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## AN ANALYSIS OF ADVANTAGES, LIMITATIONS AND PROSPECTS OF BIOREMEDIATION TECHNIQUES

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DOI: [10.5958/2249-7315.2021.00205.7](https://doi.org/10.5958/2249-7315.2021.00205.7)

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### ABSTRACT

*Increased human activity on energy reserves, hazardous farming methods, and fast industrialization have all contributed to an increase in environmental contamination over the last several decades. Heavy metals, nuclear wastes, pesticides, greenhouse gases, and hydrocarbons are among the contaminants that cause environmental and public health problems owing to their toxicity. Because of its environmentally favourable characteristics, bioremediation of contaminated areas has proved to be efficient and dependable. Bioremediation may be done ex situ or in situ, depending on a variety of variables such as cost, site features, and the kind and quantity of contaminants. Ex situ methods seem to be more costly than in situ techniques in general, owing to the extra costs associated with excavation. However, when doing in situ bioremediation, the expense of on-site equipment installation and the difficulty to properly see and manage the subsurface of contaminated areas are significant issues. As a result, selecting the right bioremediation method to successfully decrease pollutant concentrations to safe levels is critical to a successful bioremediation project. Furthermore, bio stimulation and bio augmentation are two key methods to enhancing bioremediation, provided that environmental variables that influence bioremediation effectiveness are maintained at optimum levels. This study delves further into the two main bioremediation methods, their principles, benefits, drawbacks, and future possibilities.*

**KEYWORDS:** *Biodegradation, Biological, Bioremediation, Pollution, Soil.*

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