

# RETHINKING THE POLITICAL ECONOMY OF CHINESE-AFRICAN AGRICULTURAL COOPERATION: THE CHINESE AGRICULTURAL TECHNOLOGY DEMONSTRATION CENTERS

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This paper explores the Chinese agricultural technology demonstration centers (ATDCs) in Africa, a recent evolution of Chinese-African agricultural cooperation often recognized as a representative example of South-South cooperation. More specifically, the study observes the development of the ATDCs in Africa, through a literature review, and indicates major limitations in ATDCs research. This paper proposes a new political economy approach that accounts for place and space, which are crucial lenses for the analysis of ATDCs in Africa. The reconsideration of spatial relations takes into account the importance of the local territory, where operations are based, as an active constituent in China-Africa agricultural cooperation.

**KEY WORDS:** SOUTH-SOUTH COOPERATION, AGRICULTURE, DEVELOPMENT, CHINA, AFRICA

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## Introduction

Africa is now considered China's second continent. In 2018, fifty-three African countries attended the Beijing Summit and the seventh ministerial conference of the Forum on China-Africa Cooperation (FOCAC). Under the last Beijing Action Plan the two sides strengthened in-depth cooperation for areas that range from agriculture, trade, education to military, police and anti-terrorism (Forum, 2018). President Xi Jinping illustrated this point clearly at the opening ceremony of the 2018 FOCAC: "China will do more to help Africa alleviate poverty, pursue development, increase employment and income" (Xinhua, 2018). The paucity of data represents a challenge for a nuanced estimation of

China's presence in Africa. Despite that, the Chinese involvement in the continent is still visible in terms of China's top official visits in Africa or by Beijing-funded architectural projects (Amoah, 2016).

The rapid development of the Sino-African agricultural relations has been a hotly debated issue following the 2006 Forum on China-Africa Cooperation during the 2007-08 food and financial crisis. International institutions, government officials, and scholars have tried to unpack the strong Chinese involvement in Africa, attempting to understand the real objectives of Beijing. However, despite a large number of studies that have focused on the relationship between China and Africa (e.g. Alden, 2013; Brautigam, 2011, 2015; Buckley, 2013), this topic remains highly debated.

On the one hand, Chinese involvement in Africa has been described as 'the new scramble for Africa'. According to this view, the growing role that Africa will play in the future is acknowledged by foreign governments and businesses. They are now attempting to strengthen diplomatic and economic relations with the continent; China seems to be driving this 'renewed' interest in Africa (The Economist, 2019). As a matter of fact, China-Africa total trade volume reached \$170 billion in 2017, making China the biggest trading partner of Africa.

On the other hand, there are benign views that regard China as an alternative, non-Western partner, to Africa. Amin (2016) argued that the 'international aid' to Africa from the United States, the European Union or other Western agencies "is not genuine development aid" (Amin, 2016: 155). Indeed, it is a financial support that intends to reinforce and reproduce the subordination and underdevelopment of Southern countries. The witnessed cooperation between China and Africa during the last FOCAC could represent an alternative for Africa. However, African countries should know their prerogatives before opening such negotiations (Amin, 2016).

This debate on China-Africa relations, however, is the product of a flawed mechanistic ontology, that is "not intellectually productive" (Lee, 2018) and misleading. One concern about China's presence in Africa is that it is a zero-sum game. A dialectical approach offers a more useful framework: China can be both benign and problematic in the same project. Moreover, the presence of China in Africa has been over reported while Africa's agency is often only passively considered. Africa's political systems, regulations, actors can affect the results of the Chinese involvement at different levels. African civil society can both enhance Chinese presence or pose challenges, and resistance is always a possibility - as in the case of the Hubei-Gaza friendship farm in Mozambique (Chichava, 2014). Reconsidering Africa agency shows that China-Africa relations are more locally-driven compared to conventional assumptions, and that negotiations are taking place at different levels (Alden & Large, 2018; Mohan & Lampert, 2013; Odoom, 2016). Further concerns are related to the rhetoric behind the existence of a "Chinese model". China's involvement has changed overtime and evidence suggests that the Chinese strategy differs based on which African countries it is dealing with. Moreover, China's trade pattern with Sub-Saharan African countries converges with the commodities-export pattern shared by Western countries. This convergence could reproduce the already existing negative patterns of commodity-based trade and limit the possibility for structural changes

(Sindzingre, 2016). This debate has lacked a comparative analysis of Chinese and non-Chinese involvement in Africa, or in Lee's words, between China's state capital and the global private capital (Lee, 2018).

These issues are all the more striking when we consider China-Africa agricultural cooperation. China reshaped the geographies of international development and challenged the monopoly of Western agencies. The involvement of China in African agriculture has often been reported as a case of land grabbing. The Chinese government has been blamed of being interested in Africa's abundant arable land due to China's food insecurity and land degradation (Delang, 2018). Some of these claims have been proven wrong, e.g. by Brautigam (2013, 2015). However, the influence of China's presence in African agriculture is to a large extent still unclear. Since the mid-1950s, China's involvement in African agriculture has been changing and evolving. China's cooperation with Africa is dynamic and reflects China's own development patterns, which are not linear.

Sino-African relations are in fact central to the role of agriculture in African economies. The agricultural sector is one of the primary sources of employment for the African population. According to the International Labour Organization (ILO) database, agriculture employed over 50% of the total population in Sub-Saharan Africa in 2019 (Data Worldbank, 2020). Despite the detrimental effects of climate change, agriculture has remained the main source of income for people living in rural areas.

This paper focuses on a specific modality of Chinese cooperation in Africa based on technological transfer: the Chinese agricultural technology demonstration centers (ATDCs). The ATDCs were designed to ensure food security in Africa while acting as a platform to facilitate Chinese investors in establishing new businesses.

This paper consists of three parts. First, it will discuss the relation between Chinese foreign aid and the South-South cooperation framework. Second, aid and investment are explored to facilitate the understanding of these concepts in the ATDCs. Third, the paper discusses mechanism, actors, and the evolution of the Chinese ATDCs in Africa. It then offers a review of the academic literature, pointing out a gap in ATDCs research and highlighting further limitations that have not yet been considered. The paper argues that the ATDCs are central to the impact of Chinese technology transfer on Africa agriculture, and on land use and management. The ATDCs also have direct/indirect effects on local economies and societies. Due to the recent establishment of these centers in more than twenty African countries, these implications should be urgently addressed.

### **Chinese foreign aid and South-South cooperation**

Agricultural technology demonstration centers (ATDCs) were launched in 2006 and are considered a model of South-South cooperation and Chinese foreign aid. The principle of Chinese foreign aid resembled the South-South principles (Huang et al., 2019). The eight principles of China's foreign aid are based on mutual benefits, equity, non-interference in the political sphere, and free interests in economic loans, as introduced as early as 1963 by the late Premier Zhou Enlai in Accra. They still represent the pillars of China's aid involvement in foreign countries today (Brautigam, 2011).

However, China's own developmental trajectory, especially in the field of agriculture,

played a big role in shaping China's foreign aid strategy. Since China joined the World Trade Organization (WTO) in 2001 and endorsed the "Going Global/Going Out" Policy, that encouraged Chinese companies to invest abroad, agriculture has become one of the greatest concerns. The Going Global Policy linked aid with other forms of economic engagement and encouraged the entrance of Chinese firms into the global market (Brautigam & Xiaoyang, 2009). Under the agricultural 'Going Out' strategy, the Chinese government has supported overseas farming as one of its main pillars. The old Chinese saying "Give a man a fish, and you feed him for a day. Teach a man to fish, and you feed him for a lifetime" (Huang et al., 2019: 56) is the rhetoric behind China's aid strategy in the Mainland and in foreign countries.

Chinese Agricultural technology demonstration centers in Africa represent the opportunity to bridge aid and business, aiming to solve the economic sustainability of aid projects and fulfill the mutual benefit principle. ATDCs blend, on the one hand, China's attempt to export its model of agricultural development, through technical assistance and demonstration centers, with the Chinese "win-win" principle of cooperation as a developing country itself. On the other hand, behind the mainstream assumptions of China's win-win cooperation and mutual benefit, there are alternative narratives. Buckley (2013) explored different discourses on the effectiveness of China-Africa agricultural cooperation from the perspective of different Chinese practitioners. More critical perspectives have claimed that the experience of the Chinese is not appropriate for African agriculture, and questioned the environmental implications of China's foreign aid (Urban, Mohan & Cook, 2013). China's rural development has been driven primarily by land tenure reform; hence, technology transfer could be irrelevant if a broader political transformation does not take place in Africa. Furthermore, suspicion also relates to the sustainability of China's agricultural modernization, as China's land is highly polluted and in rural areas poverty remains high. Finally, critics argue that similar detrimental effects could be transferred to Africa.

### **The in-betweenness: aid or business?**

In analyzing Chinese foreign aid projects in Africa, it is important to understand what falls under this category and how definitions and measures between Chinese and traditional donors have differed. According to the OECD Development Assistance Committee (DAC), the Official Development Assistance (ODA) is defined as government aid, with the main objective of promoting the economic development and welfare of developing countries. The ODA flows are provided by official agencies and are concessional (OECD, 2019). However, China is a non-member of the OECD and does not use the definition of the OECD-DAC. According to China's 2011 Foreign Aid White paper, Beijing delivered foreign aid in the form of grants, interest-free loans, and concessional loans. Officially, China provides aid through eight principal forms: complete projects, goods and materials, technical cooperation, human resource development cooperation, medical assistance, emergency humanitarian aid, volunteer programs, and debt relief (Xinhua, 2011). Formally, China's aid to Africa is not constrained by any conditionality, aside from the engagement in the "One China" policy, which states that the People's Republic of China

(PRC) is the only legal government representing all China, thus excluding the prospect of diplomatic relationships with Taiwan. China does not refer to any political conditions in terms of good governance or respect for human rights as conceived by Western donors. However, the ‘unconditionality’ and non-interference of China’s involvement needs to be critically analyzed as Mohan and Tan-Mullins (2019) and Alden and Jiang (2019) do, and Large (2008) observed in the case of China’s relations with Sudan. Aid and investment are not two separate spheres as is the case in the United States where the development finance process is under the Agency for International Development and separate from the Foreign Affairs offices. In China, until recently, the Ministry of Commerce managed most of China’s aid programme, and objectives were not transparent. The year 2018 marked a change, as China established the first international development cooperation agency ‘CIDCA’ (Chinese: 国家国际发展合作署), which aims to enhance the planning and coordination of foreign aid. At the moment, it seems that the CIDCA does not hold significant responsibilities, and the number of members is small. Other ministries, such as the Ministry of Agriculture (MOA) and the Ministry of Commerce (MOFCOM), still retain more decision-making powers and have specific units that support the agricultural Going Out policy. However, the establishment of the China International Development Cooperation Agency, could represent a turning point in the role that Beijing wants to play in the international development community, and the attempt to align the domestic agenda with foreign policy goals.

The link between aid and investment is crucial for understanding China’s foreign aid in Africa. Aid plays a major role in mobilizing investment and enhancing economic development, and historical relations are crucial in enhancing favorable conditions for the effectiveness of aid and investment, both at the macro and micro-level (Morgan, 2019). The role of aid in mobilizing investment underpinned the Realpolitik of both Western and Chinese aid. Right now, there seems to be a convergence of China’s foreign aid with already well-known Western self-interested cooperation models.

### **Agricultural technology demonstration centers (ATDCs): history, mechanisms, and actors**

Agricultural technology demonstration centers represented an evolution and a shift in China’s foreign aid approach. China launched the establishment of the first 10 ATDCs in Africa during the 2006 FOCAC. Since then, ten more centers have been established in Africa, and five additional centers are under construction. The ATDC model was designed to overcome the problem of economic sustainability of aid projects and, as a win-win tool to ensure food security in Africa and to encourage Chinese companies to invest abroad under the “Agriculture going out” policy. The ATDCs are based on a bilateral agreement between the Chinese and African governments. The centers are presented as a Chinese state-led aid project but are operated by Chinese companies. The companies can either be private, state-owned firms, or research institutes and universities. The selection of the companies resembled the “One Province, one Country” model. In broader terms, each province of China is responsible for a Chinese cooperation project in an African country. This model, advocated in recent years by the Foreign Economic Cooperation Center

(FECC), became popular in China's agricultural aid but also in other sectors of aid delivery (Gu, Zhang, Vaz & Mukwereza, 2016). This also reflects the relevance of provincial governments in China's State capitalism.

ATDCs can be visualized as being composed of two different parts: aid and business. According to the official 'ATDC Guidelines' (MOC & MOA, 2011), the centers are intended to serve four main goals. First, ATDCs serve to promote bilateral agreements and China's foreign strategy in recipient countries. Second, the centers aim to promote innovative agricultural practices and modern technology to enhance food security. Third, the centers are designed to be a privileged platform for Chinese companies to invest in Africa, explore new markets in line with China's 'Agriculture Going Out' policy. Fourth, ATDCs serve as a base for research, demonstration, training, and display (Jiang, 2020).

### **Mechanism and actors**

The ATDCs are an attractive soft power tool for diplomatic and political achievements, although the business and market-oriented forces are the main drivers of the centers. The centers represent an attempt not only to bridge aid and business but also public and private actors. For instance, the construction of the center is financed by the Chinese government but the management is carried out by either private or state-owned Chinese companies. ATDCs are presented as a Chinese governmental aid project and there is vigilant control by Beijing. The Chinese government set up a bidding process for subcontracting the project but this ultimately did not appear to be open and competitive; local and central Chinese governments certainly took a major role in the decision-making.

The establishment of the centers comprises three different stages: construction, technical cooperation, and sustainable or business development (Jiang, 2020). During the construction and technical cooperation phases, the majority of expenses are covered by the Chinese government. The construction of the infrastructure is usually completed in about one year, while the technical cooperation stage is carried out in three years. When the construction of the center is complete, it becomes a public asset of the recipient government. A common feature of all ATDCs is that the land-use rights of the center are donated by the host African state. However, the ownership of the land remains under the control of the recipient countries. So far, on average, 100 hectares of land have been donated for each ATDC. During the technical cooperation stage, the Chinese companies in charge of the management of the center should conduct research, test selected Chinese varieties, and disseminate relevant techniques.

ATDCs serve both as a research and training station and as a base for Chinese companies to invest abroad (MOC & MOA, 2011). Hence, Beijing aimed to solve, through an "aid + business" model, the sustainability of aid projects. During the technical cooperation phase, Chinese techniques and seeds are tested and when they are found to be successful, demonstration and training take place. During this phase, the Chinese companies in charge of the center also develop business activities able to attract Chinese investment in the project. When the three-year technical cooperation is completed, the center enters the last stage: business or sustainability phase. The peculiarity of this last phase is that by then the center should have developed an agribusiness value chain. The market-oriented

activities are supposed to allow the ATDC to cover the running cost and ensure research, demonstration, training, and display. During the business phase, the Chinese government is not supposed to make financial contributions to the centers. Indeed, the achievement of sustainable development in ATDCs accounts for 45 percent in the evaluation system (Jiang, 2020). The reality appears to be different; in fact, several countries still receive funding either directly from the Chinese government or privately through a partnership with entities such as the Bill and Melinda Gates Foundation. Despite the central focus of project sustainability, the long term economic sustainability of the ATDCs has remained a major concern (Jiang et al., 2016). Some centers have introduced agribusiness activities but the financial return has not fully covered the running costs of the center (Jiang, 2020). Economically, the major challenges of the centers begins when technical cooperation ends, so with the end of Chinese governmental financial support. At this point, it is interesting to explore the sustainable feasibility of the projects when business operations start, and how aid and business are carried out on the ground. However, the majority of centers entered the business operation phase around 2015. As a consequence, this last phase has been poorly reported and in-depth fieldwork is certainly necessary. Due to the different objectives behind the design of the ATDCs, it is necessary to seriously consider the possible implications of the centers. For instance, the ATDCs aim to introduce Chinese technology to African agriculture. This has raised questions about the applicability of these techniques in Africa, and their environmental sustainability. Land and water management is a sensitive issue in Africa, and Chinese competitiveness and the local response need to be explored. Moreover, the ATDCs were designed to be a platform to attract Chinese investment. The impact that the introduction of new business activities can have on already existing local businesses needs to be taken into account, as well as the opportunities that this could represent. Overall, the ATDCs are established in a territory where agriculture is already an important existing economic sector, and this will naturally have direct and indirect implications on the societies, economies, and environment. Many of these questions remain unanswered.

### **Existing research and emerging gaps**

The ATDCs still represent the flagship project of China-Africa agricultural cooperation, and its establishment in over twenty African countries has attracted international attention.

This section explores the academic literature on ATDCs published in English from 2013 until 2020. The geographic area of the authors is not homogenous: authors are from Africa, China, and the West. However, Chinese academics are the most committed to ATDCs research. This could also be related to the challenges, for a non-Chinese researcher, to get in contact with Chinese companies. In analyzing the content, articles of authors coming from different geographic areas have been cross-checked to avoid and overcome a single perspective. The literature review identified three recurrent themes, which facilitated the analysis of the challenges faced by ATDCs. This paper aligned with Nalwimba et al. (2019) recognizing a gap in ATDCs research. However, the purpose of this article is to point out further limitations that have not been considered in previous research on ATDCs.

### Positioning ATDCs in the academic debate

The establishment of ATDCs has attracted the attention of academics both in China, Africa and from the West (Scoones et al., 2013; Chichava et al., 2014; Chichava & Fingermann, 2015; Zhang et al., 2018; Xu et al., 2016; Alden & Large, 2018; Jiang, 2015, 2020). The existing research on ATDCs can be summarized into three themes. The first is centered on understanding how China's own experience in agriculture and how the historical evolution of Chinese aid in agriculture led to the design of ATDCs. This body of work has explored

China's own development in agriculture through science and technology, and how this was transferred to Africa through the ATDCs. China's success in agriculture has been attained by a large investment in research which has supported the high yield of staple crops, e.g., the hybrid rice (Xu et al., 2016). As a result, a key element in China-Africa agricultural cooperation is technology transfer. Research and dissemination are central to the operation of ATDCs. Moreover, the ATDC model was designed to overcome the problem of sustainability of aid projects, and this reflects China's past experiences and ideology (Jiang, 2020).

The second theme is centered on the mechanism and actors of the centers. These studies describe the different stages of the centers and deal with more specific questions such as locality, construction, and technical cooperation exploring in more detail the physical characteristics of the centers, the modality of training and demonstrations, the Chinese actors and local partners involved. For instance, Xu et al. (2016) have previously observed how macro-level policy encounters micro-level implementations.

The third theme attempts to capture local encounters and negotiations through an ethnographic lens of analysis. The mismatch between the expected design of ATDCs and local realities is recurrent (Jiang, 2020). These works reveal that there are different perceptions around the role of the ATDCs between the African and the Chinese actors (Tang, Lu & Mukwereza, 2018). Great expectations behind the inception of the ATDCs have been confronted by the local reality, which is much more complex, for instance in the area of technology transfers or market access (Zhang, Li, Qi & Wang, 2015). This body of literature provides a point of departure for the understanding of emerging critics and challenges.

### Emerging challenges

Chinese and African actors have appeared to have different understandings of the ATDC's role in extensions and demonstrations. Chinese experts supposed that the center served as a platform to show China's best practices in agriculture, and how they can be transferred to Africa. Despite that, local partners in Africa perceived that a small role is performed by the center in terms of technology transfer (Xu et al., 2016). The Chinese experts believed that the process of the extension would have been facilitated by local partners, while the cooperation seemed limited. The intrinsic nature of ATDCs is also misleading for local partners, who are used to a more paternalistic delivery of aid. The blurred line between aid and business that characterizes ATDCs is reflected in the daily tensions within business and aid activities that Chinese experts must carry out. Tang et

al. (2018) argued that, in the case of Zimbabwe, the blurred line between aid and business led to a growing misunderstanding between the different Chinese and Zimbabwean actors. The Chinese actors on the ground needed to simultaneously play the roles of technicians and aid workers. However, the background of the Chinese staff at the ATDCs is not of professional aid workers. Usually, the staff comes from agricultural research institutes, universities, or state farms. The Chinese staff is overloaded with work which is not related to the actual management of the ATDCs, and this affects the performance of the centers. Different ideas around the role of ATDCs as well as general conceptions about development have led to a growing misunderstanding between the Chinese and local partners (Tang et al., 2018; Qi, Yu, Alemu, Cook & Li, 2015).

Other major challenges of the centers relate to language, cultural barriers, and a low level of cooperation with local institutions and partners. Chinese technicians aimed to introduce intensive farming techniques and seed varieties that were instrumental in their own successful agricultural development. Local farmers rely on traditional farming and it may take a long time before they become used to the Chinese labor-intensive management method. Frequently, local farmers are not even interested in the introduction of labor-intensive techniques. ATDCs aim to introduce high-yielding Chinese varieties, but behind the rhetoric of “mutual benefit and win-win cooperation”, the Chinese tend to impose their expertise and selected varieties, neglecting the local suitability. Even if Chinese varieties could increase productivity, it does not follow that they suit the local market. This tendency has been common in Mozambique, but also in the ATDCs in South Africa and Tanzania (Jiang, 2020; Makundi, 2017). These challenges should be considered seriously. Even if it is the case that the Chinese aim at enhancing food security in Africa through the introduction of selected high-yield varieties, this does not imply that these varieties are appropriate to local farming systems. In Tanzania, Makundi (2017) explored the challenges faced by local farmers in applying Chinese rice technologies. Obstacles are common even in other cases and are related to language barriers, attachment to traditional practices, financial limitations, and limited access to knowledge. These challenges have been experienced by several different ATDCs (Xiuli et al., 2016). Thus, given the specificity of each country, it is interesting to note that there are common barriers across multiple cases. These barriers are strictly related to the local beneficiaries of the ATDC. High yield techniques, big investments in infrastructure, and extension do not seem to deliver the expected results if projects do not consider the local environment.

Beside academic literature

In addition to the academic literature, ATDCs have raised the attention of Chinese and African media and have been the focus of different research reports. Overall, the media have reported that Chinese ATDCs in Africa enhance agricultural production. For instance, Xinhua claimed that “Chinese agricultural technology boosts Tanzania’s farming”, and that since 2012 around 1,100 farmers and agricultural officials have been trained by the center (Xinhua, 2015). A report on the ATDC in Mozambique has been recently jointly published by the CIDCA and the United Nations Development Programme (UNPD). The report represented the first attempt to evaluate the ATDCs through criteria such as

relevance, effectiveness, efficiency, results, sustainability, and partnership-cooperation which are usually adopted by international development agencies. The ATDCs are presented as an innovative approach that links public and private partners and that has the potential to redefine traditional models and practices of international development assistance. The novelty of this first attempt of convergence towards international evaluation standards for a Chinese aid project should not be underestimated.

#### Reflections and limitations

Much of the previous research on ATDCs has been based on qualitative methods and ethnographic approaches that have provided a better understanding of the Chinese ATDCs in Africa. However, there are a few limitations. A recent systematic scope review (Nalwimba & Mudimu, 2019) investigated the gaps in ATDCs research and called for a framework to better understand the centers. The authors concluded that future studies on ATDCs should consider the gender dimension and farmers' abilities, elaborate a scale of adaptation for technology relevancy, consider the political economy, and discuss how the ATDCs can strike a balance between aid and business. This article agreed with an earlier finding by Nalwimba et al. (2019) of an existing gap in ATDC research, and the little consideration given to the impact of ATDCs on local communities and gender dimensions. Although the immediate implications of ATDCs directly affect technology transfer and farmers, they also have an indirect impact on the economy of the territory, local societies, and the environment. These aspects should also be taken into consideration. For instance, Nalwimba et al. (2019) suggested the introduction of a 'graduate scale of adoption' (from lower to high-level adoption) to overcome the duality of relevance or non-relevance of the new technologies introduced. However, as Makundi (2017) pointed out, the limited understanding of ATDC's impact on the adoption of farming technology is related to the fact that the same farmers received similar training by different agencies. The relevance of technology adoption goes behind Chinese influence. For example, if USAID provides loans for local farmers to buy fertilizers while the Chinese do not, the farmers will probably adopt the technique displayed by USAID. This is to say, if the objective is to provide a better understanding of ATDCs, then there are additional aspects that need to be taken into consideration. Surely there is a lack of consideration for the gender dimension, as argued by Nalwimba et al. (2019), and explaining the gender configuration could be appropriate for developing future training. However, there is also an urgent need to integrate new methodologies that not only entail the gender dimensions but the intersectionality of gender (Bastia, 2014).

There are broader limitations and challenges in studying the ATDCs that the framework proposed by Nalwimba et al. (2019) does not critically address. In the existing literature, the agency of African countries has hardly been considered. The concept of food security which underpins the entire model of the ATDCs has been accepted uncritically. Definitions of food security refer to the availability of food but do not take into consideration how food is produced and its social components. As Raj Patel observed: "It is entirely possible for people to be food secure in prison or under a dictatorship" (Patel, 2009: 665). The key issue is not just the availability of food, but as the broader concept of food

sovereignty suggests, peasants have to determine their food and agricultural system (La Via Campesina, 2007). The role of farmers has not been fully taken into account. Observations are limited to the role of the states, Chinese experts, and local partners. This restricts the understanding of the nature of the limitations and challenges that ATDCs are facing with technology transfer. The centers do not exist in a vacuum. Geographical, social, and cultural factors play a crucial role in the introduction of new methods, especially when agriculture is an important part of the existing economy. The lack of comparison with non-Chinese actors poses a major limitation to the analysis of the challenges faced by the Chinese, and the Chinese influence in Africa. The exploration of non-Chinese agricultural interventions located in the same geographic area could provide a lens for a nuanced exploration of China's presence. The use of ethnographic methods is necessary for country-level projects; however, micro-analysis should be interlinked with a political and economic analysis of China and Africa. If these limitations are not addressed, the understanding of the impact that Chinese ATDCs have on small-scale livelihoods remains limited.

Finally, in the existing academic literature, the land is not considered an issue in ATDCs. However, now that the majority of centers have been established for over ten years, some consideration of the role of land in this project can be made. ATDCs are driven by market-oriented forces; one of the objectives of the center is to promote Chinese companies to go global. What does this imply? If Chinese companies or other foreign actors invest in ATDCs, a larger amount of land is needed. Whether the land will be leased or bought, or subcontracted from local farmers, is still not clear. Some attempts to increase the amount of land allocated to ATDCs have already been made. For instance, in Zimbabwe, the Chinese ATDC team leader argued that to achieve the economic sustainability of the center at least another 600 hectares were necessary (Tang et al., 2018). The implications of the diverse land use planning and management models should be taken into consideration.

### **Challenges and call for new perspectives**

Researching sensitive topics is a worldwide challenge. In the last decade, China-Africa relations have been both a hot and a sensitive topic, and they have posed challenges in terms of academic freedom (Svensson & Pils, 2019, n.p). Access to data is limited both in China and in Africa, and data is not always accurate (Plekhanov, 2017). Nevertheless, the quality of data is not the main challenge.

Economic models for Africa's growth are still designed outside the continent and resemble the experiences of foreign actors. Economists have assumed that the rise of Africa is related to better quality data, but Africa's economic growth is not a new experience, and economists should consider that this is not a new rise in the continent but a recurrent rise. This more founded interpretation would be beneficial also in terms of policy implementations (Obeng-Odoom, 2017). Moreover, data-analyses are historical and measures of GDP do not capture the reality of Africa on the ground. Informal economies, commons accumulation, gender inequalities within Africa and other global powers are important aspects that are not reflected by GDP. Hence, GDP-based analyses should include a more critical perspective of the African political economy if economists want to grasp a holis-

tic understanding of Africa's growth. Mainstream development economics has failed to design appropriate development policies for Africa and this might have contributed to worsening social and economic conditions in the continent. In challenging mainstream approaches, African political economists called for stratification economics which goes beyond neoclassical and Marxist development economics, and presents an urgent need for the decolonization of African studies (Obeng-Odoom, 2018). These methodological and ontological questions regarding China, Africa, and Africa-China relations are serious and must be considered in contemporary studies.

Developing a critical political economy of the Sino-African relations is necessary, and different disciplines and theoretical perspectives need to be combined (Mohan, 2013; Power & Mohan, 2010). China should not be explored for the novelty, rather the underlying similarities and connections with well-established patterns of global capitalism should be explored. Mohan (2013) maintains that ethnographic studies illuminate interconnections of spatiality and refute static interpretations of space. The role of the space/place and spatial relations have not been considered in the previous exploration of ATDCs. Doreen Massey reminds us that "geography matters" too (Peet & Thrift, 1989). For instance, ATDCs are embedded in specific geographies and spatial relations that existed before the Chinese established the centers. This study assumes that the Chinese presence and implications cannot be explained if geography is not considered as a pre-existing condition, and as constitutive of the social and economic world. Massey notably observed that "It is not just that the spatial is socially constructed: the social is spatially constructed too" (Massey, 1994). This study assumes that a critical political economic and comparative analysis of China-Africa agricultural cooperation is necessarily interrelated with a reconsideration of the territory as an active constituent. The urgent need for Africa's radical transformation of agriculture calls for further attention towards China-Africa agricultural cooperation and a better understanding of the direct or indirect implications. The reconsideration of place/space allows us to go beyond mechanist analyses of the ATDCs and to deeply explore the impact on agricultural production, societies, and economies. Finally, it leads to a better understanding of the extent to which ATDCs embrace the win-win scenario.

## References

- Alden, C. (2007). *China in Africa*. London. Zed/Palgrave.
- Alden, C. (2013). China and the long march into African agriculture. *Cahiers Agricultures*, 22 (1), 16-21.
- Alden, C. & Large, D. (2018). Studying Africa and China. In Alden, C. & Large, D. (eds.), *New Directions in Africa-China Studies*, 3-35. Routledge.
- Alden, C. & Jiang, L. (2019). Brave new world: debt, industrialization and security in China-Africa relations. *International Affairs*, 95(3), 641-657.
- Amin, S. (2016). The world without Bandung, or for a polycentric system with no hegemony. *InterAsia Cultural Studies*, 17(1), 7-11.
- Amin, S. (2016). To the Memory of Sam Moyo. Agrarian South. *Journal of Political Economy*, 5(2-3), 138-157.

- Amoah, L.G.A. (2016). China, architecture and Ghana's spaces: Concrete signs of a soft Chinese imperialism? *Journal of Asian and African Studies*, 51(2), 238-255.
- Brautigam, D. (2011). *The dragon's gift: The real story of China in Africa*. Oxford: Oxford University Press.
- Brautigam, D. & Zhang, H. (2013). Green Dreams: Myth and Reality in China's Agricultural Investment in Africa. *Third World Quarterly*, 34(9): 1676.
- Brautigam, D. (2015). *Will Africa feed China?* (1st ed.). Oxford: Oxford University Press.
- Buckley, L. (2013). Chinese Agriculture Development Cooperation in Africa: Narratives and Politics. *IDS Bulletin*, 44: 4.
- Chichava, S. (2014). Chinese agricultural investment in Mozambique: the case of the Wambao rice farm. Retrieved from <https://saiscari.files.wordpress.com/2014/11/brief-2- chichava.pdf>.
- Chichava, S., Jimena, D. & Lu, J. (2014). The Chinese Agricultural Technology Demonstration Centre in Mozambique: A Story of a Gift. In China and Mozambique. In Alden, C. & Chichava, S. (eds.), *China and Mozambique: From Comrades to Capitalists*, Johannesburg: Jacana.
- Chichava, S. & Fingermaun, N. (2015). Chinese and Brazilian agricultural models in Mozambique. *The case of the Chinese Agricultural Technology Demonstration Centre and of the Brazilian ProALIMENTOS programme*. Future agricultures.
- Data.worldbank.org. (2020). *Employment In Agriculture (% Of Total Employment) (Modeled ILO Estimate) - Sub-Saharan Africa*. Retrieved from: [https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?end=2019&locations=ZG&name\\_desc=true&start=2019&view=bar](https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?end=2019&locations=ZG&name_desc=true&start=2019&view=bar).
- Delang, C. (2018). The consequences of soil degradation in China: A review. *GeoScape*, 12, 92-103.
- Ministry of Foreign Affairs, the People's Republic of China. (2018). *Forum On China-Africa Cooperation Beijing Action Plan (2019-2021)*.
- Gu, J., Zhang, C., Vaz, A. & Mukwereza, L. (2016). Chinese State Capitalism? Rethinking the Role of the State and Business in Chinese Development Cooperation in Africa. *World Development*, 81, 24-34.
- Huang, M., Xu, X. & Mao, X. (2019). *South-South cooperation and Chinese foreign aid*. New York, NY: Springer Berlin Heidelberg.
- Jiang, L. (2015). Chinese Agricultural Investment in Africa: Motives, Actors and Modalities. SAIIA Occasional Paper No. 223, October 2015.
- Jiang, L., Harding, A., Anseuww, W. & Alden, C. (2016). Chinese Agriculture Technology Demonstration Centres in Southern Africa: The New Business of Development. *Public Sphere*, April 2016.
- Jiang, L. (2020). *Beyond Official Development Assistance: Chinese Development Cooperation and African Agriculture*. Singapore: Palgrave Macmillan.
- La Via Campesina. (2007). *Nyeléni Declaration*. Sélingue: Forum for food sovereignty. Retrieved from: <https://nyeleni.org/spip.php?article290>.
- Large, D. (2008). China & the Contradictions of 'Non-Interference' in Sudan. *Review of African Political Economy*, 35(115), 93-106. Retrieved from [www.jstor.org/stable/20406479](http://www.jstor.org/stable/20406479).
- Massey, D. (1994). *Space, place and gender*. Cambridge: Polity Press.
- MOC and MOA (China). (2011). *Guanyu cujin yuanfei nongye jishu shifan zhongxin xiang- mu kechixu fazhan de zhidaoyijian* (Guidance on Promoting the Sustainable Development of the Agriculture Technology Demonstration Centre Project in Africa). Beijing: MOC and MOA.
- Mohan, G. (2013). The Chinese just come and do it: China in Africa and the prospects for development planning. *International Development Planning Review*, 35(3), p.v.
- Mohan, G. (2013). Beyond the Enclave: Towards a Critical Political Economy of China and Africa. *Development and Change*, 44(6), 1255-1272.
- Mohan, G. & Lampert, B. (2013). Negotiating China: reinserting African agency into China-Africa relations. *African Affairs*, 112(446), 92-110. Retrieved from <http://www.jstor.org/stable/23357149>.
- Mohan, G. & Tan-Mullins, M. (2019). The geopolitics of South-South infrastructure development: Chinese-financed energy projects in the global South. *Urban Studies*, 56(7), 1368-1385.

- Morgan, P. (2019). Tracing the Legacy: China's Historical Aid and Contemporary Investment in Africa. *International Studies Quarterly*, 6(3), 558-573.
- Lee, C.K. (2018). *The Specter of Global China: Politics, Labor, and Foreign Investment in Africa*. Chicago and London: University of Chicago Press.
- Nalwimba, N., Qi, G. & Mudimu, G. (2019). Towards an understanding of the Chinese agriculture technology demonstration centre(s) in Africa. *European Journal of Social Sciences Studies*, 4(2). Retrieved from <https://oapub.org/soc/index.php/EJSSS/article/view/549>.
- Obeng-Odoom, F. (2018). Critique of development economics. *The Japanese Political Economy*, 44(1-4), 59-81.
- Obeng-Odoom, F. (2017). The myth of economic growth in Africa. *Review of African Political Economy*, 44(153), 466-475.
- Odoom, I. (2016). *Beyond Fuelling The Dragon: Locating African Agency in Africa-China Relations*. PhD diss., Department of Political Science, University of Alberta.
- OECD. (2019). *Official Development Assistance (ODA)*. Retrieved from: <http://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/What-is-ODA.pdf>.
- Patel, R. (2009). Food sovereignty. *The Journal of Peasant Studies*, 36(3), 663-706.
- Peet, R. & Thrift, N. J. (1989). *New Models In Geography V2*. London: Routledge.
- Plekhanov, D. (2017). Quality of China's official statistics: A brief review of academic perspectives. *Copenhagen Journal of Asian Studies*, 35(1), 76-101.
- Power, M. & Mohan, G. (2010). Towards a Critical Geopolitics of China's Engagement with African Development. *Geopolitics*, 15(3), 462-495.
- Rostow, W. W. (1959). The Stages of Economic Growth. *Economic History Review*, 12(1), 1-16.
- Qi, G., Yu, L., Alemu, D., Cook, S. & Li, X. (2015). Copying the Extension System of China and Beyond: Implementing the Chinese Agricultural Technology Demonstration Centre in Ethiopia. *Future Agriculture*, Working paper 128.
- Scoones, I., Cabral, L. & Tugendhat, H. (2013). China and Brazil in African Agriculture. IDS. Retrieved from: <https://www.ids.ac.uk/publications/china-and-brazil-in-african-agriculture/>.
- Sindzingre, A. (2016). Fostering structural change? China's divergence and convergence with Africa's other trade and investment partners. *African review of Economics and Finance*, 8(1), 12-44.
- Svensson, M. & Pils, E. (2019). Academic Freedom: universities must take a stance or risk becoming complicit with Chinese government interference. Retrieved from <https://theconversation.com/academic-freedom-universities-must-take-a-stance-or-risk-becoming-complicit-with-chinese-government-interference-118001>.
- Tang, L., Li, X. & Mukwereza, L. (2018). Blurring the lines between aid and business: An ethnographic study of the Chinese agricultural technology demonstration centre in Zimbabwe. *China: An International Journal*, 16(1), 23-44.
- The Economist. (2019). Africa is attracting ever more interest from powers elsewhere. Retrieved from <https://www.economist.com/briefing/2019/03/07/africa-is-attracting-ever-more-interest-from-powers-elsewhere>.
- Urban, F., Mohan, G. & Cook, S. (2013). China as a new shaper of international development: the environmental implications. *Environment, Development and Sustainability*, 15(2), 257-263.
- Xinhua. (2011). Full Text: China's Foreign Aid. China Daily website. Retrieved from China Daily website: [http://www.chinadaily.com.cn/china/2011-04/21/content\\_12372839.htm](http://www.chinadaily.com.cn/china/2011-04/21/content_12372839.htm).
- Xinhua. (2015). Chinese agricultural technology boosts Tanzania's farming. *China.org.cn*. Retrieved from [http://www.china.org.cn/world/Off\\_the\\_Wire/2015-05/06/content\\_35504658.htm](http://www.china.org.cn/world/Off_the_Wire/2015-05/06/content_35504658.htm).
- Xinhua. (2018). Full text of Chinese President Xi Jinping's speech at opening ceremony of 2018 FOCAC Beijing Summit. *Xinhua | English.news.cn*. Retrieved from [http://www.xinhuanet.com/english/2018-09/03/c\\_129946189.htm](http://www.xinhuanet.com/english/2018-09/03/c_129946189.htm).

- Xu, X., Li, X., Qi, G., Tang, L. & Mukwereza, L. (2016). Science, Technology, and the Politics of Knowledge: The Case of China's Agricultural Technology Demonstration Centers in Africa. *World Development*, 81, 82-91.
- Zhang, C., Li, X., Connerley, E.F. & Wu, J. (2018). Role Tension and Adaptation in a Chinese Agricultural Aid Project in Mozambique. *Journal of International Development*, 31(3), 231-246.
- Zhang, C., Li, X., Qi, G. & Wang, Y. (2015). Interpreting China-Africa Agricultural Encounters: Rhetoric and Reality in a Large Scale Rice Project in Mozambique. *Future Agricultures*, Working Paper 126, Brighton, Sussex: IDS.