ㎥/sec. using the upstream dams, the Ara River control reservoirs and by improving the course of the river. The Takizawa Dam is playing an important part of the plan.



Municipal Water Utilization Plan for the Ara Water System

(municipal water)



The Quantity of Water Development in the Dams of the Ara River System

Facility	Developed Quantity	Akigase Weir Saitama	Akigase Weir Tokyo	Others
				Minano/Nagatoro
Takizawa Dam	4.6	3.680	0.860	0.060
				Chichibu City
Urayama Dam	4.1	2.696	1.170	0.234
Kakkaku Dam	1.0	1.000	—	—
				Hanno City
Arima Dam	0.7	0.300	—	0.400
Ara River No.1 Regulating Reservoir	3.5	2.100	1.400	—
Total	13.9	9.776	3.430	0.694

unit : ㎥/s

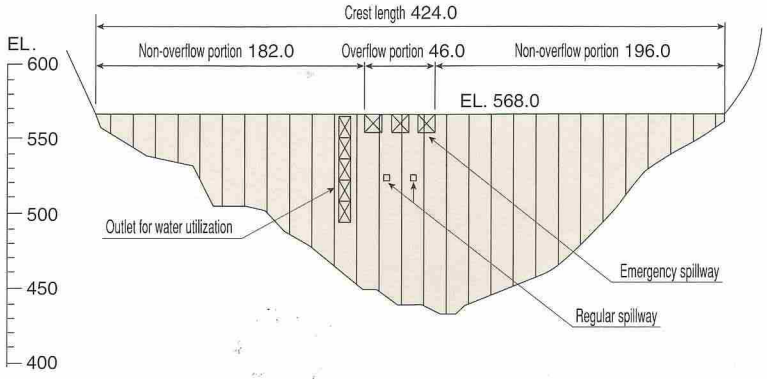
The Ara River Basin previously enjoyed abundant supplies of groundwater. However, the recent population increase resulting from urbanization and industrial development has increased demands for domestic water. Existing groundwater supplies can no longer meet these demands and a widespread drop in ground level has been caused by excessive pumping of groundwater. It is for these reasons that a number of dams are being constructed for securing water along the Tone River and the Ara River in the Tokyo Metropolitan Area.
Most water made available by the Takizawa Dam and other dams will be accessed at the Akigase intake weir and supplied to residences and buildings via the Okubo water purification plant (Saitama Prefecture) and to the Asaka water purification plant (Tokyo Prefecture) .

What is the Takizawa Dam?

Specifications *Numerical figures indicate the design value

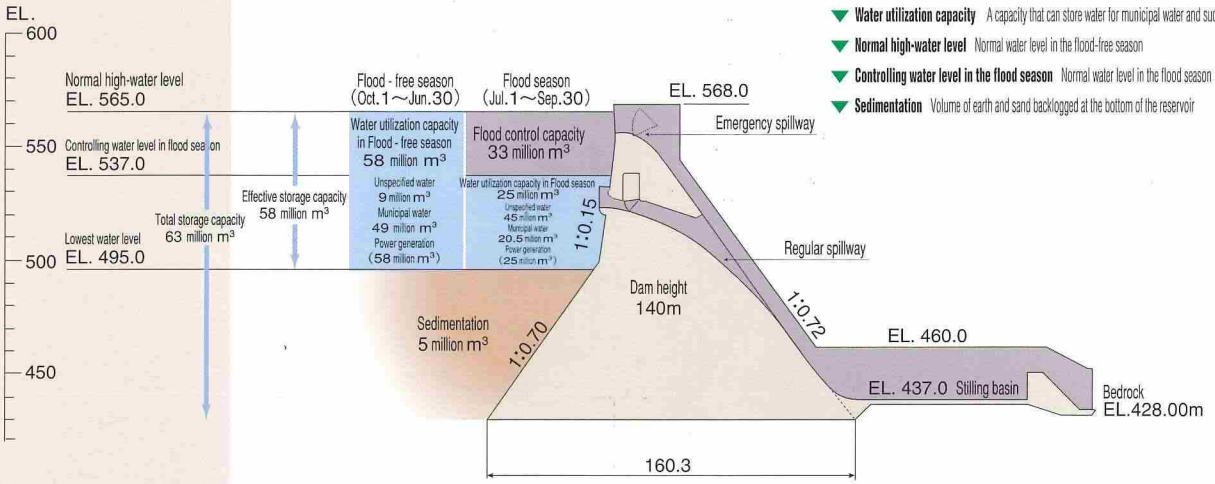
Type	Concrete gravity dam
Height	140.0m
Crest length	424.0m
Dam volume	Approx.180 million m³
Catchment area	108.6km²
Reservoir area	1.45km²
Construction cost	2,100 billion yen
Construction term	FY 1969 - 2007

Upstream and Cross-sectional Views of the Dam *Figures are design values Unit: meter



Dam Reservoir Utilization *Figures are design values Unit: meter

- **Effective storage capacity** A capacity subtracted sedimentation from total storage capacity
- **Flood control capacity** A capacity available for flood control
- **Water utilization capacity** A capacity that can store water for municipal water and such
- **Normal high-water level** Normal water level in the flood-free season
- **Controlling water level in the flood season** Normal water level in the flood season
- **Sedimentation** Volume of earth and sand backlogged at the bottom of the reservoir



The reservoir of a dam has to satisfy two contradictory demands. It must store as much water as possible for municipal water in times of drought. On the other hand, it must have a large reserve capacity available for flood water for flood control. Therefore, water levels in the reservoir are controlled separately for the flood-free season (July ～ September) and flood season (October ～ the June next year). The Takizawa Dam stores 58 million m³ of water in the flood-free season and a reserve capacity equivalent of 33 million m³ for control in the flood season.

Outline of Compensation Measures

The construction of the dam will require some residents to be relocated. The general compensation arrangements, based on a detailed survey, are designed to provide them with redress for their loss of rights and property. The public compensation scheme will provide for the relocation of roads. The special compensation scheme will cover the loss of fishing and other rights.

General Compensation

<Land>	
Residential land	7.1ha
Fields	34.6ha
Forest	224.2ha
Other	8.1ha
Total	274.0ha
<Houses>	
Relocated houses	112units

Public Compensation

National highways	5.0km
Prefectural roads	3.3km
Village roads	5.4km
Total	13.7km

Special Compensation

Transfer of high-voltage transmittion lines	Lump sum
Fishing	Lump sum
Power reduction	Lump sum
Mining rights	Lump sum

Low Impact and Regeneration of a Productive Environment

Aim

Efforts are being made at the Takizawa Dam to "regenerate nature," striving to recover and maintain the environment in harmony with the surrounding rich nature, based on a policy of "low impact" that seeks to minimize the impact of the construction of the dam on nature.

Goshawk chick(successful breeding, 2001)

Environmental Prevention Measures Taken

- Give consideration to goshawk breeding while constructing dams.
- Transfer to similar habitats for scarce and valuable plants found in the designed water-fill area.
- About 60% of alternative prefectural roads are tunneled, a change to the original plans, so as to minimize the impact on nature due to construction.
- Promoting re-generation of nature through local plants. This is done by gathering local seeds upstream of the dam sites or with soil taken from the construction sites, in order to vegetate the areas cleared due to construction.
- Using sodium lamps for lighting for night construction attracts fewer insects and reduces the impact on the surrounding natural ecological system.
- Giving consideration to the surrounding natural environment, construction machines with low noise and low vibrations are used.

Transplant of scarce plants

Gathering of local seeds

Lighting at night for construction

History of the Takizawa Dam Construction Project

April 1, 1969
The Takizawa Dam survey office was established.
【Compensation negotiations and engineering survey started】

May 10, 1972
The survey office became the Takizawa and Urayama Dam Construction Office.
【Compensation negotiations and engineering survey went on for starting construction】

January 18, 1973
The master plan for the construction of Takizawa Dam was officially published. (Specified Multi-purpose Dam Law)
【Objectives and scale of the dam were indicated】

December 24, 1974
The Ara River system was designated as a water resource development river system. (Water Resources Development Promotion Law)

April 16, 1976
The master plan for the development of water resources on the Tone River and Ara River systems was finalized. (Water Resources Development Promotion Law)
【The position of the Takizawa Dam Construction Project was determined】

September 1, 1976
The Takizawa Dam Construction Project Implementation Policy was suggested. (Water Resources Development Public Corporation Law)

September 28, 1976
The Takizawa Dam Construction Project Implementation Policy was approved. (Water Resources Development Public Corporation Law)
【The content of the Water Resources Development Public Corporation project was determined】

October 1, 1976
The project was taken over from the Ministry of Construction by the Water Resources Development Public Corporation. (Water Resources Development Public Corporation Law)

April 1, 1983
The Takizawa and Urayama Dam construction offices were separated.

The Urayama Dam

The Urayama Dam is a multipurpose dam constructed for the purpose of flood control, stable supplies of irrigation water, the preservation of the river environment and new water requirements of the Urayama River (Chichibu city, Saitama and Arakawa village, Chichibu country) in the Ara River system.

Specifications

Type	Concrete gravity dam
Height	156m
Crest length	372m
Dam volume	Approx. 1.75 million m³
Catchment area	51.6km²
Reservoir area	1.2km²
Total storage capacity	58 million m³
Effective storage capacity	56 million m³
Flood control capacity in flood season	23 million m³

Urayama Dam Museum "Urarapia"

Open 10 a.m~5 p.m (April~Octobaer)
10 a.m~4 p.m (November~March)
Closed Every Tuesday (the following day when Tuesday is a holiday)
4041, Aza Godaimichiue, Oaza - kuna, Arakawa, Chichibu, Saitama, 336-1801

Information available from
Chichibu Urayama Dam Development Center
☎ 0494-24-3333

The Urayama Dam

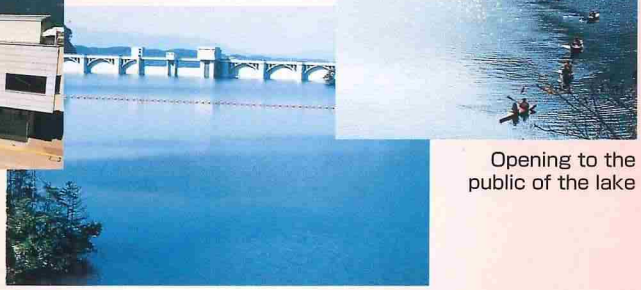
Tour of the dam

There are passages available for the general public and elevators in the dam body. You can feel the scale of the Urayama Dam. There is information concerning the Urayama Dam displayed in the museum, "Urarapia."

The desires of the local people were realized

You can enjoy riding a boat and fishing in the lake as well as improvement of parks with paved pathways. The Urayama Dam came to be an attractive dam.

Urarapia



Opening to the public of the lake

Chichibu Sakura Lake

Event exchange

There are various events including the Lake Sakura Festival for family enjoyment and a marathon race.

Chichibu Sakura Lake Utilization Conference was organized

Residents and related bodies have set up rules for utilizing the Chichibu Sakura Lake.

Lake Chichibu Sakura Festival

Marathon Race

February 2, 1988

The master plan for the development of water resources on the Tone River and Ara River systems was completely revised. (Water Resources Development Promotion Law)
【The water demand and supply project in the water system was reviewed】

December 17, 1988

The negotiation of compensation standards with residents to be relocated (104 units) was concluded.

March 17, 1989

The plan for developing the upstream area was determined. (Special Measures Law on Water Resources Area)
【The project for local activation was started】

November 10, 1992

The negotiation of compensation standards with residents to be relocated (8 units) was concluded.

March 27, 1998

The master plan for the development of water resources on the Tone River and Ara River systems was partly revised. (Water Resources Development Promotion Law)

October 3, 1998

The Otaki road of Route 140 was opened.

October 22, 1998

The changes to the Takizawa Dam Construction Project Implementation Policy were approved. (Water Resources Development Promotion Law)

March 1, 1999

The construction of dam structures commenced.

July 11, 2001

The concrete work of the riverbed for the main part of the dam was started.