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Study on the contamination with metals in the soil around Holcim cement kiln in Merone, Italy

Conclusions

The high values of Cadmium, Thallium, Lead and Mercury measured in different seasons in the sites of Baggero, Nobile and Alzate Brianza are due to human contamination and they should not be underestimated, owing to their risks for human health.

We believe that further studies should be carried out to confirm this result, assess its size and severity and to ascertain its causes.

The presence of several toxic metals (mercury, lead, cadmium, copper, arsenic) in the emissions of Holcim cement kiln, the significant quantity of such metals released daily into the environment (especially of Mercury) and the presence of vulnerable sites in possible fall-out areas for the emissions of the cement kiln, such as farm land and two lakes used for fishing, deserve special attention.

In this respect, the following measures should be taken:

- To collect emissions data on all the main sources of heavy metals (in particular Mercury, Cadmium, Thallium and Lead) in the area
- In Holcim, to take regular and constant smokestack measures of metals, using sampling and assessment methods that can measure their real values, especially for cadmium, mercury, thallium and other specific metals to be used as tracers (for example, vanadium and nickel).
- To conduct a study on the contamination with mercury, cadmium and persistent chlorinated compounds in the fish of lake Pusiano
- To draw up an air dispersion model based on updated meteorological data for the area and considering the impact of the orography on wind patterns, in order to identify, with greater accuracy, the areas of fallout of cement kiln fine particulate emissions.
- On the basis of such model, to install a fixed monitoring network for sedimentary fine particulate matter with regular measurements of metal composition.
- To this end, we believe that the use of explanted lichens, to be used as passive sampling systems, could be a useful sampling tool.
- To regularly keep under control the concentration of toxic metals in sensitive soils and lake sediments.

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