EXPORT-IMPORT BANK OF INDIA

WORKING PAPER NO. 63

FEED AFRICA:
ACHIEVING PROGRESS THROUGH PARTNERSHIP

May 2017

CONTENTS

Project Team : Research and Analysis Group

Mr. Ashish Kumar, Deputy General Manager
Mr. Rahul Mazumdar, Chief Manager

LIST OF EXHIBITS

LIST OF TABLES

LIST OF BOXES

Executive Summary

Introduction

Thousands of Africans go hungry every day, making the continent the world's most food-insecure region. Low productivity levels, and chronic underinvestment have been at the heart of Africa's food and nutrition insecurity and the incidence of extreme poverty.

Despite these enduring and structural challenges, the dependency on the agricultural sector for livelihood remains significant. While nearly two-third of Africa's population make a living through agriculture, the sector contributes less than one-third to the continent's GDP. Although its significance in the economy varies widely across African countries, agriculture remains a vital sector for most countries. Furthermore, an estimated 38% of Africa's working youth are presently employed in agriculture.

Africa has the latent potential to be an agricultural powerhouse. Africa's agriculture is dominated by a variety of staple food crops (maize, rice, sorghum, millet, cassava, yams, sweet potatoes, etc.) and a few traditional cash crops (coffee, cotton, cocoa, oil palm, sugar, tea, and tobacco). Notwithstanding this, Africa is unable to meet its basic food needs owing to population pressures, scarce water resources, and agricultural inefficiencies, among others. The continent has 60% of the world's uncultivated arable land and could grow enough food to meet its own needs and export surpluses. Unfortunately, its soil remains greatly underutilized.

The AfDB in May 2016 launched its High-5 priority projects, and one of them was the 'Feed Africa: Strategy for Agricultural Transformation in Africa, 2016-2025'. The focus of this project is on transformation, scaling up agriculture as a business through value addition, led by the private sector and enabled by the public sector, while using innovative financing mechanisms, to end hunger and rural poverty in Africa during the next decade. The 'Feed Africa' project envisages lifting 320 million people out of the realm of undernourishment by 2025. The program also hopes that Africa will be converted into a net exporter of agricultural commodities, representing the substitution of US$ 110 bn worth of imports. This could potentially lead to opening up Africa's agribusiness which could be worth more than US$ 100 bn per year by 2025

Case for Investing in African Agriculture

Some of the African countries have a high percentage of agricultural land (as a percentage of the total land area) at their disposal. While Africa has the highest area of arable uncultivated land (202 million hectares) in the world, most farms occupy less than 2 hectares. The sector is characterized by a high percentage of smallholder farmers (80%) cultivating low-yield staple food crops on small plots with a minimal use of inputs. These farms depend on rainwater, thus subjecting production to the vagaries of weather.

According to the latest data available from FAO, Africa accounted for 3% of world fertilizer consumption in 2013, which is lowest in the world regionwise, thereby showing significant opportunity for fertilizer consumption. According to FAO, fertilizer in some African countries can cost up to 10 times more than in other developing nations.

On the other hand, given the lack of mechanization of African agriculture, the productivity and value addition have been far below the desired levels. The slow productivity growth in agriculture has also constrained Africa's structural transformation process and economic diversification. The level of value addition and crop processing of agricultural commodities is low and post-harvest losses in Sub-Saharan Africa average 30% of total production, meaning that the region loses over US$ 4 billion each year. This provides significant opportunity for interventions.

Agricultural produce like yams, cocoa beans, cassava, sorghum, pulses, beans, tea and tomatoes have a double digit share in world production in 2014. Africa

has a huge potential to be a global supplier of traditional cash crops (cocoa, sugar, and tea), which accounts for about 50% of Africa's total agricultural exports. While cash crops offer a better prospect in the overseas markets, food crops can be well considered for internal consumption as well as for the African region.

During the last decade there have been many investors in the agricultural sector who have been flocking to many parts of the world, including Africa. Cumulative FDI in the African agriculture sector during January 2003 till February 2017 aggregated to US$ 9391 million. India has been one of the largest investors in the agriculture sector in Africa (excluding agro based processing).

It has been observed that since the turn of the century, there has been a sudden increase in investments in Africa's agricultural land. Three broad trends have triggered such surge in investments. First, the potentially food insecure but predominantly rich nations have sought to outsource their domestic production by gaining access and control over agricultural lands in foreign countries. Second, with high crude oil costs, the demand for agro fuels has been rising. According to the International Energy Agency, in 2006 an estimated 14 million hectares of land were used for the production of biofuels and by-products, approximately 1% of globally available arable land. At the global level, projected growth in biofuel production to 2030 could require 35 million to 54 million hectares of land (2.5% to 3.8 % of available arable land). Over the next ten years, biofuels are expected to account for about half the increased demand for oilseeds. And third, high food prices coupled with low land prices in many parts of the world have made investments in land attractive due to higher financial returns. In Africa, since large tracts of land still remains unutilized, a mechanized farming approach could help in generating a better yields as well. Leasing unused land to foreign governments and companies for large-scale cultivation would boost an underdeveloped sector and create new job opportunities. However, the need is to have a sustainable methodology wherein both local communities and foreign investors benefit. According to the Financial Times database, fDi Statistics, these investments in Africa have been across segments, with crop production having attracted the maximum focus. The other segments which have received investments in Africa include grains & oilseed, rubber products, agriculture, coffee & tea, and fruits & vegetables including tobacco.

Many investors into Africa have also been concentrating on value addition of naturally available products. The top 10 investing countries in Africa constituted 77% share of the cumulative investments of US$ 10.3 billion, with most of the investments coming from European countries like UK, Netherlands, Switzerland, and France. The countries that received the highest investments (cumulatively during Jan 2003-Feb 2017) are Nigeria, Egypt, Cote d'Ivoire, South Africa, Zambia, Ghana, Ethiopia, Angola, Tanzania, and Mozambique – together constituting almost 78% of the inward investments into processed agricultural and allied industries in the continent.

Agricultural exports from Africa aggregate to US$ 40.8 billion in 2015, accounting for 10.9% of the total exports of the continent. Among the agricultural items exported, cocoa and its preparations constituted approximately 20.8% of the total exports. The exports of edible fruits and nuts valuing around US$ 8.1 billion formed 19.8% share of the aggregate agricultural exports by the continent. Other significant agricultural products exported by Africa included edible vegetables (10.4% of the total exports) and small proportions of coffee and spices and tobacco.

The agricultural imports accounted for nearly 9.6% of the total imports by Africa during the year 2015. Cereals were the leading import item and its share in the aggregate agricultural imports was 35.5% (US$ 17.1 bn). Animal, vegetable fats and oils formed the second largest agricultural product imported followed by sugar and sugar confectionery.

India-Africa Mutual Cooperation in Agriculture

Given the fact that India is still largely an agrarian country and feeds a population of 1.2 billion people and one that has traditionally had close relationship with Africa, India can share its vast experience across the agri value chain in enabling Africa become a net exporter of agriculture products. The importance of agriculture

sector in India can be gauged from the fact that it provides livelihood for more than 70% of Indians in the rural areas, contributes around 18% to the total GDP of India and is the largest employer providing employment to 49% of the total workforce.

India has successfully introduced green revolution, contract farming, drip irrigation, created agricultural markets, and slowly bringing in robotics technology, and precision farming into farmlands. India's institutional support through research and development initiatives, and marketing support are areas which are worth sharing with the African economies. For example, India embarking upon the green revolution in 1966 which encompassed adopting high-yielding varieties of seeds, modern farming methods, irrigation development and financing of agrochemicals, changed the agricultural scenario of India forever. On the other hand the drip irrigation scheme fits into the 'Per Drop More Crop' component of one of the flagship schemes of the Government of India. This component calls for the promotion of efficient water conveyance and use of precision water application devices like drips, sprinklers, pivots, rain-guns etc. on the farms. The component also calls for the construction of micro irrigation structures to supplement source creation activities (including tube wells and dug wells).

India's Agri-Challenges : Focus On Cereals And Pulses

With the increase in consumption pattern of protein in India, there is a increasing pressure on the availability of pulses and cereals. Given the paucity of land for farming, India has to import certain produce. Whereas the position with regard to cereals, especially wheat and rice, is quite comfortable, pulses and oilseeds are an area of concern. Increasing production to meet increased demand with limited land and water resources also remains a challenge.

In such circumstances India looks abroad for import of pulses and cereals. Another possibility which India may like to increasingly explore is overseas investments in agriculture. In the current context of the Study, Africa and India may like to collaborate towards this end. Africa has significant land to offer for production of various produce, and India would like to explore the opportunity to invest overseas, produce crops to use it back in India, while creating large scale employment, generating income, and even allow the economy to move up the value chain through creation of agro-processing facilities.

Pulses, for example, are a major source of protein for most people, especially the poor. While demand for pulses continues to rise, domestic supply has perennially been falling short stoking food price inflation. Currently, as in 2016-17 the production of pulses has stabilized at 17.8 million tonnes, while India's consumption has been hovering at 22.2 million tonnes, necessitating yearly pulse imports of around 4-5 million tonnes.

India has been aspiring to become self-reliant in pulses and oilseed production by 2022, and to achieve this objective, it has to meet demand through domestic production. Given the average yields, India needs nearly 7 – 8 million additional ha of land to realize this aspiration. The declining land-base for agricultural operations, diminishing water tables, shortage of farm-labor, increasing costs of inputs and uncertainties which impact the viability of farming are some of the challenges that agriculture sector faces in India. Small and fragmented land holdings are also unsuitable for large-scale commercial farming. In such circumstances, India needs to look at alternative plans and explore areas where it can produce to meet the domestic demand.

India-Africa Win-Win Situation: Scope for Partnership

Agricultural sustainability is intrinsically linked to food security, and therefore critical to the progress and socio-economic development of both Africa and India. Seeing the complementary sectoral priorities and similar role in evolving global food markets, numerous opportunities exist for collaboration between India and Africa in the agricultural sector. Although both countries share similar sectoral characteristics, they are at different maturity and transformation levels. With impending global production and food security pressures, there exists an urgent need to adequately channelise these investments towards high-impact priority areas in order to achieve immediate and sustainable returns.

Africa on one hand, is at a crucial time in the history of its growth while being home to some of the world's fastest growing economies (7 of the 20 fastest growing economies are in Africa), and on the other hand, the region has been facing challenges to feed its population, which is close to that of India's. This is despite the fact that Africa has one of the largest availability of arable land (44%), second only to Asia. According to the World Bank, agriculture contributed nearly 32% of Africa's GDP and provided employment to approximately 65% of the labour force in 2015. Furthermore, an estimated 38% of Africa's working youth is presently employed in the agricultural sector. It is estimated that about 60% of the world's available and unexploited cropland is in Sub-Saharan Africa. However, only 5%-7% of the continent's cultivated land is irrigated, which leaves farmers exposed to the vagaries of nature. In spite of its inherent strengths, Africa is left with no choice but to import a substantial portion of its food requirements.

As against this, India has been keen to secure food production for its vast population, inter alia, through developing land overseas for agricultural purposes by leasing or acquisition, sharing knowledge and expertise to increase productivity in new areas of farming, implementing successfully tried and tested practices abroad, and facilitating agricultural growth by supplying equipment from India. Given the nature of landholding in Africa, where a large proportion of farmers are smallholders or subsistence-based, investment for the development of quality inputs, markets for produce, good soils and soil management techniques, innovative financing tools and other resources needed for sustained agricultural production becomes critical. Moreover, majority of African farmers use non-modern techniques in their production process and this limits their productivity, while the lack of irrigation leaves them exceedingly vulnerable to weather shocks. This situation is further exacerbated by inadequate inputs, lack of efficient markets and the necessary technology to ramp up production to levels beyond personal use.

In order to overcome these challenges, Africa could collaborate with a country like India, which has been a key partner in Africa's development, and shares a long history of friendship and cooperation with the continent.

Given theses facts, one common thread which binds both India and Africa is food security. Agricultural production in India has increased manifold over the last three decades, and the position with regard to cereals, especially wheat and rice, is comfortable. There exists a vast scope for India to share its experience with its counterparts in Africa so as to enable the region to become self-sufficient in food production.

The bottlenecks in Africa in terms of inadequate agricultural infrastructure, and average productivity in spite of the availability of land and natural resources provides an opportunity for India to engage with Africa to add the much needed vigour to the region's agriculture sector. These interventions could be achieved through supply of tractors and agricultural equipment, investments in tractor manufacturing or agro-based implements, providing technology based support in the form of advanced and suitable seeds for African conditions, weather forecast allowing production estimates, creation of institutions focussing marketing and finance that can help the sector to grow, amongst many others.

Financing Agriculture in Africa: India's Initiatives

According to the World Bank, agriculture and agribusiness together could be a US$ 1 trillion sector in Sub-Saharan Africa by 2030, up from US$ 313 billion in 2010. The growth generated by agriculture in Sub-Saharan Africa is estimated to be 11 times more effective in reducing poverty than GDP growth in other sectors, a vital multiplier given that 65% of the continent's labour force is engaged in agriculture.

Africa has the potential not only to feed itself but also to be a breadbasket for the world. With the right support, the continent can leverage its considerable resources – land, water, people, knowledge and potential markets – to overcome food insecurity and become a leading competitor in global food markets. While there exists huge opportunity, investment is the key to addressing the challenges facing the sector and ensuring that

agriculture delivers on its potential. For too long, the sector has been seen as one requiring government subsidy and donor funding. The realisation of agriculture becoming a potential driver of economic growth, rural incomes and job creation, in addition to food security has emerged only during the last few years.

According to AfDB estimates, the total cost for agricultural transformation for the priority commodities and agro-ecological zones in the AfDB's strategy is between US$ 315 bn and US$ 400 bn over 10 years, which works out to US$ 32 bn – US$ 40 bn per year. Current finance for agricultural development originate primarily from three sources: funds from sovereign and non-sovereign investments into agriculture from the multi-lateral and bilateral development partners including There is around US$ 9 bn per year of investments into African agriculture leaving a gap of US$ 23 bn to U S$ 31 bn per annum to be mobilized in order to drive transformation.

The financing needs in agriculture are not confined only to the pre-production or post-production stages, but are required throughout the value chain from procuring the seeds, to tilling the land with machinery and equipment, to maintaining and insuring the land from uncertainties, to harvesting mechanically, storing it in warehouses, processing it if required, and selling it to the market while adhering to the quality and labelling standards. To meet the entire gamut of these needs, banks and financial institutions should look at long term agricultural finance, financing agriculture-related infrastructure, and providing advancements in technology.

India recognizes the fact that agriculture is an important conduit for Africa to move out of poverty. Improving Africa's agriculture and agribusiness sectors means higher incomes and more jobs. It also allows Africa to compete globally. India has extended support for the development of cotton sector in the Cotton Four (C-4) countries (i.e. Benin, Burkina Faso, Chad and Mali) and also in Nigeria, Uganda and Malawi where India is providing cotton technical assistance, support and cooperation. The Energy Research Institute (TERI), New Delhi has been actively involved in the Indian Technical and Economic Cooperation (ITEC) programme offering African students courses on applications of biotechnology and its regulation. There are also some significant Africa-India initiatives undertaken at multilateral level, particularly in the domain of South-South cooperation. ICRISAT, a CGIAR (Consultative Group on International Agricultural Research) Centre, conducts agricultural research for development in Asia and Sub-Saharan Africa with a wide array of partners throughout the world. A lot of initiatives have been undertaken under the aegis of the India-Africa Forum Summit.

Exim Bank has been extending Lines of Credit (LOC) to enable Indian exporters to enter new geographies or expand their business in existing export markets without any payment risk from overseas importers. Exim Bank extend LOCs to overseas financial institutions, regional development banks, sovereign governments and other entities overseas, to enable buyers in those countries to import developmental and infrastructure projects, equipment, goods and services from India, on deferred credit terms. As on March 31, 2017, Africa's share in the total value of Exim Bank's LOC program stood at US$ 7.51 bn, which constituted 47.9% of the total LOC portfolio – of which more than US$ 1.65 bn has been to the agricultural sector alone. These have been provided to as many as 25 African countries for projects as varied as acquisition of tractors, harvesters, agricultural processing equipment; farm mechanization; setting up plantation projects and processing plants; development of sugar industry; procurement of design, supply, installation and commissioning of fuel storage facilities, irrigation network, commissioning of sugar processing facility; rice self-sufficiency programme; including setting up of the agri related institutions like the Mahatma Gandhi Institute of Technology and Biotechnology Park in Cote d'Ivoire.

India-Africa Agricultural Fund: Way Forward

Agricultural investments are generally of long gestation, and so are the funding requirements. Many interested players may not have significant experiences in overseas agricultural activities, whilst for many raising resources and risk mitigation may be difficult tasks.

Funding for development of African agriculture by India could be undertaken through a two pronged approach, both attending to the appropriate needs while addressing the challenges inherent in the African agriculture. One approach would be towards creating the necessary agri-infrastructure, and the another approach would be towards catalysing cultivation through supply of requisite inputs, agriculture implements, etc.

Most of the African nations have huge tracts of cultivable land; however, these lands are not having adequate infrastructure like connecting roads, transportation network, power transmission, communication channels, irrigation canals etc. Firms that are interested to undertake cultivation activities in Africa need to make huge upfront investments in creating such agri-infrastructure, to make the available tracts of land cultivable. Such investments have significant impact on the commercial viability of agriculture operations. The firms are reluctant to undertake such huge upfront investments due to paucity of funds and high investment risks.

While the investment funds from the domestic private sector are not likely to come up in many African countries, the Governments in African nations look at external sources of funds to build such infrastructure. It is, in this context, proposed that the necessary funds could be sourced from India's development assistance scheme.

It is proposed that the African economies could avail development assistance from India to create agri-infrastructure. The agricultural land supported by such eco-system could be leased to Indian firms for cultivation. This approach would mitigate the risks associated with upfront investments of the Indian investors. The lease rentals could serve as cash-flow to service the debt.

At the same time, Indian investors would require funds to pay upfront lease rentals, besides sourcing of agri-inputs and implements. The funding requirements could be met by Exim Bank's Overseas Investment Finance programme. However, it is proposed to create a dedicated India-Africa Agriculture Development Fund to support the Indian investments in African agriculture sector.

This would entail setting in place an appropriate institutional mechanism for the management of this fund. It is here that the role of the country's apex export finance institution, viz. Exim Bank could gain significance since it has been actively financing overseas direct investment through its flagship programme. The funds could be utilised to extend medium to long term foreign currency finance to Indian enterprises planning to invest in the African agriculture and allied sector.

To begin with an initial corpus could be created, to the tune of around US$ 5 bn. Sources for this fund could also come from the country's forex reserves. The country's reserves are in the region of US$ 375 bn. The proposed amount of US$ 5 bn constitutes less than 1.5% of the reserves, and would not dent the foreign exchange reserves position; on the other hand, the fund would serve as a conduit for promoting investments in African agriculture and to meet India's import requirements of pulses and oilseeds, besides creating tremendous goodwill.

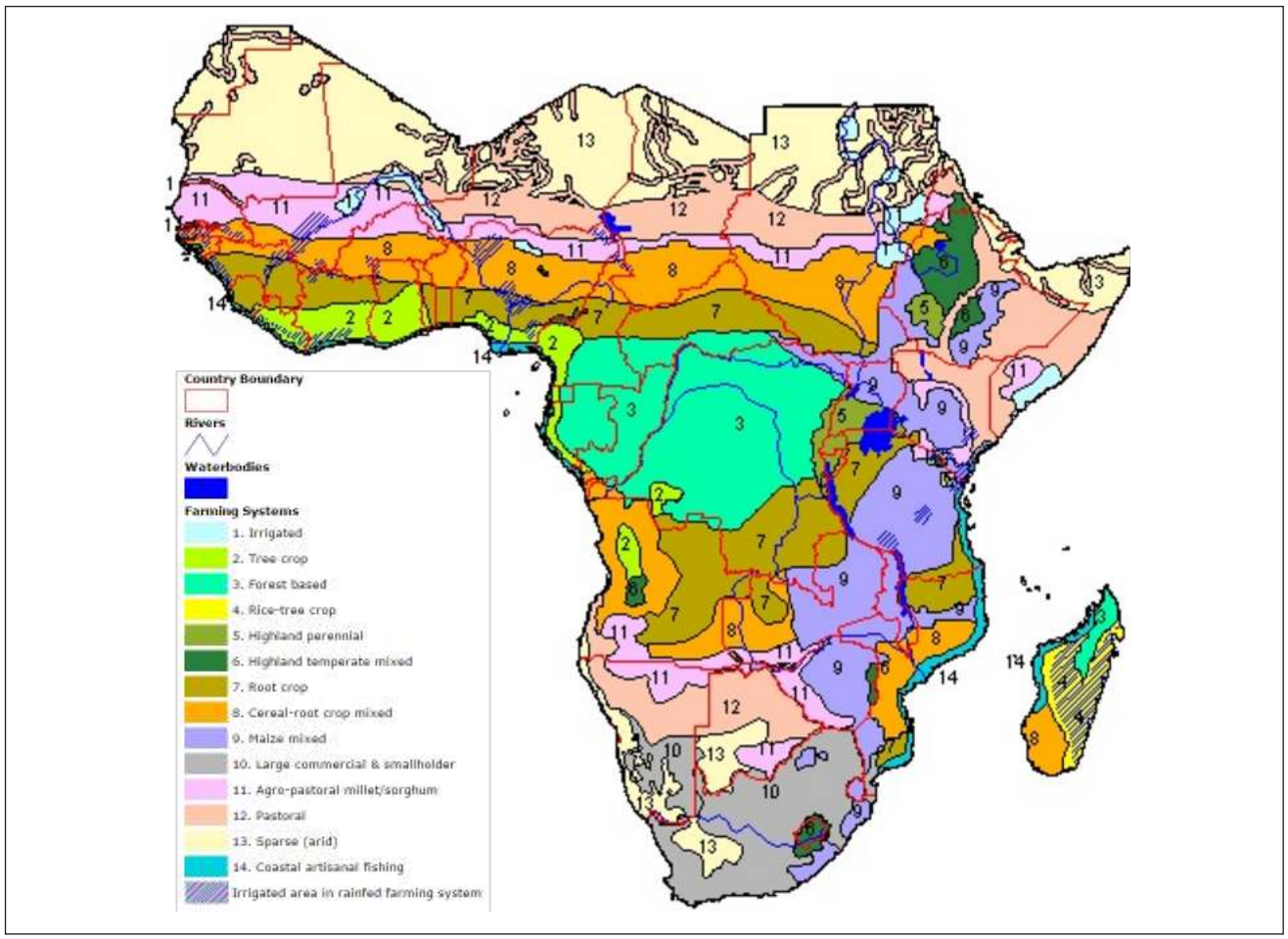
1. Agriculture in Africa: Introduction

Thousands of Africans go hungry every day, making the continent the world's most food-insecure region. Low productivity levels, and chronic underinvestment have been at the heart of Africa's food and nutrition insecurity and the incidence of extreme poverty.

Despite these enduring and structural challenges, the dependency on the agricultural sector for livelihood remains significant. While nearly two-third of Africa's population make a living through agriculture, the sector contributes less than one-third to the continent's GDP. Although its significance in the economy varies widely across African countries, agriculture remains a vital sector for most countries. Furthermore, an estimated 38% of Africa's working youth are presently employed in agriculture[1].

Africa has the latent potential to be an agricultural powerhouse. As is evident, from Exhibit 1, the farming systems involving irrigated area is miniscule. The continent has 60% of the world's uncultivated arable land and could grow enough food to meet its own needs and export surpluses. Unfortunately, its soil remains greatly underutilized.

Exhibit 1.1: Major Farming Systems: Sub-Saharan Africa



Source: FAO

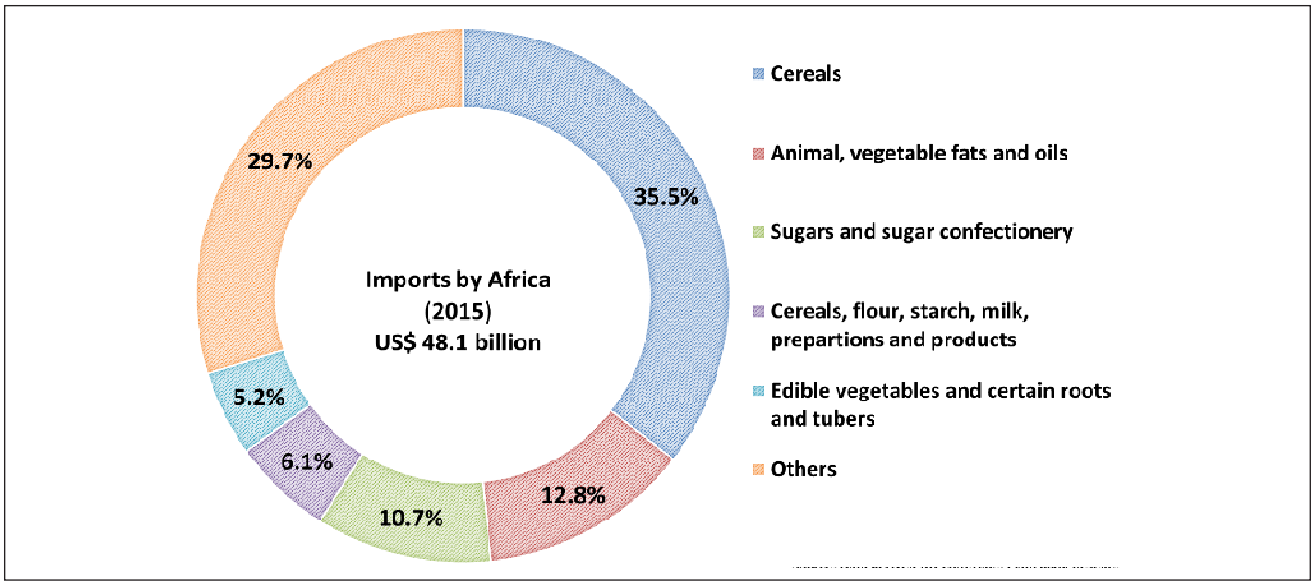
[1]World Bank

Africa's agriculture is dominated by a variety of staple food crops (maize, rice, sorghum, millet, cassava, yams, sweet potatoes, etc.) and a few traditional cash crops (coffee, cotton, cocoa, oil palm, sugar, tea, and tobacco). Notwithstanding this, Africa is unable to meet its basic food needs owing to population pressures, scarce water resources, and agricultural inefficiencies, among others. This is aggravated by the incidence of undernourishment, estimated at almost one in four persons – one of the highest in the world – and by the lack of usage of modern inputs such as improved seeds, fertilizers, machinery, and irrigation. With regard to fertilizer consumption, it has increased marginally from 25 kg per hectare of arable land in 2010 to 27 kg per hectare of arable land in 2015, and from 12.4 to 14.9 kg per hectare for low-income African countries, a quantity that is less than one-twentieth of what is used in Asian and Latin American countries.

The continent imports a substantial amount of its food requirements, primarily because food production, supply, and consumption systems function sub-optimally. The share of agricultural imports in total imports of Africa was as high as 9.6% during 2015[2]. Within this, the share of cereals – the basic items of food – was the highest at 35.5%, underlining the food-security concerns of the continent.

Cross-border trade in agricultural products has remained one of the key instruments of increasing food security for countries experiencing food deficits. While most African countries are land-locked, it is estimated that only one-tenth of all African trade takes place within Africa[3]. Cross-border trade in agricultural is important as it offers many benefits for consumers. Given the uneven distribution of food production across Africa, regional trade allows consumers greater access to higher quality foodstuffs, while reducing the volatility of prices by ensuring a stable supply.

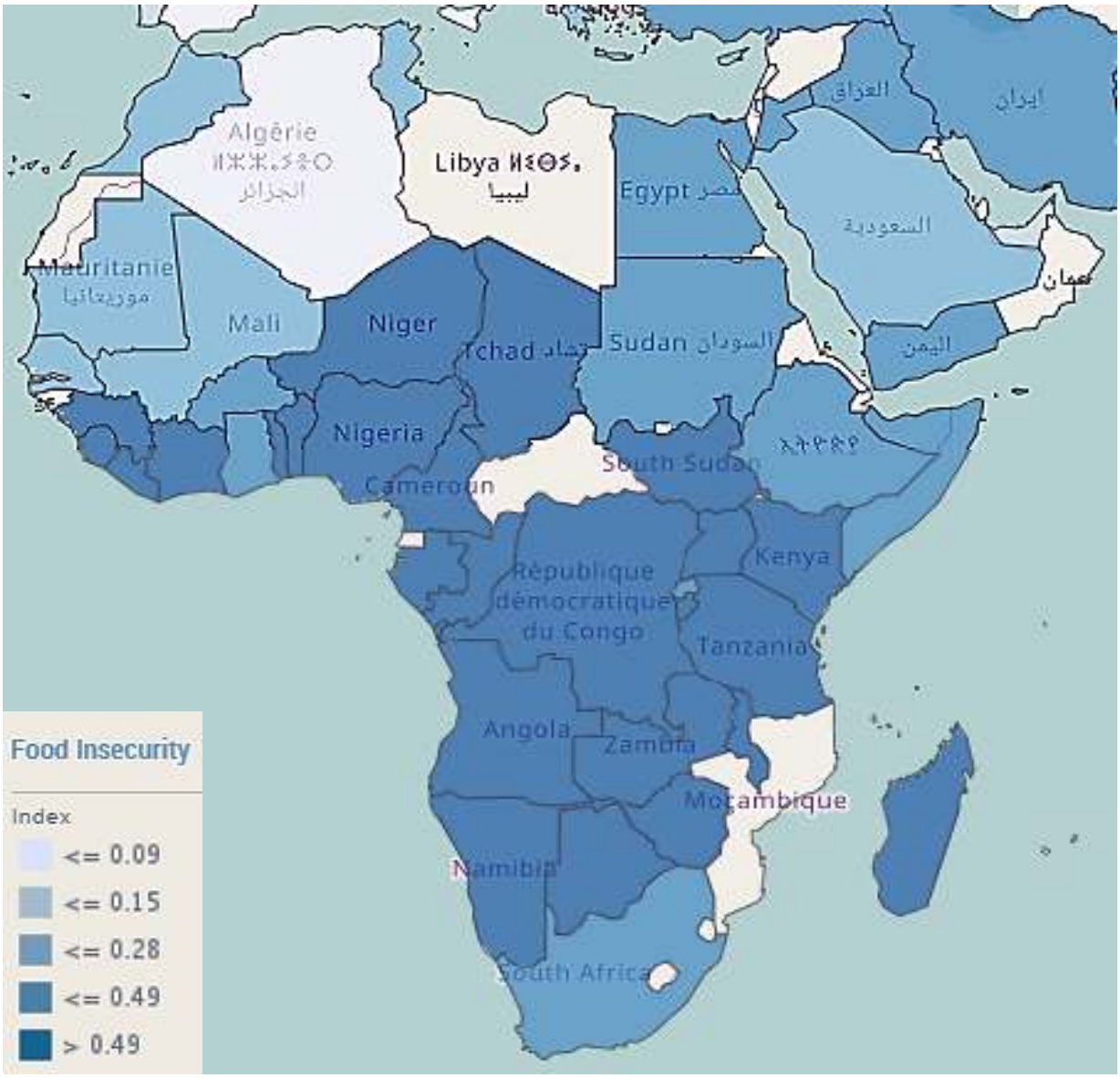
Exhibit 1.2: Share of Agricultural Commodities Imported by Africa: 2015



Source: Data derived UN Comtrade; Exim Bank Research

[2]Source: World Bank
[3]AfDB

Exhibit 1.3: Prevalence of Food Insecurity in Africa based on the Food Insecurity Experience Scale (FIES)



The Food Insecurity Experience Scale (FIES), developed by FAO, is an experience-based metric of severity of food insecurity that relies on people's direct responses. These responses are collected through the FIES Survey Module (FIES-SM) which consists of eight questions.

The FIES is a measure of access to food at the level of individuals or households. It measures severity of food insecurity based on people's responses to questions about constraints on their ability to obtain adequate food. This approach to food security measurement represents a significant change compared to traditional ways of assessing it indirectly through determinants such as food availability, or consequences such as poor quality diets, anthropometric failures, and other signs of malnutrition.

The FIES is based on a well-grounded construct of the experience of food insecurity composed of three domains: uncertainty/anxiety, changes in food quality, and changes in food quantity.

Source: FAO

Strategic Focus to Transform Africa's Agriculture

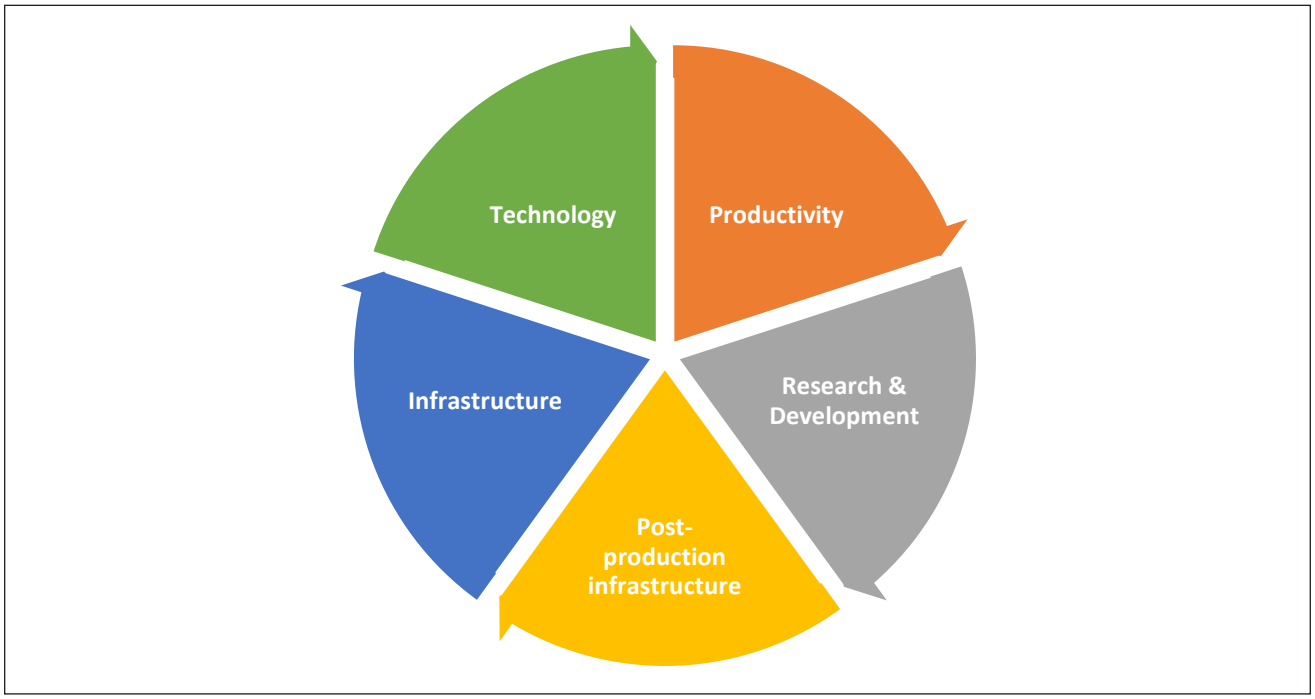
While it may be difficult to overcome the challenges intrinsic to agriculture in Africa, collaborative efforts from all the stakeholders working together over a sustained period of time can unlock the agricultural potential of the region and help it tackle food insecurity.

To begin with, a strong and committed national policy which focuses on augmenting agriculture productivity is an imperative. In most African countries, the productivity levels of crops is lower than the world average, which cripples the potential of agriculture producers to earn more. This is further exacerbated by the slow growth in the already low levels of productivity, thereby constraining Africa's structural transformation process and economic diversification. Low productivity also translates into very low average incomes. Since 2008, agricultural productivity in 34 sub-Saharan countries averaged just US$ 318 per worker annually, compared to a world average of roughly US$ 1000 per worker during the same period[4].

Second aspect is closely related to the first and it includes investment in research and development. It goes without saying that most African countries may not have the technical and financial wherewithal to undertake such an initiative. But nevertheless, this could be strengthened through collaboration between Africa and agencies and countries outside the continent. Many countries including India which faces similar challenges to feed its burgeoning population have been undertaking extensive research to enhance agriculture productivity. India has a wide range of institutes catering to agricultural research, which could potentially partner and work closely and intensively with Africa's agricultural sector. Africa can also act as a laboratory for many agricultural researchers.

The third immediate area which requires attention are forward linkages in the agriculture sector. A reasonably sound infrastructure needs to be created which will enable Africa to reduce post-production losses. One of the primary requirements would be setting up of cold

Exhibit 1.4: Strategic areas of focus in Agriculture



Source: Exim Bank Research

[4]USDA

storage facilities at the cooperative level to prevent pilferage. The proper functioning of the cold storage itself is contingent on continuous supply of electricity, which again remains an area of concern in the African context. The level of value addition and processing of agricultural commodities is low and post-harvest losses in Sub-Saharan Africa averages 30% of total production, meaning that the region loses over US$ 4 billion each year[5]. This waste is extremely detrimental to the food security of the region, as well as for the world.

Fourth is the huge infrastructure lacunae. If farmers in the continent are to produce enough food to feed a growing population, besides sustaining a living from agriculture, sufficient infrastructure needs to be set in place. For instance, better roads can link farmers to procure vital inputs such as improved seeds and fertilizers, whilst also offering them access to competitive markets where they have the opportunity to sell their produce for a better price than what may be available at a local level. It is estimated that only one in three Africans have access to all-weather roads, as compared to two in three across all developing countries.

Last but not the least, is technology. The sector is characterized by a high percentage of smallholder farmers (80%) cultivating low-yield staple food crops on small plots with minimal use of inputs. These farms depend on rainwater, thus subjecting production to the vagaries of the weather. Given their inability to access capital, most farmers in the continent are not aware of the latest technologies that can help them increase their production. By developing technology partnerships with smallholder farmers, governments and the private sector can fill many critical gaps along the entire value chain. These initiatives for all practical reasons, can be started on a pilot basis targeting efforts towards a region or cluster. The learnings from this exercise can then be replicated and gradually upscaled to help improving efforts in other areas. Technologically empowered farmers can lift their communities out of poverty and help make Africa the world's breadbasket.

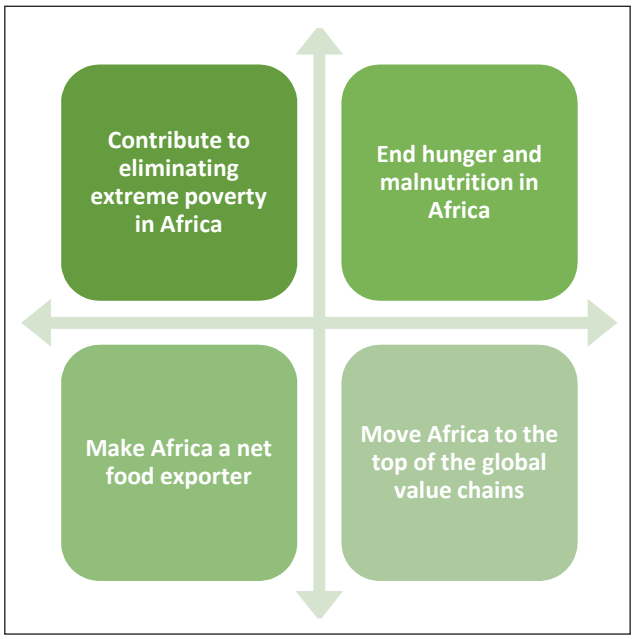
The impact of increased agricultural income is far more pronounced on poverty. According to AfDB, a 1% increase in per capita agricultural income reduces the poverty gap up to five times more than a 1 % increase in average incomes in other sectors.

AfDB's 'Feed Africa' Program

The AfDB in May 2016 launched its High-5 priority projects, and one of them was the '*Feed Africa: Strategy for Agricultural Transformation in Africa, 2016-2025*'. The focus of this project is on transformation, scaling up agriculture as a business through value addition, led by the private sector and enabled by the public sector, while using innovative financing mechanisms, to end hunger and rural poverty in Africa during the next decade.

The 'Feed Africa' strategy illustrates the drive to change African agriculture into a globally competitive, inclusive and business-oriented sector that creates wealth, generates gainful employment, and improves quality of life. It also seeks to bring to scale existing and successful initiatives across Africa and beyond.

Exhibit 1.5: 'Feed Africa' core goals



Source: AfDB; Exim Bank Research

[5]AfDB

The 'Feed Africa' project envisages lifting 320 million people out of the realm of undernourishment by 2025. In addition, 130 million people are expected to be lifted out of extreme poverty, simultaneously. The program also hopes that Africa will be converted into a net exporter of agricultural commodities, representing the substitution of US$ 110 bn worth of imports. This could potentially lead to opening up Africa's agribusiness which could be worth more than US$ 100 bn per year by 2025.

This transformation would require mobilizing resources and capital, representing a significant opportunity to drive inclusive and green growth actors along the value chains. According to AfDB, transforming an initial set of agri value chains will require approximately US$ 280-340 billion over the next decade. Such an investment would likely create new markets worth US$ 56-65 billion per year by 2025.

Sum Up

The importance of agriculture for Africa can hardly be understated, more so in recent times when most of Africa is besieged with economic slowdown at the back of plunging commodity prices. As African countries consider to pursue an agriculture led growth, it becomes important to view farmers as entrepreneurs, and not just producers, and efforts need to be made to make their operations commercially viable and sustainable.

It is empirically established that agriculture-led growth has greater impact on poverty reduction than non-agriculture-led growth. In the current scheme of things, Africa's poor performance in agriculture undermines poverty reduction and inclusive growth. Higher returns to agriculture would transform Africa's poverty profile, improve food security and nutrition, create jobs, and contribute to inclusive economic growth across the continent.

Despite its fast economic growth in the last two decades, poverty reduction in Africa has remained limited, which basically shows the huge effort that is required to be undertaken not only by countries in the continent, but also by countries beyond the African borders, which can lend their support.

2. Case for Investing in African Agriculture

The agricultural sector is a key source of livelihood across the African continent. While nearly two-third of Africa's population make a living through agriculture, it contributes less than one-third to the continent's GDP. Although its significance in the economy varies widely across African countries, agriculture remains a vital sector for most countries. Furthermore, an estimated 38% of Africa's working youth are presently employed in agriculture[6]. African soil remains greatly underutilized with the region having more than half of the world's fertile unused land. Despite this, the continent still imports a substantial deal of its food requirements, essentially because food production, supply, and consumption systems are not functioning optimally. The share of agricultural imports in total imports of Africa was nearly 9.6% during 2015[7]. This is coupled with the fact that Africa has the highest incidence of undernourishment (estimated at almost one in four persons) worldwide.

Given Africa's situation, agriculture, especially value added agriculture, is an immediate need. A large part of African population is engaged in subsistence farming and could be brought into the mainstream production through structured interventions like land reforms, mechanization, etc. This would help in ameliorating poverty levels faster given that the agricultural sector consists mostly of smallholder farmers, the majority of which are women. With higher agricultural productivity; gender-equal access to land, seed, and fertilizer; and overall better performance in rural economies, growth will reach the most disadvantaged.

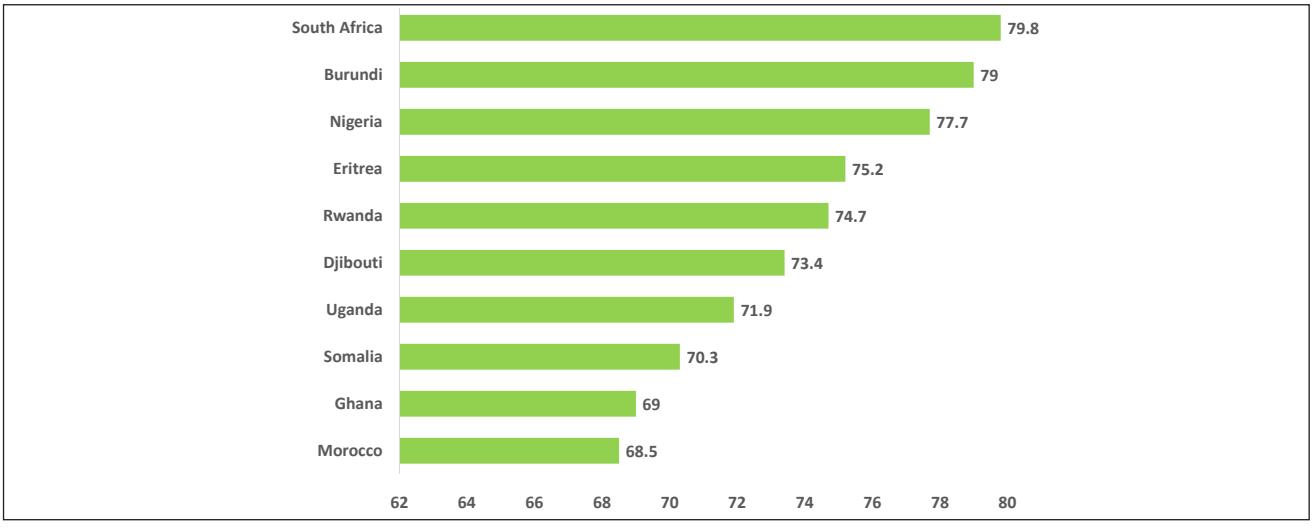
Some of the intercut challenges in African agriculture have been hightlighted which give way to quite a huge headroom of opportunity for investing in African agriculture

Agricultural Land

Some of the African countries that have a high percentage of agricultural land (as a percentage of the total land area) at their disposal include South Africa, Burundi, Nigeria, Eretria, and Rwanda with 79.8%, 79.2%, 77.7%, 75.2%, and 74.7% share, respectively. Agricultural land essentially refers to the share of land area that is arable, under permanent crops, and under permanent pastures.

While Africa has the highest area of arable uncultivated land (202 million hectares) in the world, most farms occupy less than 2 hectares[8]. The sector is characterized

Exhibit 2.1: Countries with the highest share of Agriculture Land in Africa: 2014



Source: Data derived UN Comtrade; Exim Bank Research

[6]World Bank
[7]Source: World Bank
[8]World Bank Development Indicators

by a high percentage of smallholder farmers (80%) cultivating low-yield staple food crops on small plots with a minimal use of inputs. These farms depend on rainwater, thus subjecting production to the vagaries of weather.

Fertilizer consumption

Besides this, farmers at all scales of production need access to the inputs required to produce a high-yielding crop, effective fertilizer and sufficient water. According to the latest data available from FAO, Africa accounted for 3% of world fertilizer consumption in 2013, which is lowest in the world regionwise. Even when these are available, input pricing have been found to be often too high for smallholders, resulting in fertilizer use in Sub-Saharan Africa which is just one-tenth the world average. According to FAO, fertilizer in some African countries can cost up to 10 times more than in other developing nations.

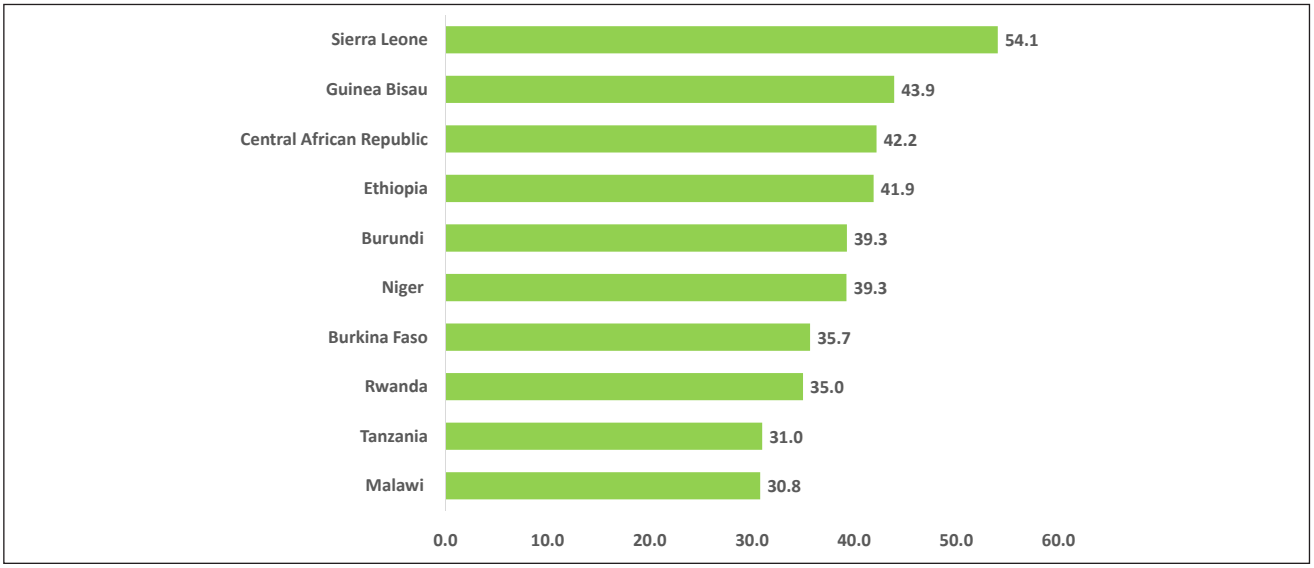
Mechanization

On the other hand, given the lack of mechanization of African agriculture, the productivity and value addition have been far below the desired levels. The slow productivity growth in agriculture is also constraining Africa's structural transformation process and economic diversification. Value addition to agricultural products is the process of increasing the economic value and consumer appeal of an agricultural commodity. The level of value addition and crop processing of agricultural commodities is low and post-harvest losses in Sub-Saharan Africa average 30% of total production, meaning that the region loses over US$ 4 billion each year[9]. Amongst the countries which figure at the top in the World Bank Development Indicators, Ethiopia, Rwanda, and Tanzania offer good scope for investments given their current growth and improving economic conditions.

Africa's agriculture is dominated by a variety of staple food crops (maize, rice, sorghum, millet, cassava, yams, sweet potatoes, etc.) and a few traditional cash crops (coffee, cocoa, oil palm, sugar, tea, and tobacco). While land availability is there, productivity remains low, and one of the major factors contributing to this is lack of mechanization. Mechanization remains a somewhat ignored constituent of agricultural and rural development polices in Africa – only limited improvement has been achieved in terms of increased number of machines and overall advances in mechanization in the continent.

While a hosts of agricultural products are produced in Africa, some of these products occupy a significant share in the world market. Focusing on augmenting their production for local consumption and as well for exports therefore offer good prospects for the continent.

Exhibit 2.2: Countries with Highest Share of Agricultural Value Added in Africa 2014 (Percentage of GDP)



Source: Data derived UN Comtrade; Exim Bank Research

[9]AfDB

Value Addition of Key Produces

Agricultural produce like yams, cocoa beans, cassava, sorghum, pulses, beans, tea and tomatoes have a double digit share in world production in 2014. Africa has a huge potential to be a global supplier of traditional cash crops (cocoa, sugar, and tea), which accounts for about 50% of Africa's total agricultural exports

An analysis of the major producers of these agricultural commodities shows that Nigeria, Mozambique, and Cote d'Ivoire are among the main producers of many of the products in which Africa has a potential edge.

There is a need to add value to African agriculture. The fact remains that a typical African smallholder farming lacks the necessary resources to transform their small farm into a thriving agribusinesses. The situation becomes more acute given the farmer's lack of knowledge and information about integrating its produce in the value chain. However, with increased globalization, there is a notable opportunity for Africa's agriculture to participate in the agri-value chain. This integration may not necessarily be global, and even has a very good potential to be regional – especially given the fact that participation at a global scale would require abiding by international norms and standards. While cash crops offer a better prospect in the overseas markets, food crops can be well considered for internal consumption as well as for the African region. Nevertheless, due to infrastructural lacunae, it is often cheaper to export outside Africa than within the continent.

Table 2.1: Key agricultural produce in Africa: 2014

Product	Production (Mn tonnes)			Share in World (%)			African countries with a minimum 1% share in global production (in 2014)
	2003	2012	2014	2003	2012	2014	
Yams	42.6	57.3	65.8	96.2	96.2	96.6	Nigeria (66%), Ghana (8%), Cote d'Ivoire (9%), Benin (5%), Togo (1%), Ethiopia (2%)
Cocoa beans	2.4	3.3	2.9	66.0	65.7	65.7	Cote d'Ivoire (32%), Ghana (19%), Nigeria (6%), Cameroon (6%),
Cassava	104.7	149.4	145.7	54.5	55.5	54.3	Nigeria (20%), Ghana (6%), Angola (3%), Mozambique (2%), Uganda (1%), Malawi (2%), Madagascar (1%), Rwanda (1%)
Sorghum	23.1	23.4	29.1	39.1	40.9	42.3	Nigeria (10%), Ethiopia (6%), Burkina Faso (3%), Niger (2%), Chad (1%), Mali (2%), Cameroon (2%), Egypt (1%)
Pulses	1.2	1.3	1.2	33.7	23.4	27.5	Mozambique (5%), Tanzania (3%), DR Congo (2%)
Beans dry	3.0	5.0	6.1	14.5	21.1	23.3	Kenya (2%), Ethiopia (2%), Rwanda (1.5%), Uganda (3%), Cameroon (1%)
Tea	0.5	0.6	0.7	14.8	12.4	13.4	Kenya (8%), Uganda (1%)
Toma-toes	14.4	17.9	19.2	12.0	11.1	11.3	Egypt (4%), Nigeria (1%)
Maize	45.6	70.1	78.0	7.1	8.0	7.5	South Africa (1%), Nigeria (1%)
Potatoes	15.5	29.3	26.3	4.9	8.0	6.9	Egypt (1%), Algeria (1%)
Rubber natural	0.5	0.6	0.6	5.5	5.2	5.1	Cote d'Ivoire (2%), Nigeria (1%)
Sugar cane	89.4	94.6	95.3	6.5	5.1	5.1	South Africa (1%), Egypt (1%),
Oil, palm	2.0	2.3	2.3	6.9	4.3	4.0	Nigeria (2%), Cote d'Ivoire (1%)
Rice, paddy	18.5	28.3	30.7	3.2	3.8	4.2%	Nigeria (0.9%), Egypt (0.7%)

Source: Data derived from FAO; Exim Bank Research

Select Agri Initiatives in Africa

The Governments in Africa have also taken some measures to increase their production. In 2009 Mozambique distributed 7,300 oxen as part of a programme to expand the use of animal traction, a measure that should enable families to cultivate at least five hectares each, instead of the average of just one. Also, in 2009 and 2010, Uganda distributed enormous quantities of good-quality high-yielding seeds leading to one of the best maize harvest witnessed in the country. This has also helped them to produce more than twice the domestic consumption, and even exported a part to South Sudan and the Democratic Republic of the Congo. In 2010 in Tanzania, the Government facilitated greater use of hybrid seeds and fertilizers enabling farmers to produce a surplus rice crop. Malawi also had taken some concrete steps - in 2005 it embarked on an innovative solution to provide government subsidies to reduce the retail costs of fertilizers and high-yielding maize seeds for smallholders, leading to having a surplus in production, thereby enabling exports.

Besides facilitating enhancement in productivity, Governments of many countries have also undertaken land reform exercises. One of the principal reasons for the abject poverty in Africa is unequal distribution of land amongst cultivators and non-cultivators. Due to poverty, the farmers sell off their lands to wealthy people who have no intention to cultivate it but use it for other purposes like constructing buildings. One of the successful land reforms was implemented in Ethiopia in 1975. Through this reform, the government nationalized rural land without compensation, abolished tenancy, forbade the hiring of wage labor on private terms, ordered all commercial farms to remain under state control and granted each peasant family the so called 'possessing rights' to a plot of land not to exceed ten hectares. Another successful land reform in Africa was in Malawi. In 2004, with support from the World Bank, the Government of Malawi instituted a decentralized, voluntary and community-based land reform pilot project that distributed land owned by large corporate estates to groups of poor farmers. The Malawi program was modeled on Brazil's market-based approach to land reform, provided the groups land rights and funds to buy the supplies needed to diversify their farming and increase production.

Investments in Agriculture

During the last decade there have been many investors in the agricultural sector who have been flocking to many parts of the world, including Africa. Cumulative FDI in the African agriculture sector during January 2003 till February 2017 aggregated to US$ 9391 million. India has been one of the largest investors in the agriculture sector in Africa (excluding agro based processing). Major investors among the developed countries included the UK, the USA, Switzerland, Singapore, France and Canada. Apart from India, amongst the developing countries

Table 2.2: Agricultural Investments in Africa : Countrywise (US$ mn)

Top 10 countries investing in agriculture in Africa during Jan 2003-Feb 2017 (Cumulative) Total Investments: US$ 9391 mn		Top 10 countries receiving investment in agriculture during Jan 2003-Feb 2017 in Africa (Cumulative) Total Investments: US$ 9391 mn	
India	2101	Cameroon	2297
Kuwait	1500	Mozambique	1927
The UK	1370	Ghana	954
The United States	1271	Liberia	640
Malaysia	782	Nigeria	619
Switzerland	482	Ethiopia	482
Singapore	186	South Africa	439
Canada	180	Egypt	222
France	171	Angola	185
Italy	150	Uganda	184

Source: Data derived from FDI Markets; Exim Bank Research

Table 2.3: Indicative Trends in Overseas Agricultural Land Acquisition

Base of Foreign Investor	Target Country	Area(ha)
South Africa	Democratic Republic of Congo	10,000,000
The US	Sudan	400000
China	Zambia	2,000,000
Egypt	Sudan	1500000
Saudi Arabia	Mali, Senegal, Sudan, Uganda	700000
South Korea	Sudan	690000
Saudi Arabia	Tanzania	500,000
Sweden	Tanzania	400000
UAE	Sudan	378,000

Source: Economic Report, Land Grabbing: myth or reality, ODDO securities

Malaysia and Kuwait were the other major investors in the African agricultural sector. Almost half the total value of investments were accounted for by two African countries – viz. Cameroon and Mozambique.

Since the turn of the century, there has been a sudden increase in investments in Africa's agricultural land. Three broad trends have triggered such surge in investments. First, the potentially food insecure but predominantly rich nations have sought to outsource their domestic production by gaining access and control over agricultural lands in foreign countries. Second, with high crude oil costs, the demand for agro fuels has been rising. According to the International Energy Agency, in 2006, an estimated 14 million hectares of land were used for the production of biofuels and by-products, approximately 1% of globally available arable land. At the global level, projected growth in biofuel production to 2030 could require 35 million to 54 million hectares of land (2.5% to 3.8 % of available arable land). Over the next ten years, biofuels are expected to account for about half the increased demand for oilseeds. And third, high food prices coupled with low land prices in many parts of the world have made investments in land attractive due to higher financial returns.

In Africa, since large tracts of land still remains unutilized, a mechanized farming approach could help in generating a better yields as well. Leasing unused land to foreign governments and companies for large-scale cultivation would boost an underdeveloped sector and create new job opportunities. However, the need is to have a sustainable methodology wherein both local communities and foreign investors benefit. This could be facilitated by ensuring a minimum value addition norm for investors in the continent. Most crops have a forward linkage opportunity which could be harnessed by the local African government so that there is additional employment as well.

According to the Financial Times database, fDi Statistics, these investments in Africa have been across segments, with crop production having attracted the maximum focus. The other segments which have received investments in Africa include grains & oilseed, rubber products, agriculture, coffee & tea, and fruits & vegetables including tobacco.

The Table 2.4 shows the major agricultural sectors receiving investment. Crop production received the highest amount of investments cumulatively between 2003 and 2015 to the tune of US$ 6469 mn, followed by grains & oilseeds at US$ 1134 million. Coffee & tea, fruits & vegetables & specialist foods, and tobacco received the remaining investments.

Table 2.4: Total FDI Investments in Agriculture in Africa (Jan 2003-Feb 2017) (in US$ mn)

Segment	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Grand Total
Coffee & tea	-	-	24	27	53	34	122	-	-	58	69	84	45	-	653
Crop production	835	12	299	-	-	251	794	12	2461	93	82	65	1510	56	6469
Fruits & vegetables & specialist foods	3	59	50	71	5.1	4	51	101	131	5	-	37	27	7	551
Grains & oilseed	10	31	26	58	5.1	24	155	173	168	91	126	220	20	25	1134
Tobacco	156	-	-	80	-	-	-	-	-	-	-	186	103	58	584
Grand Total	**1005**	**103**	**400**	**236**	**64**	**313**	**1121**	**423**	**2760**	**247**	**277**	**592**	**1705**	**146**	**9391**

Source: Data derived from fDi Markets; Exim Bank Research

In the coffee segment, in 2010, Nestle opened a factory in Mozambique, and in Angola in 2012, to cater to the rising middle class in the country. Besides Nestle has also put up manufacturing facilities in Cameroon and South Africa. They have also established distribution centres and sales offices in Kinshasa, Lubumbashi and Goma in 2009 in Congo, and have witnessed remarkable growth since then. Nestle had also invested around US$ 16.9 mn in Cote d'Ivoire (which is the largest coffee producer in Africa) for R&D in 2009. On the other hand, Nespresso ventured into Senegal by establishing retail chains in 2015. Nespresso has also expanded into Morocco and Gabon. India also has a presence in coffee through Tata Coffee in Uganda, and in tea through Kanan Devan Hills Plantations in Ethiopia.

Among crop production companies, Biopalm Energy of India has invested US$ 1907 mn in Cameroon for 200,000 hectares of land. This was followed by the next highest investment by Kuwait based Al-Bader International Development of US$ 1500 mn in Mozambique. UK based companies like Guinness Ghana, D1 Africa, D1 Oils, DOS Palm Oil Production, and Lonrho Agriculture have cumulatively invested around US$ 1139.5 mn for manufacturing of variety of products. For example, Lonrho produces and procures large volumes of produce, and then processes, packs and ships the produce to retail chains within Africa and abroad to Europe, the United States, the Middle East and, increasingly, the Far East. On the other hand, Kuwait based Al-Bader International Development Company plans to invest U$ 1.5 billion in an agro-industrial project for the production of sugarcane in Mozambique, with a view to producing ethanol.

In the fruits and vegetables segment, Turkey has been the highest investor in Africa, although there have been only a couple of investments from the country, one each in Libya (by Dardanel) and Gabon (by Dimes). Canada had invested in South Africa through McCain Foods with a total investment of around US$ 105 mn.

Africa has also seen fairly good investments in grains and oilseeds. USA based Monsanto has been the key investor, followed by Singapore based Olam International, Olam Nigeria, apart from Wilmar International. Alimentos Naturales and Borges of Spain have been found to have invested in Morocco and Egypt respectively. It may also be noted that Bakhresa, a Tanzania based company while benefitting from the Eastern African Community Customs Union, has invested in Rwanda towards establishing a plant to minimize the high cost of imports. Another Tanzanian based company Mount Meru Millers, has also invested in Uganda to take advantage of the abundant oil seeds in the country, and the potential to grow more.

In the tobacco segment, UK based British American Tobacco (BAT) had invested in Kenya and Nigeria in 2003, while Habanos has recently invested in Morocco in 2015. The segment has also witnessed an investment

Table 2.5: Agri Processing Investments in Africa : Countrywise (US$ mn)

Top 10 countries investing in agri processing & allied sectors in Africa during Jan 2003-Feb 2017 (Cumulative) Total Investments: US$ 10.3 bn		Top 10 countries receiving investment in agri processing & allied sectors during Jan 2003-Feb 2017 (Cumulative) Total Investments: US$ 10.3 bn	
The UK	2425	Nigeria	1860
Netherlands	1095	Egypt	1317
Singapore	754	Cote d'Ivoire	908
France	606	South Africa	871
The United States	557	Zambia	717
Switzerland	517	Ghana	593
Saudi Arabia	505	Ethiopia	542
Zimbabwe	500	Angola	528
South Africa	439	Tanzania	446
UAE	358	Mozambique	405

Source: Data derived from fDi Statistics; Exim Bank Research

from an Africa country – Zimbabwean company Savanna Tobacco had invested US$ 55.7 mn in Mozambique in 2014.

Investments in Processed Agricultural and Allied Industries

Many investors into Africa have also been concentrating on value addition of naturally available products. The top 10 investing countries in Africa constituted 77% share of the cumulative investments of US$ 10.3 billion, with most of the investments coming from European countries like the UK, the Netherlands, Switzerland, and France. Besides the USA, Saudi Arabia and India, two African countries, viz. South Africa and Zimbabwe also figure in the list of top 10 investors in Africa. The countries that received the highest investments (cumulatively during Jan 2003-Feb 2017) are Nigeria, Egypt, Cote d'Ivoire, South Africa, Zambia, Ghana, Ethiopia, Angola, Tanzania, and Mozambique – together constituting almost 78% of the inward investments into processed agricultural and allied industries in the continent.

As has been discussed, Africa has a good share in products like sugar and as a result the continent has witnessed a significant investment into sugar and confectionary products. The cumulative investments into the sector have been to the tune of US$ 4.8 bn during the period January 2003 to February 2017. For example, Savola, a Saudi Arabia based company, has added two sugar plants in Egypt and increasingly relies on locally produced sugar beet, rather than more expensive raw sugar, to meet rising demand in the Middle East. Singapore based Olam International has invested in Nigeria and Cote d'Ivoire. In 2010, Olam had set its first, large greenfield cocoa processing plant in Cote d'Ivoire given its forward linkages towards manufacturing chocolates. Later in 2011, Olam invested in sugar manufacturing in Nigeria, as it realized that the state's 44% duty on imports of the refined sweetener favoured local output.

Many US based companies like Cargill, Archer Daniels Midland, Cadbury, Mars, Wrigley have invested in a host of countries like Cote d'Ivoire and Egypt, Ghana, Kenya, Nigeria in the Sugar and confectionary products segment. In fact Starbucks has also invested in education and training in coffee production in a sustainable manner in Kenya.

Table 2.6: Total FDI in Processed Agricultural and Allied Industries in Africa (Jan 2003-Feb 2017) (in US$ mn)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Bakeries & tortillas	56	-	58	-	-	-	-	-	-	268	-	-	-	5	68	455
Breweries & distilleries	465	180	-	19	38	673	434	200	599	234	164	333	228	-	99	3667
Seasoning & dressing	-	-	-	-	75	-	10	-	240	-	129	-	41	69	-	564
Snack food	-	9	-	-	-	-	43	55	32	372	175	57	5	68	-	815
Sugar & confectionary products	138	51	150	158	408	587	119	452	449	666	138	750	330	405	-	4800
Grand Total	**659**	**240**	**208**	**177**	**521**	**1260**	**606**	**707**	**1319**	**1540**	**606**	**1140**	**604**	**547**	**167**	**10302**

Source: Data derived from fDi Markets; Exim Bank Research

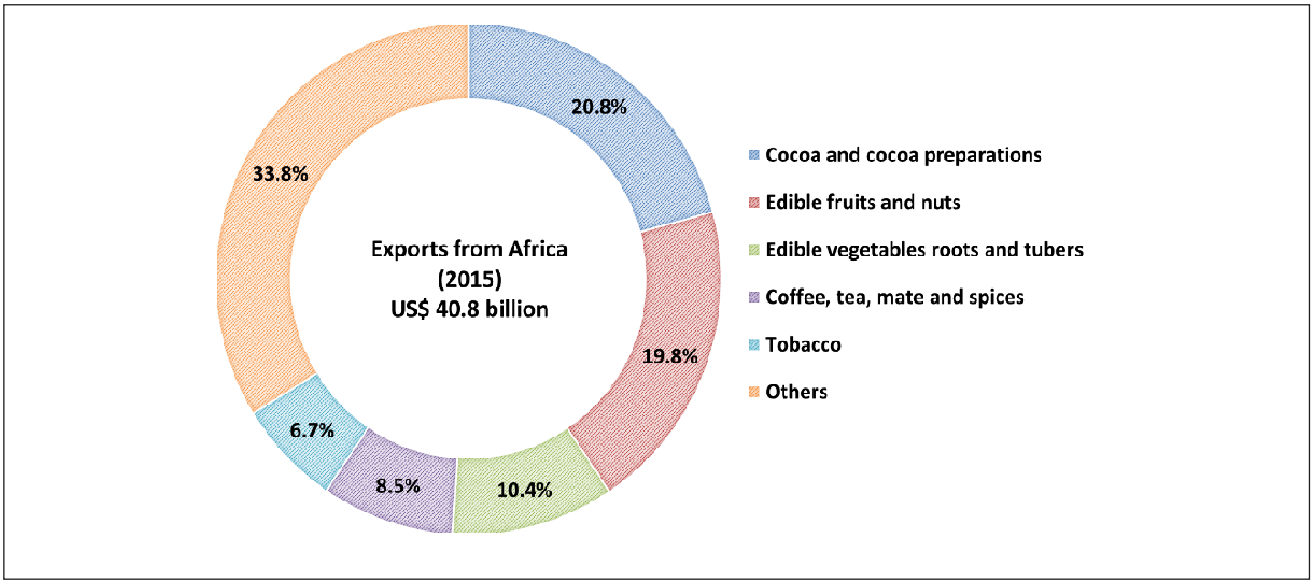
The beverages and distilleries segment also witnessed fairly good levels of investments, especially from European countries like the UK, the Netherlands, and Portugal apart from Ghana, South Africa, Mauritius, and even the USA. The Netherlands based Heineken invested in Ethiopia in 2013.

Many UK based companies have invested in the African agriculture processing and allied industries - NILE Breweries (NBL) has constructed a brewery in Mbarara in western Uganda; beer giant SAB Miller has invested in four breweries in Angola, apart from having invested in Mozambique, Namibia, Nigeria, and Ghana; Guinness has invested in Nigeria, Ghana, Tanzania; while Diageo has exposure in countries like Ethiopia, and Mozambique.

Africa's Agricultural Exports

Agricultural exports from Africa aggregate to US$ 40.8 billion in 2015, accounting for 10.9% of the total exports of the continent. Among the agricultural items exported, cocoa and its preparations constituted approximately 20.8% of the total exports. The exports of edible fruits and nuts valuing around US$ 8.1 billion formed 19.8% share of the aggregate agricultural exports by the continent. Other significant agricultural products exported by Africa included edible vegetables (10.4% of the total exports) and small proportions of coffee and spices and tobacco.

Exhibit 2.3: Share of Agricultural Commodities Exported from Africa 2015



Source: Data derived ITC Trade Map on August 14, 2016, Exim Bank Research

Table 2.7: Origin-Destination of Major Agricultural Exports of Africa

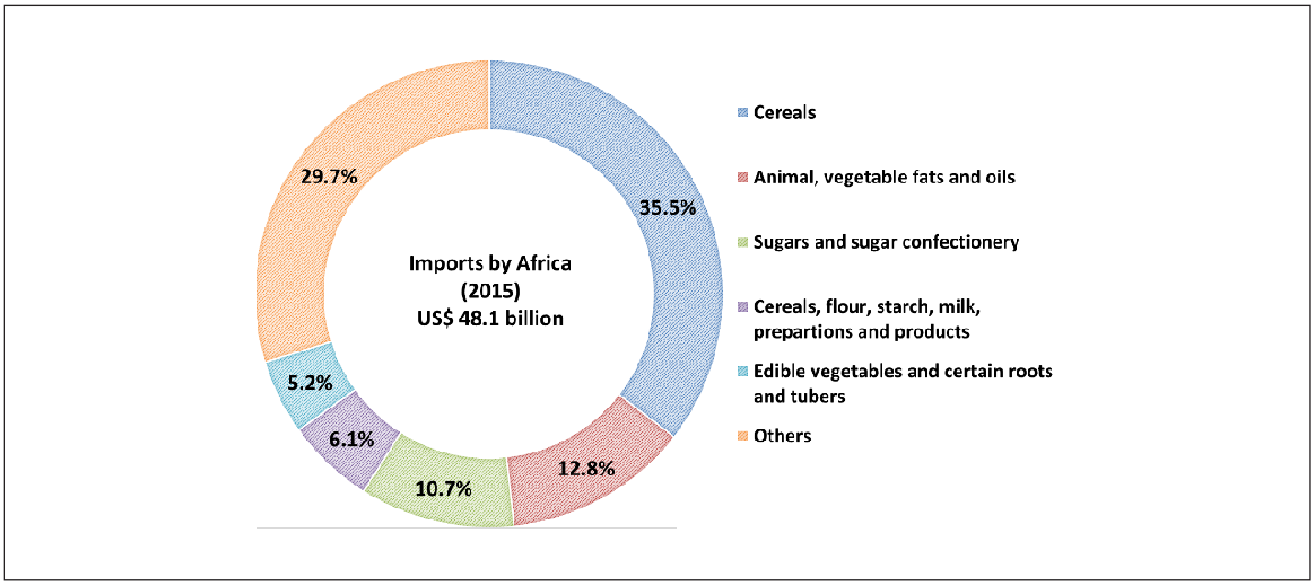
Product	Total Export (in US$ bn)	Exporting Country (% in African Export)	Destination
Cocoa	8.5	Nigeria (54.0%) Ghana (28.9%) Cote d'Ivoire (6.3%)	The Netherlands, the USA, Germany
Edible fruits and nuts	8.1	South Africa (36.2%) Morocco (15.1%) Egypt (13.3%)	The Netherlands, the UK, France, Russia, Saudi Arabia
Edible Vegetables, certain roots and tubers	4.2	Morocco (31.1%) Egypt (21.7%) Ethiopia (21.1%)	France, Spain, The Netherlands, Italy, Russia, Saudi Arabia
Coffee, tea, mate and spices	3.5	Ethiopia (30.2%) Kenya (19.6%) Uganda (13.8%)	Germany, the USA, Pakistan, Afghanistan, Italy
Tobacco	2.8	Zimbabwe (23.4%) Malawi (18%) Tanzania (15.3%)	South Africa, Mozambique, Belgium, China, Romania

Source: Data derived from ITC; Exim Bank Research

Africa's Agricultural Imports

The agricultural imports accounted for nearly 9.6% of the total imports by Africa during the year 2015. Cereals were the leading import item and its share in the aggregate agricultural imports was 35.5% (US$ 17.1 bn). Animal, vegetable fats and oils formed the second largest agricultural product imported followed by sugar and sugar confectionery (Exhibit 2.4). Most of the imports to Africa were from the developed countries in Europe – France, Switzerland, Germany, Denmark, amongst others (Table 2.8).

Exhibit 2.4: Share of Agricultural Commodities imported by Africa 2015



Source: Data derived ITC Trade Map on August 14, 2016, Exim Bank Research

Table 2.8: Origin-destination of Major Agricultural Imports of Africa

Product	Total import (in US$ bn)	Importing Country (% of African Import)	Source
Cereals	17.1	Algeria (15.9%) Egypt (15.8%) Nigeria (8.2%)	France, Argentina, Canada, Ukraine, The USA, Thailand
Animal, vegetable oil and fat	6.1	Ethiopia (18.3%) Egypt (12.2%) South Africa (9.6%)	Indonesia, Malaysia, The USA, Russian Federation, Ukraine, Indonesia, Argentina
Sugar and sugar confectionery	5.1	Algeria (11.5%) Sudan (North and South) (9.7%) Nigeria (9.4%)	Brazil, France, Germany, The USA, China, India, Thailand
Cereal, flour, starch, milk preparation and products	2.9	Nigeria (12.7%) Algeria (8.1%) Libya (6.4%)	Ireland, Denmark, New Zealand, France, Belgium, Spain, Italy
Edible vegetables and certain roots and tubers	2.5	Somalia (20.5%) Egypt (18.1%) Algeria (11.9%)	The USA, China, The UK, Australia, The Netherlands

Source: Data derived from ITC; Exim Bank Research

3. India-Africa Mutual Cooperation in Agriculture

The last two sections clearly demonstrated the need for creating an enabling infrastructure for agriculture in Africa. As was highlighted, the continent has tremendous potential of not only feeding its own population but also a large part of the population residing beyond its shores, provided it gets adequate support. In this context, India has a huge opportunity to partner with Africa whilst attempting to fulfill the 'Feed Africa' program.

Given the fact that India is still largely an agrarian country and feeds a population of 1.2 billion people and one that has traditionally had close relationship with Africa, India can share its vast experience across the agri value chain in enabling Africa to become a net exporter of agriculture products. The importance of agriculture sector in India can be gauged from the fact that it provides livelihood for more than 70% of Indians who live in the rural areas, contributes around 18% to the total GDP of India and is the largest employer providing employment to 49% of the total workforce[10].

Exhibit 3.1: Indian Agriculture – Select Successfull Initiatives

Source: Exim Bank Research

[10]Department of Agriculture & Cooperation & Statistics, 2014

Indian Agriculture – Select Successfull Initiatives

Green Revolution

India was a food importing country and depended on food imports (under food for peace program) from North America under the PL-480 scheme. In 1965 India had imported 10 million tonnes of wheat under PL-480, and the following year India again imported 11 million tonnes. However, over the years things have changed, and India exported 10.4 million tonnes of rice and 6.18 million tonnes of wheat during FY 2015-16. All this was possible because India embarked upon the Green Revolution in 1966 which encompassed adopting high-yielding varieties of seeds, modern farming methods, irrigation development and financing of agrochemicals. While the introduction of technology was fuelling India's drive towards self-sufficiency, it was the enthusiasm and entrepreneurship of the farmers who adopted it that mobilised the agricultural revolution in India. It also included continued expansion of farming areas, double cropping existing farmlands, irrigation development, and financing of agrochemicals. Thus a combination of technological development, significant investments as well as support by the Government led to a considerable increase in production of cereals.

Contract Farming

Contract farming is another phenomenon which has proved to be very useful in the Indian context. Today, it is being practiced across India and has established itself as a win-win partnership for both the farmers and the private sector firms. Major multinationals, such as Hindustan Unilever Ltd (HUL), Rallis, ITC, Reliance and PepsiCo among others are associated with contract farming in India.

In one such case, HUL, Rallis and ICICI formed an alliance with the farmers. Under this alliance, Rallis supplies agri-inputs and know-how, and ICICI finances (farm credit) to the farmers. HUL, the processing company, which requires the farm produce as raw material for its food processing industry, provides the buyback arrangement for the farm output. In this arrangement, farmers benefit through the assured market for their produce in addition to timely, adequate and quality input supply including free technical know-how; HUL benefits through supply-chain efficiency; while Rallis and ICICI benefit through assured clientele for their products and services.

Drip Irrigation

Drip irrigation is a form of irrigation that saves water and fertilizer by allowing water to drip slowly to the roots of many different plants, either onto the soil surface or directly onto the root zone, through a network of valves, pipes, tubing, and emitters. The systems are generally more efficient than conventional sprinklers, because they deliver low volumes of water directly to plants' roots, minimizing losses to wind, runoff, evaporation, or overspray Drip irrigations systems use 20 - 50% less water than conventional pop-up sprinkler.

Some of the other key benefits of drip irrigation are, increase in production & productivity, improve the quality and ensure early maturity of the crops, controls weed growth, saving of fertilizer (30%) and labour cost (10%), fertigation / chemigation can be made efficiently while controlling diseases.

According to National Committee on Plasticulture Applications in Horticulture (NCPAH), India, drip irrigation contributed to the water saving to the extent of 45% in banana cultivation, 68% in cauliflower and chilly cultivation, 40% in ground nut cultivation, 42% in tomatoes cultivation, 66% in watermelons cultivation, amongst others.

Such lower-cost, more water-efficient irrigation technologies have the potential to greatly expand small-scale irrigation in Africa and significantly improve food security and family incomes. In Africa there has been a few successful cases in drip irrigation. For example, The African Market Garden, an initiative of West Africa's dry Sahelian region combines efficient drip irrigation to save water, energy and labor with improved crop management to boost farmers' vegetable yields and economic returns. The centrepiece of the new system is a low-pressure drip irrigation unit, which is installed in a field that comprises clusters measuring 500 square meters. To irrigate a traditional vegetable garden of 500 square meters using the conventional system takes

Box 1: Case Study: Drip Irrigation

- PepsiCo is also helping farmers in water-scarce areas in Maharashtra, Gujarat, Karnataka and Haryana and promoting drip irrigation in over 3000 acres. They are also incentivizing the farmers for the adoption of drip irrigation through a buy-back mechanism.
- Jarandi, a village in Maharashtra's Aurangabad district, gets barely 750 millimetres of annual rainfall, well below the national average of 1,175 mm. Yet, this village has a unique distinction of almost its entire cultivable area being under drip irrigation. Most farmers in Jarandi harvest 17-18 quintals of cotton per acre, due to drip irrigation as against the national average of 6 quintals per acre. Drip irrigation, apart from saving water, contributes to higher yields. The reason for this is that the water (and fertiliser) is applied only at the plant's root zone and remaining soil area gets enough air to maintain an optimum air-water-nutrient balance.

Source: Accessed various sources from web.

one man, lifting two watering cans at a time, about 4 hours a day or one woman, lifting only one watering can, about 8 hours a day, compared to just 10 minutes for drip irrigation. Using a solar-powered pump or other renewable energy source to provide water allows further savings and makes the system more sustainable. African Market Garden, is implemented with about 7,000 small-scale farmers at 100 locations in Niger, Benin, Burkina Faso and Senegal. Support comes from the governments of Israel, Italy, Switzerland and the USA and from the International Fund for Agricultural Development (IFAD), the World Bank, and various international foundations and NGOs.

Drip irrigation can be a transformational technology for smallholder producers. The commercial potential for the private sector to expand this technology to smallholder farmers is enormous, given the sheer volume of potential customers at the smallholder level, and the area of arable land yet to be irrigated. Such measures could be more popularly implemented in African farms to improve efficiency and productivity considerably.

Agricultural Markets

A good agricultural harvest is of little use if the produce does not fetch enough returns to warrant a sustainable agricultural venture. Thus, marketing agriculture produce efficiently becomes important not only for expansion of the size of the market but also for transfer of appropriate price signals. An agricultural market backed by strong and adequate infrastructure goes a long way in efficiently selling agricultural produce without the interference of middlemen.

Taking cognizance of this, the Indian Government launched the National Agriculture Market (e-NAM) in 2016, with the objective of integrating agri-markets across the country through an e-platform and creating a unified national market for agricultural commodities.

These e-mandis (markets) integrates various vegetable markets across the country, bringing them all to one platform and registered farmers are able to sell their produce online in any of the markets where they can get the best price. Involvement of private sector ensures investment and entrepreneurial skills required for creation and management of modern markets. Thus, the e-marketing platform promotes free flow of agricultural commodities across the country and is gradually providing better prospects for marketing of agriculture produce. Improved access to market related information and better price discovery through a more efficient, transparent and competitive marketing platform has provided agriculture producers access to a greater number of buyers within the State and from outside, through transparent auction processes. It has also increased access to markets through warehouse based sales and thus obviated the need for transporting agri products to the nearby markets.

Box 2: Case Study: Agricultural Markets

e-Choupal is an IT-driven marketing channel that aligns farm output with market demand. The portal provides farmers with information on farming best practices, market prices, weather forecasts, news and a Q&A section which enables interaction with ITC's agricultural experts. ITC's agri-business arm, which runs the e-Choupal network, serves as the back-end source of raw materials that go into ITC's personal care products and packaged foods. The web-based e-Choupal network has now become a key driver for the FMCG business that comprises brands like Sunfeast, Aashirvaad, Vivel and Fiama Di Wills. The e-Choupal network comprises 24 Choupal Saagars (rural hypermarts), which are owned by ITC, and 70 warehousing hubs outsourced through service providers. Choupal Pradarshan Khets act as demonstration and selling points for agriculture companies; and companies sell their products and service through Choupal Haats. ITC typically organises 60,000 Pradharhan Khets and 6,000 Choupal Haats in a year. It is a profitable venture with an estimated internal rate of return (IRR) of 21.55%. It has also won awards such as United Nations Industrial Development Organization (UNIDO) Award at the international conference on Sharing Innovative Agribusiness Solutions 2008, at Cairo.

Source: Accessed various sources from web

Precision farming

Traditional agriculture techniques follow tasks such as planting, irrigating or harvesting against a predetermined schedule. By collecting real-time data on weather, soil, crop maturity, and equipment, farmers can make informed decisions. This is called as precision agriculture, using exactly the right amount of inputs at the right time and through the right means.

In India (and also in Africa), where most of the farm holdings are small, precision agriculture mainly provides precise application of agricultural inputs based on soil, weather and crop requirements to maximize productivity, quality and profitability. There are various types of ICT tools that can be used to provide information to end users, such as web-based information systems, SMS-based services, mobile apps, and even directly through telephones.

For example, Indian Farmers Fertiliser Cooperative (IFFCO), a well-known farmer cooperative organisation. It has created the 'IFFCO Kisan' app which helps Indian farmers to make informed decisions by accessing customised agricultural information on market prices, weather forecast, latest agricultural advisories, farming best practices/tips, animal husbandry/horticulture expert advice and all agriculture-related news and recent government schemes.

Robotics in agriculture

Africa has the possibility and scope of experiencing a leap-frog approach in modern agriculture. Robotics in agriculture is one such technology. It is a subset of the precision farming set of technologies used in every stage of crop yielding from soil assessment to ploughing/ seeding to harvesting and packaging. The stages include usage of various types of robots (including drones) to increase overall productivity. The advantage of using agricultural robots is that they are capable of collecting crop and soil samples because they are small in size, which allows them to be able to accumulate data close to the crops with the equipped cameras and sensors. They are also capable of mowing, spraying pesticides, finding diseases or parasites, and performing mechanical weeding. The benefits of automization and mechanization can be seen spreading to crops like tomatoes, peppers, strawberries, etc., thus making them more affordable; dramatically reduced loss of soil to erosion; reduction of agriculture's contribution to CO_2 production and reversal of the loss of soil carbon.

[11]The 'Choupal Pradarshan Khet', provides services that help the farmers to ensure productivity gains. The services are customised to meet local conditions, ensure timely availability of farm inputs including credit, and provide a cluster of farmer schools for capturing indigenous knowledge

Box 3: Case Study: Introduction of Robotics in Indian Agriculture

Among the most stated in India is the joint effort of Agriculture Insurance Company of India along with Skymet, a weather forecasting company pilot project in parts of Gujarat and Rajasthan to see how drones can be used to survey crops and help map crop diseases along with helping insurance companies settle claims. Other most stated project KISAN- C(K)rop Insurance using Space technology And geoiNformatics, initiative by Mahalanobis National Crop Forecast Centre (MNCFC). The project envisages use of Space Technology and geoinformatics (GIS, GPS and Smartphone) technology along with high resolution data from UAV/drone-based imaging for improvement in yield estimation and better planning of Crop Cutting Experiments (CCEs), needed for crop insurance programme.

For the society at a large, where drone and robotic technology is experiencing an explosive growth, there is need for a participatory approach to educate the community about the use and benefits of these technologies. The use of these tools can bring about higher production and provide a definite method for systematic farming, across globe.

Institutional Support

One of the main features of India-Africa cooperation in agriculture is India having actively pursued capacity building and sharing its experiences to help develop the African agriculture sector. Particular attention has been given to research and knowledge sharing methods on various agricultural practices. India has sent teams of farm experts from the Indian Council of Agricultural Research (ICAR) to Zambia, Ethiopia and South Africa and several African countries to get firsthand knowledge of how African countries may explore ways of improving their agricultural practices.

Moreover, Platform for India-Africa Partnership in Agriculture (PIAPA) has been set up by The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Agriculture Consulting Group (IACG) and Indian Council of Agricultural Research (ICAR) to bring various stakeholders on board as consortium partners to create better policies, more effective institutions, improved infrastructure and better access to markets and higher quality inputs, particularly for dry land farmers in India and Africa. ICRISAT has also set up ICRISAT South-South Initiative (IS-SI) to provide a systematic and effective cooperation between India and Africa in the agriculture sector. It has already established strong and successful India-Africa partnerships to scale up its role as a driver of prosperity and economic opportunities in the dry-land tropics.

Besides, a MoU for cooperation in the field of agricultural research and education was signed between the Department of Agricultural and Research and Education (DARE), Government of India and ICAR, and the Director General of Ethiopian Institute of Agricultural Research (EIAR), Ethiopia. The priority areas of cooperation include agricultural research in horticulture, crop science, fisheries, animal science, agricultural engineering and natural resource management, agricultural extension and agricultural education. Both countries agreed to extend cooperation through exchange of scientists, scholars, technologies, literature, information and germplasm, as well as pursue collaborative research projects.

India also has a host of many other research institutes in the field of agriculture like Central Food and Technology Research Institute (CFTRI), National Dairy Research Institute (NDRI), amongst others, which can work in Africa sharing their experiences and introducing successful practices, tried and tested in India.

Marketing support

Going forward Indian marketing agencies like Agricultural and Processed Food Products Export Development Authority (APEDA), state level agricultural produce market committees (APMC), and National Agriculture Market (NAM) a pan-India electronic trading portal can

all share their experiences in various countries in Africa. They, in conjunction with the Government of India, and national agencies in Africa, can undertake pilot projects seeing the feasibility of having similar operations in Africa. Such projects will also throw open a lot of experiences, which could then be improved in their next operation.

INDIA'S AGRI CHALLENGES : FOCUS ON CEREALS AND PULSES

Agriculture plays a vital role in India's economy. Over 58% of the rural households depend on agriculture as their principal means of livelihood. Agriculture, along with fisheries and forestry, is one of the largest contributors to the GDP. As per the 2nd advance estimates by the Central Statistics Office (CSO), the share of agriculture and allied sectors (including agriculture, livestock, forestry and fishery) is expected to be 17.3% of the Gross Value Added (GVA) during 2016-17, at 2011-12 prices.

India is the largest producer, consumer and exporter of spices and spice products. India's fruit production has grown faster than vegetables, making it the second largest fruit producer in the world. India's horticulture output, is estimated to be 287.3 million tonnes (MT) in 2016-17 after the first advance estimate. It ranks third in farm and agriculture outputs. Agricultural export constitutes 10% of the country's exports and is the fourth-largest exported principal commodity.

India's current excellence in agricultural production is largely because of the work India has been doing on a continuous basis since Independence. Some of those like green revolution to enhance productivity, drip irrigation to make best use of water available, agricultural research institutes to inculcate technology based approaches, strengthening agricultural marketing for better price realisations, amongst many others have been mentioned in the previous section.

Whilst these are areas where India can cooperate with Africa sharing its experiences and providing capacity building support on an ongoing basis, India at its domestic front is facing certain challenges. Although, production of staple food items has kept pace with the growth in population, there have been certain essential agricultural commodities for which India is not self-sufficient.

Whereas the position with regard to the production of cereals, especially wheat and rice, is quite comfortable,

Table 3.1: Production and Import of Select Agri Produces by India

	Edible Oil	Wheat	Rice	Pulses	Oilseed	Maize	Soybean
Production		**mn tonnes**					
2012-13	9.22	93.51	105.2	18.3	30.9	22.3	14.7
2013-14	10.19	93.85	106.6	19.3	32.7	24.3	11.9
2014-15	9.21	86.53	105.5	17.2	27.5	24.2	10.4
2015-16	9.18	92.29	104.4	16.4	25.3	22.6	8.6
2016-17 (Advance Estimates)	10.97	96.64	108.9	17.8	33.6	26.2	14.1
Import		**US$ mn**					
2012-13	50.8	1.1	725.2	2450.0	74.8	5.4	0.7
2013-14	276.3	4.4	1371.2	1828.2	162	13.2	0.5
2014-15	191.1	10.0	1772.0	2786.1	89.9	4.6	3.8
2015-16	240.7	135.4	908.2	3902.2	67.4	43.9	12.5
2016-17 (April-Jan)	262.3	646.9	826.6	3924.7	116.6	10.5	30.0

Source: Ministry of Agriculture; DGCI&S

pulses and oilseeds are an area of concern. Increasing production to meet growing demand with limited land and water resources also remains a challenge.

Pulses, for example, are a major source of protein for most people, especially the poor. While demand for pulses continues to rise, domestic supply has perennially been falling short stoking food price inflation. Currently, as in 2016-17 even as production of pulses has stabilized at 17.8 million tonnes, while India's consumption has been hovering at 22.2 million tonnes, necessitating yearly pulse imports of around 4-5 million tonnes.

The story is similar for edible oil seeds. According to the Solvent Extractors' Association of India (SEA), driven by a surge in import of soya oil and sunflower oil, India's vegetable oil imports are likely to rise by 200,000 tonnes to touch 150 lakh tonnes in oil year 2016-17 (Nov to Oct). India imported more edible oil in the last few years due to stagnant oilseed production and rising domestic demand. India's dependence on imported oil has risen to 70%. The Ministry of Agriculture & Farmers Welfare, Government of India has projected the edible oil demand to reach 16.64 million tonnes by 2016-17 (Nov-Oct), requiring 59 million tonnes of oilseeds production, provided the proportion of different oilseeds remaining constant in the coming years.

India has been aspiring to become self-reliant in pulses and oilseed production by 2022, and to achieve this objective, it has to meet demand through domestic production. Given the average yields, India needs nearly 7 – 8 million additional ha of land to realize this aspiration. The declining land-base for agricultural operations, diminishing water tables, shortage of farm-labor, increasing costs of inputs and uncertainties which impact the viability of farming are some of the challenges that agriculture sector faces in India. Small and fragmented land holdings are also unsuitable for large-scale commercial farming. In such circumstances, India needs to look at alternative plans and explore areas where it can produce to meet the domestic demand.

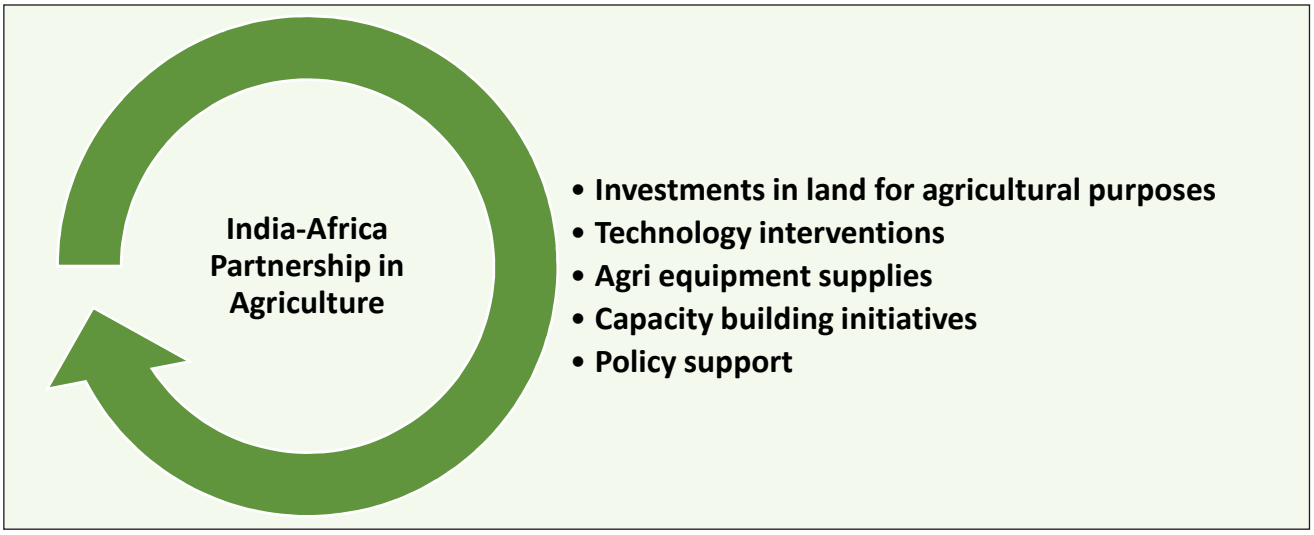
INDIA-AFRICA WIN-WIN SITUATION: SCOPE FOR PARTNERSHIP

Agricultural sustainability is intrinsically linked to food security, and therefore critical to the progress and socio-economic development of both Africa and India. Seeing the complementary sectoral priorities and similar role in evolving global food markets, numerous opportunities exist for collaboration between India and Africa in the agricultural sector. Although both countries share similar sectoral characteristics, they are at different maturity and transformation levels. With impending global production and food security pressures, there exists an urgent need to adequately channelise these investments towards high-impact priority areas in order to achieve immediate and sustainable returns.

Africa on one hand, is at a crucial time in the history of its growth while being home to some of the world's fastest growing economies (7 of the 20 fastest growing economies are in Africa), and on the other hand, the region has been struggling to feed its population, which is close to that of India. This is despite the fact that Africa has one of the largest availability of arable land (44%), second only to Asia. According to the World Bank, agriculture contributed nearly 32% to Africa's GDP and provided employment to approximately 65% of the labour force in 2015. Furthermore, an estimated 38% of Africa's working youth is presently employed in the agricultural sector. It is estimated that about 60% of the world's available and unexploited cropland is in Sub-Saharan Africa. However, only 5%-7% of the continent's cultivated land is irrigated, which leaves the farmers exposed to the vagaries of nature. In spite of its inherent strengths, Africa is left with no choice but to import a substantial portion of its food requirements.

As against this, India has been keen to secure food production for its vast population, inter alia, through developing land overseas for agricultural purposes by leasing or acquisition, sharing knowledge and expertise to increase productivity in new areas of farming, implementing successfully tried and tested practices

Exhibit 3.2: India Partnering Africa in Agriculture



Source: Exim Bank Research

abroad, and facilitating agricultural growth by supplying equipment from India.

Given the nature of landholding in Africa, where a large proportion of farmers are smallholders or subsistence-based, investment for the development of quality inputs, markets for produce, good soils and soil management techniques, innovative financing tools and other resources needed for sustained agricultural production becomes critical. Moreover, majority of African farmers use non-modern techniques in their production process and this limits their productivity, while the lack of irrigation leaves them exceedingly vulnerable to weather shocks. This situation is further exacerbated by inadequate inputs, lack of efficient markets and the necessary technology to ramp up production to levels beyond personal use.

In order to overcome these challenges, Africa could collaborate with a country like India, which has been a key partner in Africa's development, and shares a long history of friendship and cooperation with the continent.

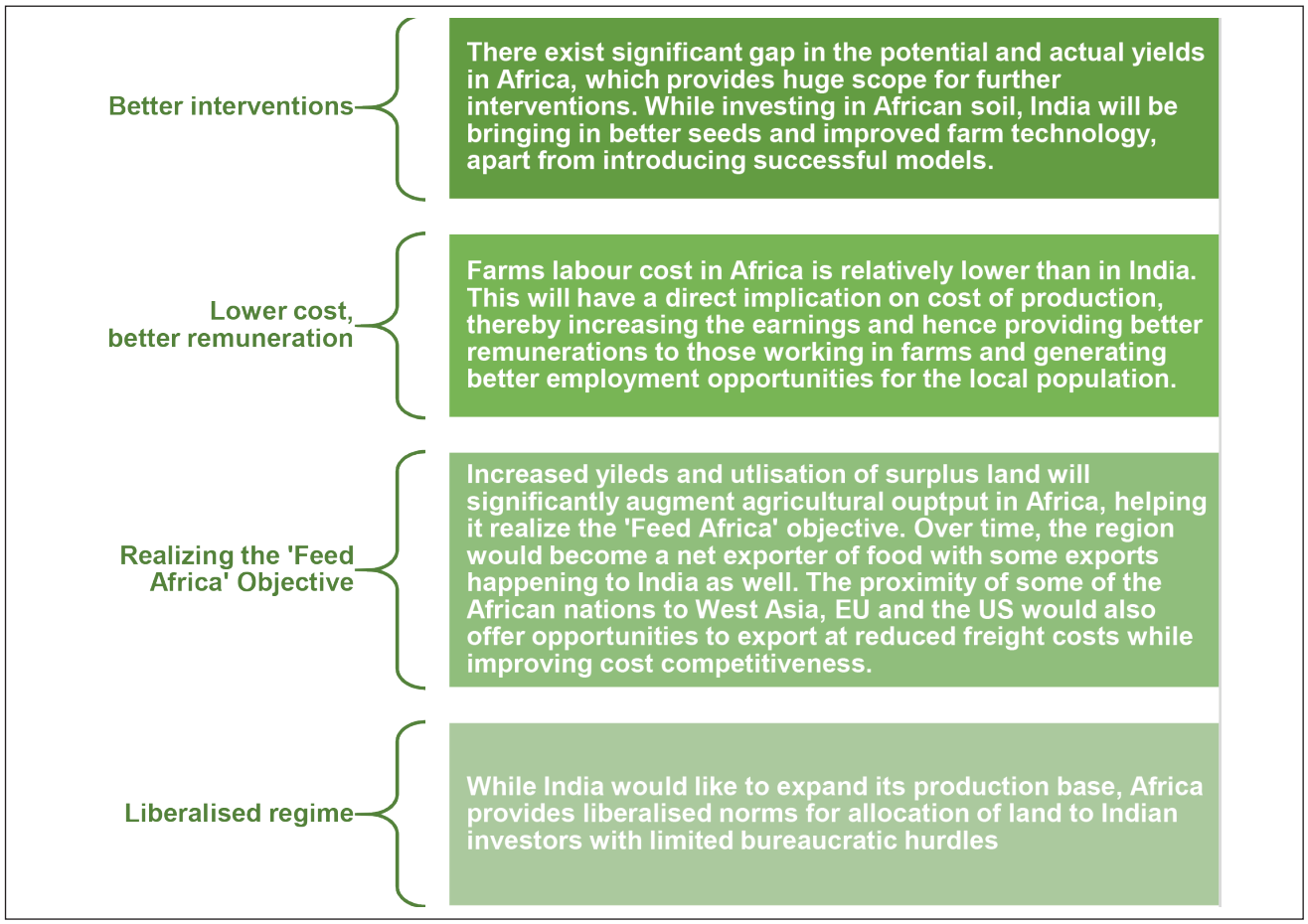
Given theses facts, one common thread which explicitly binds both India and Africa is food security. Agricultural production in India has increased manifold over the last three decades, and the position with regard to cereals, especially wheat and rice, is comfortable. There exists a vast scope for India to share its experience with its counterparts in Africa so as to enable the region to become self-sufficient in food production.

The bottlenecks in Africa in terms of inadequate agricultural infrastructure, and low average productivity in spite of the availability of land and natural resources provides an opportunity for India to engage with Africa to add the much needed vigour to the region's agriculture sector.

Investments in Agriculture Farm

The Government of India has been encouraging outward FDI in agriculture which would not only help Indian companies to purchase land abroad for cultivation but will also help serve the local communities by creating employment opportunities, enhancing productivity, thereby resulting in increased income generation for

Exhibit 3.3: Win-Win situation for India-Africa Cooperation in Farm Investments



Source: Exim Bank Research

Box 4: Socio-Economic Assessment of India's Agri Investment in Uganda

CUTS International conducted a survey in Uganda of an Indian company, which was one of the largest tea producing companies in the world, had invested in western part of Uganda. The research respondents, communities and areas were diverse, and it involved 12 communities in the areas of Kyamazima, Kiko, Kanyabeho in Kabarole and Kyenjojo Districts and Mashonga, Butare, Katima, Omukayenbe, Kibazi and Igara, in Bushenyi District. The survey showed the following:

- The Indian company was highly regarded by the community because it had a positive impact on the economic landscape of the community.
- Infrastructural investments were made on roads followed by educational facilities and then medical facilities.
- The company provided skill development trainings to its employees and helped to significantly raise the level of disposable income.
- Steps taken included restoring the environment through afforestation and training of the community on land and environment conservation measures.
- The company created more job opportunities for women.

Sources: CUTS International

Box 5: Basic Principles by FAO for Engagement at the Local Level during Agri investments

Basic principles that should be followed in engaging communities and local level stakeholders include:

- Consulting when all options are still open;
- Ensuring information is available to the community in understandable forms, including the full prior project proposal, explanation of options, impacts and alternatives, record of any agreement and pledges from either side;
- Making sure that diverse local interests are properly represented, by going beyond local elites and by making specific efforts to include groups who may be left out, such as women, minority ethnic groups and non-resident people like transhumant pastoralists;
- Crystallising any investor-community agreement emerging from the consultation in readily monitorable and legally enforceable terms;
- Providing effective arrangements for local people to voice concerns and seek redress, particularly where access to formal courts is constrained (e.g. grievance mechanisms);
- Committing to clear plans for revisiting the dialogue and reviewing progress in consultation with community.
- Attention to increased agricultural productivity needs to be balanced with assessment of how gains are achieved (for example, through mechanised or labour-intensive production) and how benefits are shared.
- State-of-the-art assessments of the social and environmental impacts of proposed investments are needed.
- Investors need to make realistic assessments of their capacity to manage farming projects at this scale.

Source: FAO

the local population. These efforts would help Africa in serving its objective of becoming a self-sufficient region in food production. At the same time, there has been a growing demand for certain crops in India which it is unable meet through domestic production. In such a situation, offshore agriculture investments emerge as a necessary solution to India's policy framework for addressing food security, especially as incomes rise, population increases, and longevity grows and available land declines in the country.

There is ample scope for India to enter into agricultural ventures abroad, especially in Africa. Africa offers immense opportunity in terms of investment in large-scale commercial farming, mainly due to availability of huge tracts of fertile land at modest prices. As with regard to small farm holdings as and where available, India can offer solutions in terms of setting cooperatives which could facilitate warehousing facilities, supply of machineries and equipment for the communities, providing logistics to supply to the primary markets of sale, etc.

Table 3.2: Job creation through Agriculture investments in Africa by India - January 2003 to March 2017

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2015	2016	2017	Total
Number of Projects	7	2	3	1	1	6	8	9	3	4	2	6	2	1	55
Capex (USD m)	161.7	11	15.2	20	8	309.8	248.8	246.1	1,920.50	91.6	34.9	213.8	102.9	43.8	3,428.2
Jobs	740	42	39	131	15	1,260	1,616	1,793	3,200	518	95	703	494	270	10,916

Source: fDI Markets; Exim Bank Research

Table 3.3: Job creation in Processed Agricultural and Allied Industries in Africa by India 2003-2015

Year	2005	2006	2007	2008	2010	2011	2013	2014	2015	Total
Number of Projects	1	2	1	4	1	1	1	1	1	13
Capex (USD m)	19.0	50.3	15.9	80.6	100.0	22.0	24.5	6.0	27.9	346.2
Jobs	22	250	29	355	654	83	27	15	202	1,637

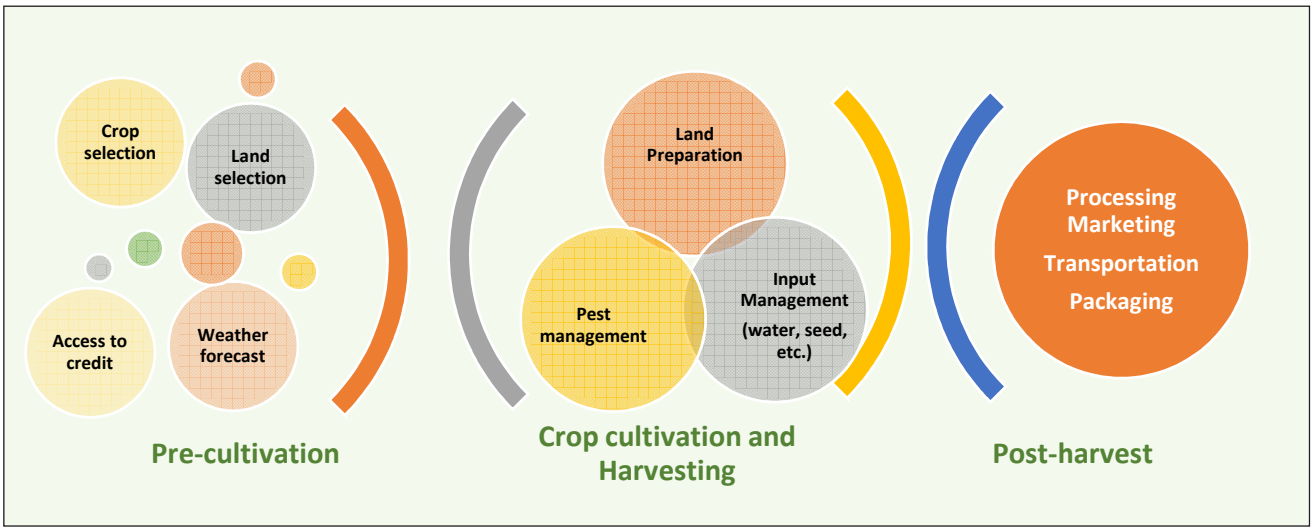
Source: fDI Markets; Exim Bank Research

Table 3.4: Select Indian Companies Having Invested in African Agriculture

Indian Company	Country	Details
Karuturi Ago Products Plc.	Ethiopia	Acquired 1, 00,000 ha in the Jakao and Itang Districts of the Gambela Region for growing palm, cereal and pulses, with conditional option to acquire another 200,000 ha. Karuturi Agro Products is a subsidiary of Karuturi Global Ltd.
Ruchi Soya Industries	Ethiopia	Acquired 25-years lease for soyabean and processing unit on 152,649 ha in Gambela and Benishangul Gumaz States.
Verdanta Harvests Plc.	Ethiopia	Acquired a 50-years lease for 5,000 ha in the Gambela region for a tea and spice plantation.
Chadha Agro Plc	Ethiopia	Acquired up to 100,000 ha in Guji Zone in Oromia Regional State for a sugar development project.
Sterling Group	Argentina	Purchased a 2,000-hectare olive farm and another 17,000 ha for graining peanuts.
Olam International	Gabon, Uruguay	Acquired 17,000 ha in Argentina to grow peanuts. 30,000 ha in Gabon for palm oil. Olam is a Non- Resident Indian firm based in Singapore.
Varun International	Madagascar	Varun Agriculture Sari leased or purchased 2,32,000 ha to grow rice, corn and pulses.
Uttam Sucrotech	Ethiopia	Won a US$ 100-million contract to expand the Wonji-Shoa sugar factory.
McLeod Russel	Rwanda	Owns five tea extates in Uganda and two estates in Rwanda.
India	Uganda	Purchased tea plantations worth US$ 25 million, including Uganda's Rwenzori Tea Investments; McLeod Russel India is owned by BM Khaitan.
ACIL Cotton Industries	Congo and Ethiopia	Plans to invest nearly US$ 15 million (Rs 68 crore) for land leases to start contract farming pulses and coffee in Congo and Ethiopia.
Neha International	Ethiopia	Leased land in the Oromia region- in Holetta for floriculture and near Bako for rice, maize, oilseeds and pulses.
Sannati Agro Farm Enterprise Pvt. Ltd.	Ethiopia	Acquired a 25-years lease on 10,000 ha in Dimi District, Gambela Region, for the cultivation of rice, Pulses, and cereals.
Jay Shree Tea & Industries	Rwanda, Uganda	Acquired two tea plantations in Rwanda and one in Uganda; Jay Shree Tea & Industries is controlled by BK Birla.
BHO Bio Products Plc.	Ethiopia	Acquired 27,000 ha to grow cereal, pulses and edible oil crops.

Source: Land Matrix

Exhibit 3.4: Possible technology based services where India can intervene



Source: Exim Bank Research

According to Financial Times database, fDI Markets, India's investments in Africa in sectors like crop production, grains and oilseed, fruits and vegetables, coffee and tea, tobacco since January 2003 have shown a total capex of US$ 3428 million and creating local jobs for more than 10,900 across various projects. There has been a total 55 project investments. On the other hand during 2003 and 2015, there has been capex in 13 processed agricultural and allied industries in Africa by India, value of which stood at US$ 346 million while having created 1637 jobs locally.

Technology

Better use of technology is at the heart of ambitions to improve productivity and efficiency in African agriculture. The impact of technology is diverse, and it influences market competitiveness in different ways. An integrated information system for agriculture stakeholders in the entire value chain ensures consistency in information dissemination, helps in better planning, and improves productivity and efficiency. The penetration of mobile handsets in information dissemination in agriculture also makes a significant difference.

Another important set of technology that is required in Africa is in terms of inputs. Africa requires a reliable supply of high-quality seeds suitable to its agro-climatic conditions to ensure productivity growth. However, low investment in science, and poor infrastructure act as barriers to enhancing quality seed production.

Some of the Indian seed companies have also ventured abroad, including the African markets. For example, It may be noted that Safal Seeds and Biotech are exporting onion seeds to Kenya, while Advanta India has become a regional partner under the 'Grow Africa' initiative, and is also playing a critical role to improve productivity in farms. Some of the other Indian entities which have made inroads into the African market are East West Seeds India Ltd, Nirmal Seeds, Nuziveedu Seeds, Mahyco. There are also some Indian seed companies which are working along with some of the NGOs such as AGRA (Alliance for a Green Revolution in Africa), One Acre Fund, IFDC (International Fertilizer Development Center), amongst others. This seed industry has also seen some acquisitions, with Mahyco acquiring a 60% stake in Quton Seed and making inroads into the genetically modified cotton seeds market. Quton Seed happens to be Zimbabwe's largest listed seed company in Africa. Another Indian seed firm, Nirmal Seeds has been working with the Ethiopian Institute for Agricultural Research for development and evaluation of crop seeds, and is slowly tapping into the seed business in the country.

This growing interest of Indian seed companies is

largely because they find a win-win situation in the offing. Indian seed companies are ready to explore the overseas market, and the African countries are showing enough appetite for absorbing this, as they search for improved quality of seeds which would augment their productivity. This further strengthens India-Africa's scope of cooperation.

R&D is a crucial determinant for improving agricultural productivity. India ranks fourth in the world in agriculture R&D spending after USA, Japan, China, and Brazil, which provides adequate opportunity for India to transfer tech-how to African economies. Besides, the green revolution experience in India offers a huge opportunity for Africa to learn, leverage and implement in its region. India has the potential to offer useful technology to African farmers in the form of hybrids (e.g. maize and cotton) with the potential for further expansion in the future. Other channels through which India can help to develop the African seed sector includes skill development and capacity building in this sector and R&D through knowledge transfer and exchange of technical expertise. For instance, traditional varieties give a mean average yield of 5,000 kg/ha (in Andhra Pradesh) compared with the Indian maize variety JC-1441 (developed by Punjab Agricultural University (PAU), Ludhiana), which gives a mean average yield of 5,846 kg/ha in the states of Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra, which have similar agro climatic conditions as that of many of the African countries.

Besides these, drip irrigation, precision farming, including agriculture cooperatives, contract farming, etc. as has been discussed earlier in this chapter, are also aspects which could be replicated in the African context.

Supply of Equipment

Adequate market penetration of farm machinery is important to increase food production in Africa. The main objective of farm mechanization is increasing agricultural production. India has over the years created infrastructure to build agricultural equipment, like tractors, harvesters, planting, seeding and tillage equipment, amongst many others.

For example, in the agricultural equipment segment, India has been one of the largest manufacturers of tractors in the world. In recent years Indian tractor companies have acquired foreign tractor set ups as well. Given the large tracts of land in Africa, Indian companies can explore exporting tractors to Africa. One way could be directly way bought by the farmers for end use, and another could be through farmers' cooperatives. These cooperatives can procure tractors, which can then be used by the members on pay and use basis. For small-holder farmers this strategy could be a part of farm mechanization. The apporoach can involve individual medium-size farmers, dealers, or new small business enterprises besides small-holder farmers.

According to a survey conducted by Agrievolution Alliance in 2016, a global network representing manufacturers of agricultural machinery, Africa holds great market potential for agricultural machines. According to the survey, 43% of manufacturers believe that Africa is 'very important' or 'absolutely essential' for their company's business. Looking at the sales perspectives for agricultural machines over the next 5 to 15 years, 3 out of every 4 respondents (73.6%) believe that the African market holds 'great' or even 'very strong' market potential.

In light of a rapidly growing demand for food in Africa fuelled by population growth, it is believed that a new approach is needed to promote sustainable mechanization and enhance agricultural productivity. Such an approach should combine reinforced institutional support with greater cooperation with the private sector with the help of PPPs. India being one of the world's largest tractor manufacturers is well equipped to provide this support. Some of the major manufacturers who supply tractors in India and abroad are Mahindra, TAFE, Escorts, Sonalika, HMT, L&T John Deere Private Limited, among many others. At the same time, there are agri-equipment manufacturers and suppliers which can increasingly explore the market in Africa, like Kirloskar, Greaves Cotton, Usha, etc.

Capacity Building

India is also making an important contribution to agricultural research and capacity building in Africa by setting up institutions such as India-Africa Institute

of Agriculture and Rural Development, India-Africa Centre for Medium-Range Weather Prediction in East Africa, India-Africa University for Life and Earth Sciences, and India-Africa Food Processing Cluster. As part of India's new initiatives towards the social and economic sectors in Africa, establishment of Rural Technology Parks, Food Testing Laboratories, Food Processing Business Incubation Centres and Centres on Geo-Informatics Applications and Rural Development, is also on the card. Two institutions, the International Crop Research Institute for the Semi-Arid Tropics and International Livestock Research Institute lead India-Africa cooperation in biotechnology. To support human resource development in Africa, India has implemented a number of scholarships for African students in India. All these efforts need to be suitably leveraged.

Policy Support

India has announced the Duty Free Tariff Preference (DFTP) Scheme for the LDCs on the occasion of the India-Africa Forum Summit of African Heads of States/ Governments and their official representatives in New Delhi on April 8, 2008. This initiative epitomized India's engagement with Africa at a time when many countries, both emerging economies and Africa's traditional partners, were seeking to deepen their trade and development cooperation with the continent. The Scheme is open to 34 LDCs in Africa.

The DFTP Scheme grants duty free access on 94% of India's total tariff lines to be implemented over a period of five years. Specifically, it provides preferential market access on tariff lines that comprise 92.5% of global exports of all LDCs. Products of immediate interest to Africa which are covered include cotton, cocoa, cashew nuts, cane-sugar, apart from non-agricultural items (like aluminium ores, copper ores, ready-made garments, fish fillets and non-industrial diamonds).

In order to expand trade with Africa, India amended its DFTP scheme in 2014 to cover around 98% of the tariff lines. As per this latest amendment, there are 97 products in Exclusion list and 114 products in MoP (Margin of Preference) list. In other words it means that barring 211 tariff lines, India provides duty free market access to LDCs for the Indian market on all remaining products.

The beneficiary LDCs can take advantage of the DFTP scheme if they have the capacity to produce and export competitively in international markets. It has been observed that LDCs have limited productive capacities and hence play a marginal role in international trade. It is here that concessional credit of GOI and the DFTP can together act as a game changer. Indian companies could also source intermediate products from beneficiary countries at zero duty, invest in African LDCs to manufacture locally to not only serve the domestic African market but also export back to India through the DFTP route. This will be a win-win situation for both India and Africa.

4. Financing Agriculture in Africa: India's Initiatives

According to World Bank, agriculture and agribusiness together could be a US$ 1 trillion sector in sub-Saharan Africa by 2030, up from US$ 313 billion in 2010. The growth generated by agriculture in Sub-Saharan Africa is estimated to be 11 times more effective in reducing poverty than GDP growth in other sectors, a vital multiplier given that 65% of the continent's labour force is engaged in agriculture.

Africa has the potential not only to feed itself but also to be a breadbasket for the world. With the right support, the continent can leverage its considerable resources – land, water, people, knowledge and potential markets – to overcome food insecurity and become a leading competitor in global food markets.

While there exists huge opportunity, investment is the key to addressing the challenges facing the sector and ensuring that agriculture delivers on its potential. For too long, the sector has been seen as one requiring government subsidy and donor funding. The realisation of agriculture becoming a potential driver of economic growth, rural incomes and job creation, in addition to food security has emerged only during the last few years.

Agriculture Financing in Africa

According to AfDB estimates (Exhibit 4.1), the total cost for agricultural transformation for the priority commodities and agro-ecological zones in the AfDB's Strategy is between US$ 315 bn and US$ 400 bn over 10 years, equivalent to US$ 32 bn – US$ 40 bn per year. Current finance for agricultural development originate primarily from threesources: funds from sovereign and non-sovereign investments into agriculture from the multi-lateral and bilateral development partners including the AfDB; public sector spending; and private sector investments into agriculture. Overall, these total US$ 9 bn per year of investments into African agriculture (AfDB's level of spend is assumed to be US$ 2.4 bn per year, rather than the current US$ 0.6 bn per year), leaving a gap of US$ 23 bn to US$ 31 bn per annum to be mobilized in order to drive the transformation.

Exhibit 4.1: African Development Banks' Estimated Investment in Agriculture (US$ bn : 2016-2025)

Enablers → Estimates

Commodities/Agro/Ecological Zones

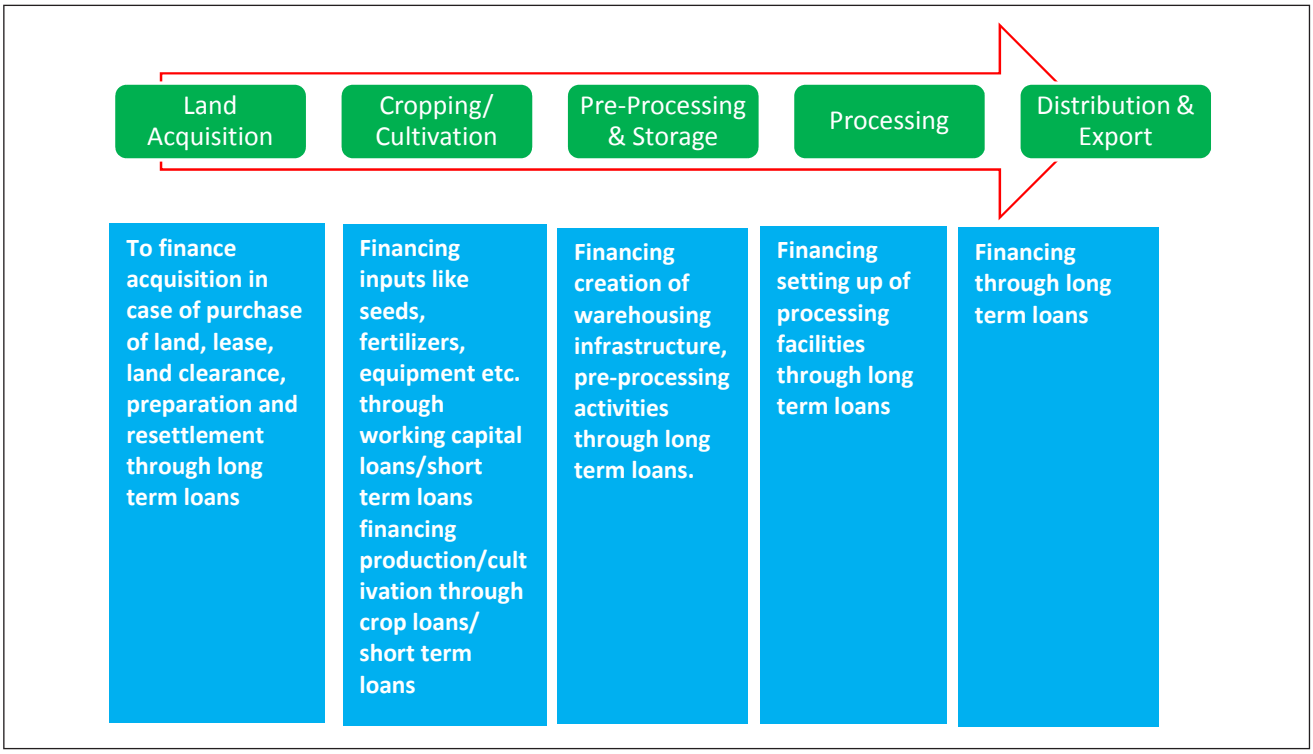
	Value Chain Investment			Hard and Soft infrastructure	Ag Finance	Enabling Environment	Inclusivity, Sustainability and Nutrition	ATA Partnership for Africa	Total	Annual Revenue Opportunity by 2025
	Production	Value Addition	Total							
Rice	~ 18 - 22	~3-4	~21-26	~65-80	~265-330	~20-30	~30-40	<5	~315 - 400	~5
Cassava	~~2-2	~2-3	~4-5							~1
Wheat	~22-27	~16-20	~38-47							~13
Cotton	~0.4 - 0.5	~1.1-2	~1-2							~0.3
Horticulture	~05-06	~4.5	~9-11							~16
Aquaculture	~1-1	19-23	~20-24							~8
Tree Crops	~14-17	~9-11	~23-28							~11
Sahel Region	*~6-7*	*~9-11*	*~15-18*							~6
Savannah	*~42-52*	*~26-32*	*~68-84*							~23
Total	~110-155	~90-110	~200-250	~65-80	~265-330	~20-30	~30-40	<5	~315-400	~85

Source: AfDB; Exim Bank Research

The financing needs in agriculture are not confined only to the pre-production or post-production stages, but are required throughout the value chain from procuring the seeds, to tilling the land with machinery and equipment, to maintaining and insuring the land from uncertainties, to harvesting mechanically, storing it in warehouses, processing it if required, and selling it to the market while adhering to the quality and labelling standards (Exhibit 4.2).

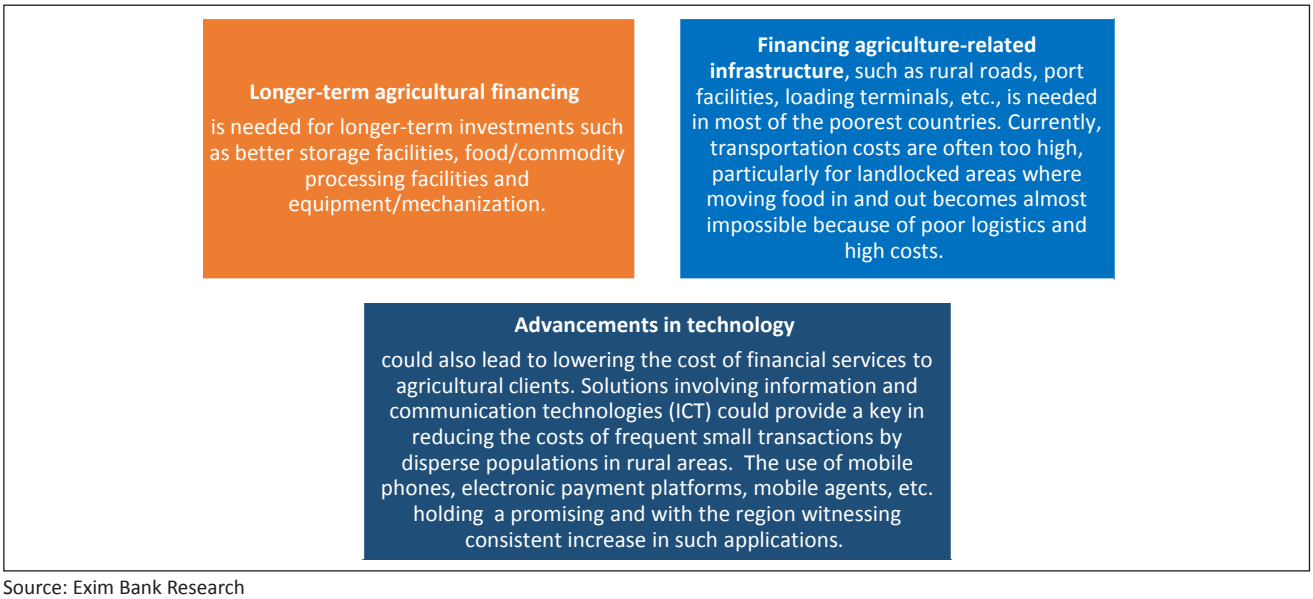
To meet the entire gamut of these needs, banks and financial institutions should look at long term agricultural finance, financing agriculture-related infrastructure, and providing advancements in technology (Exhibit 4.3).

Exhibit 4.2: Financing Needs Across the Agriculture Value Chain



Source: Exim Bank Research

Exhibit 4.3: Key Needs in Agriculture Finance in Africa



Source: Exim Bank Research

GOVERNMENT OF INDIA'S ROLE IN AFRICA'S AGRICULTURE

India recognizes the fact that agriculture is an important conduit for Africa to move out of poverty. Improving Africa's agriculture and agribusiness sectors means higher incomes and more jobs. It also allows Africa to compete globally.

Given the priorities of both the regions, it becomes quite imperative that they collaborate together utilizing each other's strengths while creating opportunities for the masses in both the regions. This would simultaneously also encourage greater participation of Africa in the global agricultural value chain.

India has been playing a proactive role in mitigating the inherent challenges in Africa's agriculture. And partnering the continent in enhancing its agricultural growth and development. For instance,

- India has extended support for the development of cotton sector in the Cotton Four (C-4) countries (i.e. Benin, Burkina Faso, Chad and Mali) and also in Nigeria, Uganda and Malawi where India is providing cotton technical assistance, support and cooperation. India's assistance includes:
  - assessing the requirements of partner countries in the areas of capacity building, technology transfer, and R&D in the cotton sector;
  - sharing the expertise developed in Indian R&D; and
  - formulating an effective cooperation programme and exploring business and investment opportunities in these countries.
- The Energy Research Institute (TERI), New Delhi has been actively involved in the Indian Technical and Economic Cooperation (ITEC) programme offering African students courses on applications of biotechnology and its regulation.
- There are also some significant Africa-India initiatives undertaken at multilateral level, particularly in the domain of South-South cooperation. For example, there is an ongoing Africa-India cooperation in agricultural biotechnology under the aegis of the International Crop Research Institute for the SemiArid Tropics (ICRISAT) and International Livestock Research Institute (ILRI).
- ICRISAT, a CGIAR (Consultative Group on International Agricultural Research) Centre, conducts agricultural research for development in Asia and Sub-Saharan Africa with a wide array of partners throughout the world.
  - The recent initiatives taken by ICRISAT include enhancing public-private partnership (PPP) and developing entrepreneurship. Through its Agri-Business and Innovation Platform, it envisions enhancing prosperity of farmers through promoting market-oriented innovative product development such as exploring new business opportunities for soybean and millets.
  - It has established Agri-Business Incubators and Value-Chain Incubators in six African countries by partnering with local bodies.
- International Livestock Research Institute (ILRI), also a CGIAR Centre, works to improve food security and reduce poverty in developing countries through research for better and more sustainable use of livestock.
  - Some of the ILRI's ongoing India-Africa programmes are: IM Goats (India-Mozambique), Milk IT (India-Tanzania), Value-Chain Development (India-Tanzania, Ethiopia, Mali) and South-South Dairy Development (India-Kenya).
  - The India-Africa Knowledge Management mechanism emphasises on dissemination of technologies, tools and approaches.
- Under the India-Africa Forum Summit – I (IAFS-I), the Department of Agricultural Research & Education (DARE) under the Ministry of Agriculture & Farmers Welfare, Government of India has been entrusted with the capacity building of African countries through Agricultural education of African students in different Agricultural Universities/ Deemed Universities of Indian Council of Agricultural Research. In accordance, the students from Africa

are being admitted in Indian Agricultural Universities for M. Sc. and Ph. D. programmes. This initiative has received good response from the African students - 49 students got admission for various courses during the first year of its launch in 2010 itself and 57 in the second year. Further, various training programmes were also organised in India under IAFS-I for capacity building of African scientists.

- Further to implementation of IAFS-I, the Ministry of External Affairs launched IAFS-II (India-Africa Forum Summit-II) towards further strengthening of capacity building through agricultural education. DARE has been entrusted to establish some centres in Africa such as (a) Soil, Water and Tissue Testing Laboratories; (b) Farm Science Centres; and (c) Agricultural Seed Production-cum-Demonstration Centres. The work relating to establishment of these centres has been taken up with the Ministry of External Affairs. Many countries in Africa have identified locations, building, etc. for the projects and some countries have already been visited by experts from India to study the existing infrastructure.
- India focuses on building capacity and sharing experience, particularly in research and knowledge. Teams of farm experts from the Indian Council of Agricultural Research (ICAR) have gone to Africa to acquire first-hand knowledge of how African countries explore ways of improving their agricultural practices.
    - The capacity building programme provides scholarship to 75 students from African countries annually in agricultural universities in India.
    - Moreover, Government of India proposes to establish new institutions in agriculture and rural development sector, and on mutual grounds, it has been agreed upon to exchange scientists, scholars, technologies and literature and to collaborate on research projects.

SUPPORT PROVIDED BY EXIM BANK

Within the various segments of the value chain, agriculture financing requirements would include project financing for new agricultural investments to assist Indian investors in financing large investments in Africa and financing of trade, which would involve assisting Indian investors already present in the segment to finance operational and trade activities.

Exim Bank has been partnering Africa in its development by financing activities in the continent across a wide range of sectors with agriculture being one of the important ones. A key financial instrument of the Bank is the Lines of Credit (LOCs) extended to overseas financial institutions, regional development banks, and foreign governments and their agencies in Africa.

Exim Bank's Lines of Credit

Exim Bank has been extending LOCs to enable Indian exporters to enter new geographies or expand their business in existing export markets without any payment risk from overseas importers. The Bank puts special emphasis on extending LOCs as an effective market entry tool as well as a means of market diversification for Indian exporters.

Exim Bank extends & LOCs to overseas financial institutions, regional development banks, sovereign governments and other entities overseas, to enable buyers in those countries to import developmental and infrastructure projects, equipment, goods and services from India, on deferred credit terms.

As on March 31, 2017, Africa's share in the total value of Exim Bank's LOC program stood at US$ 7.51 bn, which constituted 47.9% of the total LOC portfolio – of which more than US$ 1.65 bn has been to the agricultural sector alone. These have been provided to as many as 25 African countries for projects as varied as acquisition of tractors, harvesters, agricultural processing equipment; farm mechanization; setting up plantation projects and processing plants; development of sugar industry; procurement of design, supply, installation and commissioning of fuel storage facilities, irrigation network, commissioning of sugar processing facility; rice self-sufficiency programme; including setting up of the agri related institutions like the Mahatma Gandhi Institute of Technology and Biotechnology Park in Cote d'Ivoire.

Some of the LOCs extended by Exim Bank at the behest of Government of India in the agriculture sector are as follows:

Case Study 1: - LOC TO MALI

Electricity Providing Refrigeration

- The economy of Mali is based to a large extent on agriculture, with an overwhelmingly rural population, many of whom are engaged in subsistence agriculture.
- Agricultural activities occupy 70% of Mali's labour force and provide 33% of the GDP.
- Cotton and livestock makes up 75%-80% of Mali's annual exports.
- Small-scale traditional farming dominates the agricultural sector, with subsistence farming of cereals, primarily sorghum, pearl millet, and maize on about 90% of the cultivated land.
- Export potential of Mali is considerable but is hampered by poor infrastructure.
- Supply of material for interconnection transmission line and substation equipment project from Cote d'Ivoire to Mali
- Construction of high voltage transmission line
- The project connected rural areas of Mali which had no access to electricity thereby increasing the total electricity accessibility (targets 41% by 2016 from 23% in 2010)
- Cotton growing regions of Mali will be tremendously benefitted as it will help to revive the cotton processing industry (electricity accounts for over a quarter of the total cost of producing cotton yarn and nearly 30% of the cost of textile production)
- The agricultural exports from the regions of Mali will also benefit tremendously as they critically depend upon a reliable and affordable power supply for refrigerated storage.
- It is expected to boost earnings from export of perishable products such as fruit, vegetables, horizontal products and frozen carcasses.

Setting up Plant for Assembly Tractors and Agricultural Machinery

- Apart from supply of 400 tractors (US$ 12mn), kits were also supplied, which included, 300 disc harrows, 50 trailers and 100 threshing machines with motors, which were distributed to 275 individual farmers and some village communes, 100 young graduates from Agency for Promotion of Youth Employment of Mali and 25 centres of research and training for agricultural activities.
- Plant so set up in 2010 was a JV between an Indian private sector company (51%), and Government of Mali. The equity of the Government of Mali was in the form of land and buildings and not in cash. The arrangement is for 5 years after which the plan is to hand over the plant to a full Malian administration.
- The primary impact of setting up the plant is the availability of 'Made of Mali' tractors and implements are made available at a reasonable price and without the hassles of importation. It is probably the only state-of-the-art tractor assembly plant in West Africa.
- The supply of tractors and setting up of the plant is a major step in the mechanization of agriculture in the country. It also gave Malians a sense of pride as this is a small but a concrete step towards industrialisation.
- According to the Government of Mali, agricultural production and productivity has gone up by 30%, post setting up the plant and supply of tractors.

Case Study 2: - LOC to Senegal

Funded Irrigation System Project:

- Design, manufacture, supply and installation of diesel engine pumpsets in rice producing zones of North Senegal to increase production of rice in the region through better irrigation facility.
- The project helped Government of Senegal to distribute pumpsets (to rice farmers) and install

drip irrigation systems (to horticulture farmers like mango, cashew and pineapple) in North Senegal.

- Indian supplies have trained local farmers, extension workers and government staff in order to fulfil future servicing requirements of these equipment.
- With the implementation of the irrigation system under Lines of Credit to Senegal:
  - The coverage area under irrigation increased substantially
  - Rice production has witnessed a more than 200% increase
  - Irrigation project has reduced import bill - 50% of the rice demand in North Senegal is being met by local production as compared to 19% in 2006-07
  - Irrigation project has generated employment
  - The new system has been found to be economical as their running and maintenance costs are lower than the earlier available pumps since these can be operated for 24 hrs non-stop

Funded Development of Rural SMEs and Acquisition of Agricultural Machinery and Equipment:

- Contracts for supply of tractors, agricultural implements (pumps, seeders, ploughs, cultivators, rice dehuskers with polishers, honey making plants and peanut crushing machines, etc., Mahindra vehicles and its spare parts, Bajaj motorcycles and auto rickshaws)
- Tractors and implements supplied by Indian company were distributed at subsidized price.
  - tractors are being used for cultivation of peanuts, corn, banana and sorghum
  - running cost of Indian tractors (consumed 64 litres of diesel for a full day operation) lower than European tractors (which consumed 90 litres)
  - Mechanization of farming activities by Senegalese farmers with Indian tractors has considerably reduced tillage time, cost of tillage, and thus increased productivity of crops. A farmer can now produce more than 100 tonnes of corn per season, as compared to the earlier 49 tonnes of corn per season.
  - Since the arrival of the Indian tractors, the farmers who supply cotton to SODEFITEX[12], have been able to cultivate larger tracts of land in a short span of time, leading the Government of Senegal to sanction additional 6000 hectares of land for cotton cultivation.
  - This has led to a jump in cotton production from the region from 8000 tons to 17000 tons.
- As rural areas of Senegal do not have electricity, hand pumps supplied in the region have also been very useful as farmers are now able to draw groundwater for regular usage and for irrigation of farms without the use of electricity.

Case Study 3: LOC to Benin

- Exim Bank extended a Government of India supported Line of Credit of US$ 15 million to the Government of Benin for financing Tractor Assembly Plant and Farm Equipment Manufacturing Unit in Benin.
- The contract consisted of supply of 60 tractors and other agricultural equipment and accessories and installation and commissioning of tractor assembly plant with capacity of 2000 tractors per year, in Benin.
- Benin is expected to become self-sufficient in tractors in the years to come, and could even export them to the West African region.
- Some 80% of Benin's 10.3 million people earn a living from agriculture, mostly subsistence and introduction of tractors will be a huge investment opportunity.

Case Study 4: LOC to Ghana

- Exim Bank has sanctioned a LOC of US$ 35 mn for refurbishment of Komenda Sugar Factory in Ghana.
- The plant is expected to increase the production of sugar and its related products for the local and international markets.

[12]Corporation for Development of Cotton Fibre and Textiles in Senegal

- The sugar plant is expected to create 1300 direct jobs and about 5000 auxiliary jobs in Ghana.

Case Study 5: LOC to Togo

- Agricultural equipment's like Bulldozers, Excavators, wheel loaders, Submersible Pumps & Drip Irrigation kit supplied under the Exim Bank LOC of US$ 13.095 million to the Government of Togo.
- Due to the implementation of the project, each farmer in the region now owns half a hectare of land which he or she cultivates.
- A training centre has been established to train the youth in operating the agricultural equipment.

Exim Bank's Overseas Investment Finance

Exim Bank, through its Overseas Investment Finance (OIF) program (non-concessional credit) has been supporting investments abroad, including in the African region. In the field of agriculture, Exim Bank has facilitated investment by many Indian companies in Africa.

Case Study 6: OIF in Ghana

- Park Agrotech Ghana Limited (PAGL), a subsidiary of Skylark Hatcheries Private Limited (SHPL), was supported by the Bank for setting up of integrated farming of corn, soybean and poultry project in Ghana.
- The project involves, 1000 acres irrigated and mechanized farm for producing corn and soybean; Setting up of a commercial layer poultry farm with a capacity of housing 100,000 layer birds; and Setting up of a poultry breeding farm with a capacity of 12000 female chicks along with feed-mill and hatchery for captive requirement.
- There are substantial opportunities for increased maize and soya utilization for feed mills. In Ghana just around 10% of maize supplies go into the poultry feed industry, while the demand is much greater than this supply. In 2008, the government granted special import permits for more than 26,000 metric tons of yellow corn to supply the poultry feed industry. Limited supply of both maize and soya for feed production leads to constraints in the growth of the poultry industry.
- Exim Bank's support is expected to help in catering to this capacity challenges which Ghana faces in terms of availability of corn and soybean.

Case Study 7: OIF in Mauritius

- Exim Bank has facilitated Natural Oil Ventures Company Limited (NOVCL), Mauritius, to part finance equity investment in/onlending to its subsidiary, S&P Energy Solutions PLC, Ethiopia (SPES), for carrying out agricultural activities including cultivation and export of oilseeds for edible oil and bio-diesel.
- This will not only help in increasing the farm produce, but also create more jobs in the process along the value chain.

5. India-Africa Agricultural Fund: Way Forward

Agricultural investments are generally of long gestation, and so are the funding requirements. Many interested players may not have significant experiences in overseas agricultural activities, whilst for many raising resources and risk mitigation may be difficult tasks.

Funding for development of African agriculture by India could be undertaken through a two pronged approach, both attending to the appropriate needs while addressing the challenges inherent in the African agriculture. One approach would be towards creating the necessary agri-infrastructure, and the another approach would be towards catalysing cultivation through supply of requisite inputs, agriculture implements, etc.

1. Support Towards Creating Agri-Infrastructure

Most of the African nations have huge tracts of cultivable land; however, these lands are not having adequate infrastructure like connecting roads, transportation network, power transmission, communication channels, irrigation canals etc. Firms that are interested to undertake cultivation activities in Africa need to make huge upfront investments in creating such agri-infrastructure, to make the available tracts of land cultivable. Such investments have significant impact on the commercial viability of agriculture operations. The firms are reluctant to undertake such huge upfront investments due to paucity of funds and high investment risks.

While the investment funds from the domestic private sector are not likely to come up in many African countries, the Governments in African nations look at external sources of funds to build such infrastructure. It is, in this context, proposed that the necessary funds could be sourced from India's development assistance scheme.

As has been explained in Exhibit 4.4, the African nations could avail development assistance from India to create agri-infrastructure. The agricultural land supported by such eco-system could be leased to Indian firms for cultivation. This approach would mitigate the risks associated with upfront investments of the Indian investors. The lease rentals could serve as cash-flow to service the debt.

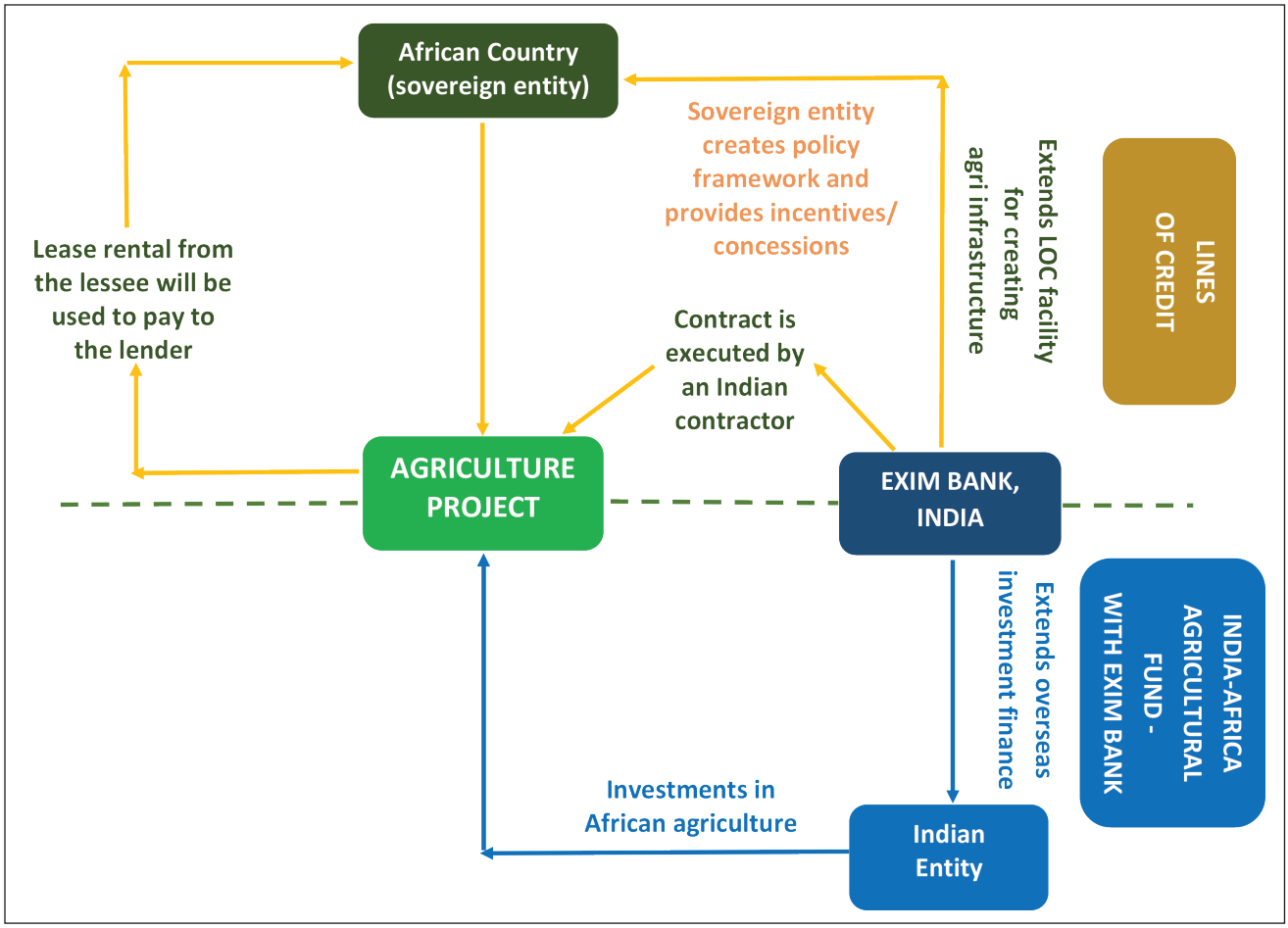
2. Support through a Dedicated India-Africa Agriculture Development Fund

Indian investors would require funds to pay upfront lease rentals, besides sourcing of agri-inputs and implements. The funding requirements could be met by Exim Bank's Overseas Investment Finance programme. However, it is proposed to create a dedicated India-Africa Agriculture Development Fund to support the Indian investments in African agriculture sector.

This would entail setting in place an appropriate institutional mechanism for the management of this fund. It is here that the role of the country's apex export finance institution, viz. Exim Bank could gain significance since it has been actively financing overseas direct investment through its flagship programme. The funds could be utilised to extend medium to long term foreign currency finance to Indian enterprises planning to invest in the African agriculture and allied sector.

To begin with an initial corpus could be created, to the tune of around US$ 5 bn. Sources for this fund could also come from the country's forex reserves. The country's reserves are in the region of US$ 375 bn. The proposed amount of US$ 5 bn constitutes less than 1.5% of the reserves, and would not dent the foreign exchange reserves position; on the other hand, the fund would serve as a conduit for promoting investments in African agriculture and to meet India's import requirements of pulses and oilseeds, besides creating tremendous goodwill.

Exhibit 5.1: Proposed Innovative Agri Financing Structure



Source: Exim Bank Research

About Exim Bank's Working Paper Series

As part of its endeavour in enriching the knowledge of Indian exporters and thereby to enhance their competitiveness, Exim Bank periodically conducts research studies. These research studies are broadly categorized into three segments, viz. sector studies, country studies and macro-economic related analysis. These studies are published in the form of Occasional Papers, Working Papers and Books. The research papers that are brought out in the form of Working Papers are done with swift analysis and data collation from various sources. The research papers under the series provide an analytical overview on various trade and investment related issues.

Previous Working Papers brought out by Exim Bank

Paper No. 30	Potential for Enhancing India's Trade with Australia: A Brief Analysis, April 2014
Paper No. 31	Potential for Enhancing Intra-SAARC Trade: A Brief Analysis, June 2014
Paper No. 32	Strategic Development of Ship Building Sector: Institutional Support System and Policy Framework in India and Select Countries, July 2014
Paper No. 33	Potential for Enhancing India's Trade with Korea Republic: A Brief Analysis, August 2014
Paper No. 34	Enhancing India's Bilateral Ties with Cambodia, Lao PDR, Myanmar, Vietnam: A Brief Analysis, November 2014
Paper No. 35	Indian Handloom Industry: A Sector Study, March 2015
Paper No. 36	Turkey: A Study of India's Trade and Investment Potential, March 2015
Paper No. 37	Study on Indian Pharmaceutical Industry, March 2015
Paper No. 38	Enhancing India's Trade Relations with ECOWAS: A Brief Analysis, May 2015
Paper No. 39	Potential for Enhancing India's Trade with Iran: A Brief Analysis, June 2015
Paper No. 40	Potential for Enhancing India's Trade with Pakistan: A Brief Analysis, June 2015
Paper No. 41	Potential for Enhancing India's Trade with China: An Update, August 2015
Paper No. 42	Potential for Enhancing India's Trade with Russia: A Brief Analysis, August 2015
Paper No. 43	Enhancing India's Trade Relations with LAC: Focus on Select Countries, October 2015
Paper No. 44	Turkey: A Study of India's Trade and Investment Potential, October 2015
Paper No. 45	Enhancing India's Trade Relations with Africa: A Brief Analysis, October 2015
Paper No. 46	Indian Leather Industry: Perspective and Strategies, November 2015
Paper No. 47	Make in India for the World: Realizing Export Potential of Railways, December 2015
Paper No. 48	Export from West Bengal: Potential and Strategy, January 2016
Paper No. 49	Act East: Enhancing India's Engagements with Cambodia, Lao PDR, Myanmar, Vietnam (CLMV), January 2016
Paper No. 50	Focus Africa: Enhancing India's Engagements with Southern African Development Community (SADC), March 2016
Paper No. 51	India's Service Sector - An Analysis, March 2016
Paper No. 52	Defence Equipment Industry: Achieving Self-Reliance and Promoting Exports, March 2016
Paper No. 53	International Solar Alliance: Nurturing Possibilities, March 2016
Paper No. 54	India-Africa Healthcare Cooperation: Way Forward, May 2016
Paper No. 55	Sustainable Investment Opportunities in Africa: Prospects for BRICS, October 2016
Paper No. 56	Intra-BRICS Trade: An Indian Perspective, October 2016
Paper No. 57	Enhancing India's Ties with Middle East and North Africa (MENA), October 2016
Paper No. 58	Enhancing India's Trade Relations with Latin America and the Caribbean (LAC) Region: Focus on Select Countries, November 2016
Paper No. 59	The Indian Automotive Industry: An International Trade Perspective, February 2017
Paper No. 60	India's Investments in Select East African Countries: Prospects and Opportunities, March 2017
Paper No. 61	International Trade in Processed Food: An Indian Perspective, March 2017
Paper No. 62	Machinery Sector in India: Exploring Options for Neutralizing Trade Deficit , March 2017