LATE QUATERNARY EVOLUTION OF THE BELAN RIVER BASIN, CENTRAL INDIA

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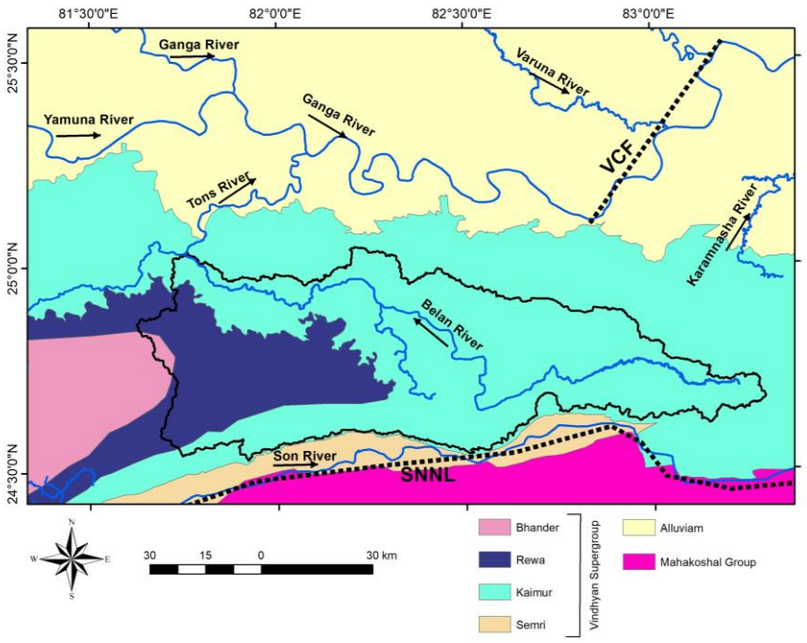
1. INTRODUCTION:

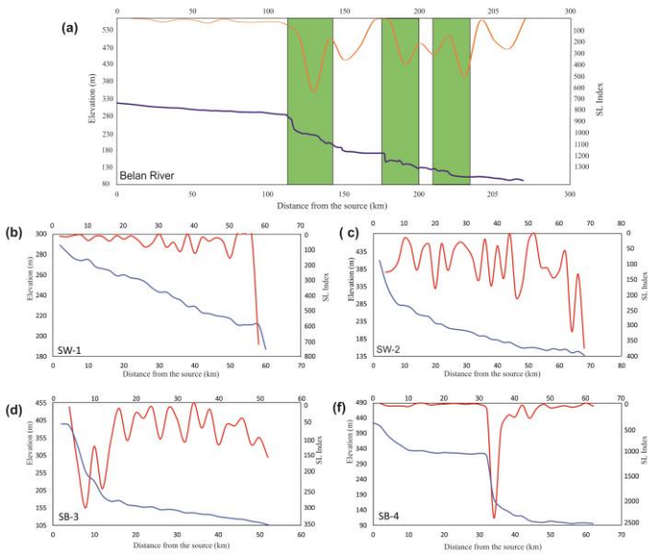
The Marginal Gangetic Plain is the southernmost segment of the Ganga Plain, formed by Himalayan Orogen thrust fold stress flexing the Indian lithosphere. Rivers that originate in the Himalayas have received much attention (i.e., Ganga, Yamuna, Kosi, Ghagra, etc.) In contrast, the tributaries draining from the peripheral bulge of the foreland basin have not been studied in detail, and it encloses seismic activity in the basement of the craton. Belan River drains through the Ganga foreland basin's peripheral bulge, which may generally have received less monsoonal precipitation than the Himalaya. (Thamban et al., 2001). Subsurface alluvial fans originating from the craton are visible in Son valley (Eastern Ganga basin), implying a key impact on climate and tectonics (Sahu et al., 2015). We present a detailed morphotectonic analysis and luminescence chronology of the exposed cliff section along the Belan River basin. It is located in the Ganga foreland basin's peripheral bulge and near Narmada–Son North Fault (NSNF) in Central India.

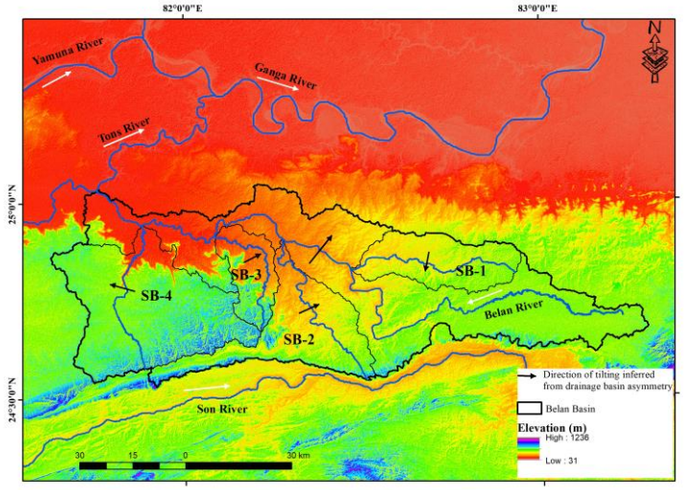
2. GEOLOGY OF THE AREA:



3. MORPHOTECTONIC PARAMETER

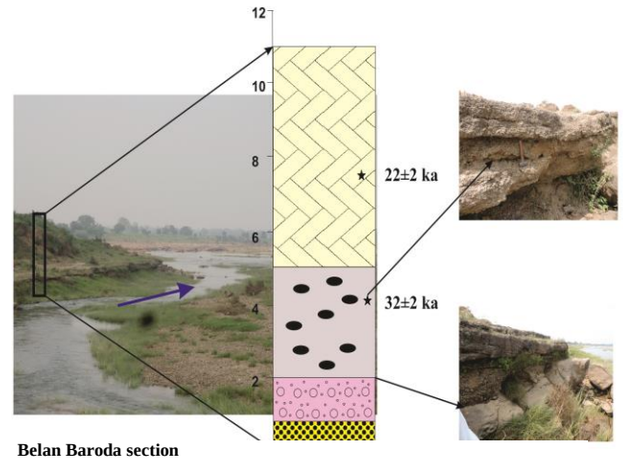
	Asymmetry factor (AF)=100(Ar/A)	Interpretation	Elongation ratio (Re)	Interpretation
SW-1	54.31	Basin titled towards the left side	0.56	Elongated (tectonic activity)
SW-2	29.55	Basin titled towards the right side	0.69	Elongated (tectonic activity)
SW-3	36.58	Basin titled towards the right side	0.54	Elongated (tectonic activity)
SW-4	59.28	Basin titled towards the left side	0.90	Oval (less tectonic activity)
BW	29.08	Basin titled towards the right side	0.43	Highly elongated (higher tectonic activity)



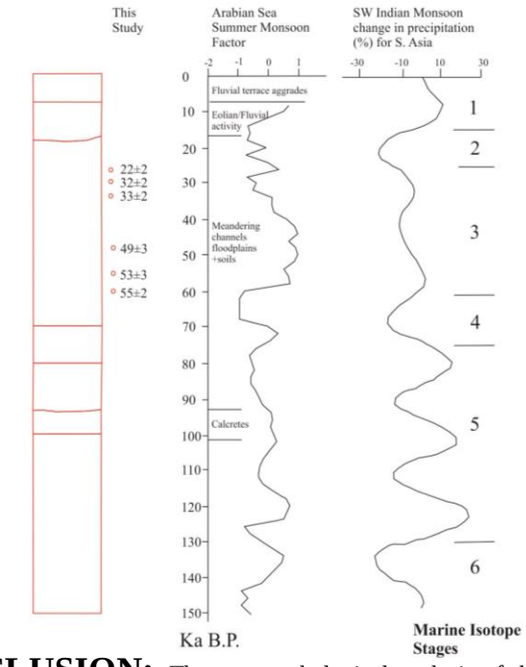


4. OPTICALLY STIMULATED LUMINESCENCE CHRONOLOGY:

Two lithological sections we have studied first are the Belan Baroda section and Ayodhya sections.



Belan Baroda section



5. CONCLUSION:

The geomorphological analysis of the Belan river basin indicates that two sub-basins have an Asymmetry Factor more significant than 50, inferring that the channel had shifted westward. In contrast, other subbasins are shifted towards the right side (eastward) of the drainage basin (as AF<50), which is further supported by paleochannels, meander scars and meander cutoffs. The most recent and extensive valley fills started accumulating at ~51±7 ka and persisted until around 22±2 ka. The aggradation was accompanied by a weakening summer monsoon, which started incision after 22±2 ka, indicating a return to warmer and wetter conditions and stronger summer monsoon. According to this research, the drainage networks of the Belan basin were built over a tectonically pre-designed valley, and denudational processes have been transforming the basin for a long time.

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