Landslide dams of the Hime river basin

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The Hime river runs parallel through the east side of the peaks of the Tateyama mountains which is included in the North Alps, ranging north and south, and flows into the Japan sea. And this river is a swift-running river having a basin area of 722km2, a total length of the main stream of approximately 60km and a average gradient of 1/70 to 1/80. Since the Itoigawa-Shizuoka Tectonic Line is located nearly along the river, the east side and west side along the river show remarkably different geographical and geological features, that is,:the west-side mountains show a steeply rugged form ranging mountain ridge and comprise deposits of the Mesozoic and the Paleozoic formation and pyroclastic materials of the Quaternary in geological condition, while the east-side mountains show a gently rugged form and comprise deposits of sandstone and mudstone etc. of the Neogene. These geology were widely influenced by the tectonic crust movement of the Tectonic Line, so that they are so much cracked with fragility.

In addition, as the erosion process by the Hime river is too active and both-side slopes of the river involve steep surface, a number of landslide areas and collapsed topographies are found.

The main stream of the Hime river has many historical events by which dammed up the river by landsliding, showing main lakes formed by these events as follows:

1)Aoki Lake:Cause of dam formation is slope failure.

2)Old Kamisiro Lake:Cause of dam formation is Debris flow.

3)Old Hakuba Lake:Cause of dam formation is Debris avalanche.

4)Old Otari Lake:Cause of dam formation is Debris flow.

5)Old Manaita Lake:Cause of dam formation is slope failure.

Additionally, dammed-up lakes were formed by such relatively small scale landslide as Kazehariyama landslide in April of 1939 and Kozutiyama landslide in July of 1971, and both of them were failed in short term. The cause why dammed-up lake had been disappeared is mainly given due to collapse of landslide dam, and in addition to this, due to carrying away and burying as special case. The reasons why the Aoki Lake formed by landslide dam is now existed are considered as follows:

a)The landslide dam became a new watershed and then made an overflow from the upper stream to the opposite valley

b)Since the saddle-back of the interrupted position of the lake is placed on a basal rock (835m above sea level), the saddle-back can be kept safety even if an overflow on the dam may be taken place.

c)The area of the basin with8.6km2 is small and then volume of inflow is limited.

d)The landslide dam has a large cross section and consists mainly rock fragments with a proper water conductivity, and takes reasonable safety against seepage water.