PROJECT DESCRIPTION

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DRAINAGE DEFLECTION ASSOCIATED WITH METEORITE IMPACT CRATERS

Drainages are manifestations of topographic and structural controls. Impact craters are a few amongst the geomorphic features that impart both topographic and structural controls on the drainages. Thus, a drainage that flows across an impact crater circumnavigates the crater either because of its unique circular elevated topography or because of the concentric faults developed during an impact event. This eventually results in drainage deflection. Such deflections can be of two types, wherein: (i) an impact event alters the course of an existing stream, i.e., river older and crater younger, and (ii) formation of a new river after the impact event, i.e., river younger and crater older. In case (i), the drainage deflection signifies the altered course of flow chosen by streams on encountering potential obstructions across the original course. In case (ii), a newly forming stream will tend to change its path due to an obstruction like the impact crater and will circumnavigate the crater.

This study aims to investigate the role of impact craters on deflecting the drainages. The aim will be achieved through quantifying the shifting of drainages (by measuring angles of deflection) at different distances from the crater centre. This study will be performed by analysing remotely sensed data. Furthermore, field investigation will be done in a few impact craters like Monturaqui impact crater in Chile and Ramgarh in India. Monturaqui is particularly noteworthy due to its two streams that deflect on either side of the crater, offering an excellent opportunity to study drainage deflection. The fieldwork will provide insights into the relationship between the crater and the associated streams, as well as the influence of ejecta deposits, morphology, structure and topography on deflection. A few stream sediment samples (both from the active- and paleo-channel) will be collected for cosmogenic radionuclide or OSL dating to get the age of the drainages using standard procedures. The proposed study will provide valuable insights into the role of meteorite impact craters on the surrounding drainage systems.

PERSONAL STATEMENT

Science, to me, is more than just a subject; it is a way of thinking and exploring the wonders of our world. From a young age, my fascination with the natural world and the complex workings of the universe sparked a deep-rooted passion for science within me. The endless curiosity to understand how things work, from the tiniest particles to the vastness of the universe, has been a driving force in my academic pursuit. As a geology student, my interest in science has naturally focused on planetary science. I believe that studying other planets and celestial bodies can provide valuable insights into the understanding of the primitive workings of Earth. Through my education and research I have honed my analytical and critical thinking skills, whereby I can continue to explore the Earth's mysteries, make meaningful contributions to the field, and inspire others to appreciate the wonders of science. Through mentorship, outreach programs, and science communication, I aspire to contribute to the broader scientific community and foster a sense of wonder and appreciation for the natural world.