

Safeguarding Biodiversity and Future Generations: An Application of RESRAD Codes for Nuclear Emergency Planning and Response

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The Chernobyl and Fukushima nuclear accidents have significantly impacted the public's perception of nuclear energy and its potential benefits. To fully harness nuclear technology's potential for contributing to the Sustainable Development Goals (SDGs), as highlighted by the IAEA bulletin of September 2016, we must restore public confidence in this energy source. Emergency preparedness and response is a cardinal principle of radiation protection, and the literature review indicates that most research and energy reactors worldwide have modelled hypothetical accident release scenarios. However, most of these models only considered respirable gaseous radionuclides released from the reactor core and failed to consider other possible exposure media, routes, and scenarios. In this paper, we propose a framework for using the RESRAD family of codes-ONSITE, OFFSITE, RDD, and BIOTA- to improve emergency preparedness and response planning, especially in Africa, where site-specific data is lacking. By critically analysing related literature through a desk review, we demonstrate the application of these codes in biodiversity conservation, protecting people and the environment, and safeguarding future generations. Our proposed frameworks, if implemented, will build public confidence in nuclear energy projects in Africa, restoring public confidence and consequently help in solving the lingering energy crisis on the continent.

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