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上高地谷の幅の広い谷底における土砂収支に沖積錐が果たす役割
Roles of alluvial cones in sediment budget in the wide valley floor of the Kamikochi valley, central Japan

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The upper reaches of the River Azusa, flowing down in the Kamikochi valley in the Northern Japan Alps, central Japan, is surrounded by very steep mountain slopes and high mountains which elevation is higher than 2500m. There are many landslides on the steep mountain slopes, from which debris is supplied to the valleys of the tributaries of the upper River Azusa.

Alluvial cones are the most important features on the valley floor of the upper River Azusa. These are formed at each outlet of the tributaries. To clarify the roles of the alluvial cones in the sediment budgets of the upper Azusa basin, landforms of the alluvial cones were investigated and the sediment linkages between the tributaries and the main river were discussed.

Many debris flow lobes are distributed on the surfaces of the alluvial cones. This shows that the alluvial cones are formed by debris flow accumulation. Most of the alluvial cones have several levels of terraced surfaces. The cone of a tributary, Furuikezawa, has four levels of surfaces. Each surface is bordered by terrace cliffs of several meters high. While the most part of the lowest surface is covered with newly deposited gravels with pioneer trees younger than 70 years, the other surfaces are covered with mature forest, the age of some trees are hundreds of years, and dense forest floor vegetation. The channel of Furuikezawa directly connects with the lowest surface and the surface borders on the main river floodplain with dense riparian forest. The surface is not contact with the channel of the main river. The lower borders of the terraced surfaces are margined by terrace cliffs which stretch parallel with the direction of the valley of the River Azusa. Other alluvial cones in the Kamikochi Valley have such similar geomorphological characteristics.

These characteristics of the alluvial cone show the alternation of accumulation of debris flows on the cone surface and lateral erosion of the toe of the cones by the channel shift of the main river. The debris supplied from a tributary basin is stored as its alluvial cone deposits. When the channel of the River Azusa will be shifted to the alluvial cone, lateral erosion will occur at the lower end of it. As lowering of the base level the channel of the tributary begin downcutting and the alluvial cone surface becomes a terrace. Debris produced by the lateral erosion is transported downstream of the main stream.

During the time lag between debris supply to the cone and eroded away from the cone and transport downstream debris became easily breakable into fine materials.

Alluvial cones on a wide floodplain play important role on sediment transport link between mountain slope and valley floor. Produced debris from the mountain slopes is not transported directly downstream by the main river. That is an important factor in basin sediment budgets.

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