



OCCASIONAL PAPER NO 102

China in Africa Project

November 2011

Understanding China's Agricultural Investments in Africa

Helen Lei Sun

South African Institute of International Affairs

African perspectives. Global insights.

ABOUT SAIIA

The South African Institute of International Affairs (SAIIA) has a long and proud record as South Africa's premier research institute on international issues. It is an independent, non-government think-tank whose key strategic objectives are to make effective input into public policy, and to encourage wider and more informed debate on international affairs with particular emphasis on African issues and concerns. It is both a centre for research excellence and a home for stimulating public engagement. SAIIA's occasional papers present topical, incisive analyses, offering a variety of perspectives on key policy issues in Africa and beyond. Core public policy research themes covered by SAIIA include good governance and democracy; economic policymaking; international security and peace; and new global challenges such as food security, global governance reform and the environment. Please consult our website www.saiia.org.za for further information about SAIIA's work.

ABOUT THE CHINA IN AFRICA PROJECT

SAIIA's 'China in Africa' research project investigates the emerging relationship between China and Africa; analyses China's trade and foreign policy towards the continent; and studies the implications of this strategic co-operation in the political, military, economic and diplomatic fields.

The project seeks to develop an understanding of the motives, rationale and institutional structures guiding China's Africa policy, and to study China's growing power and influence so that they will help rather than hinder development in Africa. It further aims to assist African policymakers to recognise the opportunities presented by the Chinese commitment to the continent, and presents a platform for broad discussion about how to facilitate closer co-operation. The key objective is to produce policy-relevant research that will allow Africa to reap the benefits of interaction with China, so that a collective and integrated African response to future challenges can be devised that provides for constructive engagement with Chinese partners.

A 'China-Africa Toolkit' has been developed to serve African policymakers as an information database, a source of capacity building and a guide to policy formulation.

SAIIA gratefully acknowledges the generous support of the main funders of the project: The United Kingdom Department for International Development and the Swedish International Development Cooperation Agency.

Project leader and series editor: Dr Chris Alden, email: J.C.Alden@lse.ac.uk

© SAIIA November 2011

All rights are reserved. No part of this publication may be reproduced or utilised in any form by any means, electronic or mechanical, including photocopying and recording, or by any information or storage and retrieval system, without permission in writing from the publisher. Opinions expressed are the responsibility of the individual authors and not of SAIIA.

Please note that all currencies are in US\$ unless otherwise indicated.

ABSTRACT

Since 2000 China has started to strengthen its agricultural co-operation with Africa in trade and other commercial activities. It has also increased its agricultural investment in Africa. With China's rapid economic rise, the global economic downturn and its uncertain recovery, and the challenge of climate change, China's agricultural investment in Africa has developed against a backdrop of closer economic ties with the continent.

Although agricultural growth has increased in Africa in recent years, food security remains a severe challenge. International organisations and programmes, such as the UN millennium development goals, have called for greater investment in Africa to reduce poverty and eradicate hunger. Despite international and local concerns, China's investment in Africa in infrastructure and agricultural technology and training could facilitate agricultural growth in Africa. China itself has demonstrated sustainable growth in agriculture, improvement in the livelihood of small-scale farmers, and success in reducing rural poverty.

The paper analyses the driving factors behind China's agricultural investment in Africa, particularly from the perspectives of economic development and market factors, and concerns about food security. It considers the implications of China's experiences in terms of institutions, productivity and technology. Finally, the paper addresses the issues of the 'Green Revolution' and 'green technology' in the context of China's agricultural investment in Africa, and suggests policy recommendations for further studies.

ABOUT THE AUTHOR

Helen Lei Sun is a visiting fellow at the London School of Economics. She is a research fellow at the Centre for Futures and Financial Derivatives of China Agricultural University, and has taught agricultural economics at the School of Agricultural Economics and Rural Development of China's Renmin University. She has a PhD in Agricultural Economics from the University of Reading, and an MSc in Economic History from the London School of Economics.

The views expressed in this publication are the author's own and do not necessarily reflect the views of others. The author thanks Dr Chris Alden (London School of Economics, author of *China in Africa*)¹ for his modification and generous support, Dr Isabelle Tsakok (former senior economist, World Bank), and Liz Wilson (deputy head of the Agriculture for Impact Programme, Imperial College London) for their helpful comments.

ABBREVIATIONS AND ACRONYMS

BIT	bilateral investment treaty
CAD	China–Africa Development (Fund)
CATERAR	<i>China–Africa Trade and Economic Relationship Annual Report</i>
CDB	China Development Bank
China Exim Bank	Export–Import Bank of China
CNY	Chinese yuan
CSFAC	China State Farms Agribusiness Corporation
FAPRI	Food and Agriculture Policy Research Institute
FDI	foreign direct investment
FOCAC	Forum on China–Africa Cooperation
FX	foreign exchange (reserves)
HRS	Household Responsibility System
MCC	Ministry of Commerce of China
MDG	Millennium Development Goal
R&D	research and development
SOE	state-owned enterprise
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme

INTRODUCTION

Since 2000 China has accelerated its investment in Africa significantly. According to the 2010 *China–Africa Trade and Economic Relationship Annual Report* (CATERAR), its foreign direct investment (FDI) in Africa increased from \$220 million in 2000 to \$1.44 billion in 2009,² reaching \$13.04 billion by 2010. For the first half of 2011, China's non-financial sector FDI achieved \$820 million.³ China's FDI in Africa has increased rapidly and has diversified its approach to include central government-led, stated-owned and private investments. China–Africa relations broadly address issues of politics,⁴ trade relations,⁵ and anthropology and sociology.⁶ China is rapidly becoming an important aid donor and investor in Africa,⁷ and is using the continent not only as a source of raw materials and potential new markets, but also to bolster its own position on the international stage.⁸

For some observers, China's agricultural investment in Africa has been a source of friction in the relationship,⁹ with speculation that China may join the export-oriented 'land grabs' by big transnational firms that have occurred since the food crisis in the developing world began with price spikes in the late 2000s.¹⁰ However, China also has much to offer Africa in terms of lessons learnt from its own success in agricultural growth, alleviating poverty,¹¹ and achieving the Millennium Development Goal (MDG) 1 in its eradication of extreme poverty and hunger. Indeed, China's involvement in Africa's agricultural sector is already evident with FDI totalling \$30 million in 2009.¹² China's official data shows that agriculture was just 2% of its total FDI in 2009. However, its investments are expected to increase in Africa's agro-processing, resource-based agriculture and agricultural commodities.¹³ Chinese projects in Africa involve a wide range of sectors in agriculture. These include agribusiness,¹⁴ investments and development projects.¹⁵

China's own experience in agriculture is perhaps as impressive as it is relevant to many countries in Africa. Chinese agriculture has been fundamentally important to its economic development. Before reform started in 1979, China was an agricultural society, with more than 80% of its population living in rural areas. The majority of these people were poor, and hunger and poverty were widespread. China's economic reform started in the agricultural sector and led to rapid agricultural growth and poverty reduction, its success gaining world-wide recognition. China clearly demonstrates that poverty and hunger can be mitigated significantly by empowering agriculture in its economic development. Indeed, the World Bank states that China's agricultural growth was three-and-a-half times more effective in poverty alleviation when compared with growth in other sectors of its economy.¹⁶ China reduced the number of people living in poverty in rural areas from 85 million in 1990 to 35.97 million by end of 2009, thereby achieving the target of halving the proportion of people living in poverty addressed by the United Nations Development Programme (UNDP). Globally, the greatest reduction in poverty occurred in East Asia and the Pacific, where the poverty rate declined from 78% in 1981 to 17% in 2005 and the number of people living on less than \$1.25 declined by more than 750 million. Much of this decline was in China, where poverty fell from 84% to 16%, leaving 627 million fewer people living in poverty.¹⁷

In contrast, agricultural growth in Africa has been slow. Poverty in Africa is predominantly rural.¹⁸ In most of the region's countries, agriculture employs 60–80% of the labour force and is home to the vast majority of the poor.¹⁹ The last 30 years have

seen minimal gains, and in some cases marked declines, in agricultural productivity and food consumption per person. Africa's solution for eradicating hunger and reaching the MDG 1 remains its highest challenge. Globally, the number of people living in absolute poverty has been in decline for around 25 years, yet in Africa this continues to increase.²⁰ Although over 70% of the continent's poor live in rural areas and depend on agriculture for their food and livelihood, financial development assistance from international aid programmes and organisations has decreased over the past two decades.²¹ In 2004 Africa's agricultural sector received just 4% of Official Development Assistance (ODA), compared with 17% in 1977.²² There has been limited investment in rural areas during this period, including in rural roads, with most small farmers receiving very little aid.²³

Agricultural investment is imperative for targeting the MDG 1, particularly in Africa. The UN Food and Agricultural Organisation (FAO) estimates that an extra \$30 billion per year needs to be invested in agriculture and safety nets to ensure that the MDG 1 target of halving the number of hungry is met by 2015. African countries have the highest rate of malnourished and undernourished people in the world. China's investment in African agriculture is particularly timely in light of the recent strengthening of China and Africa's economic co-operation. However, existing research lacks evidence on the correlation between China's investment and Africa's agricultural growth and poverty reduction. Given the paucity of data, it is hard to assess the impact of China's investment in Africa, except in an anecdotal sense. It is important to understand why China has accelerated its agricultural investment in Africa, and the extent to which China's investment has had an impact on African agricultural growth.

ANALYSING CHINA'S AGRICULTURAL INVESTMENT IN AFRICA

Under its 10th Five-Year Plan for National Economic and Social Development (2001–05), China adopted a strategy of international co-operation to strengthen its outward economic development, referred to as its 'going out' (*zou chu qu*) strategy. The agricultural sector is an important composition of its 'going out' strategy policy and its goal to ensure domestic food security.^{24, 25} China has provided aid to Africa, including its agricultural sector, since 1956.²⁶ The aid programmes in African agriculture were subsumed under China's diplomacy and, although limited, helped to pave the way for their current agricultural co-operation.²⁷

China has carried out a series of policies encouraging well-established Chinese enterprises and private companies to undertake agricultural investment and development projects abroad, including in Africa. Recently Chinese overseas farming has enhanced partnership programmes through bilateral investment treaties (BITs). By the end of 2005 China ranked second worldwide in terms of the number of BITs concluded, with 117 agreements in total, including 28 with African countries. China's encouragement and incentives have promoted FDI outflows, such as foreign exchange polices; special and general tax incentives; credit and loans; foreign exchange allowance; and favourable import and export policies, such as quotas and tariffs. China's policy to encourage outward investment has encountered two main barriers. These are approval procedures for investment projects and the transfer abroad of foreign exchange or other assets for investment use.²⁸ For instance, Chinese local enterprises may need to process their

approval procedures for FDI projects at provincial level in order to invest or conduct businesses overseas. However, some banks, fund management and insurance companies are allowed to use respective channels to gather funds and purchase foreign currencies to engage in outward FDI. Deregulation of supervision and permission also includes foreign current accounts. Chinese individuals are allowed to use Chinese yuan (CNY) to exchange foreign currency at a certain level from banks.

Since the third Ministerial Conference of the Forum on China–Africa Cooperation (FOCAC), held in Beijing in November 2006, China has accelerated agricultural investment in Africa, using old ties to build new partnerships of co-operation. At the High-level Symposium on China–Africa Cooperative and Investment,²⁹ held in Beijing on September 2011, the minister of the Ministry of Commerce of China (MCC) Chen Deming stated that there were several important issues that needed to be addressed to assist African development. He noted that despite Africa’s rich resources in land, hunger issues had yet to be resolved. The minister stated that China had adjusted its aid policy in Africa in recent years, changing its priorities from areas such as construction to agricultural development, health and education – with agriculture and food issues as the top priority.³⁰

At present, the key actors and stakeholders of China’s investment in Africa’s agricultural sector include policymakers, academics, state-owned companies, specialised banks and private enterprises. The structure of China’s government includes national-level and provincial-level departments, municipalities, as well as autonomous regions.

Box 1: Key actors and stakeholders of China’s investment in Africa

China’s government (policymakers) in charge of agriculture and commerce, such as China’s Ministry of Agriculture and Ministry of Commerce.
Provincial municipalities and autonomous regions.
Academics in universities or research institutes, and agro-industries at national or regional level; relevant co-operative platforms such as China–Africa co-operative forums and China–Africa development funds.
State-owned agricultural corporations and enterprises, such as the China National Agricultural Development Group Corporation, China State Farms Agribusiness Corporation, China Oils and Foodstuffs Corporation, and private entrepreneurs.
State-owned banks, such as the Export–Import Bank of China (China Exim Bank) and China Development Bank (CDB).

Source: Author’s own

China’s overseas farming investments comprise two key categories of enterprise management: private enterprises and state-owned enterprises (SOEs). Originally Chinese SOEs mainly conducted their agricultural business in Africa. Since the mid-1990s these have been joined by many private agricultural enterprises, most of which have been small-scale enterprises. Since 2005 a new family of small-scale private enterprises

have established themselves in Africa. These enterprises are highly flexible and adapt quickly to local conditions. However, they are less competitive than the SOEs with the latter's greater financial and human capital resources which results in track record of winning state-funded aid projects in African countries. For instance, China State Farms Agribusiness Corporation (CSFAC) began its investment in Africa as long ago as 1990, conducting mainly aid projects. In recent years the CSFAC has also adopted different channels of investment, including FDI in Africa. It continues to invest in aid programmes, which enables the corporation to obtain loans from China's government support funds for financial aid programmes with relative ease. The CSFAC has demonstrated the importance of capital support for successful agricultural investment projects, such as its investment in the China–Zambia Friendship Farm.

In recent years China's banks have also engaged in African agriculture. China Exim Bank, the CDB, Industrial and Commercial Bank of China and other financial institutions have extended substantial commercial loans to African countries.³¹ Supported by the CDB, Zimbabwe and China signed an agreement worth \$585 million aimed at reviving the southern African country's agriculture, health and mining sectors.³² Chinese academics have also been involved in research related to African agriculture. These include the African Studies of the Chinese Academy of Social Sciences, the China–Africa Research Centre of Zhejiang Normal (Shi Fan) University, and other institutes at both national and provincial levels.

Accelerating China's outward investment

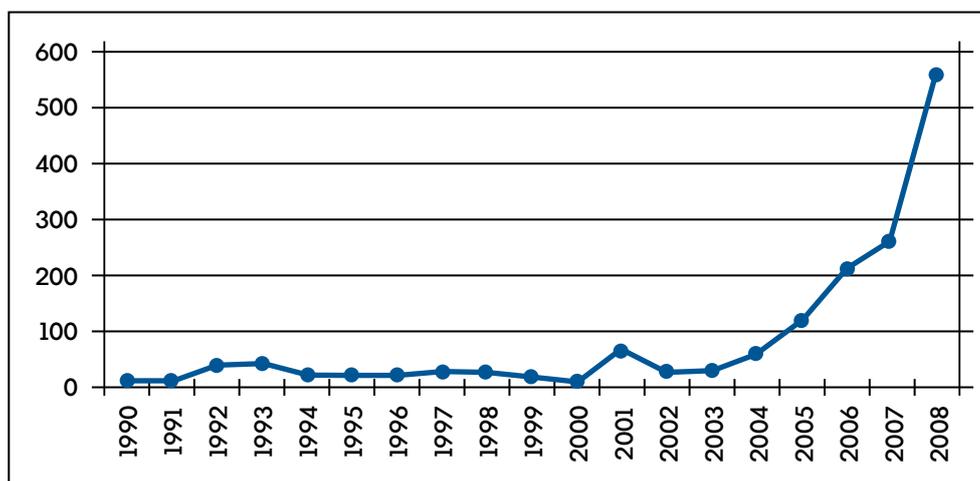
For more than two decades now China's economy has benefited from its market-oriented reform in line with its opening-up policies. Sustained growth has led to advantages in economic scale and capital resources, which have enabled China to build sound foundations on which to launch its 'going global' strategy. China's advances in agricultural technology, such as hybrid rice breeding, have also helped to accelerate its outward investment, together with its accumulating capital resources and outward investment policy.³³

Since the 1990s China has carried out its policy of an export-led economic development strategy which has resulted in rapid growth in FDI inflows. By 2010, China's accumulated FDI inflows reached \$105.7 billion, according to the MCC. This has contributed to its current position as the world's leader in foreign exchange (FX) reserves with reserves of \$3197.5 billion in June 2011. However, in comparison with China's FDI inflows, its outflows remain small. The ratio of China's inflows to outflows is 1:0.09. This is not only much lower than average level of developed countries' ratio of 1:1.14 but is also below the world average of 1:1.11.³⁴ Thus China's FDI inflows and outflows show a serious imbalance that is not evident even in developing countries.

China has accelerated its outward FDI across the world since 2004. China's FDI outflows have increased by 123% from 2004 to 2005. The annual FDI outflows increase averaged 46% between 2001 and 2010. FDI outflows reached \$68.8 billion in 2010 according to the MCC, and accounted for 5.2% of the world total in 2010.³⁵ In 2009 China's FDI accounted for 5.1% of the world's total, ranking it number one among developing countries and fifth in the world, according to the 2010 *World Investment Report*.³⁶

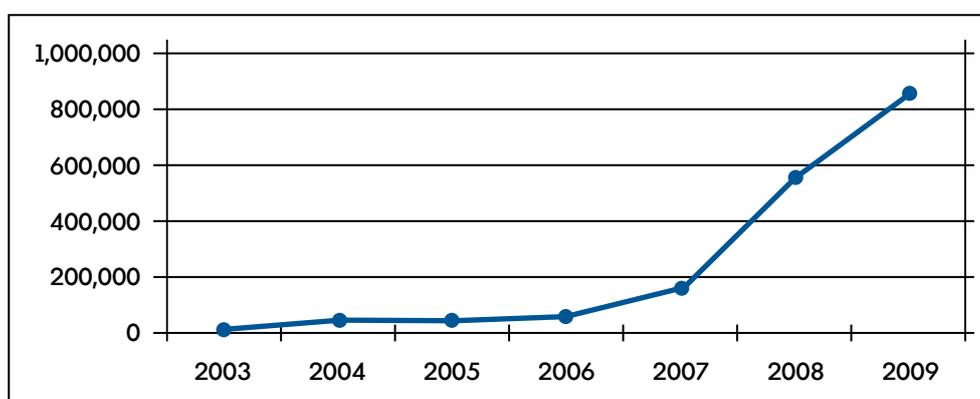
China has also increased its FDI in Africa substantially since the third Ministerial Conference of FOCAC in 2006.

Figure 1: China's FDI outflows (\$100 million), 1990–2008



Source: MCC, 2009 *Statistical Bulletin of China's Outward Foreign Direct Investment*. MCC, National Bureau of Statistics of China & State Administration of Foreign Exchange of China, Beijing, 2010

Figure 2: China's outward FDI stocks in Africa (\$10,000), 2003–09

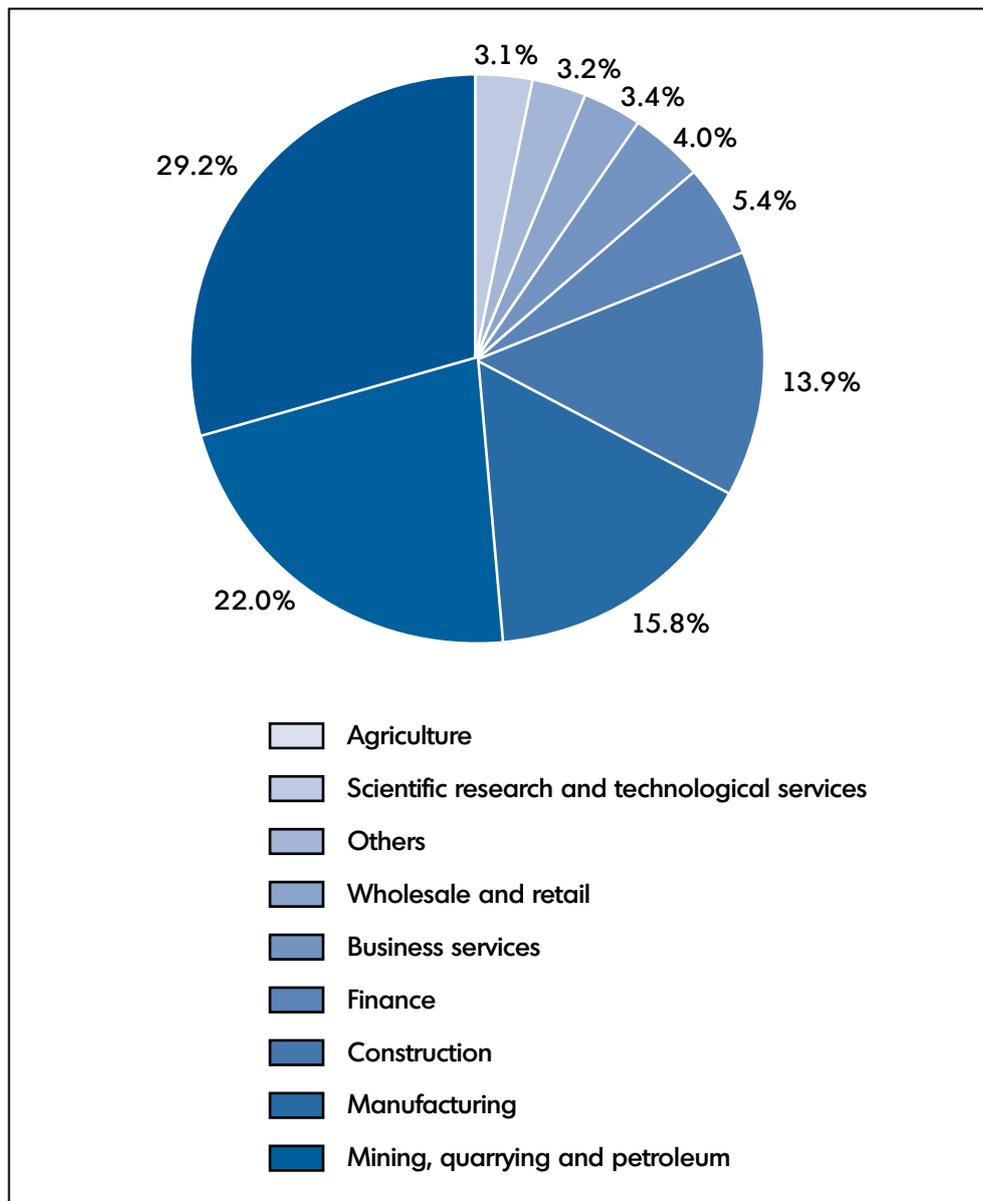


Note: MCC official statistics for non-financial sectors are only available for 2003 and 2009.
 Source: MCC, 2009 *Statistical Bulletin of China's Outward Foreign Direct Investment*. MCC, National Bureau of Statistics of China & State Administration of Foreign Exchange of China, Beijing, 2010

As reflected in Figure 3 on page 10, China's outward FDI cumulative stocks in agriculture are only 3.1%. This is small compared with other sectors in Africa but is expected to increase, with agricultural co-operation becoming a priority for policy-makers in China and some African countries. China's investment in Africa's agriculture was more than \$134 million in 2009, and it established 50 agricultural enterprises and over 100 farms.³⁷ China's

investment approaches have also diversified, for instance through development funds and financial assistance. The China–Africa Development (CAD) Fund was established on 14 March 2007 and is funded fully by the state-owned CDB, which has been a key institution in supporting China’s infrastructural development and the promotion of basic and strategic industries. The CDB has played a pivotal role in funding new development projects and advancing economic development in areas such as agriculture and public infrastructure.³⁸

Figure 3: China’s outward cumulative FDI stocks in Africa by industry (%), 2009



Source: China, Information Office of the State Council, White Paper for China–Africa Economic and Trade Cooperation. Beijing: People Publishing (Renmin), 2010

Box 2: China's financial investment in Africa

Chinese companies and the CAD Fund launched a project worth over \$20 million for cotton cultivation and processing in Malawi. In 2009, through its 'company plus farmers' approach, this project involved over 50 000 farming households to grow cotton. They processed 17 000 tonnes of seed cotton and produced 6 800 tonnes of lint.

Source: China, MCC, CATERAR (*China–Africa Trade and Economic Relationship Annual Report*). Chinese Academy of International Trade and Economic Cooperation, Beijing, 2010

China is entering its new development era for agricultural investment in Africa under global economic uncertainty. This pertains particularly to the financial crisis in the US, as China's FX reserves are composed mainly of US dollars in the form of US treasury bonds.³⁹ The Chinese government has been under pressure from Washington and other trading partners to ease currency policies and other measures, which they claim keep the CNY undervalued and swell China's trade surplus.⁴⁰ Moreover, China has recorded high levels of inflation, which was 6.2% in August 2011 and far higher than the US rate of 3.8% at the same time.⁴¹ The president of the World Bank, Robert Zoellick,⁴² cited inflation as China's most important issue. He suggested that CNY appreciation would help to ease inflation, because 'an appreciated currency lowers prices at home of the foreign goods.' Chief economist at the Bank of Communications, Lian Ping,⁴³ said that the CNY appreciation should not be the only way to curb inflation. These factors might also be considered as one of the drivers accelerating China's outward FDI in African agriculture.

Market-driven factors

China has become the world's largest importer of several agricultural commodities to feed its ravenous economy. It is the world's largest importer of oilseeds, and is set to increase these imports, as well as those of vegetable oil, palm oil, soybean and rapeseed. The Food and Agriculture Policy Research Institute (FAPRI) has forecasted that China's soybean imports will increase from 33.7 million tonnes in 2007/08 to 52 million tonnes by 2017/18. Following this period China will account for 78% of the world's growth in soybean imports, with world soybean trade projected to increase significantly by more than 27 million tonnes.⁴⁴ China's palm oil imports are predicted to increase from 5.5 million tonnes in 2007/08 to 10.8 million tonnes in 2017/18. Overall, China's import demand for agricultural products is expected to grow at double-digit rates over the next 25 years.⁴⁵

China's high demand for agricultural-processing and livestock-feed industries could place pressure on domestic supplies of corn (maize). The Chinese government does not encourage production of biofuel through corn. In the long run, China may become a net corn importer,⁴⁶ and shift from being a net wheat exporter of 2.3 million tonnes in 2007/08 to importing 1.4 million tonnes in 2017/18. It is also expected to increase its cotton imports from 3 million tonnes to 6.1 million tonnes during the same period.⁴⁷

China is also increasing its investment in Africa's biofuel agricultural products. It is making efforts to diversify its structure of energy resources in transferring from fossil

fuel to biofuel production, to mitigate the impact of climate change and to improve environmental conditions. China's government has stated that the country will use minor crops, such as cassava, palm oil and sugarcane, rather than staple food crops to produce biofuel. The Chinese government still emphasises safeguarding food security as its top priority. Domestically, China is facing serious challenges of meeting its food consumption and biofuel production requirements with the current scarcity of land resources. Accordingly, China's government has accelerated its imports of agriculture-related raw materials for biofuel production from Africa.

Box 3: China's investment in biofuel products from Cameroon

In 2006 the state farm of China's Shanxi Province announced its establishment of a 5 000-hectare rice and cassava plantation in Cameroon. The project will be financed by FOCAC funds through China Exim Bank at a cost of \$62 million.

Source: Jansson J, *Patterns of Chinese Investment, Aid and Trade in Central Africa (Cameroon, the DRC and Gabon)*, Briefing Paper. Stellenbosch: Centre for Chinese Studies, 2009

China is the world's largest cassava importer and Nigeria is the world's largest cassava exporter. Nigeria produces 120 000 tonnes of cassava annually, of which 5 000 tonnes are exported to China. The country hopes to receive 5 billion Nigerian naira (about \$38 million) from cassava exports every year.⁴⁸ In addition to China, Brazil and India are also interested in investing in Africa's biofuel production. For instance, India has recently pledged \$250 million to a West African Biofuels Fund.⁴⁹

Box 4: China's biofuel investment in Mali

In 2009 Chinese companies invested in a 60-hectare experimental plot to cultivate crops including wheat, corn and sorghum. Chinese firms have also signed contracts with the Malian government to establish a joint venture in sugar production. They plan to process 6 000 tonnes of sugar cane daily, and to produce 100 000 tonnes of white sugar and 9.6 million litres of alcohol yearly.

Source: China, MCC, *CATERAR*, *op. cit.*

Biofuel production has changed China's agricultural structure and has contributed to China's investment in African agriculture. The rapid growth of the biofuels industry has contributed to major structural changes in global agricultural production.⁵⁰ In particular, the profitability of growing crops for biofuel feedstock is an important incentive for private investment in this activity.⁵¹

Given the sheer size of China's market, even a relatively small change in China's food consumption pattern may have a major influence on the global agricultural commodities

market.⁵² China is set to increase its agricultural investment in Africa, with the Chinese government encouraging companies to invest.⁵³

Challenges of global food security

Food security is becoming a global concern with the increasing squeeze on water, land and energy resources, as well as volatility in world food prices and concern about the impact of climate change on agriculture. Growing competition for these resources, in addition to the overexploitation of fisheries, is affecting the ability to produce food and exacerbating the impact of food production on the environment.⁵⁴ During 2006–08 food shortages became a global reality, with the escalating prices of commodities beyond the reach of vast numbers of people. International agencies were unprepared for these shortages, and the World Food Programme warned that rapidly diminishing food stocks might not be able to address the crisis.⁵⁵ By 2020 it is estimated that there will be an extra 1.5 billion mouths to feed.⁵⁶

In 2008 the world emerged from the food crisis.⁵⁷ The crisis has forced the international community to reassess whether, and how, the current global food production system will be able to meet various challenges, including reaching the MDG 1 target on hunger and poverty. A recent World Bank study shows that a further 44 million people have been pushed into poverty due to the price increase of many agricultural commodities by more than 25% from June 2010 to December 2010.⁵⁸

China and Africa will face more serious challenges of food security than other parts of the world. China is the world's largest developing country, and Africa is home to the largest number of developing countries. The combined population of China and Africa accounts for over one-third of the world's total. The success of global agriculture has not been shared equally. In Africa, per person food production has not been able to keep up with population growth. Poor people are more vulnerable to meet the challenges of rising food prices and shortages in food supply. Since most food products are tradeable on the world market, food security depends on the purchasing power of the poor, rather than on the management of domestic supply.⁵⁹ The food and hunger problem is most severe in Africa, and food insecurity is worsening. For instance, in West Africa the Gambia imports more than 80% of its rice requirement.⁶⁰

Self-sufficiency in food is below 50% for a number of countries in Africa. Of Africa's 53 countries, 21 are food-aid recipients. In 2009, 265 million people suffered from hunger and malnutrition, resulting in the death of 5 million people from starvation and disease.⁶¹ According to the 2009 UN MDG report, in 1990, the baseline year for the MDGs, 57% of Africa's population were living in extreme poverty, earning less than \$1.25 a day.⁶² Africa's progress in eradicating hunger has been slow, with a slight decrease in the proportion of undernourished from 32% of its population in 1990–92 to 29% in 2008.⁶³

Global poverty measured at the \$1.25-a-day line has been decreasing since the 1980s. The number of people living in extreme poverty fell from 1.9 billion in 1981 to 1.8 billion in 1990, and to about 1.4 billion in 2005.⁶⁴ Although Africa has made progress, this has been insufficient to put Africa on target to achieve the MDG 1 by 2015.

China's food security has always been its main concern, given that it has the world's largest population and its limited cultivated land per person. China has insisted on a self-sufficient food policy as a fundamental national policy to address its food security issues.

Although this policy has worked to date, the country will face serious challenges in the future. China is also facing other challenges in response to climate change, including environmental contamination, as well as volatile world food prices in the context of globalisation.

Currently China successfully feeds 20% of the world's population by using just over 9% of the world's total cultivated land and 6% of the world's fresh water. Over the last two decades the acceleration of urbanisation and industrialisation has resulted in a decrease of agricultural land. From 1996 to 2006 China's arable land areas decreased by 8.71 million hectares. The Chinese government has announced that it will retain a minimum of 121 million hectares of arable land to guarantee its national food security.⁶⁵ Between 1997 and 2005 the rapid progress of urbanisation and industrialisation led to 9.63 million farmers migrating to towns and cities. Urbanisation and industrialisation have also resulted in the confiscation of collective land areas in rural China. As many as 40–50 million farmers have lost their cultivated land. This continues to increase by 3 million farmers every year, and by 2030 the total number is expected to reach 110 million.⁶⁶

China's improving living standards and rising middle classes have resulted in a great demand for processed consumables of meat, dairy and fish. Without an increase in food supply, there are serious challenges of feeding an increasingly wealthy population. In addition, China is developing an aging society, especially in rural areas where young labourers have migrated to towns or cities in search of work. This has contributed to a decrease in agricultural productivity. China still has around 200 million people living below the government's official poverty line. Currently the Chinese government claims that the country has 95% of food self-sufficiency, a percentage that some experts suggest will be very difficult to maintain in the next eight to 10 years.

CHINA'S AGRICULTURAL INVESTMENTS IN AFRICA

Agricultural investment is central to the provision of food and the eradication of poverty and hunger. Growth in the agricultural sector is a key means of reducing poverty,⁶⁷ and agricultural growth and rural development are of fundamental importance to achieving the MDG 1. Accordingly, China's government has strongly encouraged agricultural investment in Africa in an effort to meet and maintain these objectives.

Investment is essential to agricultural growth. China itself has received significant FDI inflows in agriculture, from \$600 million to over \$1.2 billion yearly between 1998 and 2008.⁶⁸ However, the recent decline in agricultural investment in developing countries has significantly hindered countries and the global community in meeting the MDG 1 targets.⁶⁹ A UN news centre⁷⁰ highlighted the importance of greater investment in agriculture to generate income and support rural livelihoods. Of the developing world's 1.4 billion extremely poor people, 70% live in rural areas – particularly in Africa. Thus rural development is the most rapid and most effective way of reducing poverty and malnutrition.⁷¹

China has diversified its agricultural investment in Africa through different approaches. These include aid projects; and investments by both the Chinese government and Chinese companies in infrastructure, technology demonstration and training programmes. The bulk of China's future efforts in investment development will focus on the rural sector,

and large investments will be needed to increase agricultural production and build rural roads. China's agricultural strategy in Africa has indeed brought a new grand investment to the agricultural sectors of many nations, and has the potential to change agriculture significantly on the continent.⁷²

Table 1: China's agricultural investment in Africa

Country	Year	Farm or investors	Dimension (ha)	Type of land use	Market
Cameroon	2006	Sino Cam Iko Company	10 000	Rice, vegetables, manioc	Local
Cameroon	2007	Shanxi Province Agribusiness Group	5 000	Rice, manioc, ostriches	Local
DRC	2009	ZTE	100 000	Oil palm	World
Guinea	1997	Koba Farm	1 800	Hybrid rice	Local
Mali	1961	Farako	400	Tea	Local
Mali	1996	Sukala Refinery	6 000	Sugar	Local
Mali	2008	Sukala Refinery	10 000	Sugar	Local
Mauritania	1967	M'pourie	1 400	Rice	Local
Mozambique	2005	Hubei Agribusiness Group	1 000	Rice, cotton, soybean, vegetables	Local
Senegal	2008		35 000	Sesame	China
Sierra Leone	1977	Magbass Sugar	1 280	Sugar	Local
Sudan	2010	ZTE	10 000	Wheat and corn	Local
Tanzania	1969	Mubarali Rice Farm	6 000	Rice, pigs, cows, poultry	Local
Tanzania	1970	Ruvu Rice Farm	800	Rice	Local
Tanzania	1970	Morogoro	6 900	Sisal	World
Tanzania	2009	Chongqing Seed	300	Rice	Local
Togo	2009	Complex Sucier D'Anie	1 200	Sugar cane	Local
Uganda	1973	Tilda (original kibimba)	700	Rice	Local
Uganda	1987	Doha Rice	800	Rice	Local

Source: Chaponniere JR, Gabas JJ & Z Qi, 'China Africa in agriculture: A background paper on trade, investment and aid in agriculture'. China-DAC Study Group on Agriculture, Food Security and Rural Development, Bamako, 27-28 April 2010

China's agricultural-aided projects in Africa

China has adopted several approaches in its agricultural investment in Africa. Agricultural-aided projects have been regarded as playing an important role in building economic and trade relations, particularly in the early days. Primary investments from the 1950s to the 1980s were Chinese government-aid projects. By 2009 China had completed 884 plant-aided projects, of which 142 were agricultural projects. China started commercial investments in Africa in the 1980s. The number of investment projects and the amount of investments were small, owing to the limited capability of the investors themselves. Of the 102 projects China invested in Africa from 1979 to 1990, the average investment was just \$500,000. Compared with other sectors, China's financing of agricultural-aid programmes in Africa continues to be small.

Table 2: China's aid projects in agriculture and other sectors, 2009

Total	Agricultural projects	Industrial projects	Schools	Hospitals	Stadiums	Conference centres	Others
884	142	145	71	54	53	62	357

Source: China, MCC, CATERAR, *op. cit.*

China has been increasing its agricultural aid in Africa for grain production in particular.⁷³ Agricultural projects aided by China have promoted agricultural development in recipient countries. Brautigam⁷⁴ pointed out that the Chinese press routinely praises the achievements of its foreign aid teams, although scant objective and publicly available evidence exists on the outcomes of these projects. Lin⁷⁵ also suggested that investment, rather than aid, is an effective solution for development.

China's investment in rural infrastructure

Africa's rates of agricultural productivity are normally low due to poor water irrigation systems and infrastructure. In sub-Saharan Africa, water resources and irrigated agriculture are not developed to their full potential. Currently less than 4% of renewable water resources in Africa are used for agriculture. Barriers include the lack of financial and human resources to build irrigation and related rural infrastructure and to acquire agricultural technology; and inadequate access to markets. This constrains progress towards poverty reduction.⁷⁶

According to official statistics, China has assisted African countries, such as Zambia and Nigeria, in building over 500 infrastructure projects.⁷⁷ Zoellick⁷⁸ stated that China has been particularly significant as a source of financing infrastructure investment in Africa. A World Bank report estimates that China's investment in Africa's infrastructure from 2001–06 was roughly comparable to that financed by all the Organisation for Economic Co-operation and Development countries combined over the same period.

Box 5: China's agricultural infrastructure investment

Currently Chinese companies are working on the design and construction of 12 major grain storage facilities in Zambia. Covering a total area of some 30 000 square metres, the completed grain barns will have a storage capacity of 100 000 tonnes, thereby greatly enhancing the country's storage capacity and food security.

Chinese enterprises have built numerous agricultural infrastructure facilities and irrigation facilities in Africa. The MCC has reached agreements with 35 African countries in supporting large-scale infrastructure, of which 70% of investments are in Nigeria, Angola, Sudan and Ethiopia. There are also other investments in Congo, Mali, Mozambique and Tanzania, such as contracts for infrastructure in bulk commodities worth \$8 billion in Congo.

Source: China, MCC, CATERAR, *op. cit.*

China's technology demonstration projects and training programmes

Chinese agricultural professionals are helping to establish agricultural demonstration bases in Africa. China has organised training on issues including the cultivation of rice, vegetables, meat processing, and the use of agricultural machinery. Mutual learning and knowledge sharing are important for development and poverty reduction.

Box 6: Technology demonstration centres

In 2009 the construction of Chinese-aided agricultural technology demonstration centres commenced in Benin, Cameroon, Ethiopia, Liberia, Mozambique, Sudan, Tanzania and Uganda. In addition to offering training, production, and administrative and residential facilities, the centres will help to leverage China's strong agricultural expertise by inviting Chinese experts to share their knowledge with local people in order to boost Africa's agricultural development.

In Guinea-Bissau, Chinese experts established 11 rice production demonstration areas covering a total of 2 000 hectares. Yields per hectare reached 8–9 tonnes. There were 530 tonnes of fine varieties yielded and subsequent expansion of the plantation area amounted to 3 530 hectares. The yields for many new varieties were over three times higher than those of varieties currently used.

Source: China, MCC, CATERAR, *op. cit.*

Table 3: Chinese-aided agricultural technology demonstration centres in Africa

Country	Technology centre's focus
Benin	Crop cultivation demonstration and farming technology training
Cameroon	Research, technology demonstration and training on agricultural technology
Ethiopia	Horticultural plants cultivation and livestock farming technology demonstration and training
Liberia	Rice and corn cultivation technology transfer, training, development of plant varieties
Mozambique	Soybean and corn cultivation and processing demonstration and training
Democratic Republic of Congo	Crop cultivation demonstration and training
Rwanda	Rice, <i>juncao</i> , mulberry cultivation, and technology and demonstration training on soil and water conservation
South Africa	Research, technology demonstration and training on fresh-water aquaculture
Sudan	Crop cultivation and irrigation technology demonstration and training
Tanzania	Crop cultivation demonstration, development of improved plant varieties, training
Togo	Research and training on agricultural technology
Uganda	Aquaculture technology demonstration, technology transfer and training
Zambia	Agricultural technology demonstration and training
Zimbabwe	Corn cultivation technology demonstration and training

Note: *Juncao* means fungi (such as mushrooms) and *cao* means grass in Chinese. *Juncao* techniques were invented in China in 1983 by Professor Zhanxi Lin.

Source: China, MCC, CATERAR, *op. cit.*

With its long agricultural history, China has extensive experience in both traditional and modern agricultural technology. In particular, it has comparative advantages in agricultural sectors involving labour-intensive productions and processing, such as fisheries, gardening and poultry farming. By world standards Chinese agricultural technologies, such as hybrid rice, are advanced and have contributed significantly to the country's agricultural growth. African countries have also benefited from China's advanced technology. One such example is Guinea-Bissau, where China State Farm and Agribusiness Corporation collaborated with the China Hybrid Rice Engineering Research Centre in introducing high-yielding hybrid rice.

Box 7: Expertise and training

From 2007–09 China sent 104 senior agricultural technology experts to 33 African countries to assist in the creation of agricultural development plans. China also organised extensive training on topics including the cultivation of rice and vegetables, fishery management, meat processing, and the use of agricultural machinery.

In 2009 China provided training to 568 African agricultural officials and technicians. Subject areas included rural economic reform and development, food production, soil and water conservation and dry cultivation techniques, the development of new cotton varieties, the use of agricultural machinery and continuing education for agricultural teachers.

Source: China, MCC, *CATERAR*, *op. cit.*

The anecdotal evidence reflected in Box 7 suggests that China's investment in agricultural research and development (R&D) could facilitate African agricultural growth and poverty reduction. By 2012 China plans to send 50 agricultural technology groups and 2 000 agricultural professionals to Africa.⁷⁹ Exchanging knowledge and ideas is also important for sustainable development in agriculture.

Given the paucity of data, it is difficult to measure the impact of China's investment on reducing poverty and promoting growth in Africa. In general, investment in agricultural R&D and technology are important to improve agricultural productivity and to help reduce poverty. Thirtle, Lin and Piesse⁸⁰ found that investment in agricultural R&D that raises agricultural value considerably improved rates of return, in both Africa (22%) and Asia (31%). Thus agricultural R&D pays for itself, as increased productivity results in broad-based growth, which reduces poverty in general. Fan⁸¹ also pointed out that government expenditure on agricultural R&D has the highest return on labour productivity and poverty reduction, followed closely by investments in feeder roads. Moreover, investment in agricultural extension⁸² develops systems through which technologies can be extended to and adopted or adapted by farmers, and several studies have shown the positive impact of such investments on agricultural productivity and incomes.⁸³ Agricultural extension creates awareness of technologies and developments, and strengthens the know-how and skills of producers in using these technologies. It can also raise the ability of farm households to demand technologies and further advisory services that meet their specific needs. Therefore, investments in agricultural R&D, extension and technology demonstrations are important for improving farmers' skills, agricultural production and the livelihood of small farming households.

IMPLICATIONS OF CHINA'S DEVELOPMENT EXPERIENCE FOR AFRICA

China's experience has proven that high economic growth and rapid poverty reduction are achievable. Indeed, China's starting point was even less favourable than Africa's position in the early 1980s. Africa stands to benefit considerably from Chinese agricultural experience

in agricultural and rural growth, evidence-based policy-making, pro-poor policies, institutional reform and government roles in delivering changes and implementing innovative programmes.⁸⁴

China has achieved the most rapid large-scale poverty reduction in human history.⁸⁵ Before China's reform started in 1979, it faced serious food shortages and its agricultural economy was in crisis. Since the reform China has achieved an average 13% yearly increase in agricultural gross output value up to 2008.⁸⁶ Between 1979 and 2004, 500 million people were lifted out of poverty in China. According to Liu,⁸⁷ agricultural and rural development was pivotal in China's poverty reduction and development. African countries have spent decades trying to jump-start agricultural production. In search of new approaches, many experts are looking for answers in China's impressive agricultural achievements. African countries want to learn about China's development experience, particularly about overcoming poverty and sustaining economic growth.⁸⁸

Importantly, China's experience shows that a successful pattern of private and public partnership can lead to substantial improvements in farmers' livelihood, eradicate hunger and overcome poverty. The average net income of rural residents per head increased from CNY 134 (\$21) in 1978 to CNY 4,761 (\$746)⁸⁹ in 2008 per year.⁹⁰ During this period China carried out a series of innovative programmes, such as developing its non-grain sector and small household enterprises, which are critical for increasing farmers' income and creating employment opportunities. Institutions, technology and productivity continue to be important factors for China's successful agricultural development.

Institutional perspectives

Institutional support is important for agricultural growth. Institutions matter in economic growth,⁹¹ and Coase⁹² and North⁹³ highlighted the vital importance of social institutions in economic transformation. Growth will not occur unless the existing economic organisation is efficient.⁹⁴ In a developing economy, a change in emphasis from 'getting prices right' to 'getting institutions right' is key to the transition from a planned economy to a market one.⁹⁵ In developing countries and transitional economies, often markets are imperfect or non-existent.

Institutional reform contributed largely to China's agricultural growth during the transitional economic period from a planned to a market economy.⁹⁶ Before reform started in 1979, Chinese institutions were rooted in China's planned economy. In rural China, farmers worked in production teams, which resulted in low work incentives. China's reforms introduced a Household Responsibility System (HRS), which distributed land to individual households for contract periods of five years, later extended to 10 and then to 30 years. Land was distributed according to the number of people in each household. The HRS created incentives for production by giving farmers freedom of land-use rights and decision-making, linking rewards closely with their performance. Under the new system farmers became independent producers who took sole responsibility for profit and loss.⁹⁷ Reform also brought about changes in Chinese law, with the promulgation of insurance law in the mid-1990s and the introduction of insurance markets.

China has demonstrated the critical importance for developing or transitional economies to introduce innovative programmes, especially for individual household producers, in ill-functioning or non-existent markets. Small households are operated

typically by poor people, who use a great deal of labour, both from their own household and from their equally poor or poorer neighbours.⁹⁸ How local governments are able to deliver the changes at grass-roots level, particularly where market access is poor, is always important. In the transitional period from a planned economy to a market one, overcoming poor institutional conditions and ill-functioning market access were significant challenges in rural China. The introduction of the HRS enabled small-scale household producers to act as individual agents in economic activities. The local government played an important role in co-ordinating the economic activities between small-scale farmers and markets.

By comparison, in Africa most small-scale farmers are facing major obstacles that start in the field and extend across the entire agricultural value chain. These farmers can neither access nor afford basic farm inputs.⁹⁹ Institutional conditions are also major obstacles for small households' farming production. Africa lacks institutional arrangements that enhance indigenous entrepreneurship and wealth creation. This is the most important contributor to poverty and deprivation in Africa.¹⁰⁰ Its absence of efficient organisations and institutions minimised the positive impact of investments and policies. This absence accounts for the low rate of return in agricultural investments in Africa, and the poor performance of the sector.¹⁰¹ A significant aspect of this neglect has been the failure to pay attention to the importance of small-farmer-oriented institutions in Africa. As a result of this neglect, coupled with general macroeconomic policies with strong anti-agricultural and anti-peasant bias, the majority of the Southern African Development Community states have experienced stagnant or declining trends in per person food and agricultural production.¹⁰²

The success of these investment projects depends largely on sustainable institutional environments. It is also dependent on the ability of local governments to deliver changes at grass-roots level and to co-ordinate economic activities between small-scale farmers and supply chains, especially in Africa's conditions of poor market access.

It is hard to envisage how China's experiences in institutional reform can be transferable to African society. Effective implementation of investment projects is also related to historical, social, policy, political and cultural aspects in Africa. It is important to understand how 'China's phenomenon' works for Africa in the context of its own institutional perspectives. As the former president of China, Deng Xiao Ping, told Ghana's President, Jerry Rawlings, during a visit in 1985, 'Please don't try to copy our programme. If there is any experience on our part, it is to formulate policies in light of one's own national conditions.'

Productivity and technology

Improvement of agricultural productivity is critical for agricultural growth and poverty reduction in Africa. Although Africa has experienced continuous agricultural growth during the last few years, much of the growth has emanated from area expansion rather than increases in land productivity.¹⁰³ Low productivity is one of the major difficulties that Africa is facing. In most countries, future sustainable agricultural growth will require greater emphasis on productivity growth as suitable areas for new cultivation declines, particularly given growth concerns about deforestation and climate change.¹⁰⁴

Compared with Africa, China has presented a fundamentally different picture. With a shortage of cultivated land areas and an enormous number of farmers, agricultural

productivity gains are central to China's agricultural growth. China's grain output reached 400 billion kilograms in 1984, from 100 billion kilograms in 1978. In 1984 the Chinese government announced that the country had solved the subsistence level of food demand.¹⁰⁵ China is a good example of poverty alleviation and improvement in agricultural output. China's policymakers are, however, faced with the challenge of how to sustain economic development with increasing environmental stress. Today, 37% of China's total territory suffers from land degradation, and the country's per person available land is now 40% of the world's average.¹⁰⁶ Degradation includes soil erosion, deforestation, salinity, reduced fertility and sand storms. It affects 3.56 million square kilometres and poses a direct threat to China's future economic prosperity.¹⁰⁷

China also needs to consider protecting its natural resources, such as water and soil conservation. The agricultural 'Green Revolution' aims to implement sustainable development in the context of environmental concerns that are recognised by international society. Green agriculture involves the use of 'green technology' to develop agricultural production, thereby achieving harmony among the environment, economy and people. Agricultural production minimises the waste of natural resources, and its continued development should thus be considered in the attainment of environmental sustainability.

In Africa, the concentration of the poor in rural areas and the rise in their poverty is attributed to low agricultural yields that are due largely to the failure to adopt food production methods of the Green Revolution.¹⁰⁸ Green Revolution technology includes the use of pesticides, irrigation projects, synthetic nitrogen fertiliser and improved crop varieties developed through conventional science-based methods. These skills and technology need to be adopted in Africa to help offset the worsening effect of environmental degradation in agriculture. Crucially, whether the Green Revolution or any other strategy to boost food production will alleviate hunger depends on the economic, political and cultural rules that people make.¹⁰⁹ When the new African Agricultural Revolution is eventually implemented, it is likely to be built on Africa's own indigenous technology and knowledge requirements, and on the nutrition and food security needs of its people.¹¹⁰ This is challenging, because the adaptation of different types of technology needs to consider Africa's different conditions, ecology zones and crops.

There is also concern that China's investment in agricultural-resourced projects may pose challenges of maintaining sustainable environments in Africa. For this reason, any promotion of investments and policy support for driving agricultural productivity for African farmers needs to consider environmental sustainability.

CONCLUSION

China has accelerated its investment in Africa's agricultural sector, both in the volume of investment and in the diversification of investment means. Anecdotal evidence shows that China's investment could contribute to agricultural growth and poverty reduction in Africa. China's own successful experience in agricultural growth and poverty reduction could provide valuable lessons for Africa.

However, Africa's agricultural growth and poverty reduction largely depends on the policies that meet its countries' conditions in the context of social, economic, political

and environmental perspectives. Indigenous institutions and culture will also affect the outcomes of China's investment in agriculture.

As the largest food consumer in the world, China needs to source agricultural products and commodities from Africa to help meet the needs of its giant domestic market. China's market demand could also result in profit and business opportunities for African farmers. Africa is dependent on receiving financial assistance to improve its agricultural infrastructure, such as water irrigation. Agricultural productivity can be increased by the exchange of knowledge on technology and production.

Further studies are needed on conceptual framework and methodology to measure and monitor the impacts of China's agricultural investment on African agricultural growth, poverty reduction, and its achieving the MDG 1. The extent to which the investment serves the interest of both the donor and the recipient – and the extent to which China's increased investment has actually improved livelihoods and reduced poverty in Africa – are also areas for further studies.

Food security is linked directly to national stability and national security. Agriculture has played an important role in China's diplomacy, especially in its South–South co-operation. Therefore, China's agricultural investment in Africa is related to its overall bilateral relations in the context of social, economic and political dimensions. Further studies also need to look at the role of agricultural co-operation between China and Africa in their own national strategies.

ENDNOTES

- 1 Alden C, *China in Africa*. London: Zed/Palgrave, 2007.
- 2 China, Ministry of Commerce of China (MCC), *CATERAR (China–Africa Trade and Economic Relationship Annual Report)*. Beijing: Chinese Academy of International Trade and Economic Cooperation, 2010.
- 3 Chen D, Chinese Minister of Commerce, High Level Symposium for China–Africa Economic Cooperation, Co-organised by the Ministry of China's Commerce and United Nations Industrial Development Organization, August 2011, <http://finance.sina.com.cn/roll/20110912/171710467302.shtml> (in Chinese).
- 4 Alden C, *op. cit.*; Brautigam D, *Chinese Aid and African Development: Exporting Green Revolution*. New York: St Martin's Press and Basingstoke: Macmillan, 1998; Alden C, Large D & R Soares de Oliveira (eds), *China Returns to Africa: A Rising Power and a Continent Embrace*. London: Hurst, 2008.
- 5 Broadman HG, *African's Silk Road: China and India's New Economic Frontier*. Washington, DC: World Bank, 2007.
- 6 Hsu E, 'Zanzibar and its Chinese communities', *Population, Space and Place*, 13, 2, 2007, pp. 113–124; Conal Guan-Yow H, 'The "doing" and "undoing" of community: Chinese networks in Ghana', *China Aktuell*, 3, 2008, pp. 45–76.
- 7 Zafar A, 'The growing relationship between China and Sub-Saharan Africa: Macroeconomic, trade, investment, and aid Links', *World Bank Research Observer*, 22, 1, 2007, pp. 101–30.
- 8 Taylor I, *China's New Role in Africa*. Boulder, CO & London: Lynne Rienner, 2009.
- 9 Brautigam D, *The Dragon's Gift: The Real Story of China in Africa*. New York: OUP, 2009; Hairong Y, 'Chinese farms in Zambia: From socialist to "agro-imperialist" engagement?', *African and*

- Asian Studies*, 9, 3, 2010, pp. 307–333.
- 10 Rice A, 'Is there such a thing as agro-imperialism?', *New York Times Magazine*, 16 November 2009; Kugelman M & SL Levenstein, *Land Grab? The Race for the World's Farm Land*. Washington, DC: Woodrow Wilson International Center for Scholars; Cotula L, Vermeulen S, Leonard R & J Keely, *Land Grab or Development Opportunity? Agricultural Investment and International Land Deals in Africa*. Rome: International Fund for Agricultural Development, 2009.
 - 11 Ravallion M, 'Are there lessons for Africa from China's Success against poverty?', *World Development*, 37, 2, pp. 303–313.
 - 12 China, MCC, *CATERAR*, 2010, *op. cit.*
 - 13 Broadman HG, *op. cit.*
 - 14 Üllenberg A, *Foreign Direct Investment in Land in Cambodia*. German Federal Ministry for Economic Cooperation and Development: Deutsche Gesellschaft für Internationale Zusammenarbeit, 2009.
 - 15 Davis S & J Woetzel, 'How Africa can learn from Chinese agriculture', McKinsey and Company, 20 April 2011, <http://www.howwemadeitinafrica.com/how-africa-can-learn-from-chinese-agriculture/9333>.
 - 16 World Bank, *World Development Report*. Washington, DC: World Bank, 2008.
 - 17 World Bank, *World Development Indicators*. Washington, DC: World Bank, 2008.
 - 18 *The New Dawn*, 'Lookin' inside from outside: Rural poverty in Africa', 27 April 2011, http://www.thenewdawnliberia.com/index.php?option=com_content&view=article&id=3321:lookin-inside-from-outside-rural-poverty-in-africa&catid=50:special-feature&Itemid=85.
 - 19 Buffie EF, 'Trade, agriculture and optimal commercial policy in Eastern and Southern Africa', in Sarris A & J Morrison (eds), *Food Security in Africa*. Cheltenham: Edward Elgar, 2010.
 - 20 Collier P, *The Bottom Billion: Why the Poorest Countries are Failing and What Can Be Done About It*. Oxford: OUP, 2007.
 - 21 International Poverty Reduction Center in China, *Agriculture, Food and Rural Development: Summary and Lessons*, research Report, 16, 1, 2011.
 - 22 OECD (Organisation for Economic Co-operation and Development), 'Measuring aid to agriculture for DAC countries', April 2010, <http://www.oecd.org/dac/stats/agriculture>.
 - 23 Bigman D, *op. cit.*
 - 24 China, *Bilateral Free Trade Arrangements and China's Agricultural Development*. China Agricultural Publishing House, 2008, pp. 243–260.
 - 25 China Agricultural Trade Development Report, *Building Up of Free Trade Areas, and Strategy of Going Global, Bilateral Free Trade Agreements*. China Agriculture Press, 2008.
 - 26 China, MCC, *CATERAR*, 2010, *op. cit.*
 - 27 *Ibid.*
 - 28 *Ibid.*
 - 29 Deming C, 'High-level Symposium on China–Africa Cooperative and Investment', co-organised by the MCC and the United Nations Industrial Development Organization in Beijing, September 2011, <http://vienna.mofcom.gov.cn/aarticle/ztdy/201109/20110907736068.html> (in Chinese).
 - 30 *Ibid.*
 - 31 Chinese Academy of International Trade and Economic Cooperation, *China–Africa Trade and Economic Relationship Annual Report*, 2011, <http://www.focac.org/eng/zxxx/t832788.htm>.
 - 32 *Action for Southern Africa*, 'Zimbabwe, China Sign \$585 million trade agreements', 21 March

- 2011, www.actsa.org/newsroom/2011/03/zimbabwe-china-sign-585-million-trade-agreements.
- 33 China Agricultural Trade Development Report, *op. cit.*
- 34 'The globalization of Chinese enterprises operating conditions of analysis and development ideas', 10 August 2008, Free Papers Download Center, <http://eng.hi138.com/?i80802>.
- 35 China, State Administration of Foreign Exchange.
- 36 UN, *World Investment Report*, 2010, Switzerland.
- 37 High Level Forum of China and African Agricultural Cooperation Held on August in 2010, organised by the International Department of Central Committee of CPC and China's Ministry of Agriculture.
- 38 Institute of Developing Economies, Japan External Trade Organization, 'China in Africa: The Role of China's financial institutions', www.ide.go.jp/English/Data/Africa_file/Manualreport/cia_11.html.
- 39 Rogers S, 'US federal deficit: How much does China own of America's debt?', *The Guardian*, 18 January 2011, <http://www.guardian.co.uk/news/datablog/2011/jan/18/us-federal-deficit-china-america-debt>.
- 40 Tian W & H Yuanyuan, 'RMB's appreciation "to remain gradual"', *China Daily USA*, 13 September 2011, http://usa.chinadaily.com.cn/business/2011-09/13/content_13671485.htm.
- 41 Ming Z, 'Why China's Infatuation Rate is Higher than that of American?', *Shenzhen Business Newspaper*, 29 September 2011.
- 42 Tian W & H Yuanyuan, *op. cit.*
- 43 *Ibid.*
- 44 FAPRI, 'FARPI 2008 US and world agricultural outlook', <http://www.fapri.iastate.edu/outlook2008>.
- 45 Bigman D, *op. cit.*
- 46 Chao Wang, 'Precaution of development of bio-fuel products by using corn', *Chinese Security Newspaper*, 25 July 2006, <http://www.nmgcy.com/news/about.asp?id=7441> (in Chinese).
- 47 FAPRI, *op. cit.*
- 48 *People's Daily*, 19 January 2005.
- 49 GRAIN, 'The new scramble for Africa', 8 July 2007, www.grain.org/es/article/entries/606-the-new-scramble-for-africa.
- 50 Flammini A, 2008, www.globalbioenergy.org/fileadmin/user_upload/gbep/docs/BIOENERGY_INFO/0810_Flammini_Biofuels_and_the_underlying_causes_of_high_food_prices_GBEP-FAO.pdf.
- 51 UN, *World Investment Report*, 2009, Swaziland.
- 52 Freeman D, Holslag J & S Weil, *op. cit.*
- 53 Jiabao L & B Change, 'Investment in Africa Urged', 9 September 2011, *China Daily*, http://www.chinadaily.com.cn/bizchina/2011-09/09/content_13655208.htm.
- 54 Godfray HCJ, Beddington JR, Crute IR, Haddad L, Lawrence D, Muir JF, Pretty J, Robinson S, Thomas SM & C Toulmin, 'Food security: The challenge of feeding 9 billion people', *Science*, 327, February 2010, pp. 812–17.
- 55 Magdoff F & B Tokar, *Agriculture and Food Crisis: Conflict, Resistance, and Renewal*. New York: Monthly Review Press, 2010.
- 56 Conway G, *The Doubly Green Revolution: Food for All in the 21st Century*. Ithaca: Cornell University Press, 1998.
- 57 UN, *UN Conference on Trade and Development, Addressing the Global Food Crisis: Key Trade, Communitary Policies in Ensuring Sustainable Security and Alleviating Poverty*. UNCTAD/

- OSG/2008/1, 2008, http://www.unctad.org/sections/edm_dir/docs/osg_2008_1_en.pdf.
- 58 Ivanic M, Martin W & H Zaman, *Estimating the Short-Run Poverty Impacts of the 2010–11 Surge in Food Prices*. World Bank Development Research Group Agriculture and Rural Development Team, Policy Research Working Paper, 5633, April 2011.
- 59 World Bank. Washington DC: World Bank, 2005.
- 60 Ceesay MM, 'Management of rice production systems to increase productivity in the Gambia, West Africa'. Dissertation presented to the Faculty of the Graduate School of Connell University, 2004.
- 61 'Building A Bridge for China–Africa Agricultural Cooperation through Political Party Diplomacy: Side Note on China–Africa Forum for Agricultural Cooperation', *The Contemporary World*, 9, 2010, pp. 20–22.
- 62 Poverty Reduction and the Millennium Development Goals: Situation Analysis, Africa, United Nations Development Programme, <http://www.undp.org/africa/poverty.shtml>.
- 63 *Ibid.*
- 64 World Bank, *World Development Indicators*. Washington, DC: World Bank, 2009.
- 65 This was affirmed during the State Council's 149th Standing Conference on 6 September 2006.
- 66 Chinese Academy of Social Science, *Annual Report on Urban Development of China*, Social Science Academic Press, 2011.
- 67 Sammis JF, 'Statement by US Deputy Representative to ECOSOC John Sammis at the First LDC IV Intergovernmental Preparatory Committee', US Mission to the UN, 10 January 2011, <http://usun.state.gov/briefing/statements/2011/154233.htm>.
- 68 UN, *World Investment Report*, 2009, Switzerland.
- 69 *Ibid.*
- 70 UN News Centre, 'UN agency urges investment in agriculture to feed growing world population', 23 September 2009, <http://www.un.org/apps/news/story.asp?NewsID=32165&Cr=fao&Cr1>.
- 71 Also see World Bank, *World Development Indicators*, *op. cit.*, 2008.
- 72 Rubinstein C, 'China's eye on African agriculture', *Asia Times Online*, 2 October 2009, http://www.atimes.com/atimes/China_Business/KJ02Cb01.html.
- 73 China, Information Office of the State Council of the People's Republic of China White Paper for Distribution of Foreign Aid, http://www.china.org.cn/government/whitepaper/2011-04/21/content_22411590.htm.
- 74 Brautigam D, 1998, *op. cit.*
- 75 Song Tian Lin, 'Discussion on Sino-Africa cooperative forum for 10 years', *China Talk*, 2010, http://fangtan.china.com.cn/2010-02/10/content_19400535.htm (in Chinese).
- 76 Hanjra MA, Ferede T & DG Gutta, 'Reducing poverty in sub-Saharan Africa through investments in water and other priorities', *Agricultural Water Management*, 96, 7, 2009, pp. 1062–70.
- 77 Chinese Academy of International Trade and Economic Cooperation, *China–Africa Trade and Economic Relationship Annual Report*, 2010.
- 78 Zoellick RB, President of the World Bank Group, 'Remarks for the high-level China–Africa experience-sharing Programme on special economic zones and infrastructure development', 14 September 2010, <http://www.worldbank.org/en/news/2010/09/14/remarks-high-level-china-africa-experience-sharing-programme-special-economic-zones-infrastructure-development>.
- 79 Yang Jiechi, Minister of Chinese Foreign Affairs, speech on the Ministerial Conference of Aid Countries for 'The issues of Africa hunger' in the United Nations, New York, 25 September 2012.

- 80 Thirtle CG, Lin L & J Piesse, 'The impact of research-led agricultural productivity growth on poverty reduction in Africa, Asia and Latin America', *World Development*, 31, 12, 2003, pp. 1959–75.
- 81 Fan S, Nestorova B & T Olofinbiyi, 'China's agricultural and rural development: Implications for Africa', China–DAC Study Group on Agriculture, Food Security and Rural Development, Bamako, 27–28 April 2010.
- 82 Agricultural extension refers the application of scientific research and new knowledge to agricultural practices through farmer education, such as exchange knowledge, communication of practical experiment in improving productivities, and training etc.
- 83 Alston JM, Chan-Kang C, Marra MC, Pardey PG & TJ Wyatt, *A Meta-Analysis of Rates of Return to Agricultural R&D: Ex Pede Herculem?*, IFPRI (International Food Policy Research Institute) research report, 113. Washington, DC: IFPRI, 2000.
- 84 This was affirmed during the State Council's 149th Standing Conference on 6 September 2006.
- 85 World Bank, 2005, *op. cit.*
- 86 National Bureau of Statistics of China, *Chinese Statistical Yearbook*. Beijing: China Statistics Press, 2008.
- 87 'Equality and mutual-benefit is the secret for Sino-Africa cooperation', China Envoy for African Affair, 2011, *XinHua News*, 9 May 2011, www.gov.cn/jrzq/2011-05/09/content_1860126.htm (in Chinese).
- 88 Zoellick RB, *op. cit.*
- 89 Please note the CNY dollar equivalent was calculated at the current exchange rate of \$1 = CNY 6.38.
- 90 National Bureau of Statistics of China, *Chinese Statistical Yearbook*. Beijing: China Statistics Press, 2009.
- 91 Coase RH, 'The problem of social cost', *Journal of Law and Economics*, 3, 1960, pp. 1–44; North DC, Institutions, *Institutional Change and Economic Performance*. Cambridge: Cambridge University Press, 1990.
- 92 North DC & RP Thomas, *The Rise of the Western World: A New Economic History*. New York: Cambridge University Press, 1973.
- 93 North DC, 'Economic performance through time', *American Economic Review*, 84, 3, pp. 359–68, 1994.
- 94 North DC & RP Thomas, *op. cit.*
- 95 McMillan J & B Naughton, 'How to reform a planned economy: Lessons from China', *Oxford Review of Economic Policy*, 8, 1, 1991, pp. 130–144.
- 96 Yifu Lin J, 'Institutional reforms and dynamics of agricultural growth in China', *Food Policy*, 22, 3, 1997, pp. 201–212; Fan SG, 'Effects of technological change and institutional reform on production growth in Chinese agriculture', *American Journal of Agricultural Economics*, 73, 2, 1991, pp. 265–75.
- 97 Yifu Lin J, 'Household Farm, Cooperative Farm, and Efficiency: Evidence from Rural Decollectivization in China', Economic Growth Center Working Paper, 533. New Haven, Connecticut: Yale University, 1987.
- 98 Hazell P, Poulton C, Wiggins S & A Dorward, 'The Future of Small Farms for Poverty Reduction and Growth', International Food Policy Research Institute (IFPRI) 2020 Discussion Paper, 42. Washington, DC: IFPRI, 2007.
- 99 Bigman D, *op. cit.*
- 100 Mbaku JM, *Institutions and Reform in Africa, the Public Choice Perspective*. Westport: Greenwood

- Publishing Group, 1997.
- 101 Mule HM, *Institutions and Their Impact in Addressing Rural Poverty in Africa*, International Fund for Agricultural Development, 2001, www.ifad.org/poverty/mule.pdf.
- 102 Bigman D, *op. cit.*
- 103 IFPRI, *Increasing Agricultural Productivity and Enhancing Food Security in Africa: New Challenges and Opportunities*, concept note for an international conference, 2011.
- 104 *Ibid.*
- 105 Gaoming J, 'Ecological agriculture is important for sustaining food security', *China Daily*, 3 January 2010.
- 106 De Schutter O, 'Land degradation among China's food supply challenges', *UN News Centre*, 23 December 2010, www.un.org/apps/news/story.asp?NewsID=37151.
- 107 *China Daily*, 'Solutions sought for land degradation', 28 August 2006.
- 108 Bigman D, *op. cit.*
- 109 Rosset P, Collins J & FM Lapp, 'Lessons from the green revolution', *Third World Network*, <http://www.twinside.org.sg/title/twr118c.htm>.
- 110 Sharma Y, 'Africa's green revolution "needs indigenous tech approach"', *SciDev.Net*, 9 July 2010, <http://www.scidev.net/en/news/africa-s-green-revolution-needs-indigenous-tech-approach-.html>.

SAIIA'S FUNDING PROFILE

SAIIA raises funds from governments, charitable foundations, companies and individual donors. Our work is currently being funded by, among others, the Bradlow Foundation, the United Kingdom's Department for International Development, the European Commission, the British High Commission of South Africa, the Finnish Ministry for Foreign Affairs, the International Institute for Sustainable Development, INWENT, the Konrad Adenauer Foundation, the Royal Norwegian Ministry of Foreign Affairs, the Royal Danish Ministry of Foreign Affairs, the Royal Netherlands Ministry of Foreign Affairs, the Swedish International Development Cooperation Agency, the Canadian International Development Agency, the Organisation for Economic Co-operation and Development, the United Nations Conference on Trade and Development, the United Nations Economic Commission for Africa, the African Development Bank, and the Open Society Foundation for South Africa. SAIIA's corporate membership is drawn from the South African private sector and international businesses with an interest in Africa. In addition, SAIIA has a substantial number of international diplomatic and mainly South African institutional members.

South African Institute of International Affairs
Jan Smuts House, East Campus, University of the Witwatersrand
PO Box 31596, Braamfontein 2017, Johannesburg, South Africa
Tel +27 (0)11 339-2021 • Fax +27 (0)11 339-2154
www.saiia.org.za • info@saiia.org.za

