

Emerging Seed Markets: The Role of Brazilian, Chinese and Indian Seeds in African Agriculture

Introduction

In recent years, three of the largest emerging powers, Brazil, China and India, have all brought about incredible agricultural revolutions and seeds have played a big part in that story. Nowadays, their seed markets are all within the world's top ten in terms of value and their companies are eager to expand into new markets, particularly in Africa. Their development cooperation agendas are already focused on facilitating these overseas moves, and they come with a strong narrative that these seed producers and technical experts can help bring about similar success for Africa. It remains to be seen how true this is; however, we can already identify and analyse certain trends in the technology and policy that each is transferring.

The biggest Brazilian seed companies are largely merged with multinationals. Seed co-operation is focused on developing seed production and sales of Brazilian varieties.

However, knowledge transfers on seed banks and re-use of indigenous seeds also occur through civil society groups.

China maintains a strong comparative advantage in hybrid rice seed technology, but heavy competition in home markets is driving producers overseas. The Chinese development apparatus in Africa is providing a facilitating role, especially the Agricultural Technology Demonstration Centres.

India has a very vibrant private sector underpinned by strong public sector infrastructure. Few have made it into African markets so far, but partnerships with aid programmes have occurred and policy-level talks are ongoing.

This policy brief examines the development and expansion of each country's seed industry and how it is engaging with African seed systems. An understanding of these trends

matters primarily for the African farmers and policymakers engaging with these new flows, but it can also shed light on contrasts and opportunities for collaboration on seeds with the New Alliance for Food Security and Nutrition (NAFSN).

International context

Between 2000 and 2010, the international seed trade grew from US\$3.5bn to approximately US\$10bn. Furthermore, annual growth in the industry was pegged at 14 percent, having slowed only slightly to ten percent during the economic crisis¹. According to the International Seed Federation (ISF), Kenya, South Africa and Morocco were the only African countries exporting seeds worth more than US\$1m in 2011. China ranked 12th, Brazil 15th and India 27th in the list of countries recorded, with sales worth US\$209m, US\$172m and US\$59m respectively². In 2012, China climbed to 10th with US\$251m worth of exports; Brazil climbed to 14th place with sales dropping slightly to US\$165m; and India became the 26th largest with exports worth US\$67m³.

These countries' home markets are also considerable. The ISF found that in 2012 China, Brazil and India ranked 2nd, 4th and 6th respectively in terms of the estimated value of domestic seed markets⁴.

The Brazilian seed industry

Internal seed markets and overseas engagements

In 1997, Brazil's 'Cultivars Protection Act' formalised the enforcement of intellectual property rights (IPR) over seed strains⁵. Multinational seed companies with high-yielding varieties of hybrid seed, such as Monsanto, Syngenta or Dupont, moved

Box 1. Estimated value of domestic seed markets

Country	Value US\$ (millions)
USA	12,000
China	9,950
France	2,800
Brazil	2,625
Canada	2,120
India	2,000
Japan	1,350
Germany	1,170
Argentina	990
Italy	767

quickly into the Brazilian markets. To obtain the indigenous cultivars local growers needed, the multinationals spearheaded a large number of mergers and acquisitions⁶, and formed partnerships with state-owned plant breeding institutions such as EMBRAPA⁷ and IRGA⁸. In the latter case, IPR over varieties developed are then shared by both the public and private institution⁹.

Although the increased privatisation of the seed industry led to hybrid seed varieties with higher yields and better resistance against pests and chemicals, these technological innovations have often been aimed at large-scale farming where profits are higher. Furthermore, the attempted enforcement of IPR by multinationals

has led to protracted legal battles in Brazil, often seen as punitive towards poorer farmers who fight for the right to reproduce seeds they have bought without having to pay recurring royalties¹⁰.

The Landless Workers' Movement (MST) is a civil society group in Brazil that has been particularly vocal against EMBRAPA's cooperation with private groups. They argue that these engagements make EMBRAPA complicit in the promotion of multinational agribusiness interests, and that it should not be using state funds to this end¹¹.

Brazilian seeds in Africa today

At present, there are increasing amounts of Brazilian agricultural cooperation with Africa in terms of machinery, investments and research, but the sale and transfer of seeds has only taken place through cooperation projects in a handful of countries so far. Nonetheless, an EMBRAPA project in Senegal and the ProSavana project in Mozambique help reveal how Brazil has begun to export its public-private model to Africa.

In 2010, in collaboration with the Senegalese Agricultural Research Institute, EMBRAPA carried out tests on four varieties of rice for tropical climates and eight varieties of dry-land rice. While the latter eight failed to withstand droughts in the area in which they were tested, the former four varieties all performed better than local cultivars¹². This fits into a wider project of agricultural cooperation between the two countries that also includes knowledge transfers and a drive towards farm mechanisation¹³.

In Mozambique, the Brazilian Cooperation Agency (ABC) is engaged in Brazil's largest agricultural cooperation project, called ProSavana. One of the programme's principles

is that every project within its remit should benefit smallholder farmers. In line with this, the programme states that the Mozambican government should validate indigenous seeds; however, there appears to be no funding into the promotion of informal seed markets that would more directly benefit smallholder farmers. Rather, ProSavana funding appears to be exclusively focused on introducing seed companies (largely Brazilian) to the region. No doubt this could have a potentially positive effect on large-scale farming operations, but it will certainly be another source of contention for civil society groups who have already been complaining that the project is threatening the livelihoods of thousands of farmers in the region.

Non-profit driven cooperation

In Africa, as in Brazil, depending on how draconian the enforcement of IPR is over the reproduction of seeds, this market-based model can mean such technology is unobtainable for poorer smallholder farmers. As a result, alongside the promotion of market-led seed systems in Africa, the Brazilian government also backed a knowledge sharing initiative between Brazilian civil society groups with Mozambican and South African farmers.

This programme was executed in 2011 and helped implement seed banks in areas of family farming, explicitly using native seeds. This was coordinated by the General Secretariat of the Presidency of the Brazilian Republic and the Brazilian Cooperation Agency¹⁴. However, this appears to be the only Brazilian backed project on supporting the production and use of indigenous seeds for African smallholders so far, and it seems unlikely that many more will follow. Furthermore, EMBRAPA was noticeably absent from this project.

That said, connections did continue beyond this, backed by a grouping of NGOs and social movements such as Oxfam and Cresça, as well as similar civil society groups from Brazil and Mozambique such as the Landless Workers' Movement (MST) and the Mozambican Farmers' Union (UNAC). Their follow-up project taught a community of 4,500 farmers to recover, reproduce, select and conserve the seeds of native species to create local seed banks and markets¹⁵.

The Chinese seed industry

Internal seed market and drivers to go overseas

Since China liberalised its seed markets in 2000, its industries have received increasing competition from multinationals. While China is still a global leader in some forms of seed such as rice, it is estimated that over 50 percent of vegetable seeds sold in China and over 80 percent of profits in this market are now controlled by foreign companies¹⁶. This is partly to do with superior seed technology from foreign companies such as Monsanto or Syngenta, but also because China's own seed producers are often small-scale¹⁷ and lacking in research and development investments¹⁸. As a result, some producers have grown interested in finding new markets abroad.

Since joining the WTO, China's government has promoted the internationalisation of its various business sectors under the "going out" policy (走出去). Academics, policymakers and journalists have been referring to the "going out" of the seed industry in this context, but there is still no concrete data on how many Chinese seed companies are currently operating in Africa. That said, something can be drawn from

their analyses about the trends and challenges emerging so far.

Sales Channels

In 2011 the deputy director of the National Agricultural Technology Extension and Service Centre (农业部全国农业技术推广服务中心) said that there are still no real guidelines for seed companies to follow abroad, nor do any of them have a permanent base in these markets¹⁹. His hope was to change this by increasing state support for those companies going abroad. Since then, it appears that there are still relatively few Chinese seed companies that have moved into African markets, but they are now increasingly marketing themselves through China's Agricultural Technology Demonstration Centres (ATDCs).

The ATDCs promote companies' seeds within their own training programmes in Africa, as well as set up stalls in local agricultural trade fairs. In an online article, the company Chongqing Zhongyi Seed Co., Ltd. praises the success of the Tanzanian ATDC in a recent trade fair where its seeds were on sale next to examples of the produce from the ATDC's demonstration farm, using Zhongyi's seeds²⁰. The seeds sold were 'rice, maize, vegetables, etc.' and the article concludes by saying that these ATDCs are proving to be an invaluable vehicle for Chinese companies' fulfilment of the 'going out' policy into foreign markets.

Challenges

Hybrid rice seeds are one of China's most important products in the seed market and since 2004 exports have been growing; however, they still face a number of barriers to entry. On the one hand many African countries still ban genetically modified seeds²¹, and on the

other, seeds leaving China are vetted by the Chinese authorities to make sure that their intellectual property will not be easily copied in foreign markets²². Furthermore, while some seed companies have clearly got around this problem, many are also said to be facing the challenge of mounting production costs back home due to rising land prices and labour costs²³.

IPR over the seeds are also a very important consideration for Chinese companies. Although the ATDCs grow rice on their demonstration farms using seeds from their Chinese suppliers, they are not allowed to keep the parent plants on site. Rather, they have to buy new seeds from China every year²⁴. Finding local farmers willing to buy new seeds every year has also been a problem for the Tanzanian ATDC. Critiquing their use of inferior quality seeds, the manager says, 'people tend to muddle through, without any wider foresight.'²⁵

The Indian seed industry

Current status

The Indian seed industry has grown significantly over the last decade, with turnover estimated now at US\$2.6bn, tripling inside of a decade²⁶. It is built on the foundations of strong public sector commitment to research and development that started in the 1960s under the Green Revolution. Support from international foundations established breeding centres for all major crops, a nationwide trial system and extension support. Today the private sector plays a dominant role both in R&D and marketing, but the underlying infrastructure, including skills, capacity and, crucially, germplasm, has been the result of public investments over many decades.

With the private sector dominating the market (with around 76 percent market share²⁷), there has been intense competition and a proliferation of companies. In addition there are many others that are small unregistered operations, focusing on very local markets. Contrary to claims by some²⁸, the industry has not seen a process of consolidation and concentration²⁹. It certainly is differentiated, with some now very large companies. Some of these are foreign-owned and financed from external sources, with R&D flowing from labs in Europe and the US (for example, BASF, Bayer CropScience, Dow Agrosciences and Monsanto). Others are wholly Indian owned and have developed their own R&D capacity (for example Advanta, Shriram Bioseed, Dev-gen and Mahyco), some as specialised agri-supply companies, others as part of larger industrial conglomerates.

However, despite the vibrancy of the domestic seed sector, many companies are looking to export markets for growth. Regardless of its scale, the Indian seed industry currently contributes only one percent to total global exports. Most exports are focused on the South Asian Association for Regional Cooperation (SAARC) region, but increasingly Africa is being looked at as a potential market, including by companies such as J K Seeds, Namdhari Seeds, Nuziveedu Seeds, Nath Seeds, Rasi and Vibha³⁰.

The Indian seed industry in Africa

A number of arguments are being made in favour of expansion to Africa. The 'agroecological equivalence' argument is often repeated, along with the possibility of exporting experience from India's own Green Revolution. Furthermore, the Indian seed industry's focus on small farmers and complex rural marketing systems is seen as a comparative advantage, certainly compared

to the major US and European companies. But also Africa is seen as a potentially huge market where the gains made in India over the last 20 years can be repeated given the right incentives and policy conditions.

Africa, however, is an unknown market, and companies are treading carefully. Some have got a foothold on the continent and are expanding, while others are sending out feelers, and others still have joined aid-funded programmes providing linkages. A number of Indian agribusiness companies have acquired land in Africa, particularly in recent years. They have taken advantage of encouragements from African governments and set up new farms growing everything from flowers to vegetables to maize and rice.

A number of aid-supported programmes have started to make links between India and Africa around agribusiness. Most of these have been sponsored by the US government through the United States Agency for International Development (USAID). One particular high-profile initiative, the 'India-Africa Seed Bridge', operating under the umbrella of the Feed the Future Programme and supported by the National Seed Association of India (NSAI), is being run by the Syngenta Foundation, supported by Indian advisers with good contacts in the seed industry³¹, and linked in Africa to the African Agricultural Technology Foundation (AATF) and African Seed Trade Association (AFTSA). The project focuses on Liberia, Kenya and Malawi, and involves a seed testing element in Senegal. The aim is to release new seeds on a regional basis through a harmonisation agreement in West Africa operated under ECOWAS. To date four companies (Nirmal, Ganga Kaveri, Ankur Seeds and Indo-American Hybrids) are involved, and others are being encouraged to join.

In addition, there have been bilateral discussions between Indian and African policymakers under the auspices of the India-Africa Forum, and here seed sector interactions were emphasised. The African Union has been strongly involved, encouraging Indian investments as part of the African Seed and Biotechnology Programme. Study tours of African biosafety regulators have been arranged to India, and supported the New Partnership for Africa's Development (NEPAD) African Biosafety Network of Expertise³². Technical exchanges are also picking up, with initiatives from the Indian Council of Agricultural Research (ICAR), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Platform for India-Africa Partnership in Agriculture (PIAPA)³³ and AGRA/PASS (Alliance for a Green Revolution in Africa / Programme for Africa's Seed Systems) among others. These involve training and capacity building of Africans in India³⁴, including the awarding of the C.V. Raman fellowships³⁵, and the building of longer term partnerships around research and development³⁶, part of a wider set of Government of India initiatives³⁷.

Conclusions

The New Alliance programme's approach to seeds is not so different from those of Brazil, China and India. Both groups stress the pro-poor benefits around good quality seed technology that can improve yields, nutrition and incomes. Alongside this, both have a strong focus on lowering barriers of entry to the African seed markets, but under the New Alliance this idea seems to have been taken much more seriously by the African governments involved³⁸.

These similarities of approach are borne out by the fact that in a few small cases the New Alliance projects are already working with or alongside Brazilian, Chinese and Indian

seed producers. The New Alliance project in Senegal involves the adaptation of Chinese rice and vegetable seeds³⁹; Ghana and others are receiving investments from an India-based seed company called United Phosphorous Ltd.⁴⁰; and in Mozambique USAID is investing in the same local seed producer as the Brazilian government under its ProSavana aid programme⁴¹.

Brazil's government seems to be the only one of the three countries examined here that has experimented with non-profit driven models of seed sector development. Over time it will be interesting to see how successfully this Brazilian model is transferred through the ongoing links between civil society groups, and how it compares with the investment-led models.

Brazilian, Chinese and Indian companies often claim they have comparative advantages over the G8 companies, such as experience with smallholder farmers in their own countries, or their hybrid seeds that are more suited to the African climates⁴². It remains to be seen how pro-poor and sustainable the seed technologies being promoted ultimately are, but opportunities for market shaping, collaboration and knowledge sharing may yet emerge.

End Notes

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⁷ EMBRAPA is a state-owned company, affiliated with the Ministry of Agriculture, and engages in research and development on a variety of topics related to agriculture and animal cultivation. The institution's primary remit is to transfer or sell the high-yielding methods and technology it develops to Brazilian farmers at low cost, but more recently it has become a key figure in Brazilian cooperation programmes in Africa. For more information visit <http://www.embrapa.br/english>

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