

Study on the medium scale flashing discharge in the dam

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1. Introduction

In the downstream of the dam, there arises change in the river environment such as decrease of disturbance pursuant to the degree of effect on the stream situation changes caused by the dam.

For improving that effect, in the trial execution of flexible management, which utilizes the flood control capacity, flashing discharge has been implemented to cause disturbance in the downstream river. However, it remains mainly in clearing away the river bed sediment only since the discharge is limited to a small-scale by the restriction of available water capacity.

It is required to establish a new method to utilize much more water capacity to perform broad effects such as to maintain and form the water pool, wand (pond like formation) and natural bare land.

2. Medium scale flashing discharge

We are currently studying on the medium scale flashing discharge method, which utilizes much more water capacity than flexible management and is equivalent to the flood of several times a year.

As the method of the medium scale flashing discharge, we can raise such a method to utilize the snow melting flood, draw down, later period discharge at the time of floods and so on. (Fig. 1)

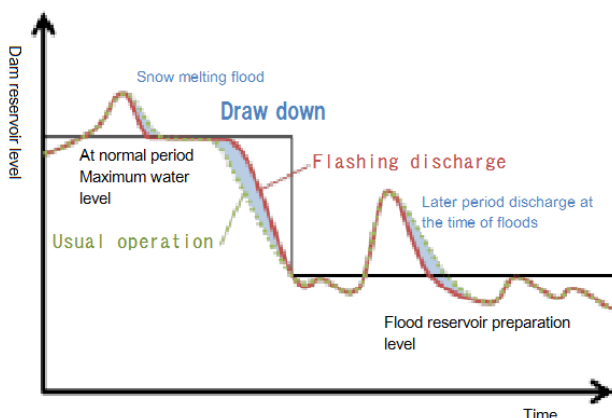


Fig. 1 Method of medium scale flashing discharge

3. Field test in the Satsunaigawa dam

In the past, there have been broad grave fields in the Satsunaigawa of the Tokachigawa river water system, in which broadly distributed the Kesho-yanagi, a kind of willow that grows only in limited area of Japan.

But on recent years, decrease of such grave fields due to the afforestation of the river channel brings us the concern on the effects on the ecological system. By that reason, to recover the grave fields, the medium scale flashing discharge utilizing using the draw down has been made a trial run aiming at the periods just before the seeds disperse from the Kesho-yanagi in the Satsunaigawa dam. Maximum discharge volume was approximately about 112 m³/s, which corresponds to approx. 65% of the annual maximum flow volume approx. 172m³/s (average of 1997 to 2010).

After the trial run, we have found changes in the river channel as we have confirmed sediment and scour at the point KP54.7 (downstream of the dam around 5km) (Fig. 2) and also observed was flow out of the seedlings of another type of the willow which are like established in the land area. We are continuing to detailed analysis on the flow speed, river bed material, attached algae, vegetation, river bed creature and fishes.

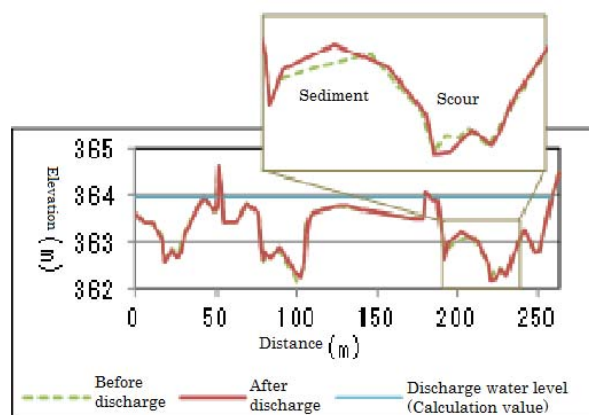


Fig. 2 Change in the cross-section before and after the discharge (KP54.7km point)

4. Conclusion

It is necessary to accumulate trial runs by different method to establish the method of the medium scale flashing discharge. For now, we would like to execute trial runs in several dams to make up a manual of the medium scale flashing discharge.