

Indian seeds for African markets: South–South trade and technical cooperation

The success of India's generic pharmaceuticals industry is seen by some policymakers as a success for international development and cooperation, bringing affordable drugs to populations not only in India itself but across the developing world, including in Africa. Could India's thriving seed sector play a similar role for affordable, high-quality seeds? Sachin Chaturvedi, Dominic Glover and Ian Scoones explain the key issues.

From Indian pharma to African farmers?

Experts agree that Africa's farmers need quality seeds, but the continent's share in the global seed trade is very low. African countries often lack the institutional capacity to support the growth of seed markets in the continent, an issue that cuts across regulation and other areas. The supply of breeder seeds is weak and improved crop varieties are introduced extremely slowly. Foreign expertise and investment could help build capacity in crop breeding and other aspects of the seed sector, including management, logistics, marketing and the integration of new technologies (CTA 2014; RIS 2014; Gisselquist et al. 2013).

Over the last three decades, India has developed a successful international pharmaceuticals industry that produces and exports affordable, high-quality generic (non-proprietary) drugs around the world. Indian drug companies such as Cipla (Mumbai), Dr. Reddy's (Hyderabad), Natco Pharma (Hyderabad) and Sun Pharma (Mumbai) have become recognised global players. Indian firms produce around 20–22 percent of the world's generic drugs, and India is the fifth largest exporter of drugs and pharmaceuticals. The country ranks third in the manufacturing of active pharmaceutical ingredients (APIs), accounting for 6.5 percent of world API production (Chidambaram 2013).

India also has a thriving domestic seed industry that is bringing improved germplasm within reach of many Indian farmers. Could the Indian seed industry follow the example of the country's pharmaceuticals companies by bringing affordable and high-quality seeds to poor farmers in the global South – for example in Africa, where there is a great need? There is great potential as well. The international trade in seeds has grown from less than US\$2bn in 1970

to almost US\$12bn by 2013.¹ The commercial seed market is estimated to be US\$45bn, but in many African countries the domestic market is not more than US\$20m.

But how comparable are India's pharmaceuticals and seed sectors in reality? And what lessons could be learned from the pharma case that might be relevant to the seed sector? In this briefing note we explore these questions.

Genesis and evolution of the Indian pharma sector

In 1959, Justice N. Rajagopala Ayyangar's *Report on the Revision of the Patents Law* proposed a new regime for patents in India. After further deliberation and consultation the Patent Act was revised in 1970. The key measure which the new legislation introduced was to allow patents on processes but not products. The new law created the conditions for a generic drugs sector to emerge, made up of fledgling companies which reverse-engineered drugs that were under patent in foreign countries. By using novel processes to create the same end products, India's new drug firms were able to produce drugs for the Indian market that were restricted by intellectual property rights (IPR) laws in other jurisdictions. This trade created international tensions that eventually led to the Trade-Related Intellectual Property (TRIPS) agreement of the World Trade Organisation (WTO).

Various factors enabled the development of India's pharmaceutical capacity. Indian drug makers enjoyed the advantages of low production costs and high volumes, which allowed them to make big profits even while

they kept consumer prices low and expanded access to a range of therapies and cures. The presence in the country of a well-trained technical workforce allowed small start-up enterprises to expand rapidly as they tapped into India's unmet demand for affordable medicines.

Over time, interactions with universities and public research institutes stimulated the growth of in-house research and development (R&D) capacities within the expanding drugs firms. From the 1970s until the liberalisation of the sector in 1994, these supportive trends were underpinned by national industrial policies that prioritised import substitution and promoted the chemicals industry. By the time of liberalisation, India's drugs firms had already attained competitive positions in a global generics sector (UNDP 2010).

For the Government of India, the motivation behind a change in the patent law had been to ensure access to affordable drugs, for reasons of public health. The emergence of an indigenous drug industry was a happy side-effect. A similar opportunity allowed this blend of self-interest and benevolence to be extended on an international scale. When the size of the HIV/AIDS emergency in the global South led to international campaigns to give poor countries access to life-saving anti-retroviral drugs, India's generics companies were poised to exploit the chance (see Box 1). In 2005, when India was supposed to switch to the new TRIPS regime – obliging the country to recognise international product patents – generic drugs from India were so important that there were calls for the trade to be allowed to continue.

Box 1. Indian generic drugs and the HIV/AIDS emergency

In 2001 Cipla began to supply HIV/AIDS drugs to Africa at a steep discount, slashing the cost of treatment per patient from an international price of more than US\$10,000 per year to around US\$1 per day. This kind of move had been fiercely resisted by Western drug companies, but it resulted in a sharp increase in the proportion of African HIV/AIDS patients receiving treatment for the disease. Today, leading international donors and treatment providers including Doctors Without Borders (MSF) still depend heavily on Indian generic drugs for their HIV/AIDS programmes.

Sources: African Business (2012); Karunakara (2013).

Similar but different: The emergence of India's seed industry

India's commercial seed sector emerged in the 1950s, during the years after Independence. In its early years the industry benefited from substantial state support. The public sector was dominant in vital food crops, principally cereals, while the private sector was active in cash crops such as cotton and sunflower. The liberalisation of the Indian economy in the early 1990s and changes in seed policy stimulated an explosion in the number of private seed firms. Seed production increased by four times between 1991 and 2011. In 2001 India adopted the Protection of Plant Varieties and Farmers' Rights Act (PPVFR) to grant IPRs over crop cultivars and seeds – plant breeders' rights, but not patents. By 2010, the private sector's share in the seed market was about 90 percent (Manjunatha et al. 2013).

India's seed industry received another fillip with the arrival of transgenic cotton – Bt cotton – in the early 2000s. The new insect-resistant technology was introduced to India by an Indian firm, Mahyco (Jalna), in a strategic partnership with the US-based biotechnology transnational company Monsanto. Bt cotton was officially

approved for commercialisation in 2002 and within a few years the genetically modified trait had been licensed to dozens of cottonseed suppliers. More than 90 percent of Indian cotton farmers now plant Bt cotton hybrids, and in such a market there is little room for growth except by eating into rivals' market share.

After Bt cotton there have been no technological changes of comparable size that would allow the seed companies to maintain their rate of growth. One reason is that, so far, permission has not been granted for commercialisation of GM crops other than cotton. Only incremental enhancements of the original Bt cotton trait have been released onto the market. Consequently there are Indian seed companies equipped with capacity and capital that are seeking new markets for expansion. Some of them are looking to develop markets in Africa.

A key issue facing seed companies and the Government of India is how to respond to the challenges and opportunities presented by emerging markets like Africa. For public policy in particular, a question is how to create public benefits as well as private profits. In this respect,

the pharmaceuticals story may hold lessons for the seed sector.

The pharmaceuticals sector has evolved – and so has the global context

India's pharmaceuticals sector and its seed sector have features in common but also important differences. In certain respects, India's seed industry today is similar to its drugs sector in the past. Both sectors are products of public and private investments over many decades. The two sectors also share a plurality of small and medium firms, with a few very big brand names alongside many small and medium enterprises. In the seed sector, thousands of small firms typically do no more than multiply seeds for sale on a local or regional scale, but a few big national firms, such as Indo-American Hybrid Seeds (Bengaluru), Mahyco, Nuziveedu Seeds (Hyderabad) and Rasi Seeds (Coimbatore) are important players in the domestic market.

There are also some significant differences between the seed and pharmaceuticals businesses. Unlike the drugs sector, India's seed businesses still have a largely domestic focus, though seed exports are increasing. In this regard, the seed sector looks rather like the drugs business in the 1980s. Unlike the pharmaceuticals sector, however, there remains substantial public sector involvement in breeding and multiplying seeds, especially of economically and nutritionally important field crops (e.g. grains such as rice and wheat). Also, whereas government policies provided crucial support for the international growth of India's pharmaceuticals sector, historically the Government of India has focused much less on developing the seed industry as an export sector.

The international context that facilitated the growth of India's pharmaceuticals sector has also changed. The international trade regime is now governed much more by globally agreed regulations of the WTO, which affect both pharmaceuticals and seeds to different degrees. These include regulations on IPRs (TRIPS), sanitary and phytosanitary (SPS) regulations, and rules determining which technical barriers to trade (TBTs) are allowable and prohibited.

National trade regulations are increasingly impacted by regional and global frameworks and Africa's seed sector is no exception to this. In the absence of global regulatory frameworks for the seed trade, regional regimes have emerged piecemeal. Regional trade in seeds is shaped and regulated by several different global and regional groupings within Africa, such as the Common Market for Eastern and Southern Africa (COMESA), Southern African Development Community (SADC), East African Community (EAC), African Economic Community (AEC) and Southern African Customs Union (SACU). There have been some initiatives to harmonise regulations at the regional level, though these have had little impact to date (OECD 2012). The G8⁺ New Alliance on Food Security and Nutrition and other similar initiatives are also changing the seed sector in Africa. These initiatives are pushing for changes in seed laws, including strengthening IPR regimes for seeds and plant varieties. Similarly, free trade agreements with different countries and economic groupings are likely to impact the seed sector. 'Capacity support' provided by India's rivals has succeeded in influencing seed trade regimes and policies in some African regions, whereas India has not been very assertive in promoting its own interests in this area. Consequently the emerging regulatory frameworks are not especially favourable to India's competitive strengths. Therefore a key

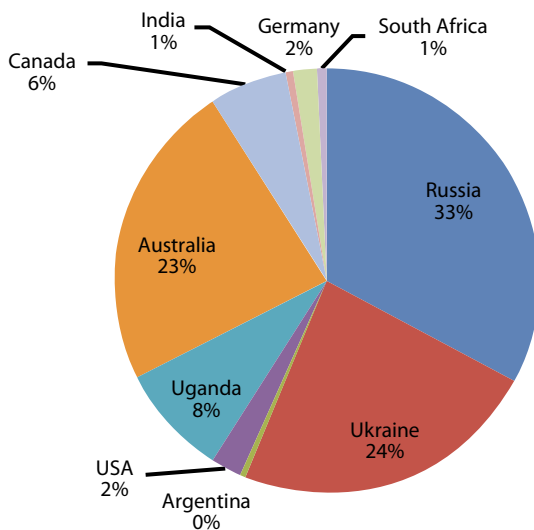
question for the Government of India is whether it regards the export of seeds to Africa as a strategic priority.

Transferable lessons for India from pharmaceuticals to seeds?

Significant challenges face Indian and other firms trying to penetrate and develop the African seed sector. Most national seed markets in Africa are small and fragmented, with low rates of seed replacement, yet they are already becoming quite competitive. In 2014 India occupied only 14th place in the list of countries exporting seeds

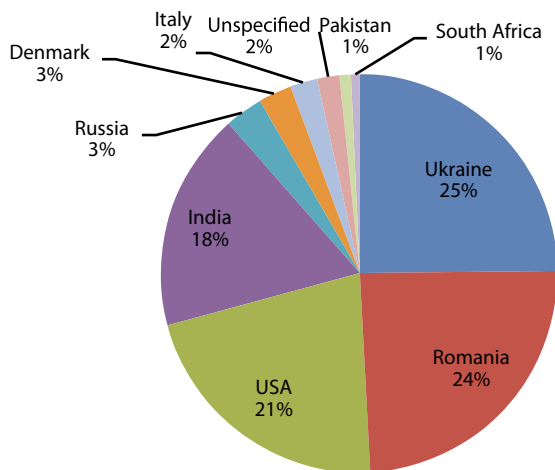
to Africa, with a 1.46 percent share of the trade.ⁱⁱⁱ India's market share varies at the national level, however. India's share of Kenyan seed imports was just 1 percent of the national total, whereas India was the 4th largest exporter of seeds to Ethiopia with an 18 percent share of the market (see Figures 1 and 2). In particular, India is the largest exporter of wheat seed to Ethiopia with a 59 percent share of that trade. The situation also varies by crop; for example, India exports negligible quantities of wheat seed to Kenya but is the third largest importer of vegetable seed into that country, with an 11 percent share.^{iv}

Figure 1: Kenya's Imports of all Seeds from Top 10 Countries, 2004-13 (US\$ Million)



Source: UN Comtrade

Figure 2: Ethiopia's Imports of all Seeds from Top 10 Countries, 2004-14 (US\$ Million)



Source: UN Comtrade

Indian seed is price competitive in some markets. For example, among the top 5 importers of vegetable seed into Ethiopia in 2013, India was the cheapest supplier. However, Indian vegetable seed was considerably more expensive in Kenya than supplies from competitors based in the USA, Denmark and France.

The more attractive market opportunities may be in horticultural crops and spices in some African countries. The analogy with pharmaceuticals may be more apt for seeds of these crops, as well as ornamentals and flowers, where volumes tend to be smaller but profit margins higher. Field crops are generally supplied in bulk, with much smaller profit margins, and consequently the market opportunities may be less attractive to Indian firms.

A key challenge lies in developing and marketing varieties that are suitable for particular markets in Africa. In this respect once more there are some important parallels but also important differences between the pharmaceuticals and seed sectors. R&D capacity is relevant in both sectors and is already present in the pharmaceuticals sector (in production systems, testing, product safety, human trials, etc.). R&D capacity is less developed in the Indian seed sector because historically it has been less vital, but it is becoming more critical in certain areas, notably modern biotechnologies. The larger Indian seed companies have the capacity to develop and test new varieties and hybrids and R&D capacity is increasing in a few of the companies working with transgenic crops.

Other areas requiring investment include customer support and sophisticated logistics. In the global seed trade an efficient supply

chain, connected by modern information and communications technologies (ICTs), is crucial. Western and even Chinese seed companies have invested substantially in these capacities, which are challenging for the smaller Indian firms to emulate.

The Indian seed industry does possess some advantages that could enable it to take advantage of market opportunities in African countries. For example, some Indian firms have already formed joint ventures or strategic partnerships with foreign companies which give them access to technology, expertise, IP and other assets. An example is Mahyco's ongoing collaboration with Monsanto (which owns a stake in the Indian firm). Mahyco has acquired the Zimbabwean cotton company, Quton, with the apparent goal of bringing Monsanto's Bt cotton technologies to African markets.

India is also in a position to mobilise a pool of trained and qualified personnel, who have benefited from the country's long-term investments in higher education. Some African seed companies have started to recruit managers and specialists from Indian seed companies to work in African seed operations. In East Africa, this move has been facilitated by historical ties of culture, ethnicity and family within the Indian diaspora community.

However, for historical reasons Indian seed companies tend to be ill equipped to investigate overseas seed markets. We have found some examples of cultural friction in which African seed industry personnel grumbled about high-handed attitudes among Indian seed company staff. Indian seed firms need to become good at carrying out research in new markets and understanding and meeting their African customers' needs and requirements.

Some implications

India's seed industry might indeed contribute usefully to the technological upgrading and improvement of African seed sectors, and in this regard the example of India's pharmaceuticals sector may hold some useful lessons. However, India's seed industry is in a very early stage of international orientation and the contemporary and sectoral context for the internationalisation of India's seed businesses is very different from the historical context that fostered an internationally competitive, outward-oriented pharmaceuticals sector in India. Indian seed companies have an opportunity to exploit new markets in Africa, but to do so they will have to compete effectively with established international rivals.

Mobilising Indian strengths and expertise built up over many decades in both public and private sectors will require strategic thinking in detail, focusing on the particular niches where Indian technical knowledge and investments might have a competitive edge; understanding the characteristic strengths and weaknesses of particular Indian firms; and identifying specific opportunities to intervene.

Different crop sectors, countries and market segments in Africa face different challenges and present different opportunities for Indian players to make a difference. The opportunity might be in the efficient delivery of cereal seeds in bulk to poor farmers who currently lack access to improved planting materials. Or Indian companies' best opportunities might be in supplying smaller volumes of seeds of high-value crops, such as Asian vegetables, spices, or vegetables destined for export to Europe. In that case, the regulatory obstacles may be lower and the major benefit could be

the development of large and medium-scale commercial agribusiness in Africa, but with few direct benefits for the food security of African small-scale farmers.

Compared to many African nations, India certainly has some relevant experience with hybrids of maize and cotton, and with the development and commercialisation of transgenic crop varieties. But India's experience with these crops and other technologies, such as fertilisers, pesticides and irrigation, may be just as useful as a source of pointers and warnings for African countries on what not to do as how to proceed. Some experts we consulted have noted that India has made some mistakes with its own management of natural resources, including soils and water, from which African nations could learn.

Moreover, supporting the development of African seed sectors means attending to the informal as well as the commercial sector. This is especially important if India is to contribute to meeting the needs of small-scale African farmers and help alleviate poverty among producers and consumers at the 'bottom of the pyramid'.

The comparison of the seeds opportunity with the pharmaceuticals case also demonstrates the importance in the latter case of political will and leadership. The Government of India might seek to demonstrate a similar commitment to find or create ways to use international trade and IPR rules so as to enable poor farmers to access improved germplasm, for the sake of global food security and poverty alleviation.

During the Green Revolution years and afterwards, India benefitted from an international flow of germplasm, expertise and technology as well as support to strengthen its national research capacity in agriculture, crop

breeding and seed multiplication. India has an opportunity in Africa to take a leading role in the development of a seed sector that brings the benefits of higher quality and improved seed to African farmers. Could this even be an inspiring way for India to 'repay' the substantial help the country received in an earlier era?

Technical cooperation and investment for the seeds sector might be approached by the Government of India and its African partners as a key arena for their developing relationships. It could perhaps allow India to distinguish itself in what it has to offer Africa compared to its BRICS rivals in South-South cooperation.

Meanwhile, on the African side, strategic decisions are to be made by India's partners and the potential beneficiaries of Indian development aid and investment. African governments in particular – including regional economic communities and the African Union – have the opportunity to frame the terms under which they want to collaborate with Indian partners in order to achieve Africa's development goals. How will they respond to overtures by Indian players from the public and private sectors? How will they protect and promote the interests of African farmers and agribusiness companies, and especially vulnerable communities, while ensuring that Africa remains an attractive destination for Indian investment?

The pharmaceuticals case also suggests a possible mechanism to ensure that Indian intervention in Africa's seed sectors yields maximum benefits for Africa and African farmers. During the campaign to allow India to export generic HIV/AIDS drugs, Brazil insisted that Indian drug firms had to invest in the domestic pharmaceuticals sectors of importing countries. This led to a measure of

'indigenisation' of pharmaceutical production. Similar measures could be demanded by African governments in the seed sector, in order to take best advantage of Indian capacities in that field. To be effective partners for India, policymakers on the African side should turn their thoughts to the instruments they might use to ensure Indian technical cooperation and investments in the seed sector benefit African as well as Indian stakeholders, promote inclusive economic and social development, and underpin food security.

End Notes

- i International Seed Federation statistics. Available at http://www.worldseed.org/isf/seed_statistics.html (accessed 9 September 2015)
- ii The Group of Eight, a multilateral forum comprising the eight largest economies in the world and the European Union.
- iii UN Comtrade Database. Available at <http://comtrade.un.org/> (accessed 10 September 2015).
- iv UN Comtrade.
- v The BRICS countries are Brazil, Russia, India, China and South Africa. Brazil and China in particular are emerging as significant sources of development investment in Africa, while South Africa is an influential African power in its own right.

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Acknowledgements:

This policy brief was written by **Sachin Chaturvedi, Dominic Glover** and **Ian Scoones** for the **Future Agricultures Consortium**. The series editor is Paul Cox. Further information about this series of Policy Briefs available at: www.future-agricultures.org

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