

The Soyang-Gang Dam Project, Republic of Korea



Background

The Soyang-gang Multi-purpose Dam (SMD) opened a new chapter in the history of civil engineering in Korea, and the project was an epoch-making water resources development project considering the poor economic situation of Korea in the early 1970's. This dam was built on the North *Han* River for the purpose of providing water and electric energy to the *Seoul* Metropolitan Area where population began to concentrate because of the industrialization. The Soyang-gang Dam is one of the largest rockfill type dams in the Far Eastern Asia (123 m in height, 530 m in length, and 9.6 million m^3 in the storage volume). Table 1 summarizes the main features of the dam.

Efforts

The construction of Soyang-gang dam was initially considered in 1950. The complete feasibility study of the construction of Soyaging multi-purpose dam was conducted in 1966. The main purpose of the dam was to meet the rapidly increasing water peak power demands in Seoul Metropolitan and Kyung-gi District Area and to reduce flood damages occurring frequently. The location of the dam was selected at the narrow gorge (13km from Chuncheon City and 108km from Seoul Metropolitan City) of the Soyang-gang, one of the longest (166 km) tributaries of the North Han River. On

April 15, 1967, the preliminary construction of the Soyang-gan multi-purpose dam was initiated as a part of the Second Five-Year Economy Development Plan. The construction of the Soyang-gan Multi-Purpose Dam was finished on October 15, 1973.

The river basin of the Soyang-gan dam covers an area of 2,703 square kilometers, which is primarily influenced by Monsoon. About 70 % of the annual rainfall occurs during June to September. Average annual rainfall and inflow into the watershed are about 1,100 mm and 1.7 billion cubic meters, respectively. SMD experienced extreme rainfall events in 1984 and again in 1990, which exceeded the original spillway design flood. In response to these events, the Korea Water Resources Corporation (KOWACO) conducted new hydrologic studies and performed evaluations for the spillway design flood. The Probable Maximum Flood (PMF) upon review and re-evaluation by the Ministry of Construction and Transportation of Korea was updated from 12,392 m³/sec to 20,715 m³/sec. Among various alternatives considered, construction of emergency spillways was the final decision for increasing the discharge capacity to maintain the safety of the dam. Construction work is scheduled to begin soon.

Table 1. Main Features of the Soyang-gan multi-purpose dam.

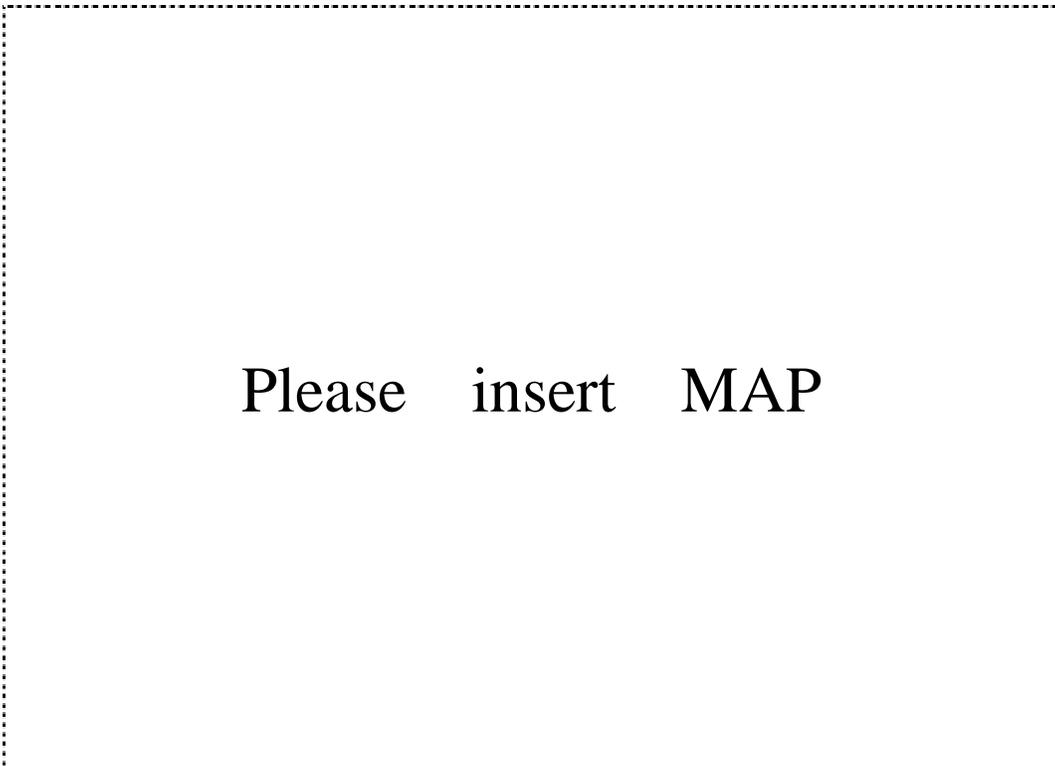
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| General | | Dam | |
| Location: | Soyanggang River | Height: | 123.0 m |
| Purpose: | Multipurpose | Length: | 530.0 m |
| Catchment Area: | 2,703 | Volume: | 9,591,000 |
| Dam Type: | ER | Dam Crest Elevation: | 203.0 EL.m |
| Construction Period: | 1967~1973 | | |
| Owner: | KOWACO | | |
| Reservoir | | Power Generation | |
| Flood Water Level: | 198.0 EL.m | Installed Capacity: | 200,000 |
| Normal Water Level: | 193.5 EL.m | Annual Energy Output: | 353 GWh |
| Restricted Water Level during Flood Season: | 190.3 EL.m | Rated Head: | 90.0 m |
| Lowest Water Level: | 150.0 EL.m | Max. Turbine Discharge: | 250.8 CMS |
| Gross Storage Capacity: | 2,900,000,000 | Water Supply | 1,213,000,000 |
| Effective Storage Capacity: | 1,900,000,000 | Annual Water Supply: | 1,200,000,000 |
| Flood Control Capacity: | 500,000,000 | Municipal & Industrial: | 13,000,000 |
| Reservoir Area: | 70.0 | Irrigation: | |

Benefits of the Project

Adequate supplies of municipal and industrial water were essential for continued economic growth of the Han River and the well being of its residents. Soyang-gang Multi-Purpose Dam provides living, industrial and agricultural water of 1.2 billion cubic meters with metropolitan areas such as Seoul, Incheon, Suwon, and Pyeonchon adjacent to the Han River. It also provides 32 million cubic meters for irrigation.

The construction of Soyang-gang Multi-Purpose Dam in the Han River Basin has significantly been contributing to controlling the devastating floods occurring periodically in the Han River basin. It stores 770 million cubic meter water for flood control, serving as the front line for preventing floods on the downstream of the Han River. Its maximum flood and normal reservoir, minimum operating levels are El. 198.00 m and 193.5 m, and El. 150.00 m, respectively.

The power generation capacity of Soyang-gang dam is 200 MW, which is large enough to light more than 5 million 40W-rated fluorescent lamps, and Soyang-gang dam generates 353 GWH every year. It also increases the generation capacities of free-fall type power plants located downstream of the dam by 61 GWH.



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