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A Case for the Congo: How Can Education and Agriculture Lead to Economic Development?

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by

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If you want to go fast, go alone. If you want to go far, go together.

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Contents

Abstract

Since its independence from Belgium in 1960 until this point in time, the Democratic Republic of the Congo has more than often experienced violence and political instability that have prevented the creation of a stable economy and functional political system. As a result, quality education and high paying jobs are scarce in the DR Congo today, resulting in poverty to the extent where many people in the country live on less than $1.90 per day. According to the International Labour Organization, as many as 68.7% of Congolese worked in agriculture in 2019. This paper investigates how education and training can help smallholder farmers in the Congo adopt more advanced farming methods, which can increase their yields and productivity, income and quality of life, and lead to economic development in the long run. Crop diversification, organizational reforms, technological change and incentivization are the four main components that this paper recommends to prioritize in order to achieve the goal of agricultural development. Agricultural education and training and farmer field schools are among the programs through which rural farming communities in the Congo can be empowered to expand their economic capabilities. However, success and replicability will depend on political and economic stability in the country.

Keywords: DR Congo, education, employment, agriculture, economic development

JEL Classification: I25, O13, Q1

CHAPTER 1: INTRODUCTION

1.1. Introduction

While the economic development of any country depends on the education and employment of its citizens, the Congo has not been able to create institutions that can provide quality education and high paying jobs for its citizens. When we think about that, it makes sense that quality education and high paying jobs will result in economic development in the long run as they both lead to a more efficient and productive economy. With that, ever since independence from Belgium in 1960 to this point in time, the Democratic Republic of the Congo has more than often experienced violence and sudden shifts of power which have been preventing the creation of a vibrant economy and functional political system (Reid, 2018). As a result, quality education and high paying jobs are scarce in the Congo, a country in which today many people live on less than $1.90 per day (Sachs, Schmidt-Traub, Kroll, Durand-Delacre, & Teksoz, 2017).

According to the International Labour Organization, 68.7% of Congolese work in agriculture, and the gross domestic product (GDP) per capita of the country's economy was just about $462 in 2017. In that same year, the Congolese labor force officially included 31.36 million people in total, or 18th most in the world (CIA, 2020). As such, more than 20 million people in the Congo work in agriculture. However, that is while an estimated 75% of the population is underfed (FAO, 2011). Further, the rural population in the Congo is reported to have been 55.54% (or just around 40 million) in 2018 by the World Bank.

This paper is going to investigate how education and agriculture can lead to economic development in the Congo. The idea here is that with specialized education and training, it is very possible that rural farmers in the Congo can become better informed as to which farming methods and technologies to adopt so that their productivity and yields, and subsequently income and quality of life, can be improved (Thurlow, Benin, Fan, & Diao, 2012). Notably, the end goal of economic development in this case is the expansion of capabilities. As a result, with an empowered agricultural workforce, economic growth can be sustained and eventually lead to economic development in the long run.

In an attempt to more precisely answer the question of how education and agriculture can lead to economic development in the Congo, where an estimated 75% of the population is underfed (FAO, 2011), the first chapter of this paper gives an overall background of the Congo; the second chapter will provide a theoretical framework that elaborates on how education and agriculture can lead to economic development along with a few examples of the available tools, programs, concepts, components, and other cases of agricultural development with the use of education; the third chapter will be a case study of four specific agricultural development programs from the Congo; and the fourth and final chapter will be a proposal on how education and agriculture can lead to economic development in the Congo, based on an analysis of information from the previous chapters.

1.2. A Portrait of the 68.7%

As it has been mentioned above, about 68.7% of the Congolese population works in agriculture. However, given that they use artisanal farming methods and that they have a limited access to markets, the many families that depend on agriculture as a source of food and income can barely get by. Many of those families live in rural areas, and while the situation is not a lot more better in terms of quality of life in big cities where high paying jobs are also scarce, the low wages in rural areas also limit access to healthcare and education other than food. As many Congolese families can more than often include six or even more members, the limited pay from the available jobs that are only in agriculture do not allow for a stable life.

As a result, many people in the Congo would initiate their own gigs and join the informal sector, which is made of a total of roughly 90% of laborers in subsistence agriculture, informal commerce or mining, among other activities in the informal economy (U.S. Department of State, 2015). In the Congo, it is very common to see women who sell everything from fruits to vegetables, fishermen who sell fresh fish, or even young children who sell clothes, shoes and candy. Barbershops and shoe shining stations are also a significant part of the informal sector in the Congo. In all of these cases, the pay is low and unreliable, and will not suffice for food, education and healthcare.

According to the Food and Agriculture Organization (FAO) of the United Nations (UN), about 13.6 million people are estimated to be severely food insecure in the Congo, with most of them residing in provinces where the security situation remains precarious and households face

serious food access constraints (2020). Further, over 6 million, or as much as 43% of children under the age of 5 suffer from chronic malnutrition in the Congo (USAID, 2018). Malnutrition in childhood and pregnancy has many adverse consequences for child survival and long-term well-being. It also has far-reaching consequences for human capital, economic productivity, and national development overall.

When it comes to the formal public and private sectors in the Congo, the situation is not at all significantly better. Notably, the official minimum wage in the Congo is $1.83 per day, which gets us to just about a salary of $600 in good cases. In worse cases, you may either be unemployed, working for very little pay, or you might have been working with years worth of arrears (U.S. Department of State, 2015). In the case of government salaries, they range from $49 to $82 per month, or more with bonuses which can sometimes be considerably higher. With that, salary arrears are also not uncommon in the public service sector. When adjusted for purchasing power parity (PPP), the GDP in the Congo was $561.78 in 2018 (World Bank, 2020).

When we think about it, it makes sense that the provision of quality education and high paying jobs will lead to economic development as the former can lead to increased productivity in advanced fields and the latter to higher incomes to sustain growth. Both education and employment are obviously inextricable from economic growth and development. However, as we can see, so far, the inability of the Congolese government and people to provide or create both quality education and high paying jobs in the local economy has been halting economic development in the country. Today, the quality of life in the Congo is very low and extreme poverty is seen throughout the country.

For instance, let us take a look at the case of André Bukasa, a 36 year-old married father of five who has learned how to work the land at a very young age from his father.[1] Like many of his neighbors in rural South-Kivu, many of whom have attended school only for a few years or not at all, Bukasa earns up to $2 on a good day from selling his crops, some milk and eggs. Most of the time, Bukasa earns even less than $2 a day. Sometimes, he even earns nothing at all from selling his agricultural products at the nearest but still very far market, or to his neighbors. Overall, machinery is not used in their community and the yields that they are able to see from artisanal farming are relatively low for nutrition and to generate a substantive income.

The little that Bukasa earns makes it very difficult for him to feed and support his family of 7. Sometimes, when things are not really going due to low production or little sales, it may even mean that not enough ingredients can be found or bought in order to cook any meals for the day. In terms of schooling, Bukasa has been struggling to send his youngest children to school. Two of his eldest were able to attend a nearby institution until 8th grade. When Bukasa and his wife gave more births and that they expanded their family, schooling became less of a priority because of more crucial needs in the present. While schooling can be beneficial in the long run, at present, paying the tuition of five children is not possible because of nutritional and other daily needs that cannot be satisfied thoroughly given financial constraints. His wife Amini, 26, is in charge of taking care of the house and the children, and she also helps with the land and some of the domestic animals that they own. She too has very little schooling. When possible, she provides hairdressing and tailoring services for their neighbors in order to generate a supplemental income.

[1] Figment of my imagination, in accordance with personal real-life experiences, documentary scenes and interviews of Congolese farmers.

On a typical day, Bukasa wakes up by 5:30 am, starts his day with a prayer, and then attends to his land for work and to gather products that he can sell later during the day at the market. The main crops that are cultivated in his area in South Kivu are manioc (cassava), plantains, bananas, peanuts, palm oil, tomatoes, other fruits and vegetables, yams, beans, peas and maize. The supply and demand of those crops fluctuates and varies depending on the season. Big cities will even import those from nearby countries. Bukasa himself grows cassava, tomatoes and plantains, in addition to owning a few goats and chickens for milk and eggs, which he sells at the market after having assured and satisfied his family's dietary needs first. In addition, trading his produce with his rural neighbors in exchange for food, cash or other goods and services is not uncommon to him.

Given that Bukasa lives in a remote village, he has to load his bicycles with products and carry them with him for a 2.5 hours journey until he arrives to Kadutu, the nearest town to him. There, at a marketplace called "Feu Rouge" (red lights), Bukasa will spend several hours among other buyers and sellers, even under the rain and burning sun, in hopes to sell as much of the products that he has brought with him. Like him, several other rural farmers sell their crops beside him while trying to make ends meet. After selling the little agricultural produce that they were able to gather and spare, Bukasa and others return home by dusk, hoping to have supper, a better day tomorrow, and an even better future for them and their offspring in the Congo.

At present, without reliable electricity and access to sophisticated farming material, Bukasa and his fellow farmer neighbors have to work the land by hand and use fertilizers from their domesticated animals. At times they are able to purchase fertilizers but that is not so sustainable given financial limitations and the lack of appropriate irrigation and infrastructure.

For assistance, both financial and agricultural education, allowing for advanced farming methods and technological adoption, would be beneficial for Bukasa and the other members of his community. Other than that, the presence of armed groups in the area does not make matters easier for them.

1.3. Historical and Geographic Background

The Democratic Republic of the Congo (DRC) spans approximately 905,567 square miles and has a population of more than 80 million people as the second largest country in Africa. The Congo is located in the middle of the African continent, an area with geographical advantages that allow for its natural riches (Herderschee, Kaiser, Mukoko, & Djomo, 2011). Vast areas of arable land and resources such as gold, diamonds, coltan and copper are to be found (BBC, 2019). In fact, raw minerals are the country's largest export and also contribute the most to its revenues. The Congo River, the second longest in Africa after the Nile, flows from Zambia in the south towards the Congo in the north and then all the way to the South Atlantic Ocean in the west. Angola, the South Atlantic Ocean, the Republic of Congo, the Central African Republic, South Sudan, Uganda, Rwanda, Burundi, Tanzania across Lake Tanganyika, and Zambia all border with the Congo.

Although it is called the Democratic Republic of the Congo, the Congo is neither a democracy nor a republic in practice. In 1960, the Congo declared its independence from Belgium after about a century of exploitation and colonialism. However, that long awaited independence was followed by years of war, conflict and violence, resulting in economic and

political instability. The current president of the Congo, Félix Antoine Tshisekedi Tshilombo, was recently, in January 2019, officially elected into office (BBC, 2019). That happened after the former president of the Congo, Joseph Kabila Kabange, became president and ruled over the country since 2001, following the assassination by shooting of his father, Laurent-Désiré Kabila, by one of his teenage bodyguards in that same year.

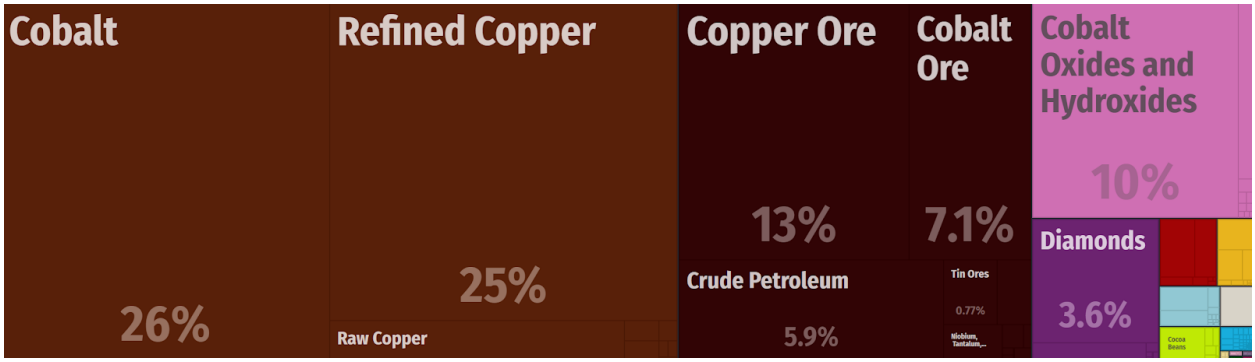
Before Kabila the son and Kabila the father, the Congo was under the rule of military dictator Mobutu Sese Seko Kuku Ngbendu Wa Za Banga from 1965 to 1997, when Kabila the father overthrew him (Reid, 2018). Before Mobutu, who failed very miserably as the leader of the newly independent country, Joseph Kasa-Vubu briefly ruled over the Congo for five years. During Kasa-Vubu's rule, Patrice Lumumba was briefly the first prime minister of the Congo from June 24, 1960 to September 5, 1960. Today, Lumumba, who was executed by a firing squad, is seen as a martyr by many.

Before Kasa-Vubu, Leopold II of Belgium, and then Belgian state, ruled over and exploited the Congo from 1885 until its independence in 1960. In 1878, with the help of explorer Henry Stanley who visited the Congo, King Leopold, who never set foot in the Congo, was able to explore the area remotely and establish his venture as a colony in the Congo area. During the period of the king's and then the state's rule, there might have been up to 10 million people who lost their lives due to the violence and forced labor system that was practiced (Hochschild, 1998). Before the Belgians, there were periods of slave trade in the 16th and 17th centuries in the Congo, with the involvement of British, Dutch, Portuguese and French merchants, which was later abolished by King Leopold II of Belgium (Gathara, 2019). Previously in 1482, Portuguese navigator Diogo Cao became the first European to visit the Congo, which was known as the

Kongo Empire at the time, and was established in the 1200s with slightly different borders (BBC, 2019).

In addition to the historical events above, a common issue in the Congo over the years has been the continued gain of control over its resource-rich lands, and then their exploitation followed by the export of their extracts abroad, very often via corruption (Reid, 2018). As a result, recurring cycles of rent seeking, which is when monetary gain is created for an exclusive group of people without adding real intrinsic value to the economy as a whole, are repeated in the country. That is while incidents of ethnic violence and the rebel groups are prevailing in the country and add to its instability.

Figure 1.1: Congo Exports, 2017



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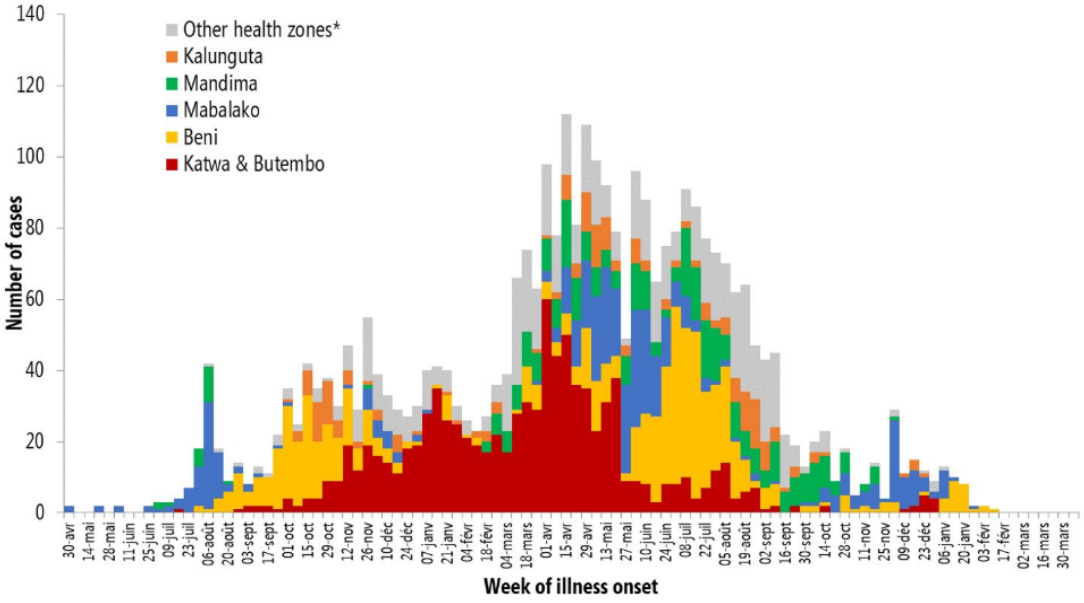
In the case of the Congo, very rich in minerals, rent seeking is a big loss as those funds are more than necessary and can be used for the good of the local economy if they were to be invested appropriately and with transparency in the provision of quality education and the creation of high paying jobs that can lead to economic growth. With that being said, based on figure 1.1 above, in 2017 the Congo, with transparency, exported $7.23 billion worth of natural

resources led by cobalt which represent 26% of total exports, and followed by Refined Copper which account for 25% (The Observatory of Economic Complexity, 2017).

However, up to this moment in time, the Congo is still unstable and often experiences both political and ethnic conflicts, as well as threats from various rebel groups, in addition to the exploitation of its natural resources. The recurring conflicts and ongoing insecurity over the years impede daily activity and work in the Congo, resulting in unemployment, poverty and uncertainty about the future (Reid, 2018). According to the British Broadcasting Corporation (BBC), conflicts in the Congo have claimed around six million lives, a figure that includes people who lost their lives during war or as a result of disease and malnutrition (2019). The current life expectancy in the country where an estimated 69% of the population lives on less than $1.90 per day is 58 years for men and 61 years for women. The high fertility rate in the Congo had increased from 6.3 children per woman in 2007 to 6.6 children per woman in 2014 (USAID, 2018).

Currently led by Félix Antoine Tshisekedi Tshilombo, its 5th President, the Democratic Republic of the Congo is soon to turn 60, and has almost emerged from a deadly Ebola outbreak in the eastern part of the country. Considered a national medical emergency and the world's second largest Ebola epidemic on record, as we can see based on figure 1.2 below, more than 2,200 lives have been lost while there have been more than 3,300 confirmed cases of infection since the outbreak was declared in August 2018 and as of April 2020. Such a life threatening situation, in addition to the current COVID-19 with 215 cases and 20 deaths as of April 2020, is having a toll on the country which already is struggling very badly politically and economically.

Figure 1.2: Ebola in the Congo, 2018 to 2020



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Tshisekedi Tshilombo, the son of the late long-time opposition leader Étienne Tshisekedi, was inaugurated as the new president of the Congo on January 24, 2019. His inauguration came to be after former president Joseph Kabila Kabange had been in power from 2001 following the assasination of his father Laurent Kabila who was shot dead by one of his bodyguards (BBC, 2019). Some today even claim that Kabila still has a hold on politics in the country from the shadows through his political allies who are still in public service and control many of the ministerial departments (Bujakera, 2019).

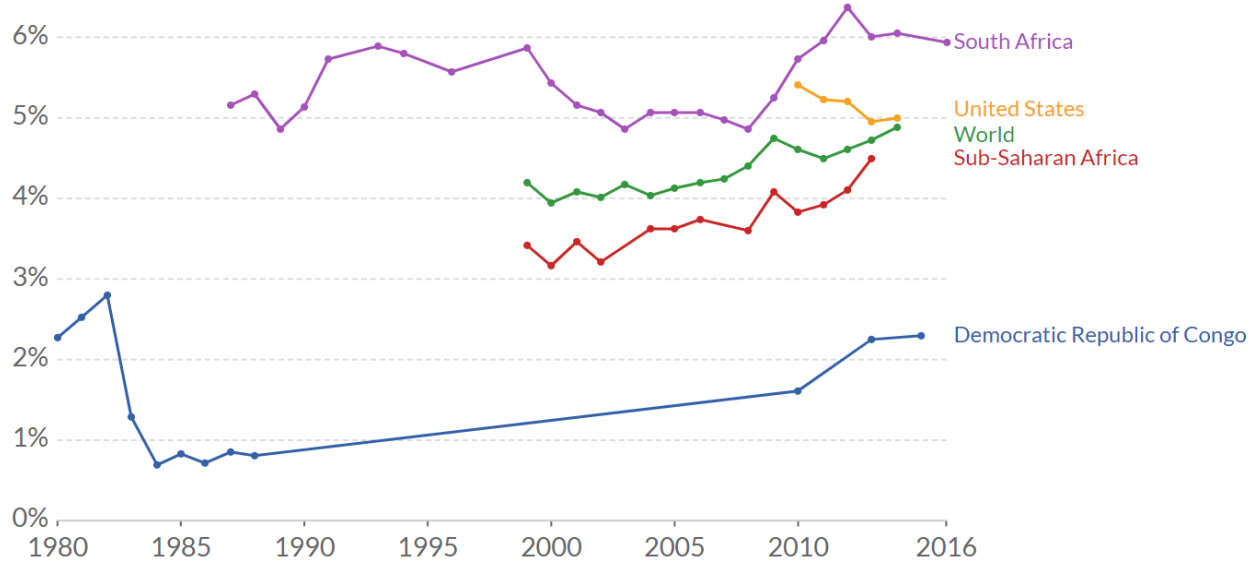
From the start, Tshisekedi had made very big social promises as part of his presidential goals, promises which started while still on a political campaign that he won following controversial elections and him being accused of, but categorically denying, having done a backroom deal with the former government (Reuters, 2019). Notably, President Tshisekedi had

promised back in early 2019 that he would establish free primary education in the Congo, which would benefit more than 20 million children (Kavanagh, 2019a). The government could invest a lot of money and fail, which is part of the reason why it needs to be heavily involved in incentivizing students, parents and teachers (Ganimian & Murnane, 2014).

Tshisekedi also created a number of agencies to work under the government in an effort to fight corruption, encourage investment and improve the business climate in the country (The Africa Report, 2020). If we want a prosperous and successful nation, the government has to start now and stop tinkering and thieving by stealth (Sowell, 2010). However, while over 40,000 new teachers were hired in 2019, and while President Tshisekedi was kept busy abroad with official visits to Belgium, France (RFI, 2019), Russia, Uganda, in addition to more trips, these measures have not been thoroughly implemented yet. None of the 40,000 teachers was paid and some of them went on strike.

In addition, the budget of Tshisekedi's educational and economic initiatives were poorly evaluated, and the Ministry of Finance has been unable to release the necessary funds (Gras & Tshiamala, 2020). $2.6 billion, or 40% of last year's budget, was the amount to be spent on free primary education for all Congolese (The Economist, 2020). This year, the Congolese government has agreed to receive big loans from the International Monetary Fund (IMF) and World Bank, conditional on more transparency and reforms. The government is counting on $500 million from the World Bank and about $1.5 billion over three years from the International Monetary Fund (Kavanagh, 2019a). To note, the IMF had halted its prior loan program with the Congo in 2012 due to concerns regarding corruption in the mining industry.

Figure 1.3: Government Expenditure on Education (% of GDP), 1980 to 2016



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As it can be seen in figure 1.3 above, the Congo has been lagging behind over the years in terms of how much of its gross domestic product (GDP) it invests into education when compared to the world, the United States, Sub-Saharan Africa, and South Africa. As one of the most developed countries in Africa at this point in time, South Africa has an estimated GDP per capita (PPP) of $13,965. For the Congo, the estimated GDP per capita (PPP) in 2020 is just about $873 (IMF).

As such, given that government expenditure on education and GDP, or a country's level of economic development, seem to correlate, Tshisekedi's plan to invest more in Congolese education is likely to be an informed and good decision to start his five-year term. For the rest, which are not at all less important, the quality of education and availability of jobs, in addition to the establishment of a stable economic and business environment, which have been included in

Tshisekedi's presidential plans, will definitely matter because they offer an opportunity for employment to transfer what has been learned into products and services for economic growth.

The Congolese government's budget for 2020 is projected to stand at $10.2 billion, which is as much as 63% higher than last year's budget (The Africa Report, 2020). While those additional funds can this time be invested into increasing the access to education and improve both the economic and business environment in the country through the new initiatives that were planned by Tshisekedi, the additional funds are also valued based on that domestic revenues will increase by 56% as a result of less fraud and tax evasion (*The Economist*, 2020). So far, agriculture has never received more than 2% of the national budget (Cros, 2019). Of that amount, some 80% is used to pay the salaries of agricultural officials, with no effect on agricultural worker production.

1.4. Education Background

While the future of any country heavily depends on the training and education of its children, given the amount of limited access to quality education in the Congo, in addition to government instability over several years, the country has been unable to reach a significant level of economic productivity although its great potential in terms of population size, area, and available resources (World Bank, 2005). According to Ann Veneman, the Executive Director of United Nations Children's Fund (UNICEF) from 2005 to 2010, the education system in the Congo has been failing as low attendance rates continued to plague its schools, adversely affecting the country's development (Bloeman, 2009). Around 2010, UNICEF had advocated

abolishing school fees in the Congo, but budgetary issues have thus far been difficult to overcome.

Today, 10 years later, budgetary issues still seem to be an obstacle for access to quality education in the Congo. At the same time, UNICEF Representative in the Congo, Pierrette Vu Thi, suggested that some progress was being done slowly but surely (2009). At that point in time, 10 years ago, the situation was such that as much as half of all children in the Congo did not go to school. Among the students who did go to school, most were boys and only half reached 5th grade (UNICEF, 2009). Unfortunately, the situation is not much better today in the Congo as the education system in the country is still plagued by low attendance and poor quality. Notably, 3.5 million children of primary school age are not in school, 44% of students start school after the age of six, and only 67% will be educated from 1st to 6th grade. Further, of those who reach 6th grade, only 75% will pass their exit exam (USAID, 2019).

One possible suggestion is that there is a need to increase government spending on education in order to improve both the access and quality of education in the Congo (De Herdt & Titeca, 2016). For now, given the current low government expenditure on education, teachers are not paid well and many families that are already struggling to feed their children are also unable to afford school fees. With Tshisekedi's new plan of free access to education, dependent on the government's ability to generate more local and international financing, more time has to pass for formal education to improve in the Congo. Eventually, with an implemented plan in the education system in the Congo, we may expect to see a population that acquires critical and analytical skills in a way that can be conducive to economic development. With more students

enrolled in primary education, attainment and achievement may both increase through tertiary education, resulting in lower cases of unemployment due to the lack of formal education.

In terms of a structure, the education system in the Congo is similar to that of Belgium in that there are three years of pre-primary school with an official entry age of three, six years of primary school, and then another six additional years of secondary education (EPDC, 2018). According to research done by Family Health International (FHI 360), around 18.5 million pupils are enrolled in both primary and secondary education in the Congo, while 22% of 15-24 year olds have not completed primary education (2018).

When it comes to tertiary education, there are many private and public colleges in the Congo but only four state universities. The universities of Goma, Kinshasa, Kongo and Lubumbashi are those four (Scholaro, 2018). The universities of Kinshasa, Kisangani and Lubumbashi are the only three universities in the Congo with the capacity to provide doctoral studies and accredited degrees (République Démocratique du Congo, 2014). While the total estimated number of higher education institutions in the Congo has increased from 764 in 2014 to 901 in 2015, the share of the adult population with advanced education in the Congo was only 7.8% as of 2012 (ILO, 2015). The estimated number of students in those institutions is 604,000, and they are taught by an estimated number of 1,965 professors.

Further, students in Congolese classrooms are only expected to memorize static lectures, and have very limited opportunities to use critical thinking skills or to apply what they learn in class in a professional setting (World Bank, 2005). As such, given today's industrialized and technologically advanced world, the education system in the Congo is not on a par with the developed world (Etshim, 2017). That is especially the case when today's most developed

countries are mostly ones in which their economic growth is based on fields such as services and high technology on levels that require a very advanced human capital.

For a better future, and in order to achieve economic development, obviously, the education system in the Congo must be reformed so that a competent, productive and efficient workforce can be trained and later contribute to the local economy (Virima, 2008; Mokonzi & Kadongo, 2010; Eyanganunga, 2006). Failing to improve access to quality education in the Congo may simply mean that the country's economic growth will remain stagnant for the coming years because the current production and services in the country have not been conducive to a significant GDP growth so far. Further, given that the instability in the Congo can mean that the country's institutions are poor, economic growth and development are not likely to occur or be sustained because of the lack of functioning socioeconomic systems that are to be influenced by a well-trained human resource (Acemoglu, Johnson, & Robinson, 2006). As such, education and economic development may be two variables that influence each other.

In summary, at this point in time, the Congo is facing a very big challenge ahead on its way to become a rich and developed country. One of the country's biggest challenges includes providing equal access to quality education for its citizens, which is a basic and common need for any society to be prosperous and achieve the public purpose, which is the wellbeing of the whole in the 21st century. Such a case goes to show how bad the situation in the country is on different levels because access to education can be considered a "stepping stone" towards joining the workforce in today's competitive global marketplace (Joshi, 2018). Further, given that education allows for dialogue and the sharing of ideas, not only the economy but also the political system in the Congo would earn more credibility and be held accountable if its citizens

were better informed. Given the plan of Tshisekedi to provide access to education for 20 million primary school students free of charge, we may hope and expect such an initiative to lead to additional ones which are similar.

1.5. Employment Background

When it comes to employment in the Congo, according to the International Labour Organization the unemployment rate in the Congo is only 4.2, which is rather surprising given how underdeveloped the country is (2019). To note, 68.7% of Congolese are employed in agriculture, 20.9% in services, and 10.5% in industry. As such, while only about 4.49% of Congolese are presumably unemployed, given that the Congo is one of the poorest countries in the world, with 68.7% of the population working in agriculture, it probably means that there is either low economic productivity or a limited access to jobs in other economic sectors. Both cases can be caused by a lack of a skilled population (Easterly, 2001). That is in addition to an estimated 75% of the population being underfed (FAO, 2011). When it comes to jobs in the industrial sector or services, their supply is either low or there are not trained workers. With either case, the economic and political instability in the country can be a factor.

With such a high rate of employment in agriculture, and with a gross domestic product (GDP) per capita of $462 in 2017, it may be suggested that the industrial, services and technology sectors are underdeveloped and have underemployment in the Congo (World Bank, 2019). As such, it may be that if other economic sectors were more developed in the Congo as a result of more stability or development, they could eventually employ more people. As such, we

could see a lower percentage of the population employed in agriculture, while even more production could be achieved by fewer farmers using more advanced farming methods and technologies.

According to Barbara Tasch, a reporter for *Business Insider*, with a very low quality of life, the Congo is ranked as one of the poorest countries in the world, just as unfortunately expected (2015). For comparison, South Africa, which can be considered as one of the most developed countries in Africa, had a GDP per capita of $6,160 in 2017 while the Congo's was $462. The United States had a GDP per capita of $59,531 in that same year. When we think about it, the difference between the United States and the Congo, in terms of GDP per capita, which can also testify for quality of life, is as much as more than 125 times better in the United States.

The minimum wage in the Congo, in the private sector, is 1,680 Congolese francs, or $1.83 per day, which was set by the government in 2009 (U.S. Department of State, 2015). As such, the average monthly wage in the Congo may not be enough to support workers and their families, with an average of six persons per household, with dignity. To note, when adjusted for purchasing power parity (PPP), the GDP in the Congo was $561.78 in 2018 (World Bank, 2020). Government salaries range from 45,000 to 75,000 Congolese francs, or $49 to $82 per month. That does not include bonuses which can sometimes be considerably higher. Both in the public and private sector, salary arrears are common.

For instance, in February 2015, the Congo National Railway Company (SNCC) is reported to have allegedly mismanaged a World Bank grant of $218 million to purchase locomotives while its employees had 72 months of salary arrears (U.S. Department of State). In

this case, the authorities arrested the union president for leading a strike to protest the mismanagement of funds. The union president was eventually released, and the government appointed a new SNCC manager and also changed the management committee. In another case, there were reports of recurring forced labor in the Congo, including forced child labor. For example, in some mining regions, there were reports that armed groups violently attacked mining communities and held local residents, men, women, and children, captive for forced labor and even sexual exploitation.

The U.S. Department of State Country Reports on Human Rights Practices for 2015 also reported that approximately 42% of children between the ages of five and 14 years were involved in child labor which was also sometimes forced. Notably, it is stated that 46% of children in rural areas were involved in child labor; the statistic is 34% in urban areas. At the same time, the minimum age for work in the Congo is 16 years old. The minimum age for hazardous work is 18 years, and child labor is most common in artisanal mining and subsistence agriculture. While the law enforced penalties for violations, which are one to three years of imprisonment and fines of up to 200,000 Congolese francs, or $218, those have been insufficient to deter violations.

Overall, it is possible that approximately 90% of laborers in the Congo work in subsistence agriculture, informal commerce or mining, or take part in other activities in the informal economy. Further, while the government has made monitoring and law enforcing efforts, conflicts between legal titleholders and artisanal miners illegally operating on their concessions are not uncommon. As such, hazardous or exploitative working conditions are prominent when the government is limited in its ability to monitor economic activities. To note,

while the estimates provided here are difficult to verify, we can still assume that in the case of the Congo, resource abundance continues to lead to the similar pessimistic conclusions that are found in the "resource curse" literature (Briggs, 2018). The resource curse literature, also known as the paradox of plenty, categorically suggests that countries with an abundance of natural resources tend to have less economic growth, less democracy, and worse development outcomes than countries with fewer natural resources.

CHAPTER 2: THEORETICAL FRAMEWORK

2.1. Using Education to Make Farmers More Productive

On the way to becoming a developed economy, the Congo has an advantage and potential given the size of its population size, natural resources, and 80 million hectares of arable land of which only 10% is cultivated albeit at a low production level (FAO, 2011). My instinct is that agricultural development can contribute to the growth of the Congolese economy if the productivity of rural farmers in the country can be increased. By helping the rural farmers increase their productivity, they can increase their incomes and quality of life, with more food and products to sell. I envision that such a process can start with specialized education and training, which will allow the successful adoption of advanced and customized farming methods and technologies among the many rural farmers in the country, resulting in the increased productivity and incomes of about 70% of the country's population.

In accordance with the plan of action above, the initial goal is to reach a stage where families that depend on their agricultural yields in order to make a living, like that of André Bukasa from chapter 1.2, are able to feed themselves and send their children to school for more years than their parents were able to. Eventually, within a few generations, we may expect to see that the increase in income among rural farmers in the Congo, as a result of a technological advancement that led to an increase in yields and agribusiness, can also result in higher educational attainment for the youth in the country.

At that stage, if farmers have successfully adopted more customized technology, increasing their output and income levels, and if their children can now attend school under better conditions, families can look into expanding their farming activities. Another option at this more advanced stage is for the children, with a higher educational attainment, to even move away from rural to urban areas where they now can work and be productive in more advanced sectors such as industry, services, and technology, or even become entrepreneurs.

As it is common among the many families that work the land in the Congo, the use of technology is very limited and more artisanal methods are used. At the same time, one of the best places to begin will be the increase of technological use among rural farmers in the Congo. However, before technology can be adopted and used well, the farmers who are to adopt it have to be trained and educated in order to know how and what to do with their new tools. In this case, the education part is not necessarily the traditional route but rather one that is specifically designed for agricultural workers. For such a social and economic improvement goal to be achieved, the government, and other institutions and organizations locally or globally, should probably be involved in the operations of the different required initiatives that need time, planning, and investment in order to be implemented well (Easterly, 2006). This development stage will undoubtedly require research and trial and error done locally for informed learning.

There exist multiple examples that point to a positive correlation between education, which allows the appropriate adoption of technology, and an increase in agricultural productivity. For instance, under the initiative of the World Cocoa Foundation (WCF) and the Bill and Melinda Gates Foundation, the Cocoa Livelihoods Program (CLP) provided small cocoa producers in Sub-Saharan Africa with training, and crop diversification and farmer-based

organization education (Tsiboe, Dixon, Nalley, Popp, & Luckstead, 2016). With the aim to improve the livelihood of more than 200,000 small cocoa producers, yield enhancements as a result of the CLP program reached as much as 32%, 34%, 50%, and 62% among cocoa farmers in Ghana, Côte d'Ivoire, Nigeria, and Cameroon, respectively.

Further, taking into account a total program cost of $151-$200 per participant and an estimated annual cash flow of $109-$322 per participant over 25 years, the calculated return ratio of the program was estimated to range from as much as $18 to $62 for every dollar spent (Tsiboe et al., 2016). As such, it should be safe to say that similar programs that provide specialized assistance to farmers in Sub-Saharan Africa should be increased in order to add to the number of farmers who can benefit by significantly increasing their agricultural yields and income, and hopefully reach similar targets such as the cocoa program's goal of doubling the income of cocoa-growing households in Sub-Saharan Africa.

In the Congo, the impact of education and technology on agriculture can be significant with as little as the correct adoption and application of fertilizers and crops, or even just the appropriate spacing between plants (Thurlow, et al., 2012, FAO, 2019). Such a process can start by increasing the awareness of rural farmers in the Congo regarding how to use fertilizers and which crops should be planted with regards to their ecosystem and the demand in the markets. With a tryout period of trial and error which is to be followed, socioeconomic, ecosystem and market adjustments can be made and finally lead to positive results with the thorough adoption of more efficient and customized farming methods.

For instance, awareness about mineral fertilizers in South Kivu is claimed to be 57%, and mainly determined by education and social capital (Lambrecht, Vanlauwe, Merckx, & Maertens,

2014). With that, while capital and credit constraints are important for adoption, only 13% of farmers who are taught do try out the suggested new farming methods. From that 13% as much as 70% adopts the newly taught ways of farming. As such, given that the tryout of advanced farming methods is directly influenced by extension interventions but that tryout is low, if more farmers were better informed of the advantages of mineral fertilizers, of how to use them and of the ways in which they have been beneficial to other farmers, and that financial support was provided along with education and training, we could expect higher adoption rates. With higher adoption rates, the hope is for more products to be yielded and for higher incomes among rural farmers to be achieved.

Agricultural development, which requires the education and the adoption of advanced technology and farming methods among rural farmers, can be promising and yield results over time. Notably, a pattern of generational wealth accumulation through agriculture has been seen in South Africa. There, agriculture has been used as a tool to increase household income, which then allowed families to provide better education and access to jobs in advanced sectors to their future generations (Mabandla, 2015). Notably, after being educated, children of farmers in South Africa continued to accumulate land for farming and thus the income from their agricultural activities kept on increasing. Eventually, some South African farmers were able to further support the educational achievement of their children while accumulating more land and wealth. The end result of that process among farmers in South Africa is known today as the country's black middle class, arguably not a post-apartheid phenomenon but the result of generational land and wealth accumulation that started in the middle of the 19th century and allowed for access to quality education and high paying jobs over time.

2.2. The Lewis and Harris-Todaro Models

An additional benefit to be yielded from agricultural development in the Congo is the reverse migration from big cities such as Kinshasa back to rural areas where additional jobs can be created in the agricultural sector. In this case, when it comes to technological adoption, labor-intensive technology should be given priority to start. At the same time, reports suggest that only 10% of the available 80 million hectares of arable land in the Congo has been in use. Hence, one way or another, there is space for growth and employment opportunities should exist with agricultural expansion given the necessity and possibility for labor-intensive work on 80 million hectares (FAO, 2011). At this point when jobs will now be available and when farmers can work on more land, aided by their addition of the use of labor-intensive technologies, growth may perhaps be seen.

In the initial phase of economic development through education and agricultural development in the Congo, a scenario in which more people will be compelled to work in rural areas will be strategic for overpopulated and dense cities with low paying jobs in the country. As is the case today, big cities in the Congo are not only dense, but they are also underdeveloped with very poor infrastructure. Electricity on a regular basis is scarce. As a result, given the very low supply of electricity, following a daily routine that includes doing work or homework at night or even during the day are both problematic when businesses cannot rely on the little available energy to power their offices and students cannot have permanent lights, computers and internet connection for work.

Given the current situation with limited energy availability and population density in major cities in the Congo, if employment can be created in rural areas first, in addition to the increase in productivity and incomes that education technological improvement can help with, many individuals and families will have more reasons to remain in their native rural communities instead of migrating internally to big cities in the hopes of finding higher paying jobs. Later on, assuming that the rural farming families maintain a smallholder model and that they are now able to better educate their children, moving to big cities can become more practical at a stage when a more stable financial foundation and skills to either work in advanced sectors such as industry, services and technology, or even as entrepreneurs, is within reach.

With that being said, a study by Samuel Ambapour seems to suggest that the creation of urban and industrial jobs in the Congo can lead to lower unemployment (2015). That does not support the claim made by Harris and Todaro, according to which internal migration to urban areas after newly created urban jobs leads to unemployment, resulting in poverty, the creation of slums and crime. As such, the idea put forward by Lewis, that the creation of urban jobs will reduce unemployment may be more relevant in the case of the Congo. In this case, a sectoral move from agriculture to industry, or other sectors in the urban area is within reason after a few generations.

2.3. How to Improve Agriculture

2.3.1. Choice of Crop

When it comes to improving agricultural yields, choosing correctly which crops to plant seems to be a significant matter given ecological differences and market demands. When we think about geographic regions, some lands are better suited for specific kinds of crops, which makes a difference in terms of the agricultural yields of farmers and the quality of their products at present and in the future. Some agricultural practices are more sustainable than others depending on what is being planted and the inputs that are being used (Vidal, 2016). With a more ecological approach to agriculture, one that does not require to heavily rely on chemical fertilisers, pesticides and antibiotics to manage farming activities, social, environmental and health benefits are to be found. In fact, diversified and environmentally friendly agriculture with respect to local ecological systems is said to pave the way for diverse diets and improved health while not affecting food supplies.

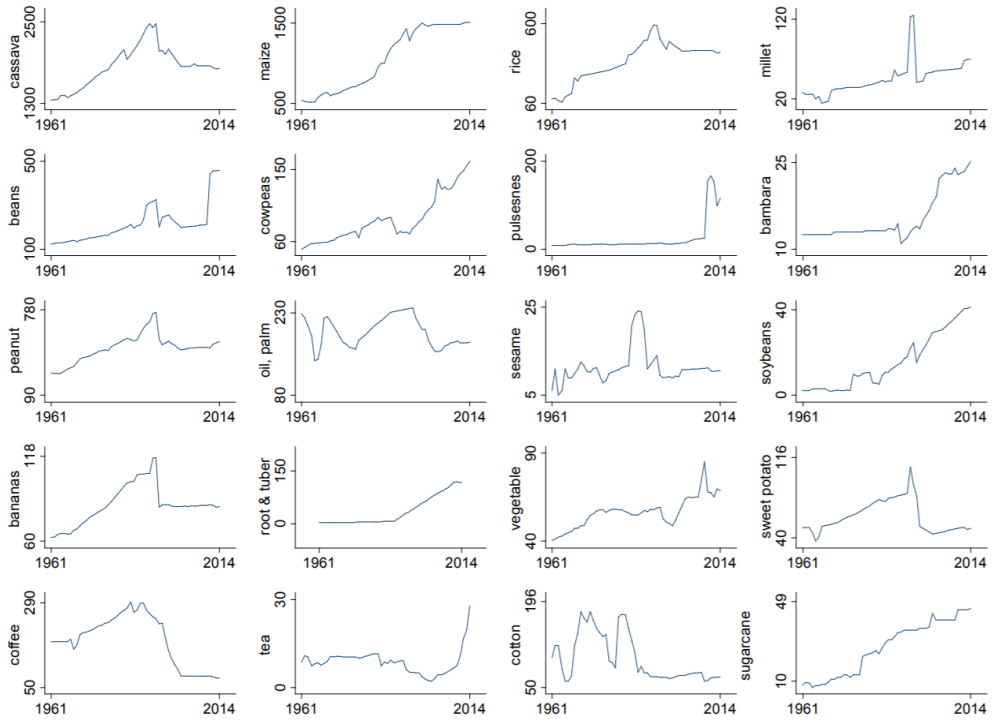
Further, the choice of crop also matters when we think about agriculture as more than just for subsistence but also as a source of income that leads to economic gains. As such, with sustainable agriculture, higher revenues from healthier and also probably more demanded yields can be expected. That can be the case with produce that is consumed by rural farming households and produce that is sold locally or even shipped to be sold abroad. In the case of products that are sold locally, it is important to keep in mind that a given rural community will

more likely be greatly helped if they were to sell yields that are already liked by their neighbors and customers. Having to sell foreign or new agricultural products for local consumption may be a risky experiment that has to be mitigated or, even better, avoided in advance. In other words, the idea here is that locally grown and consumed food crops should be given a priority before other possible export opportunities can be explored as an estimated 75% of the Congolese population is underfed (FAO, 2011).

In the case of the Congo, research has shown that cereal grain crops and root vegetables are the most efficient crops for poverty reduction (Yango & Mukoko, 2016). From this perspective, a conclusion to be made is that an agricultural strategy that is based on the expansion of food crop production should be afforded the highest priority in the country. Such a shift has the potential to lead to an 8.21% annual agricultural growth rate, which if maintained will be effective at reducing poverty and lead to the halving of poverty in the country within a few years. This scenario will not only contribute to economic growth and poverty alleviation but also to fight hunger.

As seen on figure 2.1 below, some mainly cultivated crops in the Congo include manioc, corn, tubers, sorghum, sugarcane, peanuts, beans, rice, plantains, palm oil, pineapples and yams. At the same time, with a population that has grown from around 15 million as of the year of independence in 1960 to over 80 million in 2020 (World Bank), the Congo relies on food imports given its domestic crises which have hindered production and increased malnutrition (Eric et al., 2017). A suggestion in this case is for the government to prioritize price policy on staple foods locally as it is found to be more significant for food security when compared to the income effect.

Figure 2.1: Congo Crop Production, 1961 to 2014



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With respect to the difference to be seen when it comes to the choice of crop, in the Sudanian Savanna of West Africa an improved adoption of sorghum varieties has the potential to lead to a rise in agricultural yields. That overall rise in agricultural yields can beneficially result in the increase of both the harvest share sold and dietary diversity, while reducing the harvest share consumed and purchased (Smale, Assima, Kergna, Thériault, & Weltzien, 2018). In this case, the choice of crop allows for yield consumption not to be at the expense of sales.

With that said, the adoption of sorghum in the Sudanian Savanna of West Africa has been limited, despite its economic importance and long-term investments in crop improvement. The harsh and difficult heterogeneous growing environment is a challenge for farmers. However, in

Mali, where the first sorghum hybrids in Sub-Saharan Africa were developed, research has shown that germplasm use does generally lead to larger yields among farmers. As such, while the choice of crop can make a significant difference in terms of yields, ecological settings demand for further research into the advantages of local agricultural environments to be prioritized and precede the adoption of foreign seeds by smallholders.

With the need for research and planning that should precede agricultural development, in order for the local communities in the Congo to experience a successful development that can lead to results which are seen to the eye, agricultural investment priorities and public spending will also be necessary. In order to take the first steps towards achieving the right selection of crop choice with the goals of economic growth and poverty reduction, the need for investment, inputs such as seeds, infrastructure and policy suggests that the government and other institutions and organizations must be involved in the agricultural development projects for farming communities in rural areas in the Congo in cohesion. That is due to the importance of matching between seeds, the ecology, and socioeconomic factors, with none coming greatly at the expense of the others in the long run.

In the case of the Congo, given that roots and cereals are more likely to be the more efficient crops for poverty reduction (Yango & Mukoko, 2016), there is an advantage to be found because cereals can be more conducive to socioeconomic prosperity when compared to other resources such as oil (Vahabi, 2017). Notably, unlike oil and other natural resources that can create unaccountable power and rent seeking today (Wenar, 2016), cereals and roots, which are visible and storable, can contribute to state formation and institutional development when they require not only labor but also investment in local infrastructure, and also allow for taxation at

the same time. Further, as some of the mainly cultivated crops in the Congo already include manioc, corn, tubers, yams and sorghum, there is the opportunity to skip the need to cultivate other crops that may not match the ecological system of the country well. In this case, if the Congo can use its ecology effectively, its growth can be supported by the suitability of its agriculture instead of a scenario where economic development is hampered by geography (Birdsall, Rodrik, & Subramanian, 2005).

2.3.2. Organizational Reforms

Since there are already many subsistence farmers in the Congo who strive for self sufficiency by feeding themselves and selling the surplus of their agricultural yields, it would make sense to primarily support the many smallholder farmers. With respect to the cultivated land that belongs to families in the rural areas of the country, communities may be better off with an organizational structure model of productivity growth that does not compromise their independence and ownership of land. If exterior entities were to gain ownership over the land or rural communities, there is the risk of running into a mismatch between economic goals and social structure that have already been set. The idea to prioritize local knowledge comes from the point of view that rural communities will already know better than remote entities what is good for them (Bardhan, 2002).

With a model of smallholders, the arable land in rural areas to be cultivated by the locals can rather increase employment with labor-intensive methods and technologies rather than capital-intensive ones (Oshima, 1971). Further, the growth of a labor-intensive sector in

agriculture also has the potential to strengthen rural communities if it can reduce family income inequalities and increase food security as it has been seen during the Asian Green Revolution of the 1960s, which was supported by national governments through policies and subsidies that led to increased agricultural yields. Japan and South Korea are among other countries that are today developed and benefited from the process that started in the 1960s, resulting in sectoral shifts as economic growth was caused through agriculture (Oshima, 1986).

With respect to local needs and wants, agricultural development can be helpful in improving the income of those rural families who first have to earn enough money before they can send their children to school in the hope of a better future and a sectoral shift. In the case of the Congo, given that the country is a net importer of food (Eric et al., 2017), smallholders will have a local market in a country with more than 80 million inhabitants among whom the vast majority are reportedly underfed. As such, initially, there may not be an immediate need for ports and other sophisticated infrastructure that is to be used as means of transportation. In terms of operational costs, given the suggestion to plant given crops and use methods that are agroecological and therefore sustainable, costs can likely be reduced in this case too as not much or any inputs will have to be imported. As such, most of the value added can be local and sectoral shifts can be supported with some of the newly created capital that was added to the local economy through agricultural development.

2.3.3. Technological Change

Among the different ways in which productivity growth in agriculture can be improved, technological change can be promising given the use of artisanal methods by smallholders in the Congo. In order to develop such a possibility for development, education is necessary as it can allow for technological innovation, increase in production and eventually development (Kruss, McGrath, Petersen, & Gastrow, 2015). Given that most farmers who live in rural areas tend to be more financially unstable, their productivity growth can potentially decrease the income disparity between the rich and poor in the Congo (Otchia, 2018).

Unlike other African countries that have despite significant efforts struggled to imitate the rapid agricultural growth that took place in Asia in the 1960s and 1970s, Ethiopia is a rare exception. Since 2004, Ethiopia's agriculture sector grew by more than 7% per year, a growth which research indicates has contributed to an increase in technology together with increases in both the area of land use for farming and the amount of labor (Bachewe, Berhane, Minten, & Taffesse, 2018). In this case, along with the increase of technology, more land is being cultivated with the additional labor-intensive methods that are adopted in Ethiopia and create employment there. As a result of the technological adoption, an increase of 2.3% in productivity per year was measured in Ethiopia. Technological development in the field of agriculture in Ethiopia was crucial to this growth and it also allowed for more work to be completed on the additional land that was merged for agriculture.

Other than technological adoption, the government in Ethiopia was also involved in the advancement of their agriculture sector and increase in total factor productivity by contributing to the increase in modern input use, which correlated with agricultural expansion, an improved road network, and higher rural education levels. The Ethiopian government also initiated international and local price incentives in order to promote the local agriculture sectoral growth for export crops. Additional factors that contributed to the successful technological adoption in Ethiopia include the use of organic fertilizer, improved land and water management practices, and rainfed crop production to adapt to weather conditions in the country. Overall, Ethiopia's technological adoption is not necessarily one that includes heavy machinery but rather advanced farming methods that matched the country's ecology, society and economy. In terms of results, Ethiopia's agriculture GDP has grown at 7.6% per year since 2004 (Bachewe et al., 2018).

2.3.4. Incentivization

Given the limited access to quality education in the Congo, likely to be higher among rural farmers, technological adoption can be hampered by the lack of skill. It may also be that some farmers are unaware of the value of other available farming methods that are foreign to them. As such, change, even if for the good, can many times be avoided because of it being unfamiliar. With that said, better informed farmers, or ones who see how their neighbor has increased his yields by something that can be as simple as paying more attention to the spacing between his planted seeds, then other farmers may be more open and inclined to try and change their usual way of working. Similarly to being encouraged to adopt new farming methods based

on someone else's favorable outcomes, incentives are another way in which to guarantee and encourage more farmers to change how they work.

In another case in Ethiopia, smallholder farmers reacted the most to economic incentives, which made a difference when it came to the time they waited before adopting new technologies. In comparison, traction power in the form of oxen and infrastructural factors such as proximity to markets were incentivizing but less so than prices (Dadi, Burton, & Ozanne, 2004). Further, areas of farmland, amount of labor, access to credit, extension services and personal characteristics such as education, gender and age were found to have very little, or no, effect on the adoption of technology. With respect to the adoption of agricultural inputs, fertilizers were adopted faster than herbicide. The conclusion here is that with economic incentives, farmers can be less risk averse given the ability to face adoption failure better with some financial guarantee.

With agricultural incentives, since rural farmers are also to benefit from education, training and additional farming equipment, there are ways in which the government can make it worthwhile for those who work in agriculture to adopt more productive methods with less risk. With respect to opportunity cost, training programs for farmers and even the adoption of fertilizers may create a shock that will result in a failure and the need to forgo an opportunity of harvest. As with the case above in Ethiopia, similar government interventions may include subsidies or other monetary benefits that are conditional on program participation and technological adoption. Further, other organizations and institutions that can conduct agricultural research programs locally can increase the confidence of farmers in that the proposals that they are receiving will match their environment and true needs. Access to markets, price policy and

other infrastructure can also facilitate the adoption of technology and its successful implementation if local producers are given assurances (Chang, 2002).

At a stage when access and participation in agricultural education and training programs increases, and participation is translated into adoption, an increase in total factor productivity, as seen with a Cobb–Douglas production function, can lead to higher yields among the participating farmers (FAO, 2019). As such, relatively lower production prices for farmers can be seen when the use of inexpensive labor and capital are increased and allow for higher yields per farmed area. If then rural farmers can yield more products to sell, better means of transportation will be in higher demand. At that point, support with transportation should be given priority in order to maintain the agricultural yield growth rate, which in retrospect was incentivizing for the adoption of new technologies that were used with some level of risk.

The continued results from technological adoption, which will be dependent on results and incentives requiring government involvement, will be required to continue to encourage rural farmers to participate in education and training programs for agriculture. Here the government can also further adopt policies that allow for the development of the agricultural sector in the Congo as an “infant industry” where at least 68.7% of the population is already working but technological advancement must be promoted.

For instance, in the case of England with the Corn Laws in the 19th century, measures that were taken to promote its industry included tariffs and other economic policies to limit the import of cereal grains in order to limit competition with other countries and strengthen local industries (Chang, 2003). Notably, as the Corn Law was abolished after 1860 along with other tariffs, that state did however not last for long. Britain lost its manufacturing advantage and had

to reenact tariffs, which was done in 1932. The conclusion here is that with tariffs and other protective policies, Britain was able to see local technological advancement and economic growth.

With agriculture, infrastructure such as roads and electricity, or even storage facilities, can also be beneficial for farmers with the goal of keeping operation costs low and profits high. Eventually, if agricultural yields were exponentially increased among rural farmers in the Congo, given that the Congo is a net importer of food, taxes and other policies to support local growth can later allow for exports. That can be the case when agriculture is no longer an infant industry and market liberalization can take place. The government should then be a partner of rural farmers who at one point can further benefit from being smallholders that purchase heavy equipment as independent groups that have an influence on favorable policies.

2.4. How Can Education Promote These Four Goals

When it comes to a sustainable economic development in the long run, with 68.7% of Congolese working in agriculture, agriculture can be used for poverty reduction in the short run. Eventually, with agriculture as a transitory stage that can be labor-intensive, the end goal is to eventually facilitate the very long process of development for more and more people to join more advanced economic sectors after income and education levels have increased as a result of agricultural development. With education, the agricultural sector can better adopt the required technology and methods of farming that can allow for a sectoral growth that will have both economic and social spillovers. The choice of crop, organizational structure, technological

adoption and incentives, among others, will have to be coherent and congruous, which can be learned with research, testing, learning, failures and successes.

With education, when it comes to agricultural development, the goal is to train farmers and to teach them which technologies and crops are the most suitable for their environment, how to use and cultivate those technologies and crops, and how to organize in a way that will allow them to sell their products profitably. In addition to other variables such as the business climate and security being favorable, a successful and socioeconomic responsible application of education can result in higher yields and incomes. In the cases of Ghana, Côte d'Ivoire, Nigeria, and Cameroon, specialized training and the adoption of technology among cocoa farmers led to a yield enhancement of as much as 32%, 34%, 50%, and 62% respectively (Tsiboe et al., 2016), with an estimated return of $18 to $62 per dollar spent on inclusive human capital development.

As previously mentioned, just as higher incomes can allow for more access to quality education for children who might have not been able to reach any significant educational attainment in the long run, the application of newly learned skills can eventually lead to the sustainability of productivity growth and higher incomes. Over time, with higher paying jobs in more advanced economic sectors that are now attainable given the economic growth and social advancement through the application of education and technology in agriculture, there could be an opportunity for wealth accumulation as seen in South Africa over generations (Mabandla, 2015). For sustainability, going back to the Cocoa Livelihood Program (CLP), the authors suggest that the number of participants in successful agricultural development programs should be increased and also to maintain a setting where farmers absolutely receive all of the components that allow a thorough application of what is taught (Tsiboe et al., 2016).

At this point in time, there are more than a few kinds of programs through which agricultural education and training can be provided to farmers. Agricultural extension is one of those programs, which started with the Great Irish Potato Famine of 1845 (Swanson, Bentz, & Sofranko, 1997). The goal of agricultural extensions is the application of scientific research and new knowledge to agricultural practices with the help of academics (Nnadi, Chikaire, Ani, & Echetama). The education and training provided through extension programs includes learning activities on topics such as marketing, health, communication and business for agriculture that is catered to rural farmers (Jones & Garforth, 2012). Further, government agencies, academics from different disciplines and organizations such as the World Bank and the Food and Agriculture Organization of the United Nations tend to partner with and give large amounts of support to agricultural extension agencies in developing countries around the world. Agricultural extension agencies are usually part of a university program which oversees its activities.

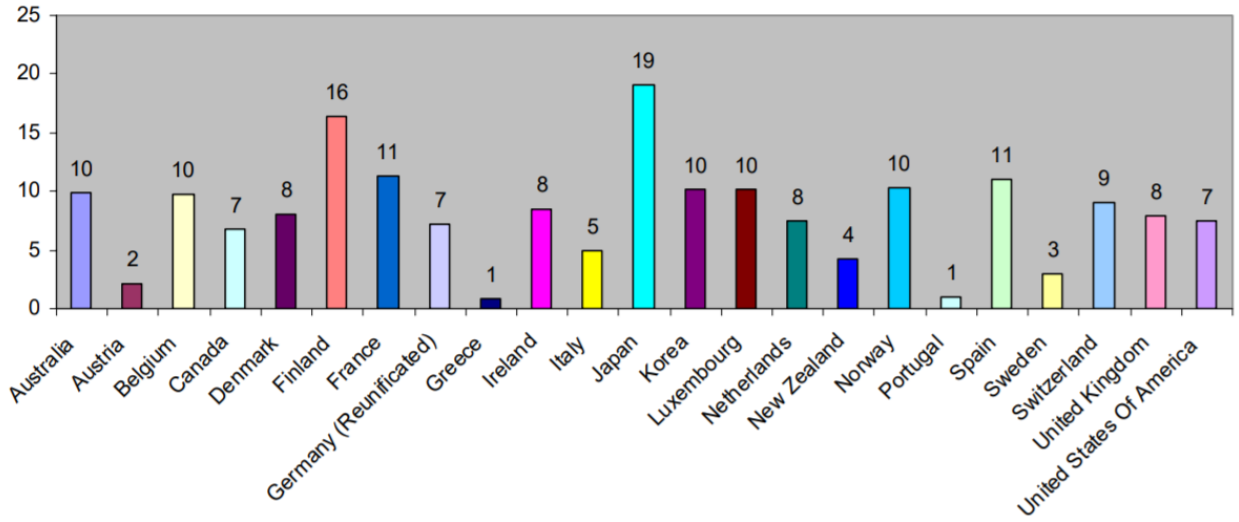
Another relevant platform for farmer education is agricultural education and training (AET), which includes both formal and informal activities that build capacity within the agriculture sector. AET programs can contribute to rural development via higher education as well as diploma and certificate training programs (Minde, 2015). The program is relevant to and can be provided during the formal education years of the rural youth, or through private and public workforce formation organisations for those who are not in school. In Sub-Saharan Africa, AET can contribute to agricultural development by strengthening innovative capabilities and business skills, allowing farmers to adopt new products, technical knowledge and farming methods (Agriculture for Impact, 2020).

A third option for farmer education are farmer field schools (FFS). A FFS is a group-based learning process during which farmers carry out on-the-field experiential learning activities that help them understand the ecology of their land and how to use it better (FAO, 2011). The learning, which is done on location, includes simple experiments, field observations and group analysis. Later on, the knowledge gained through direct experience and scientific insights allows participant farmers to make better informed choices that are based on their own locally specific ecology and agricultural needs. In the case of FFS, local farmers are more empowered because the approach to learning and execution depends on their local knowledge systems.

The opportunity to match what farmers need with what they have is mostly unique to the FFS format. Notably, under other agricultural development and education settings, farmers may tend to adopt general recommendations from specialists who came from outside their local community without customized solutions or recommendations that have been studied locally to match the local knowledge systems. With education systems that happen on the location of the farming activities, such as with farmer field schools, we can say that those are more relevant for smallholder farmers who can benefit from the trial and error learning process.

With the knowledge gained from the opportunity to learn through direct experience, there should be results that will later allow for the best application of the recommendations that are based on local specific needs that are proposed following specialized research and studies of the local land and environment. Notably, the risk of missing out on a harvest by applying less known methods that match the local environment can be reduced.

Figure 2.2: Share of ODA for Agriculture by Country, 2008



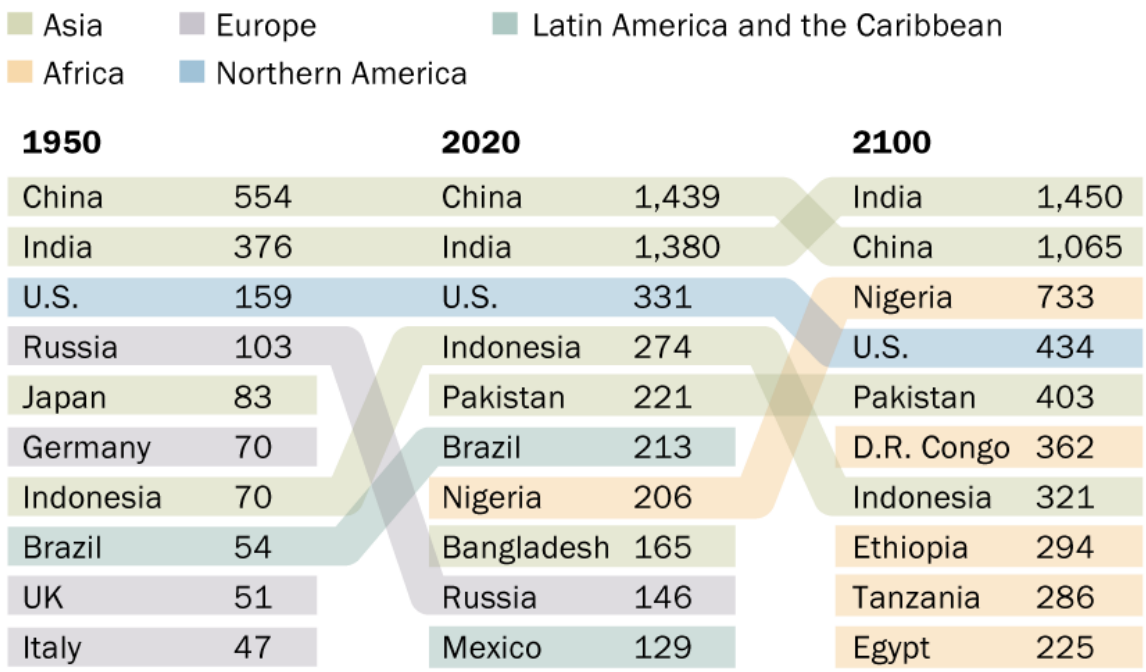
Last but not least, given in the form of foreign aid, official development assistance (ODA) for agriculture and rural development is financial support in the form of grants or loans that come from developing countries that belong to the Organisation for Economic Co-operation and Development's (OECD) Development Assistance Committee (DAC) to developing countries in order to support and take forward advanced development in agriculture and other areas that improve socioeconomic matters (FAO, 2011). As seen on figure 2.2 above, Finland, France and Japan gave the most for agricultural support in 2008 with 16%, 11% and 19% of their total ODA having been dedicated to agriculture and rural development. To note, those funds are not only dedicated to developing countries but also to multilateral institutions that will then provide aid to official agencies, including state and local governments, with the main objective being the

promotion of the economic development and welfare of developing countries through agriculture which has a crucial role in the socioeconomic development of developing countries.

Nevertheless, although the above-mentioned examples of how agricultural education and training can be provided to rural farmers with the goal of economic development, change seems to be taking time and more. At the same time, the need for applicable training and education for farmers has only been growing with time. For instance, the African continent reportedly faces an expected 700 million graduates that are to enter the job market over the next 30 years (Kabasa, Kirsten, & Minde, 2015, Minde et al., 2015). At this point in time, the Congo is estimated to have a population of more than 80 million people, and more growth is expected in terms of residents while food scarcity in the country still exists and could worsen. Notably, about 13.6 million people in the country are estimated to be severely food insecure as the country itself requires external assistance for food (FAO, 2020).

With an estimated population of 362 million by year 2,100 as seen on figure 2.3 below, which is likely similar to today's 80 million residents doubling to even as much as 160 million by 2,050, such a number may be far greater than the spots available both for education and employment in the country over time. In fact, with 80 million residents today, the country's capacities when it comes to the provision of quality education, high paying jobs and food have already been exceeded and are insufficient. Things may seem better when we think about the provision of agricultural education and training both in schools and informally outside of them. Further, as it has previously been mentioned, the Congo approximately has 80 million hectares of arable land of which only 10% is being utilized for agricultural purposes today.

Figure 2.3: Countries With Largest Population (in millions)



Given the many social and economic challenges that may arise with a critical population explosion, the availability of flexible education and training programs, in addition to the available arable land in the Congo, can become the means by which it becomes possible for the Congo to decrease urban density, provide more schooling opportunities and generate additional options for high paying jobs. For the purpose of agricultural development with an increasing population, agricultural education and training (AET) can offer the flexibility of non-formal education for the different age groups and the application of researched methods that can in turn also reduce the risk of innovation adoption failure. Further, given that AET allows for the socioeconomic and environmental factors to be included with the introduction of new products and processes, its contribution can go beyond human capital building and into sustaining

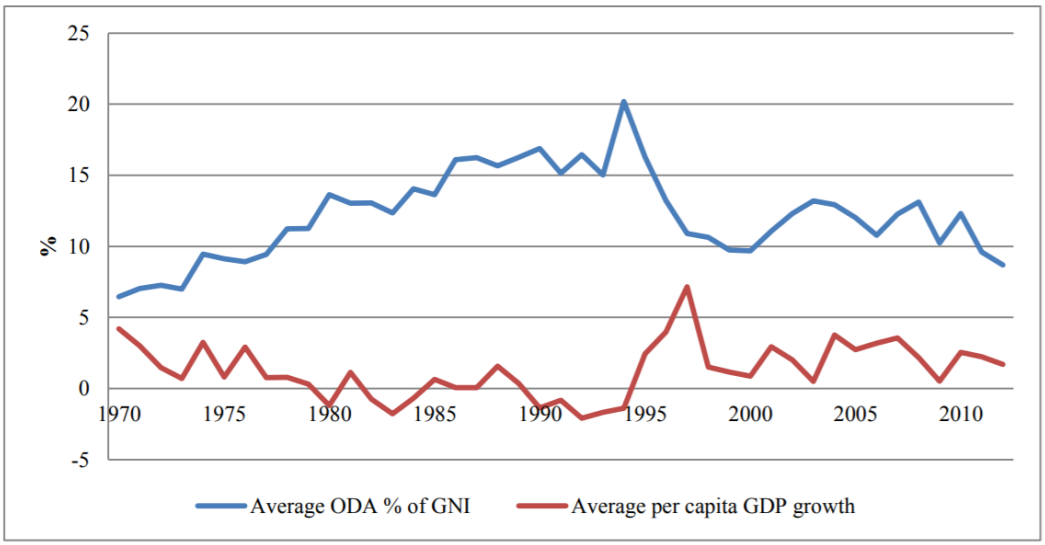
institutional development as it requires also the participation of different organizations and individuals to share new information (Davis, Ekboir, & Spielman, 2008).

2.5. Challenges

While it may be relatively easy to make suggestions about what can be done and how it should be done when it comes to the education and training of rural farmers in Sub-Saharan Africa, good intentions unfortunately do not always lead to good results right away. For instance, in her book by the title of *Dead Aid: Why Aid Is Not Working and How There Is a Better Way for Africa,* Dambisa Moyo argues that while foreign aid in the form of money can be used for African countries to achieve economic growth, the opposite is unfortunately the truth (2009). In her opinion, foreign aid is not simply one among the different problems due to which Africa is a poor continent, but rather that foreign aid itself is the problem that both creates and maintains poverty in African countries.

The solution, Moyo suggests, is to change how aid is given to African countries by shifting the focus of aid to a tool that can support social and economic transformation through innovation. Here, the goal is for foreign aid, whether bilateral or multilateral, to be given to African countries for a relatively brief period of time. As such, the eventual result in African countries could be not needing any foreign aid at some later stage in the long run as plans for self sufficiency will be required. In other words, African countries should use foreign aid money as a temporary means to satisfy present needs, with the end being to reach independent economic growth.

Figure 2.4: Aid and Growth in Sub-Saharan Africa, 1970 to 2012



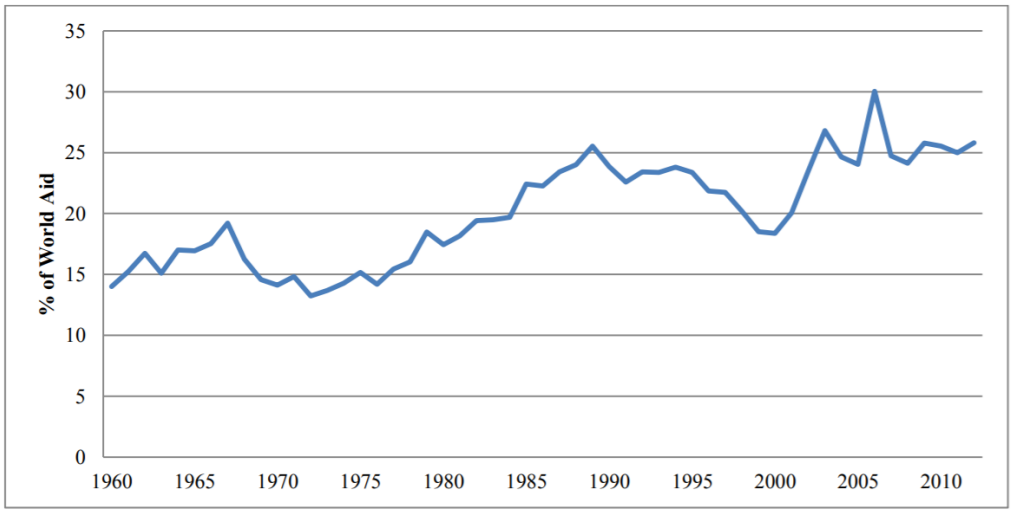
In "Foreign Aid And Economic Growth In Sub-Saharan Africa," Tait, Siddique and Chatterjee claim that aid has had a significant positive long-term impact on per capita GDP growth between 1970 and 2012 (2015). The authors add that while they think that the positive returns to aid can be seen over the 42 years between 1970 and 2012, shorter time frames do not show any significant returns. Further, they even claim that aid did not have diminishing marginal returns, nor was it conditional on the level of freedom in recipient countries. Aid designated for social infrastructure, especially education and health, has had the most positive returns.

As seen in around 1995 on figure 2.4 above, growth from aid, if any, seems to occur over time and not necessarily directly. In total, 25 developing countries from Sub-Saharan Africa are included in the sample for empirical analysis. Some of those countries include the Central African Republic, Gambia, Lesotho, Malawi, Mali, Niger, Rwanda, South Africa, Tanzania and Zambia, which have all consistently received high amounts of aid. To note, there was a wide

variation of aid ratios over the course of the 42-year study. For instance, at 21%, Gambia had the highest aid to GDP ratio during the first and second decades of the study, while Rwanda had an average aid to GDP ratio of 32% in the 1990s, which was the highest of the decade (Tait et al., 2015).

In comparison, South Africa has received the least aid over the period, with no aid received during the first two decades, and less than 1% of aid to GDP for the subsequent decades. Given that South Africa is one of the more developed countries in the continent, it may either be that the country did not need aid or that its endogenous growth has been sustained thanks to not depending on aid from the beginning.

Figure 2.5: Percentage of World Aid to Sub-Saharan Africa, 1970 to 2012



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Since the end of World War II, countries in Sub-Saharan Africa have consistently been some of the largest recipients of foreign aid to fight poverty and promote economic growth and development. For instance, in 2012 the region, which includes 48 countries with a combined

population of over 900 million as of 2013, received over 25% of total world aid, as seen on figure 2.5 above (Tait et al., 2015). With the objective to examine the impact of foreign aid in Africa between 1970 to 2012, the results of Tait et al. seem to differ from the claims made by Moyo in that they seem to be proponents of aid.

The study also found that a one percent increase in the grant to GDP ratio contributed to 0.104 percentage points to per capita GDP growth in twelve years time. Comparatively, a one percent increase in official development assistance (ODA) to GDP ratio contributed to 0.063 percentage points to growth (Tait et al., 2015). As such, aid does actually have a small positive effect on growth, results which have a lagged effect of up to 12 years. Given the time frame of the study, it may be argued that as aid does not lead to immediate results on GDP growth, it may therefore be that the measured growth is not directly caused by it. Further, while ODA includes loans and technical assistance in addition to grants, consistent with other studies, grants alone, and not ODA, have a larger impact on growth than ODA. This suggestion may therefore support the idea that aid recipients may sometimes be provided with tools that they do not really need as with money alone they know better what to buy.

For socioeconomic prosperity, what needs to change is that countries in Africa are therefore to avoid being dependent on the help of other countries in the form of development aid (Moyo, 2009). Instead of dependency on handouts from richer countries that have not led to any significant social or economic progress, many times actually leading to the lack of accountability and transparency from governments, microfinance, trade and education scholarships are, among others, the better areas and uses of foreign assistance that Moyo sees the need to shift the focus to for the purpose of creating an independent and prosperous Africa in the long run.

When we think about it, agricultural extensions, AET and FFS are similar to forgeign aid in that foreign assistance is received from countries or organizations that presumably know and have what their recipient who presumably knows and has less needs. A problem that arises here with such an approach is that the assisting body is more than often not a local farmer, and therefore his help may not fit the environment and people he intends to help because of a mismatch and lack of local knowledge. As such, customization and matching to the true needs, wants and haves of the local communities are of essence, and can be achieved with research and by asking the right questions.

A brief and probable answer to the question of whether or not foreign aid is good or bad for economic development is that it may depend on who you ask. To be a little more specific but still general, an additional answer to that same question is that foreign aid is good on a small scale and in the short run, but that it is not so sustainable on a large scale and in the long run (Kilongo, 2018). In other words, if a small intervention project which is supported by foreign aid does successfully lead to favorable educational outcomes through the provision of textbooks, there is no guarantee that that same project can be scaled and offered to more people in different locations for similar results to be attained (Ganimian & Murnane, 2014).

Further, with foreign aid, the likelihood of being given what you do not really need and cannot truly maintain, even when it is offered with good intentions following planning, is problematic. It is a given that economic development is something that is achieved overtime, built on previous progress, and requires the socioeconomic advancement of those around you. For instance, if a person in a poor developing country was to forgo working as a barber in the informal economy and instead pursue medical studies to become a surgeon, his success will

depend on the success of others (Easterly, 2001). That will be the case given that for a medical doctor to do well in his career, he needs trained nurses, infrastructure, equipment, tools and developed institutions to support his work, which is dependent on the progress and skill of those around him.

As such, a necessary solution for success, one which will allow proper aid to be delivered, or in this case for the proper agricultural education and training for rural farmers to be delivered, it will mean taking into account local infrastructure, social norms and economic structures among others. That should be in addition to accounting for what those who are being helped really need and want to achieve in their environment, or what success and prosperity actually look like from their point of view (Sen, 1999). Randomized controlled trials, which are experiments that apply an intervention to a randomly selected group of people from a targeted population, and allow to compare the effects of the intervention, can be informative when it comes to testing what kind of assistance organizational structure may work best (Duflo, Banerjee, & Kremer, 2016).

Taking into account the needs, wants and haves of the communities which are being helped could then potentially increase the probability of sustained results, which will mean maintaining what has been taught and received even after a continuous amount of time in which the teacher and helper is not present. By taking into account who the student is, and where he stands in terms of his understanding of agriculture and the goals that he wants and can achieve, it can be easier to teach him how to accomplish more progress and reach a level of significant independence. Farmer field schools (FFS), which include non-formal learning activities for agriculture through direct experience for the purpose of using scientific insight on local

knowledge systems, are relevant in this case as they can enable community empowerment (FAO, 2011).

In the case of agriculture and farming in rural areas, given that farming methods and tools that lead to significant yield increase in one place may not necessarily do so in another place, FFS are again relevant. Adoption failures can be due to crops that require a specific type of climate and land in order to grow, or because a given community is not so much prepared or willing to try a new foreign crop even if it may suit their needs better. Further, it can also be that the adoption of new farming methods and technologies do not fit the preferences, structure and expectations of those who are being helped.

As such, truly and deeply knowing who you are helping, as an individual and his environment and not at the level of assumptions made about a continent or a country, is definitely crucial for applicable farming recommendations and adoption success. Nevertheless, when new farming methods and technologies are adopted by rural farmers, there are still social and economic factors, in addition to the available infrastructure and other variables, to be taken into account for the successful continuing of teaching, training and application of better farming practices over time.

For example, while a new vehicle for agriculture such as a tractor or heavy-duty truck may be introduced and adopted by a rural farming community and actually increase their productivity and yields, it may at some point also increase unemployment if fewer workers will be needed for work to be done on a given plot of land. For that, knowing in advance that labor-intensive farming is preferable in a country with a large population, additional available land to be cultivated and many who depend on farming for food and living will help prevent

application failures. Furthermore, a broken tractor, one that had previously increased productivity and might have even led to changes in the structure of employment locally, may not be so easy to fix when the locals do not have an appropriately trained mechanic to do the job. That is in addition to possibly not even having the necessary parts for replacement. Lack of energy, fuel, and lighting as well as mountainous landscapes also pose challenges when it comes to what can or cannot be taught and provided to rural farmers by assisting entities for appropriate application.

Such problematic scenarios like the ones mentioned above are not likely to be more simply evitable even after a thorough education and training program, as surprises always occur. The ability of farmers to eventually work and properly fix sudden problems after having adopted new farming and agricultural methods and technologies is key to sustaining their economic and social development. Nevertheless, learning can only be done after making mistakes and therefore a start can never be too perfected.

In terms of how to better help rural farmers become more productive, better institutions and economic freedom should be practical means to a start that will enable agricultural productivity growth as they both increase the rate of adoption and application of new agricultural methods and technologies that are taught and provided to farmers (Ssozi, Asongu, & Amavilah, 2019). For instance, better institutions can be used as an intermediary and overseeing body that facilitates the interaction between the local farmers and those who are in charge of helping them grow education and training. Here, the idea is that communication allows for a flow of information and collaborations of different people and bodies with clarity when it comes to what is needed by the farmers, and what and how it can be best provided to them without

compromising their socioeconomic norms and structure. Better institutions and economic freedom will also allow for local independence as aid can be crippling when a country comes to depend on it. Further, with economic freedom, food and cash crops can be produced based on preference.

In conclusion, for agricultural development, education and training are needed for the successful adoption and application of knowledge. As extension programs require financing, foreign aid and other partnerships with the government and local communities can be a way to support rural farmers with the needed supervisors, tools and material (Ssozi et al., 2019). With that, when aid is available, social and economic changes that may happen following changes in agricultural practices have to be taken into account for the sake of sustainability. Therefore the need of local institutions to supervise the activities between rural farmers and organizations that are in charge of training them, allowing for a positive return on inputs and investment to be more likely. From this point of view where returns on investment may cause more promising farmers to be preferred over those in dire need, agricultural assistance policies can be effective at allowing big and small farming families to be given the appropriate amount of help.

2.6. How To Help Well

In order for rural farmers to be educated and trained well, there is the requirement to know who they really are, what they need and what they have. By knowing the rural farming communities that are being helped better, it can be easier to tell what they want to achieve, how productive they are and can possibly become, how their local socioeconomic structures can be

maintained or improved in a way that will continue to serve them, and what changes will be inevitable. Therefore, in order to educate and train rural farmers well, a partnership needs to be formed between experienced experts who are present on location and farming students who are willing to try the customized advice and suggestions that they are being offered based on their existing systems.

A combination or one of the different means of agricultural development assistance, such as farmer fields schools or agricultural education and training programs, may be a way to create a synergy that can allow for rural farmers to be trained and educated well (Bachewe et al., 2018). To note, providing farmers with customized and sustainable solutions, without interfering with their social and economic structure, should also be supplemented with improving and strengthening the already existing systems without compromising daily needs or other farming components (Tsiboe et al., 2016). When both the helper and the one who is receiving help can benefit, it may be that the project is going in the right direction.

CHAPTER 3: CONGO CASE STUDY

3.1. Introduction

When it comes to what has been done to build human capital in the agricultural sector in the Congo, different projects have been conducted in partnerships between both local and international organizations. However, those projects have not always been implemented in ways that have been successful and resulted in growth overtime. At the same time, there is a lot to be learned from the past failures and successes when it comes to planning for future agricultural development projects that aim to have a positive social and economic impact. Notably, the Congolese government, local universities, the Food and Agriculture Organization of the United Nations, the African Development Bank (AfDB), the World Bank and foreign agencies such as France's Agence Française de Développement (AFD) or Belgium's Enabel are among the different bodies who have been involved with and have contributed to agricultural development efforts in the Congo over time.

While this project asks how education and agriculture can lead to economic development in the Congo, education can mean different things while agriculture is defined by activities related to farming and the production of food. Education, in this case, does not only refer to traditional schooling. Other than traditional schooling, the kind of education that can lead to agricultural and economic development includes learning activities and training programs that build human capital and allow the transfer of knowledge. As such, in an attempt to increase

yields and improve productivity as a way to contribute to economic development, any educational experience that would allow rural farmers to increase their yields and productivity is relevant.

With agriculture as the principal field through which there is an opportunity for economic development in the Congo, extension programs, farmer field schools and agricultural education and training are tools that can lead to favorable results when applied and implemented well. For instance, with farmer field schools, farmers participate in learning activities with the assistance of experienced personnel who have scientific knowledge (FAO, 2011). If experts carry out experiments in the field, which allow them to better understand the environment in which the famers live and work, they can make more accurate recommendations on how the land can be used for farming.

With some given successes and failures when it comes to the final results of the agricultural development projects that have been implemented or attempted in the Congo, sustainable and scalable projects that result in aggregate economic growth are still to only be seen in the future. For now, it is instructive to consider the factors that contribute to successful and less successful agricultural development.

In terms of successes, a couple of notable projects are the Agricultural and Rural Sector Rehabilitation Support Project (PARSAR) in the Bandundu and Bas-Congo provinces, and the Agricultural and Rural Sector Rehabilitation Project (PRESAR) in the Katanga, Kasai-Oriental and Kasai-Occidental Provinces. To note, while both projects have similar names, it is not the case that they are exactly the same project, nor is it the case that one is the English name and the other is the French name of the same project. Rather, both projects are similar in that they were a

partnership between the Congolese government and the African Development Bank. The two projects were carried at different locations and at different times, with some proximity, and resulted in both social and economic improvements for the rural farmers in the respective communities in which they were invested.

When it comes to less successful projects, a couple of notable ones are the cases of the Bukanga Lonzo agro-industrial park pilot in Bandundu and the agribusiness Feronia which began operating three palm oil plantations in 1911 in the northern Congo provinces of Boteka, Yaligimba and Lokutu. To note, while PARSAR and PRESAR are considered to be successful projects in this paper, their sustainability and scalability can be put into question given the lack of reporting on their operations after their initial project accomplishment reports, which praised the results of both initiatives. In the case of the Bukanga Lonzo agro-industrial park and Feronia, both cases are considered to be successes by their operators. In this paper, they are presented as less successful cases given subsequent critiques of the sustainability of the projects over time.

The Bukanga Lonzo agro-industrial park pilot was set up in 2014 through a partnership between the Congolese government and the South African company Africom Commodities. The plan of the pilot was to use 80,000 hectares of land for the production of corn, tomatoes, potatoes, beans and other commodities to be sold at attractive prices locally. The Congo is a net importer of food due in part to domestic crises which have hindered production and increased malnutrition (Eric et al., 2017). In response, the local Congolese government invested close to $100 million in the project and it had ambitious projections for its future.

Figure 3.1: Bukanga Lonzo Estimated Output, 2014

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Crops	Unit						
Maize	Ha	10,000	17,500	25000	35000	50000	50000
Soya	Ha	8,000	14,000	20000	25000	40000	40000
Cassava	Ha			2500	5000	5000	5000
Beans	Ha	2,000	3,500	5000	10000	10000	10000
Potatoes	Ha	1,000	1,750	2500	2500	2500	2500
Sweet potatoes	Ha		1,000	1750	2500	2500	2500
Peanuts	Ha		300	600	1000	1000	1000
Tomatoes Fresh	Ha	250	500	500	500	500	500
Tomatoes processing	Ha			500	1000	1000	1000
Cabbage	Ha	500	750	1000	1000	1000	1000
Spinach	Ha	250	500	500	500	500	500
Onions	Ha			500	1000	1000	1000
	Total Ha/Year	12,000	22,300	35,350	40,000	65,000	65,000
Livestock							
Dairy	Head	Set-up period	2,500	5,000	5,000	5,000	5,000
Broilers	Broilers	Set-up period	4,755,456	9,510,912	14,266,368	19,021,824	23,777,280
Layers	Laying hens	Set-up period	126,720	253,440	380,160	380,160	380,160
Pigs	Porkers	Set-up period	2,120	4,770	7,500	7,500	7,500
Goats	Does	Set-up period	1,000	2,000	3,000	4,000	5,000
Aquaculture	Ha of ponds	Set-up period	40	90	140	140	140

© Agricultural Business Parks, DR Congo

Further, as seen in figure 3.1 above, crops were supposed to be cultivated on as much as 65,000 hectares of land, out of 80,000 in total, within six years. Expanding food crops production has been recommended as a way to fight poverty and malnutrition in the Congo by Yango and Mukoko (2016). In addition, attractive prices on staple foods locally are found to be more significant for food security when compared to the income effect (Eric et al., 2017). However, the project collapsed in 2017, three years after it was launched. Both the Congolese government and Africom have blamed each other for the failure. Africom even launched a court action in 2018 against the Congolese government for missed payments, seeking to recover nearly $20 million it says it is owed from the failed agriculture project (Ross, 2018).

In the case of Feronia, a Human Rights Watch report has blamed four European development banks for abusive human and labor rights practices on palm oil plantations and their surrounding communities which have also resulted in environmental hazards (2019). Those

banks include the Belgian Investment Company for Developing Countries (BIO), the CDC Group, which is a development finance institution owned by the UK government, the German Investment Corporation (DEG), and the Netherlands Development Finance Company (FMO). Human Rights Watch has dubbed the project “a dirty investment.”

3.2. Agricultural and Rural Sector Rehabilitation Support Project (PARSAR)

The Agricultural and Rural Sector Rehabilitation Support Project (PARSAR) was launched for the Bandundu and Bas-Congo provinces, costing a total of UA 28.01 million, or the equivalent of $42.3 million, which was approved on 19 May 2004 (African Development Bank, 2012). To note, UA is the official currency of the AfDB projects. Thanks to the program, every quarter, the subsistence farmers were shown new production techniques and improved seeds were also provided. The National Institute for Agronomic Study and Research (INERA) and the National Seed Service (SEMASEM) were some of the organizations involved in the project.

According to Jean Misiwense, a supervisor at PARSAR, the improved seeds have short growing cycles and high productivity levels. Further, the improved seeds are also more resistant to plant diseases when compared to other local seeds (Bakiman, 2011). As of 2011, more than 200,000 households were benefiting from the agricultural and infrastructural benefits of the program.

The Agricultural and Rural Sector Rehabilitation Support Project (PARSAR), which operated between 2005 and 2012, aimed to strengthen food security and reduce poverty in the Congo, with the idea that agriculture has significant growth margins and occupies a crucial place

in the country's economy. The agricultural sector in the Congo suffers from poor rural infrastructure and the failure of the state to provide adequate supporting services (Eric et al., 2017). That, in addition to the state of war and its social and economic consequences in the country, resulted in the impoverishment of the population and food insecurity (Bakiman, 2011). A PARSAR study estimated that the food deficit was more than 30% and that poverty affected 60% of the population in the Congo (African Development Bank, 2012).

In order to provide applicable solutions to the farming population in the country, the Congolese government partnered with the African Development Bank (AfDB) and PARSAR was initiated in the provinces of Bandundu and Bas-Congo in the western part of the country. A total of $42.3 million was invested in the project which was approved on 19 May 2004 and started later towards 2005.

In terms of objectives, the aim of the project was to increase food security and contribute to poverty alleviation in rural areas through capacity building and the improvement of agricultural production in the provinces of Bandundu and Bas-Congo through both social and economic impact. Infrastructure, education and the organization of basic community structures were given importance as part of the PARSAR project. Notably, among the main contributions of the PARSAR program is that it included activities that aimed to improve and provide basic agricultural guidance and needs relevant with seed production, agricultural products processing units, markets, warehouses, tracks and water sources. As it has been pointed out in the second chapter of this paper, agricultural development projects are most efficient when they provide an array of tools that are agriculturally, economically and socially necessary. Those necessities may specifically be access to markets, seed choice education and crop spacing awareness.

In terms of results, an improvement was counted in the average income of farmers and female traders, with both increasing by 30% and 70% respectively (African Development Bank, 2012). Further, the creation of 1,134 permanent jobs and the development of access to markets were also parts of the project's accomplishments. The project also included the regular supply of clean drinking water with no waterborne diseases to a population of 84,500 people, or 12,630 households in the same area. That is crucial for a rural community that many times may require that women take off from their working and studying time in order to walk to a distant source of water and gather water back from there.

Additional impacts at the end of the project in 2012 can mainly be summarized with the following achievements. First, the reinforcement of intervention capacities of partner structures and ministries in charge of agricultural and rural development were further improved with five rehabilitated buildings and 22 new premises of demonstration built. Premises of demonstration, or demonstration plots, are fields that can be used to teach, research, experiment and share ideas about agriculture practices. Through testing and evaluation in local field conditions, premises of demonstration help with the adaptation of new farming methods.

The newly built infrastructure was aimed to improve the working conditions of about 4,000 executives and agents who were members of organizations that were put in charge of operational aspects of the agricultural communities in Bandundu, one of them by the name of village seed organizations (VSO). With those agents involved, the educational aspect of the project was further increased, which provided the rural farmers with better informed farming techniques. Further, with the newly built facilities, more than 2,500 people from the ministries

and organizations involved in the project, 40% of whom were women, received training as managers and technical agents.

When it comes to the operational support for agricultural production, 27 VSOs brought together 768 grassroots peasant organizations (OPB) in order to set up operations and supervise them, which included 22,829 members, 56% of them being women, resulting in a direct positive impact on a total population of 570,000 people. When it comes to agricultural yields as a result of the intervention of the project's agents , controlled and certified seed production reached 1,213 tons, which was three times more than the project objective of 395 tons. In addition, as the VSO participants gradually adopted the new technology of improved seed production, the food yields produced from the improved seeds reached an estimated amount of 3 million tons, which was greater than the forecast of 1 million tons (African Development Bank, 2012).

As previously mentioned, the increase in agricultural yields were achieved as a result of an effort accompanied by the integration of different complements to the newly implemented farming methods and technologies. Those new methods and learned technologies included the popularization of harnessed farming and the distribution of equipment for the processing of agricultural products such as hullers, polishers, mills, graters, threshers and ginners. Further, the revitalization of the rural micro-finance component in the area was also conducive to the favorable results that depended on funding for the sustained adoption of improved agricultural methods and technologies over time.

PARSAR also took rural infrastructure into consideration. Agricultural yields can be increased but access to markets due to poor infrastructure and roads can be a challenge when it comes to being profitable from selling fruits, vegetables and other produce. As such, 1,020 km of

rural roads and 660 ml of civil engineering structures connecting the production areas to the marketing centers were built for ease of access. The civil engineering structures additions to the newly built roads included 20 marketplaces and 35 warehouses.

With the newly built roads and infrastructure, the production area was made more accessible following the rehabilitation of rural roads. For instance, the journey time was reduced by more than 50% with the tracks becoming more frequented, in particular by the transporters of food products and the traders that doubled in numbers. Notably, food products sold in some markets increased by around 100 tonnes per market day. Furthermore, the cost of transporting goods and people was reduced by at least 20%, and sometimes by more than 50% on certain routes, as a result of the buildings and improvements.

In order to ensure the sustainability of these infrastructures, PARSAR set up and trained management committees that oversaw the systems that were built. At the end of the project, its achievements were measured and it appears that they had many significant effects. According to the associations and management committees involved, the advantages for the population were in the grouping of certain income-generating activities or the management of collective services. As such, by avoiding scattered operations, the efficiency of the project was increased with the improved and more systematic operation of the agricultural activities.

Overall, the project revolved around institutional support, capacity building, support for agricultural production, and the rehabilitation of basic social and economic infrastructure. The success of the project resulted from an approach that took into account both social and economic dynamics, from the building of 160 drinking water sources and roads, the provision of technical support, and the provision of advanced and applicable farming methods and technologies.

In the case of PARSAR, education comes across as a tool that was used to facilitate the adoption of shared knowledge and new technology. Further, education was also used as a way to educate and train management capacities for the project. As a result, arrangements were made to sustain the initiatives as leaders and managers from the community organizations were trained to carry on the work from different aspects.

3.3. Rehabilitation of the Agricultural and Rural Sector in the Congo (PRESAR)

In December 2005, the Congolese government, with the support of the African Development Bank (ADB), established the Agricultural and Rural Sector Rehabilitation Project (PRESAR) in Katanga, Eastern Kasai and Western Kasai provinces. Having both operated around the same time, PRESAR is very similar to PRASAR. The objective of the project was contributing to food security and poverty reduction in rural farming communities in the Congo (African Development Bank, 2013). In order to achieve the agricultural development goal, PRESAR invested in infrastructure, working tools, seeds improvement, access to markets and the support of grassroots community structures. The project was completed at the end of May 2013 after lasting for about five years. With PRESAR, like with PARSAR, the type of education that took place was the training of the rural farmers and agents who supervised the operations of the project and adopted new farming methods and technologies.

Figure 3.2: PRESAR Financing

Financing	Amount expected (UA)	Amount disbursed (UA)	% Disbursement
ADF	35 000 000	34 513 352.54	98.61
Government	4 400 000	1 657 223.26	37.66
Total	39 400 000	36 170 575.80	91.80

PRESAR was valued at $54.3 million with most of the finance coming from the African Development Bank which uses the UA currency. As seen on figure 3.2 above, the project was valued at 39 million in total by the African Development Bank. To note, 1 UA is equal to 1 SDR. The SDR, or special drawing rights, is the International Monetary Fund reserve assets created in 1969. It is used to represent the amount of currency given to an IMF member country and it is not an official currency. Its value is based on the U.S. dollar, the euro, the Chinese renminbi, the Japanese yen, and the British pound sterling. So far, 204.2 billion SDR, or about $281 billion, have been allocated to member countries (IMF, 2020).

In terms of the PRESAR achievements, agricultural production was complemented with education, training, technological and farming methods adoption, access to financing, and infrastructural developments. For instance, over 2,100 officials trained in various disciplines, six craft workshops were expanded and equipped, and 125 craftsmen were trained in carpentry and mechanical tools for the production of tillage, coupling and household crafts. As seen on figure 3.3 below, the program even included community informational programs to spread best practices on HIV/AIDS, malaria, and nutrition among others. Overall, the average achievement of the objectives above was not perfect but still as high as 87%. Notably, the goal of training 100

local operators was over achieved, as 134 operators were trained. However, with a goal to train 631 infrastructure management committees, only 323 (or 51%) of the goal was achieved.

Figure 3.3: PRESAR Training and Construction

Description	Unit	Overall objective	Overall achievement	% overall achievement	Achievements by source of financing					
					Government			ADF		
					Objective	Achievem.	%	Objective	Achievem.	%
Rehabilitation of rural roads	Km	837	593.1(1)	**71**	248	28	**11**	586	575.1	**98**
Construction of markets/ warehouses	Unit	16	11	**69**	5	1	**20**	11	10	**91**
Development of water sources	Unit	360	292	**81**	64	45	**70**	296	247	**83**
Grazing infrastructure	Unit	42	32	**76**	8	0	**0**	34	32	**94**
Training of infrastructure management committees (CLER, CGME, CGIP, CGPE)(2)	Number	631	323	**51**	-	-	-	631	323	**51**
Training of local operators	Pers	100	134	**134**	-	-	-	100	134	**134**
Training of site leaders	Pers	100	102	**102**	-	-	-	100	102	**102**
Training of team leaders	Pers	200	196	**98**	-	-	-	200	196	**98**
Broadcast of sensitization messages on HIV/AIDS, malaria, nutrition, etc.	Message	24	24	**100**	Through local radio stations and contact groups					

(1) With 13 bridges and 199 permanent reinforced concrete boxes
(2) CLER: Local road maintenance committee; CGME: Market and warehouse management committee; CGIP: grazing infrastructure management committee; CGPE: Water point management committee.

Further, 114 ministry offices and five laboratories of the National Institute of Agronomic Studies and Research (INERA) and the National Seeds Service (SENASEM) were rehabilitated and equipped. Six head offices and 17 branches of microfinance institutions (MFIs) were also rehabilitated and equipped along with 25 sales points for veterinary products. Additional achievements of the project included the supply of 1,840 yoke of oxen for farmers, the training of 3,680 relay farmers, the distribution of 125 heifers to associations for the sustained use of

animal traction. Over 108 square miles were cultivated by animal traction. That resulted in the production and distribution of 20,300 tons of improved food crop seeds.

As previously mentioned, Yango and Mukoko (2016) suggest that cereals and roots are the more efficient crops for poverty reduction in the Congo. From their perspective, an agricultural strategy that is based on the production of food crops has the potential to lead to an 8.21% annual agricultural growth rate, which will be effective at poverty reduction to the extent of halving poverty in the country within a few years. Therefore, the authors suggest expanding and prioritizing the production of food crops in the Congo.

Beneficiaries of PRESAR were trained and organized by operators including INERA, SENASEM and the CEDA LEA staff, each with a given sphere of competence. The training included improved seed production, packaging, storage and conservation techniques, agricultural produce processing and development, and training and management of draft oxen. The use of animal traction and introduction of advanced agricultural production techniques led to a significant increase in farmed areas. That allowed the doubling of the average yields for food crops such as maize, beans, peanuts and rice, along with the 20,300 tons of improved food crop seeds (ReliefWeb, 2012).

The various training exercises, tools and capital improved the technical knowledge of the project's participants in data processing, farming operations, budgeting and financial monitoring, and the organization of farming labor. Given the results, the adoption through education and training of agricultural practices, seeds and technology that matches the needs and wants of the local communities and their environment have led to a significant increase in farmed areas. As seen on figure 3.4 below, senior staff and employees in various disciplines, from craftsmen to

veterinarians, were trained and objectives were perfectly achieved. Notably, with the additional aspect of rehabilitation, as many as 325 village funds were created and provided with furniture and IT equipment. The goal had initially been the creation of 150 units, and therefore the result reflects an overachievement of 217%.

Figure 3.4: PRESAR Training and Rehabilitation

Description	Unit	Overall objective	Achievement	Achievement rate	Beneficiary/Observation
Training of senior staff and employees in various disciplines	Pers.	1 652	1 810	110%	MINAGRI, MINDER, MINPLAN, MINENV, MIN GFAE, INERA, MINPLAN and PRESAR, including 32% of women
Training of craftsmen	Pers.	125	125	100%	Carpentry, mechanics, handicraft
Training of MFI employees	Pers.	300	280	93%	Collection of savings, creation of village funds, credit management, etc.
Training of veterinarians	Pers.	50	50	100%	Creation and management of sale points, supervision of stock breeders, etc.
Rehabilitation of offices	Unit	69	96	139%	MINAGRI, MINDER, INERA, PRESAR
Equipment of offices of MINAGRI, MINDER, MINENV MINPLAN, MIN GFAE and INERA	Unit	114	114	100%	Furniture and IT equipment
Rehabilitation of laboratory equipment	Unit	5	5	100%	SENASEM and INERA,
Equipment of handicraft workshops	Unit	12	12	100%	Carpentry, mechanics,
Extension of carpentry workshops	Unit	6	6	100%	Three project provinces
Rehabilitation and equipment of INERA seed stores	Unit	2	2	100%	INERA
Rehabilitation of MFI offices	Unit	6	4	67%	Three project provinces
Equipment of MFI offices	Unit	12	12	100%	Furniture and IT equipment
Opening of MFI branches	Number	25	25	100%	11 in Katanga, 7 in Kasaï-Oriental, 7 in Kasaï-Occidental
Creation of village funds	Unit	150	325	217%	Furniture and IT equipment
Rehabilitation and equipment of AMVCs	Unit	12	12	100%	Idem
Equipment of veterinary pharmacies	Unit	25	25	100%	Idem
Creation of sale points for veterinary products	Unit	9	9	100%	

With the use of animal traction and promotion of agricultural production techniques, which have led to a significant increase in farmed areas, agricultural production increased with the doubling of average yields for food crops such as maize, beans, peanuts and rice. The increased agricultural production boosted the farmers' incomes, resulting in an improved quality of housing, the acquisition of agricultural vehicles and tractors by farmers, and the extension of farmlands for individual producers and associations that received support with the promotion of their professional capacity. In terms of infrastructure and distribution, 482 km of rural roads were rehabilitated under PRESAR, and 14 bridges and box culverts were also constructed. Further, 181 drinking water sources, small-scale livestock schemes, and more than 400 hectares of market gardens were created following the installation of water retention and irrigation systems.

With the rehabilitation of rural roads, production areas became more accessible and travel time was reduced significantly. That enabled access to the production areas for all types of vehicles ranging from cars to heavy-duty trucks. With the access to new markets along the rehabilitated and newly built roads, a gradual beginning of internal migration from urban to rural areas was reported. This is therefore a case where the Todaro Paradox, that on the one hand industrial expansion will allow developing countries to reduce unemployment caused by an oversized rural workforce while that on the other hand expanding urban employment will attract the rural population into the cities thus increasing unemployment, seems to suggest that the Congo can avoid the risk of poverty as a result of rural to urban migration (Ambapour, 2015). As seen in figure 3.5 below, jobs were not only created by the project but training also was included for team trainers, seed growers, and animal traction use, and producer groups were established and trained as well with high achievement rates.

Figure 3.5: PRESAR Agricultural Infrastructure and Tools

Description	Unit	Overall objecti ve	Achievement	Achievem. rate	Observation
Procurement of ox teams	Ox team	188	188	100%	
Training of ox team trainers	Pers	188	188	100%	
Training of animal traction (AT) demonstration ox teams	Ox team	188	188	100%	
Training of farmers' AT ox teams	Ox team	3 400	2 205	68%	1 731 in Katanga, 218 in K. Oriental and 256 in K. Occidental.
Training of relay farmers in demonstration AT	Pers	376	376	100%	Conducted by ox team trainers
Training of independent farmers in AT	Pers	6 800	4 162	61%	Conducted by ox team trainers and relay farmers.
Area tilled by AT	Ha	54 400	46 323	85%	30 562 ha in Katanga, 15 311.5 ha in K. Oriental and 449.5 ha in K. Occidental
Procurement of heifers (unit)	Unit	125	125	100%	Disseminated in the 3 provinces
Training of seed growers	Pers	1 000	1 075	108%	
Organization & training of producers' groups	Grp	1 800	1 830	102%	
Training of artisanal-type associations and SMEs	Grp	400	778	195%	
Procurement of INERA seeds	Tonne	680	554.5	82%	Maize, beans, groundnuts & rice
Procurement of INERA cassava cuttings	Lkm	3 000	1 748	58%	INERA's low production capacity and transportation difficulty in isolated sites
Procurement of INERA banana shoots	1 000 shoots	2 000	245.949	12%	INERA's low capacity
Production and distribution of cassava varieties resistant to the African mosaic virus	Variety	5	12	240%	From IITA (Lueki, Sadisa, Sansi, TME419, Anti-Ota & Zizila)
Production and dissemination of blight-resistant banana varieties	Variety	5	5	100%	
Food seed multiplication area developed	Ha	11 440	16 654.6	145%	
Cassava cutting multiplication area developed	Ha	2 970	2 893	97%	
Banana shoot multiplication area developed	Ha	1 090	148	14%	
Production and distribution of improved seeds	Ton	22 880	29 390	109%	INERA & individuals

In terms of social benefits as a result of PRESAR, the locally built water schemes allowed a population of 157,000 inhabitants to have regular access to drinking water and protected them against water-borne diseases (African Development Bank, 2013). Further, given access to the water downstream of the new water sources, close to 2,640 households found the opportunity to engage in income generating activities. Among others, those activities included

market gardening, off-season maize cropping, fishing, and livestock breeding that were measured and enabled based on water retention facilities.

Women, who represent over 60% of the beneficiaries of PRESAR, were able to reduce their daily water supply duties and thus better use their time for other activities such as schooling, farming, training and educating their children. In the Congo, female farmers tend to do close to two hours more of domestic work per day when compared to male plot managers (Donald, Vaillant, Campos, & Cucagna, 2018). As a result of women spending less time on their plots, the agricultural productivity of female farmers is on average 26% lower than that of male farmers. Those differences in time allocation are even higher in male-headed households where females spend significantly more time taking care of children and going to the market, in addition to farming, which is not the case for men.

According to Lambrecht, Vanlauwe and Maertens (2016), female participation is not necessarily conducive for reaching agricultural project objectives. At the same time, when it comes to the adoption of improved legume varieties, row planting and fertiliser, which is equal to the adoption of recommended agricultural methods and technologies, joint male and female participation results in the highest adoption rates.

Further, the authors claim that female participation is not conducive for the adoption of capital-intensive agricultural technologies but that female participation does increase labor-intensive technologies. In addition, they add that the participation of female farmers that are the head of their households leads to more technological adoption when compared to the participation of female farmers in male-headed households. As such, with more female participants in agricultural economic development projects, an avoidable risk is that of increased

unemployment as a result of the use of more machinery and automation because female participation increases the use of labor-intensive technologies in the Congo as per the authors. As is evident from the project's summary and added figures, PRESAR trained staff for governance and capacity building roles, and also provided technologies such as the use of animal traction. Employment was created with the new training program and the use of traction still requires human operators.

Figure 3.6: PRESAR Cassava Cuttings Multiplication

Production and distribution of improved banana shoots	1 000 shoots	12 000	2 181.5	18%	Production limited to INERA and transportation difficulty in isolated sites
Production and distribution of improved cassava cuttings	Cuttings	75 000	88 834	118%	Significant increase in 2012 from 20 to 118%
Conduct of demonstrations	Unit	300	450	150%	Various technical themes
Dissemination of production, processing, conservation, storage, etc. of technical packages.	Number	40	41	103%	In various project sites
Construction of community premises	Unit	25	25	100%	

As we can see, PRESAR had overall taken into account all the needs of the rural farmers whose lives the project was set to improve for the better through education and agriculture. From living conditions, infrastructure and access to clean water to working conditions, technology and farming methods, and access to markets, PRESAR was a success as a facilitator through a cohesion that created synergies with very positive results. Figure 3.6 is a demonstration of how even during the project in 2012, activities were monitored and in the case of low production, the

established seed multiplication program was used. While the improved banana shoots only resulted in a 18% increase, the production and distribution of improved cassava cuttings resulted in a significant increase of 118% in yields (African Development Bank, 2013). As such, the education and training of human capital, including operators, site leaders and seed growers among others, and the popularization of advanced methods of agricultural production, was key to sustaining the success of the project.

3.4. The Bukanga-Lonzo Agro-Industrial Park

In July 2014, the Democratic Republic of Congo's government officially launched its special economic zone (SEZ) plans, using agricultural land, with the goal of solving food shortages. The fact that the Congo is poor, that 70% of its population lives in rural areas and below the poverty line, is paradoxical, given the country's access to 80 million hectares of arable land (Lubu, 2015). Further, the Congo is a country that imports over $1 billion worth of food per year (U.S. Department of State, 2018). The projected plan to improve food security in the country, a public-private partnership (PPP) model under an established management company named Société de Parcs Agro-Industriels (SOPAGRI), was to transform land covering roughly 75,000 hectares into an agro-industrial park (Misser, 2014).

The Bukanga Lonzo agro-industrial park in Bukanga-Lonzo, western Democratic Republic of Congo, was inaugurated in 2014 by President Joseph Kabila on 300 square miles. It was the first pilot out of 22 planned projects across the country that were to produce agricultural products such as maize, sunflowers and even poultry (The Oakland Institute, 2019). The park

was established about 260 km southeast of Kinshasa, the capital and most populated city of the Congo, where more than 10 million people live (World Bank, 2018). Six *mini marchés* (farmers markets) were set up in Kinshasa to sell the production from the park directly to consumers.

"The time has come to transform Congolese agriculture from a subsistence sector to a powerful engine of global economic development," claimed President Joseph Kabila Kabange, while celebrating the first harvest in March 2015 (*Congo Synthèse*). However, three years later, the pilot failed. Activity on the site eventually came to a halt because Africom Commodities Pty, a South African company that was brought in as a co-investor and to manage the park left. Their claim was that they had not been paid by the Congolese government in close to a year. The company, Africom Commodities Pty Ltd, said the problems with the successful implementation of the project included high costs and disorganization from the part of the Congolese government which would change its mind from day to day when it came to the project's direction, resulting in poor operations and the company incurring more than $50 million in losses (The Oakland Institute, 2019).

Experiments like Bukanga Lonzo point to the importance of field research that can allow for an appropriate plan that takes social and economic factors into account. As it has been seen with both PARSAR and PRESAR, their success can be attributed to their approach that took into account not only agricultural operations for profit but also the daily needs of the surrounding population such as electricity and water. Further, in the cases of PRESAR and PARSAR, both projects were rather bottom-up and included the training and empowerment of local communities.

According to Sen, human empowerment should be the end goal of economic development, as it is the most efficient way of sustaining economic prosperity (1999). With human empowerment, which allows people the freedom to pursue career and life interests, economic development agencies should include the tools that allow the individual to achieve his goals instead of alienating him in the pursuit of profits. Therefore, in the case of agricultural development projects, what can be done is to prioritize collaborations that allow the beneficiaries to communicate what they really need and want. As such, with the interests of the beneficiaries in mind, the assistance they receive would rather increase their capabilities and freedom to choose their preferred development option, and not alienate them in an attempt to improve their economic situation.

As a matter of fact, the allocated land in Bukanga Lonzo was said to be developed not only for farming but also to supply electricity for nearby villages in order to sustain schools, clinics, churches and other daily living activities. However, while electrical contractors were hired, electricity was eventually only brought to the agricultural development park and not to the surrounding villages. Chief Mbuma Mpawa from the nearby Mwala Banku claims that they "were fooled" (The Oakland Institute, 2019). These days, police guard the park entrance and while Congolese officials acknowledge the project's collapse, they hope the pilot, and the broader initiative, can be revived (Ross, 2018). Figure 3.7 below shows the other location where similar agricultural projects were planned.

Figure 3.7: Planned Agro-Industrial Parks in the Congo, 2019

N°	Name	Province	Surface (ha)
1	Bukanga Lonzo	Kwango, Kenge region	80,000
2	Gbadolite	Equateur	77,000
3	Kindu	Maniema	150,000
4	Kinzau	Kongo Central, Mbanza Ngungu region	1,000
5	Luiza	Lulua, Luiza region	60,000
6	Muhala	Tanganyika, Kalemie region	42,000
7	Mushie-Pentane	Bandundu	60,000
8	Nkundi	Kongo Central, Luozi region	60,000
9	Ruzizi	Sud-Kivu	80,000
10	Takalama	Sud-Kivu, Fizi region	4,500
11	Dibaya Lubwe	Kwilu, Idiofa region	48,000
12	Kimbinga	Kwilu, Bulungu region	20,000
13	Tshela	Kongo Central, Tshela region	22,000
14	Bumba	Mongala Bumba	110,000
15	Businga	Equateur	65,000
16	Mweka Kasaï	Mweka region	82,500
17	Ngandajika	Kabinda, Ngandajika region	78,000
18	Kaniama Kasese	Haut Lomami, Kaniama region	106,500
19	Kasongo	Maniema, Kasongo region	75,000
20	Lotokila	Tshopo	95,000
21	Yangambi	Tshopo	85,000
22	Lowa	Nord-Kivu	187,000
TOTAL			**1,588,500**

In June 2018, Africom launched a court action against the country at the International Court of Arbitration in Paris for non-payment of their expenses. Effective agricultural policy, per the Congolese government, would improve social and economic infrastructure, access to social services such as drinking water and healthcare, improve the productivity of the agricultural sector and access to markets, and support the promotion of appropriate technologies to reduce the hardships of rural families while increasing their income (2009). While the Bukanga Lonzo

pilot ground to a halt, as of 2017 the project had some achievements. To note, 20 irrigation pivots with the potential to produce 500 tons of vegetables a day, 12 greenhouses for tomato production, a 40-ton grain storage facility, an electricity substation, and operational mini-shops around the capital city were established (Ulimwengu, 2018).

According to the Oakland Institute, a progressive think tank founded in 2004 by Anuradha Mittal, the Bukanga Lonzo case is proof that there was funding available but that those funds were not being used effectively. Ultimately, the institute suggests that the development of agro-industrial parks in the Congo are not the way to lead to agricultural development in the country. Instead, their advice for the Congolese government and its supporters, the World Bank and the AfDB, is to learn from the Bukanga Lonzo case how to better implement agricultural development in the future through more effective policy.

Further, local communities have also claimed that the issues with the project included unjust land acquisition, the lack of consultation or any form of contract with the local communities, the forced displacement of local farmers, the lack of information of the actual surface and the boundaries of the park and the use of polluting products (The Oakland Institute, 2019). In reference to the abuse of labor rights in the park, at least one person was reported to have lost his life from work-related injuries. In addition, mass firings took place in response to labor strikes, and staff did not receive adequate care following accidents while working in the park.

During the initial pilot, with 80,000 hectares to be cultivated, and an investment of around $80 million (AEFJN, 2018), the company hired between 300 and 500 people (The Oakland Institute, 2019). Many of them were not from the community nearby the

Agro-Industrial Park Bukanga-Lonzo. Furthermore, with close to nearly three million people living in the province of the project, and tens of thousands nearby the project, the number of job openings was reported to be relatively small. The local population was drawn by the opportunity to work for the park, but their high expectations were not met. The Oakland Institute, which interviewed locals, also reports that many would show up at the park with hopes of employment. However, many violent incidents took place. Some of those incidents included the presence of the police force.

At this point in time, the planned agro-industrial parks in the Congo through public-private partnerships are still to be executed. As of February 2020, the Congolese minister of agriculture, Joseph Antoine Kasonga, announced the resumption of the operation of the Bukanga Lonzo Park as he was sent to visit the site following the request of prime minister Sylvestre Ilunga Ilunkamba (Actualite.cd, 2020). A recommendation for the next launch of the pilot would be to prioritize human capital development and technology transfer for the purpose of empowering the local community.

Up to this point, it seems like the project has been planned as a top-down venture, entrusted to the South African company, Africom commodities, as part of a public-private partnership (AEFJN, 2018). If investors are brought in from abroad and there is no attempt to build local human capital, there is a missed opportunity to contribute to the local growth if few farmers are turned into wage laborers on a large portion of their land and they are not provided with any training and education that could be used as a tool to further their interests for growth and development.

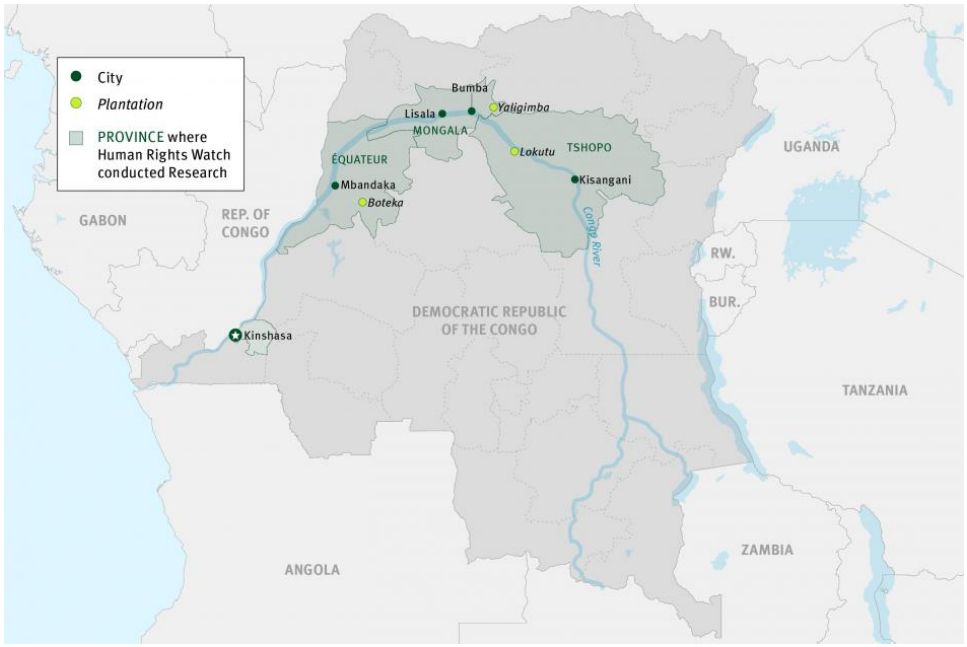
The local villagers, who are supported by the National Council of NGOs of the Congo (CNONG), are not necessarily against the park. However, their hope is to be able to benefit from the promised byproducts of the project (AEFJN, 2018). Among the infrastructure and initiatives that the Park has planned to invest in are the modernisation of villages, the construction of a school and clinics, and the training and hiring of local executives. That is in addition to a power station, irrigation system, roads and a landing strip, housing and a telecommunications network (Agricultural Business Parks, DR Congo). All of the above can empower the local community and directly improve the quality of their life, resulting in more capabilities. However, the locals have felt as if they are far from it, and that "everyone over there speaks English and we are treated like intruders" (AEFJN, 2018).

3.5. Feronia

According to a Human Rights Watch report, four European development banks are linked to abusive practices on palm oil plantations in the Democratic Republic of Congo. Those banks include the Belgian Investment Company for Developing Countries (BIO), the CDC Group, which is a development finance institution owned by the UK government, the German Investment Corporation (DEG), and the Netherlands Development Finance Company (FMO). The four are among the ten largest bilateral development financial institutions in the world and control billions of dollars in investments across more than 2,000 projects in developing countries (Human Rights Watch, 2019).

Starting in 2013, the four banks invested a total of around $100 million in a palm oil company by the name of Feronia and its subsidiaries which operate three palm oil plantations in the towns of Boteka, Lokutu and Yaligimba that are located in northern Congo, as seen in figure 3.8 below (Human Rights Watch, 2019). The three palm oil plantations span over 100,000 hectares and employ as many as 10,000 workers.

Figure 3.8: Feronia Locations



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Feronia is a public company listed on the TSX Venture Exchange in Canada and has been operating in the Congo since 1911 as an agribusiness that owns three palm oil plantations. According to The company's website, their primary objective is to meaningfully contribute to the future of the Congo by sustaining and developing the plantations that it owns and invests in. In 2018, the company had produced 40,600 tons of palm oil while being committed to

sustainability. Further, all of the company's produce is sold locally in the DRC, and it employs more than 8,300 permanent and temporary staff (Feronia, 2020).

As seen on figure 3.9 below, as part of their commitment to social and environmental responsibility, as much as 85% of households in Boteka get their primary income through employment with Feronia. In Lokutu and Yaligimba it is 34% and 67%, respectively (Thomas, Lotter, & Patton, 2015). In fact, most workers interviewed by Human Rights Watch say that their wages have allowed them to pay school fees for the education of their children, which has been their major expense (2019). However, the other social indicators are not as encouraging. For instance, as much as 92% of households in Boteka, or 89% in Lokutu, have reported food shortages.

While the official minimum wage in the Congo is $1.83 per day, Feronia says that its companies paid more than the minimum wage for agriculture in the Congo, with the average worker earning $3.30 per day. In comparison, according to Feronia, that wage is even higher than what a local teacher would earn (BBC, 2019). And while incomes from Feronia have been spent on education, school attendance for children aged 6 to 13 years is as low as 46% in Boteka, where 85% of households receive their primary income through Feronia (Digby Wells Environmental, 2015). In Lokutu, where 34% of households receive their income from Feronia, school attendance is the highest at 73%.

Figure 3.9: Feronia Social Indicators, 2015

	Boteka	Lokutu	Yaligimba
% of households who get their primary income through employment with Feronia/PHC	85%	34%	67%
% of households that reported food shortages	92%	89%	33%
% of school attendance for children 6-13 years	46%	73%	67%

As seen in figure 3.10 below, the estimated population in Lokutu is 53,192 people in 6,908 households, in Yaligimba it is 33,164 in 4,198 houselds, and in Boteka it is 11,651 in 1,739 households. As such, Feronia can have a direct impact on 98,007 individuals, or 12,845 households. However, given the estimates from figure 3.9 above and 3.10 below, it may be that employment with PHC does not necessarily result in improved food security or increased primary school attendance. Plantations et Huileries du Congo S.A. (PHC) is Feronia's subsidiary.

Figure 3.10: Estimates of Number of Households and Populations

Study Area	Number of Households	Estimated Population
Lokutu	6,908	53,192
Yaligimba	4,198	33,164
Boteka	1,739	11,651
Total	**12,845**	**98,007**

Further, according to Human Rights Watch, Feronia and the four investment banks have failed to ensure that the operations of the palm oil companies in the Congo respect basic human and labor rights for the people who work and live on or nearby the plantations where work is conducted (2019). Human Rights Watch conducted research at the plantations suspected of abuses in Boteka, Lokutu and Yaligimba, as well as in the cities of Bumba, Kinshasa, Kisangani, Lisala, and Mbandaka.

The abuses and environmental harm committed include exposing more than 200 employees to toxic pesticides without adequate protection, failing to provide employees with proper medical examinations, and oppressing the employees in a way that placed many of them under the extreme poverty line. Further, waste from the plantations was routinely dumped into nearby sources without being treated adequately, resulting in contaminating the only drinking water available to local communities. Human Rights Watch claims that it came to its conclusion by conducting field research in the Congo for a total of eight weeks between November 2018 and May 2019, when it visited the company's three plantations and interviewed more than 200

people. Those being interviewed included 102 PHC employees who reside on or near the company's plantations, 20 executives and managers, and 25 government officials.

A wide range of health problems have been reported by the plantation workers. Some have claimed that they have become impotent since they started their job, others described skin problems, several workers had vision problems, and some even claimed that they have experienced shortness of breath, elevated heart rates, headaches, weight loss and chronic fatigue. Those health problems can be attributed to being exposed to pesticides. According to Human Rights Watch, the workers were not informed of health risks nor were they appropriately protected.

PHC's sustainability director claimed that employees who work with pesticides are given a week-long training in Lingala, which is the most widely spoken language in the plantations, before they begin work. However, some workers told Human Rights Watch that the training was mostly in French, which limited their understanding of the safety information. The training sessions were conducted by company executives, plantation managers, environmental managers, and health and safety managers, without health workers such as doctors and nurses. Human Rights Watch reviewed various documents regarding the operations of the company that were submitted to Congolese authorities. They blame the Congolese authorities for having failed to ensure PHC's compliance with labor and environment laws, which allowed the deteriorated conditions among the plantation workers and local residents.

Feronia is one the five largest private employers in the Congo, and the largest in the agricultural sector. As such, the company could play an important role in promoting economic opportunities and development in Congo where two-thirds of its more than 80 million residents

live in poverty. However, Feronia seems to be failing to comply with international standards and domestic law that are concerned with human and labor rights, and the environment, thereby compromising its stated mission of being involved in the future of business in the Congo through the advancement of substantial investments. The DRC government is a 16.63% shareholder in PHC, the subsidiary, and has three directors on the company's board (Feronia, 2018). PHC paid national and local DRC Government and Authorities taxes and charges totalling $3.7 million in 2017, and $3.3 million in 2016.

Before the Human Rights Watch report was published on November 25, 2019, Feronia had published a sustainability report back in 2017 which sheds a positive light on their operations, suggesting that the company provided social and economic benefits for their workers and surrounding communities (2018). Notably, Feronia's chairman Mr. Frank Braeken claims that their responsibility towards communities and the environment is of a greater importance than companies from other locations given the lack of infrastructure in their area, which gives them the responsibility for their community. As such, they maintain roads, hospitals and medical centres that serve the wider population. Those infrastructures and services are provided in addition to shops and trading activities that serve not only the company employees but also everyone else who lives nearby.

As of 2017, approximately $11 million was spent on environmental and social improvements per Feronia's report. Further, in addition to job creation, Feronia has been able to create additional economic impact through the taxes they pay, the money they pay to suppliers in the DRC and the wages that they pay. Feronia also said it is improving working conditions, increasing salaries, investing in clean water, and training staff to better protect themselves from

toxic chemicals. “We recognize that there is still a great deal to be done and are committed to operating to international standards,” Feronia said in an emailed statement (Kavanagh, 2019b). In a joint statement, the four European development banks that have invested in Feronia, and the company itself, said they were aware of the problems at the plantations, and that they were working to address them.

Overall, while in the palm oil business, the company reports that its contribution to its surrounding community included the building of 51 schools, a port, 21 water sources, 6 markets, 2 colleges and road repairs. All those additional benefits for the surrounding community are similar to aspects of PARSAR and PRESAR that are aligned with social and economic development that have the mindset of a long-term contribution.

In this case, while involved in human rights violations, Feronia does seem to have an educational aspect that allows for social and economic development that comes about directly through their involvement in the palm oil business and in the improvement of the quality of life of the youth and elders in their community. What's more, with the initiative to increase access to schools and markets, Feronia adds to the knowledge and technologies that can be adopted and utilized among the beneficiaries of its social contributions. At the same time, the 2019 report by Human Rights Watch still blamed Feronia and its operations for workers being exposed to toxic pesticides, dumping untreated waste in undesignated locations where locals live, labor rights violations and low wages, which is a complete contradiction to the reports of the company.

With the growth of palm oil farming, land-use changes can lead to both environmental and social negative externalities. Therefore, better policies and labor protection will be significant to prevent future exploitation and meaningfully contribute to poverty alleviation

(Jacoby, 2019). The recommendations for the company by Human Rights Watch included providing appropriate and complete equipment that adequately protects all workers from hazards, clear information for workers to understand the risks associated with their job, tests and medical examinations (2019).

In addition, Human Rights Watch recommended that the company treat all waste according to industry standards and the Congolese law, take care of complaints about water contamination in affected communities, and allow access for Congolese authorities to all company sites for regulatory inspections. All of the recommendations would seem to have been followed according to the Feronia 2017 Sustainability Report, where the company claims that "improving the long-term livelihoods and wellbeing of employees and their families is a priority for Feronia" (2018). The company also gives a list of achievements that includes providing housing and free healthcare, supporting education and security practices.

CHAPTER 4: PROPOSAL

4.1. Conclusion

At this point, it seems that successful agricultural development projects that contributed to local communities took into account both social and economic matters, while agricultural projects that were less successful seem to have only prioritized profit maximization while being detrimental to their environments. With the PRESAR and PARSAR case studies, bottom-up community participation and empowerment are common. In comparison, Feronia and Bukanga Lonzo are rather top-down, for-profit, and are accused of environmental damage. If we know that social and economic components such as education, training and technological innovation, including tools for agriculture, living and working facilities, infrastructure and environmental friendly practices are a good recipe for agricultural development while labor rights violations, forsaking social dynamics and the local ecological conditions are not so conducive to sustainable development, then why isn't the obvious happening more?

Given the political and economic instability in the Congo, good solutions to the provision of agricultural education and training can be found but the country's economy will only benefit from the continued momentum of stability to evolve in the right direction. Further research is necessary to identify where, when and how exactly to start with agricultural development projects that will fit the micro and macro environment in the country. Further, given the size of the country, finding methods that can be implemented and scaled successfully over time in the

Congo will be necessary for sustainability. Similarly to Easterly's example of a doctor who for his own success needs others around him to also be successful and support him, so can economic development also have such a dependency relationship (2001). As such, micro and macro instabilities in the country will be crippling to its sustained economic growth. Good knowledge can be transferred to rural farmers, but tools, infrastructure and institutions that allow them to work over time are equally fundamental.

In the case of the Congo, among others, both social and economic instability have almost always existed, resulting in one problem on top of another. Poor institutions and governance, the resource course, ethnic and rebel disputes, underdeveloped infrastructure and insecurity are among the issues that impede economic development in the country. For instance, when it comes to the scalability of PRESAR and PARSAR, both projects with good final reports, the existing insecurity in the country can limit the access to some of its regions. Further, given the need of financing, both bilateral and multilateral aid or loans can be difficult to find due to instability. Nevertheless, poor infrastructure and institutions can increase the costs of projects when much has to be provided while there is little to work with.

It can also be argued that other projects such as Feronia and Bukanga Lonzo are victims to the weak institutions in the country. One reason can be that better infrastructure would have allowed for a more ecological management of environmental hazards. Another reason, having to do with the training of workers, is that language barriers that access to education could have prevented create an obstacle with the sharing of knowledge and safety practices. Notably, in the case of Feronia, while training was well administered by various company executives, plantation managers, environmental managers, health and safety managers, and agricultural managers, the

one-week training was mostly in French, which posed comprehension barriers (Human Rights Watch, 2019). Even when some explanations were provided in Lingala, the most widely spoken language on Feronia's three plantations, it still was not enough for the transfer of information.

As success with agricultural development would likely require the provision of all and not only some of the needs of rural farmers, and to as many as possible (Tsiboe et al., 2016), there are additional aspects to be covered about the current state and future possibilities and opportunities of agricultural development in the Congo. In the case of Ethiopia, the second most populous country in Africa, its agriculture sector recorded remarkable rapid growth between 2004 and 2014 (Bachewe et al., 2018). That rapid growth in Ethiopia, a country with a population of 109.2 million as of 2018 according to the World Bank, was the result of numerous changes and actions that took place in the country. With a significant increase in land and labor use, Bachewe claims that total factor productivity grew by about 2.3% per year between 2004 and 2014 in Ethiopia.

Notably, in Ethiopia, the improvement in agriculture was the result of the modernization of the sector. The improvement in modern input use was driven by high government expenditures on the agriculture sector, in addition to farmer education via agricultural extension (Bachewe et al., 2018). Further, in addition to the application of research and new knowledge to agricultural practices through farmer education, other factors that affected productivity were an improved road network, higher rural education levels, and favorable international and local price incentives.

Here again, the different aspects that were included in the Agricultural and Rural Sector Rehabilitation Project in Katanga- Kasai-Oriental and Kasai-Occidental Provinces (PRESAR),

and the Agricultural and Rural Sector Rehabilitation Support Project (PARSAR) are relevant. Both projects were not simply limited to providing agriculture knowledge and tools to farmers. Instead, above and beyond, rural roads and structures that link production areas to marketing centers were constructed, markets were also built, drinking water sources were developed, and management committees were trained to ensure the sustainability of the project and its infrastructure (African Development Bank, 2012, 2013).

In the future, a pattern to be followed for agricultural development can be similar to that of PRESAR and PARSAR, or even the similar examples from Ethiopia and South Africa. In Ethiopia, agricultural transformation has been the result of a land and labor use expansion that was supported by the use of modern inputs and high government expenditures on the agriculture sector. Agricultural extensions, road improvements, higher rural education levels, and international and local price incentives were also part of the success (Bachewe et al., 2018).

At this point in time, thinking about the development level in the Congo, a bottom-up solution with a human face will be more similar to the Cocoa Livelihood Program (CLP) in Ghana, Côte d'Ivoire, Nigeria, and Cameroon. Under the CLP program, specialized training, crop diversification and the establishment of farmer-based organizations among cocoa farmers led to a yield enhancement of as much as 32%, 34%, 50%, and 62% respectively (Tsiboe et al., 2016). Further, the program achieved an estimated return of $18 to $62 per dollar spent on inclusive human capital development. Here, for continued success, Tsiboe recommends increasing the number of farmers who receive all and not only some of the program components (2016). The CLP can be a starting goal of agricultural development, one that is sensitive to local social and ecological conditions, with the expansion of capabilities as the initial goal.

In South Africa, agriculture was used to establish today's black middle class, something which was presumably accomplished regardless of the apartheid epoch which lasted from 1948 to the early 1990s. To start, farmers in South Africa started producing for the market and used their surpluses to educate their children. Next, after being educated, these children accumulated more land for farming and increased their quality of life when compared to that of their parents. This similar pattern was then followed generation after generation, starting in the middle of the 19th century, with income and area of land farmed increasing, and thus wealth was created over time. According to Lewis (1984), Bundy (1979) has attributed this cycle to technological innovation, crop diversification, and the expansion of output among black agriculturalists. Further, Lewis also mentions Cooper (1981) with the idea that what was common among the poor farmers in South Africa was the use of outdated farming practices and their inability to adopt new and improved methods.

In the specific case of agricultural development in rural communities in the Congo, access to markets, trade and investment, and shifts in the labor market have to be planned for and prioritized in order to go beyond subsistence farming and to farming for profit and economic development. With better institutions and economic freedom, there can be an increase in the effectiveness of development assistance for economic and social transformation in the near and far future. That can be done by being involved in selling to the local market, or even exporting. To date, the Congo borders with nine other countries with whom it can trade. With the goal of having a short-term dependency on agricultural aid and a long-term independent community, working according to a structured plan that has very clear objectives and deadlines will be conducive to goal attainment.

In later years, assuming that farmers have been empowered and are now capable of increasing the educational attainment of their children in addition to the decrease of malnutrition, a more prosperous society can be the strong foundations on which agricultural operations can be scaled. In this case, top-down projects such as the Agro-Industrial Park in Bukanga-Lonzo, Feronia or others similar to the case in Ethiopia can become advantageous. As previously mentioned, the Congo has close to 80,000 hectares of arable land, of which only 10% is being used (The Oakland Institute, 2019). Even with the empowerment of 68.7% of the population that works in agriculture through education and training, smallholder farmers may not be able to work on all of the 80,000 hectares. A more industrial approach to agriculture can be adopted, which may allow the Congo to go from a net importer to an exporter of food and even cash crops.

From the empowerment of smallholders to possible industrial agriculture, education and training should be complemented by building markets and infrastructure with the intent of possibly starting to use capital-intensive technology. Scaling operations in a later stage will be worthwhile given the probability of a sectoral shift from agriculture as farmers earn more and the educational achievement of their children can be higher than theirs. With higher educational attainment, services and technology can be better ways for modernization and innovation when compared to agriculture. Japan and South Korea are two of the best examples in the world (Oshima, 1986).

The use of modern inputs and high government expenditures and policy on the agriculture sector will become more significant for the later stage of agricultural transformation. Agricultural extensions, road and infrastructure improvements for exports, higher rural education

levels, and commercialization through market development and price incentives will all be part of the success. Further, expansion in modern input use correlated with extension, incentives, and education, which drove productivity growth (Bachewe et al., 2018). At the same time, both the initial empowerment of smallholders and the later stage of industrial agriculture production will depend on political and economic stability, and cannot be sustained or scaled unless institutional problems are first resolved at the national level.

In any case, the end goal of development should remain sustaining economic life and securing the welfare of the country's population (Sen, 1999). A lot more can be achieved when there exists a collaboration between political and economic forces in order to maintain order when it comes to agricultural creativity and capabilities, which contribute to innovation and development. As Sen terms them, capabilities are what allow people the freedom to have real opportunities and valuable options or alternatives in the pursuit of life and career interests (Robeyns, 2016). They do not merely exist formally or legally, but they are also available to be taken advantage of by the individual.

Given the size of the Congo, the existence of a lot of diversity among agrarian communities can be an advantage or a challenge. As such, there are more adjustments to be made from one location to another, but also more knowledge to be shared and synergies to be tapped into through a hybrid of agricultural development models. At this point in time, for the Congo, sustainable agricultural transformation will also depend on the economic and political environment in the country to improve first, and on supplemental studies and proposals on agricultural development in the country.

4.2. A Marshall Plan for the Congo?

After the end of World War II, Europe and other parts of the world were left in total ruin with bankrupt economies, destroyed infrastructure, and people who were forced to tighten their belts day by day due to the chaotic circumstances at the time. On June 5, 1947, General George Marshall, at the time Secretary of State under the 33rd U.S. President Harry Truman, presented in his speech at Harvard University a plan to fight “hunger, poverty, desperation and chaos” (George C. Marshall Foundation).

The speech itself was delivered at 2:50 PM to a crowd of 15,000 in the Harvard Yard. Officially known as the European Recovery Program (ERP), the original Marshall Plan was signed into law on April 3, 1948, with the goal of providing foreign aid to Western European countries. In total, over $12 billion (or the equivalent of $128 billion as of 2020) was transferred by the United States in order to support economic recovery programs in Western European countries (Schain, 2001).

As seen on figure 4.1 below, some of the recipient countries included the United Kingdom which received around $3 billion, France which received $2 billion, West Germany with $1 billion, Austria with $468 million, and Portugal which received $70 million (Schain, 2001). The Marshall Plan was prepared by United States Secretary of State General George Marshall at the behest of then president Harry Truman. The program lasted for four years between April 1948 and 1951. The transfer of $12 billion for economic recovery programs to Western European countries was among others intended towards rebuilding war-torn regions,

reviving trade relations, and modernizing industry and agriculture. As a result, trade barriers had to be reduced, policies and regulations changed, and an increase in productivity encouraged along with the adoption of more advanced business procedures.

Figure 4.1: Marshall Plan Aid, 1948-51

Country	Funds Received (in millions of dollars)
Austria	488
Belgium and Luxembourg	777
Denmark	385
France	2,296
Greece	366
Iceland	43
Ireland	133
Italy and Trieste	1,204
Netherlands	1,128
Norway	372
Portugal	70
Sweden	347
Switzerland	250
Turkey	137
United Kingdom	3,297
West Germany	1,448

In terms of results, in "The Marshall Plan: A Reality Check," Nicholas Crafts suggests that there is a debate about whether the European Recovery Plan itself contributed directly to the rapid recovery of the recipient countries (2011). Crafts, Professor of Economics and Economic History at the University of Warwick, claims that the direct effects of the program were "positive but modest." From the conclusion of his paper which surveys the literature on the Marshall Plan, the findings show that it is not the direct aid that was received but rather newly introduced policies which might have been more effective in the recovery of Europe. As such, the Marshall

Plan is rather an example of how successful structural adjustment programs such as the Washington Consensus can be. Further, in terms of GDP growth, the European Recovery Program's aid might have only increased GDP by less than half a percent while it accounted for about 3% of the national income of all recipient countries combined.

Figure 4.2: Washington Consensus Items

Original Washington Consensus	*Augmented Washington Consensus the previous 10 items, plus:*
1. Fiscal discipline	11. Corporate governance
2. Reorientation of public expenditures	12. Anti-corruption
3. Tax reform	13. Flexible labor markets
4. Financial liberalization	14. WTO agreements
5. Unified and competitive exchange rates	15. Financial codes and standards
6. Trade liberalization	16. "Prudent" capital-account opening
7. Openness to FDI	17. Non-intermediate exchange rate regimes
8. Privatization	18. Independent central banks/inflation targeting
9. Deregulation	19. Social safety nets
10. Secure Property Rights	20. Targeted poverty reduction

Figure 4.2 above includes a snapshot of both the original 10 as well as the augmented items of the Washington Consensus. It so happens to be that similarly to the Marshall Plan, the Washington Consensus also has mixed reviews in terms of its results (Rodrik, 2006). Originally, the Washington Consensus was published as a set of ten economic policy recommendations which were considered to be a standard package for developing countries in financial crises. The items were named and proposed by British economist John Williamson in 1989 (Agarwal, 2018). Institutions such as the International Monetary Fund, the World Bank and the United States

Department of the Treasury are proponents of the items which present free-market economic policies.

With the intention of helping developing countries that face economic crises, the recommended structural reforms of the Washington Consensus suggest the increased role of market forces in exchange for financial help. Some of those items include free-floating exchange rates and free trade (Agarwal, 2018). However, critics may argue that free trade and markets are not always in the best interest of developing countries as some strategic and infant industries have to be protected initially for long-term growth. In terms of trade, these industries may require protection in the form of subsidies or tariffs against imports which may create a competition against local infant industries (Chang, 2003). As such, the proposed Washington Consensus items can be unhelpful and fail to improve the condition of developing countries in crisis.

Rodrik claims that there might be better approaches to economic growth in poor developing countries that can replace policies such as the ones proposed in the Washington Consensus (2006). One of them is the World Bank's "Economic Growth in the 1990s: Learning from a Decade of Reform" from 2005 wich has an emphasis on humility, policy diversity, selective and modest reforms, and experimentation, which demonstrate the extent to which the development policy community has transformed over the years.

Another perspective for economic development, also from Washington, D.C., is to put more weight on extensive institutional reform. Lastly, foreign aid is also mentioned as a driver of economic growth as highlighted in the United Nations' Millennium Development Report. The differing perspectives on economic growth in developing countries may perhaps suggest that the

existing constraints on growth differ from one place to another to a large extent, which adds to the difficulty in finding applicable solutions.

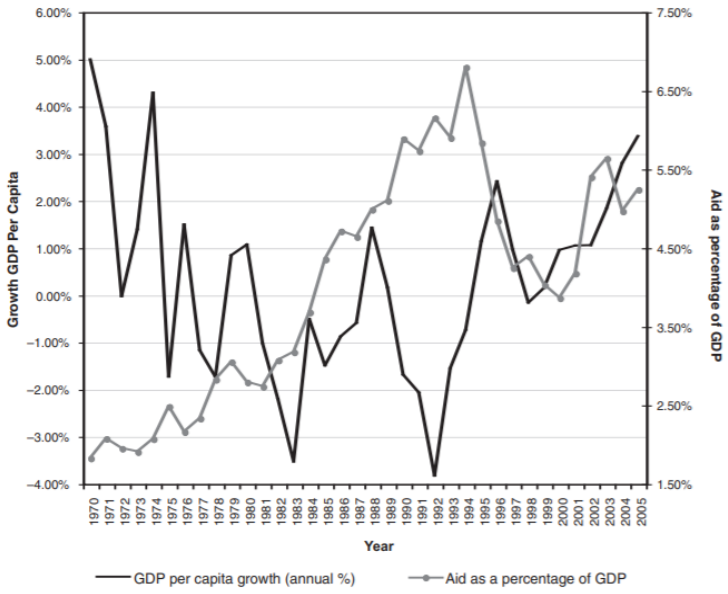
Going back to the Marshall Plan, for which a recently proposed version for the Congo will be presented and summarized below, it may be that neoliberal policies are very good for countries that have already reached an advanced level of economic development, and not so suitable for poor and developing countries with infant industries. It may therefore be the case that plans such as the Marshall Plan that helped with the recovery of Europe after World War II and the Washington Consensus are programs with policies that help countries that already have developed institutions and advanced knowledge. When it comes to poor and developing countries that lack developed institutions and advanced knowledge at the equivalent of those found in rich and developed countries there may be failures with the success of similar policies.

In Africa, according to Deepak Lal and Sarath Rajapatirana in “The Triumph of Hope over Experience: A Marshall Plan for Sub-Saharan Africa?” the Marshall Plan may not lead to any significant results (2007). In Europe, the authors suggest, the Marshall Plan can be described as the funding of infrastructural damages post-war, and therefore not the introduction of new systems and ideas that led to economic advancement. The idea here is that with the existence of developed institutions and advanced knowledge in European countries before the war, European countries only needed time and money in order to return to their fully developed pre-war levels.

In contrast, in the fifty years since gaining independence, Sub-Saharan Africa has remained the poorest, most troubled, and most tragic region in the world, and therefore only funding economic development programs in the continent is not going to be enough because good institutions and knowledge are not existent. For instance, in Africa, as seen on figure 4.3

below, as foreign aid has been increasing, economic growth rates have not been in correlation with the monetary transfer increases and growth has rather dipped and stagnated (Lal & Rajapatirana, 2007). Further, Lal and Rajapatriana also found that while foreign aid is received, it does not necessarily lead to new and other forms of investments for economic growth, while poverty can increase and social indicators remain poor.

Figure 4.3: Foreign Aid and GDP Growth in Sub-Saharan Africa, 2006



Between 1985 and 2005, foreign aid amounted to up to 70% of government budgets in Africa. Most of these funds were largely given to the public sector, which often misappropriated aid. The public sector has had low or negative returns that negatively impact economic growth. As a result, in addition to debt repayment problems, aid to Africa kept in power governments that ignored the general welfare of their populations and helped perpetuate poverty (Lal & Rajapatirana, 2007).

"$800 billion over 15 years can raise the per capita GDP in the Congo from $394 to $15,000 and reach full employment" (Muadiamvita, 2017). At the time of this writing, the World Bank's most recent estimate is that the Congo's GDP per capita was $561.78 in 2018. The Democratic Republic of the Congo is ranked by the World Bank at 181 out of 190 based on its per capita nominal GDP. Based on 2018's standards, the $15,000 range is where you can find countries such as Chile, Costa Rica, Croatia and Poland; all of them but Costa Rica are middle-income countries. Mexico, China, Turkey and Brazil barely had just below a per capita GDP of $10,000 in 2008. At the same time, they belong to the upper-middle-income group of countries.

Given the comparison, Noel K. Tshiani Muadiamvita, a presidential candidate during the 2018 elections in the Congo, had composed an ambitious plan for the Congo to grow its economy and presumably become a developed country over 15 years. Notably, the strategy of Muadiamvita "will be based on the private sector as the main driver of growth and is based on liberalism with a human face with a reasonable dose of state interventionism" (2017).

The plan is structured around nine pillars. Those include: (1) investing in human resources with a focus on education, health and food self-sufficiency; (2) promoting good governance and the efficient and transparent use of public resources; (3) promoting peace, security, the rule of law and democracy; (4) promote the emergence of national finance; (5) promote the emergence of a responsible domestic private sector; (6) to promote large-scale labor-intensive infrastructure works; (7) to promote and accelerate the industrialization of the country through the local processing of minerals, the mechanization of agriculture, stock-breeding and fishing. The planned and orderly development of forests and the outbreak of

the tertiary sector, including tourism; (8) create synergies between the internal market and regional integration; and finally (9) mobilize human and financial resources to implement the various pillars of the plan.

Muadiamvita, an economist who was a presidential candidate during the 2018 elections in the Congo, and an experienced banker and World Bank country manager, claims that his ambitious vision will require a new democratic national environment to work in the Congo (2017). In this case success will occur "if we eradicate corruption, impunity and all kinds of anti-value; Put in place a functional rule of law and improve governance under visionary leadership, competent, responsible and integral (2017). He adds that the government will have sufficient resources to have an annual budget of at least $72 billion across the country to implement this vision of development reaching full employment and increasing GDP per capita to $15,000 in 15 years. According to the World Bank, the GDP per capita in the Congo stood at $561.78 in 2018.

Muadiamvita's Marshall Plan with its nine pillars for the reconstruction of the Congo, while very ambitious, may justify its goals. This is an example to demonstrate the importance of macro improvements in order to sustain and replicate micro projects. Notably, as it seems to be that not a single factor alone can be attributed to successful economic development, a cohesive plan, while perhaps excessive, may touch on just enough social, economic and political matters that will increase the odds of success. With Muadiamvita's program, however, there seems to be some calculations with a rationale behind them. In the case of agricultural development, success will depend on stability in the country, access to social services such as education, infrastructure and public expenditure.

4.3. Proposal

When the title of this research paper asks how education and agriculture can lead to economic development in the Congo, the meaning of education here should be clarified. At the beginning, the assumption was generally that by educating rural farmers in the Congo, you can teach them how to be more productive as farmers, which will allow them to increase their yields. As such, they could then feed themselves better and sell their agricultural surplus at the market, which will allow them to increase their income.

With the idea that education and agriculture can lead to economic development in the Congo still being the general argument of this paper, while conducting research for this paper and analyzing different read sources, different ideas for what exactly education may mean have arisen. For instance, there are cases in which education may mean access to traditional schooling for rural communities as a way to allow them to either study more advanced and applicable agricultural methods that match their local social and economics needs and want, or education as an opportunity to gain the necessary skills to work in a different economic field such as services or even technology. Education can also be the process through which farmers are taught about how to use advanced farming methods and technologies which can be adopted based on their ecological conditions.

As mentioned above in chapter two, farmer field schools (FFS) and agricultural education and training (AET) programs are among other possible means through which education can be provided for rural farmers. Notably, with both cases, farmers can receive education that takes

into consideration local needs and wants. For instance, FFS is a group-based learning process during which farmers can carry out experiential learning activities on the land in the area in which they work, which helps them understand the ecology of their land and how to use it better. The learning which is done on location includes experiments, field observations and group analysis opportunities. Given the breadth and depth of learning, the gained knowledge allows participant farmers to later on make better and informed choices that are based on their specific local agricultural needs.

The opportunity to match what farmers need with what they have locally in terms of farming, social and economic structures is unlike other agricultural development programs in which farmers adopt general recommendations from specialists who come from outside areas. As such, the local experiments and education would allow farmers to benefit from the trial and error learning process that will later allow for the application of what is best for their environment.

The other relevant platform for farmer education is agricultural education and training (AET), which includes both formal and informal activities that build capacity within the agriculture sector. AET programs contribute to rural development via higher education, as well as diploma and certificate training programs. The program is relevant and can be provided during the formal education years of the rural youth, or through private and public workforce formation organizations for those who are not in school. In Sub-Saharan Africa, AET can contribute to agricultural development by strengthening innovative capabilities and business skills, allowing farmers to adopt new products, technical knowledge and farming methods.

Nevertheless, the socioeconomic setting of rural communities also seem to matter when it comes to agricultural development. As it can be seen in both the case of the Bukanga Lonzo

agro-industrial park and the Feronia palm oil plantations, both from the point of view of the companies and their critiques, the social and economic wellbeing of local communities were key performance indicators. As such, failing to increase or at least to maintain appropriate social and economic standards when conducting agricultural projects would make the difference between success and failure. That would especially be the case because the end goal of economic development is to improve the quality of people's lives. In this case, saving on costs at the expense of the wellbeing of rural communities would not be worthwhile if they are not the ones who are enjoying an increase in quality of life.

An additional advantage with FFS and AET is that they allow farmers to be well informed about and practice sustainable farming. Given the increasing awareness and importance that environmental, social, and governance (ESG) matters are receiving, measuring the sustainability and societal impact of agricultural development projects is going to be worthwhile. The idea here is that ESG criteria can help to better determine the future performance of projects.

In the case of rural farmers who can benefit from education, research and the use of some form of sustainable practices, including organic farming that uses the naturally available land, water, biodiversity, labor, knowledge and technology will be beneficial to both grow crops and reduce environmental impacts like pesticide pollution, soil erosion, and greenhouse gas emissions. Being environmentally friendly, which can be achieved through research and education, is beneficial in the long run given the ability to make better informed decisions that take into account available resources and future needs, without compromising the capital used.

When it comes to what can be done in the Congo, my proposal is that agriculture should be supported with education, while taking into account the adoption of advanced technology and

farming methods. That is in addition to taking into account the social and economic factors of the community that is involved in an agricultural development project. In other words, the needs of a community, social, economic and agricultural, should be researched and implemented through work on site and based on adaptable and sustainable solutions.

In an attempt to give an answer to how education and agriculture can lead to economic development in the Congo, I believe this paper comes close to providing a framework for additional research before action can be taken. Given that this paper was written far away from the Congo, and that it warns about the pitfalls of providing aid without matching the needs of the recipient from his point of view, additional questions are to be asked and answered. With education and training, the end goal should be to give farmers tools that will allow them to be as independent as possible and sustain their social and economic advancement. With empowered and more capable farmers, in a country with 80,000 hectares of arable lands, of which only 10% is being used, the impact of agricultural development on the aggregate economy can be direct. If 68.7% of the Congolese population works in agriculture, then there are at least 20 million people who earn less than $1.90 per day.

A qualitative research strategy, based primarily on interviews may be a way to understand better how exactly education and agriculture can lead to economic development in the Congo. For that, in ways that are somehow similar to agricultural extension programs, a team of researchers can be deployed to travel around the Congo and undertake in-depth research and interviews with local farmers and relevant organizations. Questions that can be posed include ones that attempt to understand the needs of the local farmers, their goals and aspirations, the ecology and environment in which they live, and what kind of education and training programs

will be a match. Overall, the main purpose of the research and interviews would be to take stock of the state of "local knowledge," and therefore a better understanding of what people closest to the problem think what success and effectiveness will look like (Rodrik, 2008). With open-ended questions, there may be a higher chance that the locals can help reveal new solutions that the outsider may not have thought about before.

Since its independence from Belgium in 1960 until this point in time, the Democratic Republic of the Congo has more than often experienced violence and sudden shifts of power which have been preventing the creation of a stable economy and functional political system. As a result, quality education and high paying jobs are still scarce in the Congo today, resulting in widespread poverty to the extent where many people in the country live on less than $1.90 per day. Improving the choice of crop, better organizational structure for smallholder farmers, increasing the use of technology and incentives are the four main components that this paper recommends in order to achieve the goal of development.

Agricultural education and training, and farmer field schools are among programs through which farming communities in the Congo can be empowered. In the successful case studies of PRESAR and PARSAR, cohesion and empowerment were a common factor. Education and training was provided, infrastructure was built and rehabilitated, the choice of crop was upgraded for higher yields, the use of technology increased, and access to markets allowed with better roads and the construction of facilities. However, the success and scalability of other similar projects will depend on political and economic stability in the country.

This paper investigated how education and training can help Congolese farmers adopt more advanced farming methods, which can increase their yields and productivity, income and

quality of life, and lead to economic development in the long run. In terms of success, a best case scenario may be what was seen in South Africa, where today's black middle class was built over the years, starting in the middle of the 19th century (Mabandla, 2015). Notably, between the present and then, African farmers increased their production and used their surplus to educate their children. After being educated, these children continued to accumulate land for farming. With the increase in income from the additional land, educational attainment was furthered, more land was accumulated, and wealth was thus created.

4.4. Another Portrait of the 68.7%

If my proposals were implemented, what would life look like for André Bukasa, the hypothetical farmer we met in the first chapter, five years in the future? It has been five years since the last portrait of the 68.7% of Congolese who, according to the international labor organization, officially work in agriculture (2019). André Bukasa, now 41, still lives in rural South-Kivu. Not much has changed in practice, but the government has made progress with its agricultural development plans. Notably, the launch of additional agricultural projects such as PRESAR, PRASAR and the Agro-Industrial Park Bukanga-Lonzo are more feasible. The political and economic environment in the country is more stable as threats from rebel groups and ethnic conflicts have been considerably diminished.

Over the next five years, the government plans to launch a pilot that will include Bukasa's village. The plan is to use a model that is similar to farmer field schools (FFS) for the benefit of group-based learning processes during which farmers carry out in-the-field

experiential learning activities that help them understand the ecology of their land and how to use it better (FAO, 2011). The Congolese government has partnered with other international organizations that will be able to send faculty and students from agricultural research university programs. Later on, with the knowledge that will be gained through the direct experience and scientific insights, locally trained organizations will oversee the adoption of customized methods and technologies for ecological farming.

Bukasa and his wife, Amini, now 31, are among the participants in the program that is due to start in four months. The initial in-the-field experiential learning activities will last for four months with the delegations from research universities who will then move to other locations. After those four months, local site managers who have also been trained will remain to oversee the activities. Some of the food crops that will be consumed and sold locally at attractive prices include corn, tomatoes, potatoes, beans and plantains. The five-year *Initiative Fini La Récréation* (or back to work initiative) aims to double the average yields for food crops during that period of time. Similar hybrids to the Missouri mules will be used for animal traction as part of the promotion of agricultural production techniques.

With the ongoing experiments during the four-month farmer field school, additional methods and technologies to adopt will be recommended. Hydroelectric power, water schemes, classrooms, some roads and facilities are planned to be built, some before and most after the program begins. The hydroelectric power and water schemes will allow a population of 157,000 inhabitants from Bukasa's province to have regular access to electricity and drinking water that will protect them against disrupting water-borne diseases. The project is still due to start. What can be said for now is that its successful implementation can allow participant farmers to make

better informed choices that are based on their own locally specific ecology and agricultural needs. In this case, local farmers will be empowered and given capabilities that will allow them to sustain the development of their community.

In terms of schooling, Bukasa hopes that two of his eldest children, who he has been struggling to send to school, can also participate in the agricultural education and training programs. Given that his eldest, a pair of identical twins, Amini and Imani are already in their 20s, formal education through high school is something that they have missed. They were only able to attend a nearby institution until 8th grade. Some good news is that Amini and Imani are being courted by distant relatives. One of the gentlemen is a commercial business attorney from Kinshasa. The other is a high school English teacher from Bukavu who is a prominent member of the *Mouvement Socialiste Populaire pour le Développement du Congo* (popular socialist movement for the development of the Congo).

The family's three other members are Gaston who is 15, Patrick who is 12, and Benjamin who is 8. Whether they will be able to graduate from highschool depends on the additional income that Bukasa will be able to earn if the implementation of the agricultural education and training programs will be successful. Looking forward, the political and economic stability in the country will have to remain in the more stable state in which it stands today. Success in this case will be that Bukasa and his family will be educated, accumulate land for farming and increase their income. In 20 years, further education and additional land accumulation will allow some rural farmers in the Congo to increase their wealth and join the middle class. Through intra-generational wealth transmission, education and agriculture can lead to economic development in the Congo.

References

Abu, G. A., & Soom, A. (2016). Analysis of Factors Affecting Food Security in Rural and Urban Farming Households of Benue State, Nigeria. *International Journal of Food and Agricultural Economics*, *4*(1), 55–68.

Acemoglu, D., Johnson, S., & Robinson, J. (2006). Understanding Prosperity and Poverty: Geography, Institutions, and the Reversal of Fortune. In *Understanding Poverty*. Oxford University Press. https://www.oxfordscholarship.com/view/10.1093/0195305191.001.0001/acprof-9780195305197-chapter-2

Actualite.cd. (2020, Samedi février - 15:26). *RDC : le ministre de l'Agriculture annonce la reprise de l'exploitation du Parc de Bukanga Lonzo*. https://actualite.cd/2020/02/29/rdc-le-ministre-de-lagriculture-annonce-la-reprise-de-lexploitation-du-parc-de-bukanga

Africa Europe Faith Justice Network AEFJN. (2018). *Bukanga Lonzo: Land Grabs and the International Community | AEFJN*. http://aefjn.org/en/bukanga-lonzo-land-grabs-and-the-international-community/

African Development Bank. (2012). *PARSAR Aims to Strengthen Food Security and Cut Poverty in the DRC*.

African Development Bank. (2013). *DRC - Agricutural and Rural Sector Rehabilitation Project in Katanga- Kasai-Oriental and Kasai-Occidental Provinces (PRESAR)—Project Completion Report*. https://www.afdb.org/en/documents/document/drc-agricutural-and-rural-sector-rehabilitat

ion-project-in-katanga-kasai-oriental-and-kasai-occidental-provinces-presar-project-completion-report-33963

Agarwal, P. (2018, April 30). Washington Consensus. *Intelligent Economist*. https://www.intelligenteconomist.com/washington-consensus/

Agriculture for Impact. (2020). *Agricultural Education and Training*. https://ag4impact.org/sid/socio-economic-intensification/building-human-capital/agricultural-education-and-training/

Amali, I. O. O. (2012). Schooling and human capital development in agro-based rural economy in Southern Benue, Nigeria. *International Journal of Humanities and Social Science*, *2*(10), 105–110. https://www.cabdirect.org/cabdirect/abstract/20133183019

Ambapour, S. (2015). The Todaro Paradox: An Econometric Test Using Data from Congo. *Modern Economy*, *6*(8), 881–887. https://doi.org/10.4236/me.2015.68083

Bachewe, F. N., Berhane, G., Minten, B., & Taffesse, A. S. (2018). Agricultural Transformation in Africa? Assessing the Evidence in Ethiopia. *World Development*, *105*(C), 286–298. https://ideas.repec.org/a/eee/wdevel/v105y2018icp286-298.html

Bakiman, B. (2011). *DR CONGO: Sowing the Seeds of Food Security in Bandundu | Inter Press Service*. http://www.ipsnews.net/2011/05/dr-congo-sowing-the-seeds-of-food-security-in-bandundu/

Barbara, T. (2015, July 13). *The 23 poorest countries in the world—Business Insider*. https://www.businessinsider.com/the-23-poorest-countries-in-the-world-2015-7

Bardhan, P. (2002). Decentralization of Governance and Development. *Journal of Economic Perspectives*, *16*, 185–205. https://doi.org/10.1257/089533002320951037

Bashir, M. K., & Schilizzi, S. (2013). Determinants of rural household food security: A comparative analysis of African and Asian studies. *Journal of the Science of Food and Agriculture*, *93*. https://doi.org/10.1002/jsfa.6038

BBC. (2019a). *DR Congo country profile—BBC News*. https://www.bbc.com/news/world-africa-13283212

BBC. (2019b, November 25). DR Congo workers for Feronia made impotent by pesticides—HRW. *BBC News*. https://www.bbc.com/news/world-africa-50544583

Bezner Kerr, R., Young, S. L., Young, C., Santoso, M. V., Magalasi, M., & Entz, M. (2019). Farming for Change: Developing a Participatory Curriculum on Agroecology, Nutrition, Climate Change and Social Equity in Malawi and Tanzania. *Agriculture and Human Values*, *36*(3), 549–566.

Birdsall, N., Rodrik, D., & Subramanian, A. (2005). How to Help Poor Countries. *Foreign Affairs*, *84*, 136. https://doi.org/10.2307/20034426

Bloeman, S. (2009). *Low enrolment rates prompt efforts to invest in education in DR Congo*. UNICEF. https://www.unicef.org/doublepublish/drcongo_51031.html

Briggs, S. (2018). The Zambian Consensus. *Senior Projects Spring 2018*. https://digitalcommons.bard.edu/senproj_s2018/158

Bujakera, S. (2019, August 26). New Congo government shows influence of former president. *Reuters*. https://www.reuters.com/article/us-congo-politics-idUSKCN1VG0F2

Bundy, C. (1979). *The rise and fall of the South African peasantry*.

Chang, H.-J. (2003). Kicking Away the Ladder: Infant Industry Promotion in Historical Perspective. *Oxford Development Studies*, *31*(1), 21–32. https://doi.org/10.1080/1360081032000047168

Chávez, L. T. (2019). *A Dirty Investment | European Development Banks' Link to Abuses in the Democratic Republic of Congo's Palm Oil Industry*. https://www.hrw.org/report/2019/11/25/dirty-investment/european-development-banks-link-abuses-democratic-republic-congos

CIA. (2020). *The World Factbook*.

Congo Synthèse. (2015). *RDC : le parc agro-industriel de Bukanga Lonzo produit 20.000 tonnes de maïs pour la première récolte*. https://www.congosynthese.com/news_reader.aspx?Id=10444

Cooper, F. (1981). Peasants, Capitalists, and Historians: A Review Article. *Journal of Southern African Studies*, *7*(2), 284–314. JSTOR. https://www.jstor.org/stable/2636381

Crafts, N. (2011). *The Marshall Plan: A Reality Check* [CAGE Online Working Paper Series]. Competitive Advantage in the Global Economy (CAGE). https://econpapers.repec.org/paper/cgewacage/49.htm

Cros, M.-F. (2019, October 25). *RDC: Pourquoi les investissements dans l'agriculture ne viennent pas*. La Libre Afrique. https://afrique.lalibre.be/42635/rdc-pourquoi-les-investissements-dans-lagriculture-ne-viennent-pas/

Dadi, L., Burton, M., & Ozanne, A. (2004). Duration Analysis of Technological Adoption in Ethiopian Agriculture. *Journal of Agricultural Economics*, *55*, 613–631. https://doi.org/10.1111/j.1477-9552.2004.tb00117.x

Das, A. B., & Sahoo, D. (2012). Farmers' Educational Level and Agriculture Productivity: A Study of Tribals of KBK Districts of Odisha. *International Journal of Education Economics and Development*, *3*(4), 363–374.

Davis, K. E., Ekboir, J., & Spielman, D. J. (2008). Strengthening Agricultural Education and Training in sub-Saharan Africa from an Innovation Systems Perspective: A Case Study of Mozambique. *The Journal of Agricultural Education and Extension*, *14*(1), 35–51. https://doi.org/10.1080/13892240701820371

de Haas, M. (2016). Measuring rural welfare in colonial Africa: Did Uganda's smallholders thrive? *The Economic History Review*, *70*. https://doi.org/10.1111/ehr.12377

Diao, X., Hazell, P., & Thurlow, J. (2010). The Role of Agriculture in African Development. *World Development*, *38*(10), 1375–1383. https://doi.org/10.1016/j.worlddev.2009.06.011

Donald, A. A., Vaillant, J., Campos, F. M. L., & Cucagna, M. E. (2018). *Caring about carework: Lifting constraints to the productivity of women farmers in the Democratic Republic of the Congo* (No. 129119; pp. 1–19). The World Bank. http://documents.worldbank.org/curated/en/711851533108583530/Caring-about-carework-lifting-constraints-to-the-productivity-of-women-farmers-in-the-Democratic-Republic-of-the-Congo

Doocy, S., Cohen, S., Emerson, J., Menakuntuala, J., Team, the J. J. I. S., & Rocha, J. S. (2017). Food Security and Nutrition Outcomes of Farmer Field Schools in Eastern Democratic

Republic of the Congo. *Global Health: Science and Practice*, *5*(4), 630–643. https://doi.org/10.9745/GHSP-D-17-00203

Duflo, E., Banerjee, A. V., & Kremer, M. (2016). *The Influence of Randomized Controlled Trials on Development Economics Research and on Development Policy*. https://scholar.harvard.edu/kremer/publications/influence-randomized-controlled-trials-development-economics-research-and

Easterly, W. (2001). *The Elusive Quest for Growth*. The MIT Press. https://mitpress.mit.edu/books/elusive-quest-growth

Easterly, W. (2006). *The White Man's Burden*. PenguinRandomhouse.Com. https://www.penguinrandomhouse.com/books/292753/the-white-mans-burden-by-william-easterly/

EPDC. (2018). *Congo, Dem. Rep. National Education Profile 2018 Update*. Education Policy Data Center. https://www.epdc.org/sites/default/files/documents/EPDC_NEP_2018_Congo.DemRepublicof.pdf

Eric, M., Xu, S., Wen, yu, Wang, S., Ahmed, A.-G., Darith, S., & Eliane, M. (2017). Study on Food Import in D. R. Congo. *World Journal of Engineering and Technology*, *5*, 23–30. https://doi.org/10.4236/wjet.2017.52B003

Etshim, R. (2017). *Collaboration between Higher Education and Labor Market in Kinshasa, DR Congo*. https://files.eric.ed.gov/fulltext/EJ1151006.pdf

FAO. (2011a). *External Assistance to Agriculture*. http://www.fao.org/fileadmin/templates/ess/ess_test_folder/documents/Economic/External_assistance_to_agriculture_AUG2011.pdf

FAO. (2011b). *Farmer field school implementation guide*. http://www.fao.org/3/i2561e/i2561e00.htm

FAO. (2011c). *Research on Congo's basic crops*. http://www.fao.org/news/story/en/item/49320/icode/

FAO. (2019). *Strengthening good agricultural practices to boost production*. http://www.fao.org/emergencies/fao-in-action/stories/stories-detail/en/c/1185451/

FAO. (2020, March). *Countries requiring external assistance for food*. GIEWS - Global Information and Early Warning System. http://www.fao.org/giews/country-analysis/external-assistance/en/

Feronia. (2018). *Sustainability Report 2017*. https://www.feronia.com/uploads/2018-09-11/feroniareport2017-124330.pdf

Feronia. (2020). *Feronia Inc.* -. https://www.feronia.com/pages/view/about

FHI 360. (n.d.). *Democratic Republic of the Congo*. FHI 360. Retrieved May 2, 2020, from https://www.fhi360.org/countries/democratic-republic-congo

FHI 360. (2018). *Accelerating Equitable Access to School, Reading, Student Retention and Accountability (ACCELERE!)*. FHI 360. https://www.fhi360.org/projects/accelerating-equitable-access-school-reading-student-retention-and-accountability-accelere

Ganimian, A. J., & Murnane, R. J. (2014). *Improving Educational Outcomes in Developing Countries: Lessons from Rigorous Impact Evaluations* (Working Paper No. 20284; Working Paper Series). National Bureau of Economic Research. https://doi.org/10.3386/w20284

Gathara, P. (n.d.). *Berlin 1884: Remembering the conference that divided Africa*. Retrieved April 12, 2020, from https://www.aljazeera.com/indepth/opinion/berlin-1884-remembering-conference-divided-africa-191115110808625.html

George C. Marshall Foundation. (n.d.). *Marshall Plan Speech—Library*. Retrieved April 29, 2020, from https://www.marshallfoundation.org/library/digital-archive/marshall-plan-speech-original/

Gras, R., & Tshiamala, S. B. (2020). DRC: One year in and Félix Tshisekedi is yet to make his mark. *The Africa Report.Com*. https://www.theafricareport.com/22650/drc-one-year-in-and-felix-tshisekedi-is-yet-to-make-his-mark/

Halam, K., Dywili, M., & Nwokolo, E. E. (2017). The Role of Education, Income in Determining Standard of Living and Food Security amongst the Residents of Mhlontlo Local Municipality Eastern Cape, South Africa. *Journal of Human Ecology*, *60*(1), 18–28. https://doi.org/10.1080/09709274.2017.1397929

Herderschee, J., Kaiser, K.-A., Mukoko, D., Bank, S., & Tiogang Djomo, M. (2011). *Resilience of an African Giant: Boosting Growth and Development in the Democratic Republic of Congo*. https://doi.org/10.13140/RG.2.1.3050.1927

Herdt, T., & Titeca, K. (2016). Governance with Empty Pockets: The Education Sector in the Democratic Republic of Congo. *Development and Change*, *47*(3), 472–494. https://econpapers.repec.org/article/bladevchg/v_3a47_3ay_3a2016_3ai_3a3_3ap_3a472-494.htm

Hochschild. (1998). *King Leopold's Ghost*. https://www.goodreads.com/work/best_book/937922-king-leopold-s-ghost

Holod, D., Talsma, T., & Le, L. (2019). Analysis of the Adoption of CSA Practices for Cocoa Farmers in Lampung Province, Sumatra. *Global Alliance for Climate Smart Agriculture*. https://ora.ox.ac.uk/objects/uuid:187a901c-d96a-481e-890e-eb30d03cec70

Iftikhar, S., Amir, H., Khadim, Z., & Bilal, K. (2015). Farmer's Literacy Rate as Key Driver in Food Production and Food Security: An Empirical Appraisal from Punjab, Pakistan. *European Online Journal of Natural and Social Sciences*, *4*(4), 683–690. http://european-science.com/eojnss/article/view/2989

IMF. (2020). *Special Drawing Right (SDR)*. IMF. https://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/14/51/Special-Drawing-Right-SDR

International Labour Organization. (2015). *ILO*.

International Labour Organization. (2019). *Statistics and databases*.

Jacoby, E. (2019). *Colonialism, Economic Development, and Palm Oil in Indonesia*.

Jones, G. E., & Garforth, C. (2012). The history, development, and future of agricultural extension. In *Adapting Agricultural Extension to Peacebuilding: Report of a Workshop by the National Academy of Engineering and United States Institute of Peace: Roundtable on Technology, Science, and Peacebuilding*. http://www.fao.org/3/W5830E/w5830e03.htm

Joshi, V. (2018). Two Concepts of Education. *Senior Projects Spring 2018*. https://digitalcommons.bard.edu/senproj_s2018/356

Kabasa, J. D., Kirsten, J., & Minde, I. (2015). Implications of Changing Agri-food System Structure for Agricultural Education and Training in Sub-Saharan Africa. *Journal of Agribusiness in Developing and Emerging Economies*, *5*(2), 190–199.

Kavanagh, M. (2019b). Congo Palm-Oil Producer Implicated in Environmental Report. *Bloomberg.Com*. https://www.bloomberg.com/news/articles/2019-11-25/congo-palm-oil-producer-implicated-in-environmental-report

Kavanagh, M. (2019a). Congo Proposes 63% Increase in Budget to $10.2 Billion. *Bloomberg.Com*. https://www.bloomberg.com/news/articles/2019-11-11/congo-proposes-63-increase-in-budget-to-10-2-billion

Kilongo, A. (2018). Is Foreign Aid Good or Bad for Economic Growth? *Unpublished Manuscript, Bard College*.

Kruss, G., McGrath, S., Petersen, I., & Gastrow, M. (2015a). Higher education and economic development: The importance of building technological capabilities. *International*

Journal of Educational Development, *43*, 22–31. https://doi.org/10.1016/j.ijedudev.2015.04.011

Kruss, G., McGrath, S., Petersen, I., & Gastrow, M. (2015b). Higher education and economic development: The importance of building technological capabilities. *International Journal of Educational Development*, *43*, 22–31. https://doi.org/10.1016/j.ijedudev.2015.04.011

Lal, D., & Rajapatirana, S. (2007). *The Triumph of Hope over Experience: A Marshall Plan for Sub-Saharan Africa? 862*.

Lambrecht, I., Vanlauwe, B., & Maertens, M. (2016). Agricultural Extension in Eastern Democratic Republic of Congo: Does Gender Matter? *European Review of Agricultural Economics*, *43*(5), 841–874.

Lambrecht, I., Vanlauwe, B., Merckx, R., & Maertens, M. (2014). Understanding the Process of Agricultural Technology Adoption: Mineral Fertilizer in Eastern DR Congo. *World Development*, *59*, 132–146. https://doi.org/10.1016/j.worlddev.2014.01.024

Larsen, A. F., & Lilleor, H. B. (2014). Beyond the Field: The Impact of Farmer Field Schools on Food Security and Poverty Alleviation. *World Development*, *64*, 843–859.

Lewis, J. (1984). The Rise and Fall of the South African Peasantry: A Critique and Reassessment. *Journal of Southern African Studies*, *11*(1), 1–24. JSTOR. https://www.jstor.org/stable/2636544

Lubu, G. L. (2015). *Agriculture and hedge against risk, alternative strategy for the emergence of a middle class in DR Congo*.

https://www.researchgate.net/publication/281441232_Agriculture_and_hedge_against_risk_alternative_strategy_for_the_emergence_of_a_middle_class_in_DR_Congo

Mabandla, N. (2015). Rethinking Bundy: Land and the black middle class – accumulation beyond the peasantry. *Development Southern Africa*, *32*. https://doi.org/10.1080/0376835X.2014.974801

Marshall, G. (1947). *Marshall Plan Speech*. George C. Marshall Foundation.

McMillan, M. S., & Harttgen, K. (2014). *What is driving the "African Growth Miracle"?* (Availability Note: Information provided in collaboration with the RePEc Project: http://repec.org).

Mensah, J. O., Ohene-Yankyera, K., & Aidoo, R. (2018). Determinants of Response of Street Food Entrepreneurs in Ghana to Business Management Training. *Journal of Agribusiness in Developing and Emerging Economies*, *8*(2), 391–405.

Minde, I., Terblanche, S., Bashaasha, B., Madakadze, I. C., Snyder, J., & Mugisha, A. (2015). Challenges for Agricultural Education and Training (AET) Institutions in Preparing Growing Student Populations for Productive Careers in the Agri-food System. *Journal of Agribusiness in Developing and Emerging Economies*, *5*(2), 137–169. https://www.researchgate.net/publication/283709427_Challenges_for_agricultural_education_and_training_AET_institutions_in_preparing_growing_student_populations_for_productive_careers_in_the_agri-food_system

Mishra, R. K. (2015). An Analysis of Growth of Productivity of Paddy in Post-reform Period in Odisha. *Indian Journal of Economics and Development*, *11*(2), 595–599.

Misser, F. (2014, July 29). *Agriculture: Farming zones to fight rising imports*. The Africa Report.Com. https://www.theafricareport.com/4109/agriculture-farming-zones-to-fight-rising-imports/

Moyo, D. (2009). *Dead Aid: Why Aid Is Not Working and How There Is a Better Way for Africa*. Farrar, Straus and Giroux.

Muadiamvita, N. K. T. (2017). *A Marshall Plan for the reconstruction of the DRC*. http://afriqueinfomagazine.net/en/2017/11/25/a-marshall-plan-for-the-reconstruction-of-the-drc/

Nnadi, F. N., Chikaire, J. U., Ani, A. O., & Echetama, J. A. (n.d.). *IDENTIFYING ENTREPRENEURIAL ACTIVITIES, SKILLS AND ABILITIES FOR PROMOTION OF AGRICUITURAL EXTENSION EDUCATION IN SOUTHEAST, NIGERIA*. Retrieved October 18, 2019, from http://ijsser.org/more.php?id=7

Norton, M., Nalley, L. L., Dixon, B., & Popp, J. (2013). Cost-Benefit Analysis of Farmer Training Schools: The Case of Ghanaian Cocoa. *Journal of International Agricultural Trade and Development*, *9*(1), 73–95.

OEC: The Observatory of Economic Complexity. (2017). *Democratic Republic of the Congo (COD) Exports, Imports, and Trade Partners*. OEC: The Observatory of Economic Complexity.

Onyebinama, U. a. U., & Onyebinama, I. C. (2010). Extension education and entrepreneurship development in Nigerian agriculture. *Agricultural Journal*, *5*(2), 63–69. https://www.cabdirect.org/cabdirect/abstract/20103157473

Organisation for Economic Co-operation and Development. (2018). *OECD data*. http://data.oecd.org

Oshima, H. T. (1971). Labor-Force "Explosion" and the Labor-Intensive Sector in Asian Growth. *Economic Development and Cultural Change*, *19*(2), 161–183. JSTOR. https://www.jstor.org/stable/1152452

Oshima, H. T. (1986). The Transition from an Agricultural to an Industrial Economy in East Asia. *Economic Development and Cultural Change*, *34*(4), 783–809. https://doi.org/10.1086/451559

Otchia, C. (2018). Domestic agricultural value chain development and pro-poor growth: A computable general equilibrium microsimulation application for the Democratic Republic of Congo. *Review of Development Economics*, *23*. https://doi.org/10.1111/rode.12557

Perez-Estebanez, R., Urquia-Grande, E., & Rautiainen, A. (2018). Technological and Economic Factors Determining ICT Level: Evidence from Rural Micro-businesses in Democratic Republic of Congo. *Journal of International Development*, *30*(1), 118–133.

Ragasa, C., Babu, S. C., & Ulimwengu, J. (2014). Institutional Reforms and Agricultural Policy Process: Lessons from Democratic Republic of Congo. *Agricultural and Food Economics*, *2*.

Reid, S. A. (2018). *Congo's Slide Into Chaos*. https://www.foreignaffairs.com/articles/africa/2017-12-12/congos-slide-chaos

ReliefWeb. (2012). *Rehabilitation of the Agricultural and Rural Sector in the Democratic Republic of Congo—Democratic Republic of the Congo*. ReliefWeb.

https://reliefweb.int/report/democratic-republic-congo/rehabilitation-agricultural-and-rural-sector-democratic-republic

RFI. (2019). *La France annonce 65 millions d'euros d'aides à la RDC*. RFI Afrique. http://www.rfi.fr/afrique/20191112-france-rdc-65-millions-euros-aides

Robeyns, I. (2016). The Capability Approach. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Winter 2016). Metaphysics Research Lab, Stanford University. https://plato.stanford.edu/archives/win2016/entries/capability-approach/

Rodrik, D. (2006). *Goodbye Washington Consensus, Hello Washington Confusion? A Review of the World Bank's Economic Growth in the 1990s: Learning from a Decade of Reform*. ResearchGate. http://dx.doi.org/10.1257/jel.44.4.973

Rodrik, D. (2008). The New Development Economics: We Shall Experiment, but How Shall We Learn? *Harvard University, John F. Kennedy School of Government, Working Paper Series*, *RWP 08–055*. https://doi.org/10.2139/ssrn.1296115

Rogan, M. (2018). Food Poverty, Hunger and Household Production in Rural Eastern Cape Households. *Development Southern Africa*, *35*(1), 90–104. http://ezprox.bard.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ecn&AN=1690025&site=ehost-live

Ross, A. (2018a, June 21). Africa's green revolution stumbles at Congo project to solve food shortages. *Reuters*. https://www.reuters.com/article/us-congo-agriculture-idUSKCN1IN0IJ

Ross, A. (2018b, July 6). Congo faces $20 mln arbitration claim over failed farming project. *Reuters*. https://www.reuters.com/article/congo-agriculture-idUSL8N1U13EI

Sachs, J., Schmidt-Traub, G., Kroll, C., Durand-Delacre, D., & Teksoz, K. (2017). *SDG Index and Dashboards 2017*. https://sdgindex.org/reports/sdg-index-and-dashboards-2017/

Schain, M. (2001). *The Marshall Plan: Fifty Years After*. Palgrave Macmillan US. https://doi.org/10.1007/978-1-349-62748-6

Scholaro. (2018). *Education System in Congo, Democratic Republic of the*. https://www.scholaro.com/pro/countries/Democratic-Republic-of-the-Congo/Education-System

Search Results, Web Result with Site Links, & U.S. Department of State. (2018). *Investment Climate Statements for 2018. DRC*. U.S. Department of State. https://www.state.gov/e/%20eb/rls/othr/ics/investmentclimatestatements/index.htm#wrapper

Sen, A. (1999). *Development as Freedom*. https://www.penguinrandomhouse.com/books/163962/development-as-freedom-by-amartya-sen/

Smale, M., Assima, A., Kergna, A., Thériault, V., & Weltzien, E. (2018). Farm family effects of adopting improved and hybrid sorghum seed in the Sudan Savanna of West Africa. *Food Policy*, *74*, 162–171. https://doi.org/10.1016/j.foodpol.2018.01.001

Snapshot. (n.d.-a). Retrieved December 28, 2019, from http://documents.worldbank.org/curated/en/711851533108583530/Caring-about-carework-lifting-constraints-to-the-productivity-of-women-farmers-in-the-Democratic-Republic-of-the-Congo

Snapshot. (n.d.-b). Retrieved December 28, 2019, from http://documents.worldbank.org/curated/en/479351575467144366/Doing-Business-2020-Comparing-Business-Regulation-in-190-Economies-Economy-Profile-of-Congo-Democratic-Republic-of

Snapshot. (n.d.-c). Retrieved May 2, 2020, from http://documents.worldbank.org/curated/en/277181468025495019/Education-in-the-Democratic-Republic-of-Congo-priorities-and-options-for-regeneration

Snapshot. (n.d.-d). Retrieved April 26, 2020, from https://www.researchgate.net/publication/4981484_Goodbye_Washington_Consensus_Hello_Washington_Confusion_A_Review_of_the_World_Bank's_Economic_Growth_in_the_1990s_Learning_from_a_Decade_of_Reform

Sowell, T. (2010). *The Real Public Service , by Dr. Thomas Sowell | Creators Syndicate*. https://www.creators.com/read/thomas-sowell/05/10/the-real-public-service-

Ssozi, J., Asongu, S., & Amavilah, V. H. (2019). The Effectiveness of Development Aid for Agriculture in Sub-Saharan Africa. *Journal of Economic Studies*, *46*(2), 284–305.

Swanson, B. E., Bentz, R. P., & Sofranko, A. J. (1997). *Improving agricultural extension A reference manual*.

Tait, L., Siddique, A., & Chatterjee, I. (2015). Foreign Aid And Economic Growth In Sub-Saharan Africa. In *Economics Discussion / Working Papers* (No. 15–35; Economics Discussion / Working Papers). The University of Western Australia, Department of Economics. https://ideas.repec.org/p/uwa/wpaper/15-35.html

Takam-Fongang, G. M., Kamdem, C. B., & Kane, G. Q. (2019). Adoption and Impact of Improved Maize Varieties on Maize Yields: Evidence from Central Cameroon. *Review of Development Economics*, *23*(1), 172–188.

The Economist. (2020). Félix Tshisekedi has accomplished little in Congo. *The Economist*. https://www.economist.com/middle-east-and-africa/2020/02/08/felix-tshisekedi-has-accomplished-little-in-congo

The Oakland Institute. (2019). *The Bukanga Lonzo Debacle: The Failure of Agro-Industrial Parks in DRC*.

The World Bank. (2019). *Doing Business 2020: Comparing Business Regulation in 190 Economies - Economy Profile of Congo, Democratic Republic of* (No. 144123; pp. 1–66). The World Bank. http://documents.worldbank.org/curated/en/479351575467144366/Doing-Business-2020-Comparing-Business-Regulation-in-190-Economies-Economy-Profile-of-Congo-Democratic-Republic-of

The World Bank Group. (2005). *Education in the Democratic Republic of Congo: Priorities and options for regeneration* (No. 34381; pp. 1–180). The World Bank. http://documents.worldbank.org/curated/en/277181468025495019/Education-in-the-Democratic-Republic-of-Congo-priorities-and-options-for-regeneration

The World Bank Group. (2019). *World Bank Open Data | Data*. https://data.worldbank.org/

Thomas, M., Lotter, K., & Patton, P. (2015). *Feronia Environmental and Social Assessment – Summary Report*. Digby Wells Environmental. https://www.feronia.com/uploads/2018-02-08/esasummaryreportenglish71268.pdf

Thurlow, J., Benin, S., Fan, S., & Diao, X. (2012). *Strategies and Priorities for African Agriculture: Economywide Perspectives from Country Studies* (0 ed.). International Food Policy Research Institute. https://doi.org/10.2499/9780896291959

Tsiboe, F., Dixon, B., Nalley, L., Popp, J., & Luckstead, J. (2016). Estimating the impact of farmer field schools in sub-Saharan Africa: The case of cocoa. *Agricultural Economics*, *47*, 329–339. https://doi.org/10.1111/agec.12233

Ulimwengu, J. (2018, August 23). *Opinion: Congo's maiden agro-industrial park isn't perfect, but it isn't a failure*. Devex. https://www.devex.com/news/sponsored/opinion-congo-s-maiden-agro-industrial-park-isn-t-perfect-but-it-isn-t-a-failure-93091

U.S. Department of State. (2015). *Country Reports on Human Rights Practices for 2015*. U.S. Department of State. https://2009-2017.state.gov/j/drl/rls/hrrpt/humanrightsreport/index.htm?year=2015&dlid=252669

USAID. (2018). *Democratic Republic of the Congo: Nutrition Profile*. USAID. https://www.usaid.gov/sites/default/files/documents/1864/DRC-Nutrition-Profile-Mar2018-508.pdf

USAID. (2019). *Education | Democratic Republic of the Congo*. https://www.usaid.gov/democratic-republic-congo/education

Vahabi, M. (2017). A critical survey of the resource curse literature through the appropriability lens. In *CEPN Working Papers* (No. 2017–14; CEPN Working Papers). Centre

d'Economie de l'Université de Paris Nord. https://ideas.repec.org/p/upn/wpaper/2017-14.html

van Rooyen, J., Barnard, R., & van Zyl, J. (1996). Agricultural Education and Training in South Africa: An Overview. *Development Southern Africa*, *13*(5), 713–731.

Vidal, J. (2016, June 2). *A switch to ecological farming will benefit health and environment – report*. The Guardian. http://www.theguardian.com/environment/2016/jun/02/a-switch-to-ecological-farming-will-benefit-health-and-environment-report

Vlassenroot, K. (2008). *Land tenure, conflict and Household strategies in the eastern Democratic Republic of the Congo* (pp. 197–221). https://doi.org/10.3362/9781780440057.010

Wenar, L. (2016). *Blood Oil: Tyrants, Violence, and the Rules that Run the World*. Oxford University Press.

World Bank. (2018). *Democratic Republic of Congo Urbanization Review*. https://openknowledge.worldbank.org/bitstream/handle/10986/28931/9781464812033.pdf?sequence=2

World Bank Open Data | Data. (n.d.). Retrieved April 17, 2020, from https://data.worldbank.org/

Wouterse, F., & Badiane, O. (2019). The Role of Health, Experience, and Educational Attainment in Agricultural Production: Evidence from Smallholders in Burkina Faso. *Agricultural Economics*, *50*(4), 421–434.

Xaba, G. G. (2014). *Identifying Entrepreneurial Skills Required by South African Black Farmers: An Entrepreneurial Model*. University of the Witwatersrand, Faculty of Commerce, Law and Management, Graduate School of Business Administration.

Yango, J. W., & Mukoko, J. B. N. (2016). Agricultural Growth and Poverty Reduction in the D. R. Congo: A General Equilibrium Approach. *International Journal of Food and Agricultural Economics*, *4*(2), 137–150.