

# Terrace classification and geomorphological development process around Shinano river and Uono river junction area in Niigata prefecture

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Shinano river basin has long been considered an active folding area in the Niigata prefecture. A study on the diastrophism has been research the field of geomorphology, geology and geodesy. This area river terrace spreads. It has been reported that abnormal inclination to the mountain side or the upstream side of the river due to the active fold area. In the Uchigamaki area located near the junction area of Uono river and Shinano river, relatively new river terrace formed after the AT(26-29 ka) descent period has spread. In this study, aerial photograph interpretation, field surveys, a knitting year by surrounding ruins age, and terrain analysis, for example creation of river bed longitudinal section were carried out to discuss landform evolution through chronology of river basin and crusted determination in this area.

As the result of aerial photograph interpretation, field surveys, and reference data of preceding studies, river terraces in this area was divided into 11 terraces consisting of L1 to L11 terrace in total. The Araya ruin (1.725 ka) is located on the L3 terrace. The Saigura ruin (1ka) is located on the L7 terrace. The cross section along river of terrace was created using 1m grid DEM by Lidar data. Creating a river bed longitudinal section of the Uchigamaki area showed a northeast inclination in all aspects. Focusing on the inclination degree of each surface, the L1 surface to the L5 surface are steeper than the current riverbed. and the L6 and subsequent surfaces showed a gentle slope.

Generally, higher terrace ratio to riverbed is older. The Shinano river side could divide into many terraces but Uono river side couldn't it. The riverbed longitudinal section in Uchigamaki area showed a northeastward tilt in all terraces. That's why, these river terraces formed by Shinano river.

In addition, there is a decline in the sea level as a factor of formation of the river terrace. Kaizuka (1977) suggest, in the middle watershed, the river terrace formed in the glacial period is steeply inclined and is buried in the gradual inclined it formed in the post glacial period. Purpose based on this area, before the L5 terrace, it was formed during the glacial period because of the steep slope, but it is suggested that it could be buried in the L6 terrace formed in the post glacial period.

As the results of consideration flow path change of the Shinano river is as flows. Originally flowed southeastward around the Uchigamaki shrine from the northeast direction and had joined the Uono river at Aikawaguchi. The river changed the flow from the west to the east as it took off at L1, L2 terrace. The river began meandering from the time the L3 terrace was separated until 1.725 ka. After L6 terrace separated the river turned from the southwest to the northeast direction which is close to the current flow path It is thought that the water flowed out after the L7 terrace until 1ka and became the current flow path.

Keywords: Shinano River, Uchigamaki, Terrace division, Vertical section of riverbed