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India-Africa Seed Sector Collaboration: Emerging Prospects and Challenges

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Abstract: India-Africa seed sector has promises for improving trade with various African nations. This discussion paper analyses the external orientation of the Indian seed industry, institutional architecture for enabling trade of vegetable crop seeds, explores the African seed sector for its dynamics and identifies challenges in the seed sector collaboration between the regions. It also brings forth a set of prescriptive recommendations and forward looking plans to strengthen the India-Africa seed sector collaboration.

Keywords: India-Africa, seed sector, Indian seed industry, institutional architecture

I. Introduction

The challenges and trajectories give huge complementarity for tapping the Africa-India cooperation in various fields for finding out common solutions. India has introduced a triennial summit since 2008 (2015 onwards it would be quinquennial), called as India-Africa Forum Summit, as a new platform for promoting linkages with Africa. This Summit led to framing of Africa-India Framework for Cooperation. Pronouncement of Africa-India Science and Technology Initiative holds great significance, as it played a major role towards institutionalising Africa-India Science, Technology and Innovation (STI) cooperation. This sort of cooperation is primarily based on the idea of sharing Indian experiences and best practices in the field of STI with Africa.

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The challenges related to agriculture sector include food and nutrition security of the population, enhancement of crop productivity, reduction of farmers' losses and raising the economic returns for the farmers. The other important challenge relates to using technology to improve productivity and applying tools of modern biotechnology for developing varieties with specific traits to meet the diverse challenges of farmers in different agro-climatic zones for cropping of available crop varieties. Since the agro-climatic conditions are similar in the two regions, with common challenges confronting the agricultural sector, Africa and India can opt for similar approaches to choose crop varieties and their package of practices. Farms for agricultural activities include livestock, poultry, piggery, etc., and are important elements for boosting rural income. The nutritional and income security of the farmers is encouraged by practising integrated farming system that is linked to local markets.

In furtherance of Africa-India cooperation in agriculture, collaboration in crop seed sector seems to be a win-win proposition for both India and Africa. As Indian companies gain access to new markets, African farmers/ distributors have access to locally adapted certified quality crop seeds and planting materials for increasing their productivity and income.

This discussion paper attempts to capture the domain of India-Africa seed sector collaboration. It is structured to give an overview of the Indian seed industry's external orientation and Africa in Section II, followed by a look into the institutional architectures that are in place in Section III. Section IV covers the African seed sector and its dynamics. This Section also captures the nuances of African seed sector in terms of market and trade. Section V highlights trade-related challenges in the seed sector. Finally, Section VI talks about the possible way forward and presents a set of recommendations to promote further the India-Africa seed sector collaboration.

II. External Orientation of Indian Seed Industry and Africa

The domestic seed market has been growing at a compound annual growth rate (CAGR) of 15 per cent in the last few years. The Indian

seed industry has grown from US$ 800 Mn in 2009-10 to about US$ 2200 Mn in 2014-15.[1]

According to the International Seed Federation (ISF), India has the 6th largest domestic seed market in the world, which was estimated to be US$ 2000 Mn in 2013. However, India's value of export of seeds for sowing was US$ 67 Mn in 2012 and it ranked 26th among the seed exporting nations.[2]

In recent years, several Indian seed companies are making inroads into overseas markets such as Africa and South-East Asia. African and Asian markets (excluding China) together have a size of US$ 6 Bn, which is nearly three times the size of Indian seed market.[3] The estimated seed market for Africa alone is around US$ 1.1 Bn.[4]

In the present push factor the Indian seed companies are looking for expanding their business into international markets. In the pull factor prevailing in Africa w the farmers of the African countries are seeking better quality-standard-compliant seeds to increase their productivity and income coupled with the favorable context of similar agro-climatic conditions prevailing in Africa and India and to create a huge potential scope for enhanced cooperation in the seed sector through supply of crops and their varieties from India to African countries. Among the African countries, there has also been positive realisation of India's success in Green Revolution in the 1960s using high-yielding seeds and how subsequently the private seed business grew in significant proportions to support the farmers' seed requirements.

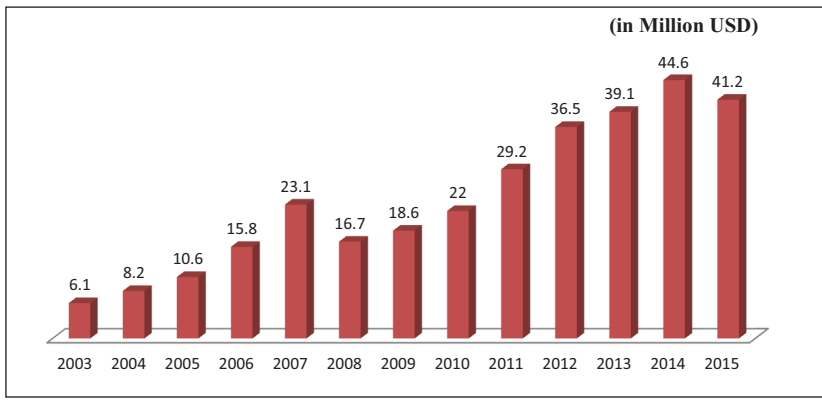
The Indian seed companies are looking at expanding to emerging African agri-input markets. From exporting seeds to partnering with local seed companies/NGOs, to investing in overseas R&D and acquiring local companies, several Indian seed companies are leveraging on this scope of harnessing the opportunity to capture African markets. Indian seed companies are using these measures in combination to have effective inroads into African markets.

India-Africa Seed Trade: A Case of Vegetable Seeds

Indian Vegetable Seeds Export

At the global level, India's export of vegetable crop seeds has increased by more than seven times since 2003. In 2015, it was US$ 41.2 Mn and India was the 13th largest exporter of vegetable seeds in the world (Figure 1).

Figure 1: India's Export of Vegetable Seeds to World



Source: WITS data compiled and analysed by authors.

African Vegetable Seeds Trade

The demand for vegetable crop seeds has been rising in Africa. Since 2003, the import of vegetable seeds into Africa has increased by more than six times. In 2013, Africa's total import trade value of vegetable crop seeds was US$ 209.76 Mn and in 2014 this value dipped to US$ 190. 5 Mn.

It is interesting to note that the Africa has maximum import in terms of trade value from China, which has replaced the European countries for the top slot in 2015. The dominance of European countries is seen to have gone down as countries from Asia such as Thailand and India and countries from Latin America such as Chile and Peru have entered into the top 10 bracket (Table 1).

Table 1: Africa's Top 15 Vegetable Seed Importing Countries in 2015

Countries	Import Trade Value in US$ Million
China	25.6
France	23.01
Netherlands	16.01
United States	15.20
Thailand	8.69
Kenya	7.71
Chile	6.70
Peru	6.65
South Africa	6.58
India	5.3
Spain	4.82
Israel	4.2
Italy	3.81
Denmark	1.45
Vietnam	1.18
Mexico	0.70

Source: WITS Data compiled and analysed by authors.

Region-wise, majority of vegetable crop seeds that are imported in the Northern and Western African countries such as Morocco, Algeria, Tunisia, Egypt, Senegal, The Gambia, Mali, Burkina Faso, Togo and Benin are from the USA and some of the European countries such as France, Netherlands, and Italy. Quite surprisingly, since 2006-07, China has emerged as one of the top exporter of vegetable seeds in this region. It is among the top three countries doing seed business in this region in vegetable seeds.

Africa's Import of Vegetable Seeds from India

In terms of export, India's trade with the African countries in the case of vegetable seeds has increased more than 30 times since 2002; from

USD 0.3 Mn in 2002 to USD 9.7 Mn in 2013. However, in 2015, this figure dipped to US$ 5.3 Mn (Figure 2). Still, India, in 2015, ranked 10th among all the countries from which Africa imports vegetable seeds, which is a significant achievement.

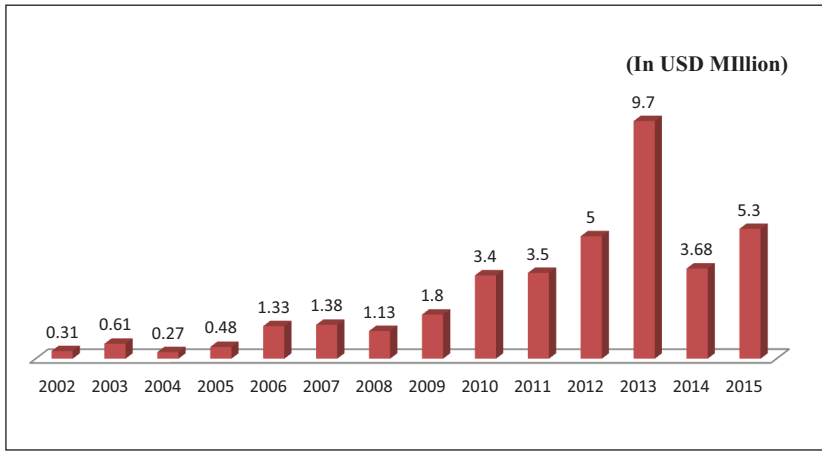


Figure 2: Africa's Import of Vegetable Seeds from India

Source: WITS Data compiled and analysed by authors.

III. Institutional Architecture

The following five channels have been noticed through which the Indian seed companies are engaged with African countries in doing seed business:

- Export/Import of seeds
- Joint Venture (JV)
- Acquisitions
- Leasing
- Registering as local company/ subsidiary (WOS)

The brief details about these channels are as follows:

- **Export of Seeds from India:** There are many seed companies in India which export seeds to various African countries through their partner local companies in Africa. Safal Seeds and Biotech Ltd (Indian seed company) had proposed to export 12 MT of onion seeds to their Kenyan partner, East African Seed Co. Ltd and 10 MT of onion seeds to their another Kenyan partner, Safari Seeds Ltd. in 2014. (The weight of 1000 seeds of onion ranges between 2.5-4.1 grams that means 200-300 seeds per gram.)

Export of onion and gram seeds are subject to approval from the Export-Import (EXIM) Committee, which regulates the proposal for exports of these seeds. Here, it was found that there are about 20 such Indian seed companies, viz. East West Seeds India Ltd, Nirmal Seeds, Nuziveedu Seeds, Safal Seeds, MAHYCO, etc., are exporting onion seeds to African countries.

- **Joint Ventures/Partnering with local African partners/Regional Initiatives/NGOs**: Some of the Indian seed companies have partnered with various local non-government organisations (NGOs) and initiatives for market distribution such as IFDC, One Acre Fund, GROW AFRICA, AGRA, SFSA's Seeds2B, USAID Feed The Future, etc. Advanta India Ltd. (Indian seedcompany) is a regional partner in GROW AFRICA initiative. It is working with leading developmental agencies for improving the farm productivity and income. It is also partnering with various NGOs such as One Acre Fund, IFDC, etc., for market development.

Similarly, some of the Indian seed companies such as Indo-American Hybrid Seed Ltd, Nirmal Seeds, Ganga Kaveri, Ankur Seeds, Rasi Seeds and Nuziveedu Seeds have joined SFSA's Seeds2B project to get smooth access to African markets and to get permit for trials for performance evaluation of crop seeds.

Companies such as Rasi Seeds, which forayed into vegetable seeds segment recently, besides exporting seeds, is also test marketing in some

African countries for the last two years through SFSA's Seeds2B platform and are quite sure of the huge market potential and high acceptance of its vegetable seeds.[5] Similarly, Vibha Seeds has expanded its business to Africa and has completed testing of some crop seeds in Ethiopia. It has registered about 30 products in cotton, rice and vegetables and has begun trials in Mozambique and Senegal. They are planning to go to Kenya and Tanzania with their cotton hybrids.[6]

Indian companies such as Indo-American Hybrid Seeds Pvt Ltd, Nuziveedu Seeds, Safal Seeds & Biotech Ltd. and Vibha Seeds are partnering with the African Seed Trade Association (AFSTA) to market their seeds in addition to nascent business approaches as narrated below.

- **Acquisitions**: Some of the Indian seed companies have actively looked at buyout of local seed company. Recently, Mahyco (Indian seed company) acquired 60 per cent stake in Zimbabwe-based Africa's largest listed seed company, Quton Seed company. This acquisition gives Mahyco a strong platform to deliver genetically-modified crop seeds to African cotton farmers for yield and income enhancement. JK Seeds, Kaveri Seeds and Nuziveedu Seeds are also contemplating buyouts as one of the options to grab the fast growing business opportunities in the African countries. This acquisition route is preferred mainly because of the advantage the local seed companies may enjoy in terms of the context of existing domestic regulatory approvals as well as fast track approvals for fresh crop hybrid seed applications in African countries.[7]

- **Lease:** India's better economic ties with African countries such as Ethiopia have attracted companies to enter farming by leasing large tracts of lands in Ethiopia. India is the largest foreign leaser of Ethiopian farm land.[8] Karaturi Global Ltd., Shapoorji Pallonji and Co., and Ruchi Agri Pvt. Ltd. (all Indian companies) have leased farm land in Ethiopia.[9]

- **Registering as Local Company/Subsidiary:** Few Indian seed companies have registered themselves as local company in Africa to expand and establish their business. For example, Nirmal Seeds has got itself registered as Nirmal Seeds PLC in Ethiopia for establishing strong foothold of its seed business there. It envisages making Ethiopia as a hub for expanding its seed business across Africa. It has partnered with the Ethiopian Institute for Agricultural Research for development and evaluation of crop seeds. It has also got one Indian green gram seed registered there and is planning to have more Indian crop hybrids registered and released in Ethiopia.

IV. The African Seed Sector and Its Dynamics

Cultural renaissance of various African countries historically was routed through agricultural development. In Africa, agriculture is believed to hold a key solution to the continent's transformation. According to the recent World Bank report '*Growing Africa: Unlocking the Potential of Agribusiness 2013'*, Africa's agriculture and agribusiness, together valued at US$ 313 Bn a year from agriculture, could triple to one trillion dollar if governments and business leaders radically rejig their policies and support agriculture, farmers, and agribusiness, which together account for nearly 50 per cent of Africa's economic activity.[10] The African Union (AU) initiated a policy framework called 'Comprehensive Africa Agriculture Development Programme (CAADP)' in 2003. The overall goal of CAADP is to "help African countries reach a higher path of economic growth through agriculture-led development, which eliminates hunger, reduces poverty and food insecurity, and enables expansion of exports of agricultural commodities".[11] It has been declared as an integral part of the New Partnership for Africa's Development (NEPAD). NEPAD is African Union's strategic framework for pan-Africa socio-economic development. However, in most of the African countries, farmers have not been benefitted from initiatives and programmes as the need for improved crop seeds, farm equipment and credit system has not been met by domestic measures.[12] They are finding it difficult to satisfy the

ever increasing demand for food crops by the local population and excel in export arena. The major factor identified is the lack of genetically improved quality seeds for cultivation. Almost three-quarters of Africa's land area is being farmed without improved inputs such as fertilizer and improved quality crop seeds. Thus, the seed sector is seen as an important component for ensuring food security in the region.[13] Realising this, the African Union formulated an ambitious and comprehensive plan for seed sector in 2008, called the African Seed and Biotechnology Programme (ASBP). The objective is to enable comprehensive development of the seed sector and related biotechnology in Africa, taking into account different needs of the countries in the growth of agriculture.[14]

The recent African "Agenda 2063" has categorically mentioned in its Aspiration 1 that for a prosperous Africa based on inclusive growth and sustainable development, Africa's agriculture needs to be modern and productive, using science, technology and indigenous knowledge. The sector also needs to be made secure, profitable and attractive to investment.

There have been various other initiatives/platforms across the continent to increase the productivity and move millions of people out of poverty and hunger. The noteworthy among such initiatives are the African Agricultural Technology Foundation (AATF), Alliance for a Green Revolution in Africa (AGRA) funded by Bill and Melinda Gates Foundation and Rockefeller Foundation, African Seed Trade Association's (AFSTA) Alliance for the Seed Industry in East and Southern Africa (ASIESA), GROW AFRICA, One Acre Fund, IFDC, SFSA's Seeds2B Project, USAID's Feed The Future Initiative, etc., (See Box).

Globally Africa has the lowest levels of the use of improved seed, mostly because such seeds are not physically made available to the majority of farmers. Also the current demand is not being met by the local seed production system of crop varieties. Thus, the major thrust area of all such governmental and non-governmental initiatives is to provide

Box: African Non-governmental Initiatives/Platforms to Strengthen African Seed Systems

African Agricultural Technology Foundation (AATF) is a not-for-profit organisation that facilitates and promotes public/private partnerships for the access and delivery of appropriate agricultural technologies for sustainable use by smallholder farmers in Sub-Saharan Africa (SSA) through innovative partnerships and effective stewardship along the entire value chain. The Foundation is a one-stop-shop that provides expertise and know-how that facilitates the identification, access, development, delivery and utilization of agricultural technologies. It is based in Kenya.

Alliance for Green Revolution in Africa (AGRA) is a dynamic partnership working across the African continent to help millions of small-scale farmers and their families lift themselves out of poverty and hunger. AGRA works to catalyse a uniquely African Green Revolution by creating transformative partnerships. It is funded by Bill and Melinda Gates Foundation and Rockefeller Foundation. It intends to improve agricultural development in Africa by addressing both farming and relevant economic issues. It has supported the Programme for Africa's Seed Systems (PASS). PASS mounts an across-the-board effort to improve the availability and variety of seeds that can produce higher yields. It is based in Kenya.

One Acre Fund began in East Africa, and currently serves farmers in Kenya, Rwanda, Burundi and Tanzania. It provides a complete bundle of services within walking distance of farmers it serves. The services include financing for farm inputs, distribution of seed and fertilizer, training on agricultural techniques and market facilitation to maximise profits from harvest sales. It is based in Kenya.

Grow Africa is a partnership platform that exists to help catalyse sustainable investment and growth in African agriculture. Grow Africa was founded by the African Union Commission, the NEPAD Agency and the World Economic Forum.

International Fertilizer Development Center (IFDC) is a public international organisation addressing critical issues such as

international food security, the alleviation of global hunger and poverty, environmental protection and the promotion of economic development and self-sufficiency. IFDC focusses on increasing productivity across the agricultural value chain in developing countries. This is achieved by the creation and transfer of effective and environmentally sound crop nutrient technology and agribusiness expertise.

African Seed Trade Association (AFSTA) promotes trade in quality seed and technologies in Africa for the benefit of members and farmers. It is based in Kenya.

Seeds2B project is a SFSA's (Syngenta Foundation for Sustainable Agriculture) demand driven approach to seed systems development in Africa. It is presently working in Sub-Saharan Africa as well as East and West Africa through its Seed Import Model and Local Production Model.

USAID's Feed the Future Initiative supports the Africa-led Comprehensive Africa Agriculture Development Programme (CAADP) which aims to achieve an annual agricultural growth rate of 6 per cent among all signatory member states by 2015. USAID/West Africa works closely with the Economic Community of West African States (ECOWAS), which leads CAADP implementation through the establishment of a regional investment plan and a regional agricultural agency. The USAID/ West Africa Feed the Future strategy aligns with ECOWAS's regional agricultural plan focussing in three core areas, viz. increased agricultural productivity, improved regional trade, and enhanced institutional capacity.

Source: Authors' compilation based on various sources.

farmers with quality and improved seeds of desired crop varieties in order to enhance and sustain crop production.

The local food basket in African countries is supported by local agricultural production through traditional agricultural practices including crop seeds/planting materials. These farmers look towards such crops

and their high yielding, pest-tolerant seeds for commercial cultivation to cater to the African and global markets.

It has come out from the interaction with such companies that presently the Indian companies are engaged in exporting/selling/trials of hybrid seeds of vegetable crops. Getting approval for field crops is very tough, given the stricter rules in the African countries for registration and release of such crops. However, in cotton, both non-GM and GM hybrids are made available for evaluation of performance. Although GM crop is not permitted for cultivation in most of the African countries, the seed business is mainly driven by crop hybrids. Location specific R&D to develop such crop hybrids in collaboration with local R&D institutions would be desirable in order to strengthen the performance of such new crop seeds.

It is also found that there are issues related to trading of crop and vegetable/fruit seeds in many African countries as these countries insist on having location specific field trial data to prove the worthiness of their hybrid seeds by the Indian companies. Lack of clarity in hybrid seed regulatory framework is the key reason for authorities in most African countries to delay approvals to foreign seeds makers including Indian companies. This delayed registration and long gestation process and duration along with lack of harmonisation of seed regulatory systems/ processes among different countries in the region caused high amount of drag and time lag for the Indian seed companies.

V. Challenges in Seed Sector

There are various challenges in the present India-Africa seed sector, both from the perspectives of Indian seed industry and African side. Some of the major challenges are depicted in Table 2.

For strengthening India-Africa seed sector trade and cooperation, it is imperative to address these challenges.

Table 2: Challenges in Seed Trade

From Indian Perspective	From African Perspective
• Delayed/denial of seed variety registration and approval • Expensive registration process • Biased seed performance evaluations against Indian seed companies by regulatory agencies in some African countries • Implementation of rules and regulations not transparent; lack of harmonisation of seed rules among African countries • Tougher SPS/TBT measures • Letters of Credit not honoured by African partners and payments are not made in time • Fragile law and order situation • African market not mature enough • Low infrastructure support for joint development of location specific crop seeds	• Low quality of seeds exported from India; poor germination rates; false claims on quality and agronomic performance • Lack of understanding of seed demand and market by Indian firms • Lack of awareness of Indian firms on regulatory process in African countries on crop variety registration and approval • Limited understanding of Indian companies on African agro-climatic zones and crop agronomy • Many Indian seed companies seem to be non-serious in building long-term trade system

Source: Presentations made by Indian and African speakers at the International Conference on India-Africa Collaboration in Agriculture: Opportunities and Challenges held in October 2015 in Hyderabad; organised by RIS.

VI. Way Forward and Recommendations

The way forward has to be built upon current initiatives and by: identifying new ones, building synergies and, in general, incentivising Africa-India cooperation by bringing more actors from public sector, private sector and academic and research institutions. Among the ongoing initiatives, the India-Africa Science and Technology Initiative has been a significant mechanism, established to foster the collaboration in the field of science,

technology and innovation. Given India's success story in achieving food self-sufficiency and its vast experience in development and application of various agricultural technologies, varying from traditional to modern, Africa-India cooperation through partnerships among academicians, researchers, institutions and industries at defined levels and pace can pave the way for intensification of seed trade engagement.

During the discussions held at the India-Africa Forum Summits and India-Africa S&T Ministers Conferences it has been emphasised that apart from making efforts towards creating institutional framework for facilitating partnerships across academics and institutions, there is a need to promote entrepreneurial collaborations in the field of agriculture. In this domain, the industry-level collaborations in the seed sector seem to be a win-win proposition for both India and African countries. As Indian companies gain access to new markets, African farmers/distributors have access to better quality seeds and increase their productivity and income. It can also build up local seed production, processing and enterprise development to boost employment market.

The Seed industry in India should formulate a strategic plan for engaging with African seed industry at macro-level and this plan should be linked with India's bi-lateral programmes in agriculture, S&T and capacity building in target African country. Better networking with relevant stakeholders such as farmers, breeders, retailers, seed associations, government bodies and public and private local companies will play a significant role in strengthening the seed sector trade and cooperation between India and African countries.

Attempt to identify countries at different stages of evolution of seed sector development to formulate policies for engagement would be rewarding. In the context of intensification of seed trade potential with Africa, a component analysis is desirable to identify country-wise elements on policy environment, regulatory framework, implementing agencies, human resource as well as market systems. The private sector in India will have to work with public sector in some African countries

where the public sector is often the dominant or perhaps the only major player. This engagement should be done as part of a broader strategy of India-Africa cooperation in agriculture.

India and Africa have already put in place a platform in the form of Africa-India Cooperation Framework. This platform should be utilised to further build and promote the cooperation in R&D and trade between Indian and African stakeholders in the area of seeds. Promising and successful varieties of seeds should gain entry into individual African countries for national performance trials and registration. Regional bodies such as AATF, AFSTA, EAC, ECOWAS and SADC should be engaged further into aiding in the registration process with most essential data requirements for which the existing partnership has prior experience and expertise.[15]

Some of the recommendations that can be taken into consideration to foster strong India-Africa overall seed trade are as follows:

Setting-up of a Seed Quality Control Authority: The government of India through the Ministry of Agriculture and Farmer's Welfare could contemplate to establish a Seed Export Council (SEC) under the Seed Division on similar terms of reference as in the case of Export Council of India. The existing government machinery is inadequately equipped for wholesome supervision of seed quality and SPS certification. The Directorate of Plant Protection Quarantine & Storage (DPPQS) in association with the proposed SEC could enhance speed and ease of doing seed export business while taking care of the quality issue.

Conducting Prior Market Feasibility Study: Indian seed companies need to conduct an in-depth market analysis and feasibility study before venturing into the African country to ascertain the demand and supply scenario and agro-climatic conditions prevalent therein. This will also help in weighing the competitive advantage that the Indian seed companies can provide vis-à-vis other foreign players. Such study reports shall be discussed in G2G bi-lateral discussions for agricultural development.

Establishing G2G Agenda: A comprehensive G2G Agenda should be designed in order to strengthen and promote India-Africa collaboration in seed sector. It should start with codifying bi-lateral or regional seed trade issues as common and specific ones. Depending on the nature of issue, a joint G2G Working Group should be set up for quicker solution, through multi-stakeholder discussions. A dedicated G2G Working Group should be operationalised to address the issues related to Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT) and to ensure Ease of Doing Business.

Awareness of Country-specific Rules for Registration and Release of Seeds: A better understanding of rules and regulations governing the registration and release of seeds will be very useful for Indian seed companies. Quite often, lack of knowledge about them leads to failure in evaluation process.

Conducting Farm Trials before Filing for Approval: To ensure that the genetic purity and quality of seeds exported from India meet the required standards, it will be quite helpful for the Indian seed companies to get the farm trails done in that country itself before formally applying for registration and release approval. Many agencies, including government agencies within the African countries, conduct these field trials and give reports on a chargeable basis.

Better Liasoning with Relevant Agencies: Indian seed companies also need to invest more time and energy on ensuring better liasoning with relevant actors and agencies in the African countries. This means spending quality time discussing the business prospects with the local government officials, seed associations, regulators, breeders, retailers and farmers. Such endeavors help in instilling trust and confidence for the long-term partnership.

Practicing "End-to-End Package" Business Model: Indian seed industries, willing to venture into African markets, can try to go out with a holistic long-term plan; ranging from supplying good quality seeds to the farmers to helping the farmers' access the market to sell their produce. Such 'Seed-to-Market' Model can be expanded to result into inter-sectoral

integration and partnership. Such inter-sectoral infrastructure dealing with farm machinery, farm irrigation, fertilizers, pesticides, food processing, banking/credit services and transportation, to put forth a "End-to-End Package Model". This can be more appealing to the farmers in African countries, as this model will be able to provide them with right inputs at the right time at one place called Agro_Service Centre in neighbourhood small towns/marketing locations in the Agrican countries.

Endnotes

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