

Key Issues: 14- Development of Regional Industries

1-Biological Diversity
7-Resttlement

Climatic Zone:

Cf : Temperate Humid Climate

Subjects:

- Development of Sightseeing and Other Facilities to Vitalize the Area Around the Dam

Effects:

- Nature preservation
- Stimulation of local industries through development of sightseeing spots

Project Name: Miyagase Dam

Country : Kanagawa Prefecture, Japan(Asia)

Implementing Party & Period

- **Project:** the Ministry of Land, Infrastructure and Transport
1987.11 through 2001.4

- **Good Practice:** the Ministry of Land, Infrastructure and Transport
2001.4 -

Keywords:

Environmental protection, biotope, stimulation of local development, vitalization of the water source area, tourism development

Abstract :

Activities, including the development of biotopes, were conducted to restore the natural environment in the area impacted by the dam development project. In addition, activities to develop sightseeing facilities such as an information center were conducted after completion of the dam to stimulate local development. The number of tourists visiting Kiyokawa Village, where the dam had been constructed, and the total tourist spending increased more than five times compared to the figures before the implementation of the project. (See Fig. 4)



1. Outline of the Project

The Miyagase Dam is a concrete gravity dam with a height of 156 m, a volume of approximately 2 million m³ and a gross storage capacity of approximately 200 million m³. It was constructed on the Nakatsu River, which is a tributary of the Sagami River, a first-class river originating in the Tanzawa Mountain Range located in the western part of Kanagawa Prefecture, to serve the multiple purposes of flood control, river environment improvement, city water supply and power generation.

The plan of the Miyagase Dam Development Project was completed and announced in 1969 to meet the needs for for the consistently planned development of the Sagami River. The project addresses both the flood control- and water utilization-related river development needs that arose as a result of the rapid urbanization of areas in and around the Sagami River basin due to the rapid development of Kanagawa Prefecture during the postwar high economic growth period (between the early and mid 1960s). The construction of the dam body and aggregate material production started in November 1987. The excavation for the dam body construction was completed in the first half of 1991 and the cast of concrete for the dam body started in October 1991, with the dam completed in November 1994. The test filling of the reservoir started in October 1995 and was completed in October 1998. The dam

system was brought into operation in April 1999 with the exception of the Doshi Conduit, which was completed in March 2001; the complete dam system was brought into operation in April 2001. Figure 1 shows the location of the dam.

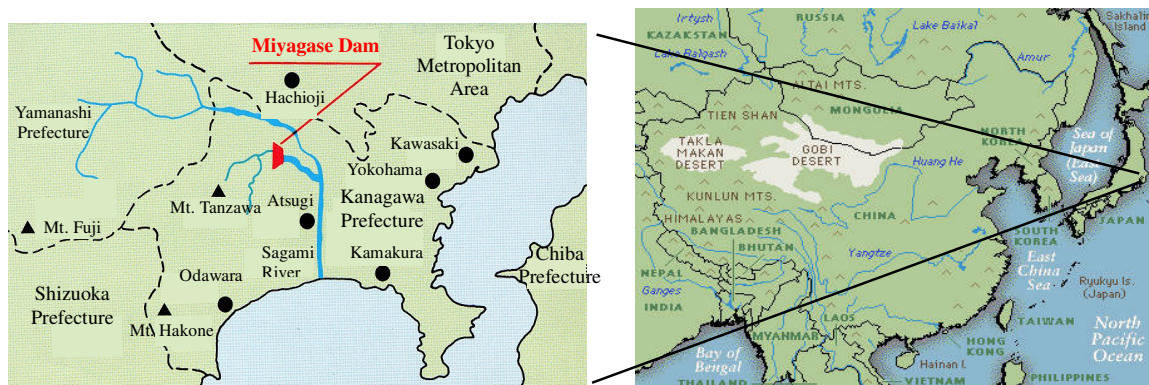


Fig. 1 Location of the Miyagase Dam

The specifications of the Miyagase Dam are as shown below. The specifications of the conduits, the storage capacity of the reservoir and the conduit routes are shown in Table 1, Fig. 2 and Fig. 3, respectively.

Location:	left bank	Aoyama-jisaki, Tsukui-machi, Tsukui-gun, Kanagawa Prefecture
	right bank	Hanbara-jisaki, Aikawa-machi, Aiko-gun, Kanagawa Prefecture
		Miyagase-jisaki, Kiyokawa-mura, Aiko-gun, Kanagawa Prefecture
		Hanbara-jisaki, Aikawa-machi, Aiko-gun, Kanagawa Prefecture
Type		Gravity-type concrete
Dam height		156 m
Crest length		Approx. 400 m
Dam volume		Approx. 2,000,000 m ³
Catchment area		213.9 km ² (of which the water channeling area is 112.5 km ²)
Water surface area		4.6 km ²

● Specifications of the Conduits

Table 1 Specifications of the Conduits

	Doshi Conduit	Tsukui Conduit
	Inlet: Aone-jisaki, Tsukui-machi, Tsukui-gun, Kanagawa Prefecture	Inlet: Hanbara-jisaki, Aikawa-machi, Aiko-gun, Kanagawa Prefecture
	Outlet: Toriya-jisaki, Tsukui-machi, Tsukui-gun, Kanagawa Prefecture	Outlet: Aoyama-jisaki, Tsukui-machi, Tsukui-gun, Kanagawa Prefecture
Total length	Concrete segment	Concrete lining
Flow rate	20 m ³ /s (max.)	40 m ³ /s (max.)
Standard cross section		

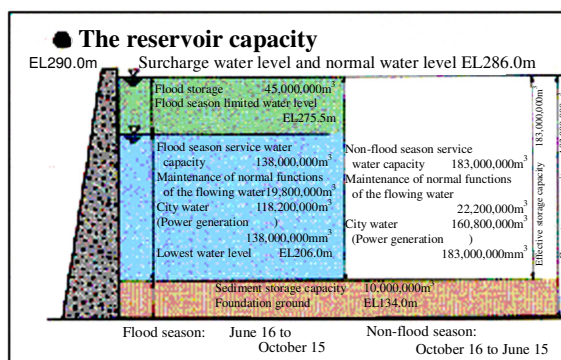


Fig. 2 Reservoir Capacity

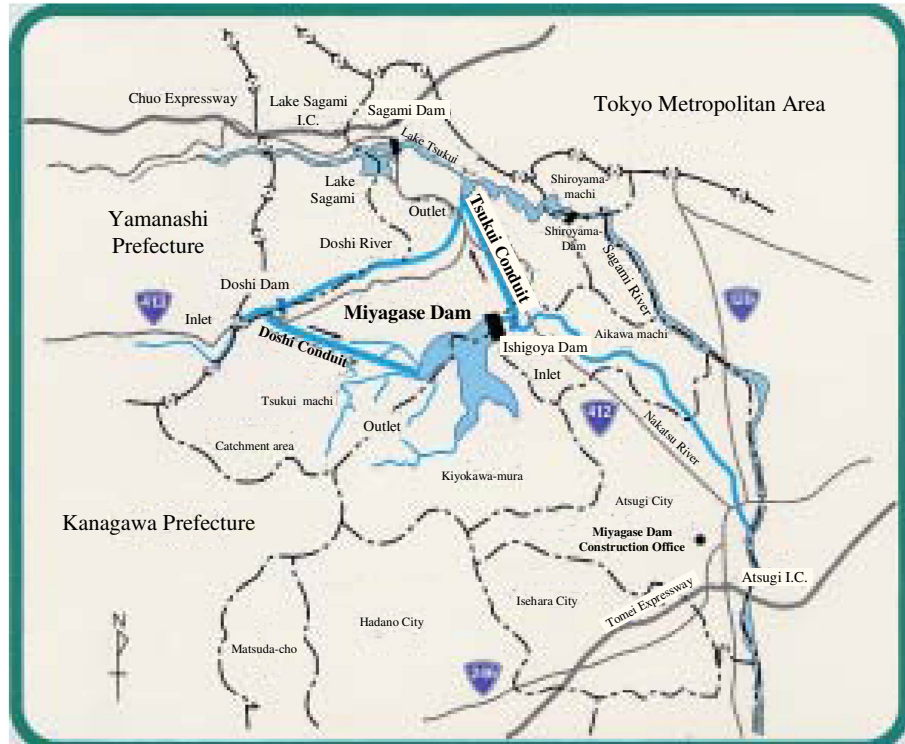


Fig. 3 Conduit Routes

2. Features of the Project Area

2.1 Sagami River

The Sagami River originates in Mt. Fuji and runs eastward across the eastern part of Yamanashi Prefecture meeting various tributaries including the Sasago River, Kuzuno River and Tsuru River along the way, into Kanagawa Prefecture where it flows into and out of Lake Sagami. The Sagami River then runs southward to discharge into Sagami Bay meeting the Doshi River, Nakatsu River and Koayu River (all of which are right-bank tributaries) along the way.

The Sagami River has an abundant natural flow and, as its former name, “Ayu (sweetfish) River,” suggests, had been utilized for many years as a rich commercial sweetfish fishing ground and an important water transport channel. The Sagami River presently plays an important role in supporting the well-being of the citizens of Kanagawa Prefecture and sustaining the economic growth of the prefecture by serving as an important source of city and industrial water for many parts of the prefecture including the Keihin Industrial Zone, as well as an important source of agricultural water in the vast Sagami Plain. The river, whose basin has a total population of approximately 1.28 million as of 1995, is very important from the standpoint of both flood control and water utilization.

The Nakatsu River, on which the Miyagase Dam is located, originates in Mt. Ohyama, Mt. Tohgadake and Mt. Tanzawasan in the Tanzawa Mountain Range and first runs northward up to Ochiai-jisaki of Kiyokawa Village, Aiko-gun where it meets the Hayato River (which is a left-bank tributary that originates in Mt. Hirugadake) and changes its direction to eastward. The Nakatsu River then changes its direction to southeastward and runs up to the Saido Bridge in Atsugi City where it reaches a plain for the first time. The Nakatsu River then runs southward up to the upstream side of the Sagami Bridge in Atsugi City where it joins the Sagami River as a right-bank tributary.

2.2 Natural Environments of the Area Surrounding the Dam

The Miyagase Dam is located approximately 50 km from central Tokyo and approximately 40 km from downtown Yokohama and Kawasaki, in the eastern edge of the Tanzawa Mountain Range, which is abundant with green forests of Japanese beech, zelkova and fir. The water source area still has

pristine vegetation including the natural forests in Mt. Kyogatake and Mt. Bukkasan. The area also has unaltered rich natural environments that provide habitats for wild mammals such as Japanese monkeys, Japanese deer and wild boars. It has also been confirmed that very rare insect species such as Gifu swallowtail butterflies, Ohmurasaki butterflies and Genji fireflies inhabit the area. In addition, the water source area has two natural parks, namely, the Tanzawa Ohyama Quasi-National Park and the Prefectural Tanzawa Ohyama Natural Park.

2.3 Water Source Area

The water source area comprises Kiyokawa Village, Aikawa Town and Tsukui Town (which altogether have a total area of approximately 228 ha and a total population of approximately 77,000) and is located in the northwestern part of Kanagawa Prefecture. Although a large portion of the population is engaged in tertiary industry, the difference between the proportion of people engaged in tertiary industry and that of people engaged in secondary industry is not so large because of the relatively high proportion in each of the 3 municipalities of people with manufacturing and manufacturing-related jobs.

The total industrial shipment amount in the 3 municipalities in 1995 was approximately 672 billion yen, which had been roughly the same level as the figures for the past 5 years. The total gross agricultural production in the 3 municipalities in 1995 was approximately 5 billion yen, which had been roughly the same level as the figures for the past 5 years as well. Of this total gross agricultural production, the share of livestock farming was the largest, followed by vegetable growing. The high proportion of vegetable growing is attributable to the proximity to metropolitan areas. The gross raw forest product production in the 3 municipalities in 1995 was approximately 9,000 m³. Although the gross raw forest product production had been increasing slightly, the total needle leaf cedar timber production was high and there had not been any major changes made in the structure of forestry and forestry-related industries.

The local industries of the water source area are mostly those relating to the cultivation of agricultural produce and the production and/or processing of products, but in recent years, orchard-related industries have also been emerging.

3. Benefits

3.1 Protection of Natural Environments

In the Miyagase Dam Development Project, various efforts were made to minimize environmental impacts so that the surrounding rich natural environments of Tanzawa would be preserved to the maximum extent possible.

For example, the construction roads for heavy dump trucks were built on the former riverbed and the Glory-hole Mining Method¹ was used for the aggregate production in the quarries to minimize the impacts on the surrounding environments.

In addition, efforts were made to restore impacted natural environments wherever possible, including those to restore natural vegetation using native tree species and those to restore biota-rich natural environments by constructing biotopes.

Biotope is a concept for “an artificially created habitat to restore/reproduce a habitat for plant and/or animal species impacted by a development activity” that was originally developed in Germany. In the Miyagase Dam Development Project, brooks, bogs, hills and



Photo 1 Higashizawa Biotope

¹ Glory-hole Mining Method: A method for extraction of aggregate. At first, a shaft is excavated in a quarry. Excavated aggregate is gathered using the shaft as a chute and stored at stock bins passing screens installed under the shaft. Stored aggregate can be loaded into trucks directly. Since the method does not need to carry aggregate to stock bins and to use big heavy equipment for excavation, it is more efficient than other methods especially in narrow and steep quarries such as limestone mountains in Japan.

scarps were created in the originally monotonous environments of the soil disposal areas to restore habitats for a diversity of wild plants and animals (Photo 1).

The area around the lake was divided into areas to be developed to promote local industries and areas whose natural environments are to be preserved to prevent disorderly development, and the latter areas were developed in such a way that they blend well into the newly created lake and the surrounding natural environments.

Because it had been intended that the dam area with the completed Miyagase Dam would provide, not only for the area surrounding the dam but also for the Tsukui-Aiko area as a whole, a new artificial environment that blends into the surrounding environment both in terms of functions and aesthetic effects, the dam was designed in such a way that it would stand in harmony with the surrounding landscape and newly developed tourism and other facilities without losing any of its original functions. The main points were (1) to make the design as simple as possible so that it would achieve harmony with the surrounding landscape and natural environments, (2) to achieve smoother connections at the inflection points of the downstream slope of the dam body and at the connections with the dam body training wall, (3) to space the vertical joints of the downstream slope at 30-m intervals and emphasize them and (4) to round the corner sections of the footing section, in order to present a non-formidable and softer atmosphere and eliminate the geometrical complexity that is present in ordinary dams, which have many small structures.

3.2 Stimulation of Local Development

To provide new houses for the people who were forced to abandon their houses as a result of the dam development, a new large-scale residential area with houses was provided near Atsugi City in conjunction with a commercial residential development and two residential areas with houses were provided around the reservoir, with a free choice given to the former residents in the project area between relocating to a residential zone and relocating to a commercial zone. The residential area in the commercial zone, which was named “Lake Town,” has already become a popular sightseeing spot that is full of life and activity and is growing as a major tourism base (Photo 2).



Photo 2 “Lake Town” Filled with Life and Activity

It is expected of the project, as a leading local development promotion project, to develop the area around the dam in such a way that newly constructed facilities will blend into the surrounding natural landscapes, which have abundant green vegetation, and provide comfortable and enjoyable environments for tourists and other people who come to visit the area (about 2.5 million people are reported to visit the area every year for sightseeing and other purposes).

Therefore, it is planned to focus development efforts on the area around the reservoir and achieve a development that uses water and green vegetation as core components and is of a much higher grade than traditional dam area development projects.

In addition, a Miyagase Dam Area Development Promotion Foundation (incorporated foundation) was established in 1992 with a total contribution of approximately 1.5 billion yen from interested prefectures and municipalities, local banks, private sector companies and other organizations, as a public-private joint enterprise to manage and operate the developed area and develop additional facilities as necessary. Furthermore, the local residents’ expectations for further



Photo 3 Largest Christmas Tree in Japan

development have been rising ever since the reservoir and roads around the reservoir were used for canoe races and bicycle races, respectively, in the 1998 National Athletic Meet hosted by Kanagawa Prefecture.

At the Miyagase Dam, various events to vitalize and promote the area are held on a regular basis in cooperation with local people and organizations. The most popular of these is the “largest Christmas tree in Japan” that is constructed using a native fir tree (Photo 3). This event has now become a famous winter attraction for visitors to the area and about 300,000 people come to the Miyagase area to see the tree every year during the 3-week Christmas tree period. Other events include (1) experience-type events such as canoeing, charcoal making, mountain life and cultural heritage discovery experience events, (2) adventure classes for children, (3) sports events such as marathon and bicycle races and (4) cultural and artistic events such as concerts. In total, more than 30 events are held each year and great numbers of people come to the area to participate in or enjoy these events.

3.3 A Dam that is Open to the Public

The Miyagase Dam was developed as a dam that is open to the public. Under this policy, specially designed information centers, lookout facilities, etc. were provided and made available to the public, and a guide staff team was set up as early as in the construction stage, to allow tourists and other visitors to see facilities of the dam as well as construction activities. As a result, the total number of people who came to see the dam facilities and construction activities during the construction period reached approximately 650,000.

The operating Miyagase Dam also attracts many people throughout the year. Visitors to the operating dam can visit the Water and Energy Information Center provided on the right bank of the dam site and the dam operation office, use the elevator in the dam body for tourists and other visitors that can accommodate as many as 46 people, walk through some of the inspection galleries and see the incline that utilizes the track for the incline counterweight that was used during the dam construction period.

In addition, discharging from the upper ordinary spillway for the benefit of tourists was started in August 2002 in cooperation with the Enterprise Activity Promotion Office of the Kanagawa Prefectural Government. Tourist discharges are currently being conducted every Wednesday and every second Sunday and are highly appreciated by tourists and other visitors to the dam. In fact, the number of people who come to the dam just to see the dam discharge for tourism has been increasing.

In addition, the Kanagawa Prefectural Government is currently developing a “Prefectural Aikawa Park” downstream of the dam and the partial opening of the park to the public in April 2002 has effectively increased the number of people who come to see the dam.

4. Effects of the Benefits

Contrary to the traditional theory that dam development leads to depopulation and/or a decline of the local economy, the Miyagase Dam area is being visited by approximately 1.2 million people each year. This is attributable to the active introduction and implementation, in coordination and cooperation with the interested local governments and municipalities as well as other interested parties, of various measures to stimulate local development in conjunction with the dam development project.

The number of people who come to visit Kiyokawa Village increased sharply after the commencement of the dam body construction (Fig. 4). This is attributable to the various events started during the construction stage to stimulate local development and the opening of the dam construction site to the public.

In addition, the number of visitors to the Water and Energy Information Center at the dam site reached one million in 2004 since it opened in 1999. This shows that the Miyagase Dam is, as intended, attracting many visitors to the area as a dam that is open to the public.

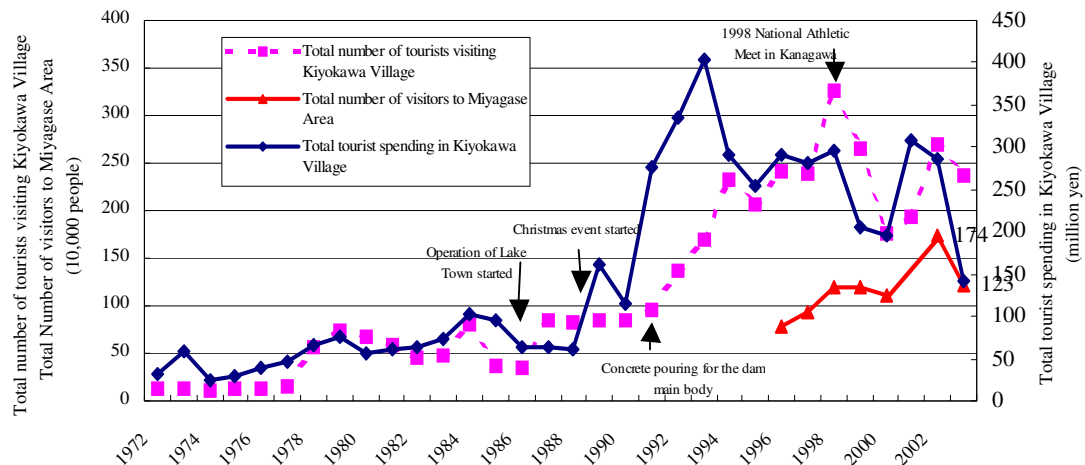


Fig. 4 Local Development Promotion Effects Achieved in the Miyagase Dam Water Source Area

5. Reasons for Success

The first reason for the success is the fact that the Miyagase Dam is located approximately 50 km from central Tokyo and approximately 40 km from downtown Yokohama and Kawasaki and is accessible from these areas within about 2 hours by car using the Tomei or Chuo Expressway. In addition, there are more than 10 cities with a population of 100,000 or more in the vicinity of the dam including Sagami City, Atsugi City and Hiratsuka City and the dam is accessible from these cities within about an hour by car. The fact that the dam area is rich with vegetation and wildlife despite its proximity to large cities is another factor that attracts many people.

The second reason is the fact that the construction of the dam was planned in such a way that impacts on the surrounding rich natural environments of Tanzawa would be minimized despite the vast size of the newly created reservoir, which is comparable to that of Lake Ashino in Hakone. In addition, the area around the lake was divided into areas to be developed to promote local industries and areas whose natural environments are to be preserved to prevent disorderly development, and the latter areas were developed in such a way that they blend well into the newly created lake and the surrounding natural environments.

The third reason is the various events that were started during the dam construction stage to stimulate local development and the opening of the dam construction site to the public, which increased the popularity of the Miyagase Dam area.

The fourth reason is the opening of the dam body and other facilities to the public that increased the interest in these facilities among the general public, and the provision of the Water and Energy Information Center and Yamanami Information Center that provide visitors with detailed information on the dam and dam area.

The last reason is the active efforts to promote the area put forth by the interested local governments and municipalities as well as other organizations such as the Miyagase Dam Area Promotion Foundation, which enhanced the cooperative relationship between these organizations and the project implementation body and increased the attraction of the area for many people.

6. Outside Comments

- 1) Kanagawa Shimbun (a major local newspaper) (October 17, 2000)

A Large “Water Tank” for the Citizens of the Prefecture Enhancing Communications and Exchanges Among Basin Residents Development of a Suburban Resort

7. Further Information

7.1 References

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— Miyagase Dam —, Dam Japan, Toshiyuki Adachi

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