

SECTION D

D - 36

GEOCHEMICAL DATA BANKS FOR SRI LANKA—THE BASIS FOR A FUTURE AGRICULTURAL STRATEGY

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The geochemical status of the soils of a region determines its fertility and agricultural productivity. The presence of elements necessary for biomass production is chiefly controlled by the occurrence of the proper rocks lying under, the climatic and tectonic conditions. Sri Lanka provides an excellent model for the study of contrasting features associated with variations of the above mentioned factors. The Dry Zone of Sri Lanka has little rainfall for most of the year and is underlain by rocks which contribute little by way of nutrient elements. Further, being tectonically inactive and due to the flat topography, there is virtually no replenishments of the elements, essential for biomass production. This is in contrast to the Wet Zone of Sri Lanka where the difference in the geochemistry of the soil is sharply reflected in the high fertility and agricultural productivity.

In the processes associated with rock-soil biomass interactions the following rates need to be considered.

Element X, Y, Z,.....in rock
rate K_1

Element X, Y, Z,.....in soil
rate K_2

Element X, Y, Z,.....in biomass product

According to the laws of conservation, if rate $K_2 > K_1$ infertility prevails. Using these criteria it can be shown that the most infertile regions are associated with lands of low elevation, climates with marked drought periods and great tectonic stability. Sri Lanka has a number of features worthy of note in such a case study. (1) It is located in the tropical equatorial belt and has very well marked Dry and Wet zones within a comparatively short distance. (2) There are 3 clearly demarcated physiographic regions that correspond to the Dry, Wet and Intermediate zones. (3) It has contrasting geological features that influence the rates K_1 and K_2 and hence marked contrasts in the biomass production.

The patterns of geochemical migration of Mg, K, Fe, Mn and base saturation were studied for the different climatic and physiographic zones and a marked contrast was seen which resulted in different agricultural productivity and hence social structure.

The compilation of geochemical data banks and production of geochemical atlases are of national importance and these could be used in a number of disciplines including agriculture, health and mineral exploration.