

# Moguri-Iwa Second Sabo Dam with Alternate Dual Axes

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## 1. Introduction

In order to achieve equilibrium condition in river morphology, in terms of especially longitudinal profile and grain size, it is required, in these days, that practices for river basin management must be carried out focusing on the quality and quantity of sediment throughout a catchment area from the watershed to the estuary.

In addition, it is required that structures for disaster prevention must be implemented with due consideration to diversity of riverin environment of fauna and flora.

In order to meet the above requirements, in another word, prevention of disasters due to sediment transportation and environmental conservation, sabo dams equipped with slits have been developed and constructed, but recently, a new technology was developed. It is a sabo dam with alternate dual axes.

Moguri-Iwa Second Sabo Dam presented here is the first case of the application of the technology. (Figure1)

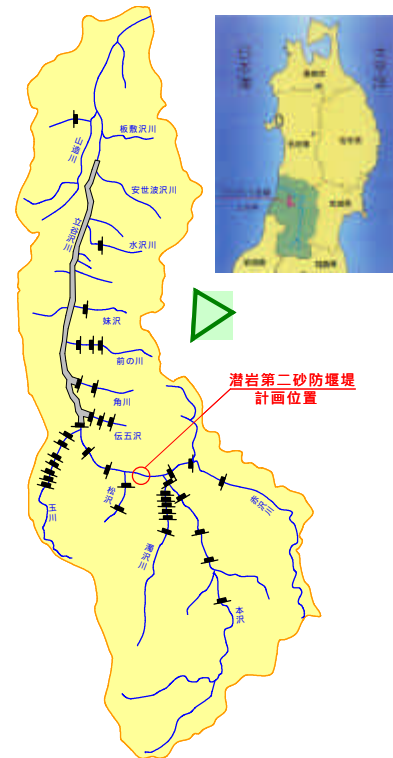


Figure1. Location

## 2. Justification of the technology employed for Moguri-Iwa Second Sabo Dam

Moguri-Iwa second sabo dam was located at Tsukinosawa, Syonai, Higashi-Tagawa, Yamagata Prefecture and construction work was implemented from 2001 for two years until 2003.

The catchment area of Tatsuyagawa is featured by geologically fractured structure which resulted in a large landslide of which volume counted for as much as 5 million cubic meters in 1998 and is still susceptible to further landslides.

The dam is located at the site of which morphological conditions are as follows;

Bed slope: 1/30

Valley width: ranges from 50m to 150m

Cross sectional shape of the valley: V type

The dam was designed and constructed due consideration with scenic environment as well as vulnerable conditions to slope failures and landslides. As a result, a specific type alternate dual axes type, was selected and the dam was made of concrete bricks.

It is expected that the dam will successfully cope with possible strain and deformation due to landslide and slope failure.

### 3. Functions of the dual alternate axes dam

Among various types of sabo dam, dams equipped with slits allow sediment load run through slits in the case of ordinary floods and check massive sediment load in case of large flood, but the dam with dual alternate axes make flood water meander.

The dam with dual alternate axes is featured by the following functions and character;

- 1 screen sediment load in accordance with grain size.
- 2 due to meandering of thalveg, bed configuration and biotope grow diversified,
- 3 the dam, because of its uniqueness in shape, provides the site with a tourism attraction
- 4 the dam, because of its structural feature, can cope with compressive forces and keep retaining its functions regardless its deformation to some extent.
- 5 the cost for construction work is rather higher compare to other types.

(Figure2, 3, 4、 Photo1)

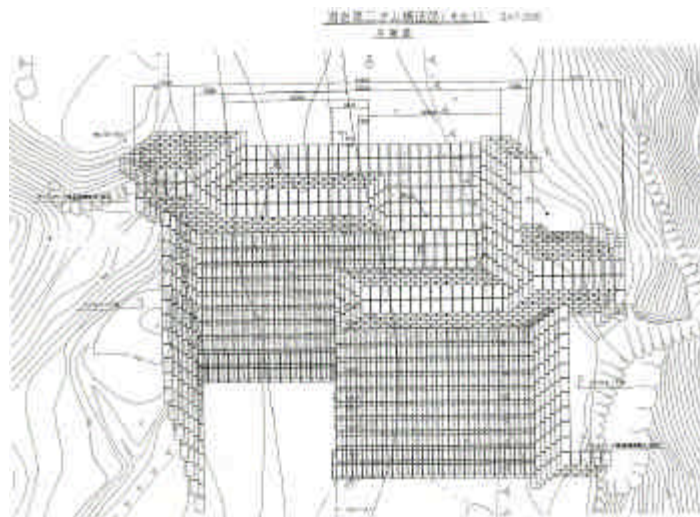


Figure2. The plane

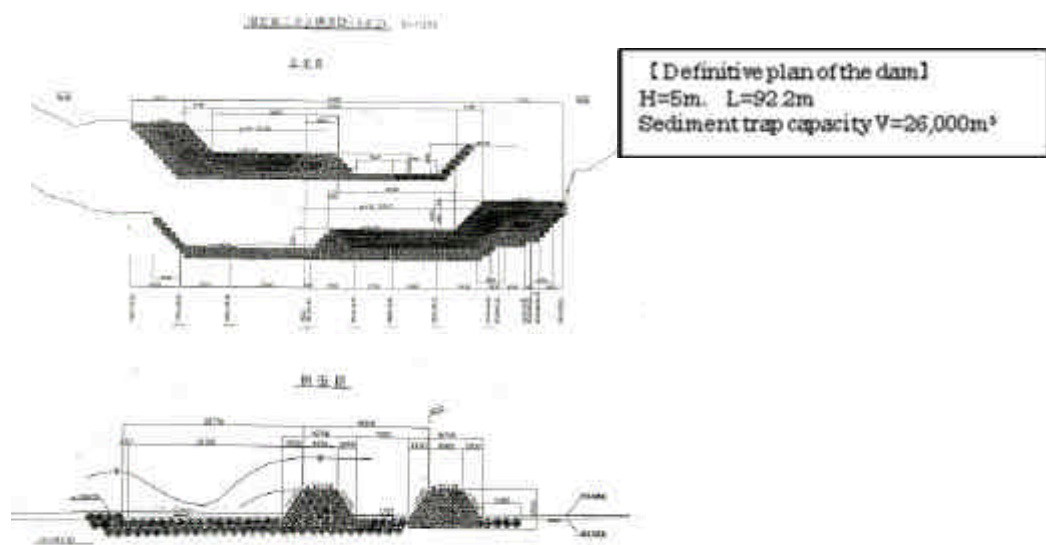


Figure3. The facade and side

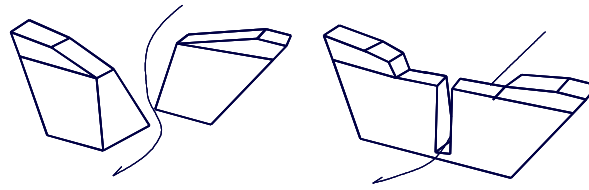


Figure4. The comparison of the structure with other types



Photo1. The present state

#### 4. Conclusion

The alternate dual axes applied for the Moguriiwa second sabo dam is the first case in Japan, perhaps even in the world, so that the functions are not well verified yet.

Although a lot more dams are needed to check excess sediment load, the sites ideal for sabo dam have been fully occupied. The sabo dam with alternate dual axes can therefore be recommendable because it can be constructed regardless geological and morphological soundness of foundation.

We are currently evaluating functions and effects of the dam by monitoring hydrological responses of the dam and changes in the valley bed. The results will be published by the end of this fiscal year, March 2006.