

TARGET AREAS FOR EXPLORATION OF CRITICAL ELEMENTS-K, LI AND MG IN INDIAN TERRAIN FOR FERTILIZER, STORAGE BATTERY AND STRATEGIC NEEDS

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Abstract

The need to extract Earth materials is always driven by a country's priorities and programmes from time to time on Development, Securities and Economy. Minerals which might (a) impact the Economy due to import and (b) face threat in supply-chain for food, energy and strategy securities turn Critical. Minerals for military use are Strategic, yet all strategic minerals need not be critical. Elements for Essential, Development and Strategic Programs that are likely to be disrupted are critical. Critical minerals are sources for the metallic and non-metallic elements that are cardinal to high-tech sectors.

Mineral exploration, mining and processing for fertilizer element potassium (K), battery element lithium (Li) and alloy element magnesium (Mg) need to be aggressively planned and executed to meet the future demands on account of food security, stored-energy security and defence applications of these elements. That would result in savings on import bills on muriate of potash, Li-batteries and Mg-alloys and improve the mineral-GDP of the country. Innovations in processing of K, Li and Mg from brines, bitters and brine-associated sedimentary deposits need to be stepped up. This would call for fresh at-home researches on mapping of salt-flats by remote-sensing, creation of spectral signatures of Earth materials rich in K, Li and Mg by hyperspectral remote-sensing, electrochemical, electrolytic, reverse osmosis and membrane technologies on salt flat sediments, brines and bitters.

Besides identification of salt flats or pans (salars) by remote-sensing and creation of hyperspectral library on various (elements-bearing) Earth materials of economic value, concurrent geological exploration and field investigations to locate Earth materials enriched in K, Li and Mg have to be launched. Target areas for geological exploration of these three elements are identified as, to begin with, the salt flats (salars) of (1) Rann of Kutch, Gujarat; (2) Sambhar Lake area, Rajasthan; (3) Pangong Tso Lake, Ladakh; (4) along the East Coast of Andhra Pradesh and Tamil Nadu. Besides, the brines of (i) Lonar Lake in Buldhana district, Maharashtra, (ii) Chilka Lake, Odisha, and (iii) Pulicat Lake, Tamil Nadu are identified as target areas for the exploration of K, Li and Mg.

Keywords: Critical elements, Exploration, Target areas, Fertilizer, Storage Battery, potash, lithium, magnesium.