

**Report of a Dialogue session titled “Nutrient for Food or Pollution?”**

**organized by**

**Global Partnership on Nutrient Management (GPNM)**

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Nutrients are crucial components in agricultural production systems and are deemed to be part of the solution to address food security in the light of an increasing global population and the degradation of soils. Unfortunately the same nutrients can also lead to eutrophication of aquatic systems leading to many adverse impacts with huge costs to the global community.

Mismanagement of nitrogen and phosphorus (key nutrients limiting growth) have resulted in numerous cases of environmental problems worldwide. Nutrient availability and use across the world is however, not uniform. In some parts of the world there is "too much" of nutrients while in some other parts there is "too little" of it. Both situations (too much or too little) can lead to numerous problems. Limited application of nutrients, e.g., in Africa has contributed to the decline in soil fertility due to soil nutrient mining. Furthermore there is an envisaged surge in nutrient use driven by population pressure and potential depletion of phosphorus, which mainly comes from mainly mined phosphate rock, a finite resource. Given such a background the objective of the session was to explore feasible nutrient management strategies that can be adopted to increase nutrient use efficiency that optimize yields and minimize environmental pollution.

The session was made up of various expert presentations covering all facets of nutrient management from 'cradle to the grave', including successful case studies from China and India. Each presentation was followed by a discussion to gain further insight into the various topics. From the presentations it is evident that there is still a lot of misuse and over application of fertilizers in some countries mainly because the prices of fertilizers are very low due to subsidies, as well as a lack of knowledge on sustainable fertilizer use for crop production and soil health. Farmers often take the view that they have nothing to lose but to gain when they over apply fertilizers. While discussing the possibility of reducing nutrient use, some experts were of the opinion that the use of nutrients in regions like Africa is inevitable since it has the oldest soils and these have been severely degraded over time.

However the situation in Europe is different in that the soils are comparably new, and nutrients have been over applied for the last decades. The time has now come to drastically reduce this over application of nutrients. It was noted that a lot of strategies for sustainable nutrient management have been successfully implemented in Europe and other developed regions however most of them cannot be replicated in developing nations because of small farm size and lack of/unavailability of mechanized agriculture. From the success story in Europe it also emerged that some of their nutrient management strategies would not result in net success but would trigger nutrient problems in other regions. An example is the reduction of livestock in Europe as a strategy without any corresponding reduction in consumption of meat and other livestock products, means transferring immediate nutrients management problems to countries supplying livestock products to Europe.

Understanding of plant nutrient requirement ratio was highlighted as critical in devising sustainable nutrient management strategies. An example is India where at one point they subsidized nitrogen fertilizers and this resulted in increasing use of nitrogen fertilizers but there

was no increase in yield since the crops were limited by other nutrients like phosphorus which was not subsidized. Recognizing this policy deficiency the Indian government has now introduced "nutrients-based subsidy" programme. It was interesting to note that recently a project has been initiated in India to monitor the impacts of present nutrient use practices on environment through ecosystem health report card and this is now being piloted in the Chilika lake region of Odisha state of India. The project has the potential of being replicated in other parts of India and other countries where it is relevant. The Chilika Lake Development Authority of India and the Laguna de Bay of the Philippines has already started a collaborative program to refine the methodology and replicate this.

Unsecure tenure systems were noted to be influencing poor nutrient management hence there was a call for reforms on tenure systems. Analyzing nutrient flows and determining nutrient budgets was also identified as crucial. Though feasible it is hindered by non-availability of data in many developing countries. On the issue of depletion of finite phosphorus the presentation showed that we are close to a point where recovery of phosphorus will be inevitable. However it was noted that this would require economically feasible technologies for phosphorus recovery from various waste streams. It was also noted that there is need for risk insurance for farmers to implement sustainable nutrient management strategies. The argument was that farmers are not willing to try something new if they are not protected against the worst case scenario of severe loss. Viewing from this perspective there was general consensus in support of a holistic approach of integrated nutrient management for sustainable agriculture.

The case study from China pointed out some of the critical issues that are needed to increase yields and reduce use of nitrogen and phosphorus. China drawing from the experiences of integrated nutrient management and integrated soil-crop system management adopted a 3 steps system. They are;

- optimization of nutrient inputs taking into considerations all possible sources of nutrients
- matching of soil quality with the selection of crops and their requirements spatially and temporally and
- deploying all possible yield increase measures into considerations

In conclusion the session agreed that sustainable nutrient management is of critical importance for ensuring soil health, food security and human wellbeing, and will require approaches that can be adapted to national and regional settings. Strengthening of extension services by national governments is crucial to improve nutrient use efficiency at the farm level. There was a general consensus that the issue should remain on the agenda and that further dialogue was needed. The Global Partnership on Nutrient Management (GPNM) which is endorsed by 64 governments and the European Commission should continue in its role of building a consensus in promoting nutrient use efficiency and work with the governments and other stakeholders to develop guidance, strategies or policies on the sustainable use of nutrients so as to improve nutrient use efficiency with attendant economic benefits for all stakeholders, including farmers, and to mitigate negative environmental impacts.

The session was moderated by Dr. Anjan Datta of United Nations Environment Programme while Mr. Tallent Dadi of Institute for Advance Sustainability Studies (IASS) of Potsdam acted as a rapporteur of the session.