Geomorphic processes in the Horonobe area, northern Hokkaido

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The landform in the western part of the Horonobe area, northern Hokkaido is developing under the influence of the 'rock-control' based on the difference of drainage pattern, relief energy, drainage density, and distribution of landslide in each formation. The study area is underlained by the Soya coal-bearing, Onishibetsu, Masuporo, Wakkanai, Koetoi, Yuchi and Sarabetsu Formation in ascending order.

The Masuporo Formation and the older formations are exposed in the eastern part of the study area. The area occupied by these formations are characterized by the development of landslide and high drainage-density landform. It shows that the mass wasting is major denudation process in the area.

In the area occupied by the Wakkanai Formation the major denudation process is downward erosion accompanied by formation of V-shaped valley in the glacial and interglacial age.

The area occupied by the Koetoi Formation is mainly developing surface erosion and downward erosion in the postglacial age. On the other hand, in the glacial age, the major denudation processes are sheet erosion with downward and lateral erosion which result in the formation of valley with bowl-shaped profile.

The Yuchi Formation is exposed in the central and western part of the study area. The erosion processes in the area are downward and lateral erosion in the postglacial and the glacial age. And the development of dendritic drainage pattern will result in the absorption of neighboring valley and the formation of low drainage-density and low relief-energy landform with broad and shallow valleys.

In the area occupied by Sarabetsu Formation it is inferred that the landform change into high relief-energy landform due to downward erosion and subsequently it turn into low relief-energy landform by mass wasting.