Evaluating the Impact of Financial Inclusion on Rural Development in Sub-Saharan Africa

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by

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ABSTRACT

The financial services sector in Sub-Saharan countries is one of the principal formal and informal employers. Financial inclusion in Africa has been described as poor and needs more attention as compared to other regions. Record based on previous research shows that the link between rural development and financial inclusion has been focused on emerging economies. The majority of the previous research analysed the association between financial inclusion and economic growth or demographic factors. The rural communities have historically experienced challenges in accessing financial services and products, with banks' availability being very low based on certain variables such as infrastructure development, electricity, water, and sanitation, which has limited the sector's growth. Therefore, it is imperative to gauge the relationship between access to financial services and rural communities' growth across the Sub-Saharan African region.

To examine the effects of financial inclusion on rural development, the research sought to firstly, explore whether an association exists between financial inclusion and rural development and secondly, determine whether a granger causality exists between rural development and financial inclusion. The research employed the Generalised Method of Moments technique covering 23 economies spanning from 2011 to 2020. The results from GMM indicated that financial inclusion is statistically significant in influencing rural communities' development in the SSA region. Additionally, the sensitivity test results revealed that financial inclusion maintained similar significance suggesting that the heavily indebted status of a country does not impact the relationship. Lastly, the granger causality results showed a uni-directional relationship between financial inclusion and rural development. These findings strengthen the notion that in Sub-Saharan Africa, rural development can be heartened by financial inclusion.

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ADFI	Africa Digital Financial Inclusion Facility
AfDB	African Development Bank
ATM	Automated Teller Machines
FI	Financial inclusion
G2P	Government to Person
GDP	Gross Domestic Product
GMM	Generalised Method of Moments
GPF	Global Policy Forum
HIPC	Heavily Indebted Poor Countries
IVC	Impact Value Chain
LDCs	Least Developed Countries
PMJDY	Pradhan Mantri Jan-Dhan Yojana
SACCO	Savings & Credit Cooperatives
SDGs	Sustainable Development Goals
SSA	Sub Saharan Africa
UN	United Nations
WBG	World Bank Group
WG	Within Group

CHAPTER 1: INTRODUCTION

1.1 Background of the Study

Financial inclusion can be loosely defined as sufficient access to proper financial services by businesses, households, and individuals in a given community as well as the sustainable delivery of these services and products (Singh & Kodan, 2011). Financial inclusion has emerged as a critical problem in monetary policy in recent years. At the United Nations conferences, they emphasized the critical importance of developing proper access to financial services in emerging economies, without which citizens and businesses cannot fully participate in the national economy (United Nations, 2019).

Commitment to the Maya Declaration entails lobbying for the Sustainable Development Goals (SDGs), chiefly SDG1 of ending poverty in all its forms. Similarly, access to financial services has been lauded as a facilitator of seven of the SDGs (Wokabi & Fatoki, 2019). By 2017, about 1.7 billion individuals were unbanked, meaning they were financially excluded (Demirguc-Kunt, Klapper, Singer, Ansar, & Hess, 2018). Similarly, according to the 2017 Findex database, a 7% increase was recorded in the segment of adults who had access to financial services either through mobile money services or through financial institutions in developed countries and by 6% in developing economies, from 54% to 63%. It also notes that 9% of women in emerging economies remained less likely to use mobile money services or have access to banks than men.

According to emerging research, inclusive financial markets help to alleviate inequality gaps and poverty by enabling households and people to rationalize their spending and payments, and secure loans and coverage of insurance (Mader, 2018). FI also encourages the formation and expansion of new creative firms, resulting in employment creation, which adds to domestic savings (Ajide, Ajide, & Folorunsho, 2020). Finally, financial inclusion assists young people, women, and other previously marginalized groups in achieving economic independence and active participation in the financial system (Hendriks, 2019; Siddik, 2017). Agyemang-Badu (2018) argued that access to financial services can reduce income inequality and poverty in Africa; hence, the need to develop programs and policies to encourage the poor's access to proper financial services. Koomson, Villano, and Hadley (2020) identified evidence that enhanced financial inclusion

reduces poverty and minimizes future poverty exposure in Ghanaian households, particularly those headed by women.

In this context, African governments and international organizations have begun to promote financial inclusion. They implemented novel policies, processes, and methods targeted at attaining inclusive development and financial services enhancement for marginalized people and businesses (Chinoda & Kwenda, 2019; Loukoianova & Yang, 2018; Saab, 2017). The African Development Bank (AfDB) launched the Africa Digital Financial Inclusion (ADFI) program in 2019. ADFI is an advanced lending facility that aims to speed up electronic access to banking services across Africa and give millions of Africans access to the formal sector.

Despite efforts, financial inclusion remains a significant challenge in Africa due to unequal distribution of digital age benefits and significant persistent access gaps between men and women, wealthier and poorer populations, and urban and rural populations (Demirguc-Kunt et al., 2018). Consequently, several economies in these regions have extremely large exclusion rates (Abubakar, Daneji, Muhammed, & Chekene, 2020; Le, Dang, Nguyen, Vu, & Tran, 2019). For example, Nigeria's financial inclusion policy was put into place in 2012, but after six years, 36.8% of its people were still left out of the financial system (Abubakar et al., 2020).

Financial exclusion continues to be a significant barrier, which is defined as the denial of access of specific segments of the community to proper financial services (Gloukoviezoff, 2007; Conroy, 2005). Governments have established legislation to ensure universal financial inclusion and give low-income groups suitable credit. Nonetheless, some groups may continue to be refused access to banking services due to pervasive issues like social and racial prejudice. Finally, rural populations are deemed too expensive for financial firms.

Banking and financial system innovations are critical for increasing financial inclusion, boosting economic development, and poverty reduction in Africa’s emerging countries. This study is motivated by the importance and necessity of inclusive financial systems in emerging nations. This study will analyze financial inclusion’s impact on rural development.

1.2 Statement of the Problem

Access to adequate financial services is a critical component of poverty reduction and wealth enhancement. (King & Levine, 1993) are confident that financial inclusion is a major contributor to rural and economic development in emerging and developing economies. Additionally, the practicality of a relationship amid rural development and financial inclusion has been overlooked in sub-Saharan African economies. The financial structure in the sub-Saharan African region is mainly undersized. However, with the introduction of digital technologies (online banking, plastic money, mobile money), the financial sector has steadily demonstrated remarkable progress, increasing individual welfare (Buku & Meredith, 2012). Financial inclusion is uneven in several SSA countries, according to World Bank Group enterprise surveys. This variability in financial inclusion provides a foundation for understanding how it affects rural development across the African continent. Therefore, the purpose of the study was to look at how financial inclusion affects rural development, with a focus on the SSA region.

1.3 Research Questions

The study was grounded on two research questions, which are given as:

1. Does a statistically significant association exist between financial inclusion and rural development in the sub-Saharan African region?
2. What is the granger causality between rural development and financial inclusion?

1.4 Research Objectives and Research Hypothesis

The study was sought to answer and test the following research objectives and hypotheses:

1. To ascertain whether there is a significant association between financial inclusion and rural development in the sub-Saharan African region,

   H_0: In Sub-Saharan Africa, a significant association does not exist between financial inclusion and rural development.

H_1: In Sub-Saharan Africa, a significant association exists between financial inclusion and rural development.

2. To determine the granger causality between financial inclusion and rural development in the sub-Saharan African region,

   H_0: A general causality does not exist between financial inclusion and rural development in the sub-Saharan African region.

   H_1: A granger causality exists between financial inclusion and rural development in the sub-Saharan African region.

1.5 Significance of the Study

As a result of data availability, the goal of the study was to analyse the effects of financial inclusion on rural development in 23 countries throughout Sub-Saharan Africa. Given the critical nature of this information for policymakers when developing microeconomic guidelines that promote financial inclusion, economic growth, and rural development, enhancing financial inclusion will contribute to poverty alleviation by advancing the SDGs and improving the health and well-being of rural residents. Demirguc-Kunt and Klapper (2013) say that financial inclusion advocates for improving and matching solutions that deal with illiteracy, inequality, scarcity, and promote full development in order to reach the SDGs.

For the sake of scientific importance, the first step is to add an explicit platform, namely emergent and developing economies, to the existing scientific literature with an emphasis on rural development. This study acknowledges that considerable research has been conducted on the relationship between economic development and financial inclusion. Nonetheless, experts continue to disagree on whether this is beneficial to the (rural) poor population in terms of improving their current circumstances. Additionally, research on the effects of financial inclusion sometimes includes distressing case studies. A small study examines the consequences of financial inclusion using quantitative data from many countries, which provides a unique perspective on the subject. Finally, scientific significance is established by the inclusion of scholarly material on how FSPs can be used to track SDGs. Scholars are talking more and more about how the SDGs are

being put into place (Nhamo & Mjimba, 2020), but no studies have looked at how FSPs in rural areas of emerging and developing countries can track the SDGs.

The study's social significance is two-fold. On the one hand, poverty is disproportionately concentrated in rural areas of emerging and developing countries (Suttie, 2019). If rural living circumstances are not improved, rural residents will continue to relocate to urban regions in search of a better life (Suttie, 2019). This will increase urbanization rather than decrease global poverty (Imai, Gaiha, & Garbero, 2017). Imai et al. (2017) found that a rise in the number of people working in rural sectors (agricultural and non-agricultural) is mostly linked to a reduction in poverty.As a result, rural growth is critical to reducing global poverty (Imai et al., 2017). This study demonstrates how institutions can comprehensively examine and monitor their contributions to the SDGs in an organized manner. Additionally, it provides insights to FSPs in emerging and developing economies on where to focus their efforts during SDG evaluations and monitoring. Lastly, this study shows how international organizations can help organizations grow in a way that is more sustainable and accountable through international cooperation, which leads to the SDG framework.

1.6 Organisation of the Research

The thesis was grouped into five chapters, where the background of the study, statement of the problem, research questions, objectives and hypothesis, and significance of the study were discussed in Chapter 1. Chapter 2 reviewed literature on financial inclusion and rural development models, as well as the theoretical framework utilized to characterize their interdependence. Chapter 3 delves into research methodology, that is, research design, model specification, data characteristics, and estimation techniques. In Chapter 4, the results of the study were presented and talked about. This was followed by Chapter 5, which summed up the results of the study and suggested areas for further research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The section explores literature to establish a theoretical framework for how financial inclusion helps to support rural development. This thesis draws on this theoretical framework to address the research issues, as the framework serves as the foundation for picking the variables to measure. In other words, it conceptualizes the variables to be quantified to answer study questions. This chapter looks at studies that have already been done to show how financial inclusion and rural development go together.

2.2 Definition of Key Terms

The study concentrated on defining two critical terms: financial inclusion and rural development.

2.2.1 Financial Inclusion (FI)

Financial inclusion refers to families, businesses, and individuals using financial services (World Bank, 2014). As described by Amidic, Massara, and Mialou (2014), access to banking services is a situation where no one is denied access to adequate banking services. Demirguc-Kunt et al. (2013) defined access to banking services (FI) as the usage of proper financial services by all individuals and businesses with the motive to improve their wellbeing. Sahay et al. (2015) also said that financial inclusion is the right of all citizens in a country to use and get good banking services.

While the concept of adequate access to banking services is widely accepted, there is no agreed-upon method for evaluating it across countries. Honohan and Patrick (2008) created a financial access index using cross-sectional household survey data to combine bank and MFI account numbers. Amidic et al. (2014) created an amalgamated FI metric based on demographic, geographic, depositor, and borrower factors. They weighed the factors and sub-indices, and then summed up the data using a weighted geometric average. Cámara and Tuesta (2015) used principal component analysis to find the endogenous dimension weights for three subdimensions: access, barriers, and usage. Furthermore, Sarma (2012) developed a financial inclusion multidimensional indicator that is similar across nations and time. In the worst case, he used the normalized

Euclidean distance between achievement points, so the research favoured the Sarma (2012) method.

2.2.2 Rural Development

To begin describing rural development, the terms "rural areas" and "development" are examined separately. There is no universal definition of rurality because circumstances vary in terms of the characteristics that distinguish urban and rural locations (Food and Agriculture Organization (FAO), 2018; UN-Habitat, 2017). Thus, while discussing rurality, several authors adhere to Dax's (1996) definition: "in public debates on regional development, the word "rural area" is frequently used to refer to non-urban or peripheral regions" (FAO, 2018). This study does the same thing, defining rural regions as those that are not urban. Additionally, "growth" within the context of society is a collection of desired social substances that society strives to achieve (Singh, 1999). Based on this definition of development, rural development is the collection of necessary societal objectives that rural society strives to achieve. Singh (1999) defines rural progress as "the entire range of variation via which a social scheme moves from an "unsatisfactory" state of living to a fundamentally and mentally enhanced state of life." Rural development, in this sense, is a broad and multifaceted notion (Singh, 1999).

Rural development can be conceptualized in one of three ways (Singh, 1999):

1) As a spectacle, rural development is defined by the interactions of multiple institutional, sociological, physical, economic, and scientific challenges.

2) As a policy that refers to rural development as a means of advancing the rural poor's economic and social welfare.

3) As a concept, rural development is interdisciplinary, meaning that it is a combination of agricultural, social, behavioral, engineering, and management fields.

Rural growth is viewed as a marvel in light of this study, which refers to rural development as the result of links between several established social, physical, economic, and technological variables (Singh, 1999). The four primary causes of rural development can be summarized as follows:

1. Dwyer, Bradley, and Hill (2008) say that the "enabling environment" is made up of policies and institutions that help make macroeconomic policy work well and create a supportive institutional structure.

2. Reduce rural poverty by addressing basic needs, which refers to eradicating absolute poverty by enabling people to meet their basic needs and live decently (Chiappero-Martinetti, 2014). According to Stockbridge and Dorward (2013), women are typically the most vulnerable and underprivileged inhabitants of rural society. Additionally, necessities typically include food, clothing, shelter, and access to safe drinking water, sanitation, education, healthcare, and public transportation (Chiappero-Martinetti, 2014).

3. Dwyer et al. (2008) say that both agricultural and non-agricultural progress help the economy grow on a large scale.

4. Natural resource availability is critical for sustainable rural development because natural resources as inputs to production processes, particularly agriculture, are critical for both productivity and the people who rely on them. Stockbridge and Dorward (2013); Dwyer et al. (2008).

Rural development must always be viewed as a synthesis of the four major factors. Actual rural development is improbable when, for example, rural communities experience economic expansion while natural resource availability deteriorates rapidly. However, just one of the four critical components of rural development is being studied to 1) define a preference for rural development and 2) reflect the time constraints of this study. This aspect is taken into account because it reduces rural poverty by addressing fundamental requirements. This factor was chosen based on two theories: According to Singh (1999), development is a collection of necessary themes that society strives to attain, and according to Chiappero-Martinetti (2014), basic requirements are aspirations to live a decent existence. Given that most of the four drivers of rural development depend on people living in rural areas being able to make a decent living, this study says that "reducing rural poverty through basic needs" will be the key to rural development.

In light of the foregoing, rural development is defined in this study as the rural poor population—including women—gradually being able to meet their fundamental needs in the rural areas in

which they live, thereby raising their standard of living. The primary objective of rural development is considered with this description. Still, real rural development is always the result of all four factors working together.

2.3 Success stories and efforts of government

Many emerging and developing nations hope to integrate excluded citizens into the official financial sector, giving them the right to use proper financial goods (Allen et al., 2016). Several government agencies are taking big steps to help more people get access to financial services. For example, they are making it easier to open bank accounts by requiring less paperwork, giving out free bank cards, making it easier to get insurance, and letting people apply for mortgages without a co-signer.

Numerous success stories of financial inclusion have been documented throughout the world, most notably India (Nimbrayan et al., 2018), Kenya (Van Hove & Dubus, 2019; Ndung'u, 2018), Rwanda (Otioma, Madureira, & Martinez, 2019; Lichtenstein, 2017), and Peru (Cámara & Tuesta, 2015). Relating to India, the PMJDY program increased financial inclusion for a large number of residents and was a huge success during the program's early years. Later PMJDY programs had problems, like subsidies for financial service providers that got stuck, but SACCOs in Rwanda were a success story.The SACCOs program has attracted at least 1.6 million clients, and more than 90% of Rwandans live in close proximity to Umurenge SACCOs (Otioma et al., 2019).M-Pesa's introduction in 2007 revolutionized Kenya's financial sector and increased financial inclusion in Kenya. As of 2009, financial inclusion was at approximately 41%, whereas 39% was recorded for financial exclusion. As for Peru, the "Modelo Peru" mobile money platform was launched to help those in need and promote financial inclusion. In addition, in Peru, the "Bim" service allowed any mobile phone user to register a bank account and make online payments.

Certainly, some countries' financial inclusion strategies and programs were successful. Nonetheless, two possible areas of concern are that financial inclusion may increase the number of wealthier people who normally benefit from banking institutions. Secondly, the question that arises is whether financial inclusion programs should focus on people who have never used proper

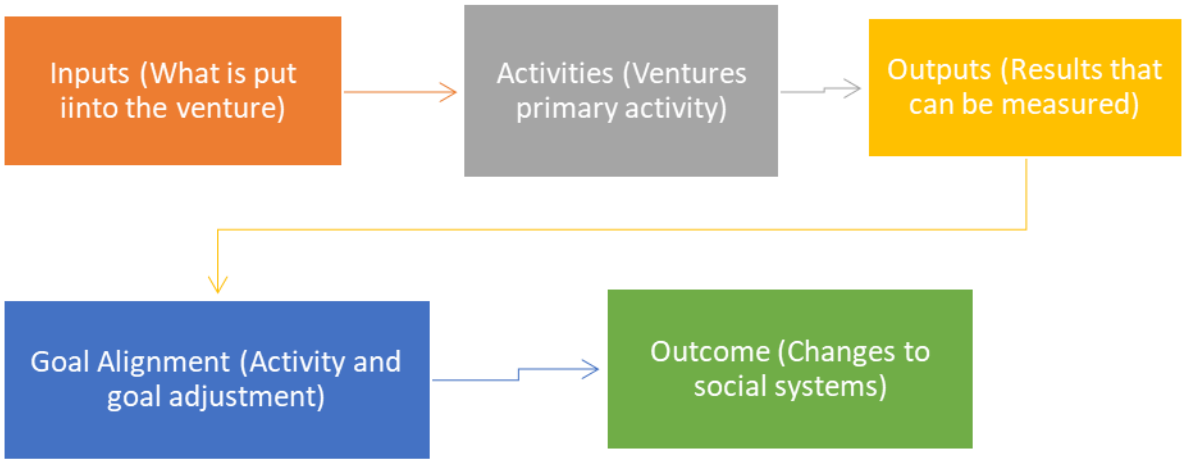
banking products or those who have used formal financial products but are now utilizing them more.

2.4 Theoretical framework

Contribution is conceptualized in this thesis using an impact measurement theory. While this thesis does not seek to establish causal links, theories of impact help construct a narrative about how financial inclusion might contribute to rural development. Constructing a story is critical because "the act of defining the narrative assists in establishing the results and indicators that should be monitored to demonstrate the objective's compliance" (Derbez, 2019). The Impact Value Chain (IVC) by Clark, Catherine, Rosenzweig, and Long (2004) was used to establish a narrative about how financial inclusion potentially benefits rural development. The IVC explains how a venture generates outputs and then outcomes changes in the social system as a result of inputs and activities (Figure 1). The essential concept of the IVC (Clark et al., 2004) is to distinguish outputs from outcomes. Outputs are tangible results that can be quantified or evaluated immediately. Additionally, goal alignment is defined as an assessment of whether outcomes or impacts meet desired goals (Clark et al., 2004). According to Clark et al. (2004), the impact of a venture is the difference between what would have happened in the absence of the endeavour and what would have happened otherwise. In the social sciences, a "counterfactual" is required to determine what changes to the social system would have occurred in the absence of the venture's actions. Clark et al. (2004) say that when a counterfactual region is used, it must have the same conditions as the region where the venture works, but without the ventures or similar activity.

By applying the IVC to this theory, the IVC is interpreted slightly differently than explained (Clark et al., 2004). To begin, this thesis does not examine any venture, but rather financial inclusion. As a result, the venture's inputs are irrelevant to this theory, and "activities" refer to enhanced financial inclusion. Second, because rural development is being explored, the term "goal alignment" will relate to rural development. Finally, Clark et al. (2004) emphasize that a counterfactual analysis is necessary to recognize changes to the social system that could occur regardless. This thesis is unable to identify such a counterfactual, depending on the research design. So, there must be another way to figure out if development depends on the amount of financial inclusion.

Figure 1: Impact Value Chain



Source: (Clark et al., 2004)

Applying the IVC to this argument strengthens it in two ways. To begin with, the IVC distinguishes clearly between outputs and outcomes. This is advantageous since outputs are generally simple to quantify, and hence information on outputs is readily available. However, there is a research gap about whether financial inclusion in rural communities of emerging and emerging economies is a strategy for improving rural standards of living and thereby affecting social system changes (outcomes). Second, the IVC leads to the creation of a story, which helps define indicators and put the thesis's findings in order (Derbez, 2019).

The preceding part used the IVC as an example to demonstrate how financial inclusion benefits rural development. In the last paragraph of the story, "financial inclusion" is explained, and its theoretical outputs and outcomes are named.

Outputs and outcomes of financial inclusion

Following the IVC's structure, this segment moves on to classifying theoretical outputs of financial inclusion. Outputs are quantifiable results (Clark et al., 2004). Sarma and Pais (2011) defined an inclusive financial system's two primary outputs as "improved efficiency" and "enhanced safety." Improved efficiency, in this context, refers to the effective allocation of financial resources (Sarma

& Pais, 2011). The outputs of increased efficacy include reduced capital costs (Sarma & Pais, 2011) and governments directly funding stakeholder accounts (Khan, 2011; Muralidhar, Bossen, & O'Neill, 2019). Effective resource allocation is predicted to improve the stability of individual (conventional) banks as well (Ahamed & Mallick, 2019), for example, by lowering the marginal cost of delivering financial services (Ahamed & Mallick, 2019). Reduced minimal costs may increase financial institutions' pricing power, stabilizing them (Ahamed & Mallick, 2019). Also, financial inclusion helps banks stay stable by letting them get more retail deposits that aren't too expensive (Ahamed & Mallick, 2019; Demirgüc-Kunt & Levine, 2010).

The increased core output of financial inclusion is bolstered by the assurance that comes with the use of official financial services rather than informal ones. This refers, among other things, to the use of formal sources of credit (Sarma & Pais, 2011). In addition, sufficient access to formal financial services facilitates credit acquisition from FSPs (Muralidhar et al., 2019). This continuously reduces the use of informal credit sources such as informal creditors who are frequently found abusive (Sarma & Pais, 2011). Additionally, securely storing money in an FSP account enables individuals to accumulate savings and lessen their reliance on loans, even though loans are associated with debt repayment and (expensive) interest. Thus, storing money in an account contributes to personal welfare (Muralidhar et al., 2019). In conclusion, financial inclusion increases security by enabling governments to directly send funds to recipient accounts. This significantly reduces the likelihood of fraud and theft in social welfare systems (Khan, 2011). Table 2.1 gives hypothetical outputs of financial inclusion.

Furthermore, outcomes refer to the social system's variances (Clark et al., 2004). According to revised research, financial inclusion is increasingly being viewed as a catalyst for economic growth rather than a by-product of economic success (Kim Tae-hwa et al., 2017; Babajide, Adegboye, & Omankhanlen, 2015; Khan, 2011). This is further illustrated by the fact that financial inclusion stimulates economic activity and employment, both of which act as multipliers for the economy. Alternatively, increased disposable incomes are available while marginalized groups are assisted in improving their financial circumstances and living standards (Khan, 2011).

Table 2.1: Summary of Theoretical Outputs and Outcomes of Financial Inclusion

Outputs of financial inclusion	**Outputs through increased efficiency**
	Reduced cost of capital
	Government providing subsidies directly to the beneficiary FSP accounts
	Greater individual bank stability
	The reduced marginal cost of producing output
	The greater pricing power of banks
	Inexpensive retail deposits for banks
	Outputs through increased safety
	Easier to obtain credit
	Reduced growth of informal sources of credit
	More savings accumulated in an FSP account
	Reduce leakages and theft in social welfare schemes
Outcomes of financial inclusion	Economic growth
	Increased economic activity
	Increased employment
	Higher disposable incomes
	Improved standards of living

Source:(Khan, 2011)

Additionally, financial inclusion may raise living standards by simplifying the process of saving and obtaining loans. Because of this, there is a lot of money available to make big changes to the home, like installing a new kitchen and more bathrooms or buying luxury items that save time (Azevedo, Garone, and Rodrguez, 2018). Nonetheless, whether financial inclusion improves the living conditions of the poor remains an open question. "The idea that poor people directly benefit from financial inclusion is weak," says Mader (2018). "The literature may not show that financial inclusion has transformative or even positive effects."

2.5 Theories of Financial Inclusion

Financial inclusion theories were classified into two basic categories: beneficiary theories and delivery theories.

2.5.1 Financial Inclusion Beneficiary Theories

Divergent assumptions exist about who is supposed to benefit from adequate access to banking services. Financial inclusion benefits the poor, according to some research (Bhandari, 2018); others, women (Ghosh, Vinod, & Vinod, 2017; Swamy & Vighneswara, 2014; Aggarwal et al., 2013); and still others, the economy and financial system (Kim et al., 2018; Ozili, 2018; Mehrotra et al., 2014).Aside from women and the poor, the literature has failed to mention possible beneficiaries of financial inclusion such as young people, the elderly, institutionalized people, disabled people, and those excluded from the financial system owing to criminal conduct. Four hypotheses about who benefits from financial inclusion are presented.

Theory of Public Good

Ozili (2020) argued that proper banking services are public goods, as argued by the public good hypothesis, which is supposed to be available to all. Finance should be open to anyone. The fact that one person has access to formal financial services does not mean others do not. This indicates that the official financial sector may benefit everyone by including everyone. Financial inclusion, in this view, benefits everyone equally. Individuals or small enterprises who have a proper bank account might also be eligible for free bank cards, allowing them to use ATMs without paying a fee. Financial firms will have to bear the cost of providing formal banking services as a sunk cost. The government could give money to financial institutions to help them pay for the costs of giving people free proper banking products.

Three benefits can be derived from financing public goods. Firstly, financial inclusion benefits everyone regardless of their status, income, or demographics. Secondly, the government subsidizes the cost of proper banking services. Thirdly, the government is allowed to promote financial inclusion (Ozili, 2020). However, financial inclusion has three faults. To begin, considering formal financial services as a public good fails to tackle the core reasons for financial exclusion. Second,

recognizing formal financial services as a public good will push governments to subsidize their costs. Such subsidies may deplete public funds, leaving them insufficient to fund other vital public programs. Third, the public good hypothesis assumes that formal financial services are either free or extremely cheap for consumers. Consequently, given that banking services are considered a public good, the low cost of formal banking services might be susceptible to unsustainability in the long term.

Theory of Dissatisfaction

Ozili (2020) proposes that financial inclusion programs should initially target individuals who are no longer in the official banking sector owing to unhappiness with the latter's engagement rules or bad experiences when dealing with financial sector agents and firms. So, if the formal financial sector's areas of complaint have been completely remedied, reintroducing unhappy consumers should be easier. The idea (Demirguc-Kunt, Klapper, and Singer, 2017) is that it is simpler to persuade people who have never been in the formal financial system to return. As a result, financial inclusion programs should start with individuals who have left the proper banking sector before spreading to other groups. Unsatisfied banked adults may have suffered from bank card fraud, financial fraud, having to queue for a long time to withdraw funds, payments clearing too slowly, exorbitant transaction expenses, or excessive bank charges. Financial inclusion's dissatisfaction hypothesis has the following advantages:

To begin with, the hypothesis makes a concerted effort to address the issue of "voluntary financial exclusion." Financial inclusion’s dissatisfaction hypothesis decreases voluntary financial exclusion by persuading people to leave the formal banking sector. Secondly, it is simple to identify those members of the population who are financially excluded. Adults who were previously banked but are now unbanked can be easily identified because financial institutions maintain their data. They can be contacted to be convinced to re-join the formal financial industry. Contacting previously banked adults is easier than reaching segments of the population who have never used formal financial services. Third, financial inclusion does not need help from the government because it is based on people's ability to persuade each other.

Nevertheless, the theory has its weaknesses. To begin with, the concept does not prioritize financial inclusion for all citizens. It is not open to those who have never worked in finance (Ozili, 2020; Demirguc-Kunt et al., 2017). Second, the dissatisfaction theory implies that customers' displeasure with formal financial sector rules of interaction causes financial exclusion. This is not always the case, as people exit the official financial system for sacred and delicate reasons, as argued by Ozili (2018). Last but not least, people who are unhappy with the way banks act in the official banking industry might be forced to stay in that industry because of its communal philosophy.

Theory of Vulnerable Group

Bestowing to the vulnerable group theory, an economy's financial inclusion strategies must target the poor, youth, women, and elderly (Ozili, 2020). Victims of financial crises and economic downturns are often the most vulnerable people. Therefore, integrating the victims into the proper financial industry makes sense. Financial inclusion for vulnerable groups can be increased through social cash programs such as government to people (G2P) (Demirguc-Kunt et al., 2018). Furthermore, providing social cash transfers and other financial inclusion tools to vulnerable members of society might help them compensate for income inequality and catch up with other parts of society. Theoretically, activities for financial inclusion should focus on the most disadvantaged people in society (Ozili, 2020).

Financial inclusion for the poor offers many benefits. Starting with disadvantaged populations, the theory tries to decrease financial exclusion through mainstreaming them. Second, this concept makes it easy to identify financially disadvantaged people. Vulnerable people can be identified through socioeconomic status, which includes demographic factors. Third, it may be more cost-effective to help only the most vulnerable people in the community than to help everyone.

The weaknesses of the hypothesis are that it does not prioritize financial inclusion for all citizens. Secondly, it ignores none-vulnerable outside the official financial industry (Demirguc-Kunt et al., 2018). Even those who do not abuse money require genuine banking services (Ozili, 2020). Thirdly, it assumes that women are weak, implying that men are not. Because both genders compete for fair opportunities in modern societies, labelling women as a vulnerable group exposed to financial and social marginalisation may have unintended consequences for financial and social

inclusion (Demirguc-Kunt et al., 2018). Men may develop a cultural aversion to women. Lastly, when financial and social policies are made to help vulnerable groups, it may make social inequality worse.

Theory of Systems

According to system theory, greater access to adequate banking systems aids the functioning of the subsystems, which include social and economic ones (Ozili, 2020).One subsystem (component) modification can significantly impact the financial inclusion projected outcome. (2017) and Demirguc-Kunt & Levine (2010), changing the national financial inclusion policy does not always require changing the sub-systems since their modification should be done at the subsystem level. According to the theory of systems, one existing subsystem in a nation will ultimately gain from financial inclusion (Ozili, 2020). Financial inclusion has several benefits. The proposition acknowledges the enhancement of financial inclusion through social, economic, and financial systems. Financial inclusion is viewed at a macro level, unlike previous models. Third, the idea looks at how the relationships between subsystems affect the results of financial inclusion (Mader, 2018).

System theory has problems. To begin with, existing subsystems reflect their surroundings. Subsystems may not work properly, preventing the accomplishment of projected financial inclusion targets. Second, the theory ignores the impact of external causes and instead focuses on the impact of subsystems (Ozili, 2020; Mader, 2018). Third, the idea assumes that there is a direct link between systems and the financial inclusion that helps them work.

2.5.2 Financial Inclusion Delivery Theories

People have different opinions on who is responsible for providing appropriate financial services to the public. government financial services, according to some (Aggarwal et al., 2013; Chibba, 2009). According to Ozili (2018), private institutions, which include financial technology firms and banks, are more efficient at providing formal financial services. To understand why these agents are necessary to supply formal financial services, one must first understand why they are required to deliver formal financial services. Listed below are numerous theories or viewpoints on financial inclusion.

Theory of Community Echelon

Community-level financial inclusion advocates for the excluded to receive official financial services through community leaders (Chibba, 2009), since community leaders have the moral persuasion to motivate members of the community to join the proper financial sector. Members of the community trust its leaders to make decisions that benefit them, while leaders ensure their actions reflect the group's values and ethos. Because of the deep cultural ties that exist between community leaders and their members, the former can encourage people to partake in the official banking sector (Allen et al., 2016). The community echelon hypothesis has the merit of persuading people to make positive changes. Organizers can encourage inhabitants to join the formal banking sector, thereby allowing them to access suitable banking services.

The community echelon paradigm has drawbacks. One, corrupt communal leaders' influence can re-emerge. (2) Nepotism, fraud, and corruption are examples of agency difficulties. When community leaders are overly influenced by proponents of financial inclusion, they may make choices not suitable for the people and the community at large (Ozili, 2020). The formal financial industry may be a source of stress and anxiety for community members who are currently participating in it. The more people worry, the higher the probability that they will leave the proper banking industry. The variety of leadership styles (Ozili, 2020; Chibba, 2009) makes it difficult to establish which one is most effective in changing community members' views toward formal financial sector engagement.

Theory of Public Service

The theory of public service regards financial inclusion as a public service that the government is supposed to provide for its citizens (Ozili, 2020; Aggarwal et al., 2013; Chibba, 2009). This belief holds that the state should provide formal financial services to all citizens. According to this theory, only the state can promote financial inclusion. Financial inclusion has several benefits. First, the theory says that financial inclusion is achievable when the state is responsible. Second, banking systems and social and economic institutions are under the arm of the government (Ozili, 2020). For instance, public banks can be established in rural areas to reach out to marginalized groups (Aggarwal et al., 2013). Third, public confidence grows when the government fully owns financial

inclusion through public institutions. Financial inclusion programmes will benefit every individual, community, and business if the government takes full accountability (Ozili, 2020; Aggarwal et al., 2013).

The theory of public service drawbacks is that it makes no mention of the private sector providing official financial services to citizens. Second, it assumes taxpayers will fund financial inclusion. For a large portion of the populace, conventional banking services may be unaffordable. Third, the state can use political power to govern society. Official financial services may be provided by the state to compliant citizens. Nonetheless, the state may stop providing formal financial services to those who rebel (Ozili, 2020).

Theory of Special Agent

Special agents should provide the excluded populace with proper banking services, according to the theory of special agents (Ozili, 2020). It is often difficult to provide formal financial services to unbanked people owing to distance, people, or the environment. As a result, only specialised agents can provide formal financial services to excluded areas. The agent is supposed to be an expert and specialist who knows what makes the excluded population and society's financial systems unique. He or she should also be able to spot areas for improvement and come up with plans to bring the excluded societies' parallel banking systems into the official banking system (Ozili, 2020). This theory advocates an agent-principal association, where the principal is normally a national or international government, whilst the agent is the domestic bank, or non-financial institution (Demirguc-Kunt et al., 2017). Financial and technological institutions may also operate as special agents.

The advantages of the theory of special agents include the employment of specialised agents to provide official financial services to excluded members of the public. By outsourcing suitable banking services, it allows the state to focus on other vital issues in the country. A second need of the government is that special agents provide appropriate banking services to the financially excluded populace. Thirdly, financial inclusion targets are clear, and the special agent's compensation is set (Demirguc-Kunt et al., 2017). There is no uncertainty regarding the special agent's purpose, expectations, or salary. Aspects of the principal-agent theory that do not alter the

special agent relationship are: Agency theory comes into play when an agent, like management, spends extra money on expenses for shareholders.

The Special Agent theory has some flaws. As a first step, a principal might assign its agency as a special agent, combining the duties of agent and principal, which can counter the purpose of a separate institution rendering official banking services. Government agencies are usually ineffectual as both main and special agents. The principal may be terminated by the special agent if they breach contractual or service conditions (which is often the government). This might arise when the principal underpays the special agent or fails to provide funds to fulfill financial inclusion programmes (Ozili, 2020).

Theory of Collaborative Intervention

According to the collaborative intervention theory of financial inclusion, many partners should provide formal financial services to the excluded (Arun & Kamath, 2015). Bringing excluded people into the official financial sector will involve collaboration from numerous stakeholders, according to Ozili (2020). Financial inclusion has many benefits (Sarma & Pais, 2008). starting with a collaborative approach to providing formal financial services. Second, the stakeholders feel proud of their contribution to the financial inclusion programme (Ozili, 2020; Sarma & Pais, 2008). According to the collaborative intervention concept, it offers many benefits. Starting with a collaborative approach to providing formal financial services Second, the stakeholders feel proud of having contributed considerably to the FI programme.

Chibba (2009) stated that the theory of collaborative intervention has some weaknesses, such as ensuring proper banking services to an excluded populace requires a large number of partners. Second, some people may withdraw, leaving only a few active collaborators. Third, having more collaborators does not always guarantee triumph in providing the excluded with proper banking services.

Theory of Financial Literacy

Financial literacy boosts consumers' desire to join the formal financial sector (Ozili, 2020; Aggarwal et al., 2013). This is achieved through strengthening citizens' financial literacy.

Financially literate people would seek out formal financial services wherever possible. Financial literacy as a concept has several benefits, which include educating people about proper banking services, which in turn improve their standard of living, creating formal accounts (Aggarwal et al., 2013). Second, financial literacy increases access to formal financial instruments, develops self-sufficiency, and becomes financially secure. Ozili (2020) highlighted that governments with budget constraints can employ financial literacy as a strategy to create awareness campaigns for financial inclusion since educating the public is quite inexpensive.

Listed below are some of the financial literacy theory's drawbacks. A few points stand out: it targets "willingness" rather than "capacity." Financial literacy raises people's willingness to participate in the formal banking sector, but this does not necessarily mean that their ability to do so is increased (Ozili, 2020).

2.6 Financial Inclusion and Rural Development

Following Clark et al.'s (2004) theory of the IVC, this subsection synthesises the literature discussed in the preceding three paragraphs into a theoretical framework. This context demonstrates how financial inclusion may theoretically aid rural development. The context justifies selecting the variables to be measured to answer research questions.

While IVC's operations signify financial inclusion theoretically, this study focuses on financial inclusion input. As previously stated, FI is defined as "access, obtainability, and use of financial products and services by all social groups in society." Outputs are directly quantifiable outputs, while outcomes are the critical changes to the social system brought about by the outputs (Clark et al., 2004). The literature review discusses the theoretical outputs and financial inclusion results and categorises them according to the theoretical framework. According to the literature analysis, access to banking services also resulted in "enhanced standards of life." While this issue is relevant to rural development, the theoretical framework does not identify an increase in the standard of living due to financial inclusion. Regarding rural development, this was discussed in greater detail under the IVC's "objective alignment," since the IVC was utilized to envision the theoretical effects of financial inclusion on rural development. Additionally, the original IVC defines impact as the effects of a social system minus the variations that would have occurred otherwise. Due to the

study's emphasis on input rather than creating results, the hypothetical setting substitutes "contribution" for "impact."

Table 2.2: Impact Value Chain

ACTIVITIES →	OUTPUTS →	OUTCOMES →	GOAL ALIGNMENT
Increasing financial inclusion ● Accessibility of financial services ● Availability of financial services ● Usage of financial services	**Through efficiency** ● Reduced cost of capital ● More government subsidies directly to an FSP account ● Greater bank stability **Through safety** ● Easier to obtain credit ● Less usage of informal sources of credit ● More savings accumulated in an FSP account ● Reduced leakages in social welfare schemes	Economic growth Increased economic activities Increased employment Higher disposable income	The rural poor including a woman being increasingly able to meet their basic needs to improve their lives

Source: (Clark et al., 2004)

The theoretical framework suggests that the procedure could be iterative. When financial inclusion benefits rural development and enables people to improve their standard of living, it is expected that the rural underprivileged population will embrace and utilise these financial services. Consistently, to the greatest extent possible, usage results in the use of advanced values (Khan,

2011). This will increase their financial services benefits, and consumers will continue to improve their standard of living. Meanwhile, when financial inclusion contributes to rural development, rural development has the potential to contribute to financial inclusion, and the relationship continues. It is critical to keep in mind that distinct descriptions may exist when outcomes partially clarify the hypothetical environment. Another clarification is necessary, as this study examines connections rather than causative links. This means that, while statistics define the theoretical environment, it is impossible to determine if financial inclusion promotes rural development or whether the critical linkages are the opposite.

If the contrary is true, it is vital to promote rural development in ways other than financial inclusion to rationally increase financial inclusion. Another way of putting it is that financial inclusion will very probably not be self-sufficient. Outside circumstances that are promising can help increase financial inclusion, for example, when compliance requirements are completed and harmony is the norm (Kempson, Atkinson, & Pilley, 2004). These external conditions—which enable financial inclusion to grow—may also explain why well-known outputs, results, and rural advancements progress independently. Thus, financial inclusion, outputs, results, and rural development may be inextricably linked, even if it is not financial inclusion but favourable external conditions that drive growth.

2.7 Luhmann Social System Theory

In Luhmann's theory and Kihlström's (2012), we can see how different social systems interact. The relationship of each participant to the system is crucial to its operation (Kihlström, 2012). Both interaction and organization systems serve the goal of societal systems (Kihlström, 2012). The theory's central tenet is that each member of society must be properly integrated into their respective schemes. For every prohibition, there are support mechanisms to promote inclusion. Intercession agents like NGOs help excluded people participate in keeping the peace (Kihlström, 2012).

To begin, this idea is pertinent to my study since it focuses on a substantial component of rural development in Sub-Saharan Africa, the poor in many emerging nations, and examines whether their enclosure can result in poverty alleviation. Financial service systems, as well as numerous

social service systems (health, education, power, water), are complex social service systems. Societies can be "excluded" from some social systems if the organizational mechanism (official institutes) fails. Numerous emerging nations exclude the poor from banking and social services because they are deemed low priority (Allen et al., 2016). Moreover, the hypothesis presumes interconnectedness or interrelationships among social service systems; hence, financial and social service systems interact (Kihlström, 2012). The study's statistical analysis includes assessing whether an interaction effect exists.

As stated previously, social systems theory is important and relevant to the study's topic. The study question is if there is a significant affiliation between financial inclusion and rural communities' development in SSA. There are particular social systems present, including financial and social services, aiming to determine the impact of enclosing or excluding the target population from these systems on their welfare, as well as any contact or interdependence between them. They are the existence and function of social systems, the consequences of population confinement or exclusion from them, and system interdependence (Kihlström, 2012). The study's conclusion will support the theory's importance.

In conclusion, governments pursue financial inclusion to enhance rural development and achieve the UN SDG targets and goals. To that end, this thesis evaluated the rural development characteristics of Sub-Saharan African countries and assessed the influence of a financially inclusive economy on the 17 Sustainable Development Goals.

2.8 Empirical Literature

A little research investigated the links between financial inclusion, income inequality, and poverty. Honohan and Patrick (2008); Honohan and Kind (2009), looked into the factors that influence access to appropriate banking services, as well as their role in poverty alleviation and equality, with a particular focus on Sub-Saharan Africa. Increased per capita income, legal protections, and demographic diversity all helped to ease access to banking services, despite the fact that a large proportion of the population is financially dependent on others. Nevertheless, in Asia, education was found to have no significant impact on financial inclusion. Bruce, Gin, Goldberg, and Yang (2011). Access to proper banking services alleviates poverty and income inequality when a large number of regressors are evaluated.

Using the main component segment technique and cross-sectional method, Park and Mercado (2018) developed a new financial inclusion indicator for Sub-Saharan Africa. In conclusion, expanded financial inclusion is connected with stronger economic development and reduces poverty only for upper-middle and high-income countries. Consequently, they missed the effects of financial inclusion on income disparities at all levels.

Honohan and King (2009) and Honohan and Patrick (2008) investigated the usage of formal financial intermediaries by adults in 162 countries and their affiliation with inequality and poverty. The index was constructed by merging household survey data with published data in cross-sectional series. A dummy for Sub-Saharan Africa and per capita income did not improve poverty when financial access was included as a regressor. Also, financial access improved income inequality when combined with metrics for financial depth, which is not the case when combined with GNI per capita and SSA dummy.

A study by Mohammed et al. (2017) looked at the effects of financial inclusion on alleviating poverty in 35 SSA member states. Using 2011 data, they showed that financial inclusion reduces poverty in SSA by boosting net wealth and welfare support for the poor. Swamy and Vighneswara (2014) discovered that in India, gender analysis had a substantial influence on boosting family welfare through increased household income. Burgess and Pande (2005) found that increasing access to formal credit and savings options reduced rural poverty in India. (Brune et al. 2011) found that in Malawi, providing poor small-scale cash-crop farmers' commitment savings accounts improved their well-being by providing funding for agricultural inputs.

Garca-Herrero et al. (2015) examined financial sector size and financial inclusion's influence on income equality and found that the latter helped improve equality. Interestingly, minimal impact on income distribution as a result of financial deepening was recorded. In Latin America, Dabla-Norris, Ji, Townsend, Unsal, and Marston (2015) claim that limiting financial participation and monitoring costs helps reduce inequality. A study conducted in Mexico by Salazar-Cant et al. (2015) using regional data, concluded that income inequality is not only reduced by financial inclusion but also differences between Mexican communities. Therefore, financial inclusion plays an important role in rural development.

2.9 Chapter Summary

The chapter outlined both theoretical and empirical literature that was governed by the study. In this study, financial inclusion is defined as families, businesses, and individuals that have access to financial services, whilst rural development is a broad and multifaceted notion. The Impact Measurement Theory was employed as the theoretical framework of the study, which helped to construct a narrative about how financial inclusion might contribute to rural development. The Impact Value Chain (IVC) was used to establish a narrative about how financial inclusion potentially benefits rural development. Financial inclusion theories are divided into two broad categories: beneficiary theories and delivery theories. Following the beneficiary theories, divergent assumptions exist about who benefits from adequate access to banking services. Selected research claims that financial inclusion benefits the poor (Bhandari, 2018); others say it benefits women (Ghosh et al., 2017); yet others say it benefits the economy and financial system (Kim et al., 2018). However, delivery theories argue that people have different opinions on who is responsible for providing financial services to the public. To understand why it is necessary to supply formal financial services, one must first understand why they are required to deliver formal financial services. The empirical analysis highlighted that few studies have evaluated the relationship between financial inclusion and rural development. The following chapter outlines the research methodology employed by the researchers.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The chapter discussed the research design, data characteristics, and measurement of variables used in this investigation. It recognises research approaches and techniques that have proven to be effective in estimating the association between financial inclusion and rural development in SSA nations. It describes the estimation technique used, the data characteristics, the period covered, and the sample size, as well as the model description and variable representation.

3.2 Research Design

The study explores the relationship between financial inclusion and rural development in SSA using a deductive quantitative approach. The research was quantitative given that it involves the collection of quantifiable numerical data which can be analysed statistically (Leacock, Warrican & Rose, 2015). Given that statistical analytical procedures are deemed more appropriate when dealing with vast numerical data, as was the case in this study, quantitative research was considered to be appropriate. The study sought to test and empirically investigate existing theories on the influence of financial inclusion on rural development. Inductive reasoning becomes handy as compared to inductive reasoning. Deductive reasoning focuses on verifying already existing theories to determine their validity and utility (Bradford, 2017). As a result, a deductive investigation is regarded as appropriate given the existence of a body of theory on the interplay of rural development and financial inclusion, as presented and evaluated in the literature review.

3.3 Data Characteristics

Panel data is analysed in this study, which was defined by Hsiao (2007) as a combination of both time-series and cross-sectional data. The study uses panel data for 23 SSA member nations from 2011 through 2020. The primary rationale for using a sample of 23 nations is that other countries lacked data for at least five years and were thus omitted. Benin, Cameroon, Congo, Cote d'Ivoire, Eswatini, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome & Principe, Senegal, Togo, Uganda, Zambia, and Zimbabwe are among the sampled countries. Lopcu (2009) emphasises that panel data enables

analysis of cross-sectional data over a specified period covering units as supported by Hsiao (2007). The ability of panel data to aggregate observations from several units over numerous time spans increases the variability and reduces the possibility of multicollinearity within the variables. Hsiao (2007) argued that degrees of freedom are increased when dealing with panel data as compared to cross-sectional and time-series data, which enables examination of dynamic interactions within variables. Finally, data from the World Bank's World Development Indicators, the IMF's 2019 Financial Access Survey, and the UNDP human development databases, which cover 189 countries and allow for more accurate cross-country comparisons, were used in the study.

3.4 Variable Description and Measurement

A detailed discussion on the description and measurement of the variables employed by the study was given in this segment of the study.

3.4.1 Dependent Variable

Rural development was utilised as the dependent variable for the study.

Rural Development

The proportion of the rural populace with access to electricity was employed in this study to estimate the level of rural development in rural areas throughout SSA. As one of the measures of rural community development, access to electricity enables residents to use it for lighting, cooking energy, schools' educational instruments, health facility equipment, and network towers for effective communication. According to Agarwal, Kigabo, Minoiu, Presbitero, and Silva (2018), access to electricity can significantly improve rural welfare. According to this study, access to electricity at the household level can have a tangible effect on the value of lighting and the ability of individuals to participate in or engage in enjoyable activities as well as business activities, resulting in a material revenue increase over time. Thus, in this study, access to electricity serves as a more accurate proxy for rural development.

3.4.2 Key Variable

The study key variable was financial inclusion.

Financial Inclusion Index

Following Sarma and Pais (2008), the financial inclusion index was employed as a proxy for financial inclusion. The FII is a multidimensional variable that combines numerous elements of financial inclusion, which are availability, accessibility, and usage dimensions. The variable ranges between 0 and 1, where 0 reflects financial exclusion and 1 entail financial inclusion. The study chose this variable as a proxy because the variable was constructed using numerous indicators of financial inclusion, which reduces the bias of using one financial indicator. Additionally, FII allows for a comparison of the degree of financial inclusion in different economies and can be utilised to track the progress of financial inclusion policy initiatives over time. Following Sarma & Pais (2008), FII is calculated as follows;

$$d_i = \frac{A_i - m_i}{M_I - m_i}$$

Where A_i represents dimension actual value, m_i the means minimum value of dimension's, which in this research is 0, and M_i is the dimension's highest value.

To compute the normalisation, weights were assigned to each dimension parameter in the dimension. For the availability dimension, each of the four parameters is allocated a weight of 1/4. In the case of the usage dimension, each of the two parameters is given a half-weight. After assigning weights and normalising the data, the final FII formula becomes;

$$FII = 1 - \frac{\sqrt{[(1 - P_i)^2 + (0.5 - A_i)^2 + (0.5 - U_i)^2]}}{1.5}$$

Where FII stands for financial inclusion index, P_i stands for Accessibility Dimension Index, A_i stands for Availability Dimension Index, and U_i stands for Usage Dimension Index. Each dimension is weighted equally: $Access = 1.0, Availability = 0.5$ and $Usage = 0.5$.

The number of deposit accounts with commercial banks per 1,000 adults was used to measure the

accessibility dimension, whilst the number of ATMs per 100,000 adults measured the availability dimension, and lastly, outstanding loans with commercial banks were proxies for the usage dimension and are provided in Table 3.1.

Koomson et al. (2020) stated that financial inclusion is more effective in poverty reduction in rural households as compared to urban ones. As a result, a positive relationship is anticipated.

Table 3.1: Financial Inclusion Dimensions and Parameters

Dimension	Significance	Parameters	Description
Accessibility (Penetration)	Number of bank accounts in the study area	• Depositors per 1 000 adults	Stepping stone for financial inclusion Opening a bank account to operate financial transactions Opening operative bank account
Availability	Number of access points in the study area	• Branches of commercial banks per 1 000km^2 • Branches of commercial banks per 100 00 adults • ATMs per 1 000 km^2 • ATMs per 100 000 adults	Supply side indicators Information gathered from financial institutions in person or website based on the availability
Usage	Accounts hold by the respondents	• Depositors with commercial banks (% of GDP) • Domestic credit to private sector (% of GDP)	Demand side indicators. Information gathered from the respondents

Source: Sarma & Pais, (2008)

3.4.3 Control Variables

The study empirical model was built on the presence of the following control variables.

GNI per capita

GNI is defined as the total income received by individuals and businesses in a country, plus investment income, regardless of where it was earned. The OECD defines GNI as the sum of Gross Domestic Product and net receipts from overseas compensation of property income, net taxes, and employees' fewer production subsidies, and the variable was used to control for mean income. Therefore, a positive relationship is expected.

Inflation

The inflation rate is also added to account for the macroeconomic environment's effect, as high inflation is more detrimental to the poor than to the wealthy, who can hedge their exposure. Thus, the research anticipates an inverse link between rural development and inflation. The Consumer Price Index was used as the proxy for inflation.

Inequality Adjusted Income Index

According to Israr, Yaseen, and Ahmad (2017), their study discovered that money from farming contributes more to rural people's standard of living than income from other sources, implying that farming plays a significant role in alleviating poverty in rural regions. Farming entails the direct production of food and supplies in rural areas, typically without the use of financial resources. Also, they stressed that development and making a living are inextricably linked because both the poor and the rich look closely at how they make a living.

Inequality Adjusted Education Index

According to Todaro and Smith (2011), health and education continue to be critical components of the socio-economic development of any communal area, particularly rural communities. This is true, as education is critical to rural development since it is paramount to the evolution of rural residents, communities, and the land. Rural education does ensure the next generation's good future; hence, a positive impact is expected.

Inequality Adjusted Life Expectancy

According to Jiang, Luo, and Xu (2018), life expectancy is the expected duration of a specific population of identical age group's existence in the future, based on an exact mortality rate, and is a critical metric for assessing objective health.Because increased life expectancy is related to development, since higher life expectancy improves available resources' productivity through heartened workers' health and incentive for long-term investments (Todaro & Smith, 2011). Consequently, the study anticipates that life expectancy and rural development are positively related.

3.5 Econometric Estimation Approach

The Generalised Method of Moments estimator proposed by Arellano and Bover (1995) was utilised by the study as the econometric estimation technique. The motive behind utilising this estimator is that the estimator has an inbuilt ability to address the problem of endogeneity over other models, for instance, Generalised Least Squares (GLS), Fixed Effects, among others (Roodman, 2009). Additionally, the estimator enables the data generation process to incorporate both present and historical explanatory variable values, which are not explicitly exogenous (Bun & Sarafidis, 2013). In the end, a dynamic GMM approach was used to look at how financial inclusion affects rural development.

$$Y_{it} = \alpha Y_{i,t-1} + \beta X'_{it} + \delta V'_{it} + \varepsilon_i \quad i = 1, \dots, N; t = 1, \dots, T \tag{1}$$

$\varepsilon_i = \mu_i + \varphi_{it}$, where, μ_i denotes independent-level effects and, φ_{it} denotes error term. Y_{it} denotes the rural development index, $Y_{i,t-1}$ denotes the lagged rural development index, X'_{it} denotes the financial inclusion factor, V'_{it} are five control variables consisting of inflation, GNI per capita, inequality-adjusted income, inequality-adjusted life expectancy, and inequality-adjusted education.

From equation (1), $Y_{i,t-1}$ associates with μ_i since the previous values are dependent on specific effects, which then breaks the compatibility of orthodox panel data approaches (Kruiniger & Hugo, 2009). On the condition that $Y_{i,t-1}$ is associated with X'_{it} and φ_{it}, both fixed and random effects with GLS within group (WG) fixed effects procedures become skewed and unreliable due to the model's endogeneity (Bun & Sarafidis, 2013; Bond, 2002). Anderson and Hsiao (1982), on the other hand, strived to address the issue through assuming that $\Delta Y_{i,t-2}$ and $Y_{i,t-2}$ as the instruments

of $Y_{i,t-1}$ as endorsed by Holtz-Eakin, Newey, and Rosen, (1988), building on the latter work and (Hansen, 1982), difference GMM estimator was developed and obtained estimators by employing moment conditions induced by lagged endogenous factor that is $(Y_{i,t-2};\ Y_{i,t-3};\ \ldots;\ Y_{i,t-n})$ with φ_{it}.

Through a series of simulations, Bond (1982) demonstrated that the difference GMM estimator produces minimum potential bias in comparison to Within Group and Generalised Least Squares approaches, implying that difference GMM is more robust (Bun & Windmeijer, 2007). Validation of the instruments is critical for efficient GMM estimation. Typically, instruments are constructed using the current values and first lags of the dependent variable (in this example, the rural development index) and independent variables (Roodman, 2009a). As a result, equation (1) becomes:

$$Y_{it} = \alpha Y_{i,t-1} + \beta X'_{it} + \delta V'_{it} + \varepsilon_i; gmmstyle\left(Y_{i,t-1};\ V'_{it}; laglimit\ (\#\ \#)\right) ivstyle\ (V'_{it}) \qquad (2)$$

The lags (# #) specifies that defined lags should be utilised as dependent factors. Serial correlation in error term invalidates the instruments, impairing the competency and consistency of estimators (Bowsher, 2002; Blundell & Bond, 2000). If φ_{it}, exhibits serial correlation of order 1, $Y_{i,t-2}$ is endogenous to φ_{it}. Additionally, (Hansen, 1982) test will then be conducted to check for GMM approach's dependability which also necessitates autocorrelation test to confirm whether the error term suffers from second-order autocorrelation.

3.6 Empirical Model Specification

The study was grounded on testing two research objectives. To answer these research objectives, the following hypothesis testing techniques were employed.

To ascertain whether there is a significant association between financial inclusion and rural development in the sub-Saharan African region,

$$RDI_{it} = \beta_0 + \beta_1 FII_{it} + \beta_2 X_{it} + \varepsilon_{ij} \qquad (3)$$

where i and t signify the nation and year correspondingly; *RDI* stands for rural development; *FII* stands for financial inclusion; *X* stands for a matrix of five explanatory variables which are inequality-adjusted income, inequality-adjusted life expectancy, inequality-adjusted education, inflation and GNI per capita; and , ε_{ij}, stands for a disturbance term.

From the above research objectives, the null hypothesis is given as, in SSA, a significant association does exist between financial inclusion and rural development. The decision criteria was that, if β_1 p-value is less than 5%, reject H_0 and conclude that a significant association exists between financial inclusion and rural development.

Furthermore, to allow for interpretation of the results as elasticities, the model will be transformed into a log-log model. Gujarati (1982) argued that estimating a regression model as a log-log model reduces the problem of heterogeneity. Lastly, a sensitivity test analysis will be conducted by eliminating none-Highly Indebted Poor Countries (HIPC), namely Eswatini, Kenya, Lesotho, Mauritius, Namibia, Nigeria, and Zimbabwe, to explore whether the effects of financial inclusion on rural development vary with a country's economic status.

To determine the granger causality among financial inclusion and rural development in sub-Saharan Africa,

The granger causality test was employed to investigate the presence of either a uni-directional or bidirectional association that exists between financial inclusion and rural development. The Granger causality technique was established from the opinion that historic proceedings can cause the occurrence of forthcoming events but not contrariwise (Gujarati, 2004). To examine whether financial inclusion granger causes rural development, the test computes how much rural development can be expounded by historic efforts at financial inclusion. Therefore, financial inclusion is said to be a cause of rural development, and the extent of financial inclusion helps in anticipating the degree of rural development. The test is based on the following bivariate equations,

$$RDI_t = \partial_0 + \partial_1 RDI_{t-1} + \cdots + \partial_k RDI_{t-1} + \emptyset_1 FII_{t-1} + \cdots + \emptyset_k FII_{t-1}$$

$$FII_t = \partial_0 + \partial_1 FII_{t-1} + \cdots + \partial_k FII_{t-1} + \emptyset_1 RDI_{t-1} + \cdots + \emptyset_k RDI_{t-1}$$

The Wald statistics for the joint hypothesis $\emptyset_1 = \cdots \emptyset_k = 0$ for each equation is the reported F statistic. The test is based on the following hypothesis for the first equation,

H_0: Financial inclusion does not granger cause rural development

H_1: Financial inclusion granger causes rural development

The decision rule is that if the p-value is less than 0.05, reject H_0.

3.7 Diagnostic Tests

The following tests were done to make sure that the empirical model given in equation (3) was correctly described.

Multicollinearity Test

When several independent variables are collinear, the coefficients become uncertain or misleading. The pairwise correlation analysis approach was used to investigate whether any explanatory variables have a correlation value exceeding 0.8, which affects the robustness of the model. Given that some of the variables have a correlation value above 0.8, the variables are often estimated separately rather than jointly (Gujarati, 2004).

Autocorrelation Test

The autocorrelation problem is a recurring issue that arises when utilising the dynamic panel data estimation technique, and it can result in the invalidation of variables (Baltagi, Feng, & Kao, 2012). This issue typically occurs because of the lagged endogenous variable involvement. The primary goal of a GMM model is to ensure that the AR(2) value has a significance level greater than 5%.

Instrument Over-identification Test

One of the challenges associated with the GMM estimation technique is instrument subset validity and over-identification. This necessitates the need to conduct instrument validity and overidentification tests, which were done through the Hansen (1982) test. The decision rule is that if the probability value is greater than 5%, we conclude that the instrument subsets are valid and do not suffer from over-identification.

3.8 Chapter Summary

The study employed a deductive quantitative research design to investigate the relationship between financial inclusion and rural development in SSA. The study used panel data for 23 SSA member nations from 2011 to 2020. To conduct empirical analysis, the Generalised Method of Moments econometric estimation technique was employed, accompanied by the following diagnostic tests: autocorrelation, multicollinearity, and over-identification tests. Therefore, the following section of the study highlights the presentation and discussion of the results of the study.

CHAPTER 4: PRESENTATION AND DISCUSSION OF RESULTS

4.1 Introduction

This segment of the study presents and discusses the study findings. The chapter was categorised into three. Firstly, descriptive statistics were discussed. The second section contains Pearson correlation coefficients (multicollinearity test results), and the third section contains the estimated findings of the Generalised Method of Moments analysis.

4.2 Descriptive Statistics Results

Table 4.1 shows the results of the descriptive statistics focusing on the 23 sampled SSA economies.

Table 4.1: Descriptive Statistics Test Results

Variable	Obs	Mean	Std. Dev.	Min	Max
RDI	230	26.1575	23.5417	0.9268	100.0000
FII	230	0.1803	0.1695	0.0053	0.8329
LIFEXP	230	0.4265	0.1095	0.2320	0.7670
EDUC	230	0.3304	0.1068	0.1150	0.6390
INCO	230	0.3540	0.0870	0.1460	0.6840
GNIPC	230	8.0113	0.7041	6.8659	10.1372
INF	230	5.6896	5.0945	0.1352	27.2833

Source: Researchers Calculations using Stata 14: RDI is Rural Development Index, FII is Financial Inclusion Index, LIFEXP is Inequality-adjusted Life Expectancy, EDUC is Inequality-adjusted Education, INCO is Inequality-adjusted Income, GNIPC is Gross National Income Per Capita and INF is the Inflation rate.

As shown in Table 4.1, the rural development index averaged 26.16%, with a degree of variation of 23.54%, indicating that the majority of the nations in SSA remain poor due to a lack of access to electricity. Additionally, the statistics indicate that 26.16% of the rural populace in SSA has access to electricity, compared to 73.84% who do not, indicating rural underdevelopment. The

minimum and maximum values of 0.93 and 100, respectively, indicate a high degree of data dispersion, implying that some SSA countries are more developed than others in the sample.

The average financial inclusion index for the SSA area was 0.18, which is close to zero, indicating a high degree of financial exclusion, with a standard deviation of 0.17. These findings indicate the necessity of financial inclusion awareness initiatives to increase access to financial services in SSA. Additionally, the data suggests a considerable variation in financial inclusion within SSA, as highlighted by minimum and maximum values of 0.01 and 0.83, respectively.

As for control variables, inequality-adjusted life expectancy was 0.43 on average, meaning a relatively low life expectancy in SSA, while inequality-adjusted education was 0.33 on average, implying that a majority of the populace is illiterate in SSA. The minimum (0.12) and highest values (0.64), on the other hand, indicate that certain countries are extremely literate, while others are not. The average inequality-adjusted income value of 0.35 indicates that the sampled countries have low incomes, as evidenced by the mean gross national income per capita value of 8.01. The macroeconomic stability indicator indicated that SSA has a high level of policy inconsistency (a mean value of 5.69%).

4.3 Multicollinearity

In this study, the Pairwise Correlation matrix was employed to determine the presence of multicollinearity.

Table 4.2: Pairwise Correlation Results

	RDI	FII	EDUC	INCO	LIFEXP	GNIPC	INF
RDI	1.000						
FII	0.364	1.000					
EDUC	0.240	0.157	1.000				
INCO	0.390	0.246	0.408	1.000			
LIFEXP	0.354	0.257	0.350	0.290	1.000		
GNIPC	0.292	0.369	0.227	0.207	0.375	1.000	
INF	0.110	0.032	0.001	0.157	0.127	0.113	1.000

Source: Researchers Calculations using Stata 14

From the findings from Table 4.2, it can be noted that the variables do not suffer from the problem of multicollinearity as there is no considerable evidence of high correlation. The study's primary variables (rural development index and financial inclusion index) had a correlation value of 0.36, indicating no evidence of considerable multicollinearity. As a result, the regression analysis conducted in the study contained all variables.

4.4 Estimated Regression Analysis Results

The research explored the effects of financial inclusion on rural communities' development in sub-Saharan African economies by employing the Generalised Method of Moments estimation technique. The results of GMM are presented in Table 4.3.

Table 4.3 Generalised Method of Moments Results

	System GMM	*Difference GMM*
L.RDI	2.268	2.518
	*1.021***	*0.701****
FII	1.647	1.719
	*0.500****	*0.580****
LIFEXP	1.326	1.107
	*0.458****	*0.269****
EDUC	1.208	1.231
	*0.461***	*0.485***
INCO	1.095	1.405
	*0.358****	*0.556***
GNIPC	1.527	1.623
	*0.544****	*0.312****
INF	-1.392	-1.207
	*0.459****	*0.382****
Hansen	0.215	0.268
AR(2)	0.284	0.315
Instruments	16	14
F-stat	24.926	13.476
Prob	<0.01	<0.01
Obs	198	198

*Source: Researchers Calculations using Stata 14; * ** (***) signify significance at 10%, 5% & 1% level, in italics are the standard errors*

The Hansen and AR(2) results for both models indicated that the model was correctly specified since it does not suffer from autocorrelation and instrument over-identification problems. Lagged rural development was positive and significant, indicating that rural communities that are undeveloped are more likely to be impacted by prior underdevelopment. Relating to control variables, GNI per capita, inequality-adjusted income, education, and life expectancy all correlated positively with rural development, however, inflation correlated negatively with rural development. The findings suggest that increasing GNI per capita, life expectancy, education, and income increases living standards, thereby promoting rural development, which includes access to safe water, electricity, quality health care, and education, among other things, whereas inflation

discourages rural development. According to (Jiang, Luo & Xu, 2018), increased life expectancy is associated with rural community development, whereas (Israr et al., 2017) discovered that agricultural income contributes more to rural people's standard of living than other sources of income, thus playing a significant role in alleviating poverty in rural areas and promoting development. Todaro and Smith, (2011) argued that health and education remain critical components of socioeconomic development in any communal area, but particularly in rural communities. This is true, as education is critical to rural development since it is crucial in the evolution of rural residents, and communities.

About financial inclusion, the results indicate a positive and highly significant association exists, inferring that financial inclusion in SSA can help boost rural community development. According to Park and Mercado (2015), economic development can be realised because of a mature financial system because it attracts the investment necessary to propel a country's development, including rural development. Financial inclusion enables people to improve their standards of living. It is envisaged that the rural underprivileged population will embrace these financial services, which they will utilise freely (Khan, 2011), enhancing their financial wellbeing and individual standard of living. Mohammed et al. (2017) found that financial inclusion significantly lowers poverty levels in SSA when there are sound welfare support systems and increased net wealth for the poor.

With respect to the argument of the vulnerable group theory, financial inclusion programmes should be more focused on the vulnerable groups in the community, for instance, the young, the elderly, the poor, and women. According to the theory, economic and financial crises frequently impact the vulnerable groups as compared to the none-vulnerable people. Hence, it is of high importance to integrate the vulnerable groups into proper financial services, thus raising their standard of living.

Additionally, to assess the sensitivity of the results in Table 4.3, the estimation excludes the region's seven least-developed nations that are not significantly indebted, namely Eswatini, Kenya, Lesotho, Mauritius, Namibia, Nigeria, and Zimbabwe. In the end, the results of the sensitivity test are shown in Table 4.4. It shows that financial inclusion kept the same meaning and signs as in Table 4.3, which means that a country's high level of debt did not change the relationship.

Table 4.4: Sensitivity Test Results

	Excluding None Heavily Indebted Poor Countries	
	System GMM	*Difference GMM*
L.RDI	2.368	2.251
	*0.956***	*0.312****
FII	1.564	1.594
	*0.428****	*0.393****
LIFEXP	1.167	1.097
	*0.188****	*0.192****
EDUC	1.258	1.310
	*0.429****	*0.527***
INCO	0.995	1.007
	*0.363****	*0.161****
GNIPC	1.576	1.603
	*0.454****	*0.213****
INF	-1.209	-1.198
	*0.492***	*0.225****
Hansen	0.415	0.198
AR(2)	0.484	0.215
Instruments	12	11
F-stat	41.256	58.127
Prob	<0.01	<0.01
Obs	136	136

*Source: Researchers Calculations using Stata 14; * ** (***) signify significance at 10%, 5% & 1% level, in italics are the standard errors*

4.5 Granger Causality Results

The Granger causality test was used to examine whether a bidirectional or unidirectional relationship exists between financial inclusion and rural development in SSA. Table 4.5 presents the summarized results.

Table 4.5: Granger Causality Test Results

Null Hypothesis	F-Statistic	Decision
Financial inclusion does not granger cause rural development	6.689**	Reject
Rural development does not granger cause financial inclusion	0.985	Do not reject
Life expectancy does not granger cause rural development	2.201	Do not reject
Rural development does not granger cause life expectancy	0.084	Do not reject
Income does not granger cause rural development	0.878	Do not reject
Rural development does not granger cause income	28.845***	Reject
Education does not granger cause rural development	0.609	Do not reject
Rural development does not granger cause education	0.004	Do not reject
GNI per capita does not granger cause rural development	3.792*	Reject
Rural development does not granger cause GNI per capita	2.702	Do not reject
Inflation does not granger cause rural development	0.735	Do not reject
Rural development does not granger cause Inflation	0.457	Do not reject

*Source: Researchers Calculations using Stata 14; * ** (***) signify significance at 10%, 5% & 1% level*

As seen in Table 4.5, a uni-directional relationship exists between financial inclusion and rural development, indicating that rural development is fostered by financial inclusion. Therefore, financial inclusion stimulates rural development in SSA. This reaffirms the premise that financial inclusion may be used to improve rural populations' wellbeing by facilitating the rural populace's access to adequate banking services, for example, financial management, loans, and savings. The results are in line with Mohammed et al. (2017), who concluded that financial inclusion enhances people's welfare in Sub-Saharan Africa.

4.6 Chapter Summary

This section of the research presented discussed the research findings of the study. The multicollinearity test results highlighted that the model does not suffer from the problem of multicollianearity; hence all the variables were included in the regression analysis. Furthermore, the GMM results highlighted that financial inclusion positively influences rural development, suggesting that the more people have access to proper banking services, the more their standards of living are improved. As for the diagnostic test results, it can be concluded that the model did not suffer from autocorrelation and over-identification problems; hence the results are robust.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The main aim of the study was to explore the association between financial inclusion and rural development in 23 Sub-Saharan African nations from 2011 to 2020 using the Generalised Method of Moments. Therefore, this part of the research presents the conclusions of the study and avenues for future studies.

5.1 Research Conclusions

The primary research question for the study was as follows:

Does a statistically significant association exist between financial inclusion and rural development in the sub-Saharan African region?

According to empirical data, financial inclusion and rural development have a strong and statistically significant association. This infers that increasing financial inclusion will result in rural development because it improves the living standards of the most vulnerable people, which is in line with Mohammed et al. (2017), who established that access to proper banking services reduces poverty in SSA when net wealth and increased welfare support are provided to the vulnerable groups. Additionally, the Vulnerable Group hypothesis states that governments must pursue financial inclusion programs to enhance the vulnerable groups' welfare.

What is the granger causality between rural development and financial inclusion?

The granger causality findings highlighted that financial inclusion granger causes rural development at a statistically significant level of 5%. These findings suggest access to adequate banking services is important for rural development in SSA, as (Park & Mercado, 2015) argue that sound banking systems are a necessity for economic development and serve as a vehicle for luring investment necessary to propel development in a nation, including rural development.

5.2 Policy Recommendations

The study recommends the following policies

Invest in Infrastructure

There is a need for both the public and private sectors to take the initiative to invest in financial sector infrastructure. This allows individuals, families, and businesses in rural areas to have access to proper banking services.

Educational Campaigns

There is a need to conduct educational campaigns in rural communities in order to inform them of the benefits of having access to financial services. One of the key limitations of financial inclusion in rural communities in SSA is the knowledge of the benefits of accessing banking services as well as financial literacy.

5.3 Avenues for Future Studies

The study used a GMM estimating approach to cover 23 nations from 2011 through 2020. As a result, it is advised that future studies explore the following areas:

- Future research should take into account the differences in countries' financial inclusion levels, which may have a biased effect on the study findings; hence, a study can be conducted using subsamples of low, medium, and high financial inclusion.
- Additionally, future research can disaggregate financial inclusion parameters and scrutinise the affiliation among rural development and financial inclusion metrics with the motive to determine which metrics have the most impact on rural development.
- Additionally, future research can examine the significance of geographic advantages such as Northern versus Southern, Western, and Eastern regions within the SSA regional bloc.

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