

**Title :** Influences on Lateral Movement Pattern of Nan River in Phitsanulok Province

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## ABSTRACT

The Nan River is one of Thailand's most important water sources from the Luang Prabang Range in Nan Province. It flows through several provinces, including Uttaradit, Phitsanulok, Phichit, and Nakhon Sawan, before merging with the Ping River to form the Chao Phraya River. The Nan River plays a significant role in the region's ecosystem, agriculture, and urban development. However, its meandering nature leads to lateral movements caused by bank erosion (cut bank) and sediment deposition along the riverbank (point bar), significantly impacting land use, infrastructure, and riverbank settlements. This study aims to analyze the lateral movement patterns of the Nan River in Phitsanulok Province and identify the factors influencing these changes. The methodology involves analyzing historical satellite imagery from 1985 to 2024 using ArcMap 10.8 and Google Earth Pro, combined with detailed field surveys. The study reveals that the Nan River in Phrom Phiram District experiences obvious river shifting because water flows from steep upstream areas that cause continuous bank erosion, sediment deposition, and land use for agriculture along the riverbanks. In Bang Krathum District, the river shows moderate lateral movement, attributed to the construction of river embankments in certain areas, which reduces water flow velocity. In contrast, the Nan

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River in Mueang Phitsanulok District shows minimal or no lateral movement due to urban development and the construction of riverbank stabilization structures, which maintain consistent water flow velocity and limit changes in the river's course. The study indicates that both natural and human-induced factors influence the lateral movement of the Nan River. Natural factors include rainfall intensity, river discharge, sediment transport, and seasonal flooding. Meanwhile, human activities such as land use, dam construction, and riverbank stabilization play a significant role in lateral river changes. The study provides critical insights into the river's migration pattern and the potential factors contributing to river migration that are useful for flood risk management, riverbank protection, and sustainable land use planning.

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