

Urban areas and the global flow of potassium

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Abstract

In 2016, planning permission was granted to Sirius Minerals Ltd to mine potassium (K) from the mineral polyhalite in North Yorkshire National Park, UK. We show the impacts of such local decision on a global scale by illustrating the supply risks of K fertilizer considering the global and urban metabolism of potassium. More than 90% of all potassium mined is used as fertilizer but there is no sink of potassium other than the sea (Manning, 2015). K is of key importance to global and local policy, but interactions are constrained by separate policies. Supplies of potassium have been raised of highest concern especially in Africa and material flow accounting can help to identify the scale of the problem and the potential solutions (Fernández et al., 2015; Sheldrick and Lingard, 2004).

We developed a database that quantifies and illustrates the global and urban flow of potassium that is needed to feed the city. The poster presentation shows the supply and consumer chain of K from 'mine to mouth' using material flow and life cycle assessment principles. Using food composition data we calculate the human potassium intake, based on average daily food intake, diet and census data for the North East of England and the city of Newcastle. We link this back to the global potassium production using COMTRADE database to quantify the demands. Despite supposedly available potassium, we identify potential bottlenecks of supplies for Western cities and discuss problems of nutrient loss and soil conditioning for the cities in the Southern Hemisphere. We make recommendations to address the problems by improving policy, use of non-renewable resources for food production and the supply, consumption and recycling of potassium.

References

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