

The utility of isotopes is more effective if combined with chemical monitoring. Trace radiogenic and element characteristics of geothermal field matrices associated with the high background radiation areas (HBRA) of Kenya were studied and the combined potential of their profiles and multivariate relationships in surficial hydrothermal expressions system matrices of geothermally active HBRA were exploited for resource prospecting and environmental impact modelling. Some results are reported and it is shown how chemometrics and geostatistics assisted measurements could be combined with stable isotope studies. It is outlined how this work, part of the IAEA Project RAF/8/047 ("Introducing Isotope Hydrology for Exploration and Management of Geothermal Resources in the African Rift System"), will build on and enrich Kenya's previous participation in IAEA supported projects on the sustainable development of groundwater resources which aimed to facilitate the integration of isotope techniques with non-nuclear techniques for water resource development.