



## Some aspects of remediation of contaminated soils

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Soils are essential components of the environment, a limited precious and fragile resource, the quality of which should be preserved. The concentration, chemical form and distribution of potential harmful elements in soils depends on parent rocks, weathering, soil type and soil use. However, their concentration can be altered by mismanagement of industrial and mining activities, energy generation, traffic increase, overuse of agrochemicals, sewage sludge and waste disposal, causing contamination, environmental problems and health concerns. Heavy metals, some metalloids and radionuclides are persistent in the environment. This persistence hampers the cost/efficiency of remediation technologies. The choice of the most appropriate soil remediation techniques depends of many factors and essentially of the specific site. This contribution aims to offer an overview of the main remediation methods in contaminated soils. There are two main groups of technologies: the first group dealing with containment and confinement, minimizing their toxicity, mobility and bioavailability. Containment measures include covering, sealing, encapsulation and immobilization and stabilization. The second group, remediation with decontamination, is based on the remotion, clean up and/or destruction of contaminants. This group includes mechanical procedures, physical separations, chemical technologies such as soil washing with leaching or precipitation of harmful elements, soil flushing, thermal treatments and electrokinetic technologies. There are also two approaches of biological nature: bioremediation and phytoremediation. Case studies from Chile, Ecuador, Italy, Korea, Peru, Portugal, Russia and Spain, will be discussed in accordance with the time available.