

CHAPTER 5

Group Report: The Need for Standard Reference Material for Metal Analyses

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There is increasing interest globally in measuring levels of toxic elements in the environment and evaluating their long-term effects on human health and ecosystems. Since high quality analytical data is an essential prerequisite for arriving at estimates of exposure levels and quantification of global and regional cycles, quality control of the analytical data generated must be ensured, particularly in view of the matrix problems posed by the diversity of non-living and living materials to be analysed. The need to constantly update analytical skills and the ability to conform to rigorous standards of performance is appreciated even in some of the highly accredited laboratories.

Environmental pollution by trace metals has, of late, begun to cause concern in many countries outside the highly industrialized societies and some of them have already initiated limited monitoring programmes or participated in the recently concluded GEMS (Global Environmental Monitoring Systems) programme on Pb and Cd. Recognizing the urgent need to build data-bases on a regional basis, it is recommended that monitoring be encouraged and supported on a regional and sub-regional basis. In this context one can visualize a regional programme using rice, for example, as the monitor, with samples derived from more than one country in a given geographical region where rice is grown under comparable conditions of animal husbandry (Philippines, Viet Nam, Thailand, Burma, India, etc.). The use of shellfish, such as mussels, as global monitors was well illustrated by the international co-operative study known as Mussel Watch. Another example is pollution by arsenic arising out of burning fire wood as domestic fuel (many countries in Africa, Latin America, and in India). Yet another example is the co-operative study on mercury in fish and sediments organized by the UNEP regional seas programme. Besides the above specific reference standards, general standards need to be produced, so there can be a wide exchange of samples for inter-laboratory comparison on a regional basis.

Many reference materials already exist to ensure quality control in industrialized countries, such as those of the National Bureau of Standards in the USA, and the reference materials available for analysis through the International Atomic Energy Agency in Vienna. However, these materials are often beyond the budgets of scientists in developing countries and/or are of matrices and materials inappropriate, for example, for the tropics.

All countries entering into this new sphere of activity need to be provided with ready access to reference standards. The International Atomic Energy Agency in Vienna has been supplying limited numbers of biological samples as standards. It is understood that IAEA has a special responsibility to less developed countries in this connection.