

Title: Unraveling the nexus of natural radioactivity and radio-ecotoxicological effects in Bengal Basin: recent findings and way forwards

Author names: Abu Reza Md. Towfiqul Islam · Mehedi Hasan · Md. Nashir Uddin · Md. Abdur Razzak · Md Abdullah Al Masud · Rahat Khan · Md. Ahosan Habib · Abubakar M. Idris · Venkatramanan Senapathi

Abstract: Elevated levels of naturally occurring radionuclides (^{238}U , ^{226}Ra , ^{232}Th , and ^{40}K) present significant global environmental and public health challenges due to their increasing radio-ecotoxicological effects. Numerous localized studies have examined natural radioactivity within the Bengal Basin (BB), but comprehensive regional-scale assessments remain limited. This review synthesizes thirty years of research to provide a thorough understanding of radionuclide contamination levels, environmental dynamics, and the associated ecological and human health risks within the BB. Radiation exposure levels from key environmental components, such as soil, water, sediment, and biota, are evaluated and compared with international standards, revealing that the southeastern and central parts of the basin frequently exhibit activity concentrations at or above global averages. The review further highlights the ecotoxicological implications of radionuclide

Keywords: Radionuclide · Public health risk · Sustainable development goals · Radiation doses · Chemical waste · Radio-toxicology

<https://link.springer.com/article/10.1007/s10653-025-02904-z>