Dams in Japan
Past, Present and Future
Japan Commision on Large Dams
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Appendix 3

Outline of the existing dams in Japan

At least from 7th century, Japanese people have been constructing dams to make their life better. In the background of this restless efforts lie the following characteristics of Japan relevant to the topographic and climatic conditions [198].

- Japan consists of a chain of narrow islands with mountain ranges at their backbone, which form many small river basins with steep streams.
- Around 2/3 of the national land is covered with forests, rich in environmental assets.
- Japan belongs to the circum-Pacific earthquake belt, and is subject to strong earthquake disasters quite frequently.
- The geological constitution is very complicated, and sediment production in mountains is high.
- Major floods are brought by the "Tsuyu" rainy season in June and typhoons in autumn, whose rainfall is characterized by high intensity and short duration. Most floods end within 2 or 3 days. Snow-melt floods are often seen in the northern part of Japan.
- Alluvial plains spread in the lower reaches. Population and economic activities concentrated there which need to be protected from flood disasters. This is why Japan has a long history of people's efforts to overcome these disasters.

Table A3.1 shows the major 10 river systems in Japan in terms of the basin area. Even the largest one, the Tone River System, has the basin area of 16,840 km^2, which is quite small when compared with those in continents. It is also understood that the scale of the basin is very compact judging from the short river length.

The Tone, Kiso and Yodo River Systems are important supply source of water for the Tokyo, Nagoya and Kyoto-Osaka-Kobe metropolitan area respectively.

In correspondent with these features, dams in Japan have relatively small reservoirs. In view of water resources development by dam reservoirs, water supply is usually achieved by combining run-of-the-river flow and replenishment from the reservoir, which enables efficient supply of water.

As for flood control operation of dams, small catchment area and torrential rainfalls demand accurate operation in a limited time. In case the catchment area is very small, flood control dams are often planned as non-gate dams, not as gated ones.

Table A3.1 Major river systems in Japan.

Ranking	*Name of the river system*	*Region*	*Basin area (km²)*[1]	*Length of trunk river (km)*[2]	*Population in the basin (million)*[3]
1	Tone	Kanto	16,840	322	12.65
2	Ishikari	Hokkaido	14,330	268	2.59
3	Shinano	Hokuriku	11,900	367	2.97
4	Kitakami	Tohoku	10,150	249	1.39
5	Kiso	Chubu	9,100	229	1.93
6	Tokachi	Hokkaido	9,010	156	0.34
7	Yodo	Kansai	8,240	75	10.92
8	Agano	Hokuriku	7,710	210	0.58
9	Mogami	Tohoku	7,040	229	1.00
10	Teshio	Hokkaido	5,590	256	0.09

1, 2 Based on the web site the Statistics Bureau, Ministry of Internal Affairs and Communication (http://www.stat.go.jp/data/chouki/01.htm).
3 Based on the data of the River Bureau, MLIT (http://www.mlit.go.jp/river/toukei_chousa/kasen/ryuiki.pdf).

Table A3.2 Number of dams by year of completion.

Year of completion	*Dam height*		*Total*	*Share (%)*
	Over 30 m	*15–29 m*		
Before 1000 AD	1	8	9	0.3
1001–1899	3	658	661	21.6
1900–1945	85	607	692	22.6
1946–1999	884	650	1,534	50.2
2000–2008	132	30	162	5.3
Total	1,105	1,953	3,058	100

Based on the data of JCOLD as of March 2008: Large dams, No. 204 p. 100, 2008.

The number of so-called large dams with height of 15 m or more is shown in Table A3.2. As of March 2007, there are as many as 3,058 existing large dams in Japan, more than half of which were completed during about 50 years' period after the World War II.

Table A3.3 shows the number of existing dams counted by purpose. Dams whose project purpose includes irrigation occupy 52.7%, followed by dams with flood control purpose (16.7%) and dams with hydropower purpose (16.2%).

Table A3.4 shows major 30 dams with large reservoir capacity. Tokuyama Dam, a multi-purpose dam completed by JWA in 2008, has the largest capacity of 660 million m³. This capacity may look small when compared with multi-billion cubic meter reservoirs in US or Europe; however, its regulating capability to the river flow is quite substantial in view of the small basin scale.

Tables A3.5–A3.11 shows major high dams by dam type. The highest dam in Japan is the Kurobe Dam, an arch type hydropower dam on the Kurobe River. These table will provide general idea of existing high dams in Japan.

Table A3.3 Number of existing dams by purpose.

Purpose	*Dam height*		*Total*	*Share (%)*
	Over 30 m	*15–29 m*		
Irrigation	460	1588	2048	52.7
Waterworks/ Industrial water	365	136	501	12.9
Hydropower	433	197	630	16.2
Flood control	532	118	650	16.7
Others	53	5	58	1.5
Total	1843	2044	3887	100
(Multi-purpose dam)	(458)	(86)	(544)	

Based on the data of JCOLD as of March 2008: Large dams, No. 204 p. 100, 2008.

Remarks: Total number is not equal to that of Table 2, since the number is counted twice of more, if the dam is of multi-purpose.

Table A3.4 Major dams with large resevoir capacity.

Ranking	Name of dam	River system	Prefecture	Dam type	Purpose	Dam height (m)	Dam length (m)	Dam body volume (1000 m^3)	Reservoir area (ha)	Storage capacity (million m^3)	Catchment area (Km^2)	Leading owner	Fiscal year of completion	Ref. no.*
1	Tokuyama	Kiso	Gifu	ER	CNSH	161	427	13,700	1,300	660	255	JWA	2007	75
2	Okutadami	Agano	Niigata, Fukushima	PG	H	157	480	1,636	1,150	601	426	J-POWER	1960	
3	Tagokura	Agano	Fukushima	PG	H	145	462	1,950	995	494	702	J-POWER	1959	
4	Miboro	Sho	Gifu	ER	H	131	405	7,950	880	370	14	J-POWER	1961	120
5	Kuzuryu	Kuzuryu	Fukui	ER	CH	128	355	6,300	890	353	185	MLIT	1968	
6	Ikehara	Shingu	Nara	VA	H	111	460	647	843	338	277	J-POWER	1964	82
7	Sakuma	Tenryu	Shizuoka	PG	H	156	294	1,120	715	327	4157	J-POWER	1956	117
8	Sameura	Yoshino	Kochi	PG	CNISH	106	400	1,187	750	316	527	JWA	1978	
9	Hitotsuse	Hitotsuse	Miyazaki	VA	H	130	416	555	686	261	415	Kyushu EPCO	1963	
10	Tamagawa	Omono	Akita	PG	CNISH	100	442	1,150	830	254	287	MLIT	1990	
11	Uryu No. 1	Ishikari	Hokkaido	PG	H	46	216	188	2,373	245	203	HEPCO	1943	60
12	Tedorigawa	Tedori	Ishikawa	ER	CSH	153	420	10,050	525	231	428	MLIT	1979	
13	Takami	Shizunai	Hokkaido	ER	CH	120	435	5,120	675	229	283	HEPCO	1983	
14	Arimine	Joganji	Toyama	PG	H	140	500	1,568	512	222	50	Hokuriku EPCO	1959	
15	Yagisawa	Tone	Gumma	VA	CNISH	131	352	510	570	204	167	JWA	1967	31
16	Kurobe	Kurobe	Toyama	VA	H	186	492	1,582	349	199	185	KEPCO	1963	58
17	Nukabira	Tokachi	Hokkaido	PG	H	76	293	460	822	194	388	J-POWER	1956	
18	Miyagase	Sagami	Kanagawa	PG	CNSH	156	375	2,000	460	193	214	MLIT	2001	52
19	Ogochi	Tama	Tokyo	PG	SH	149	353	1,676	425	189	263	TEPCO	1957	49
20	Iwaya	Kiso	Gifu	ER	CISH	128	366	5,780	426	174	150	JWA	1976	
21	Abugawa	Abu	Yamaguchi	PG/VA	CNH	95	286	427	420	154	523	Pref. Gov.	1974	
22	Surikami-gawa	Abukuma	Fukushima	ER	CNISH	105	719	8,300	460	153	160	MLIT	2006	
23	Kanayama	Ishikari	Hokkaido	HG	CNSH	57	289	220	920	150	470	MLIT	1967	
24	Ikawa	Oi	Shizuoka	HG	H	104	243	430	422	150	459	CEPCO	1957	77
25	Tase	Kitakami	Iwate	PG	CIH	82	320	420	600	147	740	MLIT	1954	15
26	Niikappu	Niikappu	Hokkaido	ER	H	103	326	3,071	435	145	193	HEPCO	1974	
27	Shimokubo	Tone	Gumma	PG	CNSH	129	605	1,193	327	130	323	JWA	1968	40
28	Kazeya	Shingu	Nara	PG	H	101	330	592	446	130	660	J-POWER	1960	
29	Shin–Nariwagawa	Takahashi	Okayama	PG	SH	103	289	430	360	128	635	ENERGIA	1968	102
30	Oku–Miomote	Miomote	Niigata	VA	CNH	116	244	257	430	126	175	Pref. Gov.	2001	

* Reference number corresponds with the number in the table "Main Dimensions of Dams"
Based on the data of Dam Almanac 2007, Japan Dam Foundation.