

Case Example of the Technical Cooperation of Japan in Yangon

Background

Yangon, the capital city of the Union of Myanmar, is the urbanized city with the population of over four million as well as the designated economical center. The administration of the City is entrusted to the Yangon City Development Committee (YCDC).

Yangon water supply system has a long history of more than 150 years. Most of the existing water supply facilities in Yangon which were constructed during era of colonial rule have become old and have been deteriorated. Yangon is not rich in water resource, so reservoirs for drinking water were constructed far away at northern area from Yangon.

The present supply condition of YCDC's water supply system is very low in terms of water quality, quantity and pressure. Therefore YCDC sought the technical cooperation from the Japanese Government on improvement of water supply conditions. The Japanese Government implemented a development study in 2000 and dispatched one expert on water supply planning in 2002.

Current Condition

Water resources of Yangon City are composed of three water reservoirs and tube-wells, as shown in Table-1. Though some big rivers are located near Yangon City, river water can not be utilized for drinking water resource due to including salty water. Thereby water is supplied from reservoirs to Yangon City by the long-distance pipelines (Photo-1).

There is a water treatment plant, coagulation and sedimentation, at only Gyobu reservoir. This treatment facility is not carrying out a function because coagulant is not injected. Therefore water is supplying to Yangon City without treatment and a lot of deposits settle in the pipes and the service reservoirs. Especially in the Hlawga reservoir, which has been operated since 1904, massive floating water plants have propagated since a few years ago (photo-2). Since these plants were supplied with water, the distribution pipes were blocked up by them and the water supply was stopped in the some service area. In addition disinfection is implemented intermittently due to their budget.

Service ratio in Yangon is only 37% and water pressure is very low according to JICA study report in 2002. Water supply is sometimes suspended. Most of the consumers have installed the own pump to draw water from YCDC's distribution pipe to the ground tank or the elevated tank. Consequently conditions of the distribution pipe became negative pressure and un-fully flow. They are concerned that water in the distribution pipes would be contaminated by ground water. According to the JICA study report and the examinations of other organizations, E-coli were detected in the water of the distribution pipe and the service reservoirs. Meanwhile YCDC do not comprehend water consumption and demand of the consumers. Water supply system in the Yangon City was operated due to experience of the skilled engineers and complains of the consumers.

Some consumer out of YCDC's served area is using water from ponds and lakes constructed by YCDC. And YCDC have initiated a system of water supply to poor communities via communal tank (Photo-3). These public water stations are also exposed to a high risk of contamination, as those stations are uncovered and located on road shoulders immediately adjacent to human activities.

Activity

We should have impressed YCDC's water supply engineers with the significance of water supply in the urbanized city. And we persuaded YCDC's engineers of the relation between public health and water supply first.

YCDC has obtained water use right from Ngamoeyeik dam constructed by irrigation department to expand water supply area, where consumers are using water from ponds. Though a reservoir body and an intake facility have been constructed, a transmission main and a pumping station have not been completed owing to a shortage of the budget and technical problems for the pipe laying. Consequently YCDC depart from this plan to draw water from a main irrigation canal from Ngamoeyeik dam by an open channel. This canal water has turbidity so water treatment plant has to be constructed. But YCDC's engineers have not only designed the water treatment plant but also seen the actual plant. Therefore we transferred technologies for water treatment by the text books and the movie of the actual water treatment plants in Japan.

YCDC is implementing clean-up of old aged pipes to improve insufficient supply and public health in the downtown (Photo-4). Existing old aged pipes are dig out, after cleaning inner face and mortar lining these pipes are laid again. And YCDC is cleaning deposits in the service reservoir too. YCDC applied to Japanese government for the grant aid to replace some parts of the old aged pipes.

We provided portable water flow meters to measure actual flow rate in the water supply network (Photo-5). And we undertook a consumer survey in order to reveal served population, water consumption, water demand by use and so on. YCDC's staffs went and interviewed whole consumers as well as tolling water rate. They will have faced the truth of current water supply through these activities and they will be able to plan and operate water supply effectively based on these collected data.

Recommendation

Water supply is indispensable infrastructure in the urbanized city. In the case of Yangon City, existing water supply system was given for them in colonial time. After that they had not invested adequately in water supply facilities for a long time and had only maintained existing facilities. Current poor water supply conditions resulted from the deficiency of ownership. It is absolutely essential that decision-maker appreciates the function of water supply and has strong will to improve this condition. And people also have to recognize the current condition of water supply and cooperate to improve this system.

Table-1 Water Resource of Yangon City

		Production rate	Transmission main		Operation starting year
Surface Water					
	Gyobyu Lake	93,200 m ³ /day	Φ1400	69,200 m	1940
	Phugyi Lake	227,300 m ³ /day	Φ1000 ~ 1650	54,100 m	1992
	Hlawga Lake	75,000 m ³ /day	Φ1000	16,600 m	1904
Existing surface total		395,500 m ³ /day			
Plan	Ngamoeyeik Lake	409,100 m ³ /day	Φ1500	88,500 m	under construction
Surface water Total		804,600 m ³ /day			
Ground Water					
	217 tube wells	43,890 m ³ /day			
Total amount		848,490 m ³ /day			

Photo-1 Transmission main for Gyobyu reservoir



Photo-2 Hlawga reservoir



Photo-3 Communal tank



Photo-4 Rehabilitation of old aged pipe



Photo-5 Flow measurement

