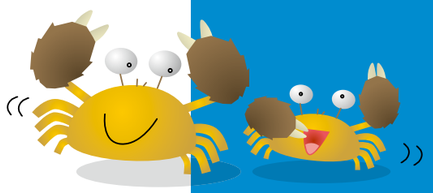

Life with "Chiggo"

Learn at the Chikugo Barrage, and develop ties with the Chikugo River

Water supports wealthy society

For inquiries about the Chikugo Barrage:

Chikugo Barrage Operation and Maintenance Office
Incorporated Administrative Agency
Japan Water Agency

1063-2 Takeshima, Yasutake-machi, Kurume, Fukuoka Prefecture 830-0071
Telephone: (0942) 26-4551
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E-mail: chikuozk@lime.ocn.ne.jp

You can see the Chikugo Barrage in real time on our website

Website: http://www.water.go.jp/chikugo/coozeki
i-Mode/Softbank/au(Ezweb):http:ckgoozeki.jp

2015.03

chikugo ōzeki

Chikugo Barrage

Life with "Chiggo"

Chikugo Barrage Operation and Maintenance Office
Incorporated Administrative Agency
Japan Water Agency

Contents

With its source in Mt. Aso's outer ring in Kumamoto Prefecture, the path of the main river is 143 km long and empties into the Ariake Sea. The area of river basin is 2,860 km^2.

The river has contributed to the regional economy for many years, providing water for use in agriculture, daily life, and power generation. During heavy rains, however, flooding has collapsed the river embankments and caused water damage throughout the area.

The Chikugo Barrage took 11 years to build, from the finalization of the plans to the completion of construction in March 1985. Stretching 23km across the mouth of the Chikugo River, it controls floods and enables water usage.

The Chikugo River and the Chikugo Barrage

Genkai Nada Sea
Fukuoka Pref.
Koishiwaragawa Dam
Egawa Dam
Mt. Hiko
Asakura City
Terauchi Dam
Saga Pref.
Tosu City
Yoake Dam
Hita City
Kurume City
Gousho Dam
Saga City
Chikugo Barrage
Mt. Yufu
Oyama Dam
Matsubara Dam
Oita City
Shimouke Dam
Chikugo River
Oita Pref.
Nagasaki Pref.
Mt. Kuju
Kumamoto Pref.
Mt. Aso
Nagasaki City
Ariake Sea
Mt. Sobo
Mt. Unzen
Kumamoto City
Miyazaki Pref.

The development and management of water resources in the Chikugo River Water System and its tributaries

Northern Kyushu is encircled by the Chikugo River and the Ariake Sea, which are rich in marine resources. This region includes of the Fukuoka area, which contains all the central administrative functions; the Kitakyushu area, which has long been an industrial belt; the Chikugo and Saga areas, which are two of Japan's primary grain-growing areas; and the Aso and Kuju areas, rich in mountain and forest resources. All are very important for the development and meticulous management of northern Kyushu.

Water resource development and management

The Ministry of Land, Infrastructure and Transport, the Ministry of Agriculture, Forestry and Fisheries, and the Japan Water Agency develop important water resources as the infrastructure for daily life and industry. They also provide a stable supply of tap water for the highly developed use of the Chikugo River water system and its tributaries, and ensure that water flow is maintained.

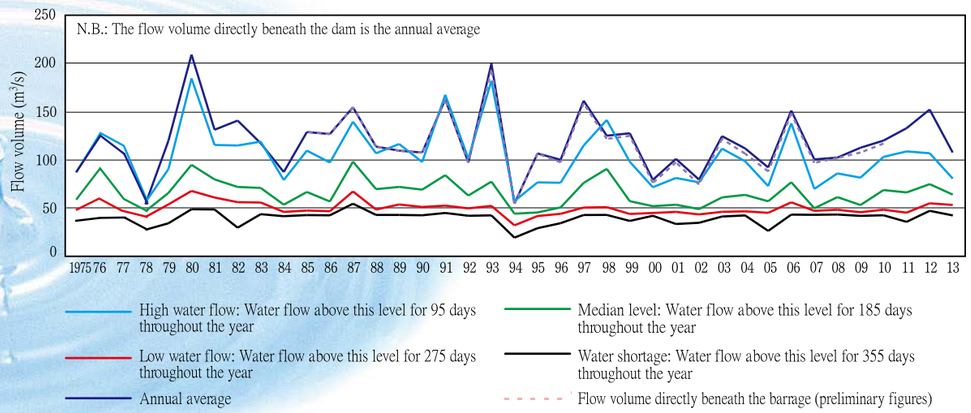
Specifically, they have built dams upstream to enable the easy acquisition of both existing and new water supplies by supplementing the water supply during droughts. Also, the Koishiwaragawa Dams are under construction to meet future water demand.

The Chikugo Barrage reservoirs allow for the intake of domestic water and agricultural water in Fukuoka and Saga Prefectures. the water supply systems there receive supplementary water supplies from the Egawa Dam, the Terauch Dam, the Gousho Dam,the Oyama Dam and the Chikugo Barrage. Also, during winter droughts, they supplement water from the Matsubara and Shimouke Dams to the downstream portion of the Chikugo River.

River discharge

Senoshita point is the location in Kurume where the Chikugo River flow volume is measured to create the standard for its management. These measurements are publicly released in an annual flow volume chart as observed by the Ministry of Land, Infrastructure and Transport. The diagram below shows the flow conditions at Senoshita point each year from 1975 to 2013. A look at the average flow volume shows that it was a maximum of 209.7㎥/s, a minimum of 52.4㎥/s, and an average of 117.0㎥/s. There are significant variations in each year. The volume for the years 1978 and 1994 were sharply below average, indicating large water shortages.

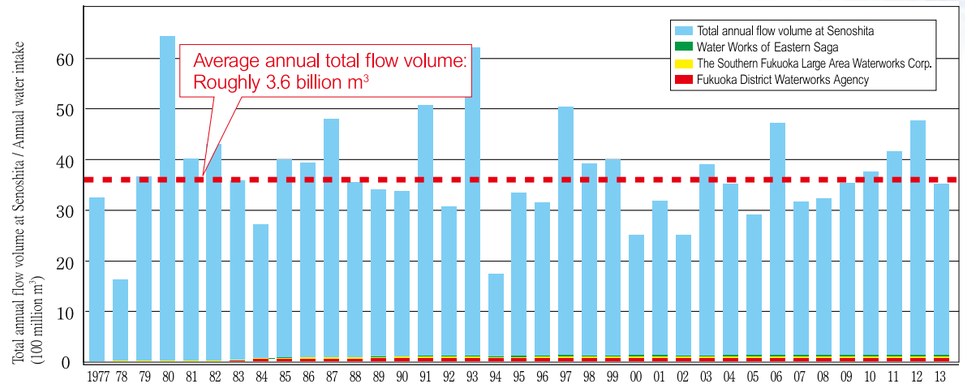
■Changes over time in the Senoshita point flow volume and the flow volume directly beneath the barrage



The chart below shows the annual total water flow volume at the Senoshita standard point on the Chikugo River. The annual average water flow volume is about 3.6 billion m³.

The domestic water intake from the Chikugo Barrage is divided among three areas: the Eastern Saga Water Supply Authority, the Greater Southern Fukuoka Water Supply Authority, and the Fukuoka District Water Supply Authority (Fukuoka Canal). The volume of water intake during one year is an aggregate of roughly 110 million m³, about 3% of the total flow volume of the Chikugo River.

■Total annual flow volume at Senoshita and trends in annual water intake

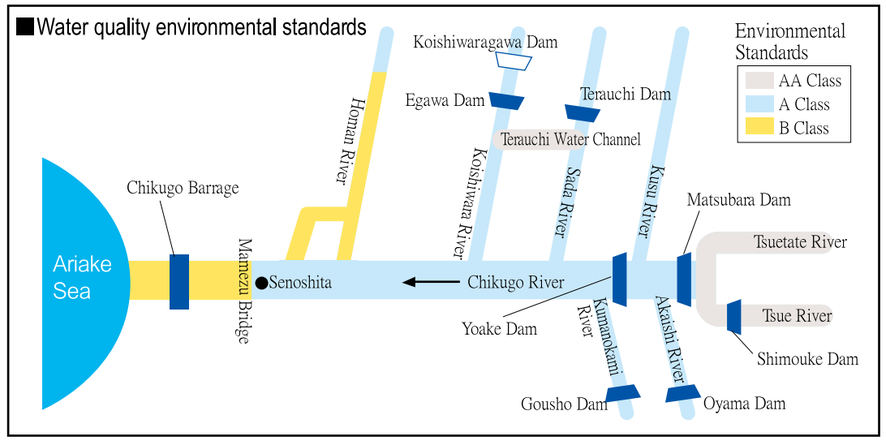


Water quality

Upstream from the Matsubara Dam, the water quality of the Chikugo River is of the AA class in accordance with the Environmental Quality Standards for Water Pollution. Downstream from this point until the Mamezu Bridge in the Chikugo Barrage water district, the quality is of the A class. Further downstream, the water quality is of the B class. The Ministry of Land, Infrastructure and Transport periodically monitors the water quality here. The Japan Water Agency monitors the water quality from the area around the Chikugo Barrage to the Ariake Sea near the river mouth.

The water quality where the Chikugo River meets the Ariake Sea is of the B class, and is of the A class further offshore. Both Fukuoka and Saga Prefectures monitor the water quality in the coastal sea area.

■Water quality environmental standards



Purpose of Chikugo Barrage (Flood control)

Purpose I

Controlling and managing floods

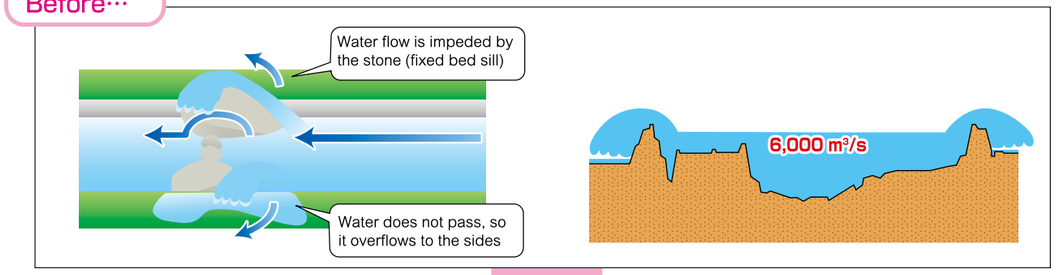
The history of the Chikugo River is the history of floods and flood control. The damage caused by the flood in June 1953 was particularly severe, and the number of people affected by the flood reached 540,000. As a result, dams were built upstream and flood control capabilities were enhanced as measures to protect the people living near the river. This enabled the safe diversion of the floodwaters downstream.

The bed sill at Kamizuru before removal

The June 1953 flood (Near Kurume University)

Previously, fixed permanent bed sill and narrow water courses resulted in water overflowing the embankments and causing great damage during heavy rains.

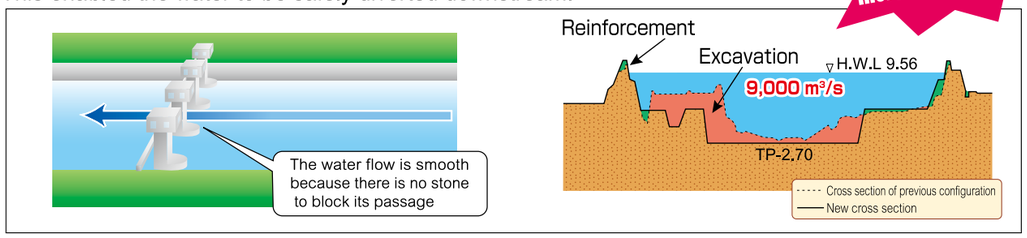
Before…



After the Chikugo Barrage was built…

The watercourse was widened, and gates were made to operate during floods.
This enabled the water to be safely diverted downstream.

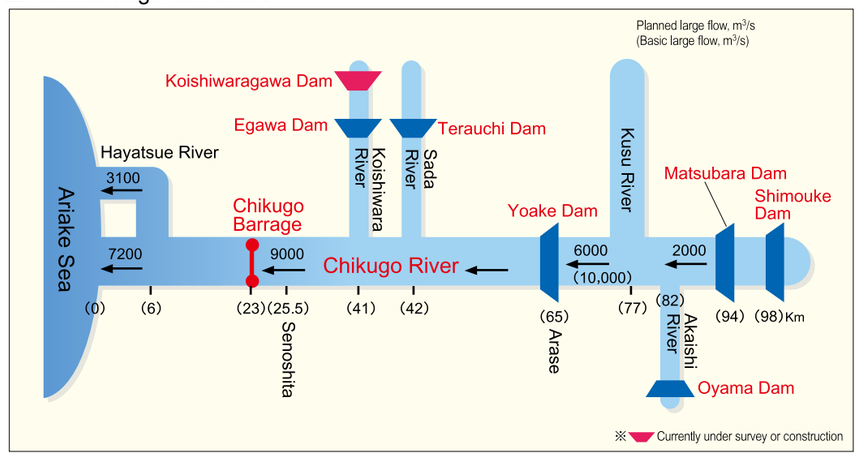
Water flow volume increases 1.5 times



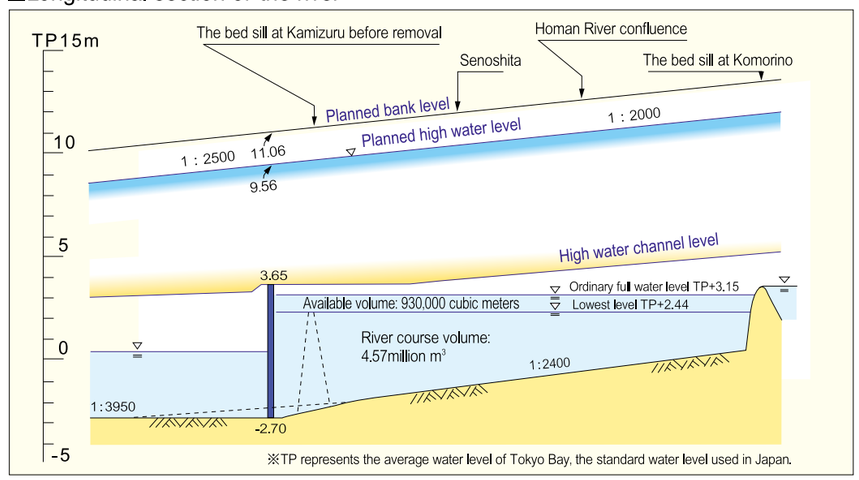
To maintain a safe life of abundance

The Chikugo Barrage was built as a movable barrage replacing the fixed bed sill at Kamizuru, which blocked floodwater from flowing downstream. This created a watercourse to safely channel floodwater to the Ariake Sea. The gates are operated during floods to allow the passage of floodwater downstream.

■Planned large flow chart



■Longitudinal section of the river



Purpose of Chikugo Barrage (Water use)

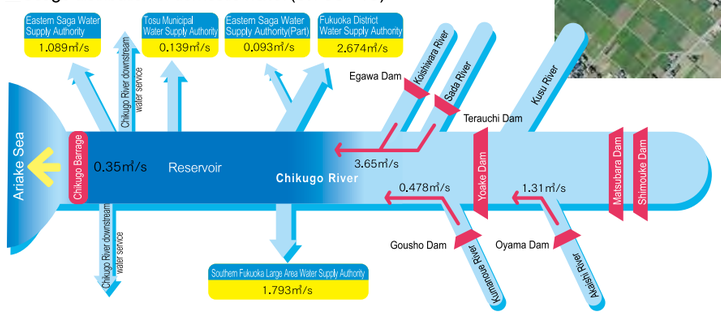
The water taken from the Chikugo Barrage reservoir is used as domestic water and water for irrigation, and benefits the lives of many people in Fukuoka and Saga prefectures.

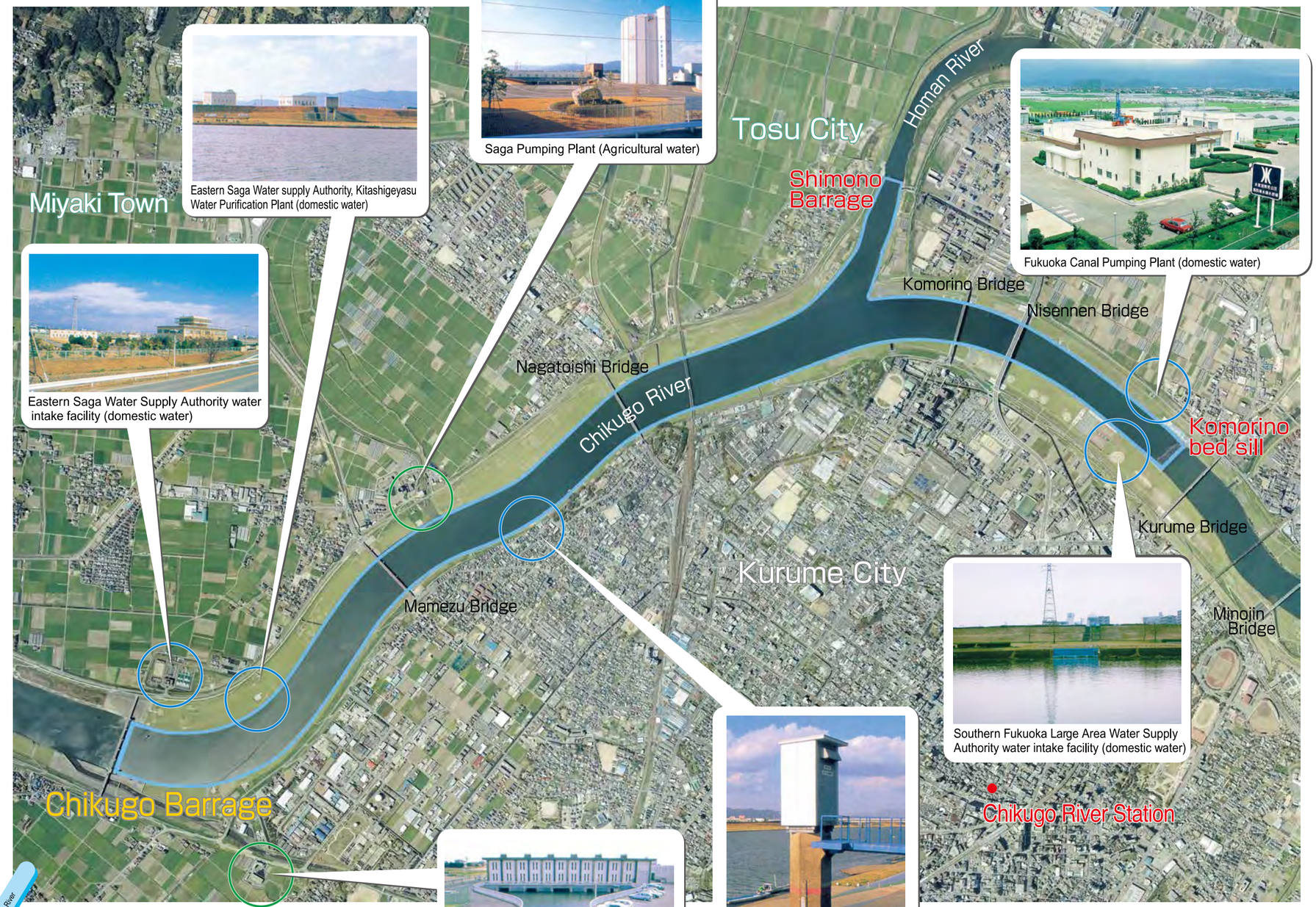
Purpose II

Maintaining new water supply for water supply systems

The 5.438㎥ of water per second developed by the upstream dams, including the Egawa Dam, the Terauch Dam, the Oyama Dam, and the Gousho Dam, flow through the Chikugo River and are temporarily held by the Chikugo Barrage. This water is combined with the 0.35㎥ of water per second developed by the barrage and used to supply water to the roughly 3.3 million people in Fukuoka and Saga Prefectures.

■Usage distribution of domestic water(5.788㎥/s)





Purpose of Chikugo Barrage (Water use)

Purpose III

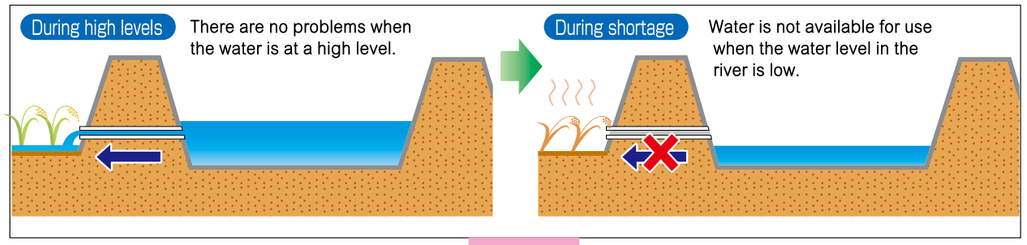
Stabilizing the water level

The average annual rainfall in the Chikugo River basin is roughly 2,200mm. Of this, 40% is concentrated in the rainy season during June and July. If the rainfall during August and September, when typhoons are frequent, is included, this four-month period accounts for roughly 60% of the area's annual rainfall. Significant amounts of rain cannot be expected during the other eight months.

The flow conditions in the Chikugo River are apt to change, with the water volume becoming too high or too low.

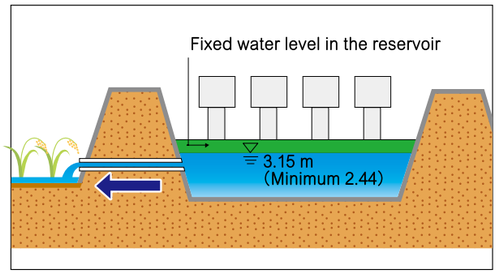
The lush agricultural land near the riverbanks

Before… The water from the Chikugo River benefits the lives of many people as domestic water and agricultural water. The water level in the river is constantly changing, however, so the water cannot be used when levels are low.

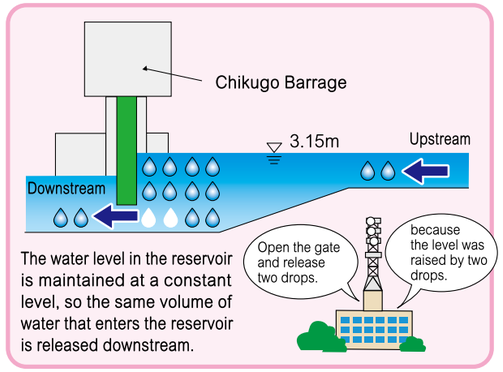


After the Chikugo Barrage was built

The Chikugo Barrage temporarily holds the water and maintains the water level in the reservoir at a minimum of TP 2.44 mm. This enables the water to be used at all times.



The meaning of the fixed water level in the reservoir



To provide an unending supply of vital water

Purpose IV

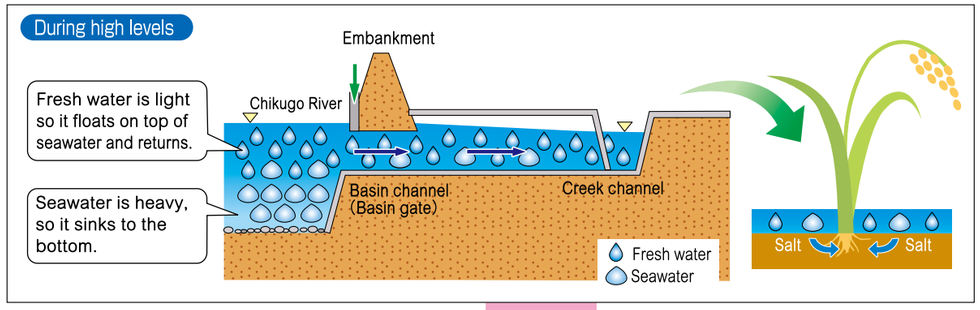
Preventing salt water damage

The greatest difference in water levels at high and low tide in Japan occurs in the Ariake Sea, reaching a maximum of six meters. This difference in the water level was utilized in the past to obtain water for agricultural use with a special method for drawing fresh water.

This method was at times unreliable because salt became easily mixed with the water. Today, however, the Chikugo Barrage allows water that contains no salt to be obtained from the reservoir.

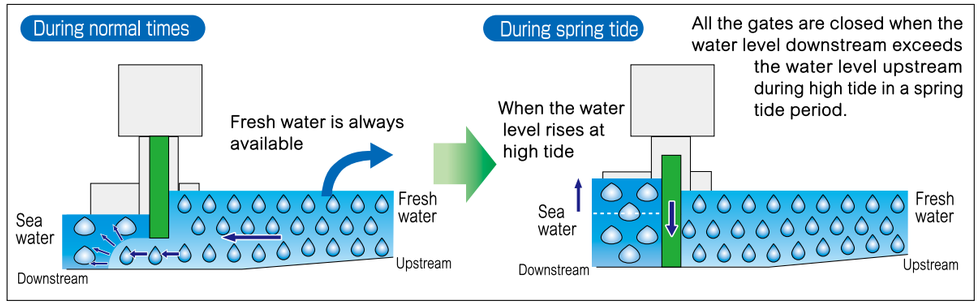
A basin gate used in the old method for obtaining fresh water

Before… Water was taken only twice a month during spring tide and stored in a water channel called a creek. Irregular amounts of water were taken, however, and the water was often mixed with salt. This water was unsuitable for raising crops.



After the Chikugo Barrage was built

Adjusting the gates maintains the water level upstream at a higher level than that downstream. Water pressure prevents seawater from entering.



The structure of the Chikugo Barrage

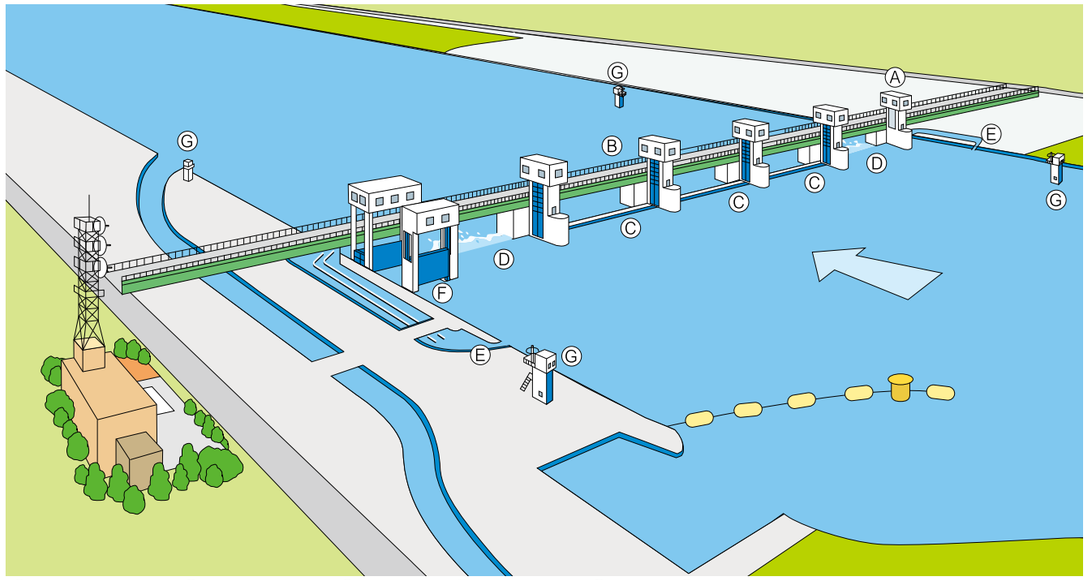
The Chikugo Barrage reservoir extends upstream as far as the Komorino bed sill and downstream as far as the Shimono Barrage on the Homan River. The reservoir has a total volume of roughly 5.5 million m³. The total length of the Chikugo Barrage is about 500 meters, and it has five main gates, a lock enabling ship passage, and two fishways.

■Size of the Chikugo Barrage

Location	Left Bank Right Bank	Oaza Takeshima, Yasutake-town, Kurume, Fukuoka Prefecture Oaza Eguchi, Miyaki-town, Miyaki county, Saga Prefecture		
Capacity and Levels	Catchment Area Reservoir Area Total Capacity	2,315km² 1.36km² 5,500,000m³	Effective Capacity Planned High Water Level Normal Full Water Level	930,000m³ TP+9.56m TP+3.15m
Types and Sizes	Type Total Length	Movable barrage 501.6m	Moveable Length Fixed Length	261.6m 240.0m
Barrage Structure	Gate Type Net Span Number of Gates Weight	Steel Roller Gate 46.0m 5 Gates: 3 contorol gates and 2 regulating gates Regulating Gate: 270 tons Control Gate: 440 tons	Lock Fishways	25m long x 10m wide One Upstream Gate One Downstream Gate 69m long x 6.5m wide Roughly 5% slope Two
River Improvements	Low Water Bank Protection Dredge	Combined length of both banks: roughly 14 kilometers. The riverbed was dredged to a predetermined depth and the old dam removed	High Water Revetment	One set

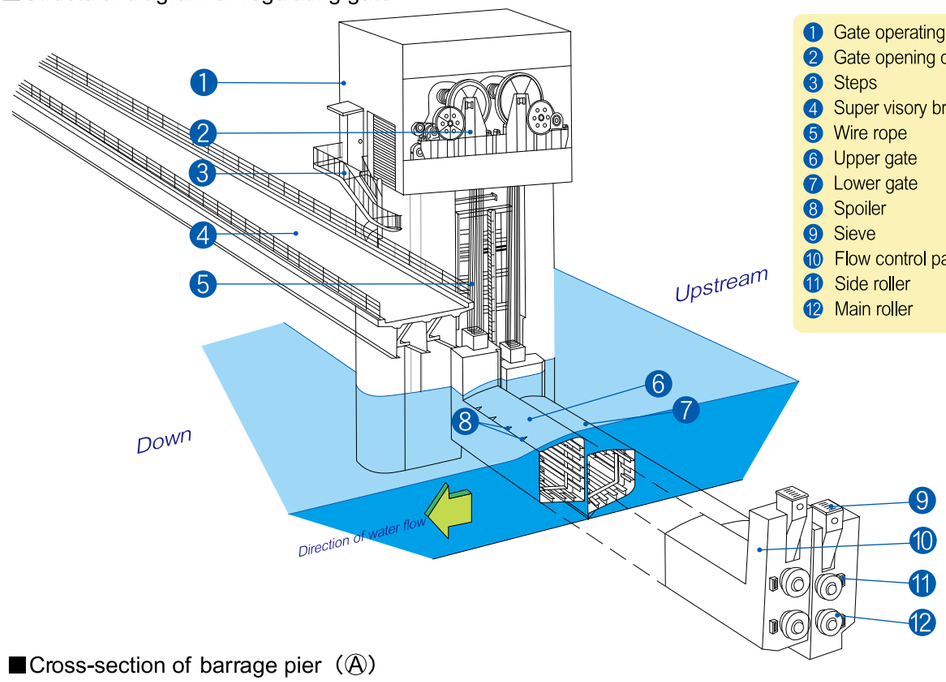
Gates

The Chikugo Barrage has three main gates for regulating the impounded water, two gates at both sides of the main gates to control the water, attraction-flow-type fishways on both banks, and a lock on the left bank to permit ship passage.

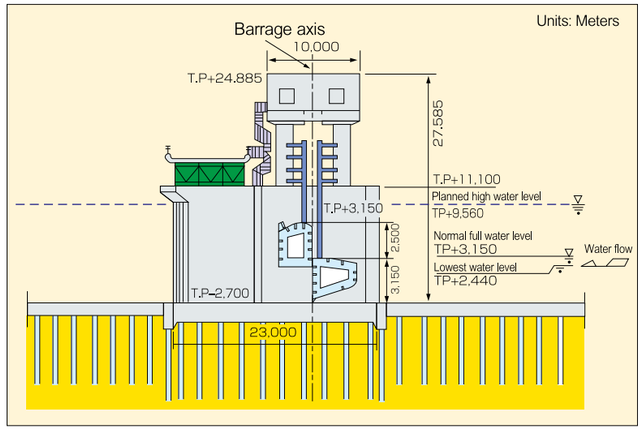


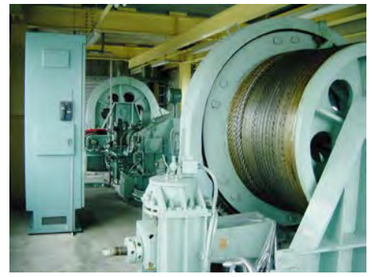
Ⓐ Gate operating room Ⓑ Supervisory bridge Ⓒ Control gate Ⓓ Regulating gate Ⓔ Fishway Ⓕ Lock for boats Ⓖ Water level and quality monitoring station

■Structural diagram of regulating gate



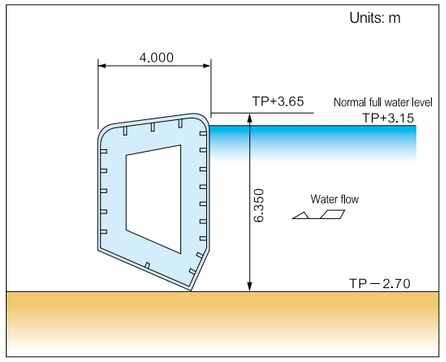
■Cross-section of barrage pier (Ⓐ)





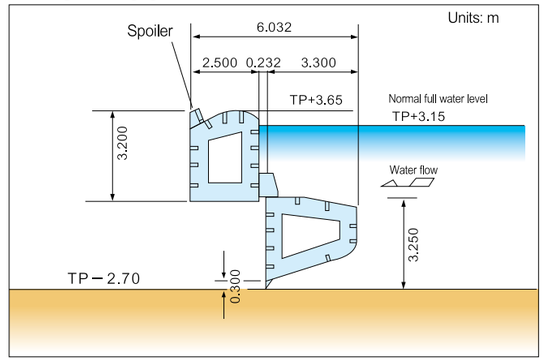
The machine winding up the gates is equipped with a gate-opening device that uses a wire rope winch. The gate moves at a speed of 0.3m per minute. This device is also used to open and close the lock. The lock gate is moved at a speed of 2.0m per minute to shorten the ship's passage through the barrage.

■Control gate (Ⓒ)



The water control gate permits the passage of the underflow during normal conditions.

■Regulating gate (Ⓓ)



At ordinary times overflow gate operations are carried out. Underflow operations are carried out during transition time to flood.

Operating the Chikugo Barrage 1

Mechanisms that play an important role

Operations during normal conditions and during floods

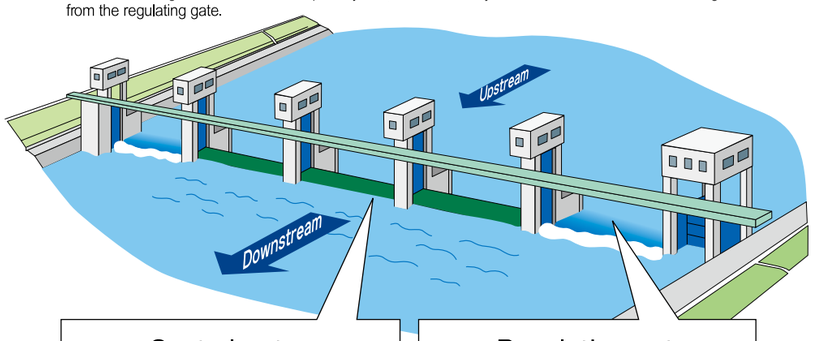
50m³/s → During normal conditions

300m³/s → During normal conditions

1000m³/s → During floods

◇Water flow less than 300 m³/s

The gate is opened and closed in response to water flow to maintain a fixed water level upstream. The underflow from the control gate is considered the primary flow, while minor adjustments to the flow are made using the overflow from the regulating gate.

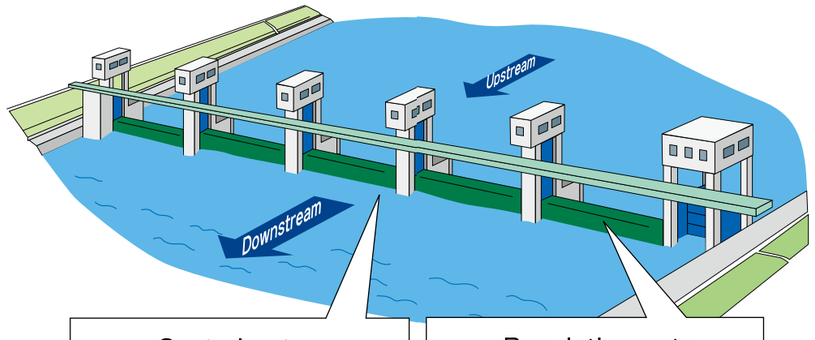


Control gate

Regulating gate

◇Water flow from 300 to 1,000 m³/s

All gates allow the underflow, while the regulating gate is converted from overflow to underflow.

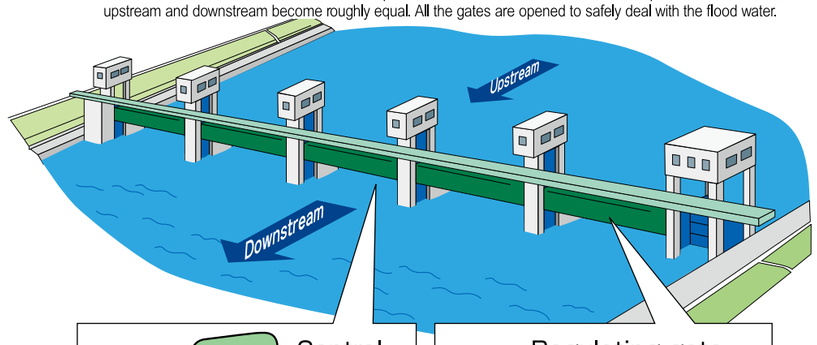


Control gate

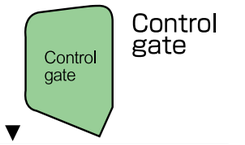
Regulating gate

◇Water flow greater than 1,000 m³/s and roughly equal water levels upstream and downstream

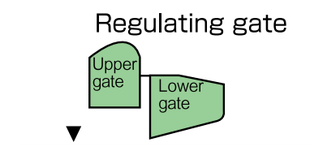
When the inflow exceeds 1,000 cubic meters per second and the water volume further expands, the water levels upstream and downstream become roughly equal. All the gates are opened to safely deal with the flood water.



Control gate

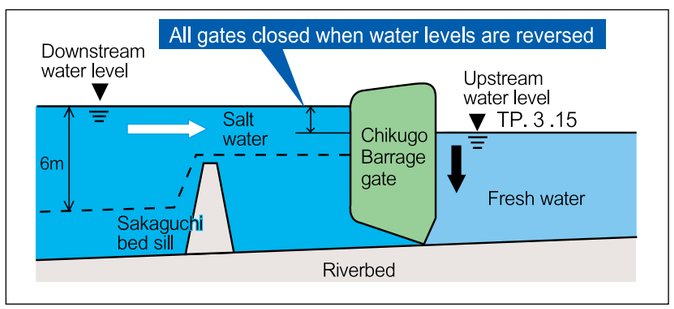


Regulating gate



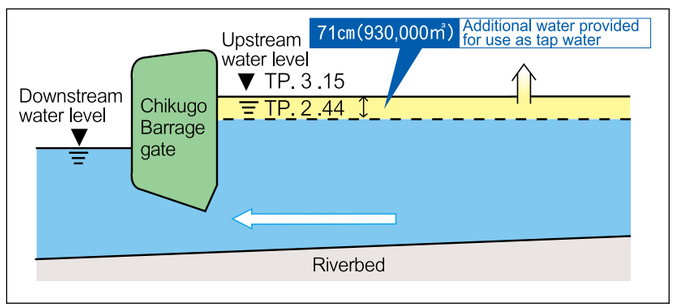
Operation during flood tide

When the water level downstream is higher than the water level upstream during high tide in a spring tide period, all the gates are closed to prevent backflow. This also prevents salt water from going upstream.



Operation during water shortages

Operations are conducted during water shortages to lower the water level in the reservoir corresponding to the amount of supplementary water provided for domestic water use. The water level is returned to its original state to improve water flow and to impound water.

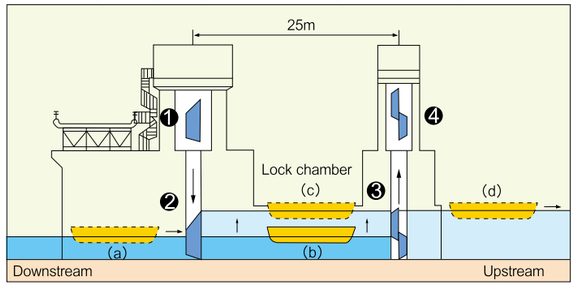


Operating the Chikugo Barrage 2

Lock operation

The lock on the left bank can allow the passage of ships at any time from 7:00 a.m. to 6:00 p.m. every day, regardless of the tide level. About 20 minutes are required for a ship to pass through the lock.

■Lock opening sequence for ships headed upstream



A ship headed upstream

❶ The downstream gate opens
❷ The ship enters the lock and the downstream gate closes
❸ The upstream gate opens slightly, and water is filled into the lock chamber until it reaches the upstream level
❹ The upstream gate opens, the ship heads upstream, passing through the lock

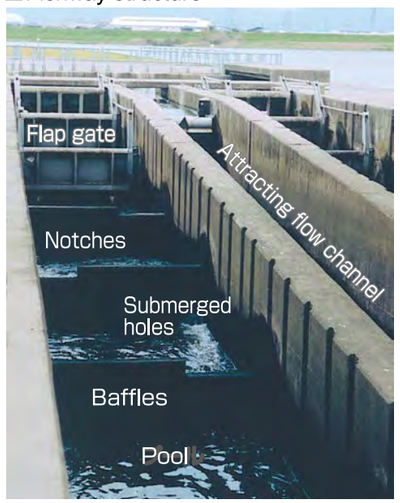
Fishway operation

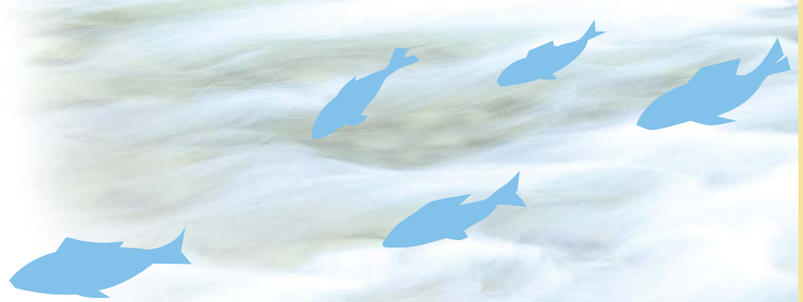
The attracting-flow-type fishways are provided at both sides of the barrage so fish, eels, and crabs swimming upstream in the Chikugo River are not harmed by the operation of the barrage. Different features have been designed for the fishways, including the provision of a priming water sluiceway and a flap gate that raises and lowers in response to changes in the upstream water level.

Attracting-flow-type fishway at high tide

Attracting-flow-type fishway at low tide

■Fishway structure





Human wisdom for protecting nature

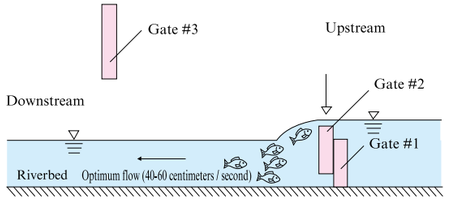
Operating the locks and fishways

The lock for ships also has a function which allows fish to pass. It is used as a fishway when no ships are passing through.

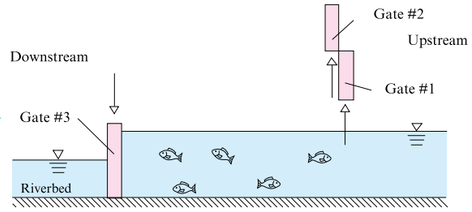
■Lowering the upstream gate
The upstream lock gate, where ish have gathered.

Operating sequence of the lock-system fishway gate

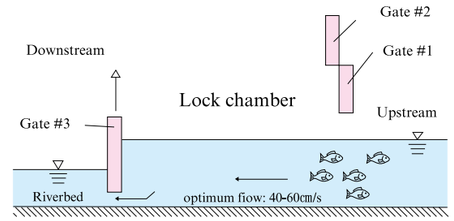
❶ Gate #2 is lowered to allow water to flow over the gate.
(Fish tend to school where water is falling.)



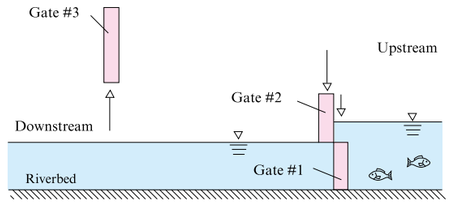
❷ After Gate #3 is lowered, Gates #1 and #2 are raised.



❸ Gate #3 is raised to maintain the optimum flow in the lock chamber.



❹ After Gates #1 and #2 are lowered, Gate #3 is raised. Conditions return to those of Step 1.



One cycle takes two hours and 30 minutes

Efforts for the environment 1

Environmental monitoring has been conducted since 1978, particularly of the water quality, riverbed quality, and marine creatures, to assess the impact of the Chikugo Barrage's construction and operation on the environment of the river, its tributaries and the Ariake Sea.

Environmental monitoring

The Chikugo Barrage Environmental Assessment Liaison Council

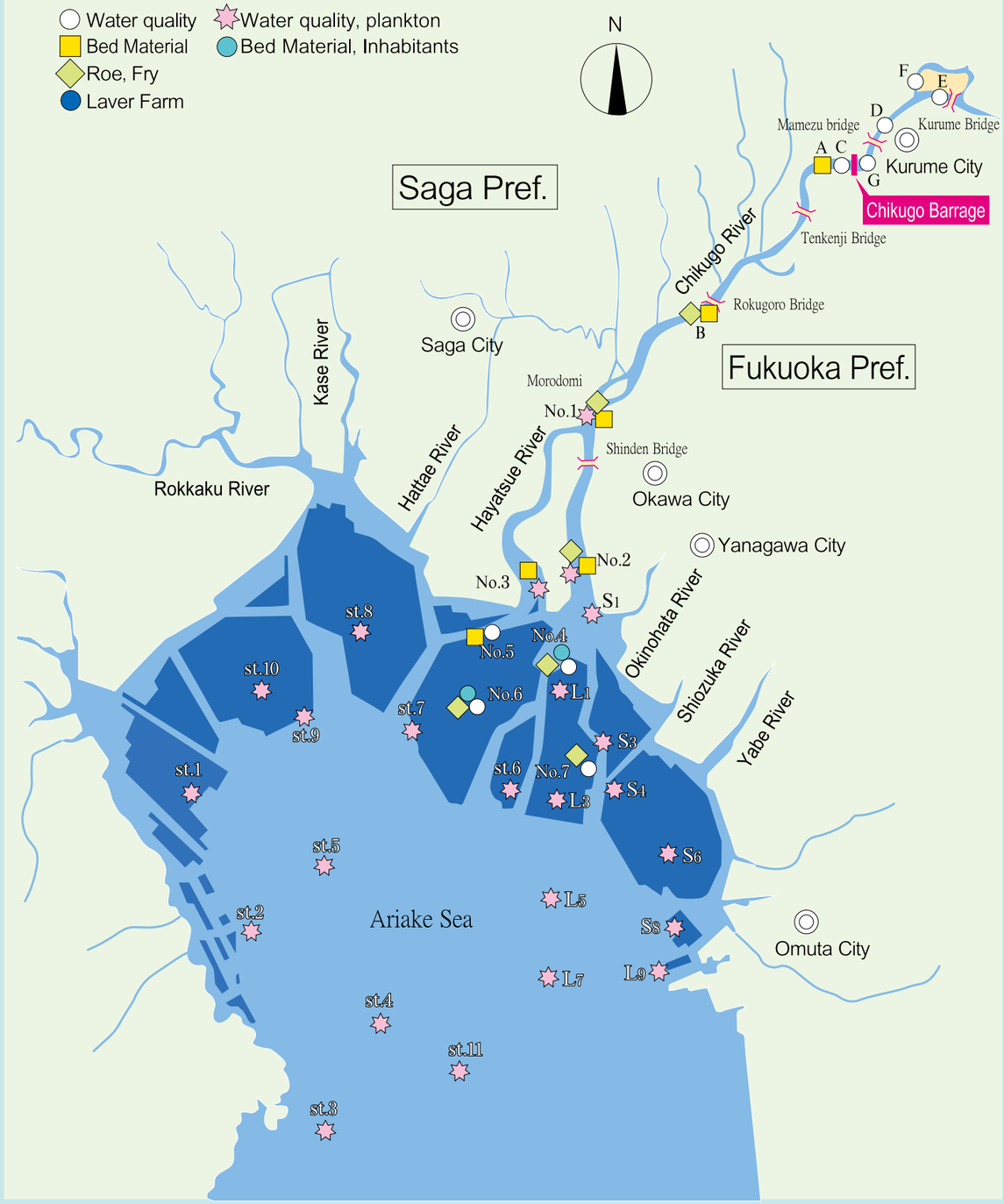
The Chikugo Barrage Environmental monitaring Liaison Council was formed in 1977 before the barrage was built to monitor the impact the construction of the Chikugo Barrage would have on the environment of the river, its tributaries, and the sea. The council comprised of members from the Ministry of Land, Infrastructure and Transport, the Ministry of Agriculture, Forestry and Fisheries, the Fukuoka and Saga Prefecture governments, and the Japan Water Agency, as well as expert members that included representatives of academia. Council membership was expanded in 1996 to include representatives of the fishing industry. Environmental surveys have been conducted since the council was formed, and the data obtained from these surveys are discussed once a year at a council meeting. It is also released to the public in a pamphlet called Environmental Monitoring.

Laver from the Ariake Sea

Environmental surveys related to Chikugo Barrage

Category assessed		Location	Assessment point	Frequency	Assessments
Water quality		Near barrage	5	Monthly	Water temperatuer, pH-DO, COD, Turbidity, salt, nutrition salt (nitrogen, phosphor)
		Downstream from barrage	3	Monthly	
		Sea area	24	Monthly	
Bed Material		Downstream from barrage	2	Annually	Ignition loss, grain composition
		Downstream area to Sea area	7	Biannually	COD, nutrition salt (nitrogen, phosphor), Ignition loss, grain composition
Water creatures	Riverbed creatures	Sea area	3	Biannually	Species and frequency of occurrence
	Roe,Fry	Downstream area to Sea area	6	Monthly	Species and frequency of occurrence
	Plankton	Downstream area	3	Bimonthly	Chlorophyll, plankton, deposit
		Sea area	21	Monthly	Plankton, deposit
	Young ayu downstream	Kurume Bidge	1 site	Weekly when swimming downstream	Number of fish
Fishways		Chikugo Barrage fishways	4 sites	Weekly when swimming upstream	Kind and number of fish
		Chikugo Barrage lock gate	1 site	As required	Kind and number of fish
Data assessment	Weather and Maritime conditions	Saga and Fukuoka Prefectures	River basin and sea areas		Air temperature, rainfall, hours of sunshine, water temperature, specific gravity of seawater
	Flow	Chikugo River and tributaries	5 sites		Daily flow
	Laver cultivation	Saga and Fukuoka Pref.	Fishing zones		Production volume and output
	Seafood products	Saga and Fukuoka Pref.	Sea areas		Fish catch by type

Environmental Survey Sites related to Chikugo Barrage



Locations A to G were surveyed by Japan Water Agency; S to L, Fukuoka Pref.: and st, Saga Pref.

Efforts for the environment 2

Annual on-site surveys of the fish that swim up the river from the sea are conducted to determine the effectiveness of the fishways at the Chikugo Barrage.

Movement of fish upstream and downstream

The Chikugo Barrage is provided with attracting-flow-type and lock-system fishways to enable the fish downstream of the barrage to move upstream. Visual surveys are conducted every year to count the numberof ayu swimming upstream in the attracting-flow-type fishways. Also, young crabs are caught for surveys. Several measures are adopted to facilitate the movement up the fishways. These include installing nylon cord to keep wild birds away and rope up which the crabs can crawl. A total of 52 varieties of sea creatures have been identified in surveys moving upstream in the Chikugo Barrage, including benthic fish and shellfish.

Visual survey of the number of young ayu on the fishways

■Young ayu swimming up the fishways

Young ayu raised in the Ariake Sea begin to swim up the Chikugo River in March. This movement reaches its peak at the Chikugo Barrage in April. More than 50,000 young ayu have been observed in one day in the fishways at that time. The ayu begin to move up the fishways at dawn, and their numbers tend to increase during high tide when the waters rise downstream from the barrage.

■Young crabs crawling up the fishways

These young crabs begin to appear at the fishways in December, and their number reaches a peak in January and February. Unlike the ayu, they move upstream primarily at night. They are seen most frequently from sunset to around midnight. As many as 1,500 young crabs have been observed crawling up the fishways in one night.

Primary fish inhabiting the Chikugo Barrage area

Ayu (15-30 centimeters, Osmeridae family)
Called the queen of freshwater fish, their life span is just one year.

Etsu (20-40 centimeters, Engraulidae family)
This is a rare species in Japan native to the downstream area of the Chikugo River. They swim upstream to spawn from June to August.

Yamanokami (10-16 centimeters, Cottidae family)
In Japan, these sculpins inhabit the mid-stream and downstream areas of the Chikugo, Kase, Suminoe, Rokkaku, and Hama Rivers, which empty into the Ariake Sea. They spawn from January to March in the estuaries or tidal areas of the sea.

Oikawa (8-18 centimeters, Cyprinidae family)
This variety of carp is called yamabe in the Kanto region and hasu in the Kansai region. They prefer to live in rocky riverbeds.

Kurume sayori
(10-18 centimeters, Hemiramphidae family)
Sometimes known as the halfbeak, these fish have elongated bodies and swim in schools close to the surface.

Tairiku shima dojo
(6-13 centimeters, Cobitidae family)
This loach has six barbels around the mouth. They feed on moss, scooping it up with the sand from the bottoms of rapids.

Nigoi (10-50 centimeters, Cyprinidae family)
This carp variety is dark gray as an adult, but has brown speckles on the sides when young. They are common in rivers, ponds, and lakes throughout Japan, except for Hokkaido.

Kamatsuka
(10-20 centimeters, Cyprinidae family)
These carp live on sandy river bottoms and feed on aquatic insects and worms.

Catfish (10-60 centimeters, Ictaluridae family)
These fish, known as namazu in Japanese, have four whisker-like barbels extending from the jaw. They inhabit the sandy bottoms of calm areas. They hide behind rocks in the daylight and attack frogs or young fish at night.

Ariake hime shirauo
(5-6 centimeters)
This fish, found only in Japan, inhabits only the tidal areas of the Chikugo River and the Midori River.
The eggs are laid on the rough sand of the riverbed in spring. Their life span is just one year.

Ginbuna (10-30 centimeters, Cyprinidae family)
These carp are known for the fewer numbers of males compared to females.

Mokuzu crab
(6 centimeter shell span, Rock crab family)
These crabs have soft furry tufts on their claws. They swim downstream in the fall to lay their eggs in the sea. In early spring, the young crabs (1-2.5 centimeters) swim upstream past the barrage.

Gengorobuna
(25-40 centimeters, Cyprinidae family)
These fish are natural inhabitants of Lake Biwa. The Chikugo River was stocked with these fish after World War II for breeding.

Efforts for the environment 3

The amount of refuse from our daily lives is sharply increasing, contributing to environmental damage. Refuse collection facilities have been built enabling the refuse to be efficiently removed.

Refuse impairs barrage functions

When the river water rises, large amounts of refuse flow to the Chikugo Barrage and get stuck there.
This refuse interferes with barrage operations in several ways.

Interfering with gate operations

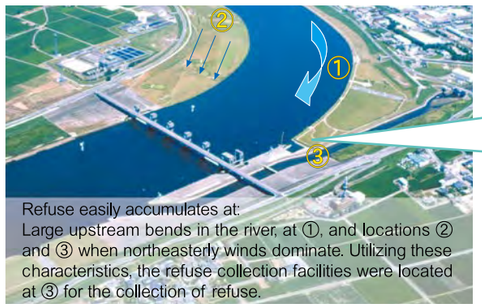
Refuse collected at the gates

The refuse clogging the locks interferes with the passage of ships and the movement of fish

Interference with downstream fishing (gill nets, laver cultivation)

Building refuse collection facilities

Refuse collection facilities were completed at the Chikugo Barrage in June 2002 to facilitate the removal of refuse. These facilities supplement preliminary operations and remove rubbish which may interfere with the gate operation and fishway function, and to improve the environment in the downstream area of the Chikugo River and the Ariake Sea. The facilities are submerged when the gates are fully open during floods, at times preventing their function.



Refuse collection facility mechanisms

Refuse collection at the refuse collection facility

The work flow for removing rubbish from the Chikugo Barrage

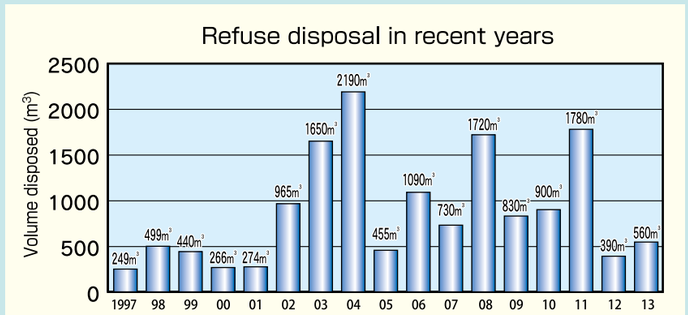
① Refuse collection by ship

② Unloading refuse with back-hoe

③ Drying refuse

④ Separating into non-burnable and burnable refuse

⑤ Transport to disposal site



Beautiful rivers
protect our way of life.
Let's stop littering.

Cooperating on refuse measures throughout the river area

Chikugo River cleanup (Anti-littering campaign)

The Chikugo River Cleanup is an anti-littering campaign begun in 1986. The fourth Sunday of every month is a no-littering day, to prevent trash from being thrown in the river. Residents of municipalities in the Chikugo and Yabe River areas and humane associations cooperate to clean up the river.

The Ariake Sea Cleanup Strategy

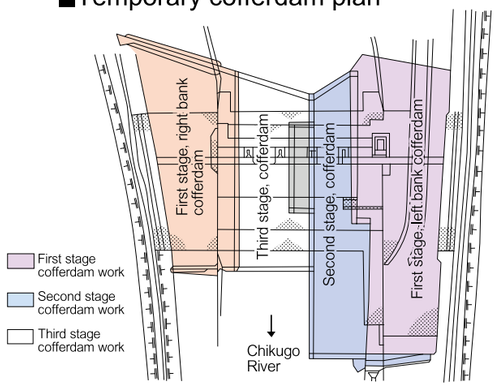
The Ariake Sea Cleanup Strategy was launched in 1989. This is an activity to clean up the shore of the Ariake Sea through the united efforts of Fukuoka, Saga, Nagasaki and Kumamoto Prefectures, the four prefectures fronting the sea. Many people, primarily those in the fishing industry, participate every year in an effort to return the Ariake Sea to its beautiful state before it was soiled by factories and households indiscriminately dumping refuse and releasing waste water.

Changes in the Chikugo Barrage

Construction

Construction began in January 1977 and was completed in March 1985. The barrage was built across the river, so construction work was done in three stages to avoid possible high water discharge.

■Temporary cofferdam plan



First stage construction work
(December 1980 to September 1981)

Work was started simultaneously on both banks. A minimum construction area was established on the right bank, with the cofferdam removed by May.

Second stage construction work
(October 1981 to May 1982)

The remainder of the first stage construction work was completed. Two barrage columns were set in the left bank, two abutment sections were mounted on both banks, and two gates were installed.

Third stage construction work
(October 1982 to May 1983)

Two barrage columns were set in the right bank, three gates were installed, and five spans were mounted to complete the supervisory bridge. In addition, equipment and facilities were installed on both banks and the stream channels were dredged. The main structures were completed.

Operation

Operation began in April 1985 and has been conducted very conscientiously. There was a record water shortages in northern Kyushu in 1994. There was also a large typhoon in September 1991 that felled many trees in the mountainous areas upstream. Wood from these trees was washed into the river and caused many problems.

The water shortages in 1994 (Terauchi Dam)

Amagase-machi, Oita Prefecture

Yamaguni River basin

Damage from the felled trees in the 1991 typhoon

Construction timeline for the Chikugo Barrage

Jul. 26, 1974:	A Cabinet decision to partially modify the basic plan for water resource development of the Chikugo River system resulted in additions to the Chikugo Barrage construction project.
Aug. 1, 1974:	The Chikugo Barrage Survey Office was established.
Nov. 24, 1976:	The Second Chikugo River System Water Resources Development Scheme was adopted by the Council for North Kyushu Water Resources Development.
Jan. 28, 1977:	Policies for the Chikugo Barrage construction project were issued by the Construction Minister.
Feb. 16, 1977:	The Chikugo Barrage Construction Office was established.
Nov. 28, 1977:	The construction plan for the Chikugo Barrage was authorized.
Mar. 31, 1978:	Barrage construction work was let to contractors.
Sep. 2, 1978:	A provisional injunction to suspend construction was issued.
Sep. 12, 1978:	A lawsuit was brought to stop construction.
Apr. 18, 1979:	Barrage construction began, but was halted the following day.
Dec. 25, 1980:	Barrage construction began again.
Sep. 30, 1983:	The Construction Minister announced that the barrage passed a test for partial use.
Jan. 9, 1984:	Temporary operation of the barrage began concurrent with the removal of the Kamizuru bed sill.
Oct. 31, 1984:	A ceremony was held to mark the completion of construction work.
Mar. 9, 1985:	The Construction Minister announced a revision of policies for the Chikugo Barrage Construction Project.
Mar. 20, 1985:	The Construction Minister authorized the revision of policies for the Chikugo Barrage Construction Project.
Mar. 29, 1985:	The Construction Minister issued the basic policies for operation and maintenance of the Chikugo Barrage.
Mar. 30, 1985:	The Construction Minister authorized the basic policies for operation and maintenance of the Chikugo Barrage.

Operation timeline for the Chikugo Barrage

Apr. 1, 1985:	The Chikugo Barrage Operation and Maintenance Office was established.
Feb. 5, 1990:	The revision of the policies for operation and maintenance of the Chikugo Barrage were authorized.
Aug. 6, 1990:	A partial revision of the policies for operation and maintenance of the Chikugo Barrage was authorized.
Oct. 1, 2003:	Incorporated administrative agency, Japan Water Agency was established.
Apr. 1, 2011:	Some organizations about The Chikugo Barrage ware integrated with The Chikugo Barrage Operation and Maintenance Office.
Mar. 22, 2013:	A partial revision of the policies for operation and maintenance of the Chikugo Barrage was authorized.

Panorama Map

Keisen Stn
Fukuoka Airport
Dazaifu Shrine
Hakata Stn
Fukuoka Tower
Fukuoka
Meinohama Stn
Fukuoka Dome
Dazaifu I.C
Futsuka-ichi Stn
Yamakasa Festival
Haruda Stn
Koishiwaragawa Dam
(under investigation)
Koishiwara Ware Shop
Castle Town in Akizuki
Egawa Dam
Terauchi Dam
Koishiwara River
Amagi
Persimmons
Saba River
Kiyama Stn
Chikugo-ogori I.C
Amagi I.C
Yamada Barrage
Oishi Barrage
Asakura I.C
Tosu I.C
Tosu JCT
Kitano Cosmos Highway
Tosu Stadium
Tosu Stn
Asakura Three-Water Wheel
Yoake Dam
Homan River
Eri Barrage
Chikugo-yoshii Stn
Cormorant Fising
Gousho Dam
Higashi-sefuri I.C
Yoshino-gari Remains
Kurume I.C
Kurume JR Stn
Kurume Stn
Grape
Azaleas
Chikugo Barrage
Yamato I.C
Balloons
Saga Stn
Kubota Stn
Chikugo River
Etsu Fish
Hainuzuka Stn
Yame I.C
Yame Brand Tea
Hayatsue River
Saga Airport
Setaka Stn
Rapid River Shooting
Ariake Brand Laver
Ariake Sea
Pear
Star Gazing Place
Taio Gold Mine
Kumamoto Pref.
to Aso
Hita Ceders
Hita I.C
Hita Stn
Yoake Stn
Amagase Spa
Amagase-takazuka I.C
Oita Pref.
Usa Shrine
Yabakei
Kusu River
Kusu I.C
Bungomori Stn
Era Stn
Kuju I.C
Akaishi River
Plum Blossoms
Oyama Dam
Matsubara Dam
Tsuitate Spa
Shimouke Dam
Tsue River
Yamanami Hwy

The Chikugo River area is rich in poetic sentiment


■Water transmission embankment near river mouth


■Eri Barrage


■Yamada Barrage


■Oishi Barrage


■The bank of the Chikugo River in Spring


■The triple waterwheel at Asakura