



## **Chinese Funding of Small-Scale Agriculture on Improving Rural Livelihoods. A Case of Small-Scale Farmers in Kilosa District, Morogoro Region, Tanzania**

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### **ABSTRACT**

The study aimed to establish the usefulness of Chinese funding of agricultural activities of small-scale farmers in Kilosa District, towards boosting the livelihoods of small-scale farmers in Kilosa District. The study also identified some barriers that impede the effectiveness of Chinese funding of agricultural activities in Kilosa District. The primary respondents for the study were small-scale farmers. They were chosen because they are the actual beneficiaries of the agricultural aid from the China-funded agricultural project. Simple random sampling was used to obtain the small-scale farmer's sample in the study area. Purposive sampling was used on the key informants such as Local Government leaders, among others. The total sample size of this study included 80 small-scale farmers who are residents of the district and 10 key informants. Focus group discussions (FGDs) using the FGD guide and personal interviewing using semi-structured questionnaires, were the data collection methods used on the small-scale farmers and in-depth key informant interviews using the key informant interview guide, on the key informants. Additional secondary sources included literature, journals and resources from websites. Quantitative data was analyzed using the Statistical Package for Social Science (SPSS). The qualitative data was analyzed through data displays in such a way that the researcher recorded the respondent's responses as they were without changing anything and presented them in the form of verbatim quotations, narratives and case studies. The findings revealed that small-scale farmers were practicing new improved farming methods as opposed to the traditional methods as a result of the training and practical agricultural demonstrations by the China-funded agricultural project, which boosted their agricultural knowledge and skills. The findings also revealed that the project installed water at the project demonstration site to increase the villagers' access to water. The findings also revealed that transport is no longer a problem as the project built a mud road linking the small interior feeder roads in the villages and to the main road but it gets slippery during the rainy season. The barriers that impede China's Small-Scale Agriculture Financing Effectiveness in Kilosa District include; Insufficient rainfall, Market, Lack of irrigation and Pastoralist invasion. The strategies that were put in place to sustain the project achievements included: Partnerships with several stakeholders to make the project's holistic approach possible; Setting up of the Learning Center / Demonstration Site to make project activities, particularly project training, more well known, broadening their impact well beyond the project region; and ownership of the project by the project beneficiaries might increase their trust in it, which could lead to spillover effects in other areas. In conclusion, therefore, the livelihoods of small-scale farmers in Tanzania's Kilosa district have significantly improved as a result of China's funding of small-scale agriculture in the area through a community development project titled "Promoting Small Farmer Agriculture for Poverty Reduction. Small-scale farmers' yields have grown significantly in the district, and higher incomes have also been noted.

**Keywords – Chinese Funding; Small-Scale Agriculture; Livelihood Improvement; Small Scale Farmers; Kilosa; Tanzania**

### **I. INTRODUCTION**

A number of justifications for aid have been communicated over the years. In the earlier years before the establishment of bodies such as the International Monetary Fund (IMF) and the World Bank (WB), development activity was viewed as a state monopoly (Estrin & Pelletier, 2018; Borcan & Putterman, 2018; Hamza & Zetter, 2013; Chimni, 2004; Stiglitz, 2003). This was mainly due to the absence of alternative actors and or stakeholders in the development arena. It did not imply that the state was always a powerful weapon for the country's growth and expansion (Chen et al., 2019; Desai & Potter, 2013). However, in the late twentieth century, it started being evident that the state was losing its position as a dominant force when agencies like the World Bank, IMF and non-governmental organizations (NGOs) became part of the development agenda (Chen et al., 2019; Meharg et al., 2009). Desai and Potter (2013) pointed out that the role of such agencies seems destined to grow as the control of the nation-state reduces and global economic activity intensifies. This is very true given the influx of aid in developing countries (Taylor, 2016; Reci, 2014; Rathore, Singh, et al. 2010). The justifications for aid range from humanitarian concerns, commercial curiosities, and political philosophies that boosted economic development (Park et al., 2019; Bergamaschi et al, 2017; Hegyi-Keri, 2013; Tarp, 2000).

Most of the aids are bilateral between states (Hackman, Desai & Potter, 2014; Thorbecke, 2000); although a significant amount is channeled through multilateral institutions such as the United Nations and the World Bank (Desai & Potter, 2013). The focus of the assistance has varied according to trends in development. For instance, in the 1960s and 1970s, emphasis was on large infrastructural projects, such as hydroelectric dams which failed to produce the expected 'trickle-down' benefits for the poor (Desai & Potter, 2013). In the 1980s, donors focused on macroeconomic stability and liberalization to tackle the persistent poverty but the approach has also proved to be disappointing (Desai & Potter, 2013). In the year 2000, the concept of foreign aid was reinvented following the adoption of the eight Millennium Development Goals which aimed at meeting targets such as poverty reduction in developing countries by the year 2015 (Easterly, 2008). This helped refocus foreign aid away from macro-economic reforms (Desai & Potter, 2013), to the priority of improving the quality of life of poor people such as achieving education (Dale, 2007; Oxfam, 2000). The seventeen sustainable development goals were agreed upon in the year 2015 by world leaders was also aim to achieve a better and more sustainable future for all, by 2030 - addressing challenges related to poverty, inequality, climate change, environmental degradation, peace and justice (Brown and Rasmussen, 2019; Bettelli, 2021).

Donors have increasingly recognized their own mistakes in providing development assistance to the poor and developing countries (Niyonkuru, 2016; Wamboye, Adekola & Sergi, 2013; Hackman, Desai & Potter, 2014; Williamson, 2009). They have acknowledged that not only more aid is needed but also perhaps more importantly better aid to these countries (Becker et al., 2015; Desai & Potter, 2013; Murshed & Khanaum, 2014; Hühne, Meyer & Nunnenkamp, 2013). Aid effectiveness has therefore been an issue for debate among the donors and the recipients (Sun, Qian, et al., 2014; Goody & Drago, 2009; Buse & Harmer, 2004; Sharma et al., 2011). Today almost all aid donors are concerned with the effectiveness of the aid they spend in foreign countries, that is, how well it is achieving the objectives for which that aid was intended. Recipients of aid and civil society at-large are also concerned about the funds invested in terms of achieving the anticipated results.

In Tanzania, the agriculture sector is one of the key sectors guaranteed for Official Development Assistance (ODA) and the sector is among the top three sectors of the economy receiving the largest percentage of assistance (Lemtiri, et al., 2014; Wolter & Veloso, 2008; URT, 2005). Several donors are funding agricultural activities in Tanzania. Chinese engagement in agriculture and rural development in Tanzania is long-standing and covers multiple activities. In Kilosa District, for instance, China is financing a community development project titled "Promoting Small Farmer Agriculture for Poverty Reduction". The project has a range of objectives including solving the prominent issues in agricultural production through field demonstration strengthening the learning and management abilities of village-level organizations and villagers in general, and increasing the agricultural productivity and farmer's income to reduce poverty by conducting diversified small-scale demonstration activities. There are variety of crops grown by the small-scale farmers in Kilosa District, but the main focus for the project implementation since 2008 to date, is maize growing, since this is the staple food in the country.

In Kilosa District in Tanzania, poverty and poor infrastructural development, constitute some of the problems hindering agricultural development in the district. Limited educational opportunities, poor health services and a large pool of unskilled human labor have brought about low human capital development (HCD). There are also serious cases of food scarcity because of the prolonged periods of drought. The most vulnerable are the small-scale farmers who have no skills to pursue other means of livelihood rather than agriculture. According to Tarp (2000), supplying resources to the agriculture industry is anticipated to lead to higher outputs and productivity, which will strengthen the economy. According to Thorbecke (2000), since it is believed that there are many poor people employed in the agricultural sector, aid is typically targeted at this industry to improve the welfare of the poor by raising small farmers' productivity and efficiency. Indeed, URT (2007) showed that over 80% of the poor population in the country lives in rural areas and it's true that about 80% of the country's population depends on agriculture. Li (2010) argued that agriculture plays a vital role in the social and economic life of Tanzanians. Therefore; one cannot talk about development in Tanzania without talking about agriculture. Through agricultural development assistance, the Tanzanian government is working tirelessly to support the local economy to improve agriculture at all levels which will ensure that food security increase the farmer's income and reduce the growth of poverty in the country. The funding for the different agricultural programs, plans and activities has boosted agricultural production in Tanzania and also pushed the country to become the second-largest economy in East Africa today (Trademark East Africa, 2016). The purpose of this study is therefore, to establish the usefulness of Chinese funding of agricultural activities of small-scale farmers in Kilosa District, towards boosting the livelihoods of small-scale farmers in Kilosa District. The study also identified some barriers that impede the effectiveness of Chinese funding of agricultural activities in Kilosa District.

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## II. METHODOLOGY

The study was conducted in Kilosa District, Morogoro Region, Tanzania. The study was conducted using a cross-sectional research design. Both the qualitative and quantitative approaches to research were used, but the study was largely qualitative. Kilosa District is located in Morogoro Region, which is located in the Eastern part of Tanzania. According to the 2012 Tanzania Population census, Kilosa District constituted about 438,175 people and the major economic activities of the people include farming, animal keeping and trading, with agriculture being the dominant economic activity. The primary respondents for the study were small-scale farmers. These were chosen because they are the actual beneficiaries of the agricultural aid from the China-funded agricultural project. The key informants included the Local Government leaders, Extension officers, agricultural research institutes, inputs distributors, district agricultural department officials, government agencies staff on agricultural issues, National development aid offices and Ministry of Agriculture staff. These were deemed to have sufficient knowledge about the usefulness of international aid on agriculture in Tanzania. The total sample size of this study was 90 respondents. This included 80 small-scale farmers who are residents of the district and 10 key informants. For purposes of this study, small-scale farmers were those farmers who farm on a small area of land, from a quarter an acre to 3 acres. Simple random sampling was used to obtain the small-scale farmer's sample in the study area. In every three households in a certain area, the researchers picked one household to ensure that all households had an equal chance of being chosen. Purposive sampling was used on the key informants. Data collection methods that were used for the

study included; focus group discussions (FGDs) using the FGD guide and personal interviewing using semi-structured questionnaires, on the small-scale farmers and in-depth key informant interviews using the key informant interview guide, on the key informants. Additional secondary sources included pieces of literature, journals and resources from websites. Quantitative data was analyzed using the Statistical Package for Social Science. Frequency tables including percentages were generated in the analysis of quantitative data. The qualitative data was analyzed through data displays in such a way that the researcher recorded the respondent's responses as they were without changing anything and presented them in the form of verbatim quotations, narratives and case studies. This enabled the researcher to capture the true feelings of the respondents which added rich meaning to the data collected.

### III. ETHICAL ISSUE

The researchers sought permission from the study district, with introductory letters to introduce them to the ward executive officers who are in charge of the village operations. The researchers carefully validated the research tools before data collection. The researchers introduced themselves and the study to the respondents before each interview and assured respondents of the confidentiality of the responses gathered. Permission was obtained from the village chairman and the respondents themselves to record the interviews using audio. No money or any rewards were promised to any respondent in exchange for information or for their acceptance to participate in the study because this would mean buying information. The face-to-face interviews lasted between 20 - 40 minutes.

### IV. RESULTS AND DISCUSSION

#### 4.1 Demographic Information of the Study Respondents

##### 4.1.1 Sex of the Respondents

The findings revealed that there were more males than females who participated in the study. This is because the male small-scale farmers were more accessible. For the project implementations, the project staff at the demonstration office in Peapea village said that equal participation of both male and female farmers is encouraged because both males and females are part of rural agriculture. Zezza and Nsiima (2009) acknowledged the importance of both males and females in agricultural production, although they clarified that women tend to produce mainly for home consumption. Table 1 below shows the sex of respondents in Kilosa district.

**Table 1: Sex of the respondents in Kilosa District**

| Sex of Respondents | Frequency | Percentage    |
|--------------------|-----------|---------------|
| Male               | 46        | 57.50         |
| Female             | 34        | 42.50         |
| <b>Total</b>       | <b>80</b> | <b>100.00</b> |

Source: Field Survey 2019

The Key informants included 10 participants who were purposively selected because they were deemed to have sufficient knowledge about the subject matter. These included 6 village agriculture extension officers (3 male and 3 female), 2 District Agriculture Officers (1 male and 1 female) and 2 project staff at the demonstration office in Peapea (male).

##### 4.1.2 Age of the respondents in Kilosa District

The study was interested in finding out the age of respondents. Age is one of the important demographic characteristics by which several study analyses have been carried out. The age of the respondents is presented in Table 2 below.

**Table 2: Age of the respondents in Kilosa District**

| Age of Respondents | Frequency | Percentage    |
|--------------------|-----------|---------------|
| 20 - 30 years      | 22        | 27.50         |
| 31 - 40 years      | 36        | 45.00         |
| 41 - 50 years      | 17        | 21.25         |
| 51 - 60 years      | 05        | 6.25          |
| <b>Total</b>       | <b>80</b> | <b>100.00</b> |

Source: Field Survey 2019

Table 2 indicates that the majority (72.50%) of the small-scale rice farmers were 40 years and below. This is because, at 40 years and below, people are still energetic and can therefore ably participate in agricultural activities. At later ages, people are normally less productive because of limited physical strength to cultivate on the agricultural fields.

#### 4.1.3 Education of the Respondents in Kilosa District

The findings revealed that the majority (92.50%) of the small-scale farmers had some level of education. Those without any formal education were very few (7.50%). See Table 3 below for more details.

**Table 3: Education of the respondents in Mvomero District**

| Level of Education  | Frequency | Percentage |
|---------------------|-----------|------------|
| No School           | 06        | 7.50       |
| Primary Education   | 41        | 51.25      |
| Secondary Education | 20        | 25.00      |
| Tertiary            | 13        | 16.25      |
| <b>Total</b>        | <b>80</b> | <b>100</b> |

Source: Field Survey 2019

#### 4.1.4 Farm Ownership

The findings revealed that the mode of ownership of farmland by the small-scale farmers was in three categories; a farmer purchased, inherited or rented the land as shown in Table 4 below.

**Table 4: Farm Ownership of the respondents in Kilosa District**

| Farm ownership | Frequency | Percentage |
|----------------|-----------|------------|
| Purchased      | 32        | 40         |
| Inherited      | 18        | 22.5       |
| Rented         | 30        | 37.5       |
| <b>Total</b>   | <b>80</b> | <b>100</b> |

Source: Field Survey 2019

Table 4 above shows that many small-scale farmers had purchased land. Those who rented land were equally many because not all farmers possess their land.

## 4.2 Achievements of China's Financing of the Community Development Project in Kilosa District titled "Promoting Small Farmer Agriculture for Poverty Reduction", on improving small-scale farmer's livelihoods

### 4.2.1 Capacity building of small-scale farmers through training and field demonstrations

The findings revealed that small-scale farmers were practising new improved farming methods as opposed to the traditional methods as a result of the training and practical agricultural demonstrations by the project, which boosted their agricultural knowledge and skills. The small-scale farmers revealed that the knowledge and skills they had acquired from the project training and live practical experiences boosted their maize production and about 90% of the small-scale farmers acknowledged that they have started producing surplus instead of only home consumption. Table 5 below shows a comparison of maize bags obtained before and after the project per acre.

**Table 5: Maize Bags obtained before and after the project per one acre**

| Number of maize bags before the project        | Frequency | Percentage    |
|--|-----------|---------------|
| 1 to 3 bags                                    | 22        | 27.5          |
| 4 to 5 bags                                    | 47        | 58.75         |
| 6 to 8 bags                                    | 11        | 13.75         |
| <b>Total</b>                                   | <b>80</b> | <b>100.00</b> |
| Number of bags of maize bags after the project | Frequency | Percentage    |
| 10 to 15 bags                                  | 56        | 70            |
| 16 to 20 bags                                  | 24        | 30            |
| <b>Total</b>                                   | <b>80</b> | <b>100.00</b> |

Source: Field Survey 2019

Table 5 above shows that the number of maize bags obtained by the small-scale farmers per acre was very few before starting the project through China's funding. The small-scale farmers said that this was due to a lack of agricultural skills. Most small-scale farmers acknowledged the use of traditional ways of farming before the project which impeded growth of more yield. As proved in Table 5 above, the small-scale farmer-beneficiaries of the project said there was an increase in the number of maize bags per acre after the implementation of the project. The results in the table show that 70% of small-scale farmers after the project implementation got 10 to 15 bags of maize per acre and other small-scale farmers (30%) got 15 to 20 bags of maize. China's financing of this agricultural project in Kilosa District provided both agricultural knowledge and financial support which boosted farmers on getting more yields. One small-scale farmer in Peapea village had this to say;

*I thank the project for its commitment to agriculture knowledge sharing. My production has increased to the extent of enabling me to sell excess food for basic income. Before having this important agricultural knowledge such as the use of fertilizers, appropriate spacing and other planting techniques like the number of seeds to put per each hole during planting and so on, I would cultivate like 5 bags of maize a year on 1 acre of land. By utilizing the knowledge and skills acquired from the project implementations, I now cultivate 8 to 9 bags of maize on 1 acre. (Small Scale Farmer, Female, Peapea Village)*

**Another small-scale farmer from Tembeni village had this to say;**

*The project provided loans to all farmers without segregation. Many lending institutions do not want to give loans to women because they think we do not have security in terms of property. I received 200,000 tshs from the project as a loan to help me buy fertilizers and pesticides for my maize field. There was no interest on the loan and I was supposed to repay the loan after harvesting. I had a huge maize production boosted by fertilizer application. Thanks to the project loan I was able to get surplus maize for sale which enabled me to buy a motorcycle for 'shamba' work and I also paid back the loan. (Small-scale farmer, Female, Tembeni village)*

**The FGD with small-scale farmers from Shuleni village had the following to disclose;**

*In the beginning, we were quite sceptical about the project. This is because many local projects have been failing to meet their intended objectives. But when we saw our fellow small-scale farmers who enrolled under this project in its first phase of 2012 - 2015 advancing in their agricultural production and even surpassing us in terms of agricultural productivity, we decided to actively participate in the project activities as well because we had then known that this will be a successful project. Many of us here are the current beneficiaries for this second phase of the project 2015 - 2018. We were very happy about the project renewal because we would have regretted our decision, in the beginning, to refuse to be part of the project. (FGD, Small-scale farmer, Male, Shuleni village, Kilosa District)*

The findings revealed that a number of trainings received by the small-scale farmers boosted farmers' agricultural productivity. The training package included; using improved seed varieties, ensuring proper spacing of maize, using the appropriate number of inorganic fertilizers, practicing intercropping, weed control, use of appropriate technologies and so on. The study elaborated on some of these trainings as evidenced below.

#### 4.2.1.1 Practicing Appropriate Maize Spacing

Small-scale farmers reported that they were trained in three types of maize spacing by the project. Table 6 below shows the maize spacing methods used by small-scale farmers in Kilosa district.

**Table 5: Maize spacing methods adopted by small-scale farmers**

| Maize spacing | Frequency | Percentage |
|---------------|-----------|------------|
| 30 x 90       | 32        | 40         |
| 30 x 75       | 12        | 15         |
| 30 x 60       | 36        | 45         |
| <b>Total</b>  | <b>80</b> | <b>100</b> |

Source: Field Survey 2019

As shown in Table 6 above, the majority of small-scale farmers opted for 30 x 90 cm spacing and 30 x 60 spacing because they could practice intercropping as well with crops like pigeon peas and sunflower. One small-scale farmer in Madukani village had this to say on the benefits he had achieved as a result of practicing appropriate maize spacing.

*I thought I did not need the project knowledge package on the spacing of maize because I considered myself an expert in maize planting. I am educated enough to know how to do farming properly. I was challenged by my pride when I realized that when I applied the maize spacing recommended during the project agricultural training, I got a lot of maize yields. I used to practice my spacing of 25 x 50 cm but when I tried using 30 x 60 cm, the results were amazing. I was a person who used to harvest only 7 bags using the previous spacing. I could now harvest 10 bags or above with the latter spacing on each acre of land. (Small-scale farmer, Male, Madukani village, Kilosa District)*

#### 4.2.1.2 Formed a Small Savings Farmers Group (SACCOs)

The findings revealed that the knowledge on saving and borrowing money acquired during the training motivated the small-scale farmers to form a small saving group or union (SACCOs) where they contribute some amount of money and a member can have an opportunity to get a loan at a small interest of 3%. The small-scale farmers said that the loan is very crucial for a farmer, particularly during cultivation where money is needed. In a focus group discussion with the small-scale rice farmers in Peapea Village, they had the following to express;

*We have our small savings group. At the moment, it has about 30 small-scale farmers. Each month, each member is supposed to contribute 5,000 tshs. The purpose of this saving group is to assist small-scale farmers with loans to buy agricultural inputs and equipment. We have a very small interest on the loans which is shared equally among small-scale farmers. For the moment, loans are only given to the SACCO group members but in the future when our group expands and is properly strengthened with proper structures and legal documentation, then we can borrow to both members and non-members. We do not have a legal name for our SACCO group yet. Our SACCO bank account is in the names of two members at the moment. (FGD, Small-scale farmers, Peapea Village, Kilosa district)*

#### 4.2.1.3 Use of appropriate technologies

Small-scale farmers reported that they were encouraged to practice mechanized agriculture. This is because mechanized agriculture saves time and reduces the costs associated with labor-intensive technology. Table 7 below shows a comparison of modern technology usage before and after the project.

**Table 6: Technology adopted by small-scale farmers before and after the project**

| Farm equipment used before the project | Frequency | Percentage    |
|--|-----------|---------------|
| Use of Tractors                        | 12        | 15.00         |
| Use of Hand hoes                       | 68        | 85.00         |
| <b>Total</b>                           | <b>80</b> | <b>100.00</b> |
| Farm equipment used after the project  | Frequency | Percentage    |
| Use of Tractors                        | 76        | 95            |
| Use of Hand hoes                       | 4         | 5             |
| <b>Total</b>                           | <b>80</b> | <b>100.00</b> |

**Source:** Field Survey 2019

Table 7 above shows that many small-scale farmers were using traditional agricultural tools such as hand hoes before the project. When asked why they were using hand hoes, the small-scale farmers said that they were not aware of the associated benefits of using tractors.

As shown in Table 7 above, a majority (95%) of small-scale farmers were using modern farming techniques such as the use of tractors after the project, as project beneficiaries. The small-scale farmers recognized that the project opened their eyes to the importance of practicing mechanized agriculture which is associated with higher yields. This motivated them to start borrowing tractors for cultivation. The tractor price per acre is 40,000tshs. One small-scale farmer had the following to say;

*A long time ago, we had enough family members who could till the land in a few days. But now, there is a lot of migration to urban areas. Farms do not have enough labor force. The use of tractors helps to fill in this labor shortage gap. Tractors also save time. For example, cultivating 5 acres of land will take a tractor only a few hours but with human labor and hand hoes, you might end up using three days. (Small-scale farmer, Male, Peapea Village, Kilosa District)*

In a focus group discussion with the small-scale farmers in Tembeni village, Kilosa district, they had the following to add;

*Tractors normally help us cultivate a large piece of land and we can grow more food. When we grow more food and earn more income, we can feed our families, send our children to school, provide for our family's health, and invest in our farms. This makes our communities economically stronger and more stable. (FGD, Small scale farmers, Tembeni Village, Kilosa district)*

#### 4.2.1.4 Use of Improved seed varieties

The findings revealed that despite small-scale farmers being encouraged to use improved seed varieties, the majority (81.25%) were using local seeds and only 18.75% were using hybrid seeds as encouraged during the project agricultural training. When asked why they opted for local seeds, small-scale farmers said the improved seeds do not grow on their agricultural fields. They reported that the government through the district provided them with improved seeds but these seeds failed to grow on their land and that is why they opted to use seeds from their previous harvest.

#### 4.2.1.5 Appropriate Number of maize seeds planted per hole

Small-scale farmers reported that the project trained them in the appropriate planting of maize seeds. The recommended number was one or two seeds per hole. However, the findings revealed that the majority (86.25%) of the small-scale farmers in the project planted either three or four seeds per hole. Since they were using local seeds as also revealed in the previous findings, they said putting three or four local seeds per hole, you are assured of growth of at least one or two seeds. This is because local seeds are normally attacked by insects in the soil as opposed to the improved seeds. Small-scale farmers who planted one or two seeds per hole were 13.75%.

#### 4.2.1.6 Application of Fertilizers

The findings revealed that the majority (92.5%) of small-scale farmers were using inorganic fertilizers and only 7.5% were using organic fertilizers. When asked the reasons why many of them opted for inorganic fertilizers, small-scale farmers said that inorganic fertilizers were good for commercial purposes. They added that if the farm is big and if anyone wants to make a profit, they have to use inorganic fertilizers.

*Organic fertilizers are normally good because they do not have chemicals and therefore good for human health. The nutrients the plant absorbs are zero-chemical. Organic fertilizers are sometimes easy to get because some of us are animal keepers and can therefore use our animal dung as manure but sometimes you might not get enough animal dung for your whole field and therefore, you have to utilize inorganic fertilizers. Inorganic fertilizers are easily accessible here in our village. It is only your pocket that will decide. The project loans are helping us greatly to buy fertilizers for applying in our farms. The project encourages us greatly to use fertilizers. (Small-scale farmer, Male, Shuleni village)*

#### 4.2.2 Infrastructure Developments

The findings revealed that the project installed water (brought the water pump to the demonstration site) to increase the villagers' access to water.

The findings also revealed that transport is no longer a problem as the project built a mud road linking the small interior feeder roads in the villages to the main road but gets slippery during the rainy season.

#### 4.3 Barriers that Impede China's Small-Scale Agriculture Financing Effectiveness in Kilosa District

The study sought to look into the barriers that impede China's agricultural aid effectiveness in Kilosa District. Responses were gathered from the small-scale farmers and the findings revealed that lack of access to markets where small-scale farmers could sell their agricultural products was the major barrier to the Chinese agricultural aid effectiveness through the community development project titled "Promoting Small Farmer Agriculture for Poverty Reduction". Table 8 below shows the barriers reported by the small-scale farmers in the project implementations.

**Table 7 Barriers to China's Agricultural Aid Effectiveness in Kilosa District**

| Barriers to effective agriculture aid | Frequency | Percentage    |
|---------------------------------------|-----------|---------------|
| Insufficient rainfall                 | 18        | 22.50         |
| Market                                | 29        | 36.25         |
| Lack of irrigation                    | 24        | 30.00         |
| Pastoralist invasion                  | 9         | 11.25         |
| <b>Total</b>                          | <b>80</b> | <b>100.00</b> |

Source: Field Survey 2019

#### 4.3.1 Lack of access to the market by small-scale farmers

The findings revealed that the main challenge was market for the agricultural products. Small-scale farmers said that they struggle to find a market for their products especially when they have a bumper harvest. They said that they have no connections to the different market outlets that can absorb their huge stocks. In the focus group discussion with the small-scale farmers in Kilosa district, they had the following to express:

*We do not benefit much from our agricultural products because we do not have access to the different markets. Middlemen come here and buy our products cheaply during harvest and sell expensively to the city. We also have a problem with the traders to whom we sell our goods to tempering with the weighing scales and therefore you cannot get the correct measurements. We also have a problem with traders who turn up for one season and the*

next season, they disappear. We are normally compelled to sell off our agricultural products at harvest without storing foregoing the profits from selling when the prices rise later in the year because we are challenged in terms of proper storage of harvest. We do not have storage capacity to keep our produce. (FGD, small-scale farmers, Kilosa District).

#### 4.3.2 Lack of irrigation in the villages

The findings revealed that the lack of irrigation in the villages is another problem constraining the project operations. The small-scale farmers said that with irrigation, you are assured of constant production but because they have no irrigation scheme in the villages, it affects their agricultural productivity. The small-scale farmers acknowledge the project for installing a water tank at the learning center (demonstration site) which is assisting the villagers with clean and safe water but the villagers reported that not all of them can easily access the water because of the long walking distance to the learning center from their homes. One small-scale farmer had the following to say;

*It is not easy for us to get water to assist us in our homes as every day we have to walk from Tembeni village to the learning site to fetch water and sometimes we are very tired from the day's farm work. (Small-scale farmer, Female, Tembeni village)*

#### 4.3.3 Insufficient rainfall

The findings revealed a problem of insufficient rainfall. Since they are still relying on rain-fed agriculture, the small-scale farmers said that they are experiencing a problem of long periods of drought lately due to the changes in the climatic conditions. They said that the rainy seasons are now scarce, when you expect to receive rain for two months, you only end up getting it in three weeks.

*Rain is very little. The sun is too much. Most of our crops have dried up. Some that have survived the scorching sun, end up giving less yields because they lack sufficient water. We are tormented by unreliable rains. (Small-scale farmer, Male, Shuleni Village)*

#### 4.3.4 Pastoralist invasion of farmer's agricultural land

The findings revealed a problem of pastoralist invasion. The small-scale farmers said that in Kilosa District, there has been a constant conflict between the pastoralist society and the farming society over land for farming and grazing. The pastoralist groups tend to migrate and settle in areas with great pastures. For example, Peapea village in Kilosa District is one of the areas with the two big pastoral groups in Tanzania, the Masai and the Sukuma and these often conflict with the farmers over land. One Agriculture District Officer said that land conflicts have contributed towards the slow growth in agriculture and therefore disrupted most poverty reduction initiatives in the area.

#### Case Study: Small-scale farmer, Shuleni Village

My name is Rose (pseudonym) and I am a small-scale farmer from Shuleni Village, Peapea Ward. I grow various crops including maize, beans, pigeon peas and ground nuts on my three-acre piece of land. Like many other farmers in the area, maize is the common crop I have planted for many years because it is my family's main source of food. For as long as I can remember before the project implementation, I was faced with many challenges in maize production although some are still apparent. This included infestation of dangerous weeds and mainly 'kiduha' weed, dwindling of land fertility leading to low maize yields and unreliable rains. The implementation of the agricultural Project by China has helped many maize farmers especially in improving their maize production. I remember when the project came to the area, I was eager to be among the project beneficiaries. The project has trained us to make the best out of our agricultural fields by using various technologies to improve yields. I am a campaigner for the use of tractors and modern fertilizers in farming in this area. I have always encouraged my fellow farmers to adopt these technologies because I have a good experience. With improved technologies, you are assured of getting good yields. The major problem is that we are still relying on rain-fed agriculture. Sometimes you hire a tractor to clear your agricultural field in readiness for the expected rains at a specific period but sometimes the rains are delayed or do not appear at all. You end up having sleepless nights thinking of the rain because you often worry about investing in a venture and reap nothing at the end of the day. I remember in 2013, I devotedly put my money into my three-acre piece of land expecting to utilize the long rains between March and April to grow maize with a very high expectation that I would get enough bumper harvest for my family's subsistence and even have a surplus for sale. I was so devastated when my efforts were for nothing because the rains were unreliable which affected the maize production and thus got lower yields.

From the above case study, we can recognize the problems associated with rain-fed agriculture. The above small-scale farmer invested money which she unfortunately lost due to unreliable rains. Rathore, Singh, et al., (2010) noted that the problems associated with rain-fed agriculture are multifarious and the more striking ones include: low cropping intensity, high cost of cultivation, poor adoption of modern technology, uncertainty in output, low productivity, increasing number of suicides among farmers, lack of institutional credit, inadequate public investment and high incidence of rural poverty. Sharma (2011) acknowledged that farmers in the high-potential irrigated regions have increased crop yields per annum compared to those in the rain-fed regions. The large yield gap suggests that there is much to gain by improving productivity in rain-fed agriculture. Sharma (2011) argued that water management could be a key strategy to unlock rain-fed production potential. Rao and Molina (2015) recommended management practices such as improved cultivars, site-specific nutrient management (precision agriculture), and water harvesting and recycling which they urged that it can potentially increase the yields in several crops, indicating the large realizable potential under rain-fed conditions. McCormick and Shah (2009) explained that collecting small amounts of run-off using macro-catchments during the rainy season and utilizing this resource for supplementary irrigation can improve



agricultural production in rain-fed areas. Gardiner, Ossiya et al., (2017) applauded the president of Uganda, Yoweri Museveni, for his practical approach in advising and demonstrating to farmers how to irrigate their gardens using a bicycle and jerrycan to fetch water. However, the reality in Tanzania is that they are largely a nation of peasant farmers. Modern technology such as motorized sprinkler irrigation systems and tractors for all farmers is a desirable but distant dream for the average farmer in Kilosa district. We have to work with what is within our reach. What we need is appropriate technology that is practical, easily accessible and sustainable. Significantly, the case study above has highlighted relying on rainfall alone as a key agricultural challenge. This high-level attention will hopefully be translated into the establishment of an irrigation scheme in Kilosa district.

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## V. STRATEGIES IN PLACE TO SUSTAIN THE PROJECT'S ACHIEVEMENTS

The study sought to identify some of the strategies in place to sustain the project's achievements. These included:

🔥 **Setting up of the Learning Center / Demonstration Site at Peapea Village:** This creative strategy is thought to make project activities, particularly project training, more well-known, broadening their impact well beyond the project region.

🔥 **Partnerships:**

The project has shown that more than one actor is required to achieve the aforementioned project accomplishments. The project's holistic approach was made possible through partnerships with a number of stakeholders, including the Ministry of Agriculture, regional office, local authorities, district officials, and the small-scale farmers themselves. Partners have a higher propensity to build on project successes and guarantee sustainability.

🔥 **Project ownership:**

Due to the project's immediate benefits, small-scale farmers who participated in interviews expressed and demonstrated a greater sense of ownership of the project. Ownership of the project by the project beneficiaries might increase their trust in it, which could lead to spillover effects in other areas.

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## VI. CONCLUSION

Much of the agricultural aid from China, through a community development project titled "Promoting Small Farmer Agriculture for Poverty Reduction", in Kilosa district, was through knowledge transfer. A small proportion of it was through financial transfer, e.g., provision of agricultural loans to small-scale farmers in Kilosa district. The Chinese donors shared agricultural knowledge at a greater scale due to the more important role information plays in agriculture whereby each agricultural issue or initiative needs to be shared with others. It is also possible that donors are under-resourced given their tight budget lines to fund activities, so knowledge transfer could be the best inexpensive form of assistance.

Sometimes when we talk about international aid, it is all about poverty reduction. So, when we are making assessments of aid usefulness, we need to be clear about what kind of poverty reduction objective are we talking about. If agricultural aid assists in addressing significant issues for small-scale farmers, it is a priceless resource. The livelihoods of small-scale farmers in Tanzania's Kilosa district have significantly improved as a result of China's funding of small-scale agriculture in the area through a community development project titled "Promoting Small Farmer Agriculture for Poverty Reduction. Small-scale farmers' yields have grown significantly in the district, and higher incomes have also been noted.

Effective aid is about how donors use their money to catalyse much more impact than the money they inject. The Chinese in Kilosa district translated their commitments into action given the evidence on the number of achievements recorded in their funded community development project titled "Promoting Small Farmer Agriculture for Poverty Reduction". Donors normally need to choose programs that work and drop those programs that do not work and they should identify things that they have not been doing at the moment. What are the development results that I want to see? and, how will I manage effectively the results that I am going to deliver. - These should be the two important questions for most donors.

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