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FOOD SECURITY:  
**Issues, Initiatives and  
Policy Directions**

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# INDIA-AFRICA PARTNERSHIP FOR FOOD SECURITY: **Issues, Initiatives and Policy Directions**

## **ABSTRACT**

India has made significant strides in agricultural production since the days of green revolution and has valuable lessons to share with its development partners, including countries in the African continent. This paper argues that there is a strong rationale for India-Africa collaboration on food security, given their common challenges of hunger, undernutrition, and low productivity. The paper finds that India plays an important role in augmenting Africa's food output by providing low-cost technology solutions, building capacity, and providing improved seeds and agricultural machinery. Contrary to conventional wisdom, this paper finds, India's interest in African agriculture is not driven by its domestic food security concerns but is in line with India's commitment to South-South cooperation. Moreover, Africa is a huge market for India's growing food and agriculture sector. This paper offers specific recommendations to African countries as they look to India for lessons in food security, among them, to avoid the harmful effects of green revolution, adopt effective food distribution systems to achieve food security, and nurture climate-smart agricultural practices.

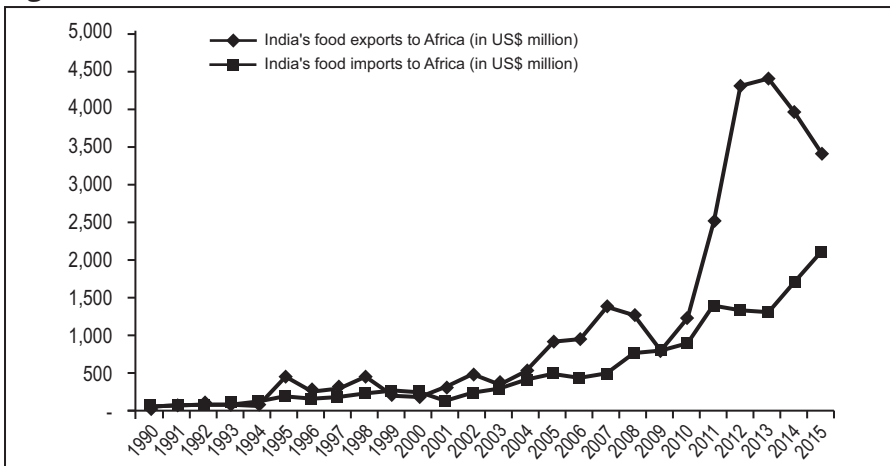
## **INTRODUCTION**

The last decade saw a marked increase in cooperation between India and Africa in the area of food security, which has taken centre stage as a key theme in all three India-Africa Forum Summits that have taken place in

succession in 2008, 2011, and 2015. In the second India-Africa Forum Summit in 2011, India and Africa committed to cooperate for increasing agricultural output and achieving the millennium development goal of halving by 2015 the proportion of people who suffer from hunger and undernutrition.<sup>1</sup> The two nations reaffirmed their commitment in the third India-Africa Forum Summit held in October 2015, making a pledge to improve farming techniques through affordable technology, use of improved crop varieties and irrigation facilities, and promoting investment in agri-business and food processing industries.<sup>2</sup>

Trade in food articles between India and Africa has been posting rapid growth since 2000 (See Figure 1). India's food imports from Africa, for instance, increased from US\$ 138.6 million in 2001 to US\$ 2,090 million in 2015 at a compound annual growth rate of eight percent. India's food exports to Africa grew even more, particularly of rice, with a five-fold increase from US\$ 802.9 million to 4,369.5 million in the brief period of 2009 to 2013. Food articles currently account for over 85 percent of the total agricultural trade between India and Africa.<sup>3</sup> Indian investment in Africa's food and agribusiness sector has also grown rapidly in recent years.

**Figure 1: Trade in food articles between India and Africa (1990-2015)**



Source: Authors' graph using data from UNCOMTRADE

However, this area has received less scholarly attention than India's cooperation with African countries in the fields of energy, and science and technology.<sup>1</sup> This paper aims to fill this critical research gap. The first section

of this paper discusses the evolution of the concept of 'food security' and explains why it continues to be a development priority for both India and Africa by highlighting the common challenges of hunger, undernutrition and poor agricultural productivity. Section 2 provides the rationale for greater cooperation between India and Africa, arguing that African countries can learn from India's development experience especially in cereal production. Section 3 discusses India's efforts towards African food security by focusing on the former's initiatives in promoting agricultural research and capacity building in Africa, providing improved seeds and agricultural inputs, extending credit lines, and encouraging private-sector participation. Section 4 examines the drivers of India's expanding role in African agriculture. Section 5 provides policy directions towards more effective partnership, and the paper concludes with Section 6. India's initiatives in other agricultural sectors such as cotton and sugar are beyond the scope of this paper.

## I. FOOD SECURITY AND ITS MEANING FOR INDIA AND AFRICA

Food security is an evolving concept. In the 1950s and '60s, the term connoted self-sufficiency in major staples.<sup>4</sup> During the following decade, the main focus was on guaranteeing the availability of food and price stabilisation through increased food production—in 1974, the World Food Conference defined food security as “availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices.”<sup>5</sup> The most widely accepted definition of food security was agreed upon at the World Food Summit in 1996:

*“Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.”<sup>6</sup>*

For India and Africa, food security is high on the list of their development priorities. Together, after all, they are home to the largest number of poor

and undernourished persons in the world. Despite posting high rates of economic growth in recent years, both India and Africa continue to suffer hunger and undernutrition on a massive scale, and significant proportions of their populations have not reaped the fruits of economic growth.

India, for example, has witnessed high rates of economic growth in the last two decades, with GDP at factor cost growing at seven percent from 1990-91 to 2013-14 and per capita income growing at five percent in the same period.<sup>7</sup> However, such high economic growth has not translated to a significant decline in undernourishment, with incidence dropping marginally from 210.1 million in 1990 to 194.6 million in 2014 (See Table 1). India also failed to meet the goal—set by the Millennium Development Goals for 2015—of halving the proportion of people who suffer from hunger. Today India is home to one-fourth of the world's undernourished population, over one-third of all underweight children, and nearly a third of the world's food-insecure people. There are no less than 12 Indian states that fall under the 'alarming' category of the Global Hunger Index. According to the government's National Family Health Survey 2015-16, the proportion of children under five years who are underweight is significantly high in states such as Bihar (43.9%), Madhya Pradesh (42.8%), and Andhra Pradesh (31.9%).<sup>8</sup> Moreover, in Bihar, Madhya Pradesh, and Meghalaya, more than 40 percent of children are stunted.<sup>9</sup> The proportion of underweight children is also high in relatively prosperous states such as Maharashtra (36%).<sup>10</sup>

The picture is similar for Africa. Most countries in the continent experienced high growth rates from 2000 onwards but poverty and undernutrition persist. In fact, Africa is the only continent where the absolute number of undernourished people has increased (See Table 1). Estimates from the World Bank's Global Economic Prospects establish that in the last decade, Rwanda, Tanzania, Mozambique, Cote-d'Ivoire, the Democratic Republic of the Congo, and Ethiopia have been the six fastest-growing economies in the world. Such impressive achievement notwithstanding, these African economies demonstrate a mixed graph in terms of social indicators of hunger and food security. Although some African countries such as Angola, Djibouti, Cameroon, Gabon, Ghana, Mali, and Sao Tome and Principe met the millennium development goal of halving

the proportion of the population suffering from undernourishment and the World Food Summit target of halving the absolute number of the hungry, there was a 20-percent rise in hungry people in East Africa due to adverse climatic and drought conditions.<sup>11</sup>

**Table 1: Prevalence of undernourishment (in millions)**

	Number of undernourished					Change (%)
	1990-92	2000-02	2005-07	2010-12	2014-16	
Africa	181.7	210.2	213	218.5	232.5	28.0%
India	210.1	185.5	233.8	189.9	194.6	-7.4%
India and Africa	391.8	395.7	446.8	408.4	427.1	9.0%
World	1,010.6	929.6	942.3	820.7	794.6	-21.4%
Share of India and Africa	38.8%	42.6%	47.4%	49.8%	53.8%	-

Source: Adapted from FAO (2015)

According to the Food and Agriculture Organization's (FAO) 'Regional Overview of Food Insecurity' (2015), Western Africa was able to lift an unprecedented number of people out of undernourishment since the early 1990s; in the Central African Republic, meanwhile, there was a significant increase in hungry people due to the long-drawn civil strife. Although Ethiopia reached the millennium development goal of halving the proportion of people who are undernourished from 75 percent to 35 percent from 1990-92 to 2014-16, it remains one of the most food-insecure countries in the world with approximately one in three people living below the poverty line.<sup>12</sup> The country also continues to be vulnerable to extreme drought conditions which are directly linked to agriculture and food security. Together, India and Africa account for over 50 percent of the world's undernourished.

The period of high growth rate in India and Africa was also marked by stagnation in the agriculture sector. India's agricultural GDP growth from 1990-91 to 2013-14 was only three percent<sup>13</sup> and many parts of India are also reeling under severe agrarian crises. Similarly, the contribution of agriculture in Africa's growth story has been minimal. Apart from a few countries such as Ethiopia<sup>ii</sup> which experienced high rates of agricultural growth, most of them were largely dependent on commodity exports: their agricultural growth rate was low and the sector's contribution to GDP growth was much lower than that of the industrial sector.<sup>14</sup>



African agriculture also suffers from a number of problems such as low productivity, fragmented production systems, and limited use of modern technology. Although there has been a marginal improvement in Africa's agricultural performance in the last decade, agricultural growth in Africa has largely been led by an expansion in the areas under cultivation. Given the limits to further increase in expansion of cultivated areas, there is an urgent need to improve farm productivity in Africa, particularly because African farm yields are lowest in the world.<sup>15</sup>

As shown in Table 2, the average farmer in sub-Saharan Africa produces only 1,433 kg of cereals<sup>iii</sup> per hectare – less than half of what an Indian farmer produces. Cereal yields in African countries such as Botswana, Namibia, and Niger are among the lowest in the world at 299.8, 315, and 424.4 kg per hectare, respectively.<sup>16</sup> The average fertiliser consumption is 16.24 kg/ha which is one-sixth of the world average of 98.2 kg/ha.<sup>17</sup> Therefore, increasing productivity by providing appropriate inputs along with improved technologies such as stress-resistant and high-yielding varieties will be an important step towards agricultural transformation in Africa. Although India produces large quantities of cereals, particularly rice and wheat, and yield rates in India are more than double that of sub-Saharan Africa, India's yield rates are also drastically lower than those of developed regions such as North America (6,671 kg per ha), East Asia and Pacific (5,184 kg per ha), and Euro area (5,855.4 kg per ha).

**Table 2: Cereal yields (kg per ha, 2013)**

Country/ Region	Kg per hectare
East Asia & Pacific (developing only)	5,184.0
Central Europe and the Baltics	4,131.1
Sub-Saharan Africa	1,433.5
Europe & Central Asia (all income levels)	3,661.6
Euro area	5,855.4
North America	6,671.0
India	2,961.6
World	3,851.3

Source: World Bank Database,

<http://data.worldbank.org/indicator/AG.YLD.CREL.KG/countries?display=default>

## II THE RATIONALE FOR INDIA–AFRICA COOPERATION

Although India and Africa share common agricultural conditions, there are also a number of differences which create opportunities for cooperation. For one, the reasons behind food insecurity in Africa and India are different. In the case of Africa, the main challenge lies in increasing the production of cereals by improving agricultural productivity and adopting modern agricultural practices. Despite possessing 65 percent of the world's arable land, the African region remains heavily dependent on food imports. According to Africa Progress Report 2014, Africa's food import bill is worth US\$ 35 billion (excluding fish) every year.<sup>18</sup> In the West African region, about 40 percent of the demand for rice is met by imports.<sup>19</sup>

Economists such as Sam Moyo blame Africa's food insecurity on the historical over-emphasis on export agriculture—of commodities such as coffee and cocoa—rather than production of food crops for self-sufficiency.<sup>20</sup> As a result, Africa, which was a net food exporter during the 1960s, soon became a net food importer and has not recovered since. Many African countries have also become extremely dependent on food aid in the last two decades. Under the structural adjustment programme imposed by the International Monetary Fund (IMF) in the 1980s, many African countries were also forced to withdraw agriculture subsidies; state investment in the sector declined, leading to a drop in agricultural productivity.

India, for its part, is largely self-sufficient, posting surplus in fact in the production of food grains. Yet hunger persists in many parts, and analysts have blamed poor management and a faulty distribution system. Unlike in African countries, India's achievement of self-sufficiency in food production was accorded high priority since the mid-1960s. The country's third five-year plan (1961-66) prioritised self-sufficiency in food grains and increase in agricultural production to meet the needs of industry.<sup>21</sup> The 'green revolution' brought about an unprecedented increase in agricultural yields in India due to advancements in agronomic technology. Today, the country has the largest area under cultivation for wheat, rice and cotton and is the second largest producer of key agricultural commodities like rice, sugar

cane, farmed fish, milk, and vegetables.<sup>22</sup> India has made effective use of agricultural technologies and innovations, and has substantially invested in human and capital resources to achieve self-sufficiency in food production.

Fujita (2010) also made similar observations. According to him, the critical difference between India and Africa was the performance of the agriculture sector during the 1980s.<sup>23</sup> During that decade, India accomplished a nationwide development of the agricultural sector due to the spread of the second wave of green revolution while in sub-Saharan Africa, agriculture stagnated. Fujita argues that sub-Saharan Africa should aim to raise rural incomes to develop those areas into a market for non-agricultural products and services. If that is realised, sub-Saharan Africa can proceed to the next step of economic development based on industrialisation. To raise rural incomes to a certain level, the agricultural sector, especially the staple food production sector, should be developed by productivity growth rather than expansion of area under cultivation—which has been the path taken by most regions in sub-Saharan Africa so far.

Still, things have changed in Africa in the last decade, and food security and agricultural development have emerged as major policy goals. The African Union adopted the Comprehensive Africa Agriculture Development Programme (CAADP) in 2003 to address Africa's food insecurity and poverty. The overall goal of CAADP is to *“Help African countries reach a higher path of economic growth through agriculture-led development, which eliminates hunger, reduces poverty and food insecurity, and enables expansion of exports.”*<sup>24</sup> To achieve this goal, CAADP focuses its intervention on four key pillars:

- Pillar 1: Extending the area under sustainable land management and reliable water control systems
- Pillar 2: Improving rural infrastructure and trade-related capacities for market access
- Pillar 3: Increasing food supply, reducing hunger, and improving responses to food emergency crises
- Pillar 4: Improving agriculture research, technology dissemination and adoption

One of the objectives of Agenda 2063 is to modernise African agriculture and agro-businesses through scaled up value addition and productivity. The Agenda 2063 aims to do the following:

- Completely eliminate hunger and food insecurity
- Reduce the imports of food and raise intra-Africa trade in agriculture and food to 50% of total formal food and agricultural trade
- Expand the introduction of modern agricultural systems, technology, practices and training, including the banishment of the hand-hoe
- Develop and implement affirmative policies and advocacy to ensure women's increased access to land and inputs, and ensure that at least 30% of agricultural financing are accessed by women
- Economically empower women and youth by enhancing access to financial resources for investment.

Agriculture has become the political priority in many African countries as well. Countries such as Nigeria have adopted programmes to address food insecurity. Ethiopia has adopted a national development strategy, Agricultural Development-Led Industrialisation (ADLI), which aims to transform the Ethiopian economy through higher growth rates in agriculture.

India's own green revolution experience and its significant advances in agro-tech—which transformed it from a food-deficient to a food self-sufficient country—can aid Africa. By sharing its experiences with African countries in a developing country context, India can help in achieving food-security goals. Indian technology has the potential to make a significant contribution towards African green revolution. This is largely because there are significant differences between developed and developing countries in terms of agricultural systems, market institutions, and research and regulatory capacity. As a result, technologies developed in the Global North may not be directly applicable in the developing countries of the South. On the other hand, similar agro-ecological conditions and small holder-based

farming systems in India and Africa make a formidable case for the application of Indian agricultural technologies in Africa.

Many African leaders have expressed admiration for India's development experience and are keen to draw lessons. In the first India-Africa summit in April 2008, the President of the United Republic of Tanzania and the then Chairperson of the African Union, Jakaya Mrisho Kikwete, issued a statement saying that "India has the technology and the skills, which if made available to Africa, it will help implement the African Green Revolution."<sup>25</sup> In the words of Lene Sebgo, Burkinabe Minister of Health, "India is known in Africa also for having developed low-cost, appropriate technology. Many Burkinabe business people are coming to India to learn from India's expertise and set up agriculture processing plants, for instance. This is the contribution of India."<sup>26</sup> Significant gains are also likely to accrue to India, particularly to private agribusiness firms which have a huge potential to expand in Africa's rapidly growing market.

### III. INDIA-AFRICA PARTNERSHIP FOR FOOD SECURITY: CURRENT INITIATIVES

Food security and agricultural development have been an integral theme in India's engagement with Africa. The following sections highlight the major areas of cooperation between India and Africa.

#### ***a. Agricultural research and capacity building***

Given that the biggest challenge for African agriculture lies in the use of modern technology to improve productivity, India is trying to address the research and technology gap in African agriculture. Two institutions—the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) and International Livestock Research Institute (ILRI)—lead India-Africa cooperation in biotechnology. ICRISAT has established agribusiness incubators and value-chain incubators in five African countries, i.e., Angola, Cameroon, Ghana, Mali and Uganda, by partnering with local bodies. ILRI focuses on reducing poverty and improving food security in African

countries through a more sustainable use of livestock. It has ongoing programmes in Mozambique, Tanzania, Ethiopia, and Kenya in the field of animal biotechnology.<sup>27</sup>

**Table 3: Proposed locations of agriculture-related institutes in Africa (2012)**

Type of institution	Countries
Rural technology park	Zimbabwe Republic of Congo Malawi South Sudan Côte d'Ivoire
Food-testing laboratory	Republic of Congo Benin Zimbabwe Gambia Chad
Food-processing business incubation centre	Uganda Cameroon Ghana Mali Angola
Technical assistance programme (TAP) in the cotton sector	Benin Burkina Faso Chad Mali Malawi Uganda Nigeria
India-Africa food-processing cluster	Location to be decided by the AU
IAIARD	Location to be decided by the AU
Regional soil, water and tissue testing laboratory	Kenya Democratic Republic of Congo
Regional farm science centre	Burkina Faso
Regional agricultural seed production-cum-demonstration centre	Ethiopia Central African Republic Liberia
	South Sudan Republic of Congo Togo

Source: Singh (2013)<sup>28</sup>

India is making a significant contribution to capacity building in African countries by setting up pan-African institutions such as India-Africa Food

Processing Cluster, India-Africa Institute of Agriculture and Rural Development, India-Africa Centre for Medium-Range Weather Prediction in East Africa, and India-Africa University for Life and Earth Sciences. India also has bilateral collaborations with many African countries. For instance, India has offered to set up eight Farm Science Centres in Burundi<sup>29</sup> and is also contributing towards strengthening of research institutions in Benin, Gabon and Tunisia.<sup>30</sup> Table 3 lists the agriculture-related institutes in Africa.

To support human resource development in Africa, India has implemented a number of scholarships for African students in India. Moreover, a number of African scientists are trained in the Department of Agriculture Research and Education (DARE) and the Indian Council of Agriculture Research (ICAR). ICAR also provides two-to-four-week-long customised training in water conservation and utilisation; production of seed, sapling and planting material; livestock production; fisheries production; farm mechanisation; post-harvest processing and value-addition. India also offers scholarships to African students under the India-Africa Fellowship programme. So far, 195 African students have enrolled in Master's and PhD programmes in Indian agricultural universities and research institutes,<sup>31</sup> with most students coming from Nigeria, Ethiopia and Sudan. Eminent scientist and the father of green revolution in India, MS Swaminathan, has stressed on the role that Indian agricultural scientists can play in global development. He has also suggested the creation of an international cadre of agricultural research services (ARS) along the lines of the Foreign Services to help the developing nations in Asia and Africa.<sup>32</sup>

## **b. Seeds**

African seed systems are informal and farmer-based, with farm-saved seeds accounting for about 80 percent of the planted seeds, compared to a worldwide average of 35 percent.<sup>33</sup> Production of quality seeds is a major challenge for most African countries. Like India's pharmaceutical companies which have played an important role in providing affordable drugs to Africa, Indian seed companies also have the potential to play an

important role in addressing Africa's food insecurity by providing improved seeds at affordable prices. Indian seed companies have a number of advantages in Africa. Apart from the oft repeated 'agro equivalence argument', Indian seed companies are experienced in dealing with small-scale farmers and complex rural marketing systems as compared to US and European companies. Some Indian crop varieties of sorghum and millets are also performing well in African countries. For instance, two sorghum hybrids (G-202 and G-204) which were introduced by an Indian private company, Zuari Seeds Limited, performed well in Ethiopia.<sup>34</sup> The National Seed Association of India is also partnering with the Syngenta Foundation India in the 'India-Africa Seeds Bridge' project, which aims to develop the seed system in Africa by providing better seeds to African farmers and creating a market for Indian seed companies. Main beneficiaries are African countries such as Liberia, Kenya, Malawi, and Senegal.<sup>35</sup> Many other Indian seed firms are experimenting on the production of hybrid seeds in sorghum, pearl millet, rice, maize, and vegetables in Africa. J.K. Seeds, Namdhari Seeds, Nuziveedu Seeds, Vibha Seeds, and Nath Seeds, are some of most the active Indian seed companies in Africa.

Although India has a thriving seed sector with capacity for international expansion and some Indian seed companies have in fact entered African markets, India's share in this seed market is currently inconsequential. According to Chaturvedi et al. (2016), India accounted for only 1.46 percent of the annual seed exports to Africa. However, Indian companies have successfully penetrated seed markets in some African countries. India was the fourth largest exporter of seeds to Ethiopia with a market share of 18 percent.<sup>36</sup> Moreover, India is the largest exporter of wheat seeds to Ethiopia with a market share of 59 percent, and the third largest exporter of vegetable seeds to Kenya, with a market share of 11 percent.<sup>37</sup> Some Indian firms such as Nirmal Seeds and Vibha Seeds—which have made direct investments in African countries—are still struggling to secure regulatory approvals.<sup>38</sup>

Indian seeds companies face many hurdles in Africa. Firstly, Indian companies face stiff competition from Western, Chinese, and Brazilian seed companies in Africa. Secondly, the African seed market is highly segmented



for different crops and seed technologies. Further, Africa's national and regional seed systems vary considerably despite many initiatives to harmonise seed sector policies.<sup>39</sup> These differences pose serious challenges for Indian seed companies which are at an early stage of internationalisation and lack sufficient knowledge about the African markets. Therefore, Indian seed firms should focus on a few crops in which they have an advantage, such as hybrid maize. They should also try to partner with local small traders and form joint ventures with local African seed firms in order to establish marketing chains and get better information about local African seed markets. To overcome the policy and regulatory barriers, there is a need for better collaboration between Indian and African governments.

### **c. *Indian credit lines to Africa***

Addressing Africa's food insecurity has emerged as one of the major goals of India's development cooperation with African countries. India has extended credit lines worth US\$ 1,106.2 million towards agricultural development and food security in African countries. Table 4 lists EXIM Bank's operative credit lines in Africa which are directed towards food security and African agriculture.

**Table 4: Indian operative credit lines directed towards agriculture and food security in Africa**

Sr. No.	Country	Purpose	Duration	Amount of Credit (US\$ million)
1	Cote d'Ivoire	Project for renewal of urban transport system in Abidjan and for agricultural projects in the field of vegetable oil extraction, fruits and vegetable chips production, production of cocoa, coffee etc.	20 years	26.8
2	Mali	Rural electrification and setting up of agro machinery and tractor assembly plant in Mali.	20 years	27.0
3	Ghana	Rural electrification, agriculture, communication and transportation projects.	20 years	27.0
4	Ghana	Rural electrification project and construction of Presidential Office	20 years	60.0
5	Chad	Setting up of cotton yarn plant, Steel billet plant and rolling mill, plant for assembly of agricultural equipment and bicycle plant	20 years	50.0
6	Burkina Faso	Agricultural projects including acquisition of tractors, harvesters, agricultural processing equipment and construction of national post office	20 years	30.0
7	Gambia	Tractor assembly plant project	20 years	6.7
8	Senegal	Irrigation project	20 years	27.0
9	Niger	Acquisition of buses, trucks, tractors, motor pumps and flourmills	20 years	17.0

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10	Guinea-Bissau	Electricity project, mango juice and tomato paste processing unit and purchase of tractors and water pumps for development of the agricultural sector	20 years	25.0
11	Sudan	(i) supply of agricultural inputs for the Sudanese Agricultural Bank, (ii) technical and laboratory equipment to Higher Educational Institutions, (iii) scientific equipments for Ministry of Science and Technology, (iv) solar electrification and (v) meeting requirement of Sudan Railways	20 years	48.0
12	Sudan	Singa-Gadarif Transmission line extension to Galabat, micro-industrial projects and development of livestock production and services	12 years	52.0
13	Malawi	Supply of irrigation, storage, tobacco threshing plant and one village-one project in Malawi	20 years	30.0
14	Cote d'Ivoire	(i) Mahatma Gandhi IT and Biotechnology Park, (ii) Fisheries Processing Plant and (iii) Coconut fibre processing plant	20 years	25.5
15	Ghana	Track materials, tools and equipment, procurement of high capacity mineral wagons and spares, Procurement of covered wagons, Spares of low capacity mineral wagons, flat trucks/buses, and Foundry materials, Communication and Technology (ICT) and Good Governance project, and Agro Processing Plant	20 years	25.0
16	Senegal	Rural electrification project and Fishing Industry Development Project	20 years	25.0
17	Madagascar	Project for rice productivity and project for fertilizer production	20 years	25.0
18	Sierra Leone	Procurement of tractors and connected implements, harvesters, rice threshers, rice mills, maize shellers and pesticide soarat equipment	20 years	15.0
19	Burkina Faso	Rural Electrification	20 years	25.0
20	Cameroon	Maize Farm Plantation Projects and Rice Farm Plantation Projects	20 years	37.7
21	Tanzania	Export of tractors, pumps and equipments from India to Tanzania	20 years	40.0
22	Eritrea	Multipurpose agricultural projects and educational projects	15 years	20.0
23	Mali	Agriculture and food processing projects	20 years	15.0
24	Cote d'Ivoire	Rice production programme	20 years	30.0
25	Ghana	Improved fish harvesting & fish processing project and Waste management equipment and management support project	20 years	21.7
26	Mozambique	Enhancing Productivity of Rice-Wheat-Maize Cultivation	20 years	20.0
27	Togo	Financing farming and cultivation of Rice, Maize and Sorghum in Togo	20 years	13.1
28	Chad	For financing four projects viz. (i) Compost Production Unit (USD 7.20 million); (ii) Rural Electrification Project (solar energy) (USD 15 million); (iii) Production Unit for Live Stock Feed (USD 2.22 million); and (iv) Extension of Spinning Mill (addition of weaving and processing capacities) (USD 15.90 million) in Chad	20 years	40.3
29	Benin	For financing tractor assembly plant and farm equipment manufacturing unit in Benin	20 years	15.0
30	Swaziland	For agriculture development and mechanization of agriculture in Swaziland	20 years	37.9
31	Senegal	Fisheries Development Project	20 years	19.0
32	Rwanda	[i] Export Targeted Modern Irrigated Agricultural Project (USD 60.22 million); and [ii] Extension of Export Targeted Modern Irrigated Agricultural Project (USD 59.83 million)	20 years	120.1
33	Senegal	Setting up a Modern Abattoir, Meat Processing, Cold Storage, Rendering and Tannery Plant and Market Place in Senegal	20 years	42.0
34	Burundi	Farm Mechanization	20 years	4.2
35	Burundi	Preparation of Detailed Project report for an Integrated Food Processing Complex in Burundi	20 years	0.2
36	Senegal	Rice Self-Sufficiency Programme in the Republic of Senegal	20 years	63.0
			<b>Total</b>	<b>1,106.2</b>

Source: Compiled from EXIM Bank database, [www.eximbankindia.in/sites/.../files/Operative%20LOCs-05.02.2016.xlsx](http://www.eximbankindia.in/sites/.../files/Operative%20LOCs-05.02.2016.xlsx)

#### **d. Indian private sector in Africa**

Investments by Indian private companies in African agriculture have grown rapidly. Indian industry associations such as the Federation of Indian Chambers of Commerce and Industry (FICCI) are also playing an important role in bringing together sector experts and business leaders from India and Africa. FICCI has been organising India-Africa Agrifood Summits since 2007. The objective of the India-Africa Agribusiness Forum held in February 2016 was not limited to increasing agricultural output but to also promote the development of upstream and downstream products like fertilisers, seeds, pesticides, grain refining, and food processing. Such business-to-business interactions have the potential to generate employment opportunities and contribute to the economic growth and food security of both India and Africa.

Most African countries have encouraged the growth of Indian private sector through business-friendly policies. For instance, Burkina Faso allows 100-percent foreign investment with easy repatriation of profits, and new companies benefit from a tax holiday for the first few years. Some African countries have also offered land on lease to Indian farmers and a number of farmers from Punjab and Andhra Pradesh have already migrated to these countries. For instance, the Andhra Pradesh government has sent about 500 farmers to cultivate 50,000 acres of land in Kenya and 20,000 acres of land in Uganda.<sup>40</sup>

So far, about 80 Indian companies have invested US\$2.3 billion in Ethiopia, Kenya, Madagascar, Senegal, and Mozambique. Indian investors have also articulated their plans to spend \$2.5 billion on millions of hectares of land in East Africa, to grow products such as maize, palm oil and rice.<sup>41</sup> Many business enterprises such as Jain Irrigation, Mahindra and Mahindra, Ruchi Soya, Karuturi Global, Renuka Sugars, and Kirloskar Brothers (KBL) have established their presence in several African countries in farm and related sectors.

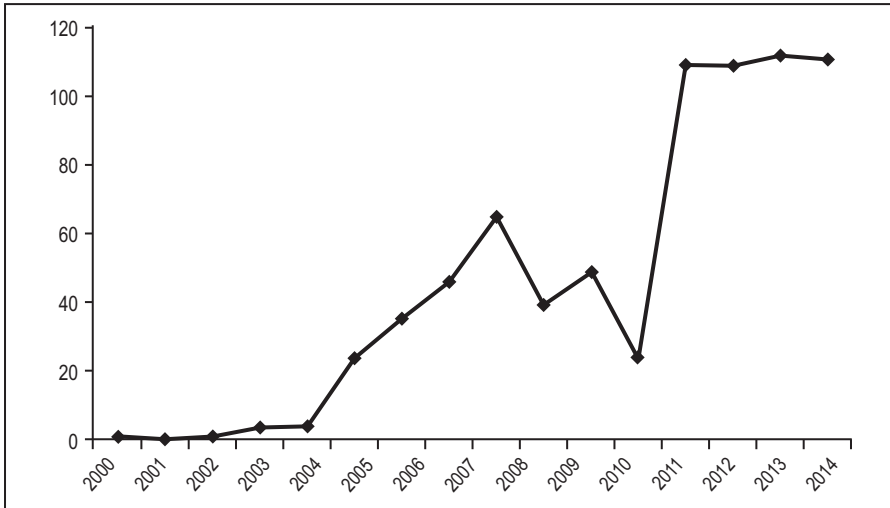
Indian companies like KBL are playing a particularly important role in Africa's irrigation sector. The use of KBL water pumps in Senegal, for example, has led to an increase in total area under cultivation and Senegal

can now meet about 40 percent of its rice demand locally, as compared to 19 percent earlier.<sup>42</sup> Indian water pumps have been successful in Africa because the cost of Indian pumps is much lower than European ones.<sup>43</sup> Jain Irrigation is sharing the drip irrigation technologies in several countries in Africa.<sup>44</sup>

**e. *India as a supplier of agricultural machinery and equipment***

As discussed earlier, low level of mechanisation in African agriculture is one of the major impediments to increasing cereal production. According to a report by the Africa Rice Centre, the number of tractors and draught animals has been stagnating in sub-Saharan Africa and agriculture has had to rely on human labour. More than 50 percent of the cropland in Eastern and Southern Africa is cultivated by hand.<sup>45</sup> Tractors are only used on 20 to 25 percent of the cropland, and on less than 10 percent in Western and Central Africa.<sup>46</sup> About 60 percent of the arable land in Africa is unutilised and most African farmers depend on traditional agricultural methods.

India has emerged as a major supplier of agricultural machinery, particularly tractors, to many African countries in recent years. Figure 2 shows the rapid growth of tractor exports from India to sub-Saharan African countries from 2005 onwards. The years after the global financial crisis from 2008 to 2010 saw a rapid decline in tractor sales to Africa but there was a major recovery in tractor exports from 2011 onwards. The value of India's tractor exports to sub-Saharan Africa increased from a low US\$ 3.9 million in 2004 to US\$ 110.6 million in 2014. Indian credit lines are also helping African countries such as Burkina Faso, Niger, Guinea-Bissau, Tanzania, Sierra Leone, and Benin procure Indian tractors (See Table 3). The Ouidah Tractor Plant in Benin, funded by a US\$ 15-million Indian line of credit, will not only help Benin become self-sufficient in the production of tractors but also enable it to export tractors to other West African countries.<sup>47</sup>

**Figure 2: India's tractor exports to sub-Saharan Africa (2000-2014, in US\$ million)**

Source: Authors' graph using data from UNCOMTRADE

Various Indian companies have set up tractor assembly facilities in African countries. For instance, Sonalika International has established its presence in as many as 30 African countries. It has also set up plants in Cameroon, Nigeria, and Algeria. Mahindra and Mahindra, India's top tractor manufacturer, has set up tractor assembly plants in Tunisia, Kenya, Tanzania, Algeria, Mali, and Chad.<sup>48</sup> According to Rajiv Wahi, Senior President, International Business, International Tractors Ltd, Indian tractors are more suited to African conditions because European ones are technologically more sophisticated and Chinese tractors, light-weight.<sup>49</sup>

#### **f. Common position in global platforms**

Due to similar agricultural conditions in both regions, India and Africa have often held a similar stance on agriculture and food security issues in global platforms. India has worked closely with South Africa and other African countries to represent the interests of developing countries in international trade forums such as the World Trade Organization (WTO). Mohanty and Chaturvedi (2008) assert that the formation of G-20 was itself a culmination of South African and Indian efforts to deepen their relationship since the WTO's Seattle meeting in 1999.<sup>50</sup> India and Africa worked closely to guard

their collective interest in agriculture and have often emphasised that protecting the interests of farmers, including food and livelihood concerns, should be the main focus of the Doha Development Round. Moreover, India and Africa have also moved several joint proposals such as the Agricultural Framework Proposal and Protection of Geographical Indications in World Trade Organization (WTO) and World Intellectual Property Organization (WIPO), respectively.<sup>51</sup> More recently, South Africa also supported India's position on the issue of public food stockholding. India, China, South Africa, Indonesia, Ecuador and Venezuela also tabled detailed proposals for a permanent solution for public stockholding programmes for food security and a special safeguard mechanism (SSM) to protect low-income farmers from the import surges from developed countries in the Nairobi Ministerial of WTO in December 2015.<sup>52</sup>

#### **IV. WHAT DRIVES INDIA'S GROWING ROLE IN AFRICAN AGRICULTURE?**

A number of scholars have argued that India's growing interest in African agriculture is largely due to its domestic food security concerns. The global food crisis in 2007-08 triggered widespread concern about food security and the welfare impacts on the poor of the sharp increases in the prices of food staples such as rice, corn, and wheat. Some media reports suggested that countries with large populations such as China, India and Middle eastern nations are increasingly turning towards Africa to meet their food security concerns.

Relevant sections from the news reports are reproduced below:

*“The global food price crises between 2008 and 2009 led countries that bore the brunt of the catastrophe to look elsewhere for agricultural land to mitigate the effects. In 2008 prices of some foods, including wheat, soared by 130% in a single year and the United Nation's Food and Agriculture Organisation's food price index shot up 40%. The result was a frenzied scramble that saw countries acquire an estimated 40 million hectares of land in foreign countries, most of it in Africa.”<sup>53</sup>*

A great deal of attention was paid to the role of China in obtaining large tracts of land in Africa to feed its large population. However, Brautigam and Zhang (2013) argued that the initial media reports on Chinese land deals in Africa were erroneous and were circulated without critical examination, and became the foundation for influential databases (GRAIN and Land Matrix) and scholarly analyses. Based on their field visits, they concluded that there is no evidence of a coordinated Chinese government effort to obtain land in Africa. Some Chinese agribusiness firms did pursue land acquisitions in Africa but in most cases, the amount of land was far smaller than reported and the projects were commercial in nature. In her book, 'Will Africa feed China?', Brautigam argues that China is not buying up huge tracts of African land to grow food to ship back to China. On the other hand, China actually exports more food to Africa than it imports.<sup>54</sup>

Though much less attention was placed on India, a section of the international media and a few scholars also stated that India's growing investment in African agriculture is driven by the country's need to obviate the effects of high food prices by outsourcing supply. In Mohammad Amir Anwar's words, "*India's ability to feed its 1.22 billion people is under increasing strain. This is due to a rapidly growing population, low agricultural productivity, reductions in farm sizes, declining water tables, increasing control of the seed sector by multi-nationals and a gradual withdrawal since the 1990s of the farm support system.*" He went on to argue that the Indian government was encouraging firms to seek land abroad for growing crops because of the spike in global food prices and to make more land available to investors.<sup>55</sup> Some scholars such as Rick Rowden and Suresh Kumar have echoed similar concerns. According to Rowden (2010), India's efforts to outsource food production can be traced to the government's concern over India's long-term food security based on declining agricultural productivity, growing import dependence on certain commodities such as pulses and oilseeds, and depleting groundwater tables.<sup>56</sup> According to Kumar (2010), India will be the world's largest importer of food in the world and the country needs to outsource the production of different cereals to feed its population.<sup>57</sup>

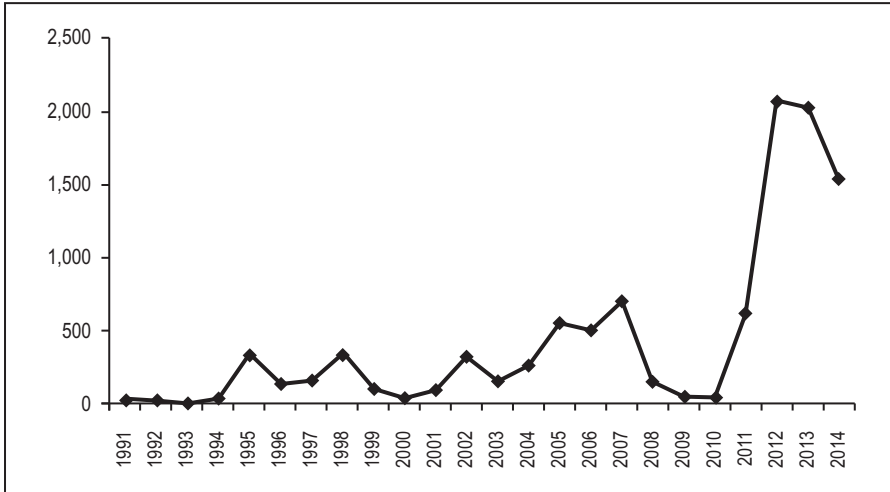
This position is flawed for various reasons. Firstly, unlike in the 1960s, India no longer suffers from an acute shortage of key food grains (rice and

wheat). As described in Section 2, the attainment of food self-sufficiency became a major goal of Indian planners after the country faced acute food deficits in the 1960s. The green revolution in India started in the late 1960s and the country attained self-sufficiency in wheat within a decade. In the 1980s, during the second wave of the green revolution, agricultural output of all major crops including rice increased rapidly.

From early 2000 onwards, a number of economists argued that the food grains available with the government agencies were well above the normative buffer stock prescribed by the government. For instance, Virmani and Rajeev (2002) argued that India's problem was not one of a shortage of food grains but finding ways and means of managing the accumulated surplus.<sup>58</sup> India's problem of plenty has only worsened over the years. As against the buffer stock norm of 21.4 million tonnes of rice and wheat, total central pool stocks were 61.6 million tonnes as of 1 January 2015.<sup>59</sup> Given the fact that a large section of the Indian population is undernourished and the country has failed to meet the millennium development goal of halving the number of people suffering from hunger, India desperately needs efficient management of food reserves as opposed to new sources of food grains.

Second, and more importantly, India has emerged as a large exporter of food grains, particularly rice, to many African countries. Figure 3 shows the steep rise in India's rice exports to Africa from 2010 onwards. Major destinations of India's non-basmati rice are Benin, Senegal, South Africa, and Liberia. Indian parboiled non-basmati rice is cheaper than Thai rice, making it more competitive in the African market. Thus, India's huge exports of low-priced non-basmati rice from 2009 onwards have stabilised international prices, in turn, helping African consumers.



**Figure 3: India's rice exports to Africa (1991-2014, in US\$ million)**

Source: Authors' graph using data from UNCOMTRADE

Although India is self-sufficient in the production of rice and wheat, there is a huge demand-supply gap in pulses and oilseeds. According to a recent study by ASSOCHAM, India may have to import some 10 million tonnes of pulses to bridge the demand-supply mismatch on account of a deficient rainfall in 2015.<sup>60</sup> Domestic price inflation in major pulses like tur, moong, and urad have adversely affected poor consumers. Some African countries (notably in the east like Tanzania, Mozambique, Malawi, and Kenya) have emerged as important sources of pulses which are a major source of proteins for Indians.<sup>61, 62</sup> Imports of African pulses have not only helped address the shortfall in domestic production but have also contributed to price stabilization.<sup>iv</sup> Radha Mohan Singh, the Indian Minister of Agriculture also suggested collaboration between Indian and African companies for the production of pulses and vegetable oils in the India-Africa Agribusiness Forum.<sup>63</sup>

While Africa has indeed emerged as an important source of pulses for India, it is important to bear in mind that augmenting supplies through imports is a short-term strategy to address current shortages and contain prices. As a long-term strategy, the government is trying to increase the domestic supply by incentivising farmers to grow pulses. Indian agricultural price support policy has traditionally favoured cereals over pulses but in recent years, the government has been hiking the minimum support prices

of pulses regularly.<sup>64,v</sup> In a nutshell, Africa is not headed towards becoming a 'food basket' for India although it may be an important source of essential commodities like pulses and oilseeds in the short to medium term. It is thus incorrect to say that India's interest in African agriculture is primarily driven by its domestic food security concerns.

There are two main motivations for India. Firstly, greater cooperation between India and Africa in the area of food security is in line with India's commitment to South-South cooperation. Secondly, a partnership between India and Africa is a great opportunity for the expansion of India's private sector in Africa which is at a nascent stage of internationalisation. Africa presents itself as a huge untapped market for India's growing food and agriculture sector. According to a study by the World Bank, agriculture and agribusiness together are projected to be a US\$ 1-trillion industry in sub-Saharan Africa by 2030.<sup>65</sup> A dynamic agribusiness sector will also contribute to Africa's growth.

## V. RECOMMENDATIONS

- **Need for a multi-dimensional approach towards food security**

This paper finds that India's initiatives have mainly focused on addressing supply-side challenges in African countries via adoption of improved technology and better inputs. It is important to recognise that food security is a multi-dimensional concept which includes three components – the availability of food, the consumption of food, and the absorption of food which is measured in terms of nutrition. India's own experience clearly shows that a food-sufficient country may not necessarily be a food-secure country. The widespread prevalence of hunger and under nourishment among the vulnerable sections of the Indian population shows that food insecurity at the household and individual level can co-exist with surplus food grain production due to bad management and faulty distribution systems.

- **Policy lessons from India**

Notwithstanding the deficiencies in India's public distribution system, there are some important lessons for African countries. India has made significant efforts towards the realisation of the human right to food. India operates one of the largest food safety nets in the world. India's experience in implementing the mid-day meal scheme and the National Food Security Act can offer important insights to African policymakers who are working on developing national food security programmes. Civil society organisations in Africa which are demanding the full implementation of the right to food will also benefit from the Indian experience. Global dialogues on food security organised under the Knowledge Partnership Programme initiative<sup>vi</sup> may be regarded as an important step towards that end. Table 5 presents a summary of the main points of the presentations by the African participants which attended the Global Dialogues on Food and Nutrition Security in Mali.<sup>vii</sup> Most of the African countries stated that they need support in advocacy for expanding the government's social interventions and seek to learn from India's experience in feeding school children and pregnant and nursing mothers. Ghana, Sierra Leone, and Togo stressed the importance of collaboration between civil society organisations. The participant from Burkina Faso emphasised on the need for a food security law in Burkina Faso and sought India's help in drafting one.

Within India, there are some states such as Kerala, Tamil Nadu, Himachal Pradesh, and Chhattisgarh which have performed better than others in providing better access to food. For instance, Tamil Nadu's universal public distribution system—under which every household is entitled to subsidised food grains—is widely regarded as a model for other Indian states. Given the fact that actual implementation of welfare schemes is the responsibility of state governments in India, African policymakers have a lot to learn from better-performing Indian states. Therefore, this paper strongly

recommends that lessons from the experiences of Indian states should be shared with African policymakers. Indian researchers, civil society organisations, and think-tanks can play an important role in this regard.

**Table 5: Main points by African participants, Global Dialogues on Food and Nutrition Security, June 28-29, 2015**

Sr. No.	Country	Main points of country presentations	How India can help
1.	Benin	"The country has a project called the Centre for Social Promotion for the mothers' and their children's nutrition "Existence of ONASA - The national agency for food security	"Share its experiences in feeding pregnant and lactating mothers and children
2.	Burkina Faso	"Need for a food security law "Need for inclusion of Right to Food, Right to Livelihood and Shelter in the Constitution "Need for social welfare policies in favour of weaker sections	"Provide assistance in drafting a food security law
3.	Ghana	"Right to Food is a fundamental right enshrined in the constitution but not enforced "Government policies neglect the issue of access to food "The school meal programme is implemented in limited districts. Out-of-school children and children in private schools are not covered. "Need for special provisions for people affected by disasters	"Need for collaboration between CSOs* in India and Ghana to implement the Right to Food "Advocacy on expanding government's social interventions "Learn from India's experiences in mid-day meal scheme
4.	Kenya	"Right to food enshrined in the Constitution "Need for effective policies to realise this right	"Support to identify needs of excluded communities "Advocacy for social protection for food security
5.	Mali	"Free grains for the poor	"India can provide help in better monitoring and implementation of food programmes
6.	Niger	"Need for a system of transfer of food or cash entitlements for vulnerable and marginalised communities	"Assistance to help understand how the right to food can be implemented
7.	Senegal	"Need for a mechanism to assess the food situation in the country "Need for capacity building	"Help in state and civil society advocacy
8.	Sierra Leone	"School feeding programme should become a law	"Work with CSOs* to advocate for a law on school feeding programmes "Share experiences in providing free meals and maternity assistance to pregnant and lactating women
9.	Togo	"Right to Food should be a part of the Constitution "Need for appropriate infrastructure, monitoring mechanism, and advisory panel to implement the right to food	"Support to CSOs* for Capacity building

Source: Compiled from DFID (2015)<sup>66</sup> \*CSO – Civil Society Organisation

- **Learning from India's 'green revolution'**

The Green Revolution has been remarkably successful in increasing production of major crops but the increase in agricultural production came at the price of various environmental problems: deforestation, water logging, salinity, alkalinity, soil erosion, declining water tables, contamination of groundwater, and loss of biodiversity. Therefore, African policymakers must be mindful of sustainability problems associated with any 'green revolution' and take into account the carrying capacity of natural resources, soil and water. Moreover, African policymakers must also reflect on the social impact of green revolution. The capital-intensive approach to increasing crop production is inherently against small farmers because they cannot afford to buy the required expensive inputs. In India, small farmers did not benefit much from new technology and the income gap between small and large farmers in fact widened.

- **Climate change risks**


Climate change is a fundamental threat to food security in India and Africa. Sub-Saharan Africa is extremely vulnerable to impacts on agriculture because most of the agricultural crop production is rain-fed and thus susceptible to changes in precipitation and temperature. Similarly, crop production in India is vulnerable to climate change because more than 60 percent of the crop area in India is rain-fed. India's groundwater resources, which are mainly recharged by precipitation and surface water, are also expected to be affected by climate change. As a result, there is an urgent need to concentrate on building adaptive capacity and improving the resilience of food production systems in India and Africa by efficient management of natural resources (land and water). Developing climate-smart agricultural practices should be a key component of India-Africa partnership for food security.

- **Maximising the potential of Indian private sector**

Africa's growing food and agriculture market offers a great opportunity for Indian companies. At the same time, India's private sector can play an important role in addressing the investment and technology gap in Africa's food sector. However, specific challenges that Indian companies are facing in Africa need to be addressed through greater cooperation between Indian and African governments. Moreover, there needs to be more frequent dialogue between the government of India and business organisations so that Indian government can advance the interests of Indian companies in Africa. To maximise their gains in Africa, Indian companies must invest in research and development. Negative experiences with Indian farming operations, particularly in Ethiopia, have severely dented the image of Indian private sector in Africa. Indian companies must therefore engage in responsible behaviour in Africa.

## VI. CONCLUSION

This paper has sought to show that cooperation between India and Africa is mutually advantageous for a number of reasons. Africa can be an important source of essential commodities such as pulses and vegetable oils for India in the short to medium term. Similarly, Indian exports of rice to African countries are also beneficial to poor African countries through lower prices and wider availability. The paper also finds India is playing an important role in alleviating hunger and food insecurity in Africa by providing low-cost technology solutions, building African capacity by setting up institutions in Africa and training their scientists, bridging the investment gap, and providing agricultural inputs. However, India-Africa collaboration for food security has largely focused on addressing supply-side challenges in African countries via adoption of improved technology and better inputs. It is important for African nations to recognise that food security is a multi-dimensional concept which includes three components: the availability of food, the consumption of food, and the absorption of food which is

measured in terms of nutrition. India's own experience clearly shows that a food-sufficient country does not necessarily become food-secure. The widespread prevalence of hunger and undernourishment among the vulnerable sections of the Indian population shows that food insecurity at the household and individual level can co-exist with surplus food grain production due to various reasons, including poor management and faulty distribution systems. Further, in order to avoid the adverse environmental consequences of green revolution and meet the challenges posed by climate change, India and Africa must work together to develop sustainable agricultural practices. It would also do well for African countries to draw relevant policy lessons from India, particularly from its better-performing states. 

**NOTES**

- i. India's scientific and technical cooperation with Africa started in 1964 with the launch of the Indian Technical and Economic Cooperation Programme. Energy cooperation became an important feature of India's cooperation with the increase in India's energy requirements.
- ii. Ethiopia's GDP grew at a rate of 10.9 percent from 2003 to 2013 due to a remarkable growth in agricultural production from 2000 onwards. The compound annual growth rate of production of major food crops viz. maize, sorghum, wheat, and barley from 2000 to 2013 was 7.2 percent, 9.7 percent, 8.9 percent and 6.9 percent, respectively.
- iii. Cereals include wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains.
- iv. India also imports pulses from Myanmar, Canada, and Australia.
- v. According to Economic Survey 2014-15, the prices of pulses and oilseeds often fall below the minimum support price as there is no effective price support. Agricultural price support operates primarily in wheat and rice which has created an incentive structure that is highly skewed in favour of rice and wheat.
- vi. Knowledge Partnership Programme (KPP) is an initiative to explore and showcase India's success in meeting development challenges in terms of policy and practice. KPP is led by IPE Global Limited and is supported by the Government of UK's Department for International Development.
- vii. Global Dialogues on Food and Nutrition Security: Sharing Experiences from India and Brazil to Develop National Frameworks was held in Bumako in June 2015. Governments and civil society representatives from 11 West African countries - Benin, Burkina Faso, Congo, Ghana, Ivory Coast, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo, participated in the event.



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