

What is BRAHMA-2D?

December 23, 2023 • vajiramandravi.com



About BRAHMA-2D

- BRAHMA-2D (Braided River Aid: Hydro-Morphological Analyzer) is a mathematical model to gauge the flow of large braided rivers like the Brahmaputra.
- It is a quasi-3D river flow model which helps to understand how fast the water moves at different depths inside a river and its circulation around a structure like a spur installed to prevent river bank erosion.
- It can help engineers in the design of sustainable hydraulic structures like spurs, reverent, and other river bank protection measures in order to check river bank erosion.
- It was developed by the researchers at IIT Guwahati in collaboration with the Brahmaputra Board under the Union Ministry of Jal Shakti.
- It was successfully validated on the Brahmaputra River near Majuli Island, the second largest freshwater River Island in the world, in Assam, which is prone to river bank erosion.
- It integrates a two-dimensional model of water movement with a theory about entropy, a measure of disorder or randomness.
- Specifically, it observes a dip phenomenon near spurs where the flow of water underneath increases, a phenomenon absent at points away from these structures.
- It has also been applied to understand the habitat suitability of aquatic species, especially endangered species, based on the availability of the required depth and flow velocity.

Q1) What is Entropy?

Entropy is a measure of how dispersed and random the energy and mass of a system are distributed. Importantly, entropy is a state function, like temperature or pressure, as opposed to a path function, like heat or work. This means that as a system changes in entropy, the change only depends on the entropies of the initial and final states, rather than the sequence (“path”) taken between the states.

Source: [IIT Guwahati researchers develop BRAHMA-2D model to understand flow of large braided rivers](https://www.vajiramandravi.com/current-affairs/entropy-2d/)

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