

利根川上流部流域の概要

Outline of the upper course of the Tone River

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The Tone River, or "Bandou Tarou" - the river often overflows - is one of the largest river in our country, and an important river on the Kanto region.

The Tone River originates from the mountainous region on the border of Gunma and Niigata prefectures.

The stream runs southeast through the Kanto plains, with receiving various large and small tributaries, and empties into the Pacific Ocean at Choshi City, Chiba Pref.. The drainage basin area of the Tone River is 16,840km², and the annual outflow is about 13 to 14 billion m³.

The Metropolitan area plays an important role in the society, economy and culture of our country. There is a large demand of water in this area, due to the recent industrial development and the concentration of the population. The maintenance of water supply has become a problem to be solved.

To guarantee the water resources and protect the Metropolitan area from floods, multi-purpose dams were built and have been operated at the mountains on the upper course of the Tone River. Also at the middle and the lower courses, regulating pondage・"diversion channel" such installations have been built and operated.

The upper course of the Tone River are the basin of 8,600km² drainage area, and from the upper course to the Kurihashi bridge, the drainage area is the half of that of the Tone River basin, and is classified by the characters of the lay of the land, the geology, the rainfall outflow conditions and so on roughly into four courses such as Okutone, Azuma River, Karasu-Kanna River, and Watarase River.

The annual average precipitation at the upper course is about 1,500mm, but there is a regional difference, and in the area of the Mt. Akagi and of the Mt. Haruna, located in the north of the Okutone-Azumagawa basin, there is much more precipitation than that of the south area.

The total annual outlet is about 6 to 7 billion m³. There is a tendency of increase of the outlet from the Okutone-Azumagawa basin in April and May, because of the snow-melt water. Usually the other basin have a maximum outlet



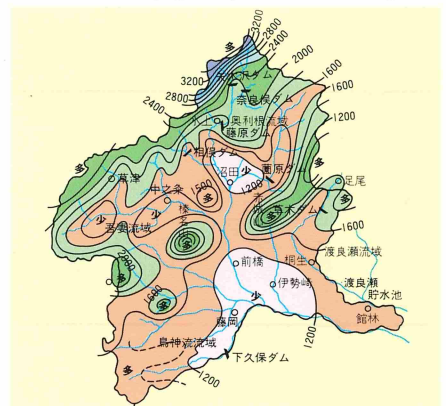
Water resources of Tone River(Snowy valley of Ou-minakami Mt.)



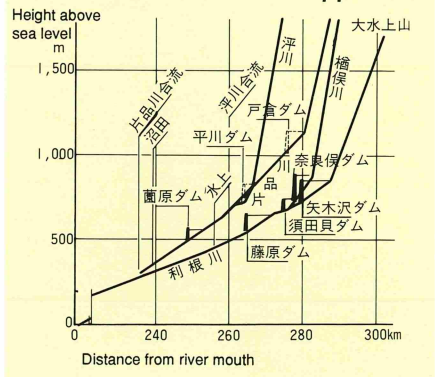
Monument of Tone river water resources

in typhoon season, in August, September, and October. The Yagisawa dam was completed in 1967, and the Naramata and five other multi-purpose dams are been completed now, at the upper course of the Tone River. Under the control of the dam groups of the upper course, the seven dams are contributing to the flood control and the water supply.

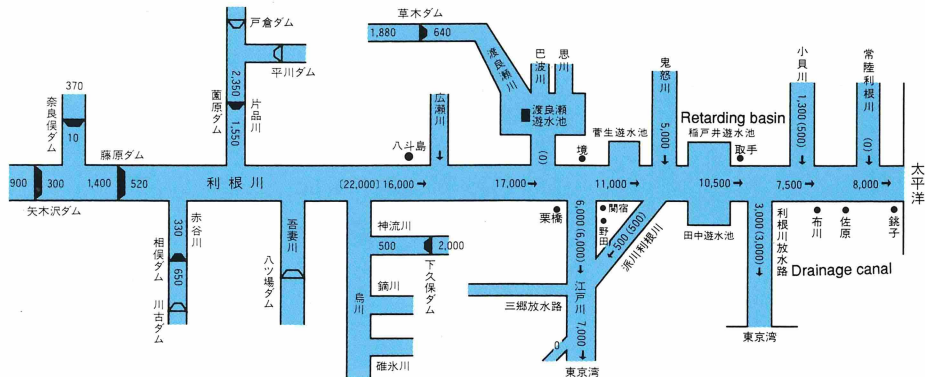
Annual average equi-rainfall diagram



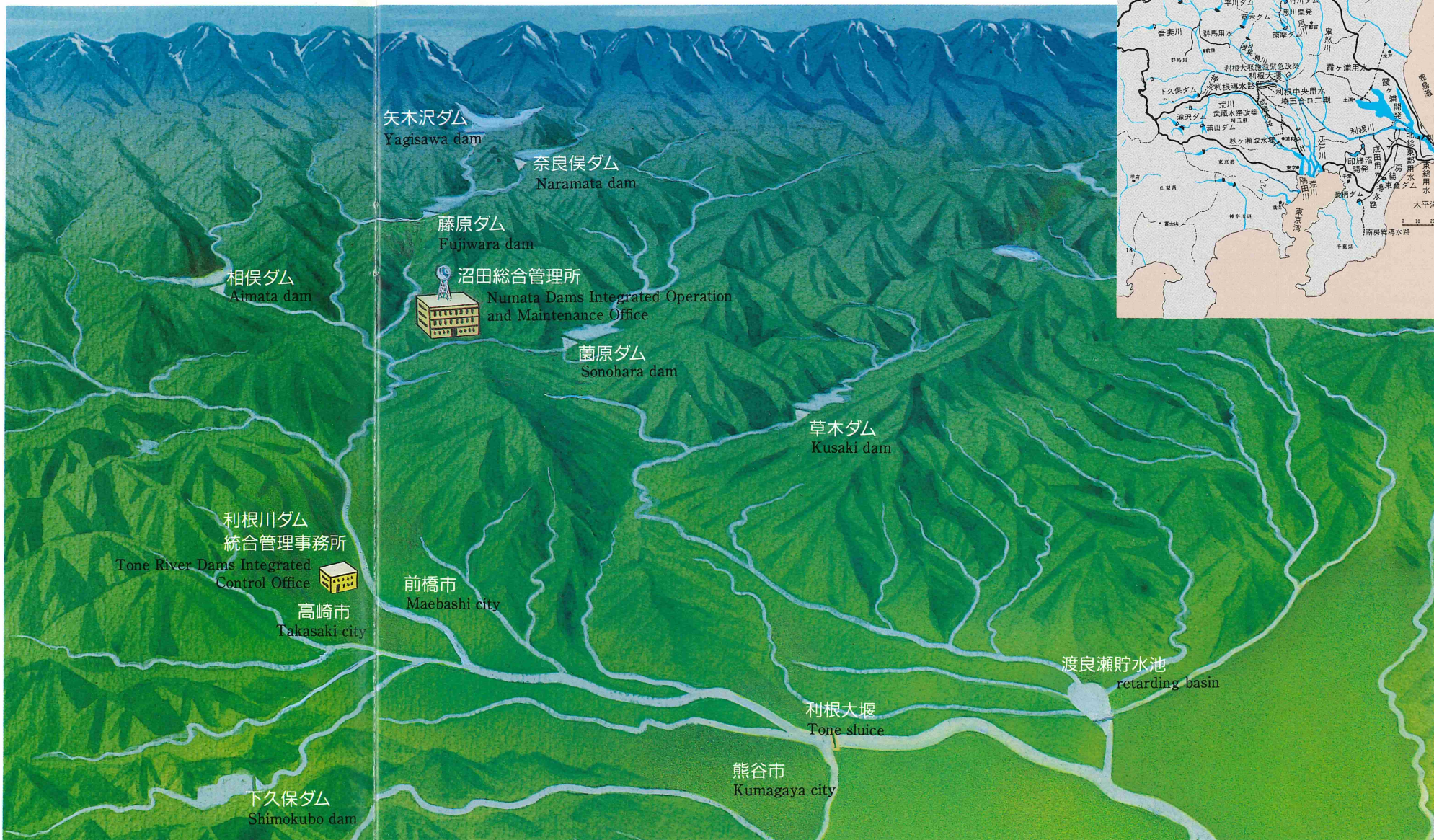
Longitudinal section diagram of Tone upperreach



Estimated high water discharge diagram of Tone River



単位: m³/s (): 分合流量 (): 基本高水ピーク流量
Unit Normal high water peak discharge



Outline of Tone River・Ara River water system water resources development plan

●Flood control planning

The " Catherine typhoon ", which attacked the Kanto region in September 1947, brought a record heavy rain and caused a huge outflow of earth and sand all over the Mt. Akagi.

It had disastrous consequences on river structures, such as levees, bank protection, " revetments " in both main river and sub rivers.

Since the Meiji era, the flood control plan for the Tone River has been revised every time there is huge floods. On the occasion of the 1947's typhoon, the normal high water was revised to 14,000m³/s (3,000m³/s out of 17,000m³/s should be adjusted by dam).

The basal planning on the construction enforcement at the present time was revised in 1980. The revision, which target was the flood occurred in November 1947, was also based on the survey conducted about the past amount of rainfall and outflow of the Tone River basin. The basal line of revision decided that the peak flow of the normal high water for the Tone River is 22,000m³/s "Yattajima" point, the distribution flow to with after adjustment of 6,000m³/s by a group of dams of the upper course is 16,000m³/s.

●Water supply planning

The demand for water in the Metropolitan area still shows a tendency to increase with the increase in population, the improve of living conditions, the growth of economy, and the development of industries. In order to cope with this increasing demand for water supply, the construction of water resources development installations have been promoted.

In the Tone River system, the Yagisawa dam and other various installations have been built, also water for irrigation have been developed.

The vested water supply in the Tone River consists mainly of irrigation water, and than domestic water, industrial water, and the water for maintenance of normal functions of the river.

The water resources development basal plan estimates that from 1986 to 2000, the Tone and Ara River water system will draw up.

This plan includes the outlook of demand for water and the water-supply needs of the Metropolitan area and the 5 Pref. located at the Tone River basis, and also of the Kanagawa Pref. regions. In the twenty first century, these area are thought to depend on the Tone and Ara River water system for the various water supply.

Table of development water discharge relates to Tone River

Institution name	Municipal water			Irrigational Gunma canal	Total	Complete year
	Domestic water	Industrial water	Total			
Yagisawa dam	東京都 4.00 群馬県 3.20		7.20	8.66	15.86	昭42
Naramata dam	東京都 8.045 群馬県 2.07 茨城県 2.435 埼玉県 0.179 千葉県 0.951 千葉県 2.41	群馬県 0.65	8.695	0.69	9.385	平3
Shimokubo dam	東京都 14.20 埼玉県 12.60 埼玉県 1.60	埼玉県 1.80	16.00		16.00	昭43
Kusaki dam	東京都 7.04 埼玉県 5.68 埼玉県 0.54 桐生市 0.52 佐野市 0.30	埼玉県 1.88 (東京都 0.98) (群馬県 0.60) (足利市 0.30)	8.92	3.45	12.37	昭51
Kawaji dam	2.63 (栃木県 2.01) 千葉県 0.62	栃木県 4.49 (千葉県 2.66)	7.12	3.47	10.59	昭58
River mouth barrage of Tone River	18.76 (東京都 14.01) 千葉県 3.60 埼玉県 1.15	千葉県 1.24	20.00	2.50	22.50	昭46
Inbanuma development		千葉県 5.00	5.00		5.00	
Watarase retarding basin (1st reservoir)	2.50 (東京都 0.505) 茨城県 0.505 埼玉県 0.505 千葉県 0.505 小山市 0.349 野木町 0.131		2.50		2.50	平1
計	60.375	15.06	75.435	18.77	94.205	

沼田総合管理所のあらまし

Outline of Numata Dams Integrated Operation and Maintenance Office

●Outline

The number of dams under the integrated control increases now in the whole country, as the need for water systems results on the increase of dam construction.

The development of the integrated operation and maintenance of several dams has been important for the sake of the effective utilization and the efficient management of the dams.

Also in Okutone region, the necessity of an effective, efficient, and economical control and management of the dams in this area lead to the start of the controlled operation of Naramata dam in 1991, in addition to that of Yagisawa dam, since 1967.

Numata Dams Integrated Operation and Maintenance Office was established in Numata city, on Gunma Prefecture, with the purpose of integrating the operation and maintenance of dams in Okutone region, in behave of the future dam arrangement and the traffic condition, and moreover, thinking on the future control of both the two public corporation dams already completed, and the dams to be constructed from now on.

The dams of public corporation under construction, are going to be controlled by the integrated operation and maintenance, for effective and efficient control management.

●Integrated operation and maintenance

① The Numata office always collects and controls the weather information, the water-related information, and the dam-control conditions in both Yagisawa and Naramata dam branch control offices. For the grasp of synthetic conditions, also the weather information and so forth are collected separately. For the sake of the efficient and safety operation of both dams, when preventing flood and water shortage, the indicative contacts are unified between Numata office and the Ministry of Construction, Tone River Dams Integrated Control Office.

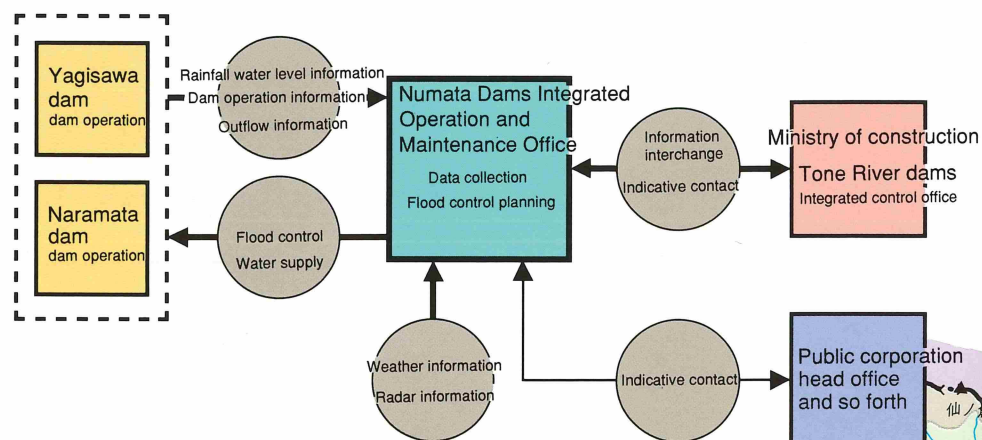
② Carries out the economical dam control, for example, the simplification of the organization, the labor-saving of staff, and the rationalization of the management office by the bureaucracy concentration.

③ Corresponds synthetically to the diversifying needs, such as the water quality maintenance, the environmental servicing of dam environments, the removal of accumulated sand, the correspondence to the visiting person, the providence to the water shortage, and so forth.

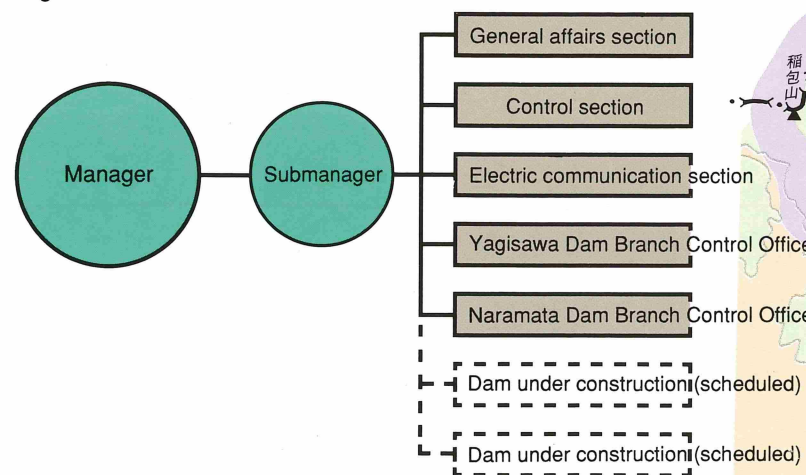


矢木沢ダム渇水状況

Integrated operation and maintenance system



Organization of office



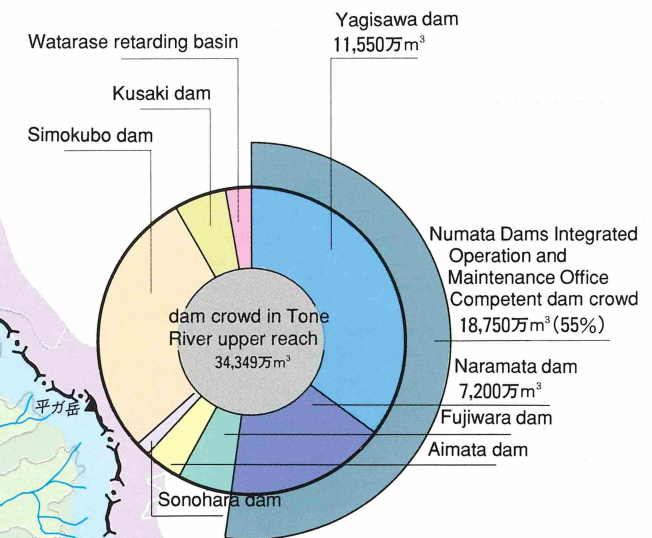
legend
 Public corporation dam
 Other dam

沼田総合管理所(空撮)

●History

- April 1959
Yagisawa dam construction start
- October 1967
Yagisawa dam control start
- April 1947
Naramata dam survey start
- June 1978
Naramata dam construction start
- April 1991
Naramata dam control start
- April 1991
Establishment of Numata Dams Integrated Operation and Maintenance Office

Storage capacity of Tone River upper reach dam crowd (water supply capacity in summer)



新潟県

