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FOOD INSECURITY IN AFRICA: THE ROLE OF AGRIBUSINESS

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DECLARATION

I shadrack Agaki hereby declare that this research project is my original work and has not been presented for the conferment of any degree in any university or for any award.

Signed ……Date ……...

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This project has been submitted for examination with my approval as the University Supervisor.

Signature …… Date …….....

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DEDICATION

I want to dedicate this work to actors who work towards ensuring the world meets the aspiration of Zero hunger.

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ABSTRACT

Agribusiness is seen as a panacea to the challenge of food insecurity in Africa. However, the agribusiness productivity paradox abounds with structural transformation within the agribusiness ecosystem in Africa since the structural adjustment program in most Africa countries creating more inequalities. Insistence on commercialization of smallholder's production in Africa is at the heart of new agribusiness models, yet the heterogeneity of smallholder farms occasioned by geographical, ecological, cultural, level of literacy, stage of economic development of African countries bring about difficulties in policy formulation and implementation to effectively support new agribusiness models in order to promote sustainable agricultural productivity which could in turn ensure attainment of food security. With the changes occasioned by introduction of digital technologies especially digital platforms and the attendant structural transformation, it has increasingly become important to explore different ways in which to change the perception of rural smallholder agriculture from what Dr. Akinwumi Adesina Calls zones of economic misery to Zones of Economic prosperity. Changing agriculture from a way of life, practiced by the old to a profitable economic activity embraced by people from all the generations. Agreeably, use of new technology could play a critical role but the rate of adoption of new technologies in Africa is low and of major concern to stakeholders especially due to inadequate capacity and skills of Africa human capital, inadequate development of infrastructure and other externalities. This study in general confirms the mixed blessing hypothesis developed by Stefan Pahl and Marcel Timmer (2020) where in one hand there are positive result while on the other a disastrous impact. In chapter two, new agribusiness models exhibit potential of ensuring food security if different enablers such as collaboration among all stakeholders is embraced while the downside becomes inevitable when disharmony exist especially in policy formulation and implementation. In chapter three, while digital platforms promise immense returns, the underdeveloped nature of digital infrastructure in Africa coupled with inadequate human digital skills among smallholders, new agribusiness models based on digital platforms will further alienate them leading to exacerbation of food insecurity. In chapter four, the structural transformation including development of global value chain within new agribusiness models, could lead to accessibility of food from other productive areas, however with unpredictable nature of emerging global issues such as covid19 food self-sufficiency is key. This dependence on the international food trade unfortunately vitiate food sovereignty aspect. In addition, many African countries that are not in the center of global production process will face challenges in terms of influencing global prices, therefore, negatively impacting on production capacity which may lead to food insecurity.

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ABBREVIATIONS

SDG -Sustainable Development Goals

MDG-Millennium Development Goals

NEPAD- New Partnership for Africa Development

FAO- Food Agriculture Organization

CAADP- Comprehensive African Agriculture Development Programme

EBA-Enabling Business of Agriculture

GVC- Global Value Chain.

CHAPTER ONE: INTRODUCTION

1.0 Background of the Study

Food security is a critical element in realization of sustainable economic, social, political development and global peace and its absence in most times leads to conflicts which can escalate into wars. Accordingly, the preamble of the United Nation Charter aspiration to prevention of the scourge of war and ensuring adherence to fundamental human rights and dignity of human worth remains relevant and valuable to the people of the United Nations. It is from this vantage point that global effort to ensure food security never disappears from global discourse.

At the start of the millennium, in the year 2000 under the auspices of the United Nation, the world established a plan in form of 8 Millennium Development Goals (MDGs) geared towards maintaining world peace and security, to show the significance of Food Security, preeminence was given to the eradication of extreme poverty and hunger, UNCTAD (2017)[1]. To terminate hunger and poverty, three targets were identified; halving global poverty; achieving productive and full employment and decent work for all and reducing by half the proportion of people who suffer from hunger. However, as the FAO, IFAD, AND WFP (2015) report indicated, only 72 countries out of 129 countries which were being monitored for progress reached those targets by the end of the end of 2015.

Not letting go, after the dismal performance in the Millennium Development Goals, leaders from 193 countries under the leadership of the United Nation again met and agreed on

[1] Millennium Development Goals; https://www.undp.org/content/undp/en/home/sdgoverview/mdg_goals.html

enhanced plan structured in terms of 17 Sustainable Development Goals (SDGs) to try and achieve targets that were missed from the previous plan of MDGs. Under these goals the prevalence of food security was demonstrated again by the introduction of an aspiration to achieve Zero hunger by 2030. Under this goal, the aim is to end hunger, by ensuring that all people all year-round access sufficient, safe and nutritious food[2]. Three components around achieving zero hunger include ending hunger, promoting sustainable agriculture and achieving food security and improved nutrition and consequently, for the goal to be attained, tasks such as increase in agricultural yield, improved infrastructures, functioning local commodity markets and international markets must be attained. Unfortunately, according to the State of Food Security and Nutrition in the world 2018 and 2019, countries are lagging behind towards attaining Zero hunger by 2030.

According to FAO (2019), there have been shifts in the way food is produced, distributed, and consumed globally. Climate change, increasing climate variability and extremes are negatively affecting agricultural productivity, natural resources and food production which in turn leads to ineffective food systems and resulting in decline of rural numbers of farmers. To get back on track to attaining zero hunger, building inclusive structures is recommended. Martinez, Feddersen and Speicher (2016) call for mechanization as a remedy to low agricultural productivity. Mechanization is key in making agriculture attractive to young people who are

[2] The United Nation Sustainable Development Goals Plan
https://www.undp.org/content/dam/undp/library/corporate/brochure/SDGs_Booklet_Web_En.pdf

majority in the Africa continent[3]. Further, African countries are being encouraged to embrace sustainable agribusiness aided by smallholders.

The Africa Union, aware that the continent is the most vulnerable to the impact of food insecurity and unemployment among young people instituted several initiatives such as the Comprehensive Africa Agricultural Development Programme (CAADP) to foster entrepreneurship, encourage investment in Agribusiness and Agri-food value chain, improve markets and promoting regional integration and partnership [4]. A number of academic researchers have confirmed that Africa development hinges on her ability to utilize vast resources in terms of arable land and human capital to increase agriculture productivity in order to generate required employment opportunities for the young population that is rapidly increasing. Ademola, Manning and Azadi (2017) in their paper agribusiness innovation: the path to sustainable economic growth in Africa opines that agribusiness is an essential element in addressing food insecurity by increasing wealth for rural farmers and enhancing productivity. They further observe that agribusiness contributes more to Gross Domestic Product (GDP) than pure agriculture in the farm.

The Alliance for Green Revolution in Africa (AGRA) 2018 report points out several elements that that will foster enabling business of agriculture in the continent, among them agricultural technology adoption, agricultural mechanization, agriculture research technology,

[3] Food security in sub-Saharan Africa: A fresh look into agriculture mechanization, Martinez, Feddersen and Speicher in their paper argue for adoption of mechanization in the Rural world (5RW).
[4] Africa Agriculture transformation and Outlook NEPAD, A white Paper prepared by New Partnership for Africa Development

agricultural extension training and education and many others[5]. Developing a digital ecosystem within the agriculture sector will boost development of agribusiness, in the context of attaining zero hunger therefore, stakeholders are called to embrace new agriculture technology to accelerate economic development through increasing production, cost efficiency and market opportunities, social cultural benefits by instituting better communication infrastructure and optimization of resources while better adapting to climate change vagaries.

Even with the optimism imbued by the potential of agribusiness, there is raging fear that this phenomenon contributes to food insecurity in Africa. It is from this point of view that a study on the role of agribusiness in relation to food Insecurity is imperative.

1.2. Statement of the research Problem

Food insecurity being a monumental challenge in Africa, several initiatives and proposals have been put forward on how to effectively curb the problem. Global conversation around the impact of agribusiness in ensuring food security has gained traction. However, with the impact of food price crisis in 2007/2008, the Coronavirus (COVID-19) Pandemic and its ripple effect on food availability, access, stability and Utilization, the need to critically look at the role of agribusiness in perpetuating food insecurity in Africa is of essence.

I.3. Research Questions

I. What is the role of Agribusiness in Food Insecurity Situation in Africa?

II. What is the role of Digital platforms in development of Africa Agribusiness?

[5] Agribusiness innovation: Pathway to sustainable economic growth in Africa, the authors attempted to establish a link between agribusiness and socio-economic sustainability.

III. To what extent do Structural transformation impact African Agribusiness Development?

1.4. Objectives

1. To examine the role of Agribusiness in food insecurity Situation in Africa.
2. To determine the role of digital platforms in the development of Agribusiness.
3. To evaluate the impact of structural transformation in African agribusiness development.

1.5. Literature Review

1.5.1. Food Security Conceptualization.

Security is among the key aspect of the people of the United Nation as expressed in the Charter preamble, with the major aspiration of the global body being to maintain peace and security in the world by ensuring future generation are not affected by the scourge of war, while affirming the significance of basic human rights and dignity and worth of human persons[6]. Given that the need to attain different aspects of human security ranks high in the United Nation aspiration; Food security is a key element to be understood. The definition of Food security by Food and Agriculture Organization (FAO) where the phenomenon having physical social and economic access to sufficient, safe, and nutritious food exists to all people at all times, which meets food preferences and dietary needs for active and health life, offer critical insights [7]. The four pillars of food security that have been identified include food availability, access, utilization

[6] UN Charter .1945. The Charter of the United Nation Preamble.
[7] UNCTAD, 2017 The role of science technology and innovation in ensuring food security by 2030, indicate the four dimensions.

and stability; from these elements' food insecurity is a situation where there is lack of any of the elements.

The advent of the millennium saw establishment of the MDGs, wherein food security was conceptualized under the goal of ending hunger and poverty in the world with specific target of halving poverty, achieving full and productive employment and decent work for all and reducing by half the proportion of people who suffer from hunger[8]. In 2015, world leaders sought to enhance the definition of food security by framing it in the form of Sustainable Development Goals. The new framework was informed by the realization of the need to use available finite resources wisely while striving to attain aspiration of sustainable peace and security. Under the second goal, global leaders were asked to imagine a world with zero hunger by 2030. To achieve this, countries aim at achieving food security, ending hunger, improving nutrition and promoting sustainable agriculture by 2030[9]

1.5.1.1. Technological Transformation and Food Security

Klaus Schwab considers the 21st century as one which exponential technological transformation will drastically change the way human beings relate, interact and work. Technological and digital transformation will usher in the fourth industrial revolution, very distinct from initial revolutions that banked on water and steam to mechanize production, the second that utilized electric power to power mass production and the third that made use of ICT and electronics to automate production, all this resulted into more productivity and production for countries and firms that took advantage of them. The fourth industrial revolution, a

[8] ibid
[9] UNDP Sustainable Development Goals https://www.undp.org/content/undp/en/home/sustainable-development-goals.html

phenomenon that promise a wide array of fusion between physical, digital and biological spheres offers tremendous changes in productivity and production[10] ushering in new economic social, and political models.

The plausibility of digital transformation in global operations is fostered by the fact that penetration of digital products such as mobile phones is on the increase, according to State of Mobile Internet Connectivity (2019), and (2020a) reports, 3.5 billion people are connected to the internet globally[11]. According to the report, Sub-Saharan Africa recorded an increase in mobile internet penetration by 11% from 13% in 2014[12]. The improvement in mobile internet penetration adds impetus to call for digitalization of records especially in Agriculture, which is believed to be the key to economic transformation in most developing countries.

In the agriculture sector, Krishnan (2020) opines that the use of new technologies promises exponential growth if governments can support big open data initiatives such as center for agriculture and bioscience, and international and African regional data cube[13]. Krishnan's view is bolstered by the assertion in UNCTAD (2017) report on the role of science and technology and innovation that achieving zero hunger by 2030 will need extensive use of new and existing technology, science and innovation across the food system which in that case include agribusiness. Application of biotechnology to improve productivity by utilizing transgenic crops to increase productivity is one of the technologies that countries are being

[10] Klaus Schwab the Founder and CEO of the World Economic Forum (2016), Article "The Fourth Industrial Revolution: What it means and How to respond" enunciate what needs to be taken into consideration to take benefit from the new phenomenon.

[11] GSMA State of Mobile Internet Connectivity report 2019

[12] Ibid

[13] Aarti Krishnan. 2020. Seven Ways technology can ensure food security, Sunday Nation 24/05/20202

encouraged to adopt. The call for transgenic modification of crops has gained traction following the vagaries of climate change that has made natural weather dependent agriculture unreliable.

The IPCC (2019) report on Climate Change and Land raises the stakes with the conclusion that land degradation is entering red zones where more productivity will not be guaranteed, putting the world state of food security in jeopardy. This therefore calls for sustainable use of the resources such as water, water bodies and forests. New innovations in biotechnology, that will enable production of products that will be favorable to certain conditions; introduction of precision farming that use digital technologies to optimize usage of resources such as water and nutrients then become fundamental in the race to improve productivity. However, there exists controversy over biotechnology use in Africa and this has impacted the rate of adoption. In Kenya, production of genetically modified products was stopped after the controversial research indicated that there were adverse effects of GM products to human beings[14].

While this push and pull could be encouraged in order to ensure safe products are produced, the danger of dragging the adoption of technology could exacerbate the food insecurity situation. This would in turn bring about inequalities, which with the interdependent nature of the current globalized world could precipitate global crisis. As Marc Goodman (2015) points, even though there is potential of future crimes aided by the advanced technology

[14] Is Kenya Finally ready to roll out GM crops? https://www.theeastafrican.co.ke/scienceandhealth/Is-Kenya-finally-ready-for-rollout-of-GM-crops/3073694-5110736-9bbdi4z/index.html

including biotechnology, the propensity for them to be used for good purpose must override the fear of not adopting[15]

1.5.1.2. Agribusiness in Africa

Agriculture has experienced growth and transformation; however, the rate of growth has been slow as compared to the increase in population hence danger of incessant food insecurity challenges. In an effort to improve agricultural productivity in Africa which is dominated by smallholders who own less than two hectares of land, a sizable number of researches shows that agribusiness development will add impetus to improvement of agricultural production. However, the extent of food insecurity and malnutrition call for enhancement of the conceptualization of agribusiness as part of agriculture and Agribusiness first. Towards this end, the farm centric definition developed in 1955 by Johan Davis has been enhanced to incorporate other sectors of the economy such as processing and marketing.

To enhance agricultural productivity in Africa, NEPAD (2013) called for commercialization of smallholder farming systems through establishment of structures, initiatives and policies that promote agribusiness ecosystem. Payumo, Lemgo and Maredia (2017), link agribusiness innovation to improvement of agricultural productivity emphasizing on the role of capacity building in development of agricultural skills and knowledge. On this backdrop, national, regional and global key stakeholders have tried to initiate programs to promote capacity building and enhance technical capacity of agribusinesses in Africa[16].

[15] Marc Goodman, Future Crimes: inside the digital underground and the battle for our connected world, 2015.
[16] UNIDO. 2010. Agribusiness Development for Food Security and poverty reduction. Creation of Accelerated Agribusiness and Agri- Industrial Development Initiative(3ADI) seeking to offer technical assistance programs and integral policy support to Africa.

However, agribusiness in the Africa continent has also attracted criticism due to the perceived land grab debate. Faye Gajigo and Mutambatsere (2013) point to a trend that raises eyebrows given that most land transactions in Africa were between foreign companies and some requiring resettlement of host communities. This further raises the political issue on land policies which are very sensitive in Africa. Further, the agreements are said to be drawn with loopholes for overexploitation. With issues of climate change and natural resource degradation, sustainability of large-scale agribusiness is of great importance.

1.5.1.3. Agribusiness Digital platforms

Global urgency to transition to a digital economy in order to benefit from the fourth industrial revolution inform the need for the development of digital platforms. According to Kenney and Zysman (2016), digital platforms encompass increasing number of digitally enabled activities in business, politics and social interactions[17]. They view digital platforms as computing frameworks upon which a range of activities are undertaken by users, most times forming an entire ecosystem of creating value. The World Bank report of 2005 on e-development set the pace for adoption and use of new technology to increase efficiency and productivity[18] which is seen as ground zero for development of a digital economy. From a business point, Bharadwaj Elsassy and Venkantraman (2013) look at a digital economy as a business strategy using digital technologies in a multi-sided digital market, this view is expanded by Cusumano, Gawer and

[17] Martin Kenny and John Zysman 2015, choosing a Future in the platform economy: the implication and consequence of digital platforms.

[18] World Bank 2005, http://documents.worldbank.org/curated/en/261151468325237852/pdf/341470EDevelopment.pdf

Yoffie that platform entrepreneurs make money by facilitating connection and its associated innovations [19],[20].

The business of Digital platforms where emphasis on the network effects drive sustainability[21], match with the aspiration of Sustainable Development Goals (SDGs) of not leaving anyone behind. Digitally enabled agribusinesses then become critical in ensuring optimum productivity in the agriculture sector; Aleksey, et. al. (2019) points out the effort by Russia to introduce regional agribusiness linked to the country's digital economy. In Russia, a digital economy is seen as the inextricable connection of all spheres and sectors of national economy using digital technologies[22]. Therefore, a digital platform economy, an ecosystem where digitally enabled agribusiness could thrive could be premised on platforms that play multiple roles in the economy giving a chance for realization of the network effects.

Establishment of agribusiness digital platforms is essential in order to tackle incessant agricultural underproduction especially in rural areas if Zero hunger aspiration is to be attained by 2030. However, as Opara points out, transformation of Africa's small-scale subsistence agricultural system in rural areas into an agribusiness value chain requires structural and technological changes; this must be done by partnership between the public and private sector but the government must take a bigger role. Opara warns that Africa Governments must not

[19] Bharadwaj, El sassy and Venkantraman. 2013. Digital Business Strategy: Towards a next generation insight

[20] Cusumano, Gawer and Yoffie 2019 The Business of Platform

[21] Geofrey G. Parker, Marshall W. Van Alstyne and Sangeet Paul Choudary 2016 Platform Revolution; How networked markets are transforming the economy -and how to make them work for you.

[22] Aleksey et al 2019: interaction of regional agribusiness entities in transition to a digital economy.

overly depend on foreign aid[23]. Like Dambisa Moyo posits in the book Dead Aid, those who receive aid become complacent hence proclivity to invest in critical infrastructure in key sectors is hampered since most aid is accompanied by terms that might not be in line with national interest of aid receiving state.

For countries to benefit from digital platforms, developing enablers of the digital economy is essential. According to Rossotto, Hohlov, and Eferin (2018), governments must invest in development of digital infrastructure such as broadband and fixed mobile internet, ensure availability of consumer equipment like smartphone and laptops, fintech solutions to allow for payments[24] . Beyond digital infrastructure, there is a need for significant investment in physical infrastructure such as electricity connectivity and roads. AGRA (2018) report sees catalyzing government capacity to drive agriculture transformation as an important step towards agribusiness development.

1.5.1.4. Government structures and Agribusiness development

Government as custodian of power is vested with the responsibility to ensure security of the people they govern. The responsibility of ensuring access, availability, use and stability of food lies on the government shoulder, a reason transformation of its structures to ensure increased agricultural yields, enough to feed people and contribute to economic development is important. For Africa continent, leaders knowing the implications of food insecurity and the new trend of declining agricultural productivity with rapidly increasing population; estimated to be over 9 billion in 2050, established Comprehensive Africa Agricultural Development Programme

[23] Umezuruike Linus Opara 2011, Editorial: The urgent need to transform small-scale subsistence farming in Africa towards sustainable agribusiness value chain.
[24] Digital Platforms in Russia, 2019: Competition between National Foreign multisided Platforms stimulates growth and innovation.

(CAADP) to guide investment in the agriculture sector with the aim of sharing knowledge and experience, seeking joint financing and improving economic policies institutions and leadership[25]. The need to chart a different root came at the backdrop of failure of the Structural Adjustment Program (SAP) to achieve sustained agricultural growth. The reason for the failure could be linked to over emphasis on macro-economic policies which failed to invest in paired interventions at the sectoral and sub-sectoral levels in areas such as land policy smallholder farmers access to input and agricultural research and extension[26].

Maputo and Malabo declaration added impetus towards agricultural transformation when it was agreed that Africa Union Member states strive and commit up to 10% of their national budget towards development of Agriculture to realize 6% increase in Gross Domestic Product as documented in NEPAD (2013). Given that by 2025, over three hundred million young people will have joined the labour market, the pressure on the government to embrace agricultural transformation focusing on development of digital agribusiness platforms must be the right move. Following Trendov, Varas and Zeng finding that digital agriculture through increased productivity, cost and market efficiencies, could deliver economic benefit by optimization of resources development of a digital ecosystem is of practical benefit.

Harnessing agricultural data is another critical exercise that Africa governments are encouraged to undertake. With the advent of big data and artificial intelligence, data has been termed as oil that runs the wheels of digital transformation, however proper and better regulation structures must be put in place to facilitate effective utilization of these resources. The legal

[25] NEPAD white paper, 2013, Africa agriculture transformation and outlook
[26] AGRA, 2018: Africa Agricultural status Report: Catalyzing government capacity to drive agriculture transformation.

Frameworks to be established must protect citizens from breach of privacy while making sure innovation is not hampered by the set rules. Encouraging homegrown digital platforms is one critical aspect that the government must be keen on fostering. As per Jin (2015), digital platforms are not value neutral but always reflect the value system of the owner or proprietor; therefore, dominance of foreign owned digital platform in a country may lead to the breach of information sovereignty given that most terms of service by majority of digital enterprises have the prerogative to use the information in their possession whichever manner they please[27].

Given the importance and ubiquity of digital information being collected by digital enterprises, coupled with the fact that data has become a new form of capital, as countries seek to embrace digital agribusiness platforms, it will be imperative to enhance cyber security infrastructures to ensure safety. Developing human capacity and skills to take advantage of enormous data is another essential step that governments must take in order to ensure digital dividends accrue to the economy.

1.5.2. Gaps in the Literature

Even though several studies on agribusiness have been carried out, there is inadequate knowledge relating to how agribusiness is contributing to the food insecurity situation in Africa. Borrowing a leaf from the economic field on the multisided platform, which are market places that link producers and consumers, with the emerging new trends such as exponential population growth, rapid urbanization, climate change and avalanche of digital data in the agriculture and agri-food ecosystem, it will be imperative to look into the role new models of agribusiness will

[27] Dal Yong Jin, 2015, Digital Platforms, Imperialism and Political Culture

play in the food insecurity situation using a political economy paradigm where little studies have been extensively undertaken.

1.6 Hypotheses

- Agribusiness is linked to the state of Food Insecurity in Africa
- Digital Platforms impacts the development of agribusiness
- Lack of adequate and favorable structural transformation hampers agribusiness development.

1.7. Justification

1.7.1. To academicians

There have been few studies looking into the potential of agribusiness exacerbating the food insecurity challenges in Africa. This study will add extra knowledge on the food insecurity perspective in Africa

1.7.2. To policy Makers

The finding from this research will be essential in helping the government through the Ministry of ICT innovation and Youth to establish balanced digital policies within the agriculture ecosystem to support development of sustainable agribusiness that could lead to high food productivity.

The recommendation from this study will also inform decision makers in the Ministry of Agriculture Livestock and Fisheries to put in place relevant policies to boost agriculture and agribusiness productivity.

1.8. Theoretical Framework

The question of security is central to national leaders in any country for it is the singular mandate that is vested on the state since the Westphalia era. Food security, an aspect of human security, is a critical element in ensuring social stability, in the absence of food availability, affordability, countries face political turmoil. Therefore, establishment of structures, institutions and processes to ensure food security is critical political process which calls for political considerations and analysis to aid decision making[28]. According to OECD-DAC quoted in DFID (2009) Practice Paper, political economic analysis is alarmed with the interaction of political and economic processes in society; the distribution of power and wealth among diverse groups and individuals and the processes that create, sustain and transform these relationships overtime[29].

Consequently, this research applied neo-liberalism theory using the Political Economic approach to analyze secondary data such as books, academic journals, articles agricultural online video clips and the primary data from responses obtained from key respondents from agribusiness stakeholders. Liberalism theory is characterized by multiplicity of actors shaping decision making in society, according to early thinkers such as Adam Smith, David Ricardo et cetera saw the actions of the market as a key influencer of the affairs of the State and agribusiness as part of the economic activities, involved actors shape the policy making processes. Attainment of Food security being a global, regional and national aspiration which call for collaboration between and among State and Non-State actors; and that myriad conflict of interest abound, to make sense of the processes and initiatives that will be required in order to be

[28] Alan Whaites, 2017, Beginners guide to Political Economy Analysis, this guide offers important tips to the use of different PEA tools to aid economic development.
[29] DFID Practice paper, 2009, Political Economy Analysis: How to Note

on track to attain the sustainable development goals, lenses of liberal political economic analysis of agribusiness suffices.

Further, technological transformation, upon which the subject of new agribusiness model is founded, is a global phenomenon. The concept of digital economy which in itself is a function of ubiquitous digital platforms have geopolitical implications which in turn shape the development of agribusiness and possibly linked to the economic field where optimization of profit is key. This research therefore makes use of a blend of tools of neo-liberal political economic analysis including Growth diagnostic tools, drivers of change to study the concern of food insecurity in Africa in relation to new model of agribusiness.

1.9. Research Methodology

1.9.1 Research Design

The research was seeking to understand the role of agribusiness in aggravating food insecurity in Africa. From the vantage point of global development, this research used Liberalism theory through political economic perspective and tools to collect and analyze data. Liberal Political economy paradigm was relevant for this study because food insecurity is a social problem that requires to a large extent a political solution. According to Mosco[30], political economy is a study of social relations mostly the power relations that constitute the production, distribution and consumption of resources and that it drives beyond technical issues of efficiency to engage with basic moral question of justice equity and public good[31]. With the main objective of the research

[30] Vincent Mosco. 2009. Political economy of communication: Definition of political economy

[31] DFID practice paper 2009, political economy analysis how to note

being finding a solution to the issue of food insecurity using agribusiness, consideration of different actors' structures, institutions, ideas and incentives would form the foundation of the in-depth inquiry.

Going by the objective of the research which is to look into the role of agribusiness in aggravating food insecurity, the study used a case study method to answer the questions raised in this research. Kenya as a unit of analysis helped in generalization of the research finding that could be a representative of the Africa continent. According to Sterns, Schweikhardt and Peterson (1998), case study research is able to generate robust comprehensive array of knowledge about a difficult and highly interdependent and dynamic social phenomenon[32]. The choice of the liberalism theory under the political economic approach as a perspective from which to study the issue of food insecurity through a case study method is supported by the view of FAO (2011) where it is observed that the best way to support countries to improve food security and Nutrition in a coherent and inclusive manner is a query of politics as of policy and technical assistance[33].

1.9.2. Research Site

The research site for this study was in Nairobi Kenya. The research was aimed at carrying out an in-depth study through interviews with key stakeholders in the agribusiness ecosystem, who are high level government employees and leaders and employees of international agribusiness firms. Most essential offices and employees for both government and international agribusiness organizations are situated in Nairobi because of its status as the capital city and political base of

[32] James A, Sterns, Schweikhardt, and Peterson. 1998, Using Case Studies as an approach for conducting agribusiness research.

[33] FAO, 2017, Political economy analysis

Kenya and that critical infrastructure for efficient and effective operations are well developed this makes it relevant as a site for this research.

1.9.3. Target Population

The research sampled senior government employees from the Ministry of Agriculture and Ministry of ICT Innovation and Youth Affairs, who are in charge of policy formulation. The research also targeted employees and leaders of major local and International agribusiness enterprises that are situated within the environs of Nairobi city. The respondent occupy a position that is key for formulation and implementation of policy.

1.9.4. The Sample Size

This research selected respondents through purposive sampling supported by snowball technique. Purposive sampling according to Creswell 2005 quoted in www.ecologyandsociety .org[34]is relevant to qualitative research since such research is not geared towards generalization but instead focused in undertaking in-depth exploration of a central phenomenon. The research targeted four officials from the Government Ministries, two from each of the two Ministries and six leaders /employees from six different local and international agribusiness corporations selected using the researcher judgmental ability while leaving room for snowball technique in selecting two more respondents to be referred by agribusiness corporation respondents. The two respondents must be individuals of influential standing within the agribusiness circle for an in-depth interview. Elmusharaf opines that with careful sampling and collection technique, a small

[34] www.ecologyandsociety .org

number of interviews and narratives or focus groups can yield sufficient data to answer a research question. This informs the selection of 12 respondents for this study[35].

1.9.5. Data Collection

This study utilized an interview method to collect data complemented by data gleaned from secondary sources such as video clips from agricultural conferences and interviews. The interviews were semi-structured

1.9.6. Data Analysis

Analysis of data from this study was analyzed using Creswell (2009) steps that include transcribing data, reading through, creating codes and themes and finally interpreting the meaning. To understand the implication of the results, the study utilized political economic analysis tools such as Drivers of Change (DoC) and Levels of Political Economic Analysis approach developed by the Department for International Development (DFID) in the United Kingdom.

1.9.7. Data Presentation

Data obtained was presented as a project to be submitted to the University of Nairobi

1.9.8. Ethical Issues

Given that some of the respondents were high ranking government officials, privacy consideration was highly recommended. This also applied to senior officials from agribusiness corporations.

[35] Khalifa Elmusharaf, 2012, Qualitative Sampling Technique

1.9.9 Scope and Limitation

The study made an assumption that the in-depth learning of the subject of food insecurity in Africa by interviewing agriculture stakeholders in Kenya would yield results that were applicable in other countries within the African continent. However, given different political regimes and structures with differing political and social processes some of the findings from the research might require modification in some country scenarios. Secondly given the dynamic changes in the technological world, the research findings from this study need to be reviewed regularly with further studies on the topic undertaken consistently.

1.9.10. Chapter Outline

Chapter one comprises an introduction to the study, which comprises the historical background of the problem of food insecurity in Africa, identifying the objectives with the questions that need to guide the study. The chapter has considered the government and institutional reports and work that has been done by other scholars in the subject of food security and insecurity. Theoretically, Liberalism theory through the Political Economic approach has been adopted to help in the analysis of data. The study has adopted interview method using purposive and snowball sampling techniques to aid in collection of data

Chapter two will explore the role of agribusiness in food insecurity challenge in Africa,

Chapter three will delve into the role of digital platforms in Africa Agribusiness development linking this with the effort of adopting a global digital economy.

Chapter four will seek to demystify the impact of structural transformation pointing out how the changes affect agribusiness with the aim of pointing their link with the fight against food insecurity in Africa

Chapter five will analyze data collected to bring out the major themes under the subject of food insecurity in relation to agribusiness with a view of developing a framework that will ensure proper formulation and implementation of policies geared toward eliminating food insecurity while creating sustainable employment.

Chapter six will offer concluding remarks and policy recommendations from the analysis of data considered in the study.

CHAPTER TWO: THE ROLE OF AGRIBUSINESS IN AFRICA FOOD INSECURITY

2.0 Introduction.

In this chapter, the researcher explored in detail how agribusiness impacts the food security situation in Africa. The rest of the chapter will proceed by addressing the conceptualization and investment in agribusiness in Africa, then proceed to consider smallholder farming in relation to agribusiness, and food insecurity challenge. Smallholder agribusiness policy situation and the political economy of smallholders in Africa will also be given attention with further consideration given to Intra-Africa food trade with trends in smallholder agribusiness development themes being explored. Finally, the Covid-19 impact on development of agribusiness in Africa will be assessed.

The debate on new models of agribusiness continues gaining traction as the food insecurity situation worsen due to urbanization and rapid increase in population. World statistics indicate that by 2050, the global population will be over 9 billion and food requirement will exponentially increase[36], hence the global call for better ways of improving agricultural productivity. Many see the advent of new models of agribusiness as an effort by global stakeholders to address the challenge of food insecurity. However, a significant number of scholars and institutional reports have indicated that insistence on agribusiness in Africa promotes food insecurity. On this backdrop, this chapter will critically look into the evolving conceptualization and the role of agribusiness in the food insecurity situation in Africa.

[36] United Nation https://www.un.org/en/development/desa/news/population/2015-report.html

2.1 Agribusiness conceptualization.

Agribusiness a concept introduced in 1955 by Johan Davis, a generic name referring to various business involved in food and fiber production on farm has undergone evolution caused by different factors including globalization, Information Communication Technology, exponential population growth among other exigencies resulting to a new conceptualization and framing of the term as a dynamic and systemic endeavor that serves consumers locally and globally through innovation and management of multiple value chains that supply valued goods and services derived from sustainable orchestration of food fiber and natural resources[37], however this conceptualization was farm centric .

Agribusiness in 21st century conceptualization moves from considering agriculture as a solution to food insecurity based on the farm, a thought informed by expansion of the agriculture ecosystem which is seen as consisting of production, processing and primary marketing to the consumers[38], and incorporates a dynamic systemic stakeholder focus with multiple integrated input concerned with taking advantage of economies of scale and the globalization phenomenon[39]. As Firdous and others (2019) observe, food system development focused on pillars of food security that include food availability, accessibility, stability and utilization has necessitated redefinition and conceptualization of agribusiness[40].

[37] Mark R Edwards, C J Shultz II. 2005. Reframing Agribusiness: Moving from Farm to Market.

[38] Fortes et al 2020, Look into the role of small farms and small food businesses in food and nutrition security this eventually shapes the debate on conceptualization of agribusiness

[39] Ibid

[40] R.B Radin Firdous, Mahinda Senevi Gunaratne, Siti Rahyla Rahmet and Norsamsinar Kamsi. 2019. Discuss the impact of climate change on food security which in turn inform agricultural production models.

Expanding the scope of agribusiness according to Verkaart, Mausch, and Harris (2018) requires thorough understanding of the new meaning of a farmer, farming and attendant activities such as agricultural intensification and diversification[41]. The debate on the contribution of agribusiness towards solving food insecurity and unemployment while improving socioeconomic status in Africa adds impetus to the new conceptualization and emphasis in development of the agribusiness ecosystem. Gassner and others (2019) opine that closing the gap between actual and potential agricultural food productivity especially in Africa will ensure that there is enough food for consumption as well as surplus for sale[42]. Such thinking continues to spur innovation within the agriculture ecosystem with various initiatives to improve agriculture productivity. Jim Maxwell, and John Holtzman, in their technical paper in 1997 called for Africa leaders to set up innovative approaches to support agribusiness growth[43], hence the effort by Africa leaders to develop initiatives such as Comprehensive Africa Agriculture Development Program (CAADP), under the New Partnership for Africa Development (NEPAD).

In Kenya, agribusiness during the colonial period was defined by the production of cash crops for export which in most times will lead to insufficient food production as pointed out by Anderson and Throup (1985). This legacy was inherited almost all African government, but with the exponential population growth, new agribusiness model focusing on increasing food productivity calls for a paradigm shift on the studies on agribusiness.

[41] Verkaart, Harris and Harris 2018.

[42] Gassner. et. al. 2019: Poverty Eradication and food security through Agriculture in Africa: Rethinking Objectives and Entry Points

[43] Jim Maxwell John Holtzman.1997. Innovative Approaches to agribusiness development in Sub-Saharan Africa

Following the new understanding of agribusiness through the lenses of Edwards and Shultz, as a dynamic systemic stakeholder focused, with multiple and integrated inputs that encompass production processing, distribution, marketing and communication, the following section will explore Agribusiness investment In Africa.

2.2 Agribusiness Investment in Africa.

The pressure to achieve Sustainable Development Goals, in order to attain the global aspiration of Zero Hunger coupled with the understanding of agribusiness as an enabler to the attainment of this aspiration of the Africa continent has necessitated several initiatives to promote the development of the agriculture sector. The Agenda 2063, the roadmap to Africa prosperity appreciates the role of agriculture as a driver to social, economic and political transformation of the continent. For the aspiration to attain a prosperous continent to be achieved, the process must be aided by modern agriculture with improved productivity and production[44]. The narrative of agriculture as the foundation of global development has added impetus to the debate on agribusiness investment in Africa. For instance, The Magazine, Africa Renewal- Agriculture as Africa New Frontier, contributes heavily to the agenda setting in the agriculture sector development conversation[45].

The World Bank 2013 report highlights on the potential of agribusiness in Africa, serves as an ignition of the debate on development of new models of agriculture ecosystem in the

[44] Africa Agenda 2063. 2014. Under aspiration, the goal 5 - the role of modern agriculture, increased productivity and production is given prominence, specific initiatives have been outlined to ensure funds are available to support various local, regional and continental investment efforts.

[45] Africa Renewal Magazine, Strategic Communication Division of the United Nation Department of Public Information Publication

continent, this with an aim of attracting Private investors to invest in the Development of the agriculture sector[46]. The report further observes that Africa Governments, Business leader's community and development donors are critical drivers of Agricultural growth. The establishment of the Comprehensive Africa Agriculture Development Program (CAADP) by the Africa Union (AU) with framework such as Malabo and Maputo declaration which requires member state to increase budgetary allocation to the agriculture sector to about 10% of the national budgets while increasing the GDP by 6% depicts the importance of agriculture. Further, collaboration and Partnership to pool resources to enhance investment in agriculture and agribusiness in Africa has dominated many forums. The establishment of Africa Agribusiness and Agro-Industrial Initiative in 2010 by Food and Agriculture Organization (FAO) Africa Union Commission (AUC), United Nation Industrial Development Organization(UNIDO) among other partners to surge private Sector investment flow into the agriculture sector in Africa by mobilizing resources for agribusiness and Agro-industries development from national, regional and international system serves as an indication of the urgency and significance of agriculture led development[47].

The role of agribusiness in solving Food Insecurity and attendant challenges in Africa informs every effort by different stakeholders globally. The United Nation Industrial Development Organization in 2011, in an extensive research came up with seven pillars for agribusiness development in Africa: Enhancement of agricultural productivity, upgrading of value chain, exploitation of local and international demand, strengthening technological and

[46] World Bank. 2013. Growing Africa: Unlocking the Potential of Agribusiness. World Bank, Washington, DC. © World Bank. http://hdl.handle.net/10986/26082

[47] FAO/UNIDO 2010, Africa Agriculture and Agro-Industries Development Initiative, A Program Framework.

innovation, promoting innovative financing, stimulation of private participation and improving energy access and infrastructure[48].

Calestous Juma (2015) on his part opines that improving Africa's agriculture and agribusiness ecosystem requires significant political leadership, investment and deliberate national, regional and continental policy effort[49]. According to FAO, the cumulative agriculture sector investment required from 2006 to 2050 in order to ensure optimum agriculture productivity is in excess of 940 billion US dollars. Political innovation in terms of policy formulation to attract multiple investment into the agriculture sector therefore will be informed by a thorough understanding of the political economy of the agriculture sector as espoused by the Malthusian population principle [50]. Albert Sasson (2012) warns that Africa leaders must be careful to devise different pathways to Africa Green Revolution rather than wholesome adoption of the strategies used in the Asia green revolution[51] . This thinking is aligned with AGRA, Africa Agriculture Status report (2018) that put emphasis on development of Government capacity to transform Agriculture through establishment of national and regional enabling the Business of Agriculture (EBA) platforms[52]. According to the report, EBA is essential in the development of agribusiness because it could ensure formulation and implementation of sound macro and micro economic policies.

[48] United Nation Industrial Development Organization 2011, Agribusiness for Africa's Prosperity.
[49] Calestous Juma. 2015.New Harvest: Agricultural innovation in Africa

[50] Thomas Malthus. 1798. An essay on the principle of population chapter two the different ratio in which population and food increase and the necessary effect of these ration increase

[51] Albert Sasson. 2012. food security in Africa: An urgent global challenge

[52] AGRA 2018, Africa Agriculture Status Report: Catalyzing government capacity to drive Agriculture Transformation

The role of Agribusiness investment to spur economic growth must be emphasized since its contribution to most Sub-Saharan Africa countries GDP is estimated to be 13 times more than actual farming, therefore, Africa's internal market potential which is underexploited according to Umezuruike Opara (2011) offers an opening for transformation of small-scale subsistence agriculture system into agribusiness value chain[53], In the Africa Development Bank (2017) Africa Economic Brief on Agriculture transformation, Africa value chain are dualistic, in which the informal system serve the low income consumers while the formal serving the high income domestic consumers yet in the global agriculture value chain, Africa exports products with little or no processing fetch the list price. Martinez, Feddersen and Speicher (2016) indicate that Mechanization could improve the life of the African farmer hence promising to increase agricultural productivity and production level[54], this makes it necessary for agribusiness development by all stakeholders.

2.3 Smallholder Farming and Agribusiness

The discussion on the role of smallholders in establishment of agribusiness in Africa has been advanced by various scholars. On their part Babu, Manvatkar and Kollavali (2015) opines that agricultural transformation depends on moving smallholder farmers from primary substance to commercialized production[55.] This idea marries Gassner et al (2019) who further calls for understanding the heterogeneity of smallholders and the different incentives that motivate them

[53]Umezuruike Linus Opara 2011, Editorial, the urgent Need to transform small-scale subsistence farming in Africa towards Sustainable agribusiness Value chain.

[54] Martinez Feddersen and Speicher .2016. Food Security in Sub-Saharan Africa: A fresh look on agricultural mechanization: How adapted financial solutions can make a difference.

[55] Suresh Chandra Babu, Rupak Manvatkar and Shashidhara Kolavalli. 2015. Strengthening Capacity for Agribusiness Development and Management in Sub-Saharan Africa.

to adopt new strategies that could lead to increased productivity. Gassner and others also argue that understanding the multidimensional conceptualization of poverty eradication effort, which is the issue that has added impetus to the debate on the significance of agribusiness, will help in targeting agricultural investment policies which affect the effectiveness of farm-level technologies[56].

To ensure the effectiveness of agricultural productivity by smallholders through adoption of new agricultural technologies, Dorward, Ybarnegany and Rushton (2009) developed a schema that identifies different strategies that are used by majority of smallholder farmers with different cadres of farmers having different aspiration which in the end determine their responsiveness to particular agricultural technologies[57]. In their research paper, they identify hanging in strategy that is adopted by smallholder farmers whose assets only enable them to maintain a livelihood for survival, stepping up strategy which is adopted by those who possess enough capital and can use their assets to improve their livelihood by engaging in more investments in the agriculture sector and finally stepping out strategies practiced by those who engage in agricultural activity as an investment which can act as a launching pad to the next investment level which most probably is nonagricultural. On this background, targeted policies are critical in enhancing the capability of smallholder's agricultural productivity.

The debate on the significance of smallholder farmers in development of agribusiness is premised on two concepts; agricultural intensification and Diversification. According to

[56] A. Gassner, et al. 2019. Poverty eradication and food security through agriculture in Africa: Rethinking Objectives and Entry Points.

[57] Dorward, A., S. Anderson, Y. Nava Bernal, E. Sánchez Vera, J. Rushton, J. Pattison, and R. Paz. 2009. "Hanging in, stepping up and Stepping out: Livelihood Aspirations and Strategies of the Poor." Development in Practice 19 (2): 240–247.

Verkaart, Mausch and Harris (2018)[58]Intensification by smallholders will be facilitated by the adoption and use of new agricultural technologies, which aims at increase of income which then facilitate diversification into different economic portfolios that generate extra income. The fact that different smallholder farmers own different types of assets, and that the nature of assets owned determine the nature and strategy of livelihood aspiration; depicts the heterogeneity of smallholders in Africa. This in turn calls for multifaceted investment policies to promote development of small-scale farming.

Hall and Dijkman (2018) report call for system innovation as a solution to improving productivity of smallholders. According to their study, public research must be undertaken to reconfigure and realign social, political, technical institutional and policy in order for sustainable and inclusive growth to be realized in agriculture sector[59].

At the center of food security debate is the conversation of the place of agriculture transformation which is seen as a process in which agri-food system changes over time from being subsistence and farm centered to one that is more commercialized, productive and off-farm centered all this facilitated by increasing productivity among smallholders[60]. Smallholders, according to various studies forms majority of global farms estimated at 500 million[61] providing

[58] Simone Verkaart, Kai Mausch, and Dave Harris. 2018. Who are those People we call farmers? Rural Kenya aspiration and Realities

[59] Hall, A. and Dijkman, J. 2019. Public Agricultural Research in an Era of Transformation: The Challenge of Agri-Food System Innovation. Rome and Canberra: CGIAR Independent Science and Partnership Council (ISPC) Secretariat and Commonwealth Scientific and Industrial Research Organization (CSIRO), IX + 67 pp.

[60] AGRA (2016). Africa Agriculture Status Report. 2016.

[61] AGRA. (2017). Africa Agriculture Status Report (2017): The Business of Smallholder Agriculture in Sub-Saharan Africa (Issue 5). Nairobi, Kenya: Alliance for a Green Revolution in Africa (AGRA). Issue No. 5

livelihood for over 2 billion people. These statistics create a compelling narrative that Africa agriculture transformation is anchored in the prosperity of smallholders hence necessitating the debate on agribusiness powered by smallholders in quest to achieve Sustainable Development Goals.

The debate on smallholders' place in achievement of food security in Africa is in a critical stage. Many observes that for Africa smallholders to contribute to food security, conceptualization of policy drivers is key, Danielle Resnick and others (2015) opine that conceptualizing drivers of policy alteration in agriculture, nutrition and food security would add impetus to the agriculture transformation agenda in Africa[62]. They hold a view that understanding policy formulation cycle could help in augmenting productivity of smallholders which dominate the Africa setting. Key determinants of policy change in the agriculture sector according to them could be expressed in a Kaleidoscope model which comprises setting agendas, designing policies, adopting policies, implementation, evaluation and reform. However, the nature of agricultural policy that affect smallholder engagement in agribusiness in different parts of the continent are not homogeneous due to the heterogeneity of smallholders' farms and farmers as well as the different stages of economic development as elucidated by Hazel and others[63].

[62] Resnick, Danielle and Babu, Suresh Chandra and Haggblade, Steven and Hendriks, Sheryl and Mather, David, Conceptualizing Drivers of Policy Change in Agriculture, Nutrition, and Food Security: The Kaleidoscope Model (January 30, 2015). IFPRI Discussion Paper 01414, Available at SSRN: https://ssrn.com/abstract=2564542

[63] Peter Hazell, Colin Poulton, Steve Wiggins, and Andrew Dorward. 2007. The Future of Small Farms for Poverty Reduction and Growth. 2020 Discussion Paper No. 42. Washington, D.C.: International Food Policy Research Institute.

2.3.1 Smallholder Food Insecurity challenge.

The effectiveness of Africa's smallholders' farmers and farms in advancing the food security agenda through agribusiness is being questioned following myriad challenges of unsustainability. The IPCC (2019) report indicate that the impact of unsustainable use of natural resources impact greatly the productivity of the agriculture sector and in the long-term can cause tremendous damage to the production capacity of land hence looming danger of food insecurity[64]. The danger of climate change coupled with other megatrends such as rapid population growth, calls for agribusiness system innovation in order to ensure sustainable increase in productivity in the agriculture sector. This calls for context specific policies that will encourage investment in development of agribusiness as espoused by Hazel, et, al (2007) and Dorward et al (2009). As Julie S. Stanton argues, the role of government in promoting agribusiness development must not diminish but rather be focused in particular segments[65].

The Africa Continent has put concerted effort towards development of institutions and frameworks aiming at achieving continental aspiration of ending hunger and ensuring food security by 2025. This has seen emphasis on the improvement of smallholder productivity in the agriculture sector. According to research though, the increase has been achieved through expansion of cultivated land area. Even though Henderson and others (2016) observe that

[64] IPCC, 2019: Summary for Policymakers. In: *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems* [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.- O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. In press.

[65] Julie Stanton. 2000. The role Agribusiness in Development: Replacing Diminished Role of Government in Raising Rural Income.

technical efficiency within farms to a large extent determines productivity [66] In the long term, the logic of agricultural intensification as a strategy to improve productivity among smallholder farmers in Africa face enormous challenges in the form of adverse impact of climate change.

Immense effort in transforming the agriculture policy environment has gained traction. However, these efforts, according to Danielle Resnick and others in their (2015) discussion paper, face a challenge of a perceived homogenous policy environment. They argue that smallholder agricultural policy should be diverse with specific targeted initiative following the heterogeneous nature of smallholders in Africa. Such debate is also advanced by Peter Hazel and others, (2007) who opine that policy for smallholder needs to be formulated within different contextual frameworks focusing on different stages of economic development of different regions, countries and societies as also pointed out by Andrew Dorward (2009), assessment of various aspiration and strategies of livelihood among smallholders.

Despite the importance of smallholder farming to Africa economic growth and development, Alie Kimura, Abudl Conteh, Edward Rhodes and Richard Cooke in 2019 established that the most constraints that face smallholder farmers include: Inadequate capital assets that fall into four categories (natural, physical, financial, and human); Poor market linkages; Underdeveloped rural infrastructure and climate change.

2.3.2 Smallholder Agribusiness Policies

The policy environment that boosts smallholder agribusiness development is key in establishment of a food secure continent. The Africa continent has experienced a monumental

[66] Henderson B, et. al .2016. Closing system-wide yield gaps to increase food production and mitigate GHGs among mixed crop-livestock smallholders in Sub-Saharan Africa. Agriculture System.

challenge of piecemeal, fragmented initiatives which are difficult to scale hence difficulty in transforming the food system to ensure food security[67]. It is the reason Jonathan Crush and Bruce Frayne (2014) observe that if Africa emphases on the smallholder productivity as the only way to ensure food security in rapidly increasing population coupled with exponential growth of cities, failure will be the end result in the long term[68] The authors therefore call for the institution of policy frameworks that will encourage commercialization of agriculture and modern agri-food supply chain. This conversation is given prominence with reports such as the High-Level Panel of Expert (2016) that calls for proper classification of agricultural activities such as that in Livestock. The call by Gollin, (2014) on new smallholder policies that take into consideration the impact of shifts in technology, markets, climate and global environment also serve to enrich the debate.

2.3.3 Political Economy of Smallholder Agribusiness

Smallholders constitute the largest percentage estimated to be over 500 million farms globally contributing almost 80% of Africa agricultural productivity. As Danielle Resnick et al. (2015) observe, effective smallholder policy must include issues of power and conflicts while considering the impact of external actors. To a large extent, the heterogeneity of smallholders and the different stages of economic development of countries in Africa make it difficult to establish a single policy framework which could be universally applied, improving productivity of small-scale agricultural sector.

[67] Laura Pereira and Scott Drimie. 2016. Governance arrangement for Future Food System: Addressing Complexity in South Africa

[68] Jonathan Crush and Bruce Frayne. 2014. Book Chapter Africa Urban Revolution. Feeding African Cities: The growing challenge of urban food insecurity.

Intra-African agricultural trade is said to be a significant factor towards ensuring food security since it boost agricultural growth and transformation, however, the level of integration among states and societies in Africa is considerably low hence low level of productivity[69]. Haggblade, (2013) observes that arbitrary Africa borders serve as a hindrance to agricultural trade, in the research he further points out that Africa's high-density political borders brings about the small-country problem that limits competitiveness due to lack of economies of scale. The question whether the small-scale nature of smallholders in Africa will be negatively impacted by positive regional integration policies is however, refuted by Hoekman and Shephard (2013) whose empirical research concluded that all firms will benefit from national, regional and continental trade facilitation policies.

As Haggblade (2013) points out, low level of intra-African trade coupled with the political economy of political boundaries in Africa plays a critical role in underdevelopment of sustainable agribusiness in the continent. The legacy which was built by colonialists during the scramble of Africa Conference in berlin has consistently negatively impacted the food security situation, however, Africa leaders have an opportunity to reverse the course by ensuring success of regional integration works by establishing innovative political and economic platforms that facilitate harmonious working relationships through regional and continental engagement.

2.4 Intra-African Food Trade

Trade among Africa nations is said to be the lowest globally and this has a bearing to persistent food insecurity in the continent yet according to the AGRA (2020) report, it is almost universally accepted that intra-African trade in agricultural products has potential to ensure

[69] Charles Nhemachena, Kuraune Murwisi and Daniel Njiwa. AGRA 2020. Intra Africa Food Trade.

socio-economic development which in turn leads to food security. But for transformation and growth to be realized as Van Dijk (2011) writes, key factors such as trade barriers and infrastructure must be sufficiently addressed. Restructuring the key factors requires that the issue of political boundaries as well as trade tariffs raised by Haggblade (2013) be addressed by political and policy leaders. On the political boundaries, establishment of Regional Economic Community blocks with attendant integration structures and tools are thought to be major contributors to agricultural growth and development. According to FAO (2020), Intra- Africa imports stand at 17% while exports are at 27% and this according to the Africa Regional Integration Index is around 0.327, the lowest globally.

To solve the political boundary problem, several Regional Integration initiatives intended for socio-economic development have been put in place. For instance, Abuja Treat, 1991 which led to the formation of Africa Economic Community (AEC), the 2003 Comprehensive Africa Agricultural Development Program (CAADP), intended to promote investment and development of Africa agriculture sector, the Maputo and Malabo Declarations which aim at increasing country investment into the agriculture sector and accelerate agricultural growth, and the Africa Continental Free Trade Area (AFCFTA) which came into force in 2018; depicts the urgency and significant effort by the Africa Union and its member states to institute considerable transformation in the continent .

To tackle the issue of Infrastructure and regional integration, the formation of New Partnership for Africa Development (NEPAD/AUDI) which is tasked with responsibility to coordinate and facilitate physical infrastructure development such as regional and continental roads corridors could open the regional market in order to increase intra Africa Agri-food trade.

As a research on Ghana poultry carried out by Baker et.al. (2020) proves, increased production cost resulting from bad roads make importation of poultry cheaper than domestic production; hence augmenting infrastructure development is predicted to boost intra-African Food trade.

However, the growth in the agriculture sector and to a large extent regional agri-food trade remain low hence a call by the AGRA (2020) report for concerted effort to get rid of the bottlenecks identified as causing little development in Africa.

2.5. Trends in Smallholder agribusiness Development in Africa

Smallholders dominate the Africa continent with the global figures placed at over 500 million and 30 million small scale farms in Africa which contribute about 80% of agricultural food production. In Kenya according to the Agriculture Sector Transformation and Growth Strategy (ASTGS) 2019-2029, seeks to increase the number of small farms to over one million[70]. Acknowledgement that development of agribusiness could positively impact food security situation in Africa has led to calls for commercialization of smallholder farming, diversification and specialization[71] within the country, regional and continental agricultural ecosystem. Peter Hazell et al. (2007), call for caution when they point out that previous successful role of agriculture that saw increase in agricultural productivity might be reversed in the face of rigid policy framework that will not adopt to new global changes occasioned by rapid increase in population, globalization due to advancement in Information Communication Technology and climate change.

[70] ASTGS 2019-2029

[71] Thomas S. Jayne and David Ameyaw. 2016. Africa's emerging agricultural transformation: Evidence, opportunities and Challenges,

The importance of system innovation and innovative systems in the agri-food ecosystem in order to generate policy that encourage sustainable intensification is seen as the only way to encourage sustainable growth in the agriculture sector. Fan et al. (2013), points that development of sustainable national, regional and continental policies is a perquisite to development of resilient agri-food systems. In the absence of inclusive institutions and policies, with clear understanding of different stages of economic transformation and different types of smallholders in different countries and regions, viability of agribusiness as a solution to food insecurity would be vitiated.

2.5.1 Covid-19 Pandemic and Agribusiness.

Global issues such as the Coronavirus pandemic that has seen restriction of movements locally and internationally call for a rethink of the agri-food ecosystem. According to FAO (2020) policy brief, intra-Africa trade faces critical challenges from covid-19 pandemic lockdowns and movement restrictions. Given that agriculture is labor intensive, and that restriction of movement negatively impacts the agri-food supply chain, national governments together with regional and continental bodies must institute progressive policies that are sensitive even as they seek to reduce the spread of the pandemic. According to the FAO policy brief, avoiding blanket import and ad hoc export restriction policies is key to ease the impact of the pandemic on the intra-Africa agri-food trade[72].

Covid-19 pandemic according to AGRA (2020) offers an opportunity for Africa to enhance trade among member states by ensuring strong linkage between the rural and cities by development of essential public goods such as roads, last mile electricity connectivity and clean

[72] FAO. 2020. Intra- Africa Trade, Africa Continental Free Trade Area and the Covid-19 Pandemic. Policy Brief http://www.fao.org/3/ca8633en/ca8633en.pdf

and safe water. The AU Lobby Note (2020), recommended that agriculture and agricultural supply chain be categorized as essential services to allow for movement of agricultural products. The document calls for establishment and strengthening of food reserve to be used during emergencies, minimizing restrictions to allow for inter-regional mobility not to disrupt market for producers and consumers while also improving health information dissemination by utilizing local communication structures[73]. However, the calls have been disregarded owing to the fact that some countries have experienced acrimony calling for travel restriction as experienced by some members of East Africa Community, Kenya and Tanzania when Tanzania prohibited Kenya Airways from going to and through Tanzania[74]. This is compounded by a ban on international travel because of global lockdown and closure of national borders which clearly adversely affect international and regional trade.

2.6 Chapter Summary and Conclusion.

The role of agribusiness in boosting agricultural productivity cannot be gainsaid since the trade aspect could impact food access, stability, utilization and availability. However, several impediments starting from little integration within the Africa continent, inadequate and ineffective agribusiness policies for smallholders who are majority in the continent could lead to exacerbation of food insecurity challenge in Africa. Understanding the politics of food is a critical political economy question that deserves careful attention. Emerging issues such as Covid-19 on the other hand offers a glimpse of what the globalized world can expect if local issues are not sustainably solved.

[73] AU Lobby Note.2020. The impact of Covid-19 on Small-scale farming Food Security and Sovereignty: A Summary discussion among Key Stakeholders.
[74] Voice of America. August 2020. Tanzania bans Kenya Airways as CoronaVirus Spat Escalate. https://www.voanews.com/africa/tanzania-bans-kenya-airways-coronavirus-spat-escalates

The foundation of agribusiness is profit making. Even though business stimulate optimization in production through balance of supply and demand, Africa faces several challenges to due to inadequate development of infrastructure and low level of human development. Given that agriculture and agribusiness has become knowledge intensive, Africa countries must deliberately invest in development of human capital through policies such as universal free primary and secondary education; formulate policies that will incentivize private investors to invest in rural towns where majority of smallholder farmers reside. Consequently, policy makers must involve smallholders through public participation in order to develop appropriate policies that will encourage improvement of productivity.

On the continental front, policies that encourage smooth intra-regional trade is imperative. Development of Joint infrastructure such as transport corridors will reduce agricultural cost of production which in the end will stimulate productivity within regional economic blocks and this will then add impetus to the full implementation of the AfCFTA.

CHAPTER THREE. THE ROLE OF DIGITAL PLATFORMS IN AFRICA AGRIBUSINESS DEVELOPMENT.

3.0 Introduction

The world aspiration to attain zero hunger goal by feeding an exponentially growing global population which is estimated to be over 9 billion people by 2050 has necessitated the debate on how to increase agricultural productivity in Africa. The debate over agribusiness as a possible solution to food insecurity continues to dominate Africa conversation. With the advent of Coronavirus Pandemic (COVID19) and the attendant challenges of global lockdowns, social distancing, the debate on the place of information communication technology, digital technologies and many other technological innovations in the economy has intensified.

The debate of a digital economy that has dominated global conversation, beyond Covid-19 debacle, will intensify with the need to elucidate the role of digital platforms- which have served to keep the world in operation after the shutdown occasioned by the novel Coronavirus; in every facet of the economy. It is on this backdrop that the sections a head in this chapter will consider different conceptualization of the digital economy; Africa digital transformation; Digital platforms; agribusiness digital platforms; Political economy of platforms, challenges and opportunities of agribusiness digital platforms.

3.1 Conceptualization of Digital economy

Global economy has undergone different technological transformation, every time resulting in expansion of the economy with dramatic impact on living standards through increase in productivity and production efficiency. The fourth industrial revolution that mirrors the

advent of a digital economy is characterized by blend of technologies and their interaction across different domains including, physical, digital and biological. According to Haggel III, Brown, and Davison (2010) a digital economy features the flow of information rather than managing the stock of information[75], to Schwab (2016) a digital economy is characterized by ubiquitous mobile phones, internet and smaller but with more powerful sensors which are relatively cheap than those of the earlier computer age[76] . The government of Kenya in its Digital Economy Blueprint (2019) considers digital economy as an ecosystem of sectors that operate using digitally enabled communication networks leveraging on the internet, mobile phones, and other technologies[77] Yu (2017) on the other hand consider a digital economy as one defined by use of modern information networks and communication technologies which include cloud computing, Internet of Things(IoT), big data and financial technologies (Fintech) in order to cause transformation of social interactions, drive productivity, stimulating innovation while at the same time remaining lean and creative[78]

Technological transformation that led to the present digital economy is premised on e-development which is development of Information Communication Technology (ICT). Information Communication Technology, a term, according to International Telecommunication Union (ITU) is used to describe technologies in manipulating and communicating information while according to Wangwe, (2007) ICT refers to technologies that pertain to the new science of collecting, storing, processing and transmitting information to enable convergence of information

[75] John Hagell III, John seely Brown and Langan Davison. 2010. The power of Pull: How small moves smartly made can set big things in motion.
[76] Schwab, K. 2016. The Fourth Industrial revolution
[77] GOK (2019). Kenya Digital Economy Blueprint
[78] Yu. 2017. Beyond Ecommerce: The social case for China's digital economy.

computing and telecommunication[79]. The definition points to the existence of the ICT sector, which Organization of Economic Cooperation for Development (OECD) member states 1998[80] agreed to define as an integrated system with a combination of manufacturing and service industries that capture, transmit, display data and information electronically.

Nissanke (2007) identifies five different ICT development paths:

a) Earlier adopters and primitive tools that occurred between 1961 and 1962
b) Regulated environment and frustrated users of between 1963 and 1974
c) End user computing and decentralization 1975-1984
d) Information Technology as a competitive strength 1985- 1995
e) E-commerce and common computing that started in 1996 to [present.

All the paths according to Wangwe (2007), led to the evolution of the application of ICT in data processing, authorized and economic institutions as well as social structures and processes. This then necessitated a look into the enablers of Information Communication technology.

3.2 Enablers of ICT

The ICT path framework developed by Nissanke (2007) which enumerates the processes that were undertaken by now known developed countries in the establishment of ICT transformation offers a glimpse on what elements are critical in development of digital economy. According to Britannica website, the revolution in the ICT sector, is characterized by

[79] Wangwe. 2007. Evolution, Status and Impact of ICT on Economic Development and Transformation in Africa: An Overview
[80] Ibid

technological, socio-economic, and cultural changes[81]. Broadly stated, ICT development, according to Wangwe (2007) involves three subsystems:

1) Technology and Infrastructure
2) Institutions
3) Social structure and processes

3.2.1 Technology and Infrastructure

Several researches have confirmed that ICT development and transformation is market driven, hence availability of right technology and infrastructure is key. As it is depicted by the ICT revolution in East Asia, country investment in development of ICT technology accelerated the transformation of the sector in the region[82]. Yusuf (2004) opines that government effectiveness and quality of regulation impact ICT adoption. Given that the sunk investment is deemed to be so high becomes a prohibition for investment by private sector, there is need for reassurance of fair dealings that could ensure private investors recoup their fair share of return on investment, in line with this, World Trade Organization (WTO) established Basic Telecommunication Agreement (BTA) that encourages telecommunication liberalization.

The Reference paper on Regulatory principles highlights, the Basic Trade Agreement offers a roadmap to be followed by member states in establishment of regulatory framework to boost investment in development of Information Communication technologies and infrastructure. Among the key factors in the General Agreement on Trade and Services (GATS) of WTO,

[81] Britannica https://www.britannica.com/technology/technology

[82] ICT in East Asia and the future of Growth 2004

include establishment of a regulatory authority which is free of all suppliers of telecommunication service and network to check on anti-competitive tendencies.

3.2.2 ICT Technologies and Infrastructure in Africa

Studies show that Africa Continent and other developing countries have the least levels adoption of digital technologies[83] Yusuf (2004) points out that East Asia investment in the production of electronics and other digital tools begot ICT development in countries like Singapore, South Korea, and Japan, Africa, as Nissanke (2007) observes could learn from the strategies and paths taken by developed countries to accelerate development of technological infrastructure.

Nkama (2014) found that investment in ICT yielded little or no increase in productivity in Cameroon[84] , this can be replicated in most developing countries. Given that use of mobile phones, internet, social media, and digital skills forms the foundation of digital economy, and Africa's little disposable income hamper investment in technological infrastructure and development of human capital, as Nissanke (2007) opines, there is need to learn from the ICT developmental path of developed economies for insights on Africa specific areas of focus to invest for the realization of digital transformation. Nissanke further observes that Africa countries and all other developing economies could draw from lessons and experience of developed economies to sidestep some developmental processes in development of ICT infrastructure.

[83] GSMA 2019. The state of Mobile Internet Connectivity
[84] Arsene Honore Gideon Nkama. 2014. An analysis of ICT investment on productivity in Developing Countries.

3.2.3 ICT Institutions in Africa

Under this subsystem, the development of ICT is viewed from the economic and legal standpoint. According to research, ICT has pervaded all sectors of the economy and that most Information Communication Technologies are demand driven, this has seen calls for institutionalization of economic and legal frameworks to support its development[85]. For instance, with digital tools like computers, mobile phones, and software being critical in the functioning of a digital economy, the economic models around the technological phenomenon are less developed in Africa, a reason why Nkama (2014) concluded that investment in ICT infrastructure by private investors is not feasible given the little or no return on the investment could be achieved both in short and long run. The sectors, according to Nissanke (2007) are divided into primary economic sectors which in most sub-Saharan Africa countries entail agriculture, secondary which involve industry and tertiary that refer to the service sector. The legal framework that include taxation regimes and business registration processes have a direct impact on investment in the digital economy hence directly influencing the level of ICT economic and legal framework.

3.3 Social Structures and Processes

The digital economy model is largely based on the network effect as observed by Parker, Choudary and Van Alstyne (2016), this necessitates better socializing processes within the society, to promote adoption of ICT technologies. Given the demand driven nature of ICT investment, organization of the social structures to ensure spread of technological tools like computers and mobile phones will increase feasibility of the digital sector. The level of

[85] World Bank. 2016. World Development Report 2016: Digital Dividend.

education is an important factor in determining the extent to which Information communication Technologies adoption is embraced as espoused by World Bank (2016). Further, World Bank (2005) indicates that social structures are important in the planning, designing, implementation and maintenance of digital tools as in India computer-based systems.

3.4 Africa Digital Transformation

Information Communication Technology that has been defined as the use of digital tools such as mobile phones, Computers, internet, and other advanced technologies like digital platforms including social media such as facebook, google, twitter, WhatsApp and many others has gone through various changes heralded by various industrial revolution. Penetration of digital technologies in Africa and other developing countries has been tremendous, according to GSMA (2019) report, the number of people connected by mobile phones is in upward trend now estimated to be 3.5 billion people globally. The growth has been facilitated by decrease of the cost of digital tools such as mobile and smartphones which are said to be the main influencer in the increased use of the internet.

3.4.1 Mobile phone penetration in Africa.

In line with part of SDG 9 on increasing access to information and knowledge in order to nurture innovation and entrepreneurship, there is concerted effort to ensure increase in mobile broadband and mobile phone connectivity in Least Developed and Developing countries. This effort made through encouraging partnership between public and private investment with emphasis on compliance to the guidelines by WTO General Agreement on Trade and Services (GATS) that call for adoption of measures preventing and safeguarding against anti-competitive practices by

major suppliers in the digital technologies[86]. The relative improvement of adoption of mobile phone access and usage in most of Africa countries, can according to the World Bank (2016) be attributed to favorable supply side national policies including availability, accessibility and affordability of some technological tools such as mobile phones and relative growth in urbanization.

Africa ICT research survey in 2008 highlights five key indicators that determine the ability of an individual or a country to access and use ICT which include: Infrastructure, Knowledge, affordability quality and usage, considering all this, the survey concludes that even though there has been exponential growth in access to mobile telephony its usage is low[87].

The Pew research Center (2019)[88], GSMA (2020)[89] corroborate the conclusion of previous studies confirming that Africa mobile phone penetration has been on the upward trend projected to be 50 % in 2025 from the current 45%. The studies however go step further and compute the adoption rate of Smartphones in Africa, observing that in 2017, the year of the survey, Sub-Saharan Africa smartphone ownership was up 33% from 15% in 2014 however this is still very low when compared with global figures. Accessibility and affordability according to GSMA (2020) of mobile phones especially smart-phones is being drive by initiatives such as Lipa Mdogo Mdogo established by Safaricom in collaboration with Google in Kenya, Mara phones partnership with banks in Rwanda are helping those who want to own smartphones to get them on loan and then pay slowly at the rate of $4-5 dollars per month.

[86] UNDP Sustainable Development Goals https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-9-industry-innovation-and-infrastructure.html
[87] ICTAfrica. 2008.Towards evidence-based ICT policy and regulation: ICT access and Usage in Africa
[88]Pew Research Center .2019. Internet connectivity seen as having a positive impact on life in sub-Saharan Africa: but Digital Divide persists.
[89] GSMA. 2020. The Mobile economy Sub-Saharan Africa 2020.

3.4.2 Internet Access and usage in Africa

The Internet is seen as a monumental phenomenon that has pervaded all sectors of the economy globally with its role being hailed as transformative in social, economic and political spheres. With the introduction of e-development in 2005, internet access and usage continue growing albeit at a slow pace. According to GSMA (2020a), despite mobile connectivity being 45% in Sub-Saharan Africa, internet usage is nearly 50% of those who own mobile phones. In absolute numbers, slightly over 250, million individuals make use of the internet in Africa out of the 477 million people owning a mobile phone. From the 2019 GSMA report on the state of internet connectivity, 3.5 billion people are connected to the internet via mobile phones which is 47% of the global population. It is also indicated from various studies that the differences of internet access and usage in Africa also differ from one country to another as well as from the urban and Rural Areas.

The disparities in internet access and usage as observed by GSMA (2019) could be attributed to several factors that include affordability, level of literacy and digital skills, relevancy and safety and security concerns. The digital divide can also be occasioned by gender inequalities. The government role in facilitating a favorable environment for technological investment, according to Wangwe (2007), could be classified into technological and infrastructure, institutions and social structure and processes. The technological and infrastructure pertain to development and access to better roads, electricity and broadband. On the other hand, institutional factors include legal and economic regimes such as developing and adopting sustainable digital technologies frameworks while social structure concerns itself with

the socialization and organization of community. All these factors impact the use of the internet globally and locally.

The significance of mobile phones and internet globally cannot be gainsaid. The phenomenon has widely spread, impacting almost every sector of the global economy. According to Wangwe (2007), the evolution of ICT application could be divided into three different phases that include data processing, Information Management and Knowledge management. According to Nissanke (2007) also, the primary sector which is dominated by agriculture in most of Sub-Saharan Africa, the secondary that is predominantly industrialized and tertiary sector that is service based have all been impacted by use of internet and technological tools hence ushering in a digital platform economy debate.

3.4.3 Digital Economy in Africa

The term digital economy does not have a definite and clear definition but rather has evolved according to changing environment. Since definitions are always a replication of the times and trends from where they emerge, the conceptualization of the term Digital Economy started with Don Tapscott in (1996) which then focused explanations on the relationships between the emerging economy, new business and new technology and how they impacted each other. With the fear of a single definition defeating the logic of the nascent sector, Margherio and others (1999) in their article advancing the digital economy chose to segment the digital economy into its foundational elements to facilitate understanding.

In 2016, Dahlman and others observed as follows:

> Digital economy is the amalgamation of several general purpose technologies and the range of economic and social activities carried out by people over the internet and related technologies and encompasses the physical infrastructure that digital technologies are based on (broadband lines, routers), the devices that are used for access (computers and smartphones), the applications they power (google and salesforce) and the functionalities they provide (IoT, Data analytics cloud computing).

The above conceptualization and many others over a period of time led to UNCTAD (2019)[90] Digital Economy Report to adopt a simple definition developed by Bukht and Heeks (2018)[91] that a digital economy derived solely or primarily from digital technologies is that part of economic output with business models based on digital goods and services.

Going by the above conceptualization, and corroborating it with the rapid penetration of digital technologies in Africa and other developing countries, especially mobile phones which is at 45% in sub-Saharan Africa means the intensity of digital economy will increase considerably. However, as Bukht and Heeks (2018), UNCTAD (2019) GSMA (2020), and many other studies observe, there is a huge disparity in the levels of development of the digital economy globally with the lowest level being experienced in SSA. Better ways of addressing the disparities as Nissanke (2007) observed is to tap into the knowledge of the developmental paths taken by developed nations to glean from their mistakes and target investment in critical areas where greater value could be drawn from.

[90] UNCTAD. 2019. Digital Economy Report 2019. Value Creation and Capture: Implication for Developing Countries.
[91] Rumana Bukht and Richard Heeks. 2018. Defining conceptualizing and Measuring the digital economy

To set the ground for a digital economy, Africa countries are putting in place frameworks to facilitate development of the nascent sector. Kenya through its inaugural Kenya Digital Economy Blueprint (2019) seeks to foster and accelerate the growth and governance of the economy.

3.4.4 Digital platforms in Africa

Under the wider conceptualization of the digital economy, the place of digital platforms is elevated such that they play an important role in the activities within the digital economy ecosystem. A digital platform has been defined as a marketplace where revenues are based on subscriptions, services and advertisement UNCTAD (2018), Kenney and Zysman (2016) define digital platforms as multi-sided digital frameworks that form the terms on which participants interrelate with one another. Progressively, given the evolving nature of the concept, Annabelle Gawer (2014) conceptualizes digital platform in organizational and meta-organizational framework marrying both economic and engineering perspectives with digital platform as platform competition and Technological innovation respectively. With the two perspectives amalgamated, then different functions of digital platforms are used to classify the digital platform into search engine platform, social media platform and market places.

3.4.5 Digital Agriculture in Africa

Digital economy has percolated across all sectors of the economy. Several reports indicate that digitalization of the agriculture sector is critical to improvement of productivity. Schwab (2016) points to the transformative nature of the internet of things (IoT) and the tremendous impact it can have on the development of Digital agriculture. Internet of Things, a situation where sensors are used to digitalize information is key in creating data which is said to

be the oil running the wheels of digital transformation. CTA 2018-2019 Report considers agriculture digitization as the use of technologies, data and business models' innovations to transform practices across agriculture value chain addressing challenges in productivity, post-harvest, marketing and supply chain management to improve income levels of smallholder farmers. Mobile phone technologies, according to GSMA (2020a) report has the highest adoption rate, GSMA (2020b)[92] point out that digital payment in the agricultural value chain has the highest potential to rise productivity and transform the socio-economic situation of smallholder farmers in Africa.

3.4.6 Mobile Phone enabled Agriculture

Mobile phones are the fastest spreading technology in Africa and promises tremendous transformation of the agriculture sector. Trendov, Vora and Zeng (2019), estimate that 3.5 (67%) billion people globally have access to a mobile phone with 477 (47%) million unique mobile subscribers in Africa and sim penetration placed at 816 million, representing 77% of global population GSMA (2020a). Accenture (2011) opines that mobile telecommunication can connect farmers to market finance and education[93], further, it has been validated that development of multi-level strategies for digitizing agriculture is critical in improving economic and environmental sustainability[94].

[92] GSMA Analysis (2020b). Digitizing payments in the agricultural value chain: The revenue opportunity to 2025.

[93] Accenture 2011. Connected Agriculture: the role of mobile phones in driving efficiency and sustainability in the food and agriculture value chain.

[94] EIP-AGRI seminar. 2018. Multilevel strategies for digitizing agriculture and rural areas Report: Antwerp Belgium

CTA digital for agriculture development study of (2019)[95] categorizes digitally enabled agriculture solutions into different parts that include advisory and information services, supply chain management, finance access, market linkages, macro-agricultural intelligence and Data for Agriculture Super Digital Platform. Under advisory and information services, there are various organizations such as Esoko in Ghana and Grameen Foundation Community Knowledge Worker solution in Uganda, Tigo Kilimo in Tanzania, M-Kilimo in Kenya which form part of the private agribusiness enterprise efforts to enhance advice and information to smallholder farmers, however, according to the CTA report, in line with the vision of scaling up, there has been changes to previous economic models that entail customer fees and donor funding to development of more sustainable models that rely on commission fees as well as data monetization.

The government effort as indicated by CTA (2019), on the other hand, has also been intensified to improve agricultural productivity through offering of agricultural advisories and information to farmers. The 8028-call center initiative in Ethiopia, Zambia Integrated Agricultural management system (ZIAMIS) in Zambia, Kenya Agricultural and Livestock Research Organization (KALRO) digital initiatives and Smart Nkunganire System (SNS) in Rwanda demonstrate that commitment. It is instructive to note that Multinational Organization (MNOs) are also involved through initiatives such as Viamo 321, Orange D4Ag working in more than 10 countries, Eco-farmer in Zambia run by ECONET, iShamba in Kenya, iCow in Kenya, Tanzania and Ethiopia Verdant Agritech in Nigeria, 399 Service offered by Farmerline in Ghana and the SMS based Market Price dissemination; all these initiatives being a revelation of

[95] CTA 2019. The digitalization of African Agriculture Report 2018-2019

MNO engagement in digital technologies exploiting them to offer general agronomic information and advisory to farmers in Africa effectively and efficiently.

3.4.7 Precision Agriculture Advisory

As a change of tact in order to take advantage of advancing technology, multiple organizations and governments are moving from offering generalized digital information to targeted advisory to individual farmers, farms and farm-fields. Most of these solutions are focused on weather and climate; some of the initiatives include CLIMARK[96] that serve pastoralists in Kenya and Southern Ethiopia offering timely weather forecasts delivered digitally through SMS or using their Dashboard, ECONET in Zimbabwe delivering ICT enabled weather information. Those in the pest and disease Surveillance include CABI plantwise initiative[97]a knowledge bank portal which offer information on various pests, early warning systems to smallholder farmers, water watch cooperative alert[98] that seeks to use artificial intelligence, big data and mobile application to avail essential information to smallholder farmers. Agripredict [99] in Zambia uses smartphone pictures of plants and with the help of machine learning technology to diagnose sending back instant feedback. Further, it should be noted that there are efforts to expand the scope of advisory offered to farmers by amalgamating several services while enabling farmers to perform the tasks such as soil testing, for instance, Yala International

[96] CLIMARK an initiative by CTA, International Institute for Rural Reconstruction (IIRR), International Livestock Research Institute Amfratech, aWhare and other with an objective of enhancing Market Response to resilient Livestock Value Chain in Eastern Africa http://www.climark.org/about

[97] CABI plantwise a global project that seek to close gap on information asymmetry with the objective of reducing the product lost to pests https://www.plantwise.org/resources/

[98] Crop Disease Alert /Water Watch foundation. https://waterwatchfoundation.com/crop-disease-alert/

[99] AgriPredict, uses a cutting-edge technology tools to help farmers manage droughts, pest and diseases https://agripredict.com/

Imageit[100]a smart phone application that is used to determine the nitrogen status to the crops using images, while some others involve peer-to -peer sharing and learning platforms like that provided by WeFarm[101] agricultural network of smallholder farmers connected via the website or SMS .

3.4.8 Market Linkages

Several studies have shown that smallholder's success in agribusiness is linked to access to the market. With the omnipresence of mobile phones and other digital technologies in Africa, digitally enabled market linkage solutions are booming. According to the D4Ag report (2019), market linkage solution initiatives are critical since they play a role in connecting farmers to offtake markets. Market linkages help in ensuring efficiency, transparency, accountability and trust into the agricultural value chain hence lowering farmers cost of production. In sub-Saharan Africa, market linkages can be classified into different clusters that include digitally enabled value Chain; Mechanization Access services such as hello tractor services in Nigeria, Agri-Input, Food e-commerce services, and Virtual Buyer seller e-market places. Within the agriculture and agri-food ecosystem, the development of digital platforms to ensure expansion of the scope of services offered remain key.

3.4.8.1 Financial Access

Innovation in the financial field is playing a critical role in agriculture development in Africa, given that the majority of smallholders were previously locked out of the finance

[100] https://www.yara.my/crop-nutrition/farmers-toolbox/imageit/

[101] https://wefarm.co/

ecosystem. Various digitally enabled solutions are breaking these barriers[102]. Financial Service providers (FSP) range from Business to Person solution such as AgroPay in Ghana that is integrated in Agro-trade platform helping to tackle access to market and finance by smallholders [103], e-wallets such as the Growth Enhancement Support (GES) scheme involving input subsidy developed by Cellulant in collaboration with the Federal Government of Nigeria [104] and MyAgro in Mali that use innovative system to enable smallholder farmers access to improved seeds and fertilizer via a scratch card based system[105], Kilimo Booster loans [106] from Musoni utilizing the Mpesa platform and Unstructured Supplementary Service Data (USSD) to handle the loan application and repayment processes. Akellobanker in Uganda that offer credit products, according to their website, they use data and mobile technology such as USSD, SMS and mobile money to offer loans to smallholder farmers and traders[107]. Agricultural insurance, another key plank in smallholder agriculture transformation has seen various initiatives including the solutions ACRE Africa, Pula, OKO, World Cover in Ghana and SumAfrica in Uganda.

[102] World Bank Group. 2019. Future of Food: Harnessing Digital Technologies to Improve Food system outcomes *Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/31565 License: CC BY 3.0 IGO*

[103] Started in 2015, Agrocenta was to improve the agriculture value chain in Ghana rural smallholder farmers to access market and finance.

[104] Agritech in Africa: How an e-wallet solution powered Nigeria Government's GES. 2019 blog. https://cellulant.com/blog/agritech-in-africa-how-an-e-wallet-solution-powered-nigeria-governments-ges-scheme/

[105] Global Innovation Fund .2019. https://www.globalinnovation.fund/investments/myagro/

[106] Nicole Brand.2017. The future of Micro-Finance for Kenya's smallholders: Musoni Kenya and Kilimo Booster available https://musoni.co.ke/docs/Musoni_Case_Study.pdf

[107] AkelloBanker website. https://www.akellobanker.com/about-us

3.4.9 Agriculture Super Digital Platform

Agriculture ecosystem digital platforms have extensive structures which connect different aspects of the agriculture sector that range from information and advisory, market linkages, supply chain management, financial access and macro-agricultural intelligence solutions offered to various customers that include but are not limited to smallholder farmers. The Super Digital Platforms in the agriculture and agri-food is conceptualized within the model espoused by Kenny and Zysman (2016) of multi-sided market places that allow interaction between the customer and the vendor and allow farmers to access different integrated and bundled services such as linking individual people and organization to finance, advisory services as well as linking farmers to off-take markets.

The nascent super digital platforms in the agriculture sector have attracted a number of players that include government Multinational Organizations, Non-Governmental organization and private enterprises. Following Annabelle Gawer (2014) construction of digital platforms as organization and meta- organization and the success of some platforms in India such as e-NAM, Rwanda through Rwanda Agriculture Board (RAB) in collaboration with Bank of Kigali developed Smart Nkunganire System (SNS) making possible access to finance through e-wallet and Bank account while offering advisory services to more than one million farmers. In an effort to build a super digital platform, Ethiopian government in collaboration with Digital Green Advisory Data Ecosystem Consortium and other partners embarked on digitizing and linking

national asset to enhance advisory services to farmers through the hotline 80-28 as well as e-payment[108].

Further, the phenomenon has attracted more other players such Farm to Market Alliance in Rwanda a public private consortium, Financial Service Providers such as Kenya Commercial Bank that has developed MobiGrow that offer a range of services to farmers; Multinational Organizations Such as ECONET that has developed EcoFarmer and Safaricom that has developed DigiFarm in Kenya, Payment Players such as MasterCard has also come in, developing MasterCard Farmer Network that seek to offer full spectrum of agricultural digital services to farmers. All this effort is directed towards creating effective and efficient digital platforms that combine various services with an objective of holistically addressing smallholder farmers challenges.

3.5 Political Economy of Digital platforms

Data as the oil that drives digital transformation elicit local, national, and international challenges as pertains to data ownership and privacy. On the ownership front, Gin (2016) talks of the danger of digital platform imperialism as a new form of colonization, going by the fact that most super digital platforms data are localized in developed countries, the highest percentage being in the United States of America. Shoshana Zuboff (2019) on the age of surveillance capitalism and Marc Goodman (2016), Future crimes, raise the stakes on the debate of preponderant digital platforms on their impact on social, political and economic of a country. As GSMA report (2020a) and World Bank Digital Divide (2016) shows, the inequalities brought

[108] 8028 Farmer Hotline. http://www.ata.gov.et/programs/highlighted-deliverables/8028-farmer-hotline/

about by development of digital platforms could exacerbate poverty if proper policy intervention are not put in place.

Agriculture Digital Platforms are specifically critical since the economies of most developing countries are powered by smallholder farmers who are mostly based in rural areas[109] and form a significant portion of political actors in the economic growth of developing countries. The views from the study of the political economy of food price policy in Kenya raises the question of how ubiquity of digital platforms will transform policy making[110]. Further, with the informal nature of most agricultural activities in Africa, the use of digital platforms would add to the complexity of understanding the question posed by Antony Chapoto and others on who hold the key to change the politics of Maize in Zambia[111]and to a certain extent this challenge can be extrapolated to the African continent.

3.5.1 Opportunities and challenges of Agribusiness Digital platforms.

The global digital environment continues expanding with attendant opportunities and challenges growing exponentially. Digital divide is the single most significant challenge identified in different studies, while GSMA (2020a) point to the increase of mobile phone and internet penetration in most Sub-Saharan Africa countries, the question of human capacity in terms of digital skills is still lingering as observed Nissanke (2007), AGRA (2020) WBG (2016), the lack of adequate human skills is among the hindrances coupled with underdevelopment of other digital economy infrastructural enablers such as roads, last mile

[109] Africa Agriculture Status Report. 2020. Feeding Africa Cities: Opportunities challenges and policies for linking African farmers with urban growing markets.

[110] Jonathan Makau Nzuma. 2014. The political economy of food price policy in Kenya

[111] Anthony Chepoto et.al. 2015. The politics of Maize in Zambia: Who holds the Key to change the status quo?

broadband, and electricity complicating the agribusiness development. The other challenge is the dominance of digital platforms and its perceived monopoly which brings about conflicts as revealed by the recent investigation and anti-trust lawsuit against Google in the united states[112].

Political environment which facilitates formulation and implementation of stable policies that promotes agribusiness is also a critical challenge in Africa as pointed out by Steven Haggblade (2013). The boundaries both virtual and physical together with national and regional laws, rules and regulations occasioned by political economic consideration according to AGRA (2020) are major contributors to less intra-African trade and this is predicted to increase as digital economies take root. The dynamic nature of global digital transformation which is faster than policy formulation process is a major drawback. This requires according Danielle Resnick and others (2015) political innovation to ensure proper digital policies are put in place to facilitate agribusiness development among smallholder farmers, however this remains an aspiration yet to be attained in most countries due to heterogeneity of farming systems in Africa and other developing economies.

Opportunities in Agriculture and agribusiness brought about by the digital transformation phenomenon in Africa is immense. The use of big data to improve agricultural productivity through precision farming has been highlighted by various studies[113]. As pointed out by Andrew Dorward (2009) and other several studies, digital technologies like mobile phones and Internet

[112] New York Times Report: U.S Accuses Google of illegally protecting Monopoly https://www.nytimes.com/2020/10/20/technology/google-antitrust.html

[113] Dean Evans. Precision farming with big data. https://www.intel.co.uk/content/www/uk/en/it-management/cloud-analytic-hub/big-data-helps-farmers.html

use has accelerated financial inclusion while reducing information asymmetry which in turn impact the decision making of farmers while deciding on their aspirations and strategies concerning agriculture development and food security in relation to livelihood. Therefore, as observed by AGRA 2020 agribusiness powered by technological platforms offers a viable path to attaining sustainable agriculture and ensuring food security.

3.6 Summary and Conclusion

From the foregoing discussion there is enough evidence that digital platforms have a critical role in development of the new economy through establishment of new business models within the agriculture ecosystem. The increasing penetration rate of ICT tools within the Africa continent reinforce perception of the relevance of digital platforms in solving the current challenge of food insecurity. However, the digital divide emanating from the underdevelopment of the digital economy is cause for alarm since its persistence will lead to little productivity hence danger of increasing food insecurity situation in Africa.

Globalization has made the use of digital technologies inevitable, therefore, Africa countries must be persuaded by the thinking of Nissanke (2007) to critically study the technology development path undertaken by developed economies, skip processes that may not make sense in the 21st century but adopt best practices such as developing skills in software development which is key in development of digital platforms. Africa governments must also be deliberate in development of rules and regulations that will protect data acquired through digital platforms. Finally, Africa countries must collaborate and partner to build digital infrastructure such as regional and continental broadband that could enable technological transformation.

CHAPTER FOUR: THE IMPACT OF STRUCTURAL TRANSFORMATION ON AFRICA AGRIBUSINESS DEVELOPMENT

4.0 Introduction

The prospects of intensifying food insecurity in Africa as the population exponentially increase is a cause for alarm. Effective and monumental structural transformation according to studies is the only viable solution out of the quagmire. However, as some stylized facts depict, structural transformation in Africa has shown confusing trends where little economic growth is attained through traditional structural transformation processes[114]. Instead of improving economic growth and development, most Africa economies that are depended on the agricultural sector have stagnated, this according to McMillan and Rodrik (2014) could be attributed to the changing dynamics globally and this must be understood for proper prognosis of the impact of structural transformation to be made in relation to the development of agribusiness and food security situation in Africa.

It is instructive to note that structural transformation is a constant and continuous process that causes both static and dynamic gains. According to UNCTAD virtual institute, Static structural transformation gains, a situation where the rise in economy-wide labour productivity creates more jobs in different sectors while dynamic structural gains accrue as a result of skills upgrade and positive externalities due to exposure to better technologies. To many African countries, agriculture is seen as the engine of development, yet the many components such as agribusiness said to contribute to economic growth and development receive little attention

[114] McMillan, M., Rodrik, D., & Verduzco-Gallo. 2014. Globalization, structural change, and productivity growth, with an update on Africa. World Development, 63(1), 11-32. They discuss the issue of reducing structural transformation.

hence the reason for decomposing and exploring the impact of structural transformation phenomenon on agricultural growth and development.

The next sections in this chapter will explore the conceptualization and definition of structural transformation looking into evolution of the Structural Transformation phenomenon. Further, the sections a head will dive into forms and drivers of structural transformation then will proceed with agribusiness development under the emerging Structural transformation capping it with the conclusion on the impact on Food Security situation in Africa.

4.1 Conceptualization and Definition of Structural Transformation

Structural transformation according to Lewis (1954) is a term that refers to movement of labour and other productive resources from low productive to high productivity sectors of the economy[115]. Peter Timmer (2009) putting Structural Transformation in a historical perspective finds agriculture as the foundation of structural transformation and economic development hence the engine of growth. According to Timmer, Structural transformation is conceptualized within for basic elements in an economy[116][117]that comprise of:

a) Decline share of agriculture contribution to the Gross Domestic Product (GDP) and employment
b) Rural to Urban migration giving rise to urbanization
c) Rise of modern service and industrial economy

[115] Lewis 1954 conceptualized structural transformation in terms of productivity of labour where labour moved from low productive to high productive sectors.

[116] Peter C Timmer 2009. A World without Agriculture: Structural Transformation in Historical perspective

[117] UNCTAD Virtual Institute. The structural transformation process: Trends, theory and empirical findings. https://vi.unctad.org/stind/m1.pdf

d) Demographic transition is brought about by reduction of death and birth rates due to decrease in fertility rate.

Within the elements, McMillan, Rodrik and Verduzco-Gallo (2014) define structural transformation using the lenses of labour movement with the gaps created by the reallocation of labour resources defining the transformation[118]. This view is bolstered by the debate on static gain and dynamic losses within the model of structural transformation as advanced by McMillan and Rodrik (2011)[119] where they point out that in some cases, labour does not follow the conventional reallocation of labour from low productivity to high productive sectors rather taking the opposite stance where labour moves from high productivity agriculture sector to low service sector. Static structural transformation take place when improved labour productivity in the agriculture which is also known as the primary sector produce more capital which is invested in other nonfarm sectors which are more productive hence taking the excess labour while dynamic loses happen as a result of slow growth of the agriculture sector hence little spillover meaning minimal development in other sectors such as services yet the increasing pressure in the primary sector forcing labour to more to less productive sectors in the Africa context service sectors.

[118]Margaret McMillan, Dani Rodrik and Verduzco- Gallo. 2014. Globalization structural change and productivity growth with an update on Africa

[119] McMillan, M. S., & Rodrik, D. (2011). "Globalization, structural change and productivity growth

4.2 Evolution of Structural transformation in Africa

The study of structural transformation evolution could be understood from the prism of historical perspective advanced by Timmer (2009), Rodrik and McMillan (2011) through Heidhues and Obare (2011) study on the impact of Structural Adjustment Programmes in Africa[120] [121]. As observed by Agbenyo (2020), Structural transformation as espoused by Arthur Lewis in his well-known dual economic model which is underpinned by the move of labour from a low productive sector to a more productive sector still remain relevant, however Agbenyo goes further and consider the aspect of technology as part of the additional elements that impact the structural change of economies [122]. Structural Transformation is a continuous process that is shaped by emerging issues as pointed out by Carlos Lopes (2016), further it is generally accepted that structural transformation is characterized by decline in agriculture share to the Gross Domestic Product(GDP) and employment in a country, urbanization occasioned by the rural urban migration, increase in modern industrial and service economy and demographic transition that is as a result of reduction death rates with subsequent increase in birth rate[123]. Lopes continues pointing out that the structural transformation does not entirely focus on the reallocation of resources between the agriculture, industry and service sector but also concerns itself with elements of sustainability and inclusivity.

[120] Franz Heidhues and Gideon Obare. 2011. Lessons from structural adjustment programmes and their effects in Africa, looking at the impact and contribution of Washington consensus and Aid assistance to Africa and other developing economies.
[121] Tim Dobermann and Francesco Caselli. 2018. Rethinking traditional structural transformation https://www.theigc.org/blog/rethinking-traditional-structural-transformation/
[122] John Stephen Agbenyo.2020. The structural change theory: an analysis of success and Failure of Technology
[123] Carlos Lopes, UN Undersecretary -General and Executive Secretary of ECA .2016. Speech on Structural transformation https://acetforafrica.org/highlights/transformation-is-a-continuous-process/

To place Africa structural transformation process in perspective, the UNCTAD virtual Institute[124] compartmentalizes various debates influencing the process which include: New structural economic literature, New Latin American literature, Schumpeterian literature, global value chain and resource-based industrialization drawing inferences that point to the structural change in the developing countries. From the New structural literature, structural process is seen from the prism of comparative advantage of the firms and sectors, New Latin American viewing the process in terms of technological progress that hinder development of the manufacturing sector while Schumpeterian literature speaks to the issue of innovation and capability as elements to be built within the structural changes within a sector. The Value chain literature in its part considers structural transformation as a process that is globally fragmented where part of the production work in the manufacturing industry is scattered in various countries. The resource-based literature help focus the availability of resources and their impact on the transformation process.

4.2.1 Industrialization as Engine of Growth

The debate on industrialization as an engine of growth could be seen from early conceptualization of structural transformation. The Arthur Lewis dual model that focuses on the reallocation of resources from low productive sector to high productive sector is framed by various scholars as a move from primary sector which is predominantly agriculture based to industry that is dominated by manufacturing activities. In this process, innovation and capability accumulation contribute greatly to transitioning of the economy from primary sector to industry,

[124] UNCTAD Virtual Institute. The structural Transformation Process: Trends, theory and empirical findings https://vi.unctad.org/stind/m1.pdf

in Africa though, where agriculture has remained a dominant activity especially in the rural areas has experienced economic stagnation and underdevelopment owing to the colonization that exerted extractive tendencies and export of raw agricultural commodities as indicated by Walter Rodney (1973) in how Europe underdeveloped Africa.

Following the conventional debate on structural transformation, it is indisputable that industrialization especially manufacturing plays a serious role in economic development paths taken by different countries. Stylized facts on the development trajectory of some Asian countries such as Japan, South Korea, and China indicate that increase in manufacturing activities led to economic growth and development. Filipe Jesus (2018) work on Asia's Industrial transformation validate the view of manufacturing as an engine of growth[125]. However, deindustrialization as explained by Rodrik (2015) a phenomenon where countries start experiencing the move of labour from a high productive manufacturing sector to a service sector with low productivity as the economies develop into high income countries seem to be happening in Africa prematurely. Rodrik concludes that while productivity improvement plays an important role in the industrialization of developed economies, globalization phenomenon is the key variable accelerating deindustrialization in developing countries owing to the global value chain development.

4.3 Drivers of structural transformation in Africa.

Just like structural transformation phenomenon in Asia was propelled by agriculture development, Africa transformation will be underpinned by the development of this primary sector where the continent has a comparative advantage in terms of the availability of arable land

[125] Jesus Filipe 2018. Asia's Industrial transformation: the role of manufacturing and Global Value chain

which is placed at 60% of global arable land[126]. However, the environment under which the process will take place will not only be defined by the movement of labour from low to high productivity sectors as advanced by the classical structural transformation theories but rather will take a new perspective that espouse sustainability and inclusivity as expressed by Lopes (2016) and Islam and Iversen[127] (2018).

Agriculture remains the foundation of economic transformation in Africa as indicated by Africa Agenda 2063 aspirations and United Nation Sustainable Development Goals. As opined by Arthur Lewis (1954) that Industrial and Agrarian revolutions continually go together, the fourth industrial revolution which is well defined and documented by Schwab (2016) that represents the current global economy calls for new strategies of economic transformation as pointed out by IFPRI (2012). Even though Collier and Dercon (2009) indicates that Africa agriculture in the next fifty years will require transformation including increase rate of urbanization, developing satellite towns near rural areas and improving productivity in the agriculture sector, production of enough food is emphasized with the concern of climate change consideration given prominence with its sustainability being a critical factor and pointer of successful economic growth and development.

From the experience of development in Asian countries, Roehlano, Briones and Jesus Filipe (2013) highlight the following as key drivers of structural transformation:

1. Demographics

[126] The Report 2019. Agriculture in Africa 2019
https://oxfordbusinessgroup.com/sites/default/files/blog/specialreports/949525/africa_2019_special_report.pdf

[127] S.Nazral Islam and Kenneth Iversen.2018. From Structural change to transformational change. Rationale and Implication

2. Natural resources
3. Technical progress
4. Global Value Chain

4.3.1 Demographic Transition in structural Transformation

Conventionally, as population increases in rural areas, it exerts pressure on labour leading to decrease in wages hence occasioning rural urban migration phenomenon. According to Arthur Lewis dual economic model, the labour moving from rural areas get absorbed into the modern sector in the industrialized cities**.** However, in the case of most African cities, the demographic transition from rural to urban has not reduced the rural population as theorized due to high fertility rate. On the other hand, those moving to the cities meet with organically growing population in the city leading to mushrooming of informal settlements with poor living standards, this according to Arthur Minsat (2015)[128] is a monumental challenge for policy makers. Against this conventional knowledge, the growth of cities in Africa, Minsat observes is taking place without adequate industrialization, hence becoming places of consumption without production of tradable goods.

This phenomenon brings forth a situation where the majority of those living in cities have no decent residential places. According to Minsat (2015), those living in city slums in most Africa countries are estimated to be 62% while 43% of the city dwellers live below one dollar. The demographic changes on the continental level could occasion intra-regional as well as inter-regional migration. As per the Economic Development in Africa Report (2018), the

[128] Arthur Minsat. 2015. African cities can be actors of structural transformation. OECD Development center 2015 http://www.oecd.org/development/development-posts-african-cities-actors-structural-transformation.htm

establishment of Africa Continental Free Trade Area (AFCFTA) could help solve the movement of labour, occasioning structural transformation within the continent that could ease the burden of population growth within individual African countries by distributing human capital within the continent which is forecast to be among the leading market globally. However, this is subject to formulation of policies and frameworks such as Africa Union Migration Policy Framework adopted by council of Africa Union in 2006[129] to facilitate smooth migration processes.

4.3.2 Natural resources impact on Structural Transformation

The new strand of literature within the UN Sustainable Development Goals framework appreciates the broad understanding of natural resources as a driver of economic growth and development. As Lopes (2016) points out, there is a new perspective of structural transformation where it is seen as a constant process that involves aspects on sustainability and inclusivity. The element of natural resources degradation which was never considered in the classical dual economic model study of structural transformation now plays a predominant role in the debates. For instance, as pointed out by Shabbir, S. Kousar F. Kousar (2020)[130]Water, as a natural resource is critical and contributes immensely to economic growth and development, yet according to prediction by UNESCO (2013), by 2025, over 66% of the global population will be living in water stressed regions.

Water as a resource can also be seen from the view point of conflicts. The contestation for control of the Nile water is a case where shared resources could bring about geopolitical

[129] UNCTAD 2018. Economic Development in Africa Report 2018: Migration for Structural Transformation. https://unctad.org/system/files/official-document/aldcafrica2018_en.pdf

[130] Aiza Shabbir, Shazia Kousar and Farzana Kousar. 2020. The role of natural resources in economic growth: New evidence from Pakistan https://www.emerald.com/insight/content/doi/10.1108/JEFAS-03-2019-0044/full/html#sec24

strife. The building of the Grand Renaissance Dam in Ethiopia has brought about the strife between Egypt, Ethiopia, and Sudan. And as Boutros Boutros- Ghali pointed out in 1988, "The next war in the middle east will be fought over the water of the Nile[131].

The impact of climate change on the other hand calls for better understanding of the effect of structural transformation on economic growth and development especially when it comes to utilization of natural resources. IPCC 2019 report on climate change and land add impetus to the debate on the use of natural resources sustainably, the report indicates that human activity on land can have disastrous effect on productivity of land hence precipitating global food security challenge[132]. Manufacturing and industry, both essential elements of structural transformation play a monumental role in the emission of Greenhouse Gas which is said to be the leading factor in global warming which if not capped below 1.5 degree Celsius according to IPCC 2018 report means lack of safety within global ecosystem and livelihoods[133]. As McMillan and Harttgen (2014)[134] confirms, part of the Africa growth miracle is driven by structural

[131] https://www.wilsoncenter.org/publication/water-conflict-and-cooperation-lessons-the-nile-river-basin-no-4

[132] IPCC 2019. An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems 2019 https://www.ipcc.ch/site/assets/uploads/2019/08/Fullreport-1.pdf

[133] IPCC, 2018: Global Warming of 1.5°C.An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press. https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf

[134] McMillan, Margaret; and Harttgen, Kenneth (2014), What is Driving the 'African Growth Miracle'?, Working Paper Series N° 209 African Development Bank, Tunis, Tunisia. https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Working_Paper_-_209_-_What_is_driving_the_African_Growth_Miracle.pdf

transformation phenomenon since 2000, but convergence of debate on the significance of sustainability and inclusivity perspectives draw attention to the need for establishment of new ways to advance economic growth and development through sustainable exploitation of Natural resources with emphasis put on development of better institutions as well as maintenance of political stability of African countries.

4.3.3 Technical progress

Technological advancement has been the major driving factor of economic growth and development processes throughout the industrial revolutions. As Schwab (2016) documents, the agrarian revolution was as a result of the invention of the wheel, steam engine bolstered first industrial revolution, electricity powering the second industrial revolution, computer development and usage ushered in the third industrial revolution while the internet is the phenomenon leading the transformation in the current fourth industrial revolution dominated by digital technologies. At the heart of technological progress, Kaya (2015)[135] points out that innovation and entrepreneurship which Schumpeter revealed was the introduction of new discoveries in the production process, is the critical driver of economic growth and development.

At the center of positive projection of Africa transformation is the adoption of digital technologies. It is instructive to note that Africa according to Rodrik (2016) has experienced premature deindustrialization, where the development of the manufacturing industry has not marched the increased labour movement from agriculture to the industry hence pushing majority of labour force to the service sector which in most African countries is informal and less

[135] Perihan Hazel Kaya.2015. Joseph. A. Schumpeter's perspective of innovation http://ijecm.co.uk/wp-content/uploads/2015/08/383.pdf

productive. The industrialization phenomenon in most Africa countries must chart a new path to development one such mean according to research must be powered by information communication technology, with John Page revealing[136] that the rise of new economies in Africa is powered by digital technology transformation.

The service sector, where most Africa labour force is finding refuge has been put into focus with high potential of digitization, with the critical look going into the digitally enabled jobs, institutional drivers necessary for digital success and foundational digital potential of some countries in Africa being the center of the study by Chakravorti and Chaturvedi (2019)[137]. According to the study, the digital economy jobs created could be divided into three categories that include high skilled, medium skilled and Low skilled digital jobs. Unfortunately, most of the jobs created in African countries are in the low skill cadre because of a combination of factors including inadequate digital skills and capacity as pointed out by Nissanke (2007).

4.5.4 Global Value Chain enabled Structural Transformation

World integration, a phenomenon enabled by technological advancement with reduced transport and communication cost, has brought forth the aspect of cross boundary production with different parties contributing to the development of products within a continuum of a production process without moving out of their countries. Structural transformation process which includes reallocation of resources from low to high productive sectors of the economy in this case from the traditional activities in the agriculture sector to the modern activities that

[136] John Page. 2018. Rethinking Africa's structural transformation: The rise of new industries https://www.brookings.edu/wp-content/uploads/2018/01/foresight-2018_chapter-4_web_final.pdf

[137] Bhaskar, Chakravorti and Ravishankar Chaturvedi.2019. How technology could promote growth in 6 African countries. https://hbr.org/2019/12/research-how-technology-could-promote-growth-in-6-african-countries

include manufacturing and industry seem to have hit a dead-end in Africa given that most countries are experiencing premature deindustrialization as observed by Rodrik (2016). The emergence of Global Value Chain (GVC) according to Eric Ogunleye (2014)[138] is seen as a panacea to correcting the deindustrialization phenomenon in the majority of African countries. In his study he points out the case of Asian countries Such as Malaysia, Philippines and Singapore that took advantage of the GVC phenomenon to establish their industries in textile and apparel.

Ogunleye (2014), while making case for the development of GVCs in Nigeria point to various benefits of the phenomenon, for instance, GVC development is seen as the easiest way to industrialization of Nigeria as it happened in Bangladesh, it can also ensure skills upgrade and access to global best practices, will lead to technological upgrade through innovation and learning, and could allow for country export diversification. Even though the GVC are seen as a critical element to industrialization, Stefan Pahl and Marcel Timmer (2020)[139] consider the phenomenon using a mixed blessing hypothesis where Development of GVC leads to improvement in productivity while its impact on employment is not feasible a conclusion that marries that of Rodrik (2016) on deindustrialization phenomenon.

This therefore leave African countries with an option of seeking better ways to benefit from the development of GVCs and this path according IMF (2016)[140] will be pursuing

[138] Eric K.Ogunleye. 2014. Global Value Chain Development and Structural Transformation in Nigeria https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/AEB_Vol5_Issue_2__2014__AEB_Vol5_Issue_2__2014_.pdf

[139] Stefan Pahl & Marcel P. Timmer (2020) Do Global Value Chains Enhance Economic Upgrading? A Long View, The Journal of Development Studies, 56:9, 1683-1705, DOI: 10.1080/00220388.2019.1702159 https://doi.org/10.1080/00220388.2019.1702159

[140] IMF 2016. Trade Integration and Global Value Chain in Sub-Saharan Africa: In pursuit of the missing Link https://www.imf.org/external/pubs/ft/dp/2016/afr1602.pdf

integration linkages with the view of increasing intra-regional trade as well as inter-regional trade to be achieved by ensuring development of infrastructure and other enablers of development such as information communication technologies, broadband and internet connectivity. In the end, according to Criscuolo and Timmis (2018)[141] achieving full potential of GVCs in Africa will be dependent on formulation and implementation of proper and effective policies that will promote flexible labour markets, better access to finance strong contract enforcement and simplified export procedures.

4.4 Agribusiness Structural Transformation

The debate on the role of agribusiness in attainment of Zero hunger and creation of employment for rapidly increasing Africa population has gained traction. Rodrik (2016) premature industrialization study which concludes that developing countries are turning into a service economy before going through a full cycle of Arthur Lewis conceptualization of industrialization heightens anxiety of global policy makers, hence the calls for transformation of the agri-food ecosystem. Against the backdrop of failed structural adjustment programmes that led to massive stagnation of agricultural growth and development in Africa, as argued by Heidhues and Obare (2011), critical changes like collaboration and partnership among the public and private sector must be instituted with favorable policies to promote inclusive development.

Agribusiness activities that range from production to transportation, storage and value addition of agricultural products could be the foundation for the reemergence of Africa

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[141] Criscuolo, C., and Timmis J., "GVC centrality and productivity: Are hubs key to firm performance?", OECD Productivity Working Papers, 2018-14, OECD Publishing, Paris. https://www.oecd-ilibrary.org/docserver/56453da1-en.pdf?expires=1604400970&id=id&accname=guest&checksum=A49A236EB1208940F3E30770E92084BD

reindustrialization. However, Pereira and Drimie (2016) predicates transformation on the government creation of a favorable environment that involves a wide range of stakeholders. Policies that ensure development of public goods such as roads are important since they reduce the production cost while attracting private investors, AGRA 2020 report on the other hand calls for elimination of trade barriers in order to facilitate development of agribusiness activities. Steven Haggblade (2013) further calls for development of joint solutions to evade the hurdles erected by the challenge of physical boundaries created during the colonial period which separate countries in the Africa Continent in order to allow for increased frequency in doing cross-border business. This fact is corroborated by the view expressed in the last section on how Global Value chains could enable developing countries take part in the manufacturing sector.

Technological progress which according to Schumpeterian theory has components of innovation and entrepreneurship could spark agribusiness transformation in Africa. Schwab (2016) has indicated that the fourth industrial revolution holds great potential in increasing agricultural productivity. While looking into how technology can promote growth and development in developing countries in Africa, Chakravorti and Chaturvedi (2019) indicate that considering issues like jobs created by digital platforms, Institutions necessary for digital platforms and a country's digital potential could offer gainful insights on the transformational process. Developing technological capability and skills in the end determines the centrality of a country or sector while interacting with the rest of the connected world.

4.4.1 Structural transformation of Smallholder farms in Africa

From the Lewi’s Dual economic model, it is evident that agriculture which is the predominant activity in Africa is critical for economic growth and development. Africa

agriculture alternatively is dominated by smallholder farms that are estimated to be over 33 million contributing to almost 80% of food[142]. The success of Asian Green revolution that was powered by the transformation of smallholders has added impetus to the debate on the significance of smallholder farmers in solving food insecurity, employment and sustainable economic development. However, the consistent question asked is whether Africa smallholder can farm themselves out of poverty[143] Peter Hazell and others in (2007) putting the question into a global context opined that the smallholder farms challenge could be exacerbated by globalization and donor policies. In trying to offer an answer to the above question, Jayne and Ameyaw in Africa Agriculture Status Report (2016) indicate that agricultural transformation requires diversification, sophistication and specialization of the agri-food system.

Technological progress amongst smallholder farmers in Africa could contribute greatly to growth and development of agriculture and agribusiness. Adoption and use of digital technology according to Abdulai, Duncan and Fraser (2019)[144], especially through digitalization of the agriculture ecosystem could significantly raise productivity. For digitalization of agriculture to be successful, Trendor, Varas and Zeng (2019), opine that availability, affordability of ICT education, connectivity, supportive policies and programmes are essential this in addition to the

[142] George Rapsomanikis.2015. The economic lives of smallholder farmers: an analysis based on household data form nine countries http://www.fao.org/3/a-i5251e.pdf

[143] Can African smallholders farm themselves out of poverty? https://theconversation.com/can-african-smallholders-farm-themselves-out-of-poverty-126692

[144] Abdul Rahim Abdulai, Emily Duncan and Evan Fraser.2019. How digital technologies can help Africa's Smallholder farmers. http://www.fao.org/e-agriculture/blog/how-digital-technologies-can-help-africa%E2%80%99s-smallholder-farmers

existence of digital economy enablers such as mobile phones, social media tools, digital skills together with ubiquity of entrepreneurial and innovation culture .

Dorward, Anderson, Rushton and Ybarnegaray (2009) however call for a holistic approach while looking into the issue of adoption of technology among smallholders in agriculture by establishing the different carders of farmers and farms and the livelihood strategies they adopt for this determine their willingness and capacity to use new technologies. In the end, as Dannson et al (2004) points out, technological progress among smallholder farmers will develop if concerted effort is put by all stakeholders, especially governments and private sector to guarantee strong linkages between the farm and the market.

4.5 Chapter Summary and Conclusion

The impact of structural transformation on agribusiness development in Africa was extensively covered in this chapter starting with the conceptualization of structural transformation seen as the move of labour from a low productive sector to high performing sector in the economy. This view is modeled through the prism of the dual economy theory developed by Arthur Lewis (1954). The evolution of structural transformation is the next theme given attention with a look at the industrialization as an engine of growth also covered.

The drivers of structural transformation in the contemporary economies are highlighted in subsequent together with the impact on structural transformation. A critical analysis is undertaken to bring out the role played by demographic transition; national resources, technological progress, and world value chain in the structural transformation process in Africa continent. With the final section tying up with the discussion on agribusiness structural transformation in Africa in relation with smallholder farmers.

In conclusion, this chapter observes that a number of structural changes have taken place in the agriculture and agribusiness facilitated by emerging issues such as globalization technological changes and the current covid19 pandemic. Top on the list is the introduction of global value chain which have ushered in dynamic trade issues such as fragmented production processes where different processes can be completed in different countries before they get hto the final consumer. The issue of Food sovereignty become of interest given that reliance on the international market decimate national and local production. Worthy to note that given Africa is dominated by stallholder farms and farmers these structural changes contribute to lowering of food production.

Africa Governments, therefore, must take appropriate measures to cushion and promote local and national food producers to avoid food stress such as the one experienced during the covid19 pandemic where lockdowns and travel restriction have been imposed causing shortage due to supply chain disruption

CHAPTER FIVE: DATA PRESENTATION AND ANALYSIS

5.0 Introduction

This chapter reports the result from the interviews carried out by the researcher and analysis of six online video clips from YouTube for agricultural conferences and experts' interviews aiming at elucidating the role of agribusiness in food insecurity in Africa. The list of respondents together with their role and brief description of their responsibilities is contained in appendix ii. The report is organized using various themes gleaned from the interviews and analysis of video clips. One of the most critical issues coming out of majority (95%) all respondents is the unbalanced conversation concerning agribusiness, technological and structural transformation. It is further revealed from the interviews and analysis that the understanding of smallholder farming and farmers is shallow hence the possibility of biasness. The role of youth in agribusiness is done in a superficial manner while the role of government in agribusiness development is not well articulated. The use of Big data and globalization phenomenon proving to be central in the debate on food insecurity and agribusiness development.

5.1 Obscurity of agribusiness Contribution to Food Insecurity Situation in Africa

The debate on development of agribusiness has gained traction globally but taking root in Africa due to the urgency to feed the rapidly growing population while the failure of structural adjustment programmes which led to stagnation of most African economies which are dependent on agriculture adding impetus to the conversation. Akinwumi Adesina, the president of Africa Development Bank and Former Nigeria Minister for Agriculture and Rural Development has emerged as the greatest champion of agribusiness. In several interviews and media appearances, he has severally stated that his vision is to help Africa see agriculture as a business and not a

usual way of life. To make this an African political issue, while appearing on a panel at the 11th edition of Africa Economic Conference, on CNBC Africa, Adesina said "*You are not independent if you cannot feed your people*" this statement speaks to the heart of every sovereign state and government that are mainly tasked to ensure citizens are secure in all forms. The stance taken by Dr. Adesina and other global leaders serves to shape the agenda within the agriculture sector.

The euphoria over the significance of agribusiness in growth and development of the economy within the Africa continent has pushed the conversation away from balanced debate causing asymmetry which could portend serious food production unsustainability. This view is validated by the result from the interviews where 70% of the respondents had little to say on the negative contribution of agribusiness in food security even when prompted by the researcher. Balanced conversation concerning agribusiness development is critical if proper responsive policies have to be formulated and implemented. The failure of structural adjustment programmes was due to narrow focus on limiting Africa governments from supporting various initiatives such as extension activities in agriculture operations and liberalizing the market. As seen from Heidhues and Obare (2011), giving little attention to the social dimension of development contributed greatly to the failure of SAPs, this therefore calls for a multidimensional approach in addressing the issue of agribusiness development in Africa this views were captured by Res G, a youth in agribusiness Res B from Biotechnology adoption, Res D from regional trader in cereals and food products.

The debate on making agriculture and agribusiness appealing to young African people has also gained prominence, proponents of this debate point to the "digital farmer" narrative

where the use of digital technology is predicted to cause considerable growth in agriculture and agribusiness ecosystem. However, there is danger of not speaking to the digital divide occasioned by inadequate skills and capacity. Further, given the heterogeneity of farmers and their different strategies and aspiration as pointed by Dorward et. al (2009) and the finding that parents aspire that their children take off-farm activities, may require critical vetting and training of youths who want to be farmers. This on the other hand calls for expansion of the agriculture ecosystem with valuable linkages to support cross-sector engagement in order to promote creation of more off- farm opportunities.

Even as the debate on industrialization as the engine of growth percolates global conversation, Abdoulaye Mar Dieye, while offering his thoughts in a panel discussing "*How to achieve agricultural transformation" in 2016, he said "You do economics using the initial conditioning*" using the case of New Zealand that attach high value to agriculture, he called on Africa leaders to embrace agriculture and invest in training and research development. In a 2017 debate "*Within Agriculture, Off-farm activities will yield more the greatest opportunities for youth*" organized by Mastercard Foundation, a video clip uploaded online, reveals that both farm activities and off-farm must coexist for agriculture growth and development but a greater bias towards off-farm since 51.1 % of those in the meeting agreed with the proposition. 80% of the respondents go with the view that industrialization is key in promoting agribusiness development. Res H (ICT ministry), sees the establishment of the Kenya Digital economy blueprint as a major boost towards making use of big data for business efficiency. Res G (Youth in Agribusiness) looks at technology positively but thinks unless more is done by the governments in terms of education and infrastructure development, little will be achieved.

Res E from Ministry of Agriculture, Livestock and Fisheries, point out that putting in place Kenya Youth in Agribusiness strategy 2017-2021[145] is a step towards improving the agribusiness environment, however Res G critique this saying that those are plans on paper that have no impact on operations of agribusiness among the youth. To respondent G, the ministry is organized in silos and information stacked in Ministry Shelves where they are not accessible and this negatively impacts the development of agribusiness. Digitalization of Data in the ministry of Agriculture according to Res E, could go a long way in opening the opportunities in utilization of big data as well as targeted investment and training. However, the use of this data requires skills which to a large extent are not within the reach of the majority of young people who are engaged in informal agribusiness.

5. 2 Technological Transformation impacts on Agribusiness development

The innovation and new technology have been the driver of economic growth and development. The Agrarian revolution was propelled by the invention of the wheel, steam engine led to industrial revolution, computer, and internet and now digital technologies are shaping the subsequent economic social and political revolutions. Agriculture and Agribusiness structural transformation also depend on employment of new efficient technologies to improve productivity. According to the 2017 Mastercard foundation debate on whether, off-farm activities offer more opportunities for the youth, over 51% participants agreed that off- farm create more opportunities[146]. According to the proponents, off-farm activities entail value

[145] Kenya Youth Agribusiness Strategy 2017-2021 Positioning the youth in the forefront of Africa growth and transformation http://extwprlegs1.fao.org/docs/pdf/ken171450.pdf

[146] Mastercard foundation debate 2017. Online video clip. Within Agriculture, off-farm activities will yield the greatest opportunities for the youth https://youtu.be/jPWfhnLNfaA

addition and manufacturing which products fetch higher prices. This proposition is in line with the structural transformation models such as the Lewis 1954 dual economic model where the place of manufacturing is given preeminence in terms of creating more value hence causing movement of labour. Majority of the respondents in this study agree with the proposition that opportunities emanating from off-farm are more than those on Farm.

Technological transformation according to Schumpeterian literature is underpinned by Innovation and entrepreneurship. In an effort to foster innovation and entrepreneurship, Africa Development Bank's High 5[147] are geared towards improving Africa environment to open up agribusiness opportunities. The bank has committed to power Africa through the new deal of energy for Africa[148] to make energy accessibility possible, According to Dr. Adesina the president of the Bank, Feeding Africa through increased agricultural productivity is the major mandate of the Bank given what he says no independence without feeding African people. Respondents' interviewed by the researcher corroborate the views that innovation and creativity require a conducive environment with physical infrastructure such as access to electricity being a critical factor.

Res H and E highlights Kenyan government initiative of e-citizen as a consequential step towards digital structural transformation, with the intention to register all Kenyans for Huduma number hailed within the government as a monumental initiative to enable Kenya transition to a

[147] Africa Development Bank Accelerates pace with High 5 priorities https://www.afdb.org/en/news-and-events/african-development-bank-accelerates-pace-with-high-5-priorities-15879

[148] The new deal on Energy for Africa https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Brochure_New_Deal_2_red.pdf

digital economy. The use of digital technologies has a great role to play in development of agriculture and agribusiness. All respondents acknowledged the significance of digital technologies in access and dissemination of knowledge and information by helping to break the asymmetrical feature of most markets. The impact of digital technologies especially after coronavirus pandemic could not be gainsaid, respondents interviewed unanimously agreed that digital platforms enabled continuity of business operation even when lockdowns and restrictions of movements were imposed to contain the spread of the pandemic.

5.2.1. Digital platforms in Africa

75% of the respondents had a fair understanding of digital platforms, with social media having the largest percentage points recognition, Res A, B, C, D and G agrees to be using social media as a tool of communication reaching out to clients and even to grow their network. Digital platforms are seen as new avenues to growth of agribusiness. Res G confess to have bought a farmer Facebook group having over 500, 000, this with a view of bolstering his influence on agricultural information and knowledge. With the growing number of digital technologies, harnessing agricultural data could enable organizations to make use of big data to transform agribusiness by increasing productivity, offering weather prediction and many other services that will in the end expand the agriculture and agribusiness ecosystem. However, without establishing processes that will ensure development of human capital such as digital and analytical skills, it will be impossible for Africa to take advantage of the nascent digital economy.

5.2.2 Digital Agriculture

Digital agriculture refers to the use of digital technology from the farm to the consumer to integrate agricultural production. This according to E-agriculture has potential opportunities as

well as challenges, while the advantages of digital agriculture among respondents are appreciated, there exists a general trend of overlooking the limitations. Given that public policy is always informed by public conversation, overlooking the debate on the limitation of digital agriculture such as inadequate infrastructural development will negatively impact the rate of growth and development in the economy.

At the end, all respondents agreed to the rationale for balanced debate on the role of digital transformation in the economy. Most of them 80%, point to the need for development of digital hubs in different counties in Kenya. This can be extrapolated to other countries in Africa in order to boost continental wide development of the digital economy.

5.3. Smallholder Farmers policy in Africa

There are over 500 million smallholder farms globally with Africa having over 33 million. All the respondents think that smallholders have the potential of transforming the agriculture sector by producing enough to feed Africa. Dr. Adesina has in several occasions spoken passionately about "*Transforming rural agriculture from the Zones of economic misery to those of Prosperity"* in the online video clip published in 2016 on Rethinking Agriculture[149] However, Philip Kiriro, President and Chairman Eastern Africa Farmers Federation when asked why there is little innovation within smallholder farmers and farms point to the fact that there exist innovation but they are not documented. Geraldine Mukeshimana, Minister of Agriculture and Animal Resources in Rwanda pointed to lack of coordination between research, policy making and implementation as one of the key impediments to increase of smallholder

[149] 2016 Africa: Rethinking Agriculture. Online You Tube Video Clips https://www.youtube.com/watch?v=q1nppAYq-ew&feature=youtu.be

productivity. Resnick et al (2015) on the other hand noted that there is a need for understanding in policy formulation processes in order to formulate policies that will positively impact smallholder operations.

Heterogeneity of smallholder farmers consequently, present a critical challenge for policy makers. Given geographical, ecological and cultural differences in Africa, it is not possible to formulate a single policy to cater for diverse regions and individuals, this therefore making zoning and clustering farms and farmers uneconomical. yet, to some extent aggregation and zoning could enable smallholder farmers form cooperatives to take advantage of economies of scale which in this situation is vitiated. Respondents C and D who deal directly with farmers have a challenge to scale up their operation due to low margins that exist in case operations were extended to rural areas, a reason why they prefer having their major operation in the cities.

Due to geographical, ecological and cultural differences in Kenya, respondents E and L consider the establishment of the 10 years plan articulated by Agriculture Sector Growth and Transformation Strategy (ASGTS) 2019-2029 important. The strategy which seeks among other things to develop one million smallholder farms while also setting up large farms as a way of encouraging devolved units to take up agricultural activities within their comparative advantage could help in clustering of smallholders effectively. Due to the vast nature of smallholders, government involvement has been underwhelming in most African countries. In Nigeria, fertilizer subsidy proved challenging until the e-wallet initiative was introduced. According to Dr. Adesina, a former Minister of Agriculture and Rural development, this initiative helped reduce the levels of corruption and enabled smallholder farmers to get agricultural inputs.

Digital technologies have great potential in bridging the gap between the market and smallholders. Res F opine that using digital technology will enable smallholder farmers access to research and improved seeds easily through the use of digital platforms. Res C, confirms this view saying "*Almost all Agro-dealer shops have websites where they list the prices of their products with an option of buying online and delivery made*." Establishment of logistical companies and courier service connecting towns and rural areas in Kenya validate this view. It is clear, therefore, that smallholders can benefit greatly from the technological transformation, however, it is also evident that the agriculture sector is also becoming knowledge intensive. This call for enhancement of digital and technical skills in order to benefit from the new development.

5.4 Youth in Africa Agribusiness

Africa's population is increasing exponentially, and the number of youths joining the labour force every year is ever increasing raising questions of the future of economic growth in the continent. The Mastercard foundation debate on the proposition that off- farm activities create more opportunities than on farm, continue to portray on-farm activities as dirty, however the statement by Grace Wanene in the panel that money makes everything beautiful marry with what Dr. Adesina claim to be his mission "*To make agriculture Sex*" by ensuring that it generates enough money as a business to attract young people into the sector. However, there should be no mistake that off-farm activities can exist on their own rather they should harmoniously coexist. Following the Lewis dual economic model where resources move from low to high productive sectors in most cases without changes in output, the structural transformation can be said to depend on creativity and innovation.

The strategies and aspiration of smallholder farmers vary as pointed by Dorward et al 2009 [150]. The three categories hanging in, stepping up and Stepping Out strategies must be taken into consideration when seeking to attract young people into the agriculture sector. Different households will have different aspirations for their children in most cases to determine the path and trajectory that they will pursue. Verkaart, Mausch and Harris in their (2018) found that most of those who call themselves farmers do not aspire their children to engage in farming. This is corroborated by the views of the respondent interview in this study, Res D who is a cereal and food business and Res C who is an agro-Industrial dealer do not anticipate that their children will follow the same path. This complicates the intention of attracting youths into agriculture especially when their parents see a different social and economic path for them and work to influence them towards the desired professional line.

The realization that agribusiness could offer a path to get youth into productive engagement has been seized by majority of governments in Africa, in Kenya according to Res L, establishment of Kenya Youth Agribusiness Strategy and the Enable the Youth Program is meant to catalyze involvement of youth in productive activities with the agriculture ecosystem. The urgency for getting young people into productive activities is essential, from a political economy perspective, given that majority of the population in most Africa countries are youths, if mobilized they can cause political instability. For instance, in 2016, Ghanaian Opposition politicians armed with the report from the World Bank on the unemployment level of young

[150] Andrew Dorward, Simon Anderson, Yolanda Nava Bernal, Ernesto Sánchez Vera, Jonathan Rushton, James Pattison & Rodrigo Paz (2009) Hanging in, stepping up and stepping out: livelihood aspirations and strategies of the poor, Development in Practice, 19:2, 240-247, DOI: 10.1080/09614520802689535

people being high, mobilized young people and led to the fall of John Dramani Mahama[151]. Majority of the respondents observed that unemployed youth have been used by politicians to advance their political grievances.

5.5 Government Role in Development of Agribusiness

Majority of high panel experts point out to the significance of government involvement in establishment of favorable environment for development of agribusiness. All the respondents agree that the government must be involved. As pointed out by Heidhues and Obare (2011) failure of structural adjustment Programmes were occasioned by lack of consideration of the social impact of the changes. As observed by Prof. Eric Maskin, while contributing in a high-level panel on *Achieving Agricultural Transformation*[152]*He* emphasizes that the government must be involved in the development of agribusiness. He posits that since agriculture has become a knowledge intensive sector, governments must step in to support capacity building and skills development, in his opinion, this is because skills development could not be left to the private sector since it could be costly for them. It is the reason universal primary and secondary education is critical to give young people required literacy level which is key in establishing and running agribusiness. Audu Ogbeh in the same panel decried the lost decades while Nigerian government imported food in the end decimating rural agriculture, but saw a glimmer of hope in the government investment in enhancement program

[151] Africa's Jobless Youth Cast a shadow over economic growth. https://www.un.org/africarenewal/magazine/special-edition-youth-2017/africas-jobless-youth-cast-shadow-over-economic-growth

[152] Achieving Agricultural Transformation YouTube Online Video Clip https://www.youtube.com/watch?v=SFIhMArHIs0&feature=youtu.be

5.6 Globalization of Agribusiness

Globalization, a phenomenon characterized by improved communication, digital technologies and ubiquitous use of the internet has percolated every sector of the economy. In agribusiness, the development of the Global value Chain has been hailed as transformational. Global value chain, if well tapped, can bring tremendous transformation in agriculture and agribusiness productivity. As argued by Criscuolo and Timmis (2018) GVC gives individuals and companies access to a variety of knowledge and information especially those at the center of the process. All respondents in the study agree to the fact that international trade is critical in the development of agribusiness as it opens more markets. However, Res C and D call for deliberate effort for Kenya to establish better working relationships with her neighbors in order to facilitate cross border trade.

Dr. Adesina, in his call for the embrace of agriculture as a business indicates that the potential of intra-Africa trade is grave if the continent has to succeed in feeding the world. As a number of researches have pointed out, the greatest bottleneck in Africa is the inability to do business with each other due to poor infrastructure. Africa Development Bank Hight 5s therefore are geared towards opening Africa markets by investing in provision of public goods such as road networks, Electricity, water which will incentivize private investors into the agribusiness sector.

To optimist, globalization will enable structural transformation that will enable easy access to global knowledge, aid technical transfer, while offering more jobs by encouraging individual companies and organizations to join the Global Value Chain with the aim of boosting industrialization. Using the gravity model in economics where it is postulated that proximity

positively impacts the intensity of trade among neighbors, globalization can lead to improved interaction among neighboring states in Africa. However, without proper policies, to facilitate development of essential public goods, globalization could stifle innovation and entrepreneurial spirit due to availability of products through imports

5.7 Chapter Summary and Conclusion

The chapter presents data obtained from in-depth interviews and analysis of agricultural content from online video clips, the information is organized in major themes that developed out of the analysis by the researcher. The first theme concerns the obscurity of the role of agribusiness contribution to the food insecurity situation in Africa. Secondly, the impact of technological transformation on Agribusiness development is explored with digital platforms and digital agriculture given attention. Smallholder farmer policies in Africa are too given attention within the chapter. The question of youth in agribusiness get into the center of the debate with the government role in developing agribusiness tackled. Finally, the chapter look into the theme of globalization of agribusiness and how it impacts development of agribusiness in Africa.

In conclusion, new agribusiness models have the potential to improve food productivity but subject to establishment of key enablers such as development of rural infrastructure while adopting different strategies that those adopted by African government during the structural adjustment programs that led to the collapse of the agriculture sector and increased the prevalence of food insecurity. To this end, stakeholders, especially Africa policy makers must seek to develop targeted policies in different areas because of the heterogeneity of farmers and farms together with different farmers aspiration and strategies adopted.

Africa Countries must take heed of Nissanke 2007 observation that Africa countries should learn from the different paths taken in development of technology and skip some processes in technology development. According to Nissanke, Africa should invest in digital skills especially in development of software which requires knowledge in coding. Africa government must also encourage high enrollment in primary and secondary education, to this end policies that support universal primary and secondary education are critical for the growth and development of new agribusiness models that will promote food productivity. This view is premised on the fact that agriculture has become knowledge intensive.

Development of favorable regional and continental trade policies is critical in making new agribusiness models thrive. Africa countries must strive to break down barriers that were carried over from the colonial era as indicated by Steven Haggblade (2013). According to him, Africa political borders, which were drawn disjointedly translate into endemic diseconomies of scale, limiting competitiveness and incentive undertake joint infrastructural development hence high economic cost of intra-Africa trade. On the technological front, Africa countries must seek to encourage public private partnership because the enormous resources required to build efficient technological infrastructure will not be fully provided from national budget due to the stage of economic development. Policies that incentivize private investors must be encouraged. However, the agreements must be well negotiated to ensure better return for investment.

CHAPTERS SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The study's objective was to establish whether agribusiness has any contribution towards the food insecurity situation in Africa, secondly the study was to determine the role of Digital platforms in development of agribusiness and finally evaluate the impact of structural transformation on Africa agribusiness development. The utilized liberalism theory through the political economic lenses to organize and analyze data.

6.2 Role of agribusiness in the food insecurity situation in Africa.

The debate on the usefulness of agribusiness in most Africa countries has directed the global attention towards continent potential which is seen in the availability of arable land which is estimated at 60% of global agriculture land. With the spike in food prices in the 2007-2008 period, and the increasing global demand for biofuel products, foreign governments are encouraging private sector in their countries to seek investment in Africa by acquiring large tracts of land to produce raw materials for their home countries. With the globalization phenomenon and the unfavorable agricultural rules and regulation in the WTO agriculture protocols it is easy for repatriation of the produce to their home countries, unfortunately the acquired land in some instances is done at the expense of the native communities. This exposes these communities to food insecurity while in some instances leading to political instability like the case of Zimbabwe.

Most critical, the euphoria over the significance of new agribusiness model contribution towards food security has occasioned unbalanced debate yet policy formulation and implementation processes are shaped and determined by the public conversation. With majority

of Africa food produced by smallholder farmers, lack of adequate balanced policies to help smallholder farmers negatively impact their ability to produce enough for consumption and sale. Unfortunately, majority of smallholder farmers are not able to come together to negotiate for favourable policies such as development of rural road infrastructure, last mile rural electrification and taxation policies a situation exacerbated by the heterogenous nature of smallholders in most African countries. This in the end compels smallholder to sell all their produce immediately after harvest, therefore, exposing smallholder farmers to food insecurity.

6.3 Role of Digital Platforms in development of agribusiness

With digital technologies pervading every sector of the economy, every country is running against time to join the digital global economy**.** With most digital platforms based in developed countries and the fact that they are not value neutral meaning they inherently uphold the value system of the developers; this could eventually negatively impact growth and development of economies that depend on them. The question of Digital Platform imperialism advanced by Dal Yong (2015) red alert for Africa policy makers to ensure proper policies are put in place to safeguard Africa citizens from exploitation. This view is emphasized by Zuboff (2019) when she writes about the age of surveillance capitalism where data, which is said to be the new oil running the wheels of economic transformation must be preserved.

Further, the percolation of digital platforms and their prominent role in the agribusiness ecosystem could alienate the majority of rural Africans from benefiting due to digital divide, human capital in terms of digital skills is lowest in most African countries. This coupled with lack of proper and extensive infrastructure both technical and physical will hinder proper participation of most Africans within the agriculture and agribusiness value chain. It is important

to note that the Digital platform imperialism could pose unfathomable global crisis if they were to fail or act inappropriately. In a situation where a few international digital platforms dominate the world, where majority of the digital platforms are based in developed countries could lead to modern day colonization. As pointed out by Dal Yong (2015) digital platforms are not value neutral but reflect the value system of the proprietor. This in essence means, if Africa relies on digital platforms build by foreign entities, they will be working under the value system of those countries where the digital platforms originate. This could in the end lead to decimation of Africa food culture and value system.

6.4 Impact of Structural Transformation on development of Africa Agribusiness

Growth and development of agriculture and agribusiness is predicated on structural transformation. From the Lewis dual economic model which is relevant up to date, movement of labour from low to high productivity remains the predominant feature in economic growth and development debates. Digital technologies and platforms have a special place in the structural transformation literature, however the bias towards positivity without keen consideration of the limitation brings about the mixed blessing hypothesis where productivity is enhanced when using these tools without increasing level of employment.

The issue of premature deindustrialization raised by Rodric 2013 where economies are experiencing drop of manufacture contribution to the GDP and movement of productive labour from high productive sector to low productive sector due to saturation in this case from manufacturing to service sector must be worrying to Africa policy makers. The call to reinvigorate the agriculture by creating new agribusiness models that could enable African countries to industrialize is welcome. Given that Smallholders are the backbone of the

agriculture sector, formulating policies that take into consideration their variability within the continent, purposeful targeting must be embraced if policies are to be efficient.

Continentally, it is imperative to enhance regional integration to boost intra-regional trade which according to the gravity model will be more beneficial to proximate neighbors such as in the East Africa Community. The Africa Continental Free Trade Area on the other hand must be embraced in order to increase the size of Africa food trade market. It must not be costly to trade with the neighbor than foreign distant country as it is said to be in Ghana importation of eggs.

6.5 Recommendations

I. Agribusiness is a dynamic field that is shaped by different factors. With globalization the conceptualization keeps changing and that mean more research required to inform policy making processes. Academicians, in Africa and Kenya in particular will need to keep reviewing this topic in order to continue informing appropriate policy formulation and implementation.

II. Policy makers must take a balanced view on the role of agribusiness in ensuring food security. Within the current environment, agribusiness is seen as a panacea to solving Africa's dual challenge of food insecurity and youth employment. But it is worth noting that policy formulation and implementation requires understanding all factors including externalities if success has to be achieved. Therefore, with the heterogeneity of smallholder farmers, who are majority in most Africa countries, ministries of agriculture must ensure development of

targeted policies that suit different ecological zones, and meet different needs of farmers.

III. Digital platforms have a special place in enhancing agribusiness development. The new technologies have ushered in new business models that could be exploited to expand the agricultural value chain. On the other hand, government must be willing to invest in development of public goods such as roads, enhance last mile electricity connectivity, water and other social amenities to attract private investment. In Kenya Ministry of ICT, Innovation and Youth affairs must build ICT parks and hubs to encourage people to acquire digital skills

IV. Policy makers must take into consideration the nature of skills required to engage in agribusiness. With agriculture becoming knowledge intensive, establishing an agricultural economic hub such as Staple Crops Economic Zones advocated by the world bank and its president Dr. Adesina will serve to transform rural settings and help in growth of satellite towns which could promote manufacturing. This can be taken up by the ministry of Agriculture, Livestock and Fisheries to accelerate the implementation of ASTGS to ensure agriculture and agribusiness in Kenya is well defined in order to ensure targeted policy formulation.

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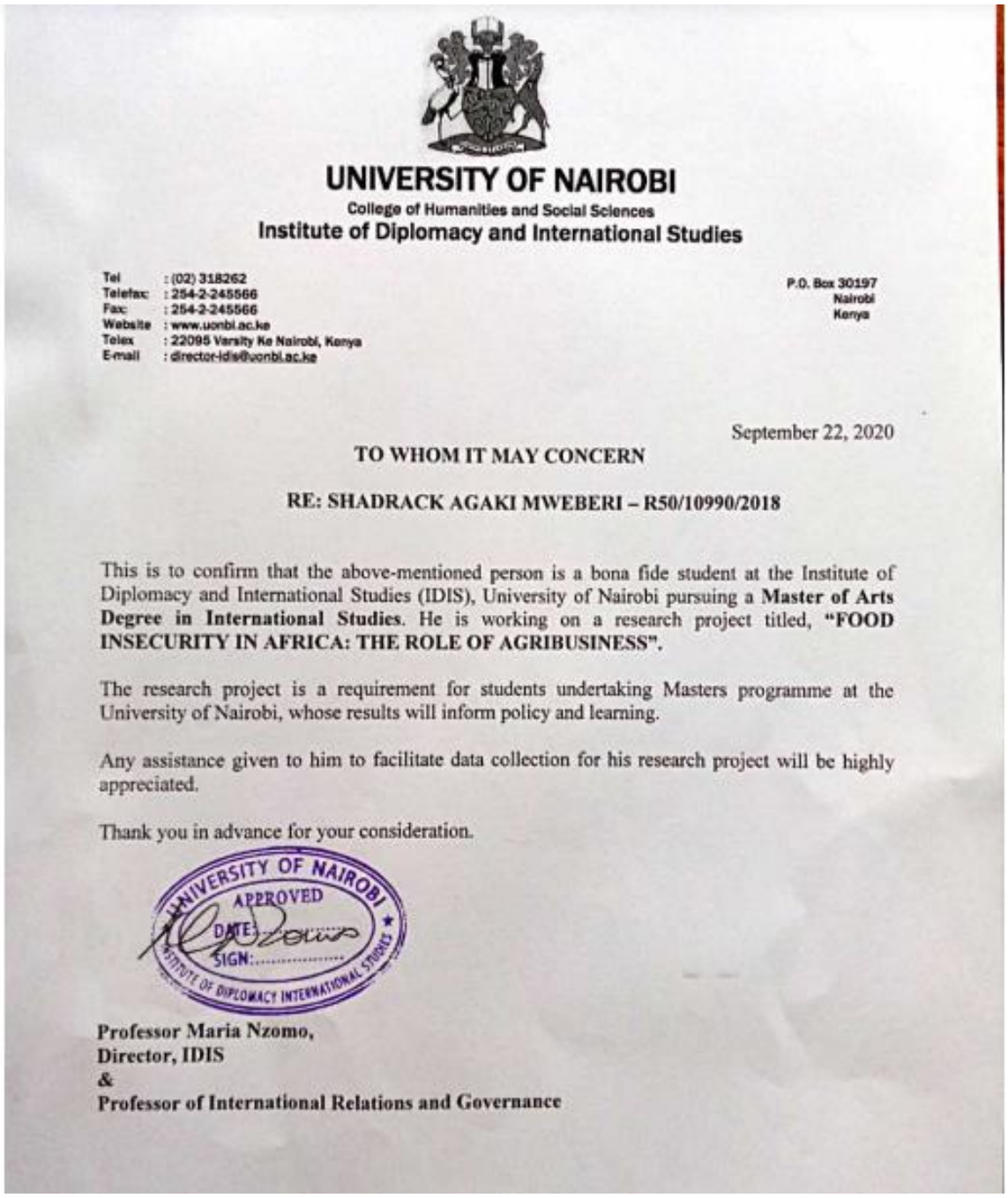
Appendix i: Letter of Introduction



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September 22, 2020

TO WHOM IT MAY CONCERN

RE: SHADRACK AGAKI MWEBERI – R50/10990/2018

This is to confirm that the above-mentioned person is a bona fide student at the Institute of Diplomacy and International Studies (IDIS), University of Nairobi pursuing a **Master of Arts Degree in International Studies**. He is working on a research project titled, **"FOOD INSECURITY IN AFRICA: THE ROLE OF AGRIBUSINESS".**

The research project is a requirement for students undertaking Masters programme at the University of Nairobi, whose results will inform policy and learning.

Any assistance given to him to facilitate data collection for his research project will be highly appreciated.

Thank you in advance for your consideration.

UNIVERSITY OF NAIROBI
APPROVED
DATE:
SIGN:
INSTITUTE OF DIPLOMACY INTERNATIONAL STUDIES

Professor Maria Nzomo,
Director, IDIS
&
Professor of International Relations and Governance

Appendix II: NACOST RESEARCH LICENCE

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION Ref No: 460930 Date of Issue: 15/November/2020 RESEARCH LICENSE This is to Certify that Mr. Shadrack Agaki Mweberi of University of Nairobi, has been licensed to conduct research in Nairobi on the topic: Food Insecurity in Africa: Role of Agribusiness for the period ending: 15/November/2021. License No: BAHAMAS ABS/P/20/7728 460930 Applicant Identification Number Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION NOTE: This is a computer-generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application. Verification QR Code THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 The Grant of Research Licenses is Guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014 CONDITIONS 1. The License is valid for the proposed research, location and specified period 2. The License any rights thereunder are non-transferable 3. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research 4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies 5. The License does not give authority to transfer research materials 6. NACOSTI may monitor and evaluate the licensed research project 7. The Licensee shall submit one hard copy and upload a soft copy of their final report (thesis) within one year of completion of the research 8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice National Commission for Science, Technology and Innovation off Waiyaki Way, Upper Kabete, P. O. Box 30623, 00100 Nairobi, KENYA Land line: 020 4007000, 020 2241349, 020 3310571, 020 8001077 Mobile: 0713 788 787 / 0735 404 245 E-mail: dg@nacosti.go.ke / registry@nacosti.go.ke Website: www.nacosti.go.ke

Appendix III: RESPONDENTS PROFILE

No	NAME	ROLE	DISCRIPTION
1	RES A	FOUNDER AGRIBUSINESS CONSULTANCY	With Five Year Experience Agribusiness Consultancy for International Firms
2	RES B	SENIOR COMMUNICATION OFFICER	International Organization on Biotech Adoption
3	RES C	AGRO-INDUSTRIAL DEAR	In Business for The Last Fifteen Years
4	RES D	CEREAL AND FOOD RETAILOR	With 20 Years in Business Importing Products From Uganda And Tanzania
5	RES E	SENIOR ADVISOR	Ministry of Agriculture
6	RES F	SENIOR RESEACHER	Research Institute In Kenya
7	RES G	YOUTH IN AGRIBUSINESS	Communication And Advocacy With Exhibition, Well-Traveled And Has Attended Several International Conferences
8	RES H	SENIOR OFFICER	Ministry of ICT, Innovation and Youth Affairs
9	RES I	SENIOR RESEARCHER	Agriculture Committee Parliament of Kenya
10	RES J	SENIOR OFFICER	Ministry of Interior and Coordination of National Government
11	RES K	SENIOR OFFICER	Ministry Of ICT Innovation And Youth Affairs
12	RES L	SENIOR OFFICER	Ministry of Agriculture Livestock And Fisheries-Enable The Youth Initiative

Appendix IV: Interview Schedule

Food insecurity in Africa: The Role of Agribusiness

Interview schedule.

The objective of the interview.

I. To examine the role of Agribusiness in food insecurity situation in Africa.
II. To determine the role of digital platform in development of Agribusiness.
III. To evaluate the impact of structural transformation in African agribusiness development.

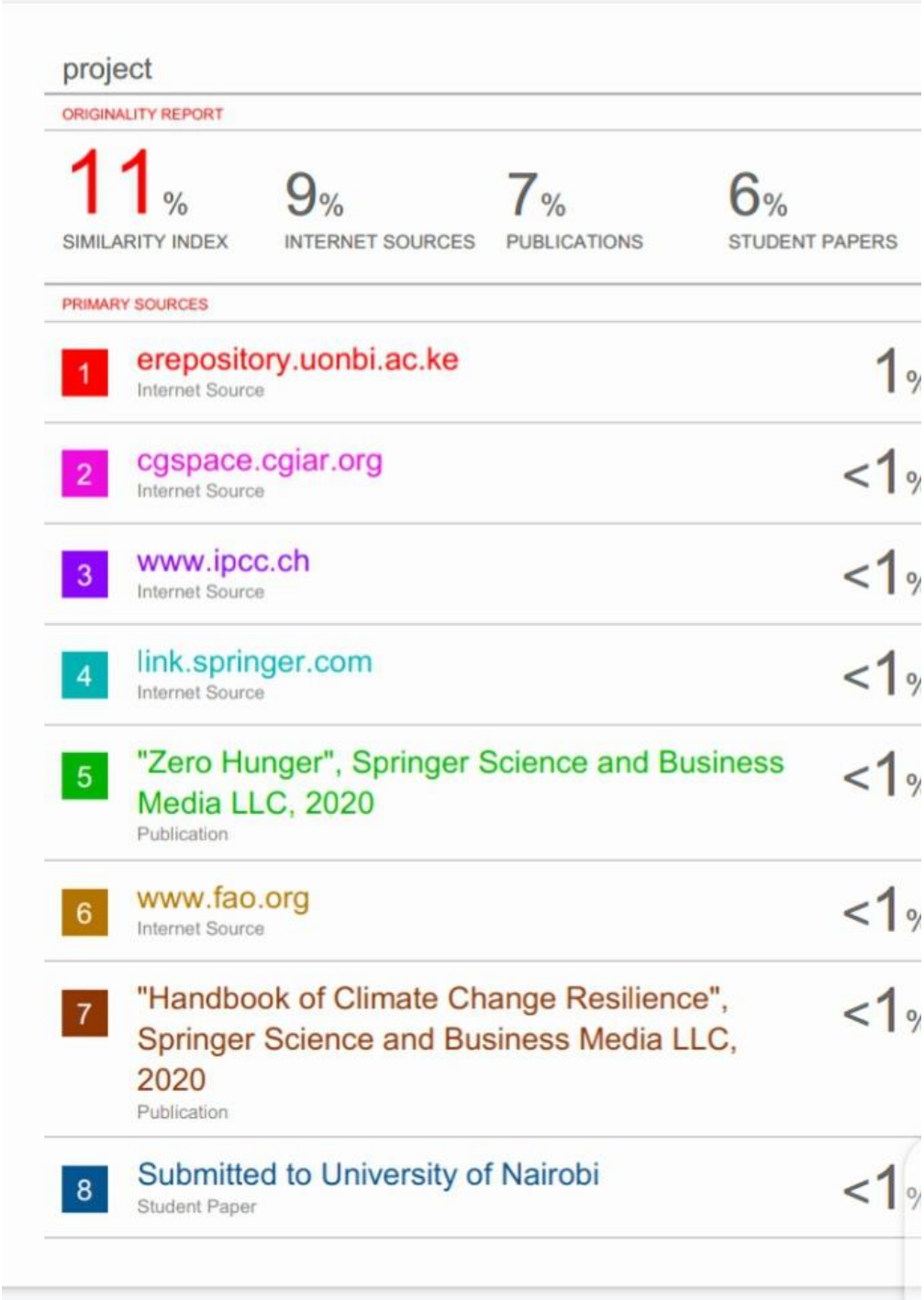
Guiding Questions

1. What is your take on the view that agribusiness is contributing to food insecurity in Africa?
2. Do you think the level of investment in agriculture relates in any way to the view that agribusiness contributes to food insecurity?
3. What is your opinion on smallholder farming participation in agribusiness and how does this impact food security situation?
4. Do you think policies concerning smallholder farmers have a bearing to agribusiness development and food insecurity situation in Africa?
5. Technological infrastructure has a bearing to adoption and use of new technology, what are your thoughts?
6. How do you think digital transformation affects agribusiness development and Food security situation in Africa?
7. Structural transformation, occurs when there is shift of labour from low productive to high productive sectors. Do you think agribusiness could be more productive that agriculture and do you think it can contribute to these changes?
8. How do you think establishment of Digital Economy could help in development of agribusiness?
9. How do you think digital structural transformation will impact agribusiness development and food security in Africa?
10. What policy changes do you think will help make technological innovation impact agribusiness, food security situation and employment?
11. What Role would governments, private sector and other stakeholders play in solving food insecurity challenge in Africa.

Appendix V: Budget for the Research.

No	Item	Cost
1	Transport	10,000
2	Airtime and Internet	8,000
3	Printing and stationary	10,000
4	Miscellaneous	2000
	TOTAL	**30,000**

Appendix VI: Project Quality Report



project

ORIGINALITY REPORT

11%	9%	7%	6%
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