

Distribution and its sedimentary process of river terrace deposits along the middle Kali-gandaki, central Nepal

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"Kali Gandaki" is the river runs through the Himalayas from Tibetan plateau to Indian plain. A number of river terraces are distributed along the middle part of the Kali Gandaki. Recent researches reported that catastrophic events such as glacial lake outburst flood (GLOF) and large-scale slope failure have strongly affected developments of river terraces in the Himalayas (Takada, 1992. Schwanghart et al., 2014). The river terraces along the middle Kali Gandaki have also been thought to be composed of GLOF deposits (Yoshida & Upreti, 2014). Sharma (1980), Yamanaka (1982) originally classified the river terraces based on aerial photo interpretation. Although these pioneering studies have contributed greatly to our understanding of the geomorphological development of the terraces, the classification needed to be examined by using modern highly-accurate altitude measurements, such as GPS. In addition, lithofacies of the river terrace deposits have not been described, which hampers understanding of the depositional processes of the terraces and its origin. Therefore, we carried out re-classification of the terraces and sedimentological description of the terrace deposits along the middle Kali Gandaki (Beni ~Phalebas) to understand their depositional process and origin. Here we report three achievements as follows.

1) Based on detailing geomorphological analysis by using GIS software coupled with absolute altitude measurements (GPS), the river terraces along the middle Kali Gandaki are re-classified.

2) Lithofacies of the terrace deposits, which were originally described as a single gravel bed, are subdivided into six different types. They often include high-density flow deposits such as debris flow or mud flow.

3) At the confluence of rivers, lithofacies of the river terraces laterally change to be finer from the mainstream to tributaries. It indicates a rapid accumulation of the river terrace deposits along the mainstream of Kali Gandaki. These suggest that the geomorphological development of this area was (partly) affected by the GLOF events. We will focus on high-density flow deposits, and consider their depositional process, origin, and depositional age.

Keywords: Himalayas, Kaligandaki, River terrace