

## Environmental traceability methodology by multi-isoscapes

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Stable isotope ratios of elements, together with the concentrations of elements, can trace a matter flow, the environmental condition of sites, ecosystem structure and food products. Spatio-temporal variation of multiple isotope ratios can be used for studying the earth systems from local to global point of view. By using the traceability function of the multiple isotope ratios, we can conduct research that contributes to solving global environmental problems covering various regions and time scales. Spatio-temporal variation of multiple isotope ratios can be used for studying earth systems, ranging from local to global scales. The information may serve as a key decision-making factor for local people to consider water, food and environmental security, all of which are fundamental for the sustainability of human society.

We are conducting a research for establishing a methodology for how to use the concept of environmental traceability. A combination of quantitative and qualitative tools, including “Multi-Isoscapes” (use of multiple elements and multiple isotope ratios, together with GIS-based mapping technique), social surveys, and workshops, are deployed to investigate the role of environmental traceability in confronting environmental issues. We hypothesize that the role and perception of traceability methods in transdisciplinary processes will differ among stakeholders and that the co-production of “Multi-Isoscapes” can act as an effective “bridging tool” for understanding and explaining variation in local environments. The ultimate objective of this research is to demonstrate the effectiveness of multi-isotopic information in solving global environmental issues. Research is taking place at sites in Ono City, Fukui; Otsuchi Town, Iwate; Saijo City, Ehime; Oshino Village, Yamanashi; the Chikusa river watershed, Hyogo; Lake Biwa and Yasu river watershed in Shiga; and Silang-Santa Rosa sub-watershed in the Philippines.

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