



Declaration on global phosphorus security

We believe that current global phosphorus usage practices are threatening the world's future ability to produce food and are responsible for widespread eutrophication. Phosphorus is an essential element for all life, and a limiting nutrient in food production. The main source of phosphorus for fertilizer production today is phosphate rock – a non-renewable resource. While estimates vary regarding when high-grade reserves will be depleted, we believe we are likely to see a peak in global phosphate rock production within the next few decades after which demand will exceed supply. What is also clear is that:

- the long-term global demand for phosphorus will increase, due to: increasing population, increasing phosphorus-demanding diets including meat and dairy, increasing demand for non-food crops such as biofuels, increasing need to boost soil fertility in developing countries, especially in parts of Africa;
- while all farmers need access to phosphorus, remaining phosphate reserves are controlled by just a few countries, including China, US and Morocco (which also controls Western Saharan reserves);
- the quality of remaining reserves is decreasing, both in terms of decreasing phosphorus concentration (% P_2O_5) and increased associated heavy metals like Cadmium and Uranium;
- the energy cost of mining, processing and particularly transporting phosphate rock and fertilizers around the world to the farm gate is increasing;
- cheap fertilizers are likely to be a thing of the past in the long-term, and more short-term price spikes such as the 800% phosphate rock price increase in 2008 could occur; and
- phosphorus discharged from out-of-date sewage treatment plants and lost via agricultural erosion and runoff is contributing to a global epidemic of eutrophication in freshwater, estuarine and near shore ocean environments, and contributing to the loss of potable water resources, aquatic biodiversity and formation of large ocean “dead zones”.

There is no substitute for phosphorus in food production and phosphorus cannot be manufactured or extracted from the atmosphere. However we believe the current use of phosphorus for food production is also largely inefficient. For example, approximately 80% of the phosphorus contained in rock mined for food production never reaches the food consumed by the global population. Phosphorus is ‘lost’ from the food system at all key stages, including mining and processing, accumulation in agricultural soils, food processing, food consumption and excretion. For example, each year, the global population generates 3 million tonnes of phosphorus in excreta, most of which ends up in water bodies and can cause eutrophication if not intentionally recovered and reused. There are currently no existing international organisations, policies, protocols or guidelines explicitly governing global phosphorus resources in the long-term for future food security.

We believe that due to these increasing environmental, economic and ethical concerns about the current sources and use of phosphorus in food production, and the global water quality problems caused by excessive phosphorus runoff, there is a pressing need to develop a coordinated response to global phosphorus scarcity, that includes: a) the development and implementation of sustainable systems and strategies for the recovery of phosphorus from the food system (including crop residues, manure, food waste and excreta) for reuse in agriculture; b) measures to reduce the demand for phosphorus and losses to water and non-arable land (including increasing efficiency of phosphorus use in agriculture and food production and consumption and changing diets); and c) effective and inclusive governance and associated institutional arrangements to ensure long-term phosphorus security.

We believe the action required to achieve phosphorus *security* should be aligned with the principles of sustainable development, and seek to identify synergies with solutions to other pertinent global challenges, such as climate change, water and energy scarcity, water pollution and food security.

Signed,

Global Phosphorus Research Initiative members and affiliates



About the Global Phosphorus Research Initiative

The Global Phosphorus Research Initiative (GPRI) is a collaboration between independent research institutes in Europe, Australia and North America. The main objective of the GPRI is to facilitate quality interdisciplinary research on global phosphorus security for future food production. In addition to research, the GPRI also facilitates networking, dialogue and awareness raising among policy makers, industry, scientists and the community on the implications of global phosphorus scarcity and possible solutions.

The GPRI was co-founded in early 2008 by researchers at the Institute for Sustainable Futures at the University of Technology, Sydney (UTS), and the Department of Water and Environmental Studies at Linköping University, Sweden. Today, GPRI members also include the Stockholm Environment Institute (SEI) in Sweden, the University of British Columbia (UBC) in Canada and Wageningen University in The Netherlands.

Relevant publications, ongoing news and events can be found at our website: www.phosphorusfutures.net. Here you can also find information on peak phosphorus and other aspects of phosphorus scarcity. We welcome your feedback, comments and questions – please email Dana.Cordell@uts.edu.au.

A Global Phosphorus Network

The GPRI is developing a global network of concerned scientists, practitioners, policy-makers, industry, NGOs and citizens. Please visit us at www.phosphorusfutures.net if you wish to be informed of the launch and/or wish to join the Network.