

Financing Repair of 2003 Earthquake Damages to Bangon Dam

ABSTRACT

Myanmar is geographically located between North Latitude 9° 32' and 28° 31' and East Longitude 92° 29' and 101° 10'. The total area of Myanmar is 677000 square km. Myanmar has a population of about 53.22 million with an annual growth rate of 2.02 percent. Out of 18.5 million hectares of cultivable land, only 10.23 hectares is presently utilized for crop production.

Bangon dam is one of the dams in Magwe East Region in the central dry zone, it is one of the (8) dams constructed in the year 1995-1997, aiming to increase the rice production for the self-sufficiency of Magwe Division in Myanmar.

Strong earthquake of intensity (6.7) Richter Scale and duration about (3.7) minutes, rocked Myanmar and Thailand on 22nd September 2003, at 00:45 hr, due to the movement along the Sagaing fault system results from the northward motion of the Indian plate with respect to Southeast Asia. The epicenter of the earthquake was very close to the Bangon Dam.

At the time of the earthquake, the water level in the reservoir was about 3 meter below FSL, and the capacity was 3.7 million cubic meter. It was already functioning since 1997. The height of the dam is 18.6 meter, with a crest 177 meter long. The dam was founded on Irrawaddian sand rock. The embankment was built as rolled fill from CL and SC type of soil and medium plasticity. The dam has a 1.5-meter wide sand chimney drain and sand and gravel sandwich filter. The earthquake caused about 1.5 meter waves in the reservoir, large open cracks on the dam, a number of landslides and cracks on the abutment and considerable damage to wooden buildings on the right abutment of main dam.

The inspection of damages were thoroughly carried out from the irrigation area to the dam. No suspect area of leakage was found, so that to save the standing crops which had the farm gate price of about 200 million kyats, so that the water was released from dam up to maturity. If the new dam has to construct the estimated cost of new dam at (2002-2003) rates was about 600 million kyats against original construction cost of 108 million kyats at (1993-1994) rates.

Several inspection of the extent of the damages of dam body appurtenance structures, abutment and foundation, the cost of repairing the damages was estimated. The estimated cost of repairing was 63 million kyats. The Ministry granted the cost since the reserved funds for Operation and Maintenance and Emergency repairs Budget for the whole country is about 2 billion kyats.

Since the Budget was granted repair works such as grouting of the abutment, stone pitching and strengthening the downstream slope of main and saddle dams were carried out. Crack line in the conduit barrel wall was covered with steel strap from inside and crack line outside the barrel was covered with clay puddle. Actual cost of repair was 62.2 million kyats.

Now Bangon Dam is in use again.

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Organization's Experience

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U Khin Maung Nyunt was graduated as Civil Engineer from Yangon Institute of Technology in 1969. He joined the Irrigation Department in 1969 as an Assistant Engineer. He became director in 1997. He had many experience in design and estimated of irrigation and drainage projects with UNDP, FAO, Euro consult and SMEC engineers. In 1980 - 81, he finished his diploma in Hydraulic Engineering from IHE (Delft). In 1985, he get training in Water Resources Planning and Management from Queensland and New South Wales Water Resources Commission in Australia. He was involved in the Planning, Design and Estimates of 60 projects. Out of those projects Mone Chaung Dam Multipurpose project was the first dam constructed on gravel bed with riverbed materials and plastic concrete diaphragm cut – of wall and 11.4 meter diameter tunnel, and hydropower of 75 MW installed capacity and 97 meters high earth dam on Salin river.

He became technical advisor for the Ministry of Agriculture and Irrigation after his retirement. He is conducting research on Monsoon rice cultivation in Asia with JIID, and training Irrigation Engineers and farmers in water Management to improve on farm Irrigation efficiency. He is also conducting research on agriculture soil improvement of low pH soil on his farm near Yangon. He is also a leader of TOT and IWRM of Myanmar. His special assignment is Capacity Building for the young engineers and water professions. Government awarded him "Excellent Performance in Administrative Field Grade 3 and 2", also Public Service Medal and Public Good Service Medal.