

Floodplain development along the lower Stung Sen River, the Tonle Sap tributary

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The Stung Sen River, the biggest influent tributary to Lake Tonle Sap in central Cambodia is influenced by Asian monsoon climate, and seasonal precipitation changes controls hydrologic and geomorphic environment in the region. Interpretation of aerial photography showed that the Stung Sen River floodplain consists of two geomorphic units: meander belt along the meandering river channel and back marsh. Observations of outcrops and six sedimentary cores across the floodplain at Kampong Chheuteal and Kampong Thom reveal that floodplain environmental changes at c.11 ka, indicated by sand layers at Kampong Chheuteal and abundant plant materials at Kampong Thom, were associated with the Holocene onset of the southeast Asian monsoon and probably with the emergence of Lake Tonle Sap. The present back marsh-meander belt system was established about 5.5 ka along with the initiation of seasonal flow direction change of the Tonle Sap river. The meander belt materials are replaced as the river channel shifts on a decadal to centennial timescale. Back marsh sediments had a constant accumulation rate of about 0.5 mm/yr during the Holocene, contrasting with rates of 0.1 mm/yr during the late Pleistocene, at least since c.36 ka. These evidence indicate that the floodplain development of the Stung Sen River is dependent on the changes of Holocene monsoon intensity and water level changes of the most downstream Lake Tonle Sap.

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