Strengthening Africa’s capacity for innovation in animal agriculture: the agriculture–mining conundrum of grass or brass, bread or stones

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Abstract

In spite of its abundant mineral resources and the activities of many mining companies extracting those resources from only a very small part of the total land area, much of Africa is still in penury. Animal agriculture is a major contributor to the economy of many African countries, especially in the arid and semi-arid areas where it occupies about 80% of the land. The sector employs some 50% of the total agricultural labour force, contributes about 10% of the gross domestic product (GDP) and accounts for 40% of agricultural GDP. An estimated 100 million people work in the pastoral economy alone. Yet the livestock sector receives less than 2% of the national budgetary allocation for development, in spite of facing changing conditions and needing innovative thinking. African governments need to find the will to insist that mining companies contribute to country revenues, so that development of mineral wealth can provide financial resources to support agricultural development and innovation. Through their sense of corporate social responsibility mining companies already contribute to improved infrastructure and local community well-being. African governments need to adopt an ‘Innovation Platform approach’, to understand how to use mineral-derived revenue to overcome technological and institutional constraints in dealing with the ever-changing needs, environments and advances in agriculture, including the livestock sector, to achieve economic benefits.

This talk is about African agriculture, particularly animal agriculture, focusing on the agricultural and mining conundrum of grass or brass, bread or stones.

To start with, here are a few guiding principles and thoughts about agriculture and mining. The first is credited to the late former President of the Republic of Malawi, His Excellency Dr Bingu wa Mutharika, who said: ‘Africa cannot, and must not, live in the past. Africa must look to the future.’ He said this when he was the Chairman of the Assembly of the African Union (2010–11), when he gave his vision of a food-secure Africa.

*This paper was co-authored by Dr Adewale Adekunle (Forum for Agricultural Research in Africa) and Dr Jimmy Smith, Director-General, International Livestock Research Institute, www.ilri.org, and presented by Dr Yemi Akinbamiyo.
The second principle is by Jacques Diouf who said, when he was Director-General of the UN Food and Agriculture Organization (FAO), in 2009:

There is need for a high political leadership to take bold decisions and follow up with the required actions to eradicate hunger, so that all people in Africa can enjoy the most basic and fundamental of human rights — the right to food and thus to existence and life.

I also want to share the thoughts of Dr Jacqueline Sultan, the former Minister for Agriculture in Guinea. She said:

It is a challenge for the two sectors to co-exist. Given the choice between a sector that employs 100,000 people or the capacity to feed 12 million people, I prefer the latter.

Agriculture and mining in Africa

This conference has heard a little about the Africa Mining Vision. In brief, it aims at having ‘Transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development’. However, Africa, and especially its agriculture, is an interesting mix of challenges and opportunities (e.g. Figure 1).

For example, in many African countries, agriculture is still largely ‘backward’, engaging about 70% of the population, largely employing minimal mechanisation and instead using archaic and primordial tools, experiencing large gaps between scientists’ and farmers’ yields of strategic crops and livestock, and high variability in input use, access to markets, infrastructure and agricultural lending. Besides, the farming populace is largely ageing.

It is also very clear that the agricultural ‘landscape’ in Africa is changeable rather than plain: there are no ‘level playing fields’.

Figure 1. Mining and agriculture both create work so that people can afford to eat. Agriculture also produces the food.
For all of these reasons, the agricultural sector is in urgent need of innovative thinking, such as via an ‘Innovation Platform’ approach (Figure 2).

In the Innovation Platform approach, you take a particular problem — in our example, agriculture versus mining — and then you look for the key elements that can contribute towards a solution so that economic benefits accrue to the community. The diagram shows a scenario with technological constraints, institutional constraints and infrastructural constraints. Governance is an overarching factor. Innovations are required in all three distinct areas — technological, institutional and infrastructural — and all of these need to be encouraged in an integrated way.

For effectiveness and sustainability, innovation must be based on capacity-strengthening in three dimensions. In the first dimension are not only the research scientists but also the extension officers and private sector players who are directly involved. The second dimension includes the support staff and supervisors working with the people in the first dimension. In the third dimension is capacity-building at the level of the community and community organisations, focusing on natural resource management capabilities in the people on the land, whether smallholders or large landowners.

As an example, with NERICA, a new type of rice for Africa, the elements of the Innovation Platform approach came together, overcoming technological and some institutional and infrastructure challenges. This specially bred rice is tailored to African environmental conditions and also needs less field labour, which gives people including children more time for other occupations and schooling. At present 23 or more countries grow NERICA, despite a major bottleneck preventing access to sufficient seed. There has been important capacity-building to reach this point.

An Innovation Platform approach is urgently needed in the livestock sector in Africa. Livestock are a major contributor to the economy, especially in the arid and semi-arid areas where this sector occupies about 80% of the land (Figure 3).
Animal agriculture employs some 50% of the total agricultural labour force, contributes about 10% of the gross domestic product (GDP), accounts for 40% of agricultural GDP, and — this is very important — supports more people per hectare (functional capacity) than other types of agriculture. Yet, the sector receives less than 2% of the national budgetary allocation for development.

In land use and expanse it cuts across the whole continent. Looking at the Sahelian belt alone, comprising so many countries, tells you how important the livestock component is to the economy of the continent — in fact it has been estimated that about 100 million people are involved in only the pastoral economy in Africa. However, conditions for livestock systems are changing, and we need to understand that they are changing all the time, and apply innovative thinking to deal with that.

An Innovation Platform approach would enable us to look for the key elements that will allow economic benefits to accrue to the community. For example, we need to design a more coherent and dynamic research and policy agenda that benefits the poor. We need to target investments more adequately, and to bridge the technology–adoption gap, and to recognise the key drivers, which are:

• population increase,
• urbanisation,
• market access,
• shifts in demand, and
• climate change.
Grass vs brass; bread vs stones

Africa is very well endowed in mineral resources (Figure 4), but mining occupies a very small part of the total land area, just as in other countries of the world (Table 1). The unpalatable oxymoron here is that our continent, which has about ten countries ranking up in the top ten producers of mineral resources in the world, still is in penury, and this is expressed in an Ethiopian proverb: ‘The child of the Nile is thirsty’. This is the ‘grass–brass’ land challenge.

Conflicts arise where mining is perceived to compete for agricultural and grazing lands (‘grass vs brass’), and where comparable land cannot be purchased for farmers displaced by mining companies, or farmers have abandoned their lands near mines, and turned instead to artisanal mining (‘bread vs stones’). The Fraser Institute (Canada), at its ‘Mining Facts’ website, lists these and other negative and positive aspects of competition between mining and agriculture.

![Figure 4. Africa has huge mineral resources. Countries shaded brown are among the top 10 countries globally for quantities of a mineral resource produced; orange shading means that country has more than one resource-holding in the top 10.](image)

![Table 1. Mining use of land, as a percentage of available land mass](image)

<table>
<thead>
<tr>
<th>Country</th>
<th>Mining land use (% of available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>0.02–0.01</td>
</tr>
<tr>
<td>Canada</td>
<td>0.01</td>
</tr>
<tr>
<td>Peru</td>
<td>0.01</td>
</tr>
<tr>
<td>Brazil</td>
<td>&lt;0.45</td>
</tr>
<tr>
<td>Australia</td>
<td>&lt;0.26</td>
</tr>
</tbody>
</table>

From: Paulo Riveiro de Santana, Ombudsman, Department Nacional de Produção Mineral, December 2011.
‘Mining Facts’ (Fraser Institute 2012) says that there can be conflict between mining and agriculture over water resources, in relation to quantity — particularly where fresh water is scarce — and water quality. Water quality is regulated by environmental legislation, but developing countries generally have weak capacity to enforce this legislation. It seems, however, that
the current best practices of large-scale foreign-owned mines in Africa are less damaging to the environment than subsistence farming, poverty-related deforestation and communal pasturing.

In contrast, livestock production, especially of ruminants, has been accused of being one of the biggest contributors to climate change. Although water pollution by large-scale mining has been alleged, it has not been confirmed by reputable studies.

Mining in an area brings in better infrastructure, such as roads, electricity, water supply and sanitation. Agriculture benefits from an effective rural road network, with potentially fewer harvest losses, higher wages, lower transaction costs. Water, sanitation and electricity support local food processing. ‘Mining Facts’ gives as an example of corporate social responsibility the Ahfo Agribusiness Growth Initiative of Newmont Ghana Gold, which ‘has provided training to 1368 farmers to increase agricultural productivity and farm business skills’ (Fraser Institute 2012).

‘Mining Facts’ also cites an International Council on Mining & Metals study that found mining complementing agriculture, giving an example from Argentina where there was an increase in the area of cultivated land around a mine during the years 2001–07 (Fraser Institute 2012).

It is encouraging to see that mutual support and synergies are possible.

Looking forward

In 1862, the American Congress passed a land-grant bill whereby land was to be made available in each state for use in developing agriculture, via training colleges. In relation to mining versus agriculture in Africa, the question is, ‘Do we have the will?’ Can we insist the company operators in the mining sector contribute a percentage of their revenues, even as little as 0.05%, to promote agricultural development in their host countries?

In the context of unrelenting climate change and competition for natural resources we are presented with the clear choice of maintaining the jobs of 100,000 or keeping 12 million people food secure! I choose the latter.

The Forum for Agricultural Research in Africa (FARA) believes in the maxim ‘Africa feeding Africa’. For Africa to do this, and to resonate with the African Union’s vision of a food-secure Africa where no child is allowed to go to hungry, a viable option would be to develop home-grown Innovation Platforms in agricultural research for development.

Closing a few policy gaps will also help Africa’s mining–agriculture interactions.

1. We need transfer of knowledge and sharing of success stories — how can we hear from communities and learn from their experience?
2. We need more effective and indigenous assessment of vulnerability and adaptation, and we need to retain experts.

3. We need to strengthen national institutions so they develop and use multi-stakeholder and all-inclusive policy formulation and implementation, as well as information for decision-making, at appropriate scales.

4. We also need to improve the institutional framework for environmental impact assessment and its implementation.

**Concluding remarks**

The livestock sector in Africa deserves to receive greater attention than it is currently given. Systems are changing continually, and we need to understand and predict how systems will change in the future, so we can determine the outcomes we want. We need to engage in foresighting and visioning, which my institution, FARA, is now beginning to embrace. FARA has been proposing the Innovation Platform as an integrated mechanism to improve agricultural innovation required to upgrade African agriculture and make it a veritable driver of the economies of African countries.

There is a dearth of information about the actual impacts of mining on agriculture, especially in the livestock sector of Africa. Major studies and ‘the will’ on the subject are required.

Finally, you should not ‘give the fish’ where corporate responsibilities are concerned. That is, African countries must not rely on the community inputs of mining companies, because those inputs — ‘the fish’ — are limited to the region and operational life of a mine. Rather, the aim should be to ‘teach how to fish’.

In other words, empower African communities by building capacity for resilience and by investing revenues from mining into public goods, looking to the future.

I leave you with the statement of Jawaharlal Nehru, India’s Statesman and first Prime Minister, who said: ‘Everything can wait, but agriculture cannot wait.’

**References**