Brainstorming on the Issues of Alternative Potash Fertilizers

Session chairs - A. Msolla - Soil scientist (AFAP)

- A. Chiwona – PhD researcher (U. Newcastle)

Executive Summary – Moving away from traditional potash sources (e.g., KCl) to exploit locally available alternatives (e.g., K-feldspar), requires an understanding of interconnected issues at multiple levels. Some questions and challenges of alternative potash are individuated in the domain of soil science, agronomy and geology (e.g., soil quality, crop response to K-fertilizers, distribution of alternative K-sources), whereas other in the domain of macro-economy, market accessibility and specific local conditions (e.g., infrastructure, farmers attitude and education towards the use of fertilizers, climate change, seasonality of crops, number of harvests per year, etc.). Such a complex matter requires dialogue among individuals with different backgrounds, both technical and geographical, who can bring to the table different perspectives towards the final common goal of adoption of alternative potash fertilizers.

This session, led by an expert and experienced soil scientist from the African Fertilizer and Agribusiness Partnership (AFAP) as well as a geology PhD researcher, had the following questions as a framework of discussion:

1. Where is the most crucial need for alternative potash fertilizers (geography)?
2. What are the needs that are currently unfulfilled from the perspective of the farmer?
3. How important are international trades and relationships between countries?
4. What is the role of governments and law-makers?
5. Is there a path toward a global action on alternative fertilizers?
6. Are there precedent successes or case studies?

These questions helped to set the stage for the workshop, and to stimulate engagement and participation of all attendees, also considering the more issue-specific sessions described Nexus sessions.

Prior the commencing of the discussion, Dr. Msolla shared some of his work and challenges, on the key role of agrodealers in getting the fertilizers to the farmers (see presentation). Mr. Chiwona also presented his perspective (see presentation).
Overall, it is clear that fertilizers are key to develop agriculture in many areas of the world. Furthermore, they typically attract the interest of different parties such as researchers, banks and NGOs. For Africa specifically, the topic of alternative and access to fertilizers is at the center of African agriculture and growth in the coming decade. Africa is open for business, and the alternative potash workshop is timely. A few questions remain open: where is the priority? Who is going to fund projects that develop new or adoption of fertilizers? (Kanu). Some regions and countries in Africa have a key role, encompassing Uganda, Senegal, Burkina Faso, Congo, Ghana, Mozambique, Cameroun, Tanzania and Chad.

While it is true that the specific link agriculture-soil quality-fertilizer is not well defined for Africa, some success stories are well known from other countries, for example Brazil and the Rochagem movement. This is an important message. Historically, there have been changes in the use, amount and type of fertilizers used in agriculture and therefore change it is indeed possible (Manning).

Many success stories on the use of alternative fertilizers do exist in Africa as well, but they are unknown. Many initiatives struggle to be funded, published or simply acknowledged. The fertilizer business is not economically profitable in developing countries and does not generate immediate reward. Knowledge transfer and dialogue across communities is typically difficult (Van Straaten).

Ultimately, the current situation and the momentum behind alternative potash can become an argument for leaders of those countries to put together business, research and educational initiatives.

Indeed, cooperation at a global scale between different actors will be the key for the success of alternative potash, and the private sector is willing to engage in such cooperation, which cannot happen on a purely technological level. As an example, a project in Brazil led by Terrativa, which is a mining company in its essence, could have not been successful without the knowledge brought in by agronomist and materials scientists (Wender). Farmers and policy-makers are key to the successful adoption of fertilizers (Le Cadre), and so is a strong political will. Generally, lack of potash fertilization is not recognized as a problem and a political push is needed in such direction. In Tanzania, 70% of soil are potash deficient (Msolla). Ministries are often divided and disconnected, or focus on very narrow issues (Van Straaten). Furthermore, politicians typically look at delivering results very quickly, which hinders the agrogeology (agronomy+geology+farmers) approach (Chiwona).

Perhaps, an important effort could stem from the educational sector. Modern technologies allow us to bring diverse communities to dialogue on educational projects. Online platforms could be used to promote the need of linking knowledge across different research fields, but also to educate farmers on the issues of fertilizers and agrogeology in general (Allanore). Biology and agroeology could be included in such an approach since the biological component is very important in fertility management (Le Cadre). There are opportunities to bring together different experts in congresses and meetings like the present workshop, or the Soil Science Society of East Africa meeting as well as the International Geoscience Congress (Msolla/Manning).

An additional point is that for the agrogeological approach to be successful, demonstrated cases of beneficial fertilization from geological sources need to be presented to the general public and research communities (Martins). Perhaps, the African Development Bank could help in identifying countries where a demonstration of the benefits of alternative potash could be carried out. From the Brazilian experience of Terrativa, a body of knowledge has been developed that could be transposed in African settings. Some possible target countries are given by Uganda, Mozambique, Senegal,
Cameroon and Malawi. The new concept of growth corridor (Mozambique-Tanzania) is emerging. However, a clear target country has not been defined from the discussion. The ideal target country would have chemical laboratories facilities as well as mining and agronomic expertise. The farmers should also be taken into account in this development: Where are they? How many are there? How can they be involved in demonstrating the success of agrogeology? The entire African continent is not that different from China when it comes to market fragmentation, i.e. many (80 million) small-scale farmers (Chiwona). Indeed, in such a context the key is the accessibility to the fertilizer market (Kanu).

When look at the South of the world, Brazil remains the best case study for agrogeology since technology transfer is easier than in other countries. As a general approximation, big farming estates are typically located in the Brazilian highlands, whereas small-scale farmers are in low valleys. Both big and small-scale farmers have a high degree of technical expertise and technology in Brazil (Martins).

As an overall recap of the session, the chairs provided the following summary based on the discussion:

1. Where is the most crucial need for alternative potash fertilizers (geography)?

   There is not yet a clear indication or proof of the areas with the highest K-depletion or where K-fertilization is particularly needed. Overall, it could be said that the entire African continent, China and Brazil are in need of K, but specific information is missing for Africa.

2. What are the needs that are currently unfulfilled from the perspective of the farmer?

   There is very little knowledge on the potash problem and fertilizers are not generally recognized as important chemicals to improve agricultural yields.

3. How important are international trades and relationships between countries?

   Accessibility to the fertilizer market is at the base of any envisioned agricultural development.

4. What is the role of governments and law-makers?

   It is a key role. Technological advances will not be successful without the support of politics, law-makers as well as farmers.

5. Is there a path toward a global action on alternative fertilizers?

   Cooperation among different communities, both technical (soil science, agronomy, farming, and policy-makers) and geographical (North-South and South-South cooperation), is the additional key factor that will make alternative fertilizers successful.

6. Are there precedent successes or case studies?

   Yes, in Brazil for example. Possibly in Africa as well, but information is difficult to access due to general lack of publicity and funding. If any, successful stories on the use of alternative fertilizers are typically over sighted.

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