

R&D Needs for Improvement of Contaminated Land Risk Assessment Recommendations on scientific priorities for future R&D programmes

Within the concerted action CARACAS leading experts on contaminated land risk assessment from all European countries have identified areas where significant improvements in the science base would greatly reduce the cost and increase the certainty of fitness-for-use assessments.

Research Needs

The Nature of Contaminated Land

Site characterisation: extent, intensity and environmental transport and fate of pollution

- robust and rapid low-cost techniques for investigation of potentially contaminated sites
- improved methods for estimating the accuracy and variability of the whole sampling and analytical process
- methods that yield information at spatial scales relevant for exposure assessment
- characterisation by biosensors and bioassays
- methods to assess migration of groundwater contamination
- methods to assess the natural potential of soil to reduce contaminants to acceptable risk levels and to monitor the process
- the interaction and general fate of contaminant mixtures
- detection of non-aqueous phase liquids and the prediction of their fate.

Bioavailability of contaminants in soil and groundwater

- to study the interaction between organisms (soil fauna, bacteria, plants) and their chemical environment
- time dependence (ageing) of bioavailability
 - cost effective procedures for estimating bioavailable fractions in the environment.

Fitness for Use

Human health risks

- validation of human exposure pathways
- availability of contaminants within the human body
- availability of contaminants in the soil as compared to the availability in the animal experiments underlying most toxicological reference values.

Ecological risk assessment

- impact of a site on its environment
- ecological recovery at the site
- changes in community structure caused by pollution-induced tolerance versus classical ecotoxicological endpoints
- biomagnification and adverse effects on food chains
- ecological soil quality requirements related to human land use.

Risk perception and communication

- Risk perception of contaminated land
- Development of communication strategies: how to communicate the results of risk assessments and the choice of solutions to those potentially at risk and to other interested parties.

Remediation Technologies

- Processes of natural attenuation
- Low-energy approaches
- Cost-effective remedial technologies
- Monitoring of remediation