CWC report on the issue of shutter breakdown at Krishnagiri dam on river Ponnaiyaru (South Pennar) in Krishnagiri district of Tamilnadu

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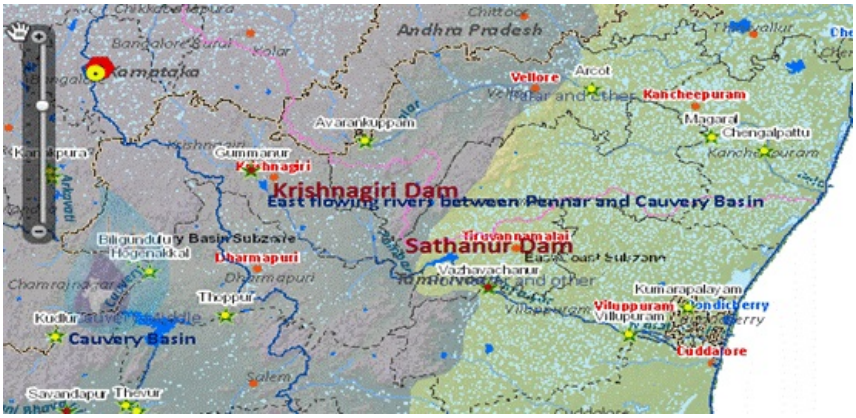
Due to very heavy rainfall during the month of September in upper catchment of the river Ponnaiyar in Karnataka and Andhra Pradesh, the Krishnagiri dam attained its FRL in September 2017 and started releasing water downstream. Due to this, the downstream reservoirs also got sufficient inflow and Sathanur Dam was very near its Full Reservoir Level. In such situation, on 29th November 2017, one of the shutters of the Krishnagiri dam got damaged and water started flowing through the damaged shutter. The project authorities and the district authorities have also opened additional spillway to avoid pressure on the damaged shutter. The district authorities had also warned all the downstream districts regarding the situation arising out of the damage to shutter. The information was analysed in Central Water Commission (CWC) with the available data as well as data collected from Project authorities. Accordingly, it was found that since 29th November 2017 0600 hrs an average outflow of 170 cumec (6000 cusec) flowed through the spillway of Krishnagiri dam due to the damage. There is also an inflow of about 10 cumec (350 cusec) into the reservoir. This reduced the water level by 1.2 m. Size of the spillway gate is 12.19X610 m. The height of the spillway is 6 m accordingly, if the same amount of discharge is maintained then it may take about 96 hours for the water to come down upto crest level of spillway. Since the water level has started falling in the reservoir, there is likelihood of reduction in discharge passing through shutter slowly every day. Accordingly, CWC infers that the peak of the flow has already passed through the damaged gate as well as through spillway discharge and there will be gradual reduction in outflow as the reservoir level reduces.



Sathanur Dam is downstream of Krishnagiri Dam. As the Sathanur dam was already near its FRL, anticipating the flow from the damaged shutter of Krishnagiri reservoir, Sathanur Project authorities started releasing water from 29th November 2017 evening. The average discharge since 29th November was approximately 64 cumec (2260 cumec). This has reduced the reservoir levels at Sathanur Dam by about 0.30 m. The available flood cushion at Sathanur Dam as on 30th November 2017 is 16 MCM (566 Mcft). The inflow likely to come during the next 96 hours with a constant discharge of around 170 cumec (6000 cusec) from upstream dam may be around 57 MCM(2073 Mcft). This means that Sathanur dam may have to release around 170 cumec (6000 cusec) for the next 4 days to keep the dam level around FRL and at the same time, there may not be any downstream problems. This is in the backdrop of a situation in which a cyclonic storm has formed in Comorin area which is giving widespread rainfall in Tamilnadu and the expected development of another cyclonic storm around 4th December 2017. The impact of intervening catchment area rainfall will have to be monitored very closely. The IMD Chennai Forecast for Ponnaiyar basin for the next 3 days is as under:

Considering a rainfall of 26-50 mm on Day 2 i.e. between 2nd and 3rd December 2017, there may be a chance of increasing the discharge to around 250 cumec (8800 cusec) on 2nd and 3rd December 2017. The CWC Gauge and Discharge Station at Vazhavachanur which is 22 km downstream of Sathanur dam have started showing the impact of release from Sathanur dam. During the last 12 hours from 29th November 2017 2100 hrs to 30thNovember 2017 0900 hrs there is a rise in water level of 1.25 m with an average flow of around 135 cumec. This will also be reflected at Villupuram another CWC maintained Gauge Station on river Ponnaiyar in another 12 hours. If the discharge is increased to 250 cumec in association with rainfall further rise of about another 0.5 to 0.6 m may also be witnessed at these stations for another 96 hours. In the downstream course near the confluence with seas near Cuddalore town, there may be effect of high tide due to full moon also as well as effect of Cyclonic storm which is likely to hinder the flow into the sea and there may be some inundation depending on the tide conditions near the confluence.

If there is no further aggravation in the damage caused to the Krishnagiri dam, the peak flow from the dam to downstream has already passed through the damaged spillway and there will be reduction in outflow. However, the effect of rainfall in Karnataka area if any in association with Cyclonic Storm “Okchi” is to be monitored closely. The inflow to Sathanur Dam will be mostly moderated around the outflow from Krishnagiri dam other than that through the intervening catchment rainfall. The forecast of rainfall for 2nd to 3rd December 2017 is around 25-50 mm in this area which may increase the inflow into the dam prompting more release which should be very carefully monitored. In the downstream of Sathanur dam as well as near the confluence with

seas, the effect of the releases from Sathanur as well as the tidal effect from sea have to be monitored carefully as well as local rainfall in association with another brewing system in the Bay of Bengal has to be monitored. There should be very close monitoring of the entire Ponnaiyar system for the next 5-7 days for the entire system in view of the likely development of severe rainfall producing systems.

The Krishnagiri reservoir was constructed across the Ponnaiyar River near Periyamuthur village about 10 km from Krishnagiri town in Krishnagiri district, Tamil Nadu. It is located at the latitude of 12º 28' North and the longitude of 78º 11' East. The execution of the KRP dam was started on Mar 1955, completed and opened for irrigation on Nov 1957. The Gross Storage capacity of the reservoir is 47.156 MCM. The Sathanur Dam was completed during the year 1957 near Thiruvannamalai town in Thiruvannamalai district of Tamilnadu. It is located at 12^{O} 12’ N and 78^{O} 35’ 30” E. The Gross Storage capacity is 228.91 MCM. CWC has started inflow forecasting activities at Sathanur Dam from 2017 North East Monsoon season onwards. The intervening catchment between Krishnagiri Dam and Sathanur Dam is about 2,000 sq.km. Distance between the two dams is 117 km.

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