



Study of sediment sources using remote sensing and GIS in Seti watershed, West Nepal Himalaya

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For the purpose of constructing a hydropower, sediment sources mapping was carried out using remote sensing and GIS techniques in the Seti watershed of west Nepal. The watershed lies in the Mahabharat Range, Midlands, and the Great Himalayan Range. Its maximum altitude reaches 7,555 m at Mt Annapurna and the minimum altitude is about 308 m at the gorge of the proposed hydropower dam site. The northernmost part of the Seti watershed lies in the Tibetan-Tethys Zone made up of marbles, slates, shales, sandstones, and limestones. It passes into the underlying Higher Himalayan rocks comprising banded gneiss, mylonitic augen gneiss, and sillimanite-kyanite schist. The Lesser Himalayan rocks are observed below the Higher Himalayan unit and include garnetiferous schists and gneisses in the north, phyllites and quartzites in the central portion, and slates and dolomites in the south. They occupy most of the region of the Seti watershed. Several levels of river terraces are seen along the major rivers of the watershed. The terraces are classified into the old consolidated ones and young loose ones. Alluvial fans and talus cones occupy the gentle foothills. Colluvial soils cover most of the hill slopes whereas the alluvial soil is seen at the lower gentler slopes of the watershed. The main sources of sediments are landslides, debris flows, gully erosion, and bank failures. The instabilities occupy about 25.46 km², which is about 1.7% of the total watershed area. About 3% of the total watershed area falls under a high sediment source, about 21% of the area is under a moderate sediment source, and about 76% of the area is under a low sediment source.