

The Role of Digital Platforms in Bridging Institutional Voids in Financing  
Agriculture: A Nigerian Case Study

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## **List of Abbreviations**

ACCS	Agricultural Credit Support Scheme
ACGSF	Agricultural Credit Guarantee Scheme Fund
ADB	Agricultural Development Bank
AFAN	All Farmers Association of Nigeria
BOA	Bank of Agriculture
BOI	Bank of Industry
CACS	Commercial Agricultural Credit Scheme
CBN	Central Bank Nigeria
CEO	Chief Executive Officer
CTA	The Technical Centre for Agriculture and Rural Cooperation
CTO	Chief Technical Officer
DCIPs	Digital Commodities Investment Platforms
DFI	Development Finance Institutions
DfID	Department for International Development
FAO	Food and Agriculture Organisation
FBN	First Bank of Nigeria
FCMB	First City Monument Bank
FMARD	Federal Ministry of Agriculture and Rural Development
GBP	British Pounds Sterling
GDP	Gross Domestic Product
GSMA	Groupe Speciale Mobile Association
IITA	International Institution for Tropical Agriculture
IMF	International Monetary Fund
LPO	Local Purchase Order
MMM	Mavrodi Mundial Moneybox
MSME	Micro Small and Medium Enterprises
MoU	Memorandum of Understanding
MSMEDF	Micro, Small and Medium Enterprises Development Fund
MTN	Mobile Telephone Network
NARS	National Agricultural Research System
NGO	Non-Governmental Organisations
NIRSAL	Nigeria Incentive Based Risk Sharing System for Agricultural Lending
OBOPS	Osun Broilers Out-growers Poultry Scheme
PAN	Poultry Association of Nigeria
ROI	Returns on Investment
RoSCA	Rotating Savings and Credit Associations
SEC	Securities and Exchange Commission
SMS	Short Messaging Service
UBA	United Bank of Africa

## Abstract

The problems with financing agriculture in Nigeria have stemmed from weak institutional arrangements required to facilitate the effective extension of finance to agricultural value chain actors – especially rural farmers. Several agricultural finance programmes have been rolled-out to bridge gaps in rural agricultural financing. However, these programmes tend to focus mainly on extending finance to more farmers, with less focus on other underlying issues with agricultural financing which this research has identified as manifestations of institutional voids. Institutional voids are often discussed as the existence of frictions in executing market transactions due to intermediation gaps between the demand and supply sides of markets (Ashwin, 2012; Droulliard, 2017; Dho et al., 2017; Heeks et al., 2021). In this thesis, I draw on the seminal work of Khanna and Palepu who conceptualise institutional voids as the absence or weakness of market intermediaries required to perform functions relating to information analysis, transaction facilitation, credibility enhancement, aggregation and distribution, regulations and public policy making, and adjudication (Khanna and Palepu, 1997, 2010). Khanna and Palepu theorise that these intermediating institutions are present in developed country markets but absent or weak in emerging and developing country markets. This research posits that the existence of institutional voids has resulted in the poor financing of Nigerian agriculture, leading to an underdeveloped sector with far-reaching economic impacts. To address the problem of weak and absent intermediaries, digital platforms have emerged to facilitate transactions between the demand and supply sides of agricultural finance markets in Nigeria. One manifestation of this digitisation is the increasing use of digital platforms to crowdsource agricultural finance to fund rural farmers, a fast-growing trend among Nigerian entrepreneurs. This research therefore seeks to identify if and how digital platforms address institutional voids in financing agriculture. The aim is to gain a better understanding of how these platforms can improve the financing of agriculture in Nigeria. The research therefore asks three questions: (i) What are the current problems in financing agriculture in Nigeria and how do they manifest as institutional voids? (ii) How are digital platforms emerging in response to institutional voids in financing agriculture? (iii) What are the implications for agricultural development, which arise due to the use of digital platforms in financing agriculture in Nigeria? To answer these questions, I conducted an in-depth case study of *Thrive Agric.* – an agricultural finance digital platform - to gain understanding of how the platform emerged to respond to agricultural finance needs, how it operates as a digital platform, and whether its operational activities bridge the institutional voids in financing agriculture. The methodological approach of the research is qualitative. Data were collected through semi-structured interviews - both face-to-face and virtual - participant observation, a qualitative survey, trialing the investment process through the platform, and through secondary sources. The research findings show that the digital platform, to some extent, bridges some institutional voids, especially those relating to information analysis, transaction facilitation, aggregation, distribution, credibility enhancement and monitoring. However, in some cases, the digital platform also maintains some institutional voids. This is partly due to its digital nature (digitality); and partly due to the nature of its intermediating arrangements that tends to exclude farmers and investors outside the influence of the platform. The research concludes that although digital platforms have the potential to contribute to agricultural development by bridging institutional voids, currently in Nigeria, their impact is at best on a micro level - isolated and contained within small clusters of farmers, without any significant ripple impacts/effect across the wider rural finance market. Nonetheless, partnerships with large-scale governmental finance schemes could support the scaling out/up of digital finance models to reach larger groups of farmers and thereby producing farther reaching agricultural development impacts.



**Declaration**

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

Bookie Ezeomah

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## **Chapter 1 - Introduction**

### **1.1 Research Rationale, Aims and Questions**

Agriculture remains the primary source of income and livelihood for most Nigerians, employing over 70 percent of the Nigerian population (FAO, 2021). Agriculture contributed to about 30 percent of Nigeria's Gross Domestic Product between 2019 and 2021 (Statista 2021). However, the slow development of the agricultural sector has resulted in widespread poverty among rural farmers with negative implications to Nigeria's economic growth (John and Dankawu, 2018). Although there is great potential for agriculture to contribute to rural development in Nigeria, poor access to agricultural finance by rural farmers is a major constraint to the development of the sector (Okunlola et al., 2019).

Some researchers and development practitioners have blamed the over-dependence on income from crude oil export for the decline in agricultural financing since Nigeria's independence in 1960 (Uzonwanne, 2015). However, the literature provides evidence that ineffective and absent institutions coupled with poor execution of agricultural finance policies are major contributors to poor agricultural financing in Nigeria (Eze et al., 2010; Rafiu and Aminu, 2019). The macro and micro economic implications of agricultural underdevelopment in Nigeria have become even more evident in the face of the global decline in crude oil prices that has exposed the need for a more diversified economy to cushion the effects of price shocks in crude markets (Ogunjimi, 2020). However, despite the increased motivation by the federal government, and private sector, to invest in developing the agricultural sector, without a concerted effort to address institutional barriers constraining the sustainable financing of the sector, these efforts remain undermined (Smith, 2018).

Well-functioning finance systems drive economic development by efficiently aggregating and distributing financial resources while reducing transaction costs (Barreti and Mutambatsere, 2008). Thus, within these well-function financial systems, financial resources are readily available for entrepreneurial activities thereby providing the facilities for businesses to contribute to economic development (Adesoye and Atanda, 2012). In Nigeria, the financial system is made up of institutions which are expected to govern the efficient distribution of financial resources by providing cheap financial services and access to long-term finance for infrastructural, industrial, agricultural, and business development activities (Eze et al., 2010). However, institutional problems within Nigeria's financial system have resulted in failures in performing these primary functions which manifests as poor

intermediation and high cost in financing the development of the country (Adesoye and Atanda, 2012).

Specifically, the problems with financing rural agriculture have been well documented in literature as existing on both the demand and the supply-side of the agricultural finance markets (Ibrahim and Muktar, 2015; Fankun et al., 2017; Ademola, 2019). On the demand-side, farmers face several barriers. First, they face the burden of high transaction cost in accessing finance (both transportation and time costs) and high intermediation cost incurred in paying intermediaries to secure agricultural loans (Njogu et al., 2018; Fadeyi, 2018; Igwe and Egbuson, 2013; Osebeyo and Aye, 2014). Second, there are high costs in accessing information on agricultural finance (Obidike, 2011; Silong and Gadanakis, 2019). Third, they face poor creditworthiness due to the reputation of loan default, absence of farm record and lack of formal collateral evidence (Nwachukwu et al., 2010; Eze et al., 2010). Fourth, they face late disbursement of funds from financial institutions even when farmers qualify for loans (Nwosu et al., 2010; Ijioma and Osundu, 2015). Finally, they face poor contract enforcement between farmers and financiers; and weak regulatory frameworks to govern agricultural finance policy execution (Eze et al., 2010; Olomola, 2018; Orji et al., 2020). Rural farmers also face challenges in repaying agricultural finance due to fluctuating prices in agricultural markets which affect farmers' purchasing power and poor access to profitable markets where farmers can earn higher profits to support loan repayment (Badiru, 2010; Agada et al., 2018; Uduji et al., 2019).

On the supply-side, financial institutions also encounter several problems. These include, first, unprofitability of extending agricultural finance to rural farmers due to the associated high transaction cost in processing small volume agricultural loans (Barreti and Mutambatsere, 2008; Famogbiele, 2013). Second, they lack information to establish farmers' identity and credit behaviour (Ololade and Olagunju, 2013; Mallum, 2016). Third, there is a lack of trust due to a high rate of loan default among rural farmers which has created an aversion to lending to rural farmers (Nwosu et al., 2010; and Ijioma and Osundu, 2015). Fourth, there is lack of formal collateral documentation (Olomola, 2010); and finally, there are challenges in efficiently recovering agricultural loans from rural farmers who tend to be located in remote rural areas (Famogbiele, 2013; Mickiewicz and Olarewaju, 2020).

There have been efforts by the Nigerian government to improve farmers' access to finance by incentivising formal financial institutions to extend loans to farmers through various finance

policies and programmes (Eze et al., 2010). These efforts to improve agricultural finance, discussed in depth in chapter 4, include providing guarantee for loans extended to farmers by commercial banks<sup>1</sup>, single digit interest rates on agricultural loans and enacting the microfinance policy, which facilitated the establishing of microfinance banks in rural areas (Fadeyi 2018). However, these efforts have been undermined because of failures to effectively tackle other underlying institutional problems with financing agriculture in Nigeria which are beyond simply providing more finance options to farmers (Famogbiele, 2013). Therefore, this research adopts the concept of institutional voids (Khanna and Palepu, 2010) as the conceptual lens to identify the institutional problems with financing agriculture in Nigeria and how digital platforms emerge to bridge gaps which arise due to the weakness or absence of actors responsible for intermediating between the providers and the users of agricultural finance in Nigeria. Khanna and Palepu's concept of institutional voids describes six institutions that exists in developed country markets but are absent in emerging and developing markets thereby resulting in inefficiencies in the performance of market functions and slow development of these markets. According to Khanna and Palepu (2010), these institutional voids emerge due to the absence of credibility enhancers, information analysers, transaction facilitators, aggregators and distributors, adjudicators and regulators and public policy.

The research investigates one of the most recent private sector responses to problems in financing agriculture through crowdfunding agricultural finance from individual investors for rural farmers who need agricultural finance. The research posits that digital platforms perform some functions that are like the functions of institutional intermediaries described by Khanna and Palepu. There are currently over 30 agricultural crowdfunding platforms in Nigeria linking agricultural financiers to rural farmers with poor access to finance (Aladejebi, 2020). However, due to the nascence of research on agricultural financing through digital platforms, there is a dearth of empirical evidence to show how these digital platforms for agricultural financing perform these intermediating functions and what implications for agricultural development arise due to the use of digital platforms for financing agriculture. This research therefore bridges this gap by providing primary evidence on how problems with financing agriculture manifest as institutional voids, how platforms are creating alternative sources of formal finance and in so doing, addressing institutional voids in agricultural financing, and what development impact arise due to the use of platforms for

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<sup>1</sup> The Nigerian government will pay up to 75% of the loan in default after financial institutions exhaust all options to recover loans from farmers (Eze et al., 2010)

agricultural financing. To achieve this, the research adopts a single case study of an agricultural finance digital platform called *Thrive Agric.*, which has emerged in an environment characterised by institutional voids, to answer the following specific questions:

- i. What are the current problems in financing agriculture in Nigeria and how do these problems manifest as institutional voids?
- ii. How are digital platforms emerging in response to institutional voids in financing agriculture?
- iii. What are the implications for agricultural development, which arise due to the use of digital platforms in financing agriculture in Nigeria?

This research adopts a single case study primarily due to the nascence of academic research on digital platforms for agricultural finance and the unavailability of platforms willing to participate in the research. The scoping phase of the research revealed that, while in 2018 there were about 20 agri-finance platforms functioning within an emerging digitally enabled agricultural finance space in Nigeria, the newness of the innovation and competition among these platforms created an aversion among most platform owners in granting the researcher access to the platform business, users, and staff. However, the researcher deemed it necessary that a closer contact with these platforms was necessary to gain comprehensive understanding of this innovation in relation to institutional voids and therefore selected the only digital platform business – *Thrive Agric.* – that gave such unreserved access.

The single case study approach proved sufficient in answering the research questions. Research question one was answered using data collected from farmers who have benefitted from agricultural finance sources; from *Thrive Agric.*'s platform owner and users (investors); and triangulated with data from agricultural sector stakeholders and information from academic literature. Research question two and three were answered using data collected from *Thrive Agric.*'s platform owners, platform staff, platform users (investors), beneficiary farmers and stakeholders from the agricultural sector.

## **1.2 Research Contribution**

This research is situated within the evolving research landscape on digital platforms for development (Bonina et al., 2021; Heeks et al., 2021; Nicholson et al., 2021). It brings together three key themes: agricultural financing in Nigeria, digital platforms, and institutional voids. The research specifically contributes to the emerging but nascent

academic research efforts on digital platforms for agricultural development, particularly concerning the use of digital platforms to bridge institutional voids in developing countries (Agyekumhene et al., 2018; Tsan et al., 2019; von Bismarck-Osten, 2021). Therefore, the primary contribution of this research is a contextual understanding of the concept of institutional voids within a developing country's agricultural finance market, which has recently experienced the mainstreaming of digital platforms to facilitate the agricultural financing. The research identified that the problems in agricultural financing arise due to the presence of the six institutional voids described by Khanna and Palepu; these are weakness of credibility enhancers, transaction facilitators, aggregators and distributors, information analysers, regulators and policy and adjudicators. However, the research also found that digital platforms are only able to address four out of the six institutional voids posited by Khanna and Palepu. These are weak: information analysis, transaction facilitation, aggregation and distribution, and credibility enhancement. Primary data also revealed an additional institutional void which is not among those described by Khanna and Palepu, but which exists in agricultural finance markets in Nigeria. This void is the weakness of *monitoring agents* required to follow-up with agricultural finance beneficiaries to ensure finance is being utilised for agricultural purposes and to facilitate loan repayment.

Secondly, the research is among initial efforts to provide an understanding of the emerging digital agricultural finance space in Nigeria. Through a mapping exercise, this research has identified and described the institutions and stakeholders that support agricultural financing through digital platforms. While some of these institutions and stakeholders' function within the agricultural sector pre-platform emergence, others functioned within other non-agricultural sectors but are now part of the agro-digital space due to the use of digital platforms. Thirdly, this research contributes primary data that supports previous academic debates on the issues of agricultural financing in Nigeria, by identifying problems on the demand and supply side of the agricultural finance markets. Finally, this research is valuable to new and existing agricultural finance digital platforms in Nigeria especially those with a focus on agricultural development. Through this research, new and existing agricultural finance platforms can strategically align their functions to fill these institutional voids thereby making their platforms indispensable in efforts to improve agricultural financing and agricultural development in Nigeria.

Although a single case study research is criticised for its lack of generalisability (Zainal, 2007), this research argues that due to the dearth of academic research that applies the



concept of institutional voids to research on digital platforms for financing agriculture in a developing country context, the in-depth approach provided by a single case study still supports the research's contribution to theory. It, furthermore, lays the foundation for future research on the wider role of digital platforms as institutional intermediaries in financing agriculture within other developing country context.

### **1.3 Thesis Structure**

The subsequent chapters are structured as follows:

Chapter 2 maps out the research landscape on the sources of agricultural finance and problems with financing agriculture in Nigeria; identifies digital platforms used to facilitate agricultural financing (broadly) in sub-Saharan Africa. This chapter also presents the research's conceptualisation of institutional voids in agricultural financing.

Chapter 3 presents the research methodology outlining the research strategy and justification for adopting a single case study. The chapter also describes the fieldwork structure, choice of data collection methods and describes the strategy for data analysis. The chapter concludes with outlining the ethical considerations of the research.

Chapter 4 is the first empirical chapter and seeks to contextualise institutional voids in financing agriculture in Nigeria by providing primary data on agricultural finance problems.

Chapter 5 is the second empirical chapter. It focuses on the research case study, *Thrive Agric.*, to describe the emergence of digital platforms for agricultural financing in Nigeria. In this chapter, the institutional setting and stakeholder map of the emerging digitally enabled agricultural finance space is also presented. Finally, primary data is presented on how *Thrive Agric.* attempts to address problems with financing agriculture (as outlined in chapter 4).

Chapter 6 discusses the research's key findings in light of data presented in chapters 4 and 5 and answers research questions one and two. The chapter then uses Khanna and Palepu's conceptual lens on institutional voids to discuss the manifestations of agricultural finance problems as institutional voids. This is followed by a discussion on *Thrive Agric.*'s intermediating functions and their attempt to address institutional voids in agricultural financing. The chapter concludes with revisiting the research's initial conceptualisation of institutional voids as drawn from Khanna and Palepu to examine the extent to which Khanna and Palepu's conceptualisation of institutional voids and description of the functions of

institutional intermediaries illustrate the contextual realities of institutional voids and intermediaries in Nigeria's agricultural finance market.

Chapter 7 answers research question three which seeks to understand the implication for development which arise due to the use of digital platforms for addressing institutional voids in agricultural finance. The chapter also summarises the research findings and contributions, concluding with recommendations to emerging agricultural finance digital platforms in Nigeria.

## Chapter 2 – Literature Review and Conceptual Framework

### 2.1 Institutions and Agricultural Development in Sub-Saharan Africa

Agriculture is a key contributor to the rural economy in sub-Saharan Africa; providing employment and sustenance for most of its population (Davis et al., 2017). On a macro level, agriculture contributes over 35% of Gross Domestic Product (GDP) and serves as a source of foreign exchange earnings in the region (Dorward et al., 2009; World Bank, 2019). Despite its proven pivotal role in driving economic growth, the agricultural sector in most sub-Saharan countries remains underdeveloped despite national and international efforts to improve the sector (Dorward et al., 2009; Nchuchuwe, and Adejuwon, 2012).

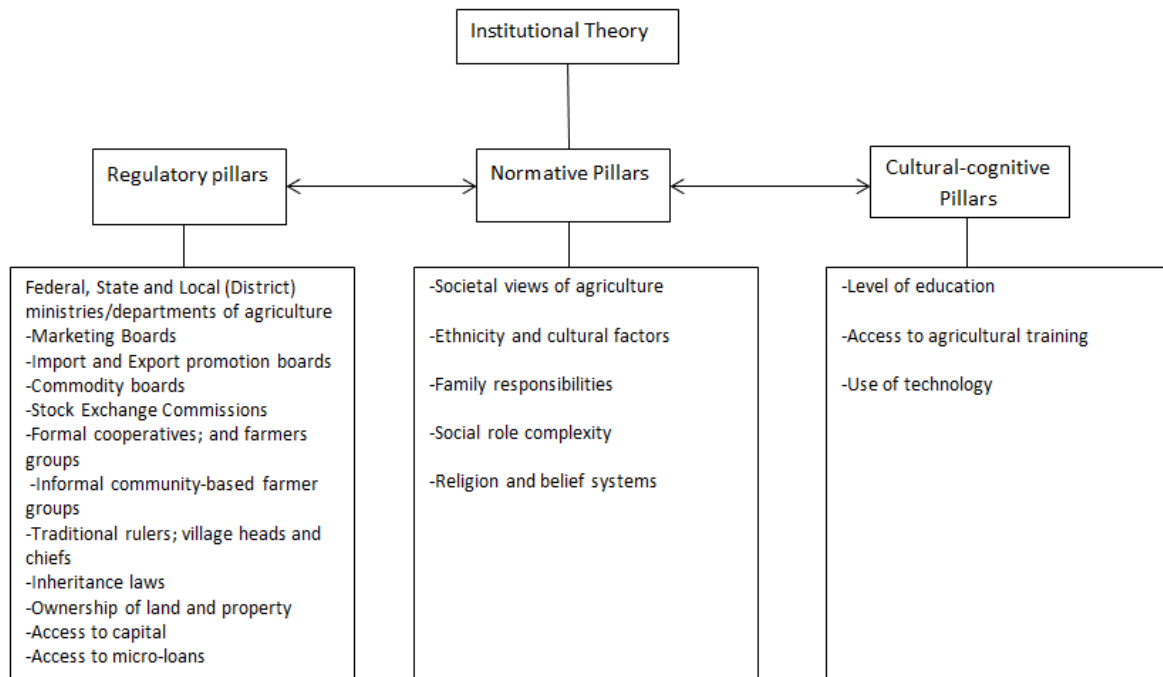
Some of the issues which constrain agricultural development in sub-Saharan Africa include: the low national budgetary allocation to the sector compared to other economic sectors (Adofu et al., 2012); low level of technology adoption by rural farmers (Ogunlela and Mukhtar, 2009); poor rural infrastructure (Olayiwola and Adeleye, 2005); absence of reliable input and output markets (Barreti and Mutambatsere, 2008); poor implementation of agricultural development policies and state-led development programmes (Dorward et al., 2004); political instability and conflict (Kimenyi, 2014); corruption and misappropriation of funds allocated to the sector (Awojobi, 2014); and mis-match between the design of development projects and local realities of target communities (Ika and Saint-Macary, 2014; Heeks, 2003). Broadly speaking, the primary cause of these problems has been attributed to failure and absence of effective institutional arrangements which are necessary to drive agricultural development across the region (Barreti and Mutambatsere, 2008; Dorward et al., 2009; Nchuchuwe and Adejuwon, 2012).

Due to their pivotal role in charting the course of development (North, 1990), *institutions* cannot be separated from discussions on agricultural development in sub-Saharan Africa (Barreti and Mutambatsere, 2008). Institutions are man-made (formal and informal) structures and activities which govern human interaction (North, 1990). They therefore exist in all social systems to prescribe the rules of behaviour and codes of conduct which serve as a roadmap for attaining the development goals of a group (North 1990). This is because institutions are highly resilient social structures which persist over time such that they become taken-for-granted (Scott, 2001). Institutions govern the social, political, and

economic interactions of a group through *regulative*, *normative*, and *cultural-cognitive pillars* (Scott, 2001) (Figure 1).

**Fig 1: A Broad Overview of Institutions Governing Agriculture in sub-Saharan Africa**

Source: Adapted from Amine and Staub (2009)



The *regulative* pillar of institutions outlines the rules and regulations which govern human behaviour and enforces sanctions in cases of default; the *normative* pillar comprises of the values, goals and objectives which outline the roles and responsibilities of group members and defines their rights and privileges; while the *cultural-cognitive* pillar embodies a groups’ shared beliefs and collective view of the world (DiMaggio and Powell, 1991; Scott, 1995; Scott, 2001). Despite this generalised understanding of institutional pillars, institutions should however be understood within the specific geographical and organisational contexts in which they are embedded (Busenitz et al., 2000).

### 2.1.1 Regulative Institutions in Agriculture

Regulative institutions comprise of the formal and informal structures and organisations responsible for the formulation and enforcement of policies and legislature which govern the behaviour of actors within the agricultural sector (de la Torre-Castro and Lindstrom, 2010; Dorward et al., 2009). Regulative institutions governing agriculture in sub-Saharan Africa include: the federal government through federal, state and local government ministries of

agriculture and parastatal which are tasked to implement agricultural development policies and programmes; organisations responsible for the enforcement of property rights and contracts; marketing boards which regulate commodity prices; cooperatives and farmers' associations; and informal local farming groups; international organisations such as the International Monetary Fund (IMF), United Nations, World Bank; and the African Development Bank; as well as international regulatory standards such as GlobalGAP (Barreti and Mutambatsere, 2008).

In sub-Saharan Africa, regulative institutions have been responsible for developing and executing policies and programmes which claim to prioritise agricultural development in the region (Dorward et al., 2009). However, the weakness and failures of these regulative institutions in sub-Saharan Africa has contributed to the current state of underdevelopment of agriculture in sub-Saharan Africa (Barreti and Mutambatsere, 2008). For instance, regulative policies in the 1980/90s which enforced Structural Adjustment Programmes (SAP) across sub-Saharan Africa which entailed: the devaluation of currency; reduction of government influence on agricultural markets; elimination of government subsidies on agricultural inputs; and trade liberalisation to the detriment of rural farmers (Riddell, 1992). The SAP resulted in higher price of inputs and commodities in agricultural markets; information asymmetries due to the abolition of market boards, and the removal of farmers' safety nets such as government absorption of excess outputs to control prices fluctuation (Barreti and Mutambatsere, 2008)

Although regulative policies such as SAP aimed at driving the economic growth of indebted countries, it failed to deliver the expected developmental outcome of intensifying agricultural production and improving market efficiencies (Duncan and Howell, 1992). This has been mainly due to failures to develop competitive and reliable markets for agricultural inputs, outputs and finance which are prerequisites for agricultural production and disposal of final products (Dorward et al., 2009). As regulative institutions often possess the economic, social and political control over productive resources, failures of regulative institutions often have far-reaching implications to national economies with even more dire outcomes for the rural poor who are less resilient to institutional failures (Barreti and Mutambatsere, 2008).

### **2.1.2 Normative Institutions in Agriculture**

The adherence to normative institutions by target beneficiaries of agricultural development initiatives has been cited as one of the reasons for the low level of innovation adoption among

farmers in sub-Saharan Africa (Hounkonnou et al., 2012). Normative institutions are those morally binding social expectations which reflect the values and objectives of a group (de la Torre-Castro and Lindstrom, 2010). While regulative institutions enforce compliance through rule of law and coercion, compliance to normative institutions is based on the individual's morals and their conformity to the shared behavioural standards of the group (Scott, 2001).

Agricultural production in sub-Saharan Africa is still largely concentrated in rural societies where traditional, social and religious norms permeate all aspects of human life (Nchuchuwe, and Adejuwon, 2012). These traditional normative institutions influence decision-making processes of individuals; agricultural innovation diffusion; and how farmers engage with agricultural development initiatives (Meijer et al., 2015). For instance, research carried out by Njuguna et al. (2016) on women's participation in chickpea training in some communities in Ethiopia revealed that restrictions imposed on the free movement of female members of these communities resulted in the exemption of women from agricultural training activities. This was even though females required this training more than males because they performed most of the farm activities in chickpea production.

Aside from the exclusion of certain groups from access to agricultural technologies, other research carried out by Ndjeunga and Bantilan (2005); Meijer et al. (2015) and Ogunlela and Muktar (2009) support theories of the influence of norms and values on the decision-making processes of farmers when faced with adopting new agricultural innovation sub-Saharan Africa. Agricultural development efforts therefore need to take account the implication of these institutional arrangements in formulating and executing agricultural development initiatives (Adekunle, 2013).

### **2.1.3 Cultural Cognitive Pillars in Agriculture**

Cultural-cognitive pillars are those socially constructed and taken-for-granted institutions such as shared beliefs which shape the identity of a group (Scott, 2001). They are the *logics of action* through which actors justify their behaviour and make sense of the world.

Therefore, they are elements which are not questioned because they are regarded as true and common-sense (de la Torre-Castro and Lindstrom, 2010). Just like normative institutions, cultural-cognitive institutions significantly influence agricultural development efforts in sub-Saharan Africa because they guide behavior patterns, actions and reactions to innovation and changes within the agricultural system (Njuguna et al., 2016). In fact, because most agrarian

societies are in the rural margins in sub-Saharan Africa, cultural-cognitive social institutions relating to ethnicity, gender, age and natural resource management tend to influence the practice and development of agriculture (de la Torre-Castro and Lindstrom, 2010). For instance, research on agricultural credit schemes for smallholder farmers in Nigeria found that late disbursement of funds was one of the significant reasons for the high rate of loan default among rural farmers. It was a generally accepted perception that loans from government is ‘*free money*’ which farmers take as their ‘*share of the national cake*’ (Nwosu et al., 2010). As a result, defaulting on loan repayment is justified by the notion that it was their right to receive money from the government; and that the government is corrupt and unaccountable, meaning they did not have to be accountable to the government (Olaitan, 2008; Nwosu et al., 2010).

New agricultural initiatives which might not align with cultural-cognitive institutions such as indigenous agricultural knowledge tend to receive push-back when introduced as development initiatives (de la Torre-Castro and Lindstrom, 2010). For instance, the integration of Zanzibar’s fisheries into global value chains resulted in the introduction of drag-net fishing which is in opposition to the prevailing *dema*<sup>2</sup> fishing model – an informal traditional sea-tenure system which has been passed on for many generations. While drag-net fishing yields higher incomes for fishermen, this has resulted in conflicts which have had broader negative impacts on these fishing communities (de la Torre-Castro and Lindstrom, 2010). Table 1 is a summary of agricultural institutions and their influence on agricultural development in sub-Saharan Africa.

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<sup>2</sup> Model for traditional fishing (with basket-traps) used in artisanal fisheries in Zanzibar, Tanzania (de la Torre-Castro and Lindstrom, 2010).

**Table 1: Institutional Perspective of Agricultural Development**

*Source: Adapted from Scott (2003); Amine and Staub (2009); Barreti and Mutambatsere, 2008; Nchuchuwe, and Adejuwon, 2012*

	<b>Definition</b>	<b>Institutional Forms (Formal/Informal)</b>	<b>Influence on Agricultural Development</b>
<b>Regulative Institutions</b>	Rules, regulations, and legislature with a coercive model of sanctioning	<ul style="list-style-type: none"> <li>-Federal, state and local (district) ministries/departments of agriculture</li> <li>-Marketing boards</li> <li>-Import and export promotion boards</li> <li>-Commodity boards</li> <li>-Stock exchange commissions</li> <li>-formal cooperatives; and farmer groups</li> <li>-Informal community-based farmer groups</li> <li>-Traditional rulers; village heads and chiefs</li> <li>-Inheritance laws</li> <li>-Ownership of land and property</li> <li>-Access to capital</li> <li>-Access to micro-loans</li> </ul>	<ul style="list-style-type: none"> <li>-Legislature determines budgetary allocation to agricultural sectors.</li> <li>-Trade policies influence farmers' participation in local international value chains.</li> <li>-Agricultural finance policies de-re-risking bank loans to rural agriculture</li> <li>-Discriminatory distribution of productive resources such as land, finance and training based on gender.</li> </ul>
<b>Normative Institutions</b>	Morally binding values and expectations	<ul style="list-style-type: none"> <li>-Societal views of agriculture</li> <li>-Ethnicity and cultural factors</li> <li>-Family responsibilities</li> <li>-Social role complexity</li> <li>-Religion and belief systems</li> </ul>	<ul style="list-style-type: none"> <li>-Agriculture is embedded in multiple institutions (social, economic, religious, traditional)</li> <li>-Role goes beyond the provision of food and income; therefore 'development' tends to mean different things to different groups</li> <li>-Social roles, responsibilities and religious beliefs determine inclusion and exclusion from development initiatives.</li> </ul>
<b>Cultural-cognitive Institutions</b>	Taken-for-granted beliefs and shared understanding; logics of actions which justify behaviour patterns	<ul style="list-style-type: none"> <li>-Level of education</li> <li>-Access to agricultural training</li> <li>-Use of technology</li> <li>-Indigenous knowledge and farming practices</li> </ul>	<ul style="list-style-type: none"> <li>-Prevailing mind-sets and common-sense beliefs which negatively impact development efforts such as intentional loan default by rural farmers and side-selling of input finance.</li> </ul>



Therefore, given the importance of institutions, it is no wonder that the failures or absence of institutions results in issues which truncate development. It has been argued that the underdevelopment of most developing country agricultural systems is not due to the absence of institutions but failures of these institutions to efficiently perform their mandated functions which should drive economic growth (Eze et al., 2010; Famogbiele, 2013; Khanna and Palepu, 2005). The subsequent section provides an overview of agriculture in Nigeria outline the institutional makeup of the agricultural sector while section 2.3 goes further to discuss the problems with agricultural development which arise due to weak/absent institutions.

## **2.2 An Overview of Agriculture in Nigeria**

Agriculture is a major contributor to Nigeria's economy employing over 70 per cent of the rural population (Rahji and Fakayode 2009). Nigeria has a total land mass of about 91 million hectares of which 25 million hectares are cultivated by smallholder farmers (AfDB, 2005). Before the discovery of crude oil in 1958, agriculture was the major source of foreign exchange and the main contributor to the Gross Domestic Product (GDP) (Folawewo and Olakojo, 2010). Post-independence, between 1960 and 1969, agriculture contributed up to 54 per cent of GDP and accounted for 46 per cent of total exports (PWC, 2017). Even by 1970 (post-colonial era) agriculture still contributed up to 42 per cent of the GDP (see: Table 2) (WDI, 2020). However, high foreign earnings generated from increasing crude oil exploration and export resulted in a decline in government investment in the agricultural sector (Okotie, 2018).

Consequently, the discovery of crude oil therefore has a positive correlation to decline in agriculture's contribution to the GDP, and the reduction in foreign exchange earnings from agriculture (Folawewo and Olakojo, 2010). This is evidenced in the decline in agriculture's contribution to GDP from the 1960's figures, to an average of about 21% in the past 10 years (Table 2). The macro and microeconomic implications of the slow development of agriculture in Nigeria is more evident in this dispensation due to decline in global crude oil prices (Ogunjimi, 2020). Despite the increased motivation by government and the private sector to develop rural farmers and the entire agricultural sector, several barriers constrain the development of the sector (Sekumade, 2009; Smith, 2018).

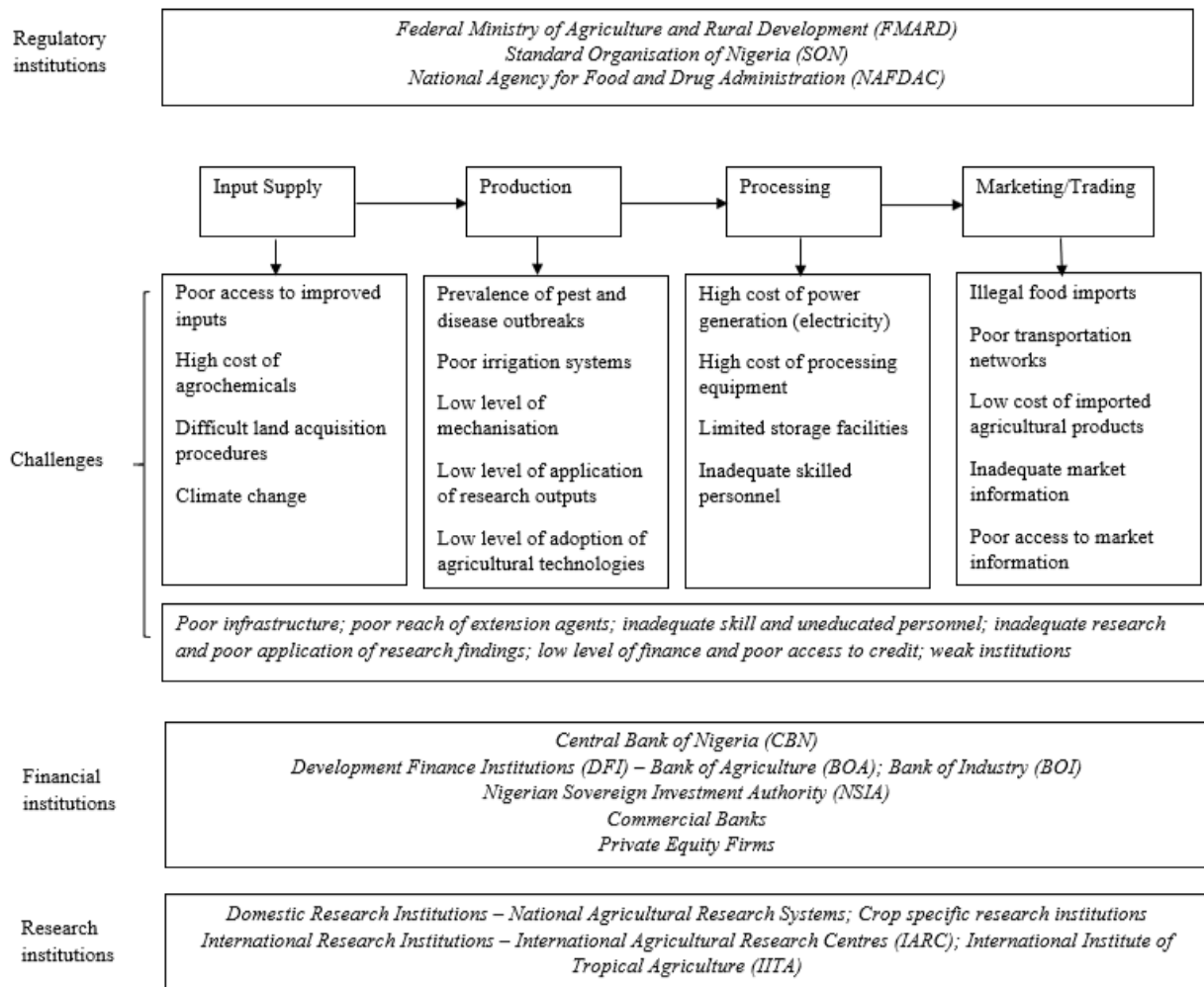
**Table 2: Performance Indicator of Nigeria’s Agriculture from 2000 to 2020**

*(Source: World Development Indicators, 2020)*

<b>Year</b>	<b>Contribution to GDP (%)</b>
1960-1969	54.0
1970	42.7
2018	21.2
2019	21.8
2020	24.1

Agriculture in Nigeria is mainly practiced on a subsistence level in rural areas on less than one hectare of farmland (FAO, 2020). This small-scale farming model is underscored by low adoption of improved farming technologies such as improved inputs, mechanisation, irrigation, and improved farming techniques (Apata et al., 2010). Beyond the production stage, the entire value chain is riddled with problems relating to poor finance for infrastructural development, poor access to finance for value addition activities, low profit markets and lack of information (FAO, 2020). Therefore, although Nigeria has the capacity to produce enough food to feed its teeming population; provide raw materials for local industries; and produce for export, the country remains dependent on the importation of basic staples to support domestic food consumption and provide inputs for processing industries (Badiru, 2010). Figure 2 provides a value chain illustration of the challenges of agriculture and institutional mapping of Nigeria’s agriculture sector.

**Fig 2: A Value Chain Approach to Mapping Nigeria’s Agricultural Sector**  
 (Source: Adapted from PwC, 2017)



**Regulatory Institutions:** The Nigerian government regulates the agricultural sector through Federal and State Ministries of Agriculture and Rural Development (FMARD) (Osabohien et al., 2019). The regulatory role of these institutions in Nigeria’s agricultural development has been that of driving the structural development of the sector through the execution of agricultural development policies and programmes to improve agricultural productivity and the contribution of agriculture to the nations development (Olomu et al., 2020). However, gaps in delivering credit, information, and infrastructural services across agricultural value chains continue to undermine the effectiveness of policy execution, resulting in large-scale failures of agricultural development programmes (Raheem and Bako, 2014). As a result, and despite the consensus that agriculture could drive the economic growth of Nigeria, the weakness of regulatory institutions has resulted in poor enforcement of policies. These policies should facilitate: rural farmers’ access to formal sources of agricultural finance; the linkage of farmers to input and output markets; infrastructural development in rural areas;

increased farm mechanisation; effective adoption of agricultural research and innovations; and improvements in farmers' competitiveness in local and international markets (Eze et al., 2010; Osabohien et al., 2019; Olomu et al., 2020). Moreover, the continuous misappropriation and diversion of agricultural development funds to non-agricultural ventures by corrupt politicians reveals a weakness in the monitoring of public funds usage by office holders (Oluleye and Toba, 2018).

**Research Institutions:** Nigeria's agricultural sector is supported by both national and international research institutions that contribute research outputs required to guide the mainstreaming technology and innovation into rural agriculture (Rex, 2013). It is expected that agricultural development efforts should be informed and directed by targeted research to bring about progressive modification of traditional methods of agricultural practice that will catalyse rural agricultural development (Ogunlela and Ogungbile, 2006). However, Nigeria's national agricultural research system (NARS) has been underscored by instabilities in policy and funding alongside political and institutional instabilities that emerged since the colonial regime (Idachaba, 2019).

Institutional instability in the NARS has been attributed to the dismantling and restructuring of institutional arrangements often accompanied by new political regimes which seek to initiate new policies and governance structures within the NARS resulting in lack of continuity of funding for ongoing research and in some cases, resulting in the duplication of some institutional functions (Idachaba, 2019). Moreover, the role of research in agricultural development in Nigeria is still not appreciated as a key driver for development especially when compared with other developed economies where agriculture is a major contributor to national economy (for instance Brazil) (Ajoni et al., 2017).

Although there has been progressive increase in agricultural research funding by the government compared to the mid-1990s (Flaherty et al., 2019), research output dissemination is still a major challenge in Nigeria's agricultural development (Sani et al., 2014). It has been reported that there is a myriad of agricultural innovation and technologies resulting from agricultural research but there is a breakdown in the translation of research outputs to actual success on the ground due to poor extension service delivery in rural Nigeria (Ironkwe et al., 2020). Consequently, despite investment in research for agricultural development, the sector remains underdevelopment due to failures of the NARS to bring about effective linkages between research and development (Idachaba, 2019).

**Financial Institutions:** The Central Bank of Nigeria (CBN) governs financial institutions within the agricultural sector (CBN, 2020a). The CBN controls the activities the Bank of Agriculture (BOA), the Bank of Industry (BOI), and other commercial banks (including microfinance banks) that have interest in financing agricultural development (Eze et al., 2010; Fadeyi, 2018). The poor financing of agriculture in Nigeria already portrays the weakness of financial institutions in providing financial services across agricultural value chains, especially to rural farmers who constitute the largest group of actors in this space and who perform the most vital function of agricultural production (Nwosu et al., 2010; Olowa and Olowa, 2011). Due to the focus of the research on agricultural finance problems, understanding how agriculture is financed and identifying institutional barriers in financing agriculture in Nigeria is the focus of this chapter and will be discussed in subsequent sub-sections.

### **2.3 Financing Agriculture in Nigeria**

The agriculture finance market in Nigeria provides a platform for exchange of capital between lenders and borrowers (Oniyishi et al., 2015). It consists of intermediating institutions that are responsible for aggregating and distributing agricultural finance (Eze et al., 2010). The agricultural finance market functions within the boundaries of regulative frameworks that govern the mechanism for the exchange of agricultural capital (Olowa and Olowa, 2011). These institutional mechanisms outline the procedures for accessing, disbursing, utilising, and repaying agricultural finance and determine the rules for actors' participation in the market (Adesoye and Atanda, 2012). In Nigeria, agricultural finance can be accessed through formal and informal sources both of which are governed by distinct institutional arrangements (Badiru, 2010). The bulk of formal agricultural finance available to Nigerian farmers comes from public sector channels governed by policy frameworks enacted by the federal government (Olaitan, 2008). These policies ensure the flow of micro and macro finance to small, medium, and large-scale agricultural producers and agricultural infrastructural development with the overall aim of developing the sector (Eze et al., 2010; Adesoye and Atanda, 2012).

Formal finance sources include the Central Bank of Nigeria; international and government institutions of development finance; commercial banks (and microfinance banks); agricultural cooperatives; and input finance contractual agreements. Informal finance sources include local and commercial moneylenders; rotating savings and credit associations (RoSCA); social

networks (family and friends); and personal savings (Badiru, 2015). It should also be noted that agricultural finance could be disbursed either as *cash finance* or as *input finance*. Cash finance as the name implies is agricultural finance disbursed in the form of cash transfers to credit beneficiaries (Gbandi and Amissah, 2014). However, with input financing, no cash is extended but cash is used by the financial institution to purchase the required inputs for farmers. The choice between disbursing agricultural finance as input or cash finance depends on the nature of the finance institutions and aim of its agricultural finance programme or scheme.

### **2.3.1 Formal Institutions Financing Agriculture in Nigeria**

Formal sources of agricultural finance are those that are enacted through government policy and governed by rule of law (Atieno, 2010). These formal finance institutions could be commercial banks, which provide credit facilities to businesses across several productive sectors, or those that are established through government policy with the specific mandate to provide small, medium, and large-scale finance to agribusiness in Nigeria (Eze et al., 2010). They include finance programmes funded by the Central Bank of Nigeria (CBN); International and national development finance institutions; commercial banks (including micro-finance banks) and agricultural cooperatives (Olaitan, 2008). These agricultural finance institutions extend finance through several programmes and schemes that outline the boundaries, terms, and conditions for accessing, disbursing, and repaying agricultural finance (Eze et al., 2010; Fadeyi, 2018).

#### ***Finance Programmes Funded by the Central Bank of Nigeria (CBN)***

The Central Bank of Nigeria is the regulatory financial institution that oversees the nation's financial system by governing the activities of all financial institutions in the country (CBN, 2020a). Table 3 summarises current agricultural finance programmes funded by the CBN. The Central Bank of Nigeria provides development finance through five key agricultural development programmes.

**Table 3: Summary of Ongoing Finance Schemes Funded by the CBN***(Source: CBN, 2020b)*

<b>Finance Scheme</b>	<b>Type of finance</b>	<b>Description</b>
Agricultural Credit Guarantee Scheme Fund (ACGSF) - 1978	Cash finance	The scheme targets smallholder farmers in need of micro loans and is executed by the Central Bank of Nigeria in partnership with commercial banks. The CBN guarantees these loans by offering commercial banks 75 per cent of the total default amount unpaid by farmers
Agricultural Credit Support Scheme (ACSS), 2006 till date.	Cash Finance	Set up with contribution from CBN and commercial banks to support high investment agricultural projects. It is a low interest rate loan to rural agriculture with interest rate set at 14 per cent, the CBN absorbs 8 per cent while the borrower pays at a rate of 6 per cent
Commercial Agricultural Credit Scheme (CACS) - 2009	Cash finance	Set up by the CBN in partnership with the FMARD to provide credit for agricultural value chain activities to the tune of 200 billion Naira (3,647,144.13 GBP)
Refinancing and Redefining Scheme - 2002	Cash Finance	Set up to incentivise commercial banks to lend medium and large-scale credit to the agricultural sector. The fund provides credit to banks with most of their cash tied down in medium and large loans.
Nigeria Incentive Based Risk Sharing System for Agricultural Lending (NIRSAL) - 2010	Value chain finance scheme - Input finance	Another scheme developed to de-risk agricultural lending through a risk sharing facility between the CBN and commercial banks. This scheme is focused on providing credit for investment in six value chains: cassava, tomatoes, rice, maize, soybeans, and cotton.
Micro, Small and Medium Enterprises Development Fund (MSMEDF) - 2013	Cash finance	Provide low interest (9%) loans for Micro and Small and Medium Enterprises through participating financial institution (PFIs) which could be banks or non-bank financial institutions

These finance programmes are aimed at encouraging lending to the agricultural sector that is considered a high-risk sector by most financial institutions (Eze et al., 2010). Therefore, in addition to these schemes, the CBN also regulates the activities of all banks. This is to ensure agriculture is part of their annual lending portfolio and to impose sanctions on banks who do not comply with CBN's directive to lend to agriculture (Olubiyo and Hill, 2003).

### ***Development Finance Institutions (DFIs)***

Development finance institutions (DFIs) are established to bridge gaps in finance markets that emerge in the absence of institutions to finance development activities in the country (Adesoye and Atanda, 2012). Development financing of agricultural production provides the

mechanism for de-risking lending to the sector by providing guarantee loans and low-cost credit with more lenient borrowing terms and conditions (Sanusi, 2012; CBN 2020b). These institutions are especially important in financial systems that have failed to provide finance for those development investments which tend to be long-term with no immediate financial returns, but which provide broader benefits to the nation's development (Adesoye and Atanda, 2012). The aim of DFIs to drive economic growth is evident in the 'project-approach' model of processing and extending credit that pays more attention to the viability of the project to be financed, as opposed to the collateral-approach model, adopted by commercial banks, which focuses on the value of collateral being provided to de-risk the loan (Atieno, 2010).

Both national and international development finance institutions operate in Nigeria. National Development Finance Institutions include the Bank of Agriculture (BOA) and Bank of Industry (BOI); while international development finance institutions include the World Bank; and Africa Development Bank (ADB), Department for International Development (DfID), United States International Development (USAID); International Fund for Agricultural Development (IFAD). These institutions, their functions, and the illustrations of their development finance programmes, are presented in Table 4 below.



**Table 4: Development Finance Institutions Extending Finance for Agriculture in Nigeria**

*(Sources: AfDB, 2005, 2020; BOA, 2020; BOI, 2020; World Bank, 2020)*

<b>Name of DFI</b>	<b>National/International DFI</b>	<b>Examples of development Finance Offerings</b>
Bank of Agriculture (BoA) formerly NACRAB	National	Youth Agricultural Revolution in Nigeria (YARN); Grow and Earn More (GEM); Cooperative Family Feeding Programme (CFFP)
Bank of Industry (BOI)	National	Federal Government Managed Funds for cassava bread production; MSME; National programme on food security; Rice and cassava intervention; Sugar development council
Central Bank of Nigeria (CBN)	National	Agricultural Credit Guarantee Scheme Fund (ACGSF); Interest Drawback Programme (IDP); Commercial Agricultural Credit Scheme (CACS); Nigeria Incentive Based Risk Sharing System for Agricultural Lending (NIRSAL); Micro Small and Medium Enterprises Development Fund (MSMEDF).
Africa Development Bank (AfDB)	International	Launched a \$500 million project for the implementation of special agro industrialised processing zones (SAPZ) in Nigeria in February 2020
Department for International Development (DfID)	International	Promoting Pro-Poor Opportunities from Commodities and Service Markets Projects
World Bank	International	Contributed 67.5 million USD to financing the national fadama Phase 1 from 1991 to 1994 and the community-based poverty reduction programme; Funds the commercial Agricultural Development Project for oil palm, cocoa, fruit trees, poultry, aquaculture and dairy, maize, and rice value chains.
United States International Development (USAID)	International	Contributed 800,000 USD to the National Rural Sectors Enhancement Programme
International Fund for Agricultural Development (IFAD)	International	Contributed 30 million USD to the Federal Government's Rural Development Strategy in 2002; also contributed 42 Million USD to the Special Programme for Food Security executed with

Due to the high-risk nature of agricultural production in Nigeria, development finance accounts for the largest pool of agricultural finance available for agricultural activities and often guaranteed by the government (Eze et al., 2010). Also, national DFIs provide finance at lower interest rates because they are government (national and international) supported institutions set-up with the primary aim to financing activities which will bring about economic development, as a result, profit making is not the primary goal of development finance institutions (Adesoye and Atanda, 2012). However, the success of development finance programmes in Nigeria has been called into question because these institutions and programmes have existed for decades but failed to bring about the much need agricultural and rural development in Nigeria.

### ***Commercial Banks***

The role of commercial banks is primarily aggregating savings and distributing credit to individuals and business across productive sectors of the economy (Atieno, 2010). Although commercial banks are not development finance institutions, they have been used by the federal government as partnering institutions to execute development finance projects (Adesoye and Atanda, 2012). For instance, commercial banks are the executors of the Agricultural Credit Guarantee Scheme Fund – a credit programme setup by the Nigerian government to improve credit extension to agriculture by serving as loan guarantors for rural farmers (Eze et al., 2010). Commercial banks with the history of partnering with the government to finance agriculture include First Bank of Nigeria, United Bank of Africa (UBA), Union Bank; Stanbic IBTC; Zenith Bank, First City Monument Bank (FCMB), Wema Bank, Skye Bank, Guarantee Trust Bank (GTB), Mainstreet Bank, Heritage Bank, Suntrust Bank, Keystone Banks, Fidelity Banks and LAPO Microfinance (CBN 2017).

Besides bespoke partnerships, between commercial banks and the federal government, to fund schemes like the ACGSF and CACS (Table 3), the federal government has a policy on compulsory commercial bank lending to agriculture. The policy entails that commercial banks must extend up to 18% of their savings to agriculture, and 45% of savings generated from their branches located in rural areas – albeit, with the agreement that the government still serves as a guarantor for these loans (Olubiyo and Hill, 2003).

In cases where borrowers seek agricultural loans directly from commercial banks, that is, outside government finance programmes, loan beneficiaries are required to open an account with the bank. They are also required to complete a loan application form that enables the

bank to determine a borrower's eligibility for the loan facility, and to provide a business plan or project proposal. In most cases, borrowers must present a collateral or guarantor (Udoka et al., 2016). Government supported loans usually entail filling out a generic loan application form that does not require the presentation of nearly as much detailed documentation as is required in a conventional commercial bank loan application process.

### ***Agricultural Cooperatives***

Cooperatives and farmer association are registered formal institutions comprised of individuals who share a common interest in agriculture (Badiru, 2010). These institutions are self-help groups that serve as a platform through which members can pool resources together in pursuance of a common goal, such as access to markets; output distribution channels agricultural produce; access to finance (Agbo, 2009). These self-help institutions have become recognised as effective financial intermediaries who support farmers in access agricultural credit facilities that may be more difficult to access on an individual basis (Innocent and Adefila, 2014). Because they are formal entities, cooperatives can provide the required guarantee and collateral for larger loan volumes than individual farmers can provide (Toluwase and Apará, 2011). As a result, accessing loans through cooperatives can reduce transaction cost incurred by financial institutions in processing many small loans and eliminate transportation and time cost incurred by individual farmers in travelling to urban areas to access bank loans (Badiru, 2010).

Cooperatives provide financial service to farmers who are often not able to access agricultural finance from other financial institutions due to terms and conditions that serve as barriers to entry (Atieno, 2001). Some cooperatives that have stood the test of time in Nigeria include the All-Farmers Association of Nigeria (AFAN), which cuts across all commodity value chains in Nigeria, and the Poultry Association of Nigeria (PAN).

### ***Contract Farming Arrangements***

Contract farming has been described as an institutional response to gaps in accessing credit in agricultural finance markets (Olomola, 2010). Most contract farming arrangements in Nigeria adopt an input financing model, where information, seeds, feeds, fertiliser, and agro-chemicals are provided to farmers who own land with the aim of sharing profits at the end of the production cycle (Adjognon et al., 2017). In Nigeria, contract farming arrangements takes the form of private partnerships between large-scale input suppliers and farmers or processing companies and farmers; and through public private partnerships between state governments,

financial institutions, farmers, input suppliers and/or processing companies (Olomola, 2010). Some of these contract-farming arrangements include CBN/NIRSAL<sup>3</sup> scheme; the Osun Broilers Out-growers Poultry Scheme (OBOPS)<sup>4</sup>; Amo out grower scheme<sup>5</sup> and Babban Gona<sup>6</sup> Initiative (Adebisi et al., 2019).

Benefits of contract farming initiatives to farmers include low interest rate, more considerate eligibility criteria, access to high quality inputs, and access to markets for outputs and insurance coverage that protects farmers in cases of crop loss (Ofuoku and Agbamu, 2016). However, contract farming arrangements have also been criticised for creating avenues for input and processing companies to adversely select rural farmers who lack information about more beneficial agricultural finance opportunities (Adebisi et al., 2019). In the absence of information on agricultural finance sources, rural farmers sometime agree to profit and risk sharing models which are unfavourable in the long run (Mwambi et al., 2016). Furthermore, contract farming may also result in other social problems such as power inequalities, farmers' loss of control over production and management decisions, and conflict over land use in the case of communal land ownership (Minot, 2011). Moreover, institutional weakness in contract enforcement allows the side selling of inputs and outputs by some rural farmers to the detriment of other contracting parties (Minot, 2011). This weakness in contract enforcement is mostly observed in government-managed contract farming arrangements due to poor monitoring of farmers activities and lack of accountability that has become a norm among farmers in receipt of government funding (Olomola, 2010).

### **2.3.2 Informal Agricultural Finance Institutions**

Informal agricultural finance institutions are unregistered entities that are not established by any finance policy or governed by a centralised financial system (Lawal and Abdullahi, 2011). They are mostly set up by community-based cultural arrangements that tend to be governed by prevailing traditional institutions (Atieno, 2001). These informal sources fulfil a higher percentage of farmers finance needs because they have emerged to bridge gaps created by difficulties in accessing agricultural credit from formal agricultural finance institutions (Lawal and Abdullahi, 2011). In Nigeria, informal finance institutions include local moneylenders; rotating savings and credit associations (RoSCA); social networks (family, friends, and farmer groups); and personal savings (Badiru. 2010).

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<sup>3</sup> <https://nirsal.com/>

<sup>4</sup> <https://guardian.ng/features/agro-care/osun-broilers-outgrowers-scheme-produces-5m-birds/>

<sup>5</sup> <https://afshltd.com/news/broiler-out-grower-scheme/>

<sup>6</sup> <https://babbangona.com/our-company/>

### ***Local Moneylenders***

Community-based moneylenders provide cash advances to farmers based on trust and pre-existing relationships between the lender and borrower (Odera, 2013). Therefore, accessing loans from local moneylenders does not entail long lending procedures such as filling out application forms or provision of formal collateral documents (Atieno, 2001). Loan eligibility is based on the borrower's status within the community and a track record in loan repayment. Contracts are verbal, with a promise to pay back being a binding enough agreement between lender and borrower (Adebayo and Adeola, 2008). Although accessing credit through moneylenders seems to be an easy option when compared with commercial banks, this source is largely unregulated and interest rates have been reported to be as high as 40% in some case making this source unprofitable for farmers (Badiru, 2010).

Lawal and Abdullahi (2011) also note that informal sources of finance, such as community moneylenders, are governed by cultural and normative institutional arrangements. These are based on shared beliefs and conventions, often more adhered to, and respected, by farmers than those of formal finance institutions. Within these informal finance institutions, trust seems to be key because of the shared belief that a person's 'word' is their bond (Odera, 2013). Furthermore, these traditional cultural and normative institutions have persisted over time, being passed down from generation to generation and have existed even longer than formalised agricultural financial institutions (Lawal and Abdullahi, 2011). However, the absence of clear-cut application procedures makes loan eligibility subjective. This means that discretion and favouritism could serve as a barrier to accessing finance through local moneylenders (Gbigbi, 2019). Furthermore, as there is no distinction between the lender and the business entity, the volume of finance available to lend fluctuates depending on the lenders personal circumstance that could also influence farmers' access to finance from this source (Lawal and Abdullahi, 2011).

### ***Rotating Savings and Credit Associations (RoSCAs)***

RoSCAs also known as *Esusu* or *Etoto* or *Adashi* in Nigeria are self-help groups that are established for the purpose of mutual financial benefit through savings and lending to group members (Bouman, 1995). RoSCAs pre-date formal financial institutions. They often fill in the gap created by the absence of formal bank infrastructures in rural areas, mainly by providing a much-needed medium for savings and lending to small farmers (Seibel 2004). RoSCAs typically gather equal amounts of money from each member and lend the total sum

to one member of the group on a monthly basis, until every member has received the bulk total savings gathered from each member (Ojenike and Olowoniyi 2013). This informal finance arrangement is deeply entrenched in many traditional societies in Africa and therefore governed by prevailing cultural and normative institutions of these societies (Oloyede, 2008). Although this channel offers interest and collateral free credit to lenders, access to agricultural finance strictly depends on the lender's membership and deposit history, thereby excluding farmers who are not members (Badiru, 2010).

### ***Social Networks and Personal Saving***

Social network represents the totality of the farmers' social capital that serves as a support system such as family, friends, and farmer groups (Odera, 2013). Relying on social networks as a source of finance is common among farmers who have relatives and friends with extra cash (savings) either to lend or to invest in the farmers' production activities as partners (Raifu and Aminu, 2019). 'Trust' plays a key role in securing finance from social networks because these arrangements are not usually consummated with a formal contract and are mostly interest and collateral free (Odera, 2013). Loans from social networks usually serve as a supplementary finance source to support personal savings and other finance sources due to inconsistent access to finance through this channel, but it used because it is easily accessible without too much repayment pressure and a shorter waiting time than other formal sources (Badiru, 2010). However, the challenges associated with this finance channel relates to the volume of funds accessed. This is because this source draws from the lenders savings, farmers do not always have access to the volume of finance needed from a single source (Oluwafemi and Ibitoye, 2014). As a result, relying on social networks alone might not be enough for a given production cycle or to scale-out production (Badiru, 2010).

Alternatively, personal savings is the segment of a farmers' disposable income kept aside for future expenses and investments. This source tends to be limited to what farmers have as leftover cash after allocating finance to other household needs (Ülkümen and Cheema, 2011.). Furthermore, research carried out by Akanni (2001) on the effects of micro finance on rural agricultural production in Nigeria and found that long waiting time, high transportation costs and cumbersome procedures where some of the reason for farmers' dependence on their personal savings as opposed to seeking finance from commercial banks. However, the high level of poverty among rural farmers in Nigeria constraints their reliance on personal savings as the major source of agricultural finance (Badiru, 2010).

## 2.4 Problems with Financing Agriculture in Nigeria

Financing agriculture has been cited as a much-needed catalyst for agricultural and rural development in sub-Saharan Africa (Atieno, 2010; Eze et al., 2010; Adesoye and Atanda, 2012). It is theorised that access to low-cost finance will enable rural farmers increase their output, thus accumulating wealth that can be invested into other non-farm sectors of the rural economy (Hossain, 1988). However, within debates on agricultural finance, the question remains of how much finance is available and how much of this available finance is mobilised and channelled to rural agricultural development (Atieno, 2010). The gap between the availability of finance and its accessibility by rural farmers has long been established in academic and practitioner debates relating to the poor financing of agriculture in Nigeria (Eze et al., 2010; FAO, 2020). This gap is especially evident in formal finance markets where terms and conditions for accessing loans serve as discriminatory barriers to accessing finance by rural farmers (Atieno, 2010). Therefore, failures of formal agricultural finance markets to meet the credit needs of rural farmers creates a gap within credit markets which informal institutions and new financing innovations are emerging to fill (Lawal and Abdullahi, 2011).

Finance has been described as the *oil that greases the wheels of agricultural production* (Olaitan, 2006). Lack of finance translates to farmers' inability to secure other resources for production such as land, labour, seeds (and breeding stock), fertilisers, machinery, irrigation facilities and other agro-chemicals (Aryeetey, 1997). The financial needs of actors, and their level of access to finance, vary markedly across the different segments of agricultural value chains (Schaffnit-Chatterjee et al., 2014). In sub-Saharan Africa, agricultural production is primarily performed on small land parcels by rural farmers who are often marginalised and exempted from accessing most formal financial sources (Abdallah, 2016). Furthermore, these rural farmers account for the poorest group of actors in agricultural markets and therefore need financial support to obtain agricultural inputs (Meyer, 2015).

However, the literature reveals that problems with agricultural financing does not stem from lack of finance or absence of financial institutions to aggregate and distribute finance but stems from failures in effectively matching of the demand and supply of agricultural finance (Eze et al., 2010; Orji et al., 2020). In addition, these incorporate problems encountered by financial institutions in loan recovery, and problems encountered by farmers in repaying agricultural finance (Orji et al., 2020). Table 5 is a summary of the literature that informed the identification of research problems in financing agriculture.

**Table 5: Summary of the Problems with Financing Agriculture in sub-Saharan Africa**  
(Source: Multiple)

Authors	Problems	Actor(s) affected	Resultant effect
Aryeetey and Udry, 1995; Kelly et al., 2003; Barreti and Mutambatsere, 2008; Mair and Marti, 2009; Nkundabanyanga, 2014	<b>Information asymmetries</b> in accessing information on available agricultural finance opportunities; and in accessing information about farmers to support loan application procedures.	Farmers; Financial institutions.	Late disbursement of funds due to longer processing times resulting in farmers' poor access to finance.
Njogu et al., 2018; Fadeyi, 2018; Igwe and Egbuson, 2013; Osebeyo and Aye, 2014; Barreti and Mutambatsere, 2008; Nwosu et al., 2010; Aryeetey, 1997; Singh, 2008; De Silva and Ratnadiwakara, 2008; Igwe and Egbuson, 2013; Osebeyo and Aye, 2014	On the demand-side: <b>High transaction cost</b> incurred by farmers in accessing finance such as transportation, information and intermediation cost (filling-out applications forms).  On the supply-side: <b>High transaction cost</b> in processing loan applications, verifying information on loan applications and recovering loans (such as cost of reclaiming collateral).	Farmers; Financial institutions.	Late disbursement of funds or outright rejection of loan applications due to the unprofitability of extending loans to farmers. This leads to farmers' poor access to finance.
Famogbiele, 2013; Njogu et al., 2018; Oboh and Ekpebu, 2011; Ofana et al., 2016; Eze et al., 2010; Nwosu et al., 2010; Lawal and Abdullahi, 2011; Orok and Asim, 2017	<b>Lack of trust and poor creditworthiness of farmers</b> due to history of loan default and poor farmer identity.	Farmers	Stringent loan application procedures to discourage farmers from applying for loans; Outright rejection of loan applications; late disbursement of funds due to increased time taken to establish farmers' creditworthiness.
Akinlo, 2014; Ojiako and Ogbukwa, 2012; Agada et al., 2018; Orji et al., 2020	<b>Poor contract enforcement</b> between farmers and financial institutions.	Farmers; Financial Institutions.	Increased possibilities of loan default; financial losses for farmers in the absence of agricultural insurance.
Olomola, 2018; Eze et al., 2010; Nwosu et al., 2010; Adams and Vogel, 1986; Owuor and Shem, 2012	<b>Weak regulatory frameworks</b> to govern financing activities and <b>poor agricultural finance policy execution.</b>	Farmers; Financial Institutions.	Poor monitoring of agricultural financing resulting in misappropriation of funds and loan default.

Table 5 shows that agricultural finance problems arise due to information asymmetries, high transaction costs, lack of trust and poor creditworthiness of rural farmers, weak regulatory



frameworks, and poor execution of agricultural finance policies, poor contract enforcement, and weak monitoring of disbursed agricultural loans. These problems are further discussed in the subsequent sub-sections.

#### **2.4.1 Information Asymmetries**

Information asymmetries result in unequal access to resources across different groups within the finance markets thereby creating a distinction between the *haves* and *have-nots* of information (Kelly et al., 2003; Barreti and Mutambatsere, 2008). In so doing, groups with information hold more decision-making power for accessing and disbursing finance (Adomi et al., 2004; Famogbiele, 2013; Mogues and Olofinbiyi, 2020). In most cases, rural farmers tend to be on the disadvantaged end of the ‘*information access spectrum*’ due to socio-economic, spatial and temporal constraints which separate them from other agricultural value chain actors (Imhanlahimi and Joseph, 2010; Egwu, 2016).

Information asymmetries are also indirectly maintained by financial institutions through cumbersome loan procedures which exclude farmers without formal education (Olagunju and Adeyemo, 2008; Abdallah, 2016). For instance, most farmers lack formal education and are unable to maintain useful farm records that could provide evidence of cash flow (Nwosu et al., 2010; Nkundabanyanga, 2014). Therefore, to overcome educational barriers to accessing loans, uneducated farmers must rely intermediaries to support the completion of loan application forms and other procedures for a fee (Aryeetey, 1997). Aside formal financial institutions, information asymmetries are also maintained by stakeholders who benefit from farmers’ poor knowledge of finance opportunities (Udoka et al., 2016). For instance, the adverse selection of farmers in contract farming arrangement is actualised in cases where farmers lack information on more profitable agricultural finance alternatives (Mogues and Olofinbiyi, 2020). However, in other cases, these information asymmetries are unintentional created and maintained due to the weakness (or absence) of public information infrastructures and actors to intermediate between farmers and information sources (Ofuoku and Agbamu, 2016).

On the lenders-side, information asymmetries in agricultural finance markets also serve as a disincentive to financial institutions (Mair and Marti, 2009). Financial institutions lack complete information (biodata, geospatial data, and socio-economic data) on their borrowers to facilitate loan applications procedures (Aryeetey and Udry, 1995). This has resulted high

transaction costs in processing loans; delays in the disbursement of loans; and ultimately, the extension of loans to farmers who are not creditworthy (Eze et al., 2010; Ibrahim and Alieroo 2012; Ademola 2019). Although, information asymmetries can be created and maintained intentionally or unintentionally, the ultimate impact is the same – poor access to information on agricultural finance generally results in poor access to agricultural finance by farmers (Ademola, 2019).

#### **2.4.2 High Transaction Cost**

Historically, the cost associated with performing market activities (transaction cost) in developing country agricultural markets has been described as high compared to developed country markets (Singh, 2008). Transaction cost can also be conceptualised in terms of the nature of the transaction. This includes three types of costs. Firstly, *information costs* as encountered by farmers before a transaction. Secondly, *negotiation costs* that are incurred in the actual performance of a transaction. Thirdly, *monitoring costs* that are encountered after the transaction has taken place. Other costs include those incurred when ensuring that the terms and conditions of contracts are fulfilled; and logistics-related transaction costs in the form of transportation and time costs in performing value chain activities (Hobbs, 1997; Pingali et al., 2005; De Silva and Ratnadiwakara, 2008).

The combination of the different forms of transaction costs associated with agricultural value chain activities determines the level of participation and inclusion of market actors (De Silva and Ratnadiwakara, 2008). In agricultural finance markets, transaction costs are determined by the nature of the source of finance (Nwaru et al., 2011). For instance, transaction costs are higher in accessing finance formal financial institutions (such as banks) than from informal moneylenders (Eboh, 2002; Eze et al., 2010). Furthermore, the cost of logistics in accessing and transporting *non-cash* (input) finance such as seeds; fertiliser and agro-chemicals tends to be higher than the cost of accessing *cash* finance from financial institutions (Adjognon et al., 2019).

Specifically, in formal agricultural finance markets, transaction costs are conceptualised as the cost of accessing, extending, monitoring and recovering agricultural loans (Anyiro and Oriaku, 2011; Akpan et al., 2014; Silong and Gadanakis, 2019). These costs are known to be high due to the weakness and absence (in some cases) of institutional structures to intermediate between the demand and supply sides of the market. Firstly, in order to access

finance, rural farmers must obtain information, fill out application forms, and submit said application forms to financial institutions (Igwe and Egbuson, 2013). Transportation to financial institutions – which are mostly located in urban and peri-urban areas – pose significant logistic cost to farmers especially due to poor transportation infrastructure in rural areas (Osebeyo and Aye, 2014). Secondly, to extend, monitor and recover loans disbursed to farmers, financial institutions must validate the information provided by rural farmers on loan applications forms which often include bio-data information, enterprise information and information on collateral ownership (Ibrahim and Aliero, 2012; Famogbiele, 2013). These transaction costs have therefore undermined the profitability of lending to rural farmers because in most cases, the total costs of financing a single rural farmer tends to be significantly higher than the requested loan amount (Nwosu et al., 2010; Ajuwon et al., 2018).

#### **2.4.3 Lack of Trust and Poor Creditworthiness of Farmers**

The high rate of loan default among rural farmers in receipt of formal agricultural finance is one of the major reasons for financial institutions aversion to extending credit to farmers (Famogbiele, 2013). Loan facilities, especially those guaranteed by the federal government, are one of the most abused forms of agricultural finance due to the prevailing mind-set among farmers that government money is '*their share of the national cake*' that should not be repaid (Eze et al., 2010). This has had a negative impact on the profitability of financing the sector, with no returns to investors and no tangible developmental outcomes to these rural areas (Oboh and Ekpebu, 2011; Ofana et al., 2016).

Furthermore, farmers' inability to provide formal collateral documentation also weakens their credibility in accessing loans from formal financial institutions (Nwosu et al., 2010).

Collateral provides financial institutions with an assurance of loan recovery in cases of loan default and represents a key loan acquisition requirement (Lawal and Abdullahi, 2011).

Government finance schemes, such as the ACGSF, also emerged to address the poor access to finance due the absence of formalised collateral documents (Eze et al., 2010). However, this scheme guarantees loans up to 100,000 naira (182.36 GBP) without collateral, with loan amounts higher than 100,000 (182.36 GBP) requiring proof of collateral. This cap on the amount of accessible loans, without collateral, limits farmers' ability to scale-out production activities due to the absence of collateral to prove creditworthiness (Orok and Asim, 2017).

Another key factor that influences creditworthiness of farmers is the lack of agricultural insurance coverage (Adeyonu, 2016). It has been observed that a large percentage of Nigerian farmers fail to subscribe to insurance coverage due to lack of education on the importance of insurance (Jimoh, 2012), lack of finance to pay insurance premiums (Adah et al., 2016) and lack of trust in insurance institutions (Onuche et al., 2015). However, it has also been revealed that farmers with insurance coverage, through the national agricultural insurance corporation for instance, are more likely to access loans from formal institutions than farmers without insurance coverage (Adeyonu, 2016; Shaibu et al., 2020). This is primarily because insurance coverage supports financial institutions to mitigate against loan default and supports farmers to mitigate against crop and financial losses (Nnadi et al., 2013; Adeh et al., 2016; Shaibu et al., 2020).

Ultimately, the widespread notion of farmers' poor creditworthiness stems from the risky nature of agricultural production in Nigeria, coupled with farmers' history of loan default (Eze et al., 2010). However, the absence of robust monitoring mechanisms to ensure agricultural finance (cash and input) is utilised for agricultural purposes, coupled with the absence insurance coverage to protect both farmers and financial institutions, continue to hamper the improvement of farmers' creditworthiness (Ojiako and Ogbukwa, 2012). Furthermore, as discussed in the previous sub-section, the absence of data to support farmer identification and thus match farmers with their loan repayment behaviours have also buttressed the generalised notion of farmers' poor credibility (Agada et al., 2018; Orji et al., 2020).

#### **2.4.4 Poor Contract Enforcement**

Agricultural finance contracts are binding agreements between two or more parties that state the terms of reference, profit sharing model, interest rate for repayment and the roles of each contracting party (Akinlo, 2014). In Nigeria, most contract farming arrangement require financiers to provide inputs for production activities and/or cash for overhead expenditures with the agreement that at the end of the production season, the initial investment capital will be deducted first, then the profits split between both parties (Olomola, 2010). The literature shows that problems in contract enforcement arise in cases where farmers fail to uphold their contractual obligations after the receipt of financial investment from funders (Olomola, 2010; Njogu et al., 2018). This often stems from side-selling of inputs, cash diversion to other expenditures, or other factors beyond the farmer's control such as pest and disease outbreaks

and price fluctuation in output markets (Udoh, 2008). However, the resultant effect is that rural farmers, who are considered poor and vulnerable, often bear no financial consequence for not fulfilling contractual agreement to the detriment of other contracting parties (Njogu et al., 2018).

Furthermore, failure to incorporate agricultural insurance into contract farming arrangements also exposes both contracting parties to gross losses in cases of pest and disease outbreaks and other climatic issues such as drought and floods (Adeyonu, 2016). The neglect of agricultural insurance coverage in Nigeria by farmers and contracting parties can also be ascribed to weaknesses of these institutions in attending to claims and the associated transaction costs in accessing financial returns post-claim (Olubiyo and Hill, 2005). This has served as a major deterrent to agricultural stakeholders in subscribing to agricultural insurance.

Although institutions tasked with enforcing contracts between farmers exists – such as legal institutions and the police force, however, the processes for adjudication between farmers and other contracting parties are often associated with cost implications beyond farmers' financial capabilities (Akinlo, 2011). Furthermore, the absence of formal collateral results in the inability of contracting parties to recover finance from the sale of land or other valuable assets belonging to farmers (Udry, 1990; Olomola, 2010). As a result, in the worst case scenario where defaulting farmers are incarcerated, this often do not result in any financial returns to other contracting parties, neither do these formal adjudicating processes result in consequences which farmers consider sufficient to drive them to evolve means to repay loans (Akinlo, 2011). Therefore, although the agricultural sector has been considered profitable for investment, the issue of poor contract enforcement has been cited as one of the key causes of the aversion of private investors in funding rural farmers (Olomola, 2010).

### **2.5.5 Weak Regulatory Frameworks and Poor Execution of Agricultural Finance Policies**

There has been a myriad of agricultural finance institutions, policies, programmes and schemes targeted at improving rural farmers' access to finance (Eze et al., 2010; Nwosu et al., 2010) (see section 2.2.1). However, weak regulatory frameworks and poor execution of these policies have undermined the success of these agricultural finance efforts, undermining their effectiveness in bringing about the desired improvement in farmers' access to finance (Olomola, 2018). On a broader macro-level, institutional arrangements which are set-up to

address the high cost of access to rural credit such as micro-finance and credit guarantee schemes have failed to deliver their mandate due to poor governance of credit disbursement procedures and misuse of loans by beneficiary farmers (Adams and Vogel, 1986; Owuor and Shem, 2012).

Weak regulation manifests as poor monitoring of agricultural finance institutions to ensure finance is disbursed to rural farmers (Eze et al., 2010). Government schemes such as the commercial agriculture credit scheme (CACS) and the Agricultural Credit Guarantee Scheme Fund (ACGSF) have been enacted to encourage commercial bank lending to the sector by reducing the risk of lending (Eze et al., 2010; Olomola, 2018). However, poor regulation of commercial banks has undermined the effectiveness of these schemes, as the flow of funds to the sector has not been improved due to bureaucratic bottlenecks within these institutions (Okeke and Ikponmwosa, 2012).

Moreover, lack of continuity of agricultural finance policies and programmes due to change in political regimes has negatively affected the sustainability of several finance efforts which have the potential to bring about improvement in agricultural financing (Eze et al., 2010; Olowa and Olowa, 2011). An example is the decline in funding of the e-wallet system. The e-wallet used mobile phones to provide farmers with vouchers for subsidised inputs, from registered input suppliers (Uduji et al., 2019). However, the historic behaviour of new government regimes which discontinues policies enacted by previous governments due to political rivalry and the need to be seen as introducing new policies has been a major cause of poor execution agricultural finance policies in Nigeria (Dialoke and Veronica, 2017).

## **2.5 Digital Platforms for Agricultural Finance in sub-Saharan Africa**

As discussed in the previous section, the persistence of institutional failures remains a factor which undermines the impact of agricultural finance and development initiatives in Nigeria and more broadly, in sub-Saharan Africa (Dorward et al., 2009; Salami et al., 2013). In this era of digital revolution, digital innovations are rapidly being mainstreamed into agricultural value chains to improve the efficiency of performing value chain activities and to catalyse agricultural development (Deichmann et al., 2016). These are however mixed opinions on the use of digital innovations in agriculture and their role in yielding developmental outcomes within environments characterised by institutional failures (Ndemo and Weiss, 2017). Section 2.3 discusses digital innovations being adopted in agricultural value chains in sub-Saharan Africa.

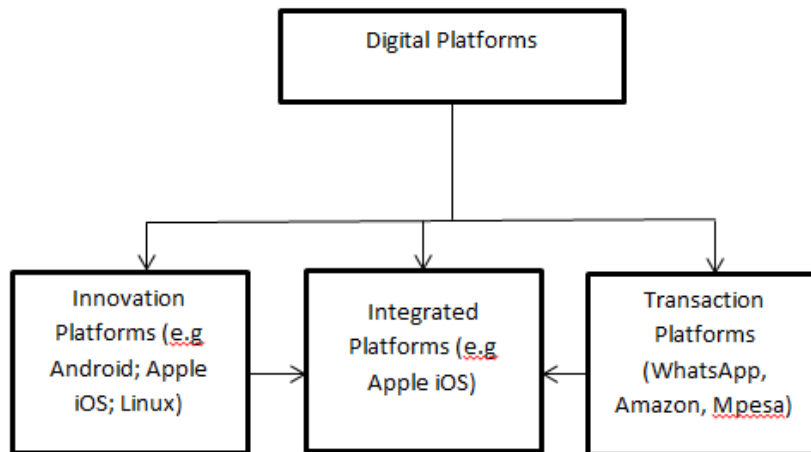
### 2.5.1 Conceptualising Digital Platforms

Conceptual ambiguities in defining digital platforms are an underlying constraint in researching the implications of digital platforms for development in developing countries (Koskinen et al., 2018). The term ‘digital platform’ is commonly conceptualised from two different disciplinary positions. These are the engineering and the economics perspectives. First, in engineering, platforms are defined as ‘*technological architectures*’ which serve as a foundation for the development of other digital platforms. For instance, Google’s android and Apple’s iOS are digital platforms that support the development of mobile applications (apps) and other web platforms (Yoo et al., 2010; Gawer, 2014; Evans, 2016). Second, economists conceptualise platforms as ‘*two-sided markets*’ or ‘*multi-sided markets*’ that facilitate interactions between two or more group of users for instance Amazon, WhatsApp, and MPesa (Gawer, 2014; Evans and Schmalensee, 2016). Uniting both engineering and economics perspectives, a platform can be broadly defined as a foundation that supports further innovation and facilitates interactions between two or more users with common interests (Gawer, 2014; Tiwana, 2014; Deichmann et al., 2016; Evans and Gawer, 2016; Parker, et al., 2016).

Evans and Gawer (2016), building on the conceptual understanding of digital platforms, as technological architectures and as multi-sided markets, categorise digital platforms into three typologies. Each platform type is based on the purpose for which it is developed, and are categorised as: *innovation platforms* (technological architectures); *transaction platforms* (two-sided or multi-sided markets) and *integrated platforms* (combination of both innovation and transaction platforms) (Gawer, 2014; Gawer and Cusumano, 2014; Evans and Gawer, 2016) (see figure 3).

**Fig 3: Typologies of Digital Platforms**

(Source: Koskinen et al., 2018)



### ***Innovation Platforms***

Innovation platforms are the technological building blocks on which other platforms are developed (Evans and Gawer, 2016). Examples of innovation platforms include Linux OS, Google Android, and Apple iOS (Koskinen et al., 2018). Innovation platforms provide third-party application developers with tools that can be combined to create new platform innovations (de Reuver et al., 2018). Open-source innovation platforms such as Google Android has served as the technological foundation for innovators in developing country to develop digital platforms tailored to their local needs (GSMA, 2017). As a result, there has been a growing number of indigenous digital transaction platforms. These have sprung up across sub-Saharan Africa as a response to economic activities in agriculture, transportation, health, and retail (GSMA, 2017). While these open-source innovation platforms serve as frugal innovations for resource-poor innovations, from a development standpoint, innovation platforms should be understood beyond the technical engineering perspective (Ahuja and Chan, 2016; de Reuver et al., 2018). They should also consider power relations between innovation platform owners and third-party developers (Koskinen et al., 2018).

### ***Transaction Platforms***

Transaction platforms are exchange platforms that facilitate the interaction between two or more groups with similar interest such as buyers and sellers, drivers and passengers, employees and workers (Evans and Gawer, 2016). Transaction platforms are the most common types of platforms used in developing countries, hence the focus of most research on digital platforms in developing regions, for instance research carried out by Ashwin (2012);



Droulliard (2014); and Boateng et al. (2017). The primary value of transaction platforms is the reduction of market frictions such as transactions costs that impede market efficiency (Jacobides et al., 2018).

Transaction platform can further be divided into social media platforms, e-commerce or online trading platforms, gig economy platforms, and sharing economy platforms (Boateng et al., 2017; Koskinen et al., 2018; van Belle and Mudavanhu, 2018). However, across all types of transaction platforms, the value created by the platform depends on direct and indirect network effects (Koskinen et al., 2018). Direct network effects results when the digital platform increases in value due to an increase in platform usage, that is, an individual user experiences more value in using the platform as the total number of platform users increase because it affords the user more people to interact with, for example WhatsApp (Gawer, 2014; Koskinen et al., 2018). On the other hand, indirect network effect is the value created by a platform as users of complementary groups increase in numbers. For instance, buyers have more incentives to use Amazon with an increase in the sellers increase and vice versa, same with other platforms like Upwork and AirBnB where employees and passengers have more incentives to use these platforms as due to larger numbers of job opportunities and drivers, respectively (Hagiou and Wright, 2015; Saldinger, 2017).

### ***Integrated Platforms***

Integrated platforms are platforms that combine elements of innovation and elements of the transaction platforms (Evans and Gawer, 2016). A typical example is Apple iOS, which provides the technological foundation for app developers to create new apps but also provides a platform for these developers to sell their applications (Koskinen et al., 2018).

### **2.5.2 Understanding Digital Platforms in sub-Saharan Africa's Agriculture**

Digital platforms<sup>7</sup> enable anywhere and anytime access to products and services (Koskinen et al., 2018). As a result, they can bridge infrastructural and geographic limitations posed by weak agricultural institutions in sub-Saharan Africa (CTA, 2019). Because they are 'digital', platforms provide real-time access to markets, services, and information, linking user groups who would have otherwise not interacted due to spatial and temporal barriers (Koskinen et al., 2018). Digital platforms also improve the efficiency and profitability of markets where

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<sup>7</sup> Going forward, the term digital platform in this research refers to digital transaction platforms except where otherwise stated

they are used by reducing transaction and information cost thereby opening such markets for increased participation for new and existing entrants (Foster et al., 2018).

GSMA (2017) has reported that agriculture in developing countries is experiencing an extended use of mobile devices beyond conventional voice and short message service (SMS) functions. Mobile devices, especially smartphones, provide functionalities that enable users to access digital platforms (mobile and web applications) which facilitate a variety of economic activities including agricultural value chain facilitation in Nigeria (Ifejika et al., 2019; Inegbedion et al., 2020; GSMA, 2020). Although most digital innovation platforms originate from developed regions; their spread and usage in developing regions has grown rapidly especially due to the wide-spread adoption of smartphones and rapid internet penetration in these regions; and the rapidly expanding start-up ecosystem (Boateng et al., 2017). This has resulted in the inclusion of innovators and platform users in developing regions in the global digital innovation ecosystem, as they can now actively engage with the platform economy (Yoo et al., 2012; Sedera et al., 2016; Graham et al., 2017; Nambisan et al., 2018).

In researching digital platforms in agriculture in sub-Saharan Africa, it is important to note that there are certain ambiguities that make broadly applying a unified conceptual understanding on digital platforms challenging. This is mostly because of variations in models of digital platform ownership; geographic location of use; user profiles; institutions; market and governance structure which influence the adoption and use of digital platform (Koskinen et al., 2018). Therefore, in platform research, context-specificity is an important parameter in understanding implications for development of digital platforms (Evans and Gawer, 2016; Koskinen et al., 2018). For instance, platform ownership models influence the degree of inclusivity which determines whether the platform is open and free for use in developing regions. This will determine whether innovators in resource poor regions are free to build on existing platform technology architectures to further develop transaction platforms further (Koskinen et al., 2018).

Context-specificity in researching digital platform is even more important in researching digital platforms for agriculture in sub-Saharan Africa. This is because of two main characteristics of digital platforms in this region. First is the existence of digital intermediaries. Digital intermediaries are middlemen who intermediate between individuals or groups and a platform, either because of the high technical level of the platforms, or

because of the low level of digital device ownership in a particular area (Warren, 2007). Without digital intermediaries, these groups would not have access to the benefits of digital platforms. The second characteristic is an offline complementarity. Most digital platforms in sub-Saharan Africa are supported by an offline complimentary segment. This segment supports intermediating functions between platform users and the platform itself (David-West, 2016). As a result, not all platform transactions are consummated on the platform, but elements of these transactions might be fulfilled offline (Koskinen et al., 2018).

However, the use of digital platforms in agriculture in sub-Saharan Africa still lags when compared to the use of digital platforms in other sectors such as transport, retail, banking, and hospitality (Karippacheril et al., 2012). Agriculture remains a unique case in digital agricultural development debates as a sector with high potential to contribute to economic growth but with a relatively slow pace of development (Ndewo and Weiss, 2017). Some of the reasons for the slow development of agriculture have been discussed in section 2.3. However, in addition to these, there are other limitations to the contribution of digital platforms to overall agricultural development. In particular, three such limitations are worth outlining. First is the infrastructural constraint which often manifest as poor or absent internet infrastructures in rural areas (Munyua et al., 2016). Second, the limitation imposed by financial constraints that manifests in high costs of digital devices, such as smartphones, and high costs of internet subscription (Baumüller, 2015). Third, the limitations imposed by technical constraints, such challenges often manifest as operational challenges in smartphones, but also as challenges of gaining access to digital platforms, especially by uneducated rural farmers (Jordan et al. (2016). Despite these limitations, there is no doubt that the use of digital platforms in sub-Saharan Africa's agriculture presents an innovation worth researching due to the perceived contributions of digital platforms to agricultural development and the rapid uptake of digital platforms in most productive sectors of the economy (Baumüller, 2015; David-West, 2016).

### **2.5.3 Digital Platforms for Agricultural Finance in sub-Saharan Africa**

This section takes a broader look at digital finance platforms in sub-Saharan Africa before narrowing down to the platform typology of interest in Nigeria. In sub-Saharan Africa, digital platforms are currently mainstreamed into facilitating the provision of financial service such as payment for agricultural inputs and outputs, savings, and access to credit and insurance (CTA, 2019; Nwagu et al., 2021) (see table 6). These platforms include several types. First

are standalone platforms, such as MPesa, that are strictly used to support the transactions performed through physical trading (Mbiti and Weil, 2015). Second are platforms embedded within other digital platforms to facilitate the consummation of online transactions, such as PayStack. Third are saving platforms that function as online bank accounts (for example piggyvest<sup>8</sup>) to provide users with additional functionalities such as investing money saved in other digital and non-digital enterprises (David-west, 2016; Nwagu et al., 2021). Fourth are crowdsourcing platforms that mainly function to link farmers with investors (Ajadi et al. 2018). These typologies of agricultural finance are summarised in table 6 below.

**Table 6: Agricultural Finance Platforms in sub-Saharan Africa**

*Source: multiple*

<b>Types of Agricultural Finance Platforms</b>	<b>Description</b>	<b>Examples of Platforms</b>
Payment Platforms	These platforms provide secured means of paying for input and outputs in agricultural markets.	MPesa <sup>9</sup> AgriWallet <sup>10</sup> AgriPay <sup>11</sup> Crop-to-cash <sup>12</sup>
Saving Platforms	The platforms provide a channel for value chain actors save funds enabling them build a saving record.	myAgro <sup>13</sup> ; PiggyVest <sup>14</sup>
Credit and crowdfunding platforms	These platforms improve farmers' (and other value chain actors) access to agricultural finance from individual and institutional investors.	e-Wallet, DigiFarm <sup>15</sup> , AgriWallet <sup>16</sup> Thrive Agric <sup>17</sup> Farmcrowdy <sup>18</sup> CompleteFarmer <sup>19</sup> Musoni <sup>20</sup> ; eFarms <sup>21</sup>
Insurance platforms	These platforms provide access to insurance cover against failures in agricultural production.	EcoFarmer <sup>22</sup> OKO crop insurance <sup>23</sup>

<sup>8</sup> Piggvest platform users have the option of using money saved to invest in agriculture through *Thrive Agric*. (a crowdfunding digital platform in Nigeria)

<sup>9</sup> <https://www.safaricom.co.ke/personal/m-pesa>

<sup>10</sup> <https://agri-wallet.com/>

<sup>11</sup> <https://www.agri-pay.com/>

<sup>12</sup> <https://www.crop2cash.com.ng/>

<sup>13</sup> <https://www.myagro.org/>

<sup>14</sup> <https://www.piggyvest.com/>

<sup>15</sup> <https://www.safaricom.co.ke/business/digifarm>

<sup>16</sup> <https://agri-wallet.com/>

<sup>17</sup> <https://www.thriveagric.com/>

<sup>18</sup> <https://www.farmcrowdy.com/>

<sup>19</sup> <https://www.completefarmer.com/>

<sup>20</sup> <http://musionisystem.com/>

<sup>21</sup> <https://www.efarms.com.ng/en>

<sup>22</sup> <https://www.ecofarmer.co.zw/>

<sup>23</sup> <https://www.oko.finance/>

Credit and crowdsourcing finance platforms are the focus of this research. The key role of this type of digital platforms is to support the activities of agricultural entrepreneurs who seek to link rural farmers to alternative sources of agricultural finance (CTA, 2019). Across sub-Saharan Africa, several crowdsourcing platforms developed by indigenous innovators have emerged, including iFarmKonnnect<sup>24</sup> (Kenya), ifarm360<sup>25</sup> (Kenya), Kwidex<sup>26</sup> (Ghana), Grow For Me<sup>27</sup> (Ghana), and Dolphin Fund<sup>28</sup> (Uganda). In Nigeria, the emergence of agri-finance platforms (see table 7) began in 2016 with FarmCrowdy which adopted the crowdsourcing model to direct cash to agriculture, mostly from investors who sought profitable investment opportunities (Kene-Okafor, 2020). Grey literature reveals that as of 2019, there were over 20 crowdsourcing agricultural finance platforms, mostly aiming to bridge the gap between farmers and investors (see Table 7). Although these platforms share a similar crowdsourcing finance business model, variations are observed in types of agricultural enterprises these platforms invest in, the percentage returns on investment (ROI) offered, and the duration for investment maturity.

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<sup>24</sup> <https://m.ifarmkonnnect.com/>

<sup>25</sup> <https://ifarm360.com/>

<sup>26</sup> <https://kwidex.com/>

<sup>27</sup> <https://www.growforme.com/en/>

<sup>28</sup> <https://dolphinfund.org/>

**Table 7: Digital Platforms used in Nigeria’s Agricultural Finance Markets***Source: Author’s field data (2018/2019); and platform websites.*

Platform name	Year of inception	ROI	Agricultural Enterprise
Farmcrowdy <sup>29</sup>	2016	6-25%	Maize, poultry, cassava, soybeans and rice
EZ-Farming <sup>30</sup>	2016	15-35%	Maize, Poultry, Groundnut, goat, farm equipment, Hydroponic farm, cucumber, Ginger, piggery, soybeans, yam flour, chilli pepper, cassava, fish, tomatoes, pineapples
Thrive Agric <sup>31</sup>	2017	15-20%	Maize, rice, tomatoes, soybeans, poultry
FarmKart <sup>32</sup>	2017	13-30%	Poultry and Fish
PiggyVest <sup>33</sup>	2017	Up to 15%	Agriculture and other sectors
NaturFund <sup>34</sup>	2017	10%	Agriculture and other sectors
E-farms <sup>35</sup>	2017	15-20%	Maize, Soybeans, Tomatoes, poultry, fish, pig, cassava
Growcropsonline <sup>36</sup>	2018	Over 100%	Yam, Fluted pumpkin, Scent leaved, Shoko, Green peas, Chilli pepper, Rice, Beans
Pork Money <sup>37</sup> (Nigeria and Ghana)	2018	20-35%	Pig farming
Agropartnership <sup>38</sup>	2018	16-35%	Sweet potatoes, Sesame seeds, cashew, sweet potatoes, cocoa
Farmsponsor <sup>39</sup>	2018	15%	Poultry
Farm Agric <sup>40</sup>	2018	13-30%	Cattle, Oil palm; cassava
Growsel <sup>41</sup>	2018	5-20%	Ginger, maize, potato, tomato, cassava, soybeans and rice
Agrecourse <sup>42</sup>	2018	20-30%	Rice, maize, fish, poultry
Menorah Farms <sup>43</sup>	2018	25-40%	Plantain, fish, poultry, Rabbit, grasscutter, cucumber
Payfarmer <sup>44</sup>	2019	12-35%	Pig, vegetables, poultry
FarmFunded <sup>45</sup>	2019	20-30%	Rice, Maize, Groundnut, Ginger, Poultry, Pepper, Cassava,
Bazuze <sup>46</sup>	2019	30-35%	Groundnut, Sesame seeds; Cashew nuts, Melon seeds

<sup>29</sup> <https://www.farmcrowdy.com/>

<sup>30</sup> <https://ez-farming.com/>

<sup>31</sup> <https://www.thriveagric.com/>

<sup>32</sup> <https://farmkart.ng/>

<sup>33</sup> <https://www.piggyvest.com/>

<sup>34</sup> <https://naturfund.com/Fund/>

<sup>35</sup> <https://www.efarms.com.ng/en>

<sup>36</sup> <https://www.growcropsonline.com/>

<sup>37</sup> <https://www.porkmoney.com/>

<sup>38</sup> <https://agropartnerships.co/>

<sup>39</sup> <https://farmsponsor.com.ng/>

<sup>40</sup> <https://farmagric.com/>

<sup>41</sup> <https://www.growsel.org/>

<sup>42</sup> <https://agrecourse.com/>

<sup>43</sup> <https://menorahfarms.com/>

<sup>44</sup> <https://payfarmer.com/page/>

<sup>45</sup> <https://farmfunded.com/>

<sup>46</sup> <https://bazuze.com/>

While financing agriculture through digital platforms presents a novel channel through which finance is channelled to agriculture, this digital platform model of financing agriculture is still quite nascent. Until 2021, there was no defined regulatory framework to govern the emerging digital agricultural finance space. Therefore, the rapid growth in the number of digital platforms financing agriculture in Nigeria went unchecked, thereby resulting in an increased scepticism about their legitimacy (Soreh, 2017; Augustine, 2019). However, agri-finance platform remains the channel of choice for investors who want to participate in the agricultural sector from the comfort of their homes (Akeredolu, 2019). Nonetheless, the nascent of financing agriculture through digital platforms coupled with the perceived developmental implications of digital platforms for rural farmers makes understanding the entirety of this innovation pertinent.

## **2.6 Conceptualising the Nexus between the Problems in Financing Agriculture, Institutional Voids and Digital Platforms**

Section 2.1 defines institutions and describes the role of institutions in driving agricultural development. The section argues that the weakness and absence of institutions in developing country agriculture remains a primary cause of the under development of the sector (Kydd and Dorward, 2004; Barreti and Mutambatsere, 2008; Eze et al., 2010; Famogbiele, 2013). Building on Scott's definition of institutions as man-made structures which govern human behaviour, Khanna and Palepu (2005) identify the actors who are responsible for performing institutional functions which determine the development trajectory of a given social context. These actors are defined as institutional intermediaries whose absence or weakness creates voids which influence development (Khanna and Palepu, 2005).

Khanna and Palepu (2005) describe institutional voids as the absence or weakness of intermediating institutions that facilitate market transactions (Khanna and Palepu, 2005). In comparing emerging and developed markets, Khanna and Palepu (2005) argue that institutional voids in emerging markets present themselves in the form of absent or weak intermediaries to perform market facilitation functions. These intermediaries, as conceptualised by Khanna and Palepu are information analysers, transaction facilitators, credibility enhancers, aggregators and distributors, regulators and public policy makers and adjudicators. Markets where these intermediaries are absent or weak are characterised by higher transaction costs in conducting business activities in these markets, barriers to entry, higher cost of capital, lower profits, and constrained labour mobility. Table 8 presents

Khanna and Palepu’s conceptualisation of institutional voids that outlines six market institutions present in developed markets but absent in emerging and developing markets, thus resulting in voids.

**Table 8: Khanna and Palepu’s Conceptualisation on Identifying Institutional Voids**  
*(Source: Khanna and Palepu, 2005)*

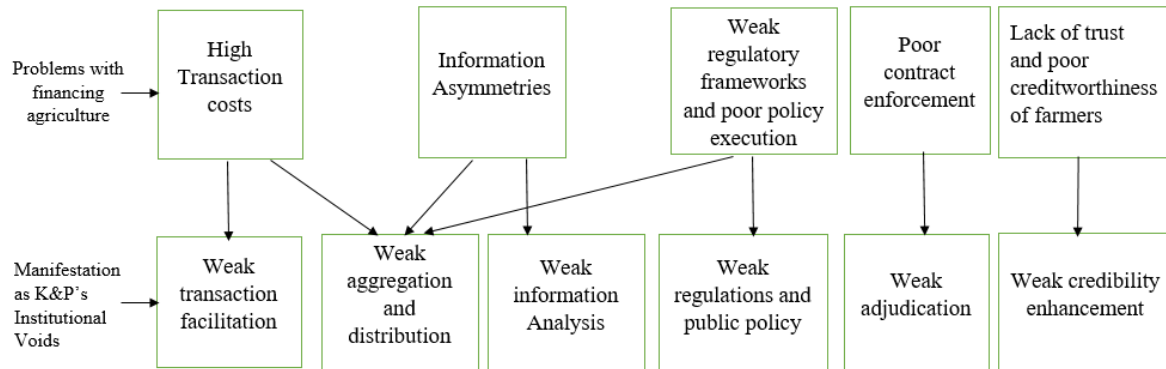
<b>Type of Market Institution</b>	<b>Function</b>
Credibility Enhancers	Third-party certification of the claims by suppliers or customers
Information Analysers and Advisors	Collect and analyse information on producers and consumers in a given market
Aggregators and distributors	Provide low-cost matching and value-added services for suppliers and customers through expertise and economies of scale
Transaction facilitators	Provide a platform for exchange of information, goods, and services, provide support functions for consummating transactions
Regulators and other public institutions	Create the appropriate regulatory and policy framework, and enforce it
Adjudicators	Resolve disputes regarding law and private contracts

This section therefore describes Khanna and Palepu’s institutional voids in light of identified problems in agricultural markets in Nigeria (section 2.3) and provides evidence from the literature of how digital platforms perform market-enabling functions that could potentially fill institutional voids. Figure 4 shows the linkage between the problems of financing agriculture and institutional voids while table 9 summaries the linkage between institutional voids, agricultural finance problems, and digital platforms.



**Fig 4: The Research's Conceptualisation of the Linkage between Agricultural Finance Problems and Institutional Voids**

(Source: Adapted from Khanna and Palepu, 2005)



Historically, institutional voids in developing country agricultural markets have manifested as various complex and interrelated problems. This includes low financial investment in agriculture, high transaction and information costs, information asymmetries, poor contract enforcement, inequalities in land and property rights, poor rural infrastructures, poor market linkages, low level of technology adoption, lack of trust, and ultimately, the slow growth of the sector (Kydd and Dorward, 2004; Barreti and Mutambatsere, 2008). There is growing evidence that digital platforms are performing market-enabling functions that address agricultural problems manifesting as institutional voids (GSMA, 2020). Digital platforms primarily provide the affordance of two-sided or multi-sided interaction between users (Koskinen et al., 2018). Due to the widespread adoption of smart phones and the Internet, digital platforms are already becoming commonplace in performing day-to-day activities in markets in sub-Saharan Africa (David-west, 2016). Ashwin (2012) and Droulliard (2017) describe digital platforms as market-enablers that address market problems that have emerged due to the absence or weakness of market institutions. In analysing the use of digital platforms in Kenya and India it was found that digital platforms could be adopted to address four out of the six institutional voids in developing country markets, mainly due to their market-enabling functions and digital nature. These institutional voids, which digital platforms can address, are those that emerge due to the absence or weakness of the following: credibility enhancement institutions; information analysing institutions; transaction facilitating institutions; and aggregating and distributing institution (Ashwin, 2012 and Droulliard, 2017).

### ***Weak Credibility Enhancement***

Credibility enhancement entails providing independent certification of market actors by performing third-party verification of market actor's identity, roles, and activities (Khanna and Palepu, 2005). Credibility enhancing institutions, such as independent auditors and credit rating systems improve market transparency and efficiency by reducing cost of identifying trustworthy actors and businesses to perform market transactions (Khanna and Palepu, 2005; Ashwin, 2012; Drouillard et al., 2016). Absence or weakness of credibility enhancing institutions manifest as: lack of trust among actors; poor market transparency; lack confidence in doing business; barriers to new entrants which results in low-level of investment and markets frictions (Khanna and Palepu, 2005).

Credibility enhancement in agricultural markets is important in building the confidence of new and existing investors in doing business with farmers and other value chains actors (Best et al., 2005). Absence of credibility enhancing institutions has created an atmosphere of lack of trust amongst agricultural value chains actors who are unable to differentiate between legitimate actors who are trustworthy and those who are not (Nwosu et al., 2010). This also has an impact on transaction cost, due to the additional cost incurred by individual actors in verifying the identities and credibility of each actor they seek to engage. The absence of independent credibility enhancing intermediaries has also influenced the level of investment in agricultural markets in sub-Saharan Africa, with broader socio-economic implications to rural farmers (De Silva and Ratnadiwakara, 2008)

As discussed in section 2.3, poor creditworthiness of rural farmers has affected farmers' access to agricultural finance especially due to the high level of loan defaulting over the years (Famogbiele, 2013). This does not imply an absence of credible farmers, but an absence of mechanism to prove the credibility of rural farmers (Ojiako and Ogbukwa, 2012; Agada et al., 2018). Lack of data on farmers' agricultural activities and credit behaviours and repayment history, coupled with the absence of intermediaries to make sense of available data, has resulted in a generalisation of rural farmers, characterising them as not being trustworthy because they fail to repay agricultural loans (Best et al., 2005; Nwosu et al., 2010).

Digital platforms can support credibility enhancement due to functionalities that enable users to gather information and opinions anonymously from a wide range of individuals. This can

reduce biases that are common when information is obtained from a single source (Davidwest, 2016). For instance, *Ushaurikilimo* an agro-advisory crowdsourcing (mobile and web) digital platform in Tanzania is used by livestock value chain actors to crowdsource information on livestock production and other value chain activities from extension agents, researchers, and agricultural experts (Sanga et al., 2016). The platform provides a feedback system where questions and answers are available to anyone looking for third party ‘independent’ perspectives on any aspect of livestock production and livestock farmers (Sanga, 2018). As a result, new entrants into the livestock value chains, can access verifiable information from multiple sources before deciding on venturing into livestock business (Fue et al., 2016).

Agricultural finance crowdsourcing platforms such as Farmcrowdy and *Thrive Agric.* advertise farms as investable agricultural units by providing information on the nature and location of investment, ROI and duration of investment (von Bismarck-Osten, 2021). These farm units are owned by farmers verified by these platforms as legitimate and credible thereby proving their eligibility for financing (Sorunke, 2019). Prior to the existence of agricultural finance digital platforms, farmers depend on government, bank loans, and personal savings to access agricultural finance with the associated problems (discussed in section 2.3). On the other hand, potential investors will have to incur high search cost in identifying farmers to invest in and incur high transaction cost in monitoring the progress of their agricultural investment (Ekekwe, 2017). However, agricultural finance digital platforms are aiming to become a one-stop-shop for identifying legitimate agricultural enterprise to invest in (DEVEX, 2018)

### ***Weak Information Analyses***

Information analysis entails gathering and analysing information about market actors and trends to provide reliable and unbiased market information that enables actors make informed decisions (Khanna and Palepu, 2005). Information gathered and analysed by these institutions should include credit history of actors; commodity price and price trends; consumers tastes and preference; market location; as well as the demographics of market actors (Ashwin, 2012; Drouillard, 2017). In agriculture financing, financial institutions require information to establish farmers’ identities (biodata and geo-spatial data) and data on farmers’ loan history and repayment behaviours (Eze et al., 2010; Nwosu et al., 2010). Public bodies that should provide information in agricultural markets include Marketing Boards; Cooperatives;

Extension services; and Federal and State Ministries of Agriculture (Poulton et al., 2006). However, in Nigeria's agricultural finance markets, institutional weakness in performing information analysis functions has resulted in information asymmetries and high information search costs that ultimately influence information access as discussed in section 2.3.

Digital platforms can address institutional voids that manifest as information asymmetries by gathering information such as market price, location, consumers' preferences, standards and trends from several sources and analysing this information making it available to market actors (Drouillard, 2017). Platforms that currently perform information analysis functions in agricultural markets provide market price and price trends, which enable farmers to make informed decisions about the volume of loans to request for in loan applications (Baumüller, 2015). For instance, RuSokoni is a crowdsourcing digital platform with a price index functionality used to gather and analyse trends in market price from across several markets in Uganda. Through crowdsourcing, the platform can work with market actors to gather and analyse commodity prices from various agricultural markets daily enabling farmers to fix their prices competitively based prevailing market price information (Rahman and Fong, 2016). MFarm also provides crop price information through a searchable database containing price trends for over 47 agricultural commodities in Kenya. The provision of these types of information enables farmers to mitigate against fluctuating prices in input and output markets that undermine farmers' ability to repay loans.

### ***Weak Aggregation and Distribution***

Aggregating and distributing institutions specialise in matching market demand and supply, at low cost, thereby reducing the cost of market participation (Khanna and Palepu, 2005). These institutions include banks, insurance companies, venture capital and private equity funds; trading companies, large-scale retailers, cooperatives, and labour unions (Khanna and Palepu, 2005; Barreti and Mutambatsere, 2008). In terms of facilitating access to agricultural finance, commercial and agricultural development banks have the mandate to aggregate finance from savers and distribute finance to borrowers (Mkpado and Arene, 2007; Adesoye and Atanda, 2012). However, high transaction cost and the absence of mechanisms to verify farmer's information results in late disbursement of finance to farmers which work against the seasonality of agricultural production in Nigeria (Anyanwu, 2002; Eze et al., 2010). Furthermore, late disbursement of funds has been cited as a key cause of loan diversion to other household expenses and consequently, loan default (Udoh, 2008). Therefore, problems

relating to high transaction cost and information asymmetries within an environment characterised by weak regulations magnify the weakness of agricultural finance institutions in financing rural farmers.

In the case of information aggregation and distribution, the abolition of agricultural market boards in several sub-Saharan African countries resulted in a void in information provision which has been filled by information intermediaries also known as middlemen (Ouma et al., 2010). Middlemen have been described as opportunistic and exploitative, and the key drivers of information asymmetries in agricultural finance markets, especially in the absence of an information regulatory structure of market boards (Kherallah et al. 2002). Furthermore, farmers' over-dependence on middlemen arises due to the poor state of communication infrastructures in rural areas coupled with the fact that financial institutions are dispersed creating both spatial and temporal constraints in gaining physical access to these institution to access information (Ofuoku and Agbamu, 2016; Acha and Acha, 2012; Unam and Unam, 2013). As a result, developing country agricultural markets are classed as poorly functioning markets due to lack of transparency which stem from lack of complete market information on both the farmers-side (producers) and consumers-side (processors and final consumers) (Jensen, 2007).

Digital platforms such as online trading platforms and crowdsourcing platforms perform aggregating and distributing functions by matching the demand and supply of agricultural products, finance, and information (Akeredolu, 2019). For instance, online trading platforms, which advertise agricultural commodities for buyers, perform commodity aggregating and distribution functions (Baumüller, 2015). Information and finance crowdsourcing platforms, which aggregate market information and agricultural finance, make these available to actors who need these services at a low-cost (Sanga et al., 2016).

### ***Weak Transaction Facilitating Institutions***

Transaction facilitating institutions are institutions that provide a platform to cost-effectively consummate transaction between two or more parties (Khanna and Palepu, 2005). These institutions encourage the participation of new entrants in markets by breaking down barriers in accessing markets (Drouillard, 2017). Transaction costs can be high or low depending on the absence, presence or nature of transaction facilitating intermediaries in any given market (Khanna and Palepu, 2005). Where transaction-facilitating intermediaries are absent, weak,

or opportunistic, there are high transactions cost and market failures (Khanna and Palepu, 2005). This is the case in agricultural finance markets. These markets have been described as high-cost markets due to the weaknesses of financial institutions in evolving cost-effective means of verification of farmers' identities, as well as loan application information that aim to facilitate timely disbursement of loans (Famogbiele, 2013). On the farmers' side, these transaction costs represent logistics and information costs incurred in accessing agricultural finance as discussed in section 2.3.

Digital platforms, by their nature, are innovations that enable two-side interaction between groups with similar interest. Therefore, transaction facilitation is one of the primary functionalities of digital platforms (Koskinen et al., 2018). In agricultural finance markets, digital platforms facilitate market transactions by providing a low-cost channel for buyers and sellers to exchange agricultural commodities, thereby overcoming logistics and infrastructural barriers imposed by physical markets (Babcock, 2015). Some of these platforms allow the embedding of third-party payment platforms, further facilitating low-cost business transactions between actors (Koskinen et al., 2018). Crowdsourcing agricultural finance has also become an innovation for improving farmers' access to finance that has been made possible due to the use of digital platforms (GSMA, 2020). These platforms function similar to other crowdsourcing platforms that entail gathering investment finance to support small businesses and start-ups. Digital platforms have enabled digital entrepreneurs in Nigeria to leverage on the widespread adoption of smart devices and internet infrastructures to create alternative sources of agricultural finance by facilitating investment transactions between farmers and potential investors (GSMA, 2020).

### ***Weak Regulatory Institutions and Public Policy***

Government regulation and public policy develops and enforces rules that govern market transactions (Khanna and Palepu, 2005). These institutions provide a framework that outlines how productive resources are harnessed and used and enforce standards which actors are required to comply with to ensure efficient market participation (Dorward et al., 2009). Absence or weakness of regulative institutions breeds opportunistic winner-take-all behaviour such that groups, which are disadvantaged and less resilient, are either exempted from such markets, or incur high participation costs (Barreti and Mutambatsere, 2008).

A key manifestation of weak regulative institutions in sub-Saharan African agriculture is the adverse incorporation of rural farmers. This results in unequal access to finance and information (Barreti and Mutambatsere, 2008) and is primarily due to unequal power relations in interactions between rural framers and other value chain actors such as middlemen, processors, financial institutions (Dorward et al., 2009).). For instance, the removal of input subsidies as prescribed by the IMF's Structural Adjustment Programme, and which encouraged the shift in pricing power to private companies, resulted in high input prices for small farmers (Kydd and Sponner, 1990). The abolition of market boards also resulted in information asymmetries created by middlemen with the monopoly of information on market price and market location (Amoah-Amankwah et al., 2018).

Furthermore, weak policy implementation framework and weak political will of public office holders has created opportunities for corruption, misappropriation of agricultural funds and finance market failures (Clark 2002). Government policy interventions to reduce the cost of accessing finance by rural farmers have so far not been efficient in lifting constraints to investment in rural agriculture especially post-structural adjustment interventions (Friis-Hansen, 2000). While the private sector has stepped-up in performing intermediating functions to reduce transaction costs through innovations such as platform-enabled agricultural financing, private sector intervention in agricultural markets has not extended to the area of infrastructural development, leaving rural markets largely difficult to access (Hoff and Stiglitz, 1990).

### ***Weak Adjudicating Institutions***

Adjudicating institutions are those institutions that mediate between actors to resolve issues relating to breach of contract, non-compliance with rules and regulations, and disregard for the rule of law in conducting market transactions (Khanna and Palepu, 2005). Absence or weakness of adjudicating institutions results in poor contract enforcement and poor accountability between actors in performing business transactions. In sub-Saharan Africa, poor contract enforcement and lack of accountability in agricultural markets has resulted in lack of confidence in doing business with rural farmers (Eskola, 2005). There is however, currently an absence of research illustrating how the mainstreaming of digital platforms in bridging voids which manifests as weakness of adjudicating institutions.

**Table 9: Institutional Voids, Agricultural Finance Problems and Digital Platforms***(Source: Adapted from Khanna and Palepu, 2005)*

<b>Institutional void</b>	<b>Type of agri-digital platform</b>	<b>Market Failures</b>	<b>Market-enabling Function of Digital Platforms</b>
Credibility enhancement	Crowdsourcing platforms	Lack of trust and confidence in doing business with farmers. Lack of traceability systems and inability to meet certification standards resulting in exclusion from high value chains. Low level of investment in rural agriculture.	Crowdsourcing platforms which gather extension information from several sources there by validating the credibility of extension information provided. Crowdsourcing of buyers and sellers' reviews on consumers, suppliers, and products; providing third party independent feedback system on value chain activities.
Information analysis	Crowdsourcing platforms;; Trading platforms Extension advisory; and farm management platforms	Information asymmetries and adverse incorporation of rural farmers.	Gathering agricultural information from a variety of sources, providing market trends analytics, and making this information digitally available to users. Online directory of commodity, price, market location; market analytics showing price, demand, and supply trends.
Transaction facilitation	Finance platform; Online trading platforms	High transaction cost.	Facilitating the consummation of transactions between buyers and sellers of agricultural commodities. Providing a virtual space for buyers and sellers to interact at low-cost. Consummating transactions through online payments.
Aggregation and distribution	Online trading platforms	High transaction cost.	Gathering information on the demand for finance and those who have finance and matching demand and supply of finance. Gathering information from buyers and sellers; coordinating logistics to fulfil buyers' and sellers' needs. Information Organising the collection agricultural products from rural famers and distributing to vendors. Hosting wide varieties of products; organising into product categories and matching with consumers needs through refined search.
Regulation and Public Policy		Weak execution of agricultural finance policies; elite capture.	N/A
Adjudication		Resolve disputes regarding law and private contracts.	N/A



## Chapter 3 – Research Design and Methodology

### 3.1 Introduction

The previous chapter discussed the research's conceptualisation of institutional voids in agricultural financing and how digital platforms can potentially bridge some of these voids. Chapter two revealed that the weakness and absence (in some cases) of intermediaries in performing institutional functions which facilitate the financing of agriculture manifests as institutional voids. The use of institutional voids as a conceptual lens in this research is due to its applicability in understanding why these problems in agricultural finance exist and how they can be addressed. As revealed in chapter 2 these problems broadly relate to high transaction cost (weak transaction facilitation; weak aggregation and distribution), information asymmetries (weak information analysis; weak aggregation and distribution), lack of trust (weak credibility enhancement), weak regulatory frameworks and agricultural finance poor policy execution (weak regulations and public policy) and poor contract enforcement (weak adjudication) (see figure 4, section 2.6).

This chapter shows the methodological procedures adopted in operationalising the research's conceptualisation of institutional voids in financing agriculture to understand the role of digital platforms in addressing these voids. In so doing, the research adopted data collection methods which facilitated the identification of agricultural finance problems to triangulate these data with findings from the literature review; and to understand the emerging agricultural digital finance space and how the functionalities of a digital platform -*Thrive Agric*. – attempts to address problems with financing agriculture in Nigeria thereby bridging institutional voids. To reiterate, this research seeks to answer three questions. These are:

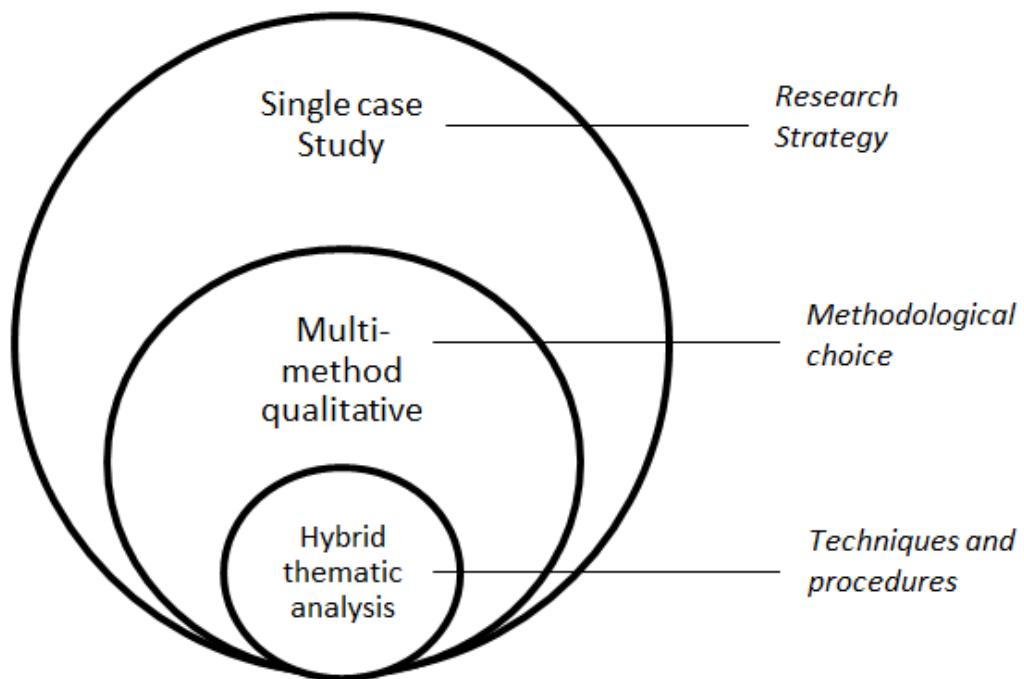
- i. What are the current problems in financing agriculture in Nigeria and how do these problems manifest as institutional voids?
- ii. How are digital platforms emerging in response to institutional voids in financing agriculture?
- iii. What are the implications for agricultural development, which arise due to the use of digital platforms in financing agriculture in Nigeria?

To answer these questions, this chapter starts with a clarifying the researcher's positionality in section 3.2; section 3.3 is a description of the research's strategy (single case study); this is followed by a justification of the data collection methods (qualitative) in section 3.4; after

which the sample selection and fieldwork structure is outlined in section 3.5. Section 3.6 describes the data analysis technique adopted in this research (hybrid thematic analysis). Section 3.7 describes the ethical considerations followed throughout data collection activities; and section 3.8 concludes with a chapter summary. Figure 5 adapts Saunders et al. (2019) “*research onion*” to present the research’s design and methodological approach.

**Figure 5: The Research’s Methodological Approach.**

(Source: Adapted from Saunders et al., 2019)



### 3.2 Positionality

Before delving into the detail of the research’s strategy, it is important to take into cognisance my positionality as a researcher who was born and raised in Nigeria but has spent the past seven years mostly resident in the United Kingdom. Growing up in the Northern part of Nigeria (Jos, Kaduna and Abuja) gave me a certain level of comfort in conducting my research within this region. Although the research location was largely determined by the location of *Thrive Agric’s* headquarters in Abuja and the advice from the Foreign and Commonwealth Office on areas safe for travel within Nigeria.

However, my experience living and working coupled with my existing social networks in Abuja contributed to gaining access to gatekeepers in the Ministry of Agriculture and to other

stakeholders within the emerging agro-digital space. Furthermore, coming back to Nigeria from the UK also gave some stakeholders the impression that I presented an opportunity for them in terms of providing information and advice on access to travel opportunities. This, largely, was a motivation to agreeing to do interviews with me. Being a Nigerian made me understand that not taking time out of my research to provide this sort of information could come off as rude and condescending. However, on more than one occasion the entire interview time was used to discuss UK university admission possibilities for children of such respondents who were often senior officials, with no time allocated for the research interview. I believed this would have not been the case if I had a different background or if I was an older researcher. In other cases, gatekeepers were sometimes inclined to introduce me to stakeholders who were of my tribe, with the notion that I would get a quicker audience due to our tribal connection. I had to emphasise my desire to meet stakeholders based on their position and usefulness to my research and not based on tribe or even gender. But this was not always possible.

Overall, my positionality served as both a facilitator and deterrent to data collection processes. This drove me to gather data from as many respondents who were willing to engage with the research given the relatively short period.

### **3.3 Research Strategy: Single Case Study**

This research adopts a *single case study* strategy to provide an in-depth understanding of how digital platforms address institutional voids created by the absence (and weakness) of institutional intermediaries in agricultural finance markets. Yin (2009) defines case study research as “*an empirical inquiry that investigates a contemporary phenomenon in depth within its real-life context especially when the boundaries between phenomena and context are not clearly evident*” (Yin, 2009:18). Although case study research has been criticised for lack of generalisable outcomes, it is useful for research seeking to obtain an in-depth and holistic understanding of a given phenomenon especially where research is lacking (Noor, 2008). In this research, the mainstreaming of agricultural finance platforms in agricultural finance markets is a new phenomenon that has recently emerged in Nigeria’s agricultural space. Furthermore, research on the application of the concept of institutional voids to understanding agricultural financing problems in a developing context underscored by the application of digital innovations is also nascent. Therefore, the absence of prior empirically supported research in this area has made it imperative for the researcher to engage with this

new phenomenon within its social context to obtain a first-hand experience of the workings of this platform-enabled agricultural organisation and how their platform model is attempting to bridge institutional voids in agricultural financing in Nigeria.

At the beginning of this research in 2017, grey literature and online search revealed the names of two active agricultural finance digital platforms in Nigeria: *Farmcrowdy* and *Thrive Agric*. Formal introductory letters were submitted to both platforms, but only *Thrive Agric* accepted to participate in the research. Upon arrival in Nigeria, contact snowballing revealed that there were about 18 digital agricultural finance platforms in Nigeria including *Farmcrowdy* and *Thrive Agric*. However, *Thrive Agric* remained the single case selected for the research as it met all criteria for case selection.

Yin (2008) describes ‘*a case*’ as a unit of analysis that could be an individual, an entity, or an event. Yin argues that a single case can be adopted if it represents a *typical case* that can be used to explain the phenomena under study (Yin, 2008). The general criteria for choosing the case in this instance were as follows, with *Thrive Agric*’s fulfilment of those criteria summarised in Table 10.

**Table 10: Criteria for Case Selection***(Source: Author's Field Research, 2018/2019)*

<b>Criteria</b>	<b>Description</b>	<b>TA Fulfilment</b>
Nature of platform service	The services rendered by the platform should be directly or indirectly linked to financing smallholder agriculture.	<i>Thrive Agric's</i> platform gathers agricultural finance from several individuals and institutional investors to invest in rural agriculture in Nigeria.
Platform user engagement	The digital platform must have active user engagement throughout the course of the research.	<i>Thrive Agric.</i> has an active user engagement with 2,439 platform users (2018) and 10,000 platform users (2019).
Access	Willingness and availability of platform owners to meet with the researcher; including willingness to give researcher access to office physical space and staff. Willingness of platform owners to provide access to platform users and partners for key informant interviews	<i>Thrive Agric.</i> provided complete access to platform owners, platform staff, platform users (who were willing to participate); physical office space; beneficiary farmers and institutional partners
Platform office location	Platform office space should be within geo-political zones in Nigeria considered to be 'safe for travel' according to the Foreign and Commonwealth Organisation (FCO) due to the Boko Haram insurgencies and cattle herdsman attacks experienced across Nigeria at the time of the research. The research therefore limited its location criteria to Abuja and Lagos Nigeria and platform-funded farmers located in areas at the boundaries of Abuja and Lagos (see figure 6).	<i>Thrive Agric's.</i> headquarters is located Abuja Nigeria. <i>Thrive Agric.</i> also has some funded farmers located in Kaduna (Jere) which is at the boundary of Abuja. The Federal Capital Territory of Nigeria is considered safe for travel by the Foreign and Commonwealth (FCO) office (see figure 6).
Formalisation of research participation	Provision of a formal letter indicating acceptance for the researcher to conduct research with the platform for use in research ethical application.	<i>Thrive Agric.</i> provided a formal letter of invitation which was attached to the researchers' ethics application form.

Figure 6 below is a map of Nigeria highlighting data collection locations. These are: Kaduna (blue); Abuja (green); Lagos (dark purple); Ogun (yellow); and Benue state (light purple) the food basket of the nation (where platform owners started aggregating agricultural produce from farmers for large scale processors).

**Figure 6: Map of Nigeria Showing Data Collection Locations**

Source: One World Nations Online (2021)



*Thrive Agric.* was selected because it represented a typical case of agricultural finance platforms because as at the time of data collection, the platform model adopted by all agricultural finance platform-enabled businesses was the ‘crowdsourcing model’ which entails gathering finance from several investors through an online or mobile application to fund agricultural production. The research acknowledges the limitations of a single case study research in relation to generalisability of research outcomes. However, *Thrive Agric’s* platform model shares similar features with all other agricultural finance digital platforms:

1. Crowdsourcing finance from multiple sources for the purpose of investing in rural small and medium enterprises such as agriculture.
2. Offering a percentage return on investment (ROI) to investors as well as a proposed investment maturity date.
3. Developing a bespoke digital platform investment channel that could either be a mobile or web application specifically to serve as a channel for gathering funds, performing payment transactions, and monitoring investment progress.

4. An active complementary offline segment where backward integration of value chain activities was carried out including providing agronomic support, extension services, input financing and final markets for outputs.
5. Private sector, digital start-up run by Nigerians.
6. An underlying social entrepreneurship model branding themselves as a private business with an agricultural development approach because of their direct engagement with rural agriculture.
7. Platform users located within and outside Nigeria.

In terms of differences between agricultural finance digital platforms in Nigeria, only two main differences were observed. These are

1. *The nature and number of farm enterprises advertised on the platform.* Some platforms focused on just one agricultural product (for example tomatoes) while other specialised in multiple agricultural products (for example maize, rice, and soybeans).
2. *The ROI offered.* The percentage return on investment for similar enterprises could differ across platforms: some platforms offer investors higher returns than other platforms.

It is also worth noting that although the bridging of institutional voids by agricultural finance platforms is the focus of the research, the researcher also engaged with other types of (non-agricultural finance) digital platforms mainstreamed in agriculture during the research scoping phase in Nigeria. The purpose of engaging with other platforms was to obtain a more holistic understanding of, and to support the development of a narrative around, the emerging digitally enabled agricultural finance space in Nigeria. This was considered necessary to contextualise the emergence of digital platforms in agricultural finance markets in Nigeria. These ‘other platform cases’ supported the mapping of the stakeholders, institutions, opportunities, and challenges encountered by actors in the mainstreaming of digital platforms in Nigeria’s agriculture.

### **3.4 Data Collection Methods**

The data collection methods adopted for this research were selected based on their suitability in operationalising the research’s conceptualisation of institutional voids in agricultural financing (see table 11). Given that the research investigates a new phenomenon in Nigeria’s agricultural financing that captures personal opinions, experiences and descriptions that cannot be quantified in numeric terms, qualitative data collection techniques were adopted for

this case study research. According to Eiesenhart (1989) qualitative research methods answer questions relating to *why*, *how* and in *what way*; while quantitative research methods answer questions such as: *how many* and *how much*. This research seeks to answer questions relating to *how* digital platforms emerge in environments characterised by weak institutions and *how* problems with financing agriculture manifests as institutional voids. Therefore, adopting a quantitative approach to gather empirical evidence for this research is unsuitable to answer the research questions.



**Table 11: Operationalising the Research’s Conceptualisation of Institutional Voids, Agricultural Finance Problems and Digital Platforms**

(Source: Author’s field research 2018/2019)

<b>Data Collection Method</b>	<b>Target Respondent(s)</b>	<b>Operationalising research’s conceptualisation on institutional voids</b>
Key informant interviews	Platform owners, Platform staff, Farmers, Platform users, Staff of FMARD, IITA consultant, ADP director	Questions relating to information asymmetries, high transaction costs, poor credibility of farmers, weak regulatory frameworks and poor contract enforcement. Questions on why these problems persist provided an understanding of their manifestation as institutional voids.
Participant observation	Platform owners and staff	Observing the daily activities performed in managing a platform business and the challenges within the emerging digitally enabled agricultural finance space shed light on institutional voids created and maintained by agricultural finance digital platforms. Participant observation supported building the narrative of the research’s case study – <i>Thrive Agric</i> .
Qualitative survey	Farmers	Questions relating to information asymmetries, high transaction costs, poor credibility of farmers, weak regulatory frameworks and poor contract enforcement. Questions on why these problems persist provided an understanding of their manifestation as institutional voids.
Testing the agricultural investment	Platform investors (users), platform owners	Testing investment procedures through the platform supported triangulation of data collected from platform users and platform owners on the platforms’ functionalities which facilitate the bridging of institutional voids by addressing problems in agricultural financing.
Secondary information		Provided the basis for establishing the linkages between agricultural finance problems and institutional voids thereby proving the suitability of Khanna and Palepu’s framework for answering the research’s questions.

Data collection activities were broken down into two phases, a scoping phase that entailed engaging with a wide range of stakeholders connected to the platform case to understand the broader space within which the platform operated. In the scoping phase, data were collected from owners of agricultural finance digital platform (both finance and non-finance platforms), farmers and experts from the agriculture sector. The scoping phase was followed by in-depth data collection from the selected case – *Thrive Agric*. Qualitative collection technique adopted for both the scoping and main data collection activities was semi-structured key informant interviews (Gill et al., 2008). This data collection method was also

supported with data from qualitative survey (Fink, 2003; Jensen, 2010); participant observation (Jorgensen, 2015); testing of the investment procedure and secondary information. These data collection techniques are discussed in subsequent sub-sections.

### **3.3.1 Key Informant Interviews**

Interviews are carried out to capture motivations, experiences, opinions, and beliefs of respondents to obtain a deeper understanding of the phenomena under study (Gill et al., 2008). In this research, key informant interviews followed a semi-structured format that served to guide the interview process but also given enough leeway for the emergence of other relevant themes (Cohen et al., 2011). The selection of a semi-structured approach in conducting interviews was to ensure that interviews were flexible enough to allow the further exploration of interesting ideas that emerged from interviews without completely deviating from the overall research scope (Swain, 2019). An interview guide was developed in line with the research questions to capture as much information from respondents around the research theme (Gill et al., 2008) (see appendix 1 and 2). Therefore, although interviewees were asked similar questions, the order in which the questions were asked varied depending on the previous responses provided by the interviewee (Cohen et al., 2011).

Questions in the interview guide (see appendix 1 and 2) were structured around the research questions and sought to operationalise the researcher's conceptualisation of institutional voids as manifestations of problems in agricultural financing. Questions asked to farmers, related to problems encountered in accessing agricultural finance prior to accessing finance through *Thrive Agric*. These questions were followed by a comparison between accessing finance through conventional financial institutions and *Thrive Agric*. Farmers were therefore asked specific questions relating to information access, transaction cost, lack of trust and poor creditworthiness, contract enforcement and regulations. Respondent farmers were also asked to discuss other problems encountered in financing their agricultural activities which formed emergent data outside the priori conceptualisation of agricultural finance problems.

Platform owners and platforms staff were asked question relating to the motivation for setting up a digital platform to determine if these were actually borne out of the need to address problems with agricultural financing. This group of respondents were asked direct questions on the use of the platform to address institutional voids including transaction facilitation, information analysis, aggregation and distribution, credibility enhancement, regulations and adjudication. Questions were also asked relating to the platform evolution to develop the case

study and understand the emergence of the platform within an environment characterised by institutional voids. Other stakeholders outside the influence of the platform including staff of the Federal Ministry of Agriculture, other platform owners, staff from financial institutions, and digital platform consultants were asked questions relating to the perception of platforms in addressing institutional voids and the development implication of platforms facilitating agricultural financing in Nigeria. A list of interview participants is presented in appendix 3.

During the scoping phase, interview guides were tested to reveal any ambiguities in the questions and to test the suitability of interview channel adopted (see Table 12). Testing the interview guide resulted in re-wording interview questions and shortening the duration of interviews by breaking down questions into themes. As expected, research on digital platforms would entail engaging with respondents who are in different parts of the world. The spread of respondents both within and outside Nigeria made it necessary for the researcher to adopt alternative channels to conduct those interviews that could not be carried out face-to-face. These alternative channels include Skype, WhatsApp chat/call, phone calls, and emails (Table 12).

Key informant interviews followed (Miller and Bell, 2020) recommendations entailed:

1. ***Obtaining prior consent:*** Potential respondents were sent introductory emails explaining the research aims and their mode of participation (interviews). A copy of the participant consent form was attached to the email to give the respondent sufficient time to read and decide on their participation the research. A verbal consent was recorded from respondents who were unable to physically sign the consent form such as with lead farmers in Jere, Kaduna state Nigeria who were not literate.
2. ***Meeting in a public place:*** Face-to-face meetings were conducted in public spaces. Respondents were also asked to select a venue of their choice in a public place and their preferred date and time for the interview.
3. ***Anonymising all interviews:*** Respondents were informed that interviews would be recorded but responses would be anonymised, and no personal identifiable information would be included in the research. Key informants for this research were: Platform Owners (PO), Platform Users (PU), Farmers (F), Platform Partners (PP) (financial institutions) and other External Stakeholders (ES) – that is, experts within the agricultural space but outside the influence of platforms businesses. Respondents also had the option of receiving transcripts of the interview

The researcher had to enlist the services of a translator in interviewing lead farmers in Jere because these farmers only spoke their local dialect and Hausa. All interviews were carried out in Hausa and recorded using an audio recorder. Interviews entailed the researcher reading out the question, which was then translated to Hausa by the translator, farmers' responses were also translated to English from Hausa.

**Table 12: Channels Adopted for Key Informant Interviews***(Source: Author's field research, 2018/2019)*

<b>Interview channel</b>	<b>Key informant</b>	<b>Description</b>	<b>Quality of data collected</b>
Face-to-face	PO; ES; PU; F	This channel entailed conducting interviews physically with respondents. An audio recorder was used during interviews. Audio recording was later transcribed into a Microsoft word document for further analysis.	This channel provided the highest quality of data due to the advantage of having the researcher physically present. Responses and feedback were obtained in real-time, and the researcher was able to take note of respondents' body language and reaction to certain questions which also informed follow-up questions.
WhatsApp	PU, PP	This channel entailed sending each interview as individual texts to enable respondents to use the 'reply function' in WhatsApp to answer each question. The reply function was also used for follow-up questions. This was the preferred channel for platform users because they were located in different locations across Nigeria and outside Nigeria. Using WhatsApp addressed logistical issues which would have been a barrier to data collection. It also reduced the cost of conducting the research (Jowett et al., 2011; Gibson, 2020).	Due to the nature of this channel which entailed the respondent typing responses, responses collected were shorter and straight to the point. The physical activity of 'typing' out individual responses influenced the depth of initial responses. Most respondents only went into detail when asked follow-up questions. To achieve high depth in responses, interviews could take between 2-4 days as respondents sent in responses at their convenience.
Email	PU, PP, ES	This was the preferred channel for platform partners and external stakeholders who were spread across Nigeria. This channel also addressed logistical issues which would have been a barrier to data collection (Jowette et al., 2011; Cheng, 2017).	As with data collected via WhatsApp, this was short, straight to the point and response time was longer. This was mainly due to the nature of the stakeholder group that preferred this channel.
Skype	PO, PU, ES, PP	This was the preferred channel for follow-up interviews with respondents who had already engaged in face-to-face interviews. Some platform users and stakeholders also chose this channel. Using the record function in Skype, interviews were recorded and transcribed. Skype presents a platform for synchronous virtual interviews quite similar to face-to-face interviews (Cheng, 2017).	This channel provided good quality data as it supported real-time response and feedback.
Phone calls	PO, PU, ES	This was used for follow-up interviews and preferred by some platform users. Phone calls were recorded and transcribed. Phone calls provided real-time information and feedback which the email channel did not, but also resulted in significant phone credit costs (Vicente et al., 2009).	Interviews carried out through phone calls had to be typed out by the researcher as the interview was ongoing, as a result, this channel did not support verbatim transcription of data as the research had to make snap decisions on what was important to note and what was not.

### 3.3.2 Participant Observation

The purpose of participant observation is to allow the researcher to observe and interact with respondents within their natural context (Jorgensen, 2015). Due to the nascent nature of this research, understanding the day-to-day management of a platform business helped understand the opportunities and challenges encountered in mainstreaming digital platforms to agricultural finance markets in Nigeria. In this research, participatory observation was carried out in the natural settings of selected case – *Thrive Agric's*. head office to experience the day-to-day running of an agricultural finance platform business in Nigeria. Participant observation entailed attending key meetings with platform partners and staff meetings to gain an understanding of the opportunities, challenges, and upcoming events around the agricultural platform business. The researcher also supported the business development team in mapping out strategies for scaling-out the platform's business activities including proffering strategic directions towards establishing a research team to utilise *Thrive Agric's*. data efficiently for agricultural development research purposes.

Working closely with *Thrive Agric.* provided a more in-depth understanding of the operational structure of an emerging platform-enabled business in Nigeria. Observations, thoughts, and reflections gathered were recorded in the researcher's journal and served as basis for further interviews with platform owners, users, and staff, and provided vital information in building the narrative on the emergence of digital platforms in agricultural finance markets in Nigeria.

### 3.3.3 Qualitative Survey

Surveys are used to study attributes of a population systematically through sampling members of the population (Grooves et al., 2004). Although commonly conducted in quantitative data collection activities to derive numerical patterns of attributes within the population of interest, survey can also be carried out in qualitative research to identify the diversity of the phenomena under study within the population of interest (Jensen, 2010). That is, a quantitative survey seeks to study the distribution of a phenomenon within a population. It is therefore more structured in the data collection approach while a qualitative survey seeks to study the diversity of a phenomenon within a population and is therefore less structured (Jensen, 2010). Fink (2003) argues that qualitative surveys are useful for exploring '*meanings and experiences*' of sampled respondents concerning a particular topic of interest. For this research, a qualitative survey was adopted to gather data from some poultry farmers located

in the South-western region of Nigeria, who had benefitted from crowdsourced funds from *Thrive Agric*'s platform. The justification for adopting this data collection model was driven by spatial constraints encountered by the researcher due to the remoteness of these farmer-beneficiaries who tend to be in rural areas within Nigeria that the researcher could not access. Therefore, the researcher was unable to conduct face-to-face interviews with this farmer group. The researcher was able to administer qualitative survey questions (see Appendix 2) to farmer-beneficiaries by “piggy-backing” on a field survey exercise conducted by *Thrive Agric* between June and September 2019. *Thrive Agric* gave the researcher the opportunity to include open-ended questions in the questionnaire booklets that were administered to 50 poultry farmers in Ogun state, located in the south-western region of Nigeria.

The questions sought to draw a comparison between conventional finance sources and digital finance sources. Similar to the question asked during key informant interviews with maize farmers in Jere, the qualitative survey questions also sought to identify past challenges in accessing agricultural finance problems to identify areas where platforms might be addressing problems encountered in agricultural finance markets.

### **3.3.4 Testing Agricultural Investment through the Platform**

To ensure that information provided by the platform owners concerning platform use, investment cycle duration and payment of ROI was factual, the researcher enlisted three family members to invest in farms advertised on *Thrive Agric*'s digital platform. At the start of data collection activities from *Thrive Agric* in October 2018, two enterprises were available for investment on their platform: Poultry (6 months; 15% ROI) and maize (9 months; 22% ROI). The aim of this test was also to enable the researcher to gain experience on the entire investment cycle from setting up the account to final receipt of the ROI. The researcher was present during the investment process of these family members and recorded their experiences in using the platform throughout the investment cycle. This micro-experiment also supported triangulation of the researcher's personal experience in using the platform with data collected from platform owners and platform users. The aim was to verify that the platform was indeed active; that the information provided on the platform on agricultural investments was factual and that platform users received their ROIs at the time specified on their dashboards.

### **3.3.5 Secondary Information**

Secondary information consists of information gathered and analysed by other researchers or other non-academic sources that provides insights into the phenomena under study (Hox and Hennie, 2005). In this research, secondary information served as the starting point for identifying platform cases and initial categorisation of platforms into four broad types: crowdsourcing platforms; farm management platforms; extension and advisory platforms; and online virtual markets. Secondary data adopted include, presentations used for pitching events by platform owners, progress reports, end of season reports and information from websites. This secondary information was vital in contextualising case study within the emerging digitally enabled agricultural finance space in Nigeria. Secondary data, such as literature reviews on agricultural finance problems, projects and programmes in Nigeria, and practitioner reports on agricultural finance platforms, were also used to triangulate primary data.

### **3.5 Sample Selection and Fieldwork Structure**

To answer the research questions, the researcher collected primary data from five categories of respondents: (1) The owners of digital platforms – this includes the owners of *Thrive Agric.* and owners of other digital platforms; (2) The users of platforms; (3) Farmers linked to platforms; (4) Platform partners; (5) Stakeholders within the agricultural sector (outside the influence of platform owners). The research adopted a voluntary sampling approach to select respondents from each category to participate in the research. Volunteer sampling is a purposive sampling technique adopted in research where random or probability sampling is not feasible due to the perceived sensitivity of the research (Jupp, 2011). Voluntary sampling was considered a suitable approach for selecting respondents for the research due to the nascence of research on digital platforms for financing agriculture in Nigeria. At the start of the research, there was no literature that mapped the stakeholders, functions, and exact nature of this emerging digitally enabled agricultural finance space. It was the task of the researcher to identify who the stakeholders were, describe their functions and stake, and to build a narrative to describe the emergence of this space. Therefore, it was deemed necessary to start the fieldwork with a scoping phase using voluntary sampling to gather preliminary data before commencing in-depth data collection from the selected case, *Thrive Agric.*



### 3.4.1 Scoping Phase

As previously discussed, the sample selection in the scoping phase followed the voluntary sampling technique. Due to the dearth of empirical evidence supporting claims of the existence of these platforms, it was deemed necessary to begin the research with a scoping exercise. The aim of conducting a scoping exercise was to:

1. Obtain a generally understanding of what was happening in Nigerian agriculture in relation to the mainstreaming of digital platforms in this space. The researcher conceptualised this new phenomenon as an '*emerging agri-digital space*'.
2. Identify and understand the actors responsible for driving the emergence of these digital platforms; what institutions exist within the space; what challenges and opportunities exist within the space; and what disruptive impact (if any) do these digital platforms have within the space.
3. To determine if what was presented in grey literature and platform websites about digital platforms in Nigeria's agricultural sector matched the realities of these platforms on the ground.
4. To develop a description of the emerging agri-digital space in terms of the types and functions of platforms operating within the space.

#### *Sample selection*

The scoping phase started with a Google search to identify digital platforms operating in Nigeria's agricultural sector in general. As discussed earlier, the research also sought to provide a description of the agri-digital space within which agricultural finance platforms were operating. The Google search yielded blogs and news articles that provided the names of eleven digital agricultural start-ups, including Farmcrowdy and Thrive Agric. The next step entailed performing a Google search on each platform to confirm that the platforms actually existed; to understand the nature of agricultural service the platform provided; and to extract contact information to send out introductory emails requesting to visit the platform office upon arrival in Nigeria. The aim was to start with platforms identified online, then upon arrival in Nigeria to use the contact snowballing technique to gather the names of similar platforms that the researcher was unable to find through google search. Selecting platform cases for the scoping followed the criteria outlined in Table 13.

Emails introducing the research and researcher were sent to eleven agricultural digital platforms between January and April 2018. Responses were received from five digital

platforms (including the selected case for the research): *Thrive Agric.*; Chowberry; Verdant; ReLeaf; and ProbitFarms. In addition, three platforms that met the selection criteria were identified through contact snowballing. These platforms were: Feedcalculator; Growsel and Agroversity.

The scoping phase lasted for one month between September and October 2018 and started with introductory meetings with each of the eight platform owners in their offices (and virtually). In some cases, members of staff were invited to join the meeting. The scoping phase also sought to gather the opinions of other stakeholders outside the influence of the digital platform. The aim of this capture was to obtain views that could add to a more objective understanding of the emerging digital platforms targeting agriculture in Nigeria. These included stakeholders from the Ministry of Agriculture, experts on digital platforms in agriculture from research institutions in Nigeria, and other platform stakeholders that were identified through contact snowballing. The aim of extending the scoping exercise to include other non-platform stakeholders was to obtain a holistic picture of the interaction between digital platforms and existing structures within the agricultural sector and to obtain a more objective view on the emergence of digital platforms in Nigeria's agricultural space. A total of 14 key informant interviews were carried out during the scoping phase. The scoping phase concluded with a preliminary data analysis and reflection exercise summarised in Table 13 below.

**Table 13: Summary of Interviews and Preliminary Findings from Scoping Phase**

*Source: Researcher's fieldwork (2018)*

<b>Platform Organisation</b>	<b>Description</b>	<b>Stakeholder interviewed</b>	<b>Preliminary findings</b>	<b>Platform Fulfilment of Criteria</b>
<b>Digital platforms</b>				
Thrive Agric	Crowdsourcing platform used to gather investment funds from several individuals and institutions to invest in rural farmers in Nigeria.	Platform owner (2) Platform staff (2)	-Platform is still in its inception phase; opportunities and challenges in scaling-out are identified. -Platform had 2,439 users as of October 2018. -Identified that an offline segment which compliments the online platform existed. -Farmers and other value chain actors fall into the complementary category. -Snowballing revealed other similar platforms which existed within the space.	<i>Nature of platform service:</i> Directly relates to rural agriculture <i>Platform user engagement:</i> Active <i>Access:</i> complete access granted to researcher <i>Platform office location:</i> Abuja <i>Formalisation of research participation:</i> Formal letter provided. <i>Status:</i> Included
Chowberry	Virtual market platform that works with supermarkets to provide real time information on expiry dates of packaged food products with approaching expiry dates. The web platform serves as an online trading platform where consumers shop, pay (lower prices) and receive a unique code for product redemption in the designated retail shop.	Platform owner (1)	-Platform service was centred on large-scale processors, supermarkets and consumers and not primary producers -Products advertised include both locally processed and foreign (imported) finished goods.	<i>Nature of platform service:</i> Not linked to rural agriculture <i>Platform user engagement:</i> Active <i>Access:</i> partial access granted (only to platform owner) <i>Platform office location:</i> Abuja <i>Formalisation of research participation:</i> Invitation for interview provided through email. <i>Status:</i> Excluded
Verdant	A digital platform which uses a mobile app, SMS and Unstructured Supplementary Service Data (USSD) to provide tailored information to farmers on all stages of the value chain from the pre-planting stage to planting, harvesting and sales, including financial service support and access to markets.	Platform owner (1)	-This platform is still at a very early inception phase with very low adoption which sheds light on challenges to platform emergence in Nigeria's agricultural sector. -This platform is one of three platforms which have been developed by the organisation. The other two platforms were developed with funding from international organisations and also handed over to these INGOs after development and capturing of farmers'	<i>Nature of platform service:</i> Directly relates to rural agriculture <i>Platform user engagement:</i> Undetermined <i>Access:</i> Platform owner not readily accessible <i>Platform office location:</i> Abuja <i>Formalisation of research participation:</i> Invitation letter for interview provided. <i>Status:</i> Excluded

			data. This revealed the influence of INGOs on platform development in Nigeria especially for data gathering. -Platform has been adopted by one agricultural cooperative in Northern Nigeria.	
Probity Farms	Online farm management platform which enables farm owners to create an account and provide information about their farms on the web-based platform including information such as: planting date, crop type, farm location, expected output etc. and obtain farm advice for a fee (online payment). Platform also hosts an online discussion “farmers’ forum”.	Platform owner (1)	-Platform is still at the early phases of development -Platform claims to have 120 platform subscriptions and one cooperative in Southwest Nigeria uses the platform -Willingness to pay for platform services is still a key constraint to platform establishment.	<b>Nature of platform service:</b> Directly relates to rural agriculture <b>Platform user engagement:</b> Inactive <b>Access:</b> Access to platform owner granted to researcher <b>Platform office location:</b> Lagos <b>Formalisation of research participation:</b> Formal letter provided. <b>Status:</b> Excluded
Agroversity	An online training platform developed by <i>Thrive Agric.</i> to address the need for agricultural and agribusiness training and development for new-entrant farmers.	Platform owner (1); Platform staff (1)	-Recently developed digital platform for agricultural education and training. -This revealed another type of platform which literature review did not capture. -First batch of trainees started in February 26, 2019.	<b>Nature of platform service:</b> Directly relates to rural agriculture <b>Platform user engagement:</b> Active <b>Access:</b> Access granted to platform owners; platform users were not willing to participate in the research <b>Platform office location:</b> Abuja <b>Formalisation of research participation:</b> No formal letter provided. <b>Status:</b> Excluded
ReLeaf	A virtual market platform which links buyers and sellers of agricultural commodities.	Platform owner (1)	-Interview revealed the challenges with the emergence of digital platforms in Nigeria. Platform was not functional at the time of the scoping and in the process of re-structuring its business model.	<b>Nature of platform service:</b> Directly relates to rural agriculture <b>Platform user engagement:</b> Inactive <b>Access:</b> Access to platform owner only <b>Platform office location:</b> None <b>Formalisation of research participation:</b> No formal letter provided <b>Status:</b> Excluded
Growsel	A crowdsourcing platform similar to <i>Thrive Agric.</i>	Platform owner (1)	-The interview with Growsel revealed challenges new platforms encounter in gaining adoption in Nigeria. Platform is not owned and managed by a Nigerian. Platform declined to be included in	<b>Nature of platform service:</b> Directly relates to rural agriculture <b>Platform user engagement:</b> Active <b>Access:</b> Access to platform representative only <b>Platform office location:</b> United States

			research.	<b>Formalisation of research participation:</b> No formal letter provided. <b>Status:</b> Excluded
Feedcalculator	A mobile app which helps farmers to formulate their own animal feed.	Platform representative (1)	- This interview revealed the challenges experienced by new platforms attempting to enter the agro-digital space in Nigeria. - The interview revealed that a major challenge with platform emergence is willingness to pay for platform services.	<b>Nature of platform service:</b> Directly relates to rural agriculture <b>Platform user engagement:</b> Undetermined <b>Access:</b> Access to platform denied; informal interview with platform representative <b>Platform office location:</b> Netherlands <b>Formalisation of research participation:</b> No formal letter provided. <b>Status:</b> Excluded
<b>Other stakeholders</b>				
Federal Ministry of Agriculture and Rural Development (FMARD)	ICT Department of the Federal Ministry of Agriculture and Rural Development.	Staff in ICT department (1)	-The interview revealed that the government is aware of the existence of digital platforms but has no influence on their operation. -Government interaction with these platforms is limited to attending opening ceremonies if they are invited, but no funding or partnerships exists.	
IITA	International research organisation in Nigeria which has introduced the SeedTracker application to improve traceability of inputs and outputs along agricultural value chains in Nigeria.	Consultant on digital platforms for agriculture (1)	-Revealed that INGOs are also working on digital platforms for agriculture. They see the potential for platforms to transform the agricultural sector, they also understand the challenges.	

### 3.4.2 Main Data Collection

*Thrive Agric.* is a crowdfunding platform set up in 2017 used to gather funds from individuals and institutions to invest in rural farming. The platform uses their website to advertise farms as ‘units’ to be purchased at a fixed price, with a stated percentage return on investment to be received by investors at the end of the production cycle. The production cycle ranges from 6-10 months depending on the nature of the agricultural enterprise. Investors can purchase more than one farm unit, and payment is carried out on the platform through a third party: a payment platform called PayStack. A dashboard is provided for each platform subscriber to monitor their investment. Regular updates on investment progress are provided to platform users using email and social media. The platform provides finance to rural farmers across several agricultural value chains in the form of input finance, extension, storage facilities, and access to markets.

The main data collection exercise lasted for a total of 6 months. The first part lasted for three months from October to December 2018 and the second part was between mid-June to mid-September 2019. Breaking down the data collection into two parts was necessary to capture two distinct phases in the platform’s evolution, that is, platform inception and scaling out, to understand opportunities and challenges encountered by platforms in different stages of emergence.

#### *Sample selection*

Sample selection followed a voluntary sampling approach (Jupp, 2011). Therefore, only respondents who were willing to participate in the research were selected. Five members of the senior management team at *Thrive Agric.* were interviewed. This includes The Chief Executive Officer (CEO), Chief Technical Officer (CTO), Head of Operations, Head of Communications, and Head of Customer Experience. The selection of samples from the pool of platform users<sup>47</sup> started in October 2018 when a bulk email was sent to all 2,439 platform users introducing the researcher and the research aims. Platform users who were interested in participating in the research were asked to respond to the introductory email, with a disclaimer that email responses which indicated an acceptance to participate in the research will be forwarded to the researcher, thereby giving the researcher access to contact them to arrange interviews at their convenience. In total, only 23 platform users accepted to be part of the research and were all included in this research. As a result, sample selection of platform

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<sup>47</sup> Platform users represent the crowd from which investment funds are gathered. Platform users are of two types, individual investors also called farm subscribers and institutional investors (such as commercial banks)

users was skewed, as the number of users who agreed to participate is significantly smaller than the total population.

*Thrive Agric.* also sent introductory emails to their four institutional partners (financial institutions) introducing the researcher and research aims. Three partners agreed to participate anonymously in the research and were therefore included. The research also sought to capture the views of stakeholders within the agricultural sector outside the direct influence of platform business. These other stakeholders were identified through the Ministry of Agriculture as people who are affiliated to research or development work relating to digital platforms and agricultural development. Five expert stakeholders' names were provided by the Ministry of Agriculture, they were all contacted through email; three agreed to be included in the research. Three of these experts were from within the Ministry of Agriculture and one was from the International Institute of Tropical Agriculture (IITA) specialising in digital platforms in developing country agriculture.

The sampling criterion for the selection of farmers was based on safety and logistics in accessing these farmers. Therefore, *Thrive Agric.*'s maize farmers located in Jere, Kaduna (near Abuja) and poultry farmers located in the southwest were included, while farmers located in Kebbi, Zaria and Niger were excluded as they fell within regions classed as unsafe for travel. The first group of farmers interviewed in October 2018 were maize farmers in Jere. For the maize farm investment, *Thrive Agric.* owns a 325-hectare irrigated farmland and works with farmers through a direct labour system. In this model, the 325 hectares is divided into management units of ten hectares with a lead farmer in charge of each unit. Ahead of the researcher's visit to the Jere maize farm, the farm manager invited all 32 lead farmers to participate in the research. Out of the 32 lead farmers, 10 lead farmers agreed to participate in the research and were interviewed. The researcher required the assistance of a translator as all farmers spoke the local language (Hausa). The second group of farmers included in this research comprised of 50 poultry farmers that made up a farm cluster located in Ogun state. Responses from these farmers were gathered from a survey carried out by *Thrive Agric.* as part of their ongoing research and development activities between June and September 2019. Out of the 50 questionnaires received, only 20 respondents completely filled out the section that contained the researcher's qualitative questions; thus, these 20 respondents were included in the research. Combining both scoping and main data collection activities, a total of 78 respondents participated in the research as summarised in Table 14 below.

**Table 14: Summary of Fieldwork Data Collection Methodology - Round 2**

*Source: Researcher's fieldwork (2018/2019)*

Strategy	Participants	Summary of Outcomes	Linkage to Research's Conceptualisation on Institutional Voids
Key informant interviews: face-to-face; WhatsApp chat, email, and phone calls	<i>Thrive Agric's</i> platform owners (2) Platform staff (7) Platform users (23) Maize farmers (10) Institutional partners (3) Agric sector stakeholders (5) Other platform owners (8)  Total interviews (58)	Data collected provided information on the platform's evolution from inception till 2019; background on platform owners; motivation for developing the platform; platform uses and users; non-platform users (beneficiaries); commodity value chains supported by platform; institutional partners (value chain); operational constraints; future opportunities; farmers' participation. Data collected also identified problems with agricultural financing encountered by platform owners and what aspects of the platform business addressed these finance problems.	Key informant interviews (see appendix 1) supported mapping out the problems with agricultural financing which have been identified by the digital platform business and how the platform attempted to address these voids. Although these problems were in line with the researcher's conceptualisation in figure 4, the interviews also revealed that the platform could not address all identified institutional voids.
Qualitative Survey	Poultry farmers (20)	Data was collected on behalf of the researcher from poultry farmers in the Southwest region of Nigeria. Data provided a comparison between conventional sources of finance and digital sources of finance. The survey also allowed gathering of data from a second group of farmers (aside from the maize farmers in Jere) who had benefitted from agricultural financing through <i>Thrive Agric</i>	Qualitative survey was instrumental in gathering data from beneficiary farmers on processes, requirements and problems with accessing, utilising and repaying finance. The research was able to triangulate these primary data from farmers with data from the literature on agricultural finance problems, thereby validating the research's conceptualisation of the linkage between agricultural finance problems and institutional voids presented in figure 4.
Participant observation	<i>Thrive Agric</i>	This took place in <i>Thrive Agric's</i> Abuja office. This provided a real-life experience of the day-to-day running of an agricultural finance digital platform business. I was able to observe, first-hand, some constraints (external and internal) to mainstreaming digital platforms in the Nigerian agricultural space. This experience was recorded in my research journal which was used to help develop the case study description and discussion section	In participating in the day-to-day operation of the platform business, the researcher was able to identify those institutional voids which the platform business could not address and those voids the platform maintained due to the nature of the platform business. This observation supported the researcher's contribution to the conceptualisation of institutional voids specifically in agricultural financing in a developing country such as Nigeria
Agricultural Investment trial through digital platform	Researcher's family members who are also included in the platform users' interview (3)	This supported the researcher's understanding of the functionalities of the platform and helped triangulate findings from other platform users. This also supported the verification that the platform was indeed active; that the information provided on ROI was factual and that platform users received their ROIs at the time specified on their dashboard.	In gaining unbiased knowledge of the platform functionality and engagement with investors, the researcher was able to triangulate this data with data from platform users and platform owners and to further substantiate claims that the digital platform addresses institutional voids in financing agriculture.
Secondary data	Formal and informal documentary evidence from platforms such as: end of season report; PowerPoint presentation for funding, and annual reports.	Secondary information played a major role in identifying institutional problems in financing agriculture in Nigeria. Information to triangulate with data collected during interviews. This information also supports the development of the case study description; and developing the picture of the nature of the agricultural finance market in Nigeria. Other documentary evidence including policy reports on agricultural finance; literature reviews on agricultural finance schemes in Nigeria; practitioner reports on agricultural finance and digital platforms; news articles; and blogs	In conducting the literature review, the researcher gained understanding on the linkage between agricultural finance problems and Khanna and Palepu's concept of institutional voids, thereby informing the conceptual lens through which the research understands the use of digital platforms in addressing institutional voids in financing agriculture in Nigeria.



### 3.6 Data Analysis: Thematic and Template Analysis

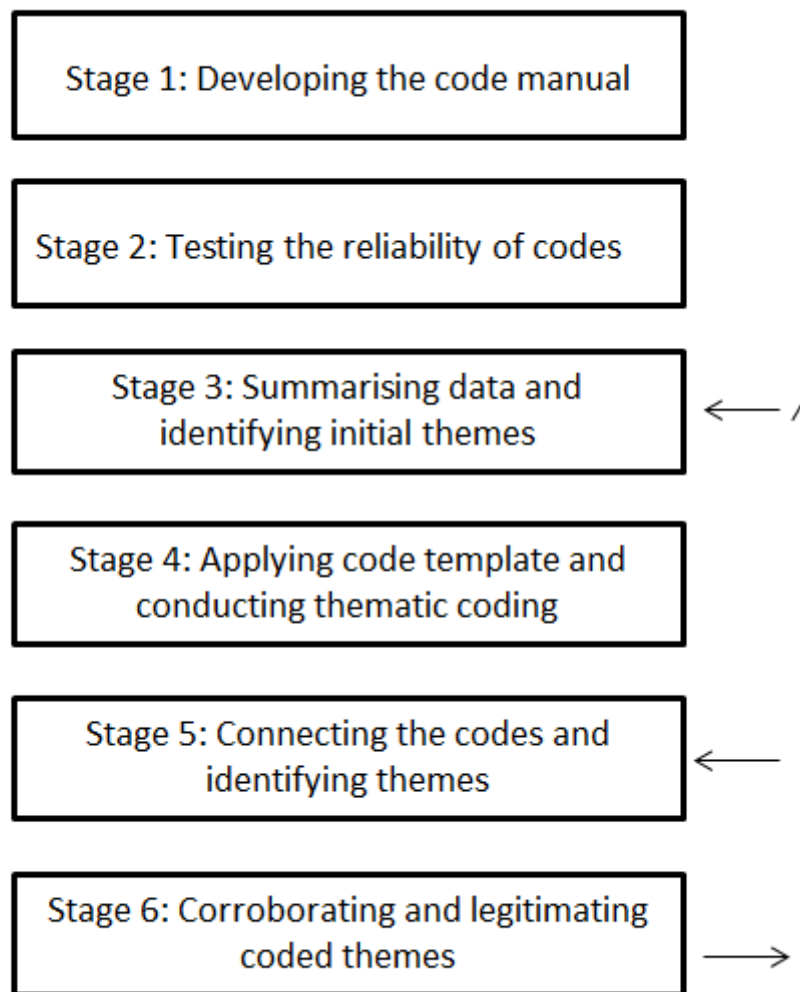
The selection of a suitable method for analysing qualitative data can be a daunting activity due to the wide range of analytical methods available in social science research (Holloway and Todres, 2003). This research adopts *hybrid thematic analysis* by combining an inductive bottom-up thematic approach with a deductive top-down template approach to analyse qualitative data (Boyatzis, 1998; Crabtree and Miller, 1999). The stepwise methodology for conducting hybrid thematic analysis provides analytical rigour that tends to be a cause of disagreement in qualitative research (Fereday and Muir-Cochrane, 2006). Analysing qualitative data thematically entails identifying emerging themes considered important for the explanation of the phenomena (Swain, 2018). It entails coding observable patterns, organising these codes into themes and using these themes as categories for discussing a phenomenon of interest (Daly et al., 1997; Braun and Clarke, 2006; Swain, 2018). Template analysis entails developing a priori codes, and then categorising and interpreting qualitative data based on these pre-determined code categories (Crabtree and Miller, 1999). A code is a term used to represent an analytical unit that contains data that captures a phenomenon (Fereday and Muir-Cochrane, 2006). The content of a code could range from a single word to an entire paragraph that captures the phenomenon of interest or sub-set of the phenomenon (Boyatzis, 1998; Swain, 2018). There are some definitional discrepancies in differentiating between a code and a theme. Swain (2018) clarifies that while a code may represent more specific ideas, themes tend to capture a broader idea and comprise several interrelated codes (Swain, 2018).

This research therefore follows Fereday and Cochrane's (2006) six-stage hybrid thematic analysis technique which combines template and thematic analysis technique prescribed by Boyatzis (1998) and Miller and Crabtree (1999) respectively (see: Figure 7). All primary data collected during the scoping and main data collection exercise through face-to-face interviews, Skype and phone interviews were recorded and transcribed. Data collected in Hausa language during interviews with farmers in Jere were also translated and transcribed in English while data collected using WhatsApp chat were copied and pasted on Microsoft Word. Survey data were extracted from the questionnaire into a Word document. All data collected were cleaned and uploaded into NVivo for coding. Coding started deductively by matching text from interview transcripts to appropriate pre-determined codes (see Table 15). These a priori codes, which served as the basis for the template coding exercise described in stage 1-3 of figure 7, were developed based on Khanna and Palepu's conceptual

categorisations of institutional voids and the research questions ahead of data collection activities (see Table 15). However, in coding data collected from the field using the QRS NVivo 12 software, new ideas outside the pre-determined codes emerged from interview text that also provided additional insight to the concept of institutional voids. These ideas were given their own codes.

**Fig 7: Stages Undertaken in Hybrid Thematic Analysis**

Source: adapted from Boyatzis (1998); Crabtree and Miller (1999); and Fereday and Muir-Cochrane (2006)



***Stage 1: Developing a code manual or template (deductive)***

Crabtree and Miller (1999) describe a code manual as a ‘*data management tool*’ for categorising related ideas from qualitative data into groups to facilitate data interpretation and discussion. For this research, the code manual was developed based on the research question and conceptual framework. It was developed prior to undertaking main data collection, and after the scoping phase to ensure that field data collection activities sufficiently covered the

core research themes. The code template followed Boyatzis (1998) proposed structure which comprises a code label (or name); code definition and description which describes the characteristic of the code and explains how to identify text which should fall into this category.

### ***Stage 2: Testing code reliability***

This was done to ensure that the codes developed are clear enough to be applied to raw data (Boyatzis, 1998). To ensure the codes were clear and sufficiently covered the research's core themes, initial themes were sent to supervisors for second opinion and input. This was followed by re-structuring and joint agreement of codes prior to the commencement of fieldwork activities.

### ***Stage 3: Summarising data and identifying initial themes (inductive)***

This entailed going over all data collected during the research (Boyatzis, 1998). First, the researcher read interview transcripts; responses to survey questions and researcher's notes gathered during participant observation; as well as listening to audio recordings again to ensure no key ideas had been left out during transcription. Second, the researcher perused secondary documentary evidence to identify key ideas for triangulation with primary data. The aim was to summarise all data in order to extract the main ideas generated from data collection activities (Boyatzis, 1998). In this stage, emerging themes that were different from the template codes were noted (see Table 15).

### ***Stage 4: Applying the code template and conducting additional coding***

This stage adopts Crabtree and Miller's (1999) template analysis technique to match interview text to related codes from the code template already created. Using the NVivo 12 software, old and new codes were represented as nodes that consisted of words, phrases, and paragraphs from the text that matched the relevant codes. Any new code emerging was assigned its individual node and sub-nodes where applicable.

**Table 15: Labels and Description of Template and Thematic Codes for Data Analysis***(Source: Author's Research, 2018/2019)*

<b>Template codes (deductive)</b>	
<b>Theme 1 Label</b>	<b>RQ1: Institutional Problems in Agricultural Finance</b>
Definition/description	This theme contains data that reveals issues with financing agriculture in Nigeria, including factors responsible for these issues. This theme included codes for problems with information asymmetries ( <b>code 1</b> ), high transaction cost ( <b>code 2</b> ), lack of trust and poor creditworthiness ( <b>code 3</b> ), poor contract enforcement ( <b>code 4</b> ), poor monitoring of the usage of agricultural finance ( <b>code 5</b> ), and weak regulations and poor policy execution ( <b>code 6</b> ).
<b>Theme 2 Label</b>	<b>RQ2: Platform Emergence and Addressing Institutional Voids</b>
Definition	This theme contains information which facilitated the development of the case study including data about the actors responsible for the mainstreaming digital platforms in agricultural financing, respondent motivation, milestones, events relating to the use of digital platforms in agriculture including opportunities and challenges encountered by platform owners in inception and scaling-out phases' challenges, opportunities and lessons learnt in developing, using or any form of interaction with digital platforms ( <b>code 7</b> ). The theme also contains data which mapped the institutional and stakeholder setting around <i>Thrive Agric</i> 's. platform ( <b>code 8</b> ) The theme also contains data on how <i>Thrive Agric</i> 's. digital platform for agricultural financing addresses institutional voids in terms of transaction facilitation, Information analysis, aggregation and distribution, credibility enhancement, regulation and policy and adjudication ( <b>code 9</b> )
<b>Theme 3 Label</b>	<b>RQ3: Implications for Development</b>
Definition/Description	This theme contains codes on the development implications of addressing institutional voids using digital platforms and codes relating to if and how platforms create and maintain institutional voids.
<b>Thematic codes (emergent)</b>	
<b>Theme 4 Label</b>	<b>Other Emerging Agricultural Finance Problems and Institutional Voids</b>
Definition/Description	This theme contains data on other agricultural finance problems not captured in the literature and other institutional voids not captured by Khanna and Palepu's concept of institutional voids which emerged from the data.

***Stage 5: Connecting code and theme identification***

This is the stage where patterns across codes were clustered into themes (Crabtree and Miller, 1999). In this stage, the researcher observed similarities and difference across data groups that served as the basis for organising codes into broader themes. There were cases where one code could fit into more than one theme and therefore appeared in multiple both pre-

determined and emerging themes. At this stage, the main goal was to cluster codes under their relevant theme to facilitate further data interpretation and discussion.

### ***Stage 6: Corroborating and legitimating coded themes***

In this stage, findings were confirmed as the researcher went over each of the previous stages to ensure the codes matched the theme in which they have been assigned (Crabtree and Miller, 1999). This iteration was done several times as the researcher crosschecked and re-organised codes into themes until the final set of themes, which were representative of the data collected, emerged.

### **3.7 Ethical Considerations**

Prior to data collection activities from respondents in Nigeria, the research was subject to a rigorous ethical review by the University of Manchester Ethical Review Committee to ensure the research did not breach any ethical standards in collecting data from respondents. All data collected was anonymised. Where real names of organisations have been included, permission has been granted by these organisations. Furthermore, it was compulsory for the researcher to develop a data management plan before setting out to collect data to clarify how data collected from respondents would be stored within the University of Manchester and the duration which data will be retained.

All face-to-face data collection activities took place in public places such as farms and conference rooms of organisations. Where interviews were carried out using WhatsApp, a separate WhatsApp account (WhatsApp for business) was created by the researcher on a mobile device dedicated for the research. All phone numbers of respondents were deleted after the interview and follow-up questions had been finalised, and after the interview text had been transferred to a Microsoft Word document. Research participation consent was provided by all respondents either in writing through the University of Manchester research consent form or verbally during recorded interviews.

### **3.8 Chapter Summary**

As identified from the review of literature on digital platforms and institutional change in agriculture, there is a dearth of academic research supported with empirical evidence in this field. Therefore, to contribute to emergent debates on digital platforms and institutional change in developing country agriculture, this chapter presents and justifies the methodological decisions taken by the researcher in gathering data to answer research

questions. The research strategy outlined in this chapter describes the procedures, methods, and techniques adopted by the researcher in gathering and analysing data for this research. The concluding section of this chapter presents the themes that guided subsequent empirical and discussion chapters. Table 16 below provides a summary of the research design.

**Table 16: Chapter Summary**  
*(Source: Author's Research, 2018/2019)*

<b>Research Design Decision</b>	<b>Option Selected</b>
Research strategy	Single case study
Data collection method	Qualitative data collection methods using semi-structured key informant interviews; qualitative survey; participant observation, testing the agricultural investment procedure, and secondary information.
Data analysis method	Hybrid thematic analysis combining a deductive theory-driven approach and inductive data-driven approach.

## **Chapter 4 – Contextualising Institutional Voids in Financing Agriculture in Nigeria**

Agricultural finance problems in Nigeria are multi-faceted cutting across all aspects of agricultural production and value addition activities (Olowa and Olowa, 2011). Finance facilitates all agricultural processes with an agricultural system; thus the presence or absence of finance has a direct influence on agricultural development (Olaitan, 2008). Responses on finance-related problems were gathered from a diverse group of respondents. These include staff of financial institutions, farmers, platform users with experience in financing rural agriculture through non-digital channels, staff of the Federal Ministry of Agriculture and Rural Development (FMARD), a consultant on digital platforms from IITA, and a former director of the Agricultural Development Programme (ADP). The list of interview participants is presented in appendix 3. As mentioned in chapter 3, the coding of these responses followed a template coding strategy (table 15) developed around the problems in financing agriculture identified from the literature review. These codes were: information asymmetries (Code 1); high transaction cost (Code 2); lack of trust and poor creditworthiness of rural farmers (Code 3); poor contract enforcement (code 4); poor monitoring of disbursed agricultural loans (code 5); and weak regulations and poor execution of agricultural finance policies (Code 6). As the research methodology adopts a hybrid approach, the researcher also sought to capture emergent themes in a separate code to ensure other problems outside those identified in the literature were captured. However, no new problem with financing agriculture emerged from the data collected.

### **4.1 Code 1: Information Asymmetries**

Farmers rely on diverse sources for information about available agricultural finance. The interviews with farmers revealed that the major sources of information were through farm gate intermediaries (including processors), fellow farmers and farmer groups, and social networks (family and friends). During interviews, farmers were asked about their preferred channels for obtaining information about agricultural finance opportunities and the associated challenges with these channels.

*“Sometimes from fellow farmers but I do not rely on farmers too much o, because you will see that these farmers may hear about a loan and not tell you because they do not want you to compete with them or to get the loan and they do not get it.”* (Respondent 73: Maize farmer)

*“Some people from the government came one time, some years ago, to talk to us, our village head gathered us, they told us about a loan the government is giving us, that we can get it from the bank, but we have not seen them again since then, it should be over five years now.”* (Respondent 63: Maize farmer)

*“We get information on agricultural finance from the people who buy maize from our farmer group. They usually know if the government is giving farmers money or if they are working with a company that wants to start giving farmers money to farm. But this has happened only once, so it is not all the time that we get this type of news. Even our village chief tells us about when the government is giving money because they come to him first to tell him to gather us.”* (Respondent 68: Maize farmer)

*“There is someone who comes to gather our maize to sell to big companies, he tells us of ways to get money for farming. He even brought a form for us to fill one time and said he will help us submit it for loans, we are still waiting.”* (Respondent 66: Maize farmer)

*“In my cooperative we share information about anything we hear, be it finance or new techniques. It was from my cooperative I heard about the finance Thrive Agric. gives”.* (Respondent 50: Poultry farmer)

*“Before, the government sends their people (extension agents) to tell us about any new loan they are giving. We don't really see them these days.”* (Respondent 71: Maize farmer)

*“I get news about government loans from the radio and our community leader. Sometimes he is the one that chooses farmers that those big organisations give money and seed to farmers.”* (Respondent 69: Maize farmer)

*“I get information from other poultry farmers, but sometimes some of them do not share information about where they get their money from, maybe they think if they do there won't be enough money to go round.”* (Respondent 49: Poultry farmer)

*“There are some finance opportunities I hear about that I keep to myself because the people giving this finance only need a few farmers and I'm lucky to find out about it. If I tell many people, they might go behind me and take the opportunity.”* (Respondent 57: Poultry farmer)



In addition to information about available finance sources, farmers need other supporting information about agricultural finance, such as the type of finance (cash or input); application process, eligibility criteria, interest rate, repayment duration and the location of the financial institution providing the finance. There was also evidence that accessing complete information on agricultural credit opportunities and understanding the information on loan applications posed an additional cost to farmers.

*“I get information from my akawo (RoSCAs) group, we help each other with this type of information, but the only thing is that most times the information is not complete, so we need to send someone to the bank to confirm the news. We also get information from the village head; some organisations go through him to select good farmers to fund.”* (Respondent 64: Maize farmer)

*“Most times we hear that they are giving loans, by the time you get there you realise that the loan will be too difficult for you to get because you cannot provide all the documents they are asking for, after wasting your time and transport money.”* (Respondent 63: Maize farmer)

Furthermore, lack of reliable sources information and absence of channels to verify information about finance sources has resulted in some farmers accepting unfavourable finance options, without complete understanding of the terms and conditions of profit sharing.

*“I have been part of a group of farmers one big company gave inputs to farm about three years ago. The company processed maize. We agreed that we will use our land and they will give us all the inputs to farm, then at the end of the harvest they will buy the maize from us but remove the money for input and pay us for the work. Maybe we did not understand what they said but the money we got back after the harvest was not as much as we expected. They charged us interest on the inputs they gave us and took money for some other things I can't remember. It would have been better if we farmed by ourselves.”* (Respondent 67: Maize farmer)

*“You see this village where we are, we do not know a lot that is happening out there. Many companies come with different arrangements of us to work together to farm, they will bring money, we will do the work on our land, they will help us sell, and then we share the profit. Not all of them go well, I feel they make money from us because*

*we do not know what they know and because we feel that they are helping us, we do not go looking for information about them.”* (Respondent 71: Maize farmer)

*Farmers are also sometimes taken advantage of because of their lack of information. Some of the farmers we work with have told us of experiences they have had with other private financiers like us where at the end of the day they didn't have much to show for all their effort. Farmers do not know how to do their own background check neither do they have the resources to do so, but private financiers have the resources to investigate farmers and choose the ones they want, so it's unbalanced.”* (Respondent 11: Thrive Agric. staff, head of operations)

Another scenario, which illustrates farmers' challenges with poor access to information, is at the point of filling out loan application forms. Due to the lack of formal education, farmers who cannot read or write rely on the support of intermediaries to facilitate loan application process. According to respondent 8, 65, and 69:

*“The procedure for obtaining agricultural loans requires applicants to fill-out an application form, provide bank details; provide farm records and provide verifiable collateral documents. Most rural farmers are illiterate which means that they can neither read nor write and might find this process too cumbersome, as a result, they have to enlist the services of other people to help them fill their forms such as the security officer at the bank and many of them charge a fee for this service.”* (Respondent 8: First bank staff)

*“A family member helped me fill the loan application with a promise that I will give him a portion of the loan when it comes out.”* (Respondent 65: Maize farmer)

*“I gave the security man in the bank some money and he helped me to fill the form.”* (Respondent 69: Maize farmer)

However, even when this support is provided, farmers are unable to crosscheck information imputed in application forms to verify accuracy. These challenges were described by respondent 70 and 72.

*“I paid a young boy in my village to help me fill the loan application form because I cannot read or write. He charged me a lot of money, but with the assurance that I will get the loan. But there is no way of knowing if what the person wrote is the correct thing. I suspect that is why I did not the loan.”* (Respondent 70: Maize farmer)

*A youth in our community said he knows how to get loans from banks, a group of us paid him to help us get this loan, he filled the application form, submitted it and followed up for us. We still gave him a small percentage of the loan after we got it. Many of us were not happy about this because at the end, we saw that getting this loan was expensive.” (Respondent 72: Maize farmer)*

During interviews with financial institutions and staff from the Federal Ministry of Agriculture, it was gathered that the institutions that should provide farmers with information on agricultural finance include the government through local governments and its network of agricultural extension agents and financial institutions themselves through news and print media.

*“We are responsible for providing farmers with information about agricultural finance opportunities and we do this through our extension agents, radio and newspapers. But due to poor infrastructure in rural areas, I’m sure this information does not get to them effectively. Bad roads make many rural areas inaccessible to extension agents, and lack of electricity means they might not get information from television and radio. Many farmers cannot read, so information in newspapers will not be useful to them. So, these are some of the issues with getting information on agricultural finance to farmers.” (Respondent 3: FMARD Staff)*

*“Commercial banks advertise loan packages on their websites and through the media. These days, bloggers also help spread the word about loans, but I don’t expect farmers to get their information through blogs and online news.” (Respondent 8: First Bank staff)*

Furthermore, it was also observed that financial institutions and individual financiers of rural farmers also do not have access to all the information they need in verifying information on loan application forms and confirming farmers’ identities.

*“Why we prefer to lend to farmers under the government’s credit guarantee scheme is because of difficulties in confirming information farmers provide. Where do we even start from especially with the number of farmers that come to us for loan? The guarantee scheme gives us a blanket covering and reduces the cost of processing loan applications due to our inability to verify farmers’ information.” (Respondent 8: First Bank staff)*

*“What we observed when we started funding farmers was the importance of gathering farmers’ data. Without data those who want to finance farms will act base on their instincts and hunch that this farmer is good or bad. This is very risky, but lack of information and the high cost of accessing information from rural areas has made so many investors make vital decisions based on a hunch and later regretted their actions.”* Respondent 10: Thrive Agric. Chief Technical Officer

#### **4.2 Code 2: High Transaction cost**

Interviews with financial institutions reveal that aside the issue of farmers’ high rate of loan default, high transaction costs incurred by financial institutions in funding farmers represents another major problem with farmers accessing agricultural loans. These transaction costs mainly consist of logistics and time costs incurred in travelling to rural areas to verify claims made on loan applications forms and to validate collateral provided.

*“It is simply not profitable to lend to rural farmers now in Nigeria due to high transaction costs in processing their loans. That is if the bank decides to take all the necessary steps to verify all the information the farmer fills out in the application form. Just travelling to remote rural areas alone is a significant cost, not to talk of the time cost which is even more difficult to estimate. That is why, like I said, we prefer to lend to farmers under the governments guarantee scheme because the terms are not as stringent, and we do not have to always check collateral.”* (Respondent 8: First Bank staff)

*“More loans will be extended to farmers if there was a way to reduce the overall transaction costs in lending to farmers. Imagine that some farmers come to borrow as little as 100,000 naira (182.36 GBP), compare this to businesspeople from other sectors coming to borrow as much as 50-100 million naira (91,178.60 – 182,357.21 GBP) for instance, but to process farmers’ loans might even cost more than these other large loans because of their location and the nature of the collateral they provide. That’s why the government had to intervene in supporting banks to lend to farmers through various loan guarantee schemes. When we try to find ways to reduce the transaction cost, it may result in delay in disbursing the loans.”* (Respondent 8: First Bank staff)

*“It takes less time for banks to process few large volume loans than many small loans. That is why loans from people who are for instance from the oil and gas sector*

*are preferred to loans from small farmers. Also, it is not easy to get hold of information about farmers without having to travel to rural areas to do so. The Federal Ministry of Agriculture does not hold this information. If at least there was available information on farmers, this would have reduced the time to process loans and the transaction cost incurred by banks in giving farmers loans.”* (Respondent 7: FCMB staff)

*“Farmers are almost like unknown entities, there isn’t much known about farmers except that they live in rural areas and engage in crop and animal production. What is needed to facilitate loan application is their biodata, socio-economic data, and geospatial data. This will help financial institution make quicker informed decisions on loan applications. Without this data, the transaction cost in processing small agricultural loans becomes remarkably high which is why banks do not like to lend to farmers.”* (Respondent 10: Thrive Agric. Chief Technical Officer)

On the farmers’ side, interviews confirmed findings from the literature review that accessing agricultural loans tend to be expensive for rural farmers. These transaction costs include transportation cost to and from banks to gather information on loan requirements; to make applications; and payments to intermediaries who support farmers in filling out forms and following-up with applications. These costs, as individual expenses, tend to be relatively small, but when aggregated and compared with the loan amount, these transaction costs undermine the value of the loan.

*“I successfully got a bank loan from a microfinance bank two years ago for my poultry farm, but the stress and cost were just too much. I cannot count how many times I went to the bank to follow up on my application. I even started asking myself if collecting this loan was a good idea because of how much I spent on transport. The loan came late but at least I used it to pay off those I borrowed from to start production.”* (Respondent 55: Poultry farmer)

*“Bank loans have lower interest than loans from moneylenders, but the issue is the delay, transportation costs and money you spend on phone calls to know whether your loan has been approved. If you are applying from a microfinance bank nearby, you may not spend as much, but if the bank you are applying from is in town, you must spend on transportation.”* (Respondent 62: Poultry farmer)

*“I got a loan from a microfinance bank but from the start to the end of getting a loan, you spend money. To get complete information about the loan, you have to go to the bank because you cannot get all the correct information from your friends. Then to apply, you have to go to the bank, to check whether you got the loan, you have to go to the bank many times, then to collect the loan, you still have to go to the bank. You spend so much.”* (Respondent 70: Maize farmer)

Furthermore, the anticipation of costs associated with accessing formal finance also deters some farmers from applying for available loans. Speaking about the influence of distance to commercial banks on access to finance, some maize farmers explained that:

*“I have never been able to get any bank loan. I could not provide the things they asked me for. Also, there is no bank close by, this means I have to travel far, and I don't have the time or the money to do so.”* (Respondent 64: Maize farmer)

*“For me, it is easier to get money to farm from the money lender in my village than travelling all the way to the city to a bank, he knows me very well and knows my family. I don't even know if I will be able to gather all the documents they need me to bring to the bank. The only issue is that what I must repay to the money lender is almost two times what I borrowed, but I am always sure of getting money from him when I need it and I can repay in instalments.”* (Respondent 72: Maize farmer)

*“My friend told me that he spent all day at the bank trying to apply for a loan, and he goes there many times to check if he has gotten the loan. He still did not get the loan. I do not have that type of money or the time to waste that is why I prefer getting my money from my people in the village. I can walk down to their houses, we discuss, and I get what I need within a week or so.”* (Respondent 63: Maize farmer)

The issue of high transaction cost also directly affects the timeliness of loan disbursement.

Due to the seasonality of agricultural production in Nigeria, the timeliness of finance disbursal is of paramount importance to rural farmers (Udoh, 2008). This also explains why respondents hardly rely on only one source of finance, due to the unreliability of formal sources of finance in providing timely finance.

*“I started my loan application at the bank over six months before I need it, anticipating that I will use the money to stock up my poultry pens for Christmas, the loan still got approved late even though I met all the requirements. I had to borrow*

*money from my friend, topped up with my saving to stock-up because I still did not receive the loan till close to a year later” (Respondent 58: Poultry farmer)*

It was also observed that some poultry farmers preferred to access agricultural finance through their cooperative to reduce the transaction cost associated with applying for loans as an individual farmer. This was explained by respondents 43, 49, 54, 56, and 57.

*“I think it is best to get loans through a cooperative because it reduces the stress and also the money you spend in travelling to the bank. The main disadvantage of getting loan from cooperative is that you might not get the exact amount you want because they have to make sure the money goes round. Sometimes you might notice favouritism in how they share the money.” (Respondent 43: Poultry farmer)*

*“I am a member of a poultry cooperative and I get loans from the cooperative. What they do is to apply for a bulk loan on behalf of all of us, and then they now share the money between us based on what you ask for. The only thing is that the interest is a bit higher than if you go to the bank yourself but when you calculate how much you are saving by not going to the bank yourself, it is better to go through the cooperative.” (Respondent 49: Poultry farmer)*

*“I get my loan through my cooperative because the loan comes out faster than if you go by yourself to the bank. I feel they trust cooperatives more than individual farmers, especially if the cooperative has been collecting money and paying back, it makes it faster when they come back for another loan.” (Respondent 54: Poultry farmer)*

*“Before getting finance from Thrive Agric., I get from my cooperative because through the cooperative you can get money and get information on where to sell your chickens. For example, some people come to buy bulk but they go through the cooperative.” (Respondent 56: Poultry farmer)*

*“I get my loans through my cooperative, it is easier that way because I do not have to go to the banks myself to fill the form and wait or pay anyone to help me get the loan. The cooperative does everything for us, then distributes the money to us and even links us with people who will buy from us when the birds are mature.” (Respondent 57: Poultry farmer)*

Therefore, it is deduced that high transaction cost in processing agricultural loans can result in the late disbursement of agricultural finance by formal finance institutions. In addition, the

small volumes of agricultural loans coupled with the absence of cost-effective channels of verifying farmers' information creates an aversion among financial institutions in extending loans to farmers. On the farmers' side, transaction costs in physically accessing banks, long and cumbersome loan application procedures, collateral documentation issues, and late disbursement of funds serve as constraints to accessing agricultural finance from formal financial institutions.

#### **4.3 Code 3: Lack of Trust and Poor Creditworthiness of Rural Farmers**

Interviews revealed that there is a prevailing reputation of rural farmers to default on agricultural loans. Farmers especially tend to default on loans disbursed by formal financial institutions and those obtained through contractual agreements with processors and individual financiers. Interviews with respondents from two commercial banks provided information about the influence of farmers' reputation on some banks decision to extend credit (or not) to rural farmers.

*“It is not like banks do not want to lend to small farmers, we even have single digit interest rates for agricultural lenders, but lending to rural farmers can be very risky. In my experience, especially with government guaranteed loans, farmers have a reputation of not repaying these loans, perhaps because they know that the government will pay up to 75 percent of the amount in default. It is not profitable for banks to lend to small farmers outside the umbrella of the government credit guarantee scheme.”* (Respondent 8: First Bank staff)

*“Rural Farmers believe that agricultural loans are their share of the national cake, many of them have no intention to repay even with the single digit interest rate policy. There is also little or no consequence for small farmers who do not repay loans. That is why it seems like we favour non-agricultural loans over loan request from small farmers and also prefer to lend to farmers under the government credit guarantee scheme because it protects us from huge losses when farmers default.”* (Respondent 7: FCMB staff)

The chief technical officer of *Thrive Agric.* also weighed in on the influence of farmers' reputation on poor access to formal sources of finance. This was based on his experience in funding farmers before setting up a bespoke crowdfunding platform for public sourcing of agricultural finance.



*“People have been burnt in trying to extend credit to farmers. There are many cases of farmers not repaying loans and these finance sources have still not been able to recover their money. Maybe because farmers think they are somehow entitled to money given to them or they think that as long as it is agricultural finance, then it has to be from the government, and government money is their own money. But this is a mind-set that keeps playing out”* (Respondent 10: Thrive Agric. Chief Technical Officer)

Interviews with farmers to verify claims made by respondents from financial institutions and individual financiers revealed that farmers are aware that they have a bad reputation due to failure to repay loans and they are aware that this has a negative impact on their access to finance from formal institutions. Furthermore, interviewed farmers want to change this narrative but face many challenges in achieving this.

*“It is not all of us that refuse to repay loans. I get my loans through my cooperative. My cooperative gets from the bank for all of us. I repay my loan to the cooperative. I have tried to get a loan by myself because I wanted more than what the cooperative could give me, but it was very hard, and I feel it is because of this bad reputation farmers have. They have not rejected my request, but it is taking too long to approve, maybe they want to frustrate me until I give up. I don’t know.”* (Respondent 47: Poultry farmer)

*“As a farmer I can believe it if they say farmers do not pay back loans, because many loans come late it is easy for farmers to use the money for something else, but not all farmers do this, some pay back their loans”* (Respondent 69: Maize farmer)

*“Many of us repay our loans, but those that do not have given us a bad reputation.”* (Respondent 51: Poultry farmer)

*“Some people disguise as farmers, take loans, and do not repay. This has made people think that farmers do not pay loans when those loans were taken by people who do not farm and used for other things. These are some of the reasons why banks think farmers do not pay loans.”* (Respondent 56: Poultry Farmer)

Furthermore, it was revealed that it was not only individual farmers who had created the bad reputation that influences farmers’ access to agricultural loans, illegitimate agricultural cooperatives were also placed in this category.

*“There have been situations where someone came as a representative of a cooperative, with a list of farmers, even with their phone numbers, collateral documents and everything required for a loan. Loans were disbursed to the cooperative and the representative vanished into thin air. Further investigations revealed that the cooperative did not exist.”* (Respondent 8: First Bank Staff)

*“When we wanted to increase the number of farmers, we were financing, we went to a bank to seek for funds. We told them we had a group of farmers who we wanted to fund and wanted to collect loan on their behalf. Our application was rejected on the basis that we were not the first set of people coming with a list of farmers to fund, banks already had bad experiences with people forming cooperatives and collecting loans for farmers which were never repaid.”* (Respondent 10: Thrive Agric. Chief Technical Officer)

However, it was understood that there is a need to differentiate between farmers who default on loans from those who repay loans, to build the confidence of investors and financial institutions in extending loans to rural farmers. In interviews that sought to identify institutions responsible for aggregating farmers’ data and credit histories to facilitate the building of farmers’ reputation in agricultural finance markets, it was revealed that there was no unified agreement on what institution should perform this function.

*“The Federal Ministry of Agriculture should have a comprehensive list of farmers who have benefited from agricultural financing schemes. Yes, we too will have our data of those who we have given loans to, but the Federal Ministry should host this information as well as farmers’ information from past finance schemes which we were not a part of, this will help us determine creditworthy farmers and also give us more data to trace them.”* (Respondent 8: First Bank staff)

*The government has the manpower and wide scale of operation to gather data of farmers which will help differentiate who are actual farmers from those who are not and differentiate between those who have repaid government loans and those who have not. If we have access to this data, it will guide us in lending to the right farmers* (Respondent 7: FCMB staff)

*Financial institutions like BOA, commercial bank, and the specific agricultural finance programmes like NIRSAL which is funded by CBN have data about the farmers the fund. They should also gather other data about farmers for themselves as*

*part of the loan application procedures, this will help them track and monitor farmers in case of default, instead of relying on the Federal Ministry of Agriculture for data. (Respondent 1: FMARD Staff)*

*I think there is plenty existing and outdated data about rural farmers which have already been collected by several institutions and programmes. The Federal Ministry of Agriculture, financial institutions and agricultural finance project executors should bring together all data they have for harmonisation and cleaning. This is where they should get the private sector involved as an independent unbiased party. This could also be a good starting point of building a unified database of farmers and their credit activities which will help financial institutions and investors to make decisions about funding farmers. (Respondent 10: Thrive Agric. Chief Technical Officer)*

*The main issue with trying to aggregate farmers' data to identify creditworthy farmers is the cost of performing this activity. It will be very expensive and who will pay for it? Only the government or international development finance organisation can bear this cost, but it does not make any business sense for banks to do so. (Respondent 10: Thrive Agric. Chief Technical Officer)*

*“If we are serious about identifying creditworthy farmers in Nigeria to fund, it can be done. But the issue is that this will be a very expensive venture which I think only the private sector will be willing to champion if they can monetise it to make profit. The government will certainly not pay for it, they might just provide support in terms of validating the activity, but you can be sure that they won't fund it. Banks will certainly not pay for it because it makes no business sense for them.” (Respondent 11: Head of Operations, Thrive Agric.)*

Therefore, it was gathered that farmers' reputation of poor loan repayment negatively influenced farmer's access to finance.

Furthermore, the provision of acceptable collateral documentation also poses constraints to farmers' credibility and eligibility for loans. Due to rural inheritance laws, most farmers often do not have legal or formal deeds or certificates of occupancy for their land (Ololade and Olagunju, 2017). Farmers' illiteracy also means that they do not keep farm records; hence, they cannot provide evidence of cash flow, purchases, and sales (Eze et al., 2010). Farmers' inability to meet loan eligibility criteria is also discussed by the private sector respondents who are of the opinion that the loan application process adopted by commercial banks makes

it difficult for farmers to access loans, especially when it comes to the provision of collateral and farm records.

*“It is almost as though these banks do not want farmers to apply”. Farmers hardly possess land documents due to the traditional system of land ownership through inheritance. Farmers are mostly not educated enough to provide farm records which provide evidence of cash flow neither can they provide legitimate reference to serve as guarantors for their loans. I think the odds are stacked up against them and these terms and conditions should be reviewed.”* (Respondent 11: Head of Operations, Thrive Agric.)

*“The current loan eligibility criteria do not take into consideration the educational status of rural farmers and the unique set of institutional, infrastructural and business challenges rural farmers face in practicing agriculture in Nigeria. Simple activities like keeping farm records are complex to uneducated rural farmers, yet farm records are required in most loan applications.* (Respondent 4: ADP Director)

*“I think agriculture finance institutions should have evolved to the point where other methods can be used to verify farmers’ collateral, especially land, without having to physically visit farmers’ fields. For instance, satellite imagery of farms can be captured if the coordinates are available. This will help farmers who do not have land documentation to prove the existence of their farms. There will still be the need to check that the land belongs to the farmer, but at least, financial institutions can know that the farm exists.* (Respondent 10: Thrive Agric. Chief Technical Officer)

Farmers also describe difficulties in obtaining land documentation in the bid to get loans and describe instance where they had to pay intermediaries to facilitate the process of obtaining loan documents.

*“This land has been in my family for so many years but to apply for a loan they said I had to bring a paper which says I am the owner. Someone introduced me to a man who works in the lands office that I paid to help me get the paper.”* (Respondent 66: Maize farmer)

*“I still do not have any document for my land, which is why I could not apply for the actual amount of loan I wanted. You can only apply for 100,000 naira (182.36 GBP) without collateral in the government loan, any amount above 100,000 you have to*

*bring the land papers. 100,000 is not enough for me, so I had to collect from other people.* (Respondent 63: Maize farmer)

Interviews with financial institutions and individual financiers also revealed the types of information sought in identifying credible farmers to fund. Respondents 8, 30 and 42 provided these insights:

*“They say our loan application procedure for farmers is tedious, but we use this means to get as much information from farmers as possible. We need information which helps us properly identify the farmer such as name, address, location of the farm, the commodity the farmer specialises in, guarantor’s information, income and expenditure, and collateral information. We also need information to help us determine the profitability of the farm enterprise as a means of assessing the farmers’ ability to make enough profits to repay the loan.”* (Respondent 8: First Bank staff)

*“I will advise individuals trying to finance farmers for profit to get all the information they can about them and also try to verify this information directly from other villagers or the village head, most especially, the farmers’ name and the location of the farm. Also ask them if they have received loans before and if they paid back the loan. In fact, take them to their village head and explain what your agreement is with the farmer, and verify the information the farmer gave you with the village head. Also find out the current prices of the product in the market and get advice on the trends of that commodity. The only issue is that you have to do all this information gathering yourself, which is expensive, but it is very necessary.”* (Respondent 42: Individual investor)

*“I think I am one of the few lucky people to successful fund farmers and get my money plus profits back. I have heard my negative stories of working with farmers in the village. So I had to do a lot of ground work and gather vital information first. That’s when I met someone who referred me to a group of tomato farmers he had worked well with. According to him, these farmers were very reliable. I got their names, location, information of the amount of money he had funded them with and how much returns he got, the current price of tomatoes in the market and the profit margin. Then we went together to visit the farmers in Kaduna so I could verify the information he gave me. I was satisfied and I’m still working with them till now, this is the second*

*year of doing business with them and it has gone very well.*” (Respondent 30: Individual financier<sup>48</sup>/platform user)

#### **4.4 Code 4: Poor Contract Enforcement and Loan Repayment**

None of the farmers interviewed directly admitted to defaulting on agricultural loans or not upholding their contractual obligations in the case of private funding arrangement. However, some farmers agreed that they have faced difficulties in repaying loans due to the timing of loan disbursement.

*“The loan I received from the microfinance bank came after I sold of all my birds, so it was of no direct use to my business, I had other pressing needs at that time which I used the loan to solve with the hope that profits from my next cycle of birds will help pay off the loan, it was a serious struggle for me to pay that loan.”* (Poultry farmer, respondent 61)

Interviews with other farmers revealed another difficulty encountered in repaying loans is due to fluctuating market prices for agricultural inputs and outputs. Farmers request loans based on their perception of prevailing market prices for inputs, however, without complete market price information coupled with fluctuations in market prices, farmers who underestimate input prices end up budgeting less than is required for their production activities. As a result, they must supplement these loans with other informal sources or savings.

*“The loan I got from the cooperative ended up being less than I really needed. By the time the loan was approved all the prices in the market had gone up. It was almost as if I the loan could only buy half of what I needed so I still had to use my personal savings to make up for the remaining inputs in needed. Sadly, I even had to buy lower quality of feed which did not help my outputs at all.”* (Poultry farmer, Respondent 48)

Moreover, access to final markets for the sale of outputs presented another constraint to repaying loans. Because most of these farmers are in rural areas, they rely on middlemen to aggregate and transport their commodities to urban markets. Interviews revealed that selling directly to middlemen is not profitable for farmers but incurring transportation cost in conveying their produce to larger markets also significantly reduces their final profits. In the absence of any other means of accessing more profitable markets at a lower cost, farmers

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<sup>48</sup> These are platform users who have past experience funding farmers on their own without the digital platform

have continued engaging with these opportunistic middlemen at exceptionally low profit margins.

*“It is one thing to get a loan to grow your crops and other thing to be able to make enough profit after sales to repay the loan. You will not believe how little the profit I get some seasons, sometimes it is just enough to pay the loan and interest with little or nothing left over for my family. This is because, the output I expect is not always what I get and the price I sell to the man who buys from many of us is not as much as I will get if I go to the big market, but I don’t want to pay to transport it, so I just sell. I still have to leave some produce for my family to eat”.* (Maize farmer, respondent 63)

*“If you don’t want to spend on transport, it’s better to sell to those people that come to buy bulk from us and take to the market. If not, all your money will go on paying for truck to take your produce to the market and bringing the ones you did not sell back, but when you sell to people who come to your farm to buy you do not make enough profit to pay your loan* (Respondent 72: Maize farmer)

*“Farming is only profitable when you produce plenty and get a good price, the people who come to buy from us from the city buy at a very low cost because they have to transport and store the produce. If I had a good place to store my maize where water will not touch it, I will keep it till the price gets better before I sell, but I do not have a good barn to store, so I have to sell off immediately.”* (Respondent 65: Maize farmer)

*“Farmers’ inability to effectively project the prices of inputs and outputs can make them request for less than required, thereby affecting their overall profits. Farmers need information on prevailing market prices to make this projection, but they hardly get information from reliable sources or rely on prices in their local markets are not stable.”* (Respondent 12: Thrive Agric. Staff - Operations Team Member)

Individual financiers with experience of engaging in contractual agreements with farmer groups shared their views on farmers’ attitude towards loan repayment and the issue of weak contract enforcement.

*“What I learnt from my experience in investing in farmers alongside a group of friends is that you lend to farmers at your own peril. I mean it. It is as if any money coming to them is from the government and it is their own. They cannot differentiate from public funds and private investment. We are still trying to get our money back*

*from a group of farmers we funded in Kogi state. It has been one story or the other. We were scared of involving the police so that these farmers do not later ambush us since we are in their terrain, so we are working with the youth group and farmer group leaders, but it is dragging so much.” (Respondent 32: Platform investor)*

*A group of us found out about ginger farming and how it was lucrative in Nigeria. One of our friends said he can rally some farmers who we can finance so we share the profit. We did the maths and it looked like a very good deal, so seven of us pulled together over 1 million naira (1823.57 GBP) which we gave our friend to give the lead farmer. Everything seemed like it was going OK until after harvest when the story changed. The lead farmer said that some of the produce was stolen from the store, then some of the produce got spoilt, what was remaining to sell was not much and he and the other farmers had to share the small money that was realised for their hard work. I am still in shock. We were advised not to involve the police as this could lead to a clash between us and the community members. We are still trying to work with some people in the community to get at least our investment capital back from these farmers but without success so far. I cannot trust rural farmers after this experience.” (Respondent 35: Platform investor)*

A similar experience was also observed in interviews with individual financiers who funded family members who are rural farmers.

*“A cousin in my hometown told me he was the head of a small farmers group back home and they needed money to cultivate their cassava farm. He claimed they already had buyers, so as soon as they harvested and sold the cassava, I would receive the money I lent to them with some good interest. Even before I gave him the money, I heard rural farmers have a reputation of being dishonest when it came to financing arrangements like this. But in my case, I thought it would be different since I was partnering with my relative. Little did I know that my case would not be any different. In fact, it turned into a big family issue when he could not repay. Long story short, I was begged to forgive him and never got even one naira back.” (Respondent 27: Platform investor)*

*I wanted to invest in agriculture and felt it would be better to invest in a farm owned by a family member in the village since I do not have any land of my own. I provided all the finance my uncle needed for his maize farm after he told me about the expected*



*returns after sales. When I approached him after the planting season to discuss my profits, he told me a lot of stories about crop losses and not being able to sell at the price he projected. Till today, I did not get back a single dime from that investment. To make matters worse, when I brought the case to the attention of my senior family members, I was told to just forget the money because my uncle is a 'poor man' and would never be able to pay me back.”* (Respondent 41: Platform investors)

Respondents also described the process for loan recovery from rural farmers in case of default and challenges that exists in applying loan recovery measures.

*“We have to rely on formal process for loan recovery such as the police and through the legal system by it is a very time consuming and tedious process. These farmers are poor, if you charge them to court, they cannot afford a lawyer, but we have seized land of farmers who have legal ownership of the collateral, but repayment after this is still very poor so we are still at a loss.”* (Respondent 8: First Bank staff)

*“No one wants to be reported to the village head for not keeping your end of a bargain, it will show that you are untrustworthy and when opportunities come for the village head to select people to benefit from something new, you might not be included. That is why we always involve village heads in funding farmers”* (Respondent 11: Thrive Agric. Head of Operations)

#### **4.5 Code 5: Poor Monitoring of Disbursed Agricultural Finance**

Recovering funds extended to rural farmers presents a major issue influencing farmers' access to finance. Primary data from interviews revealed that failure to monitor farmers' usage of agricultural finance was a major cause of problems in recovering finance from rural farmers. While the remoteness of rural farms has been cited as a reason for poor monitoring (Olagunju and Adeyemo, 2007), it has also been found that most finance programmes and institutions do not have adequate monitoring mechanisms for agricultural loans in Nigeria.

*“The high rate of loan default among rural farmers is mainly due to poor monitoring of agricultural finance extended to rural farmers.”* (Respondent 4: Ex-ADP Director)

*“For the rural farmer, it is almost as though “out of sight is out of mind”, when they spend the whole farming season without a visit from the loan institution, they tend to take repayment for granted, this is why we work closely with village heads, group leaders and local vigilante groups to ensure that farmers do not default on the loans*

*we give them and this system has worked very well for us.” (Respondent 9: Thrive Agric. CEO)*

*“Ideally financial institutions should work with public sector extension agents under the ministry of agriculture to monitor the use of loans, but we all know the issue extension agents face in carrying out their duties. Bad road networks, low pay, lack of funding and lack of motivation have crippled the agricultural extension system in Nigeria. (Respondent 11: Thrive Agric. Head of Operations)*

*“It is not easy to monitor how farmers use the money banks give them. In fact, it is not profitable to do so because of the transaction cost I told you about earlier. When you check the amount borrowed by each farmer and the amount banks have to use to monitor these farmers, transaction cost will outweigh the loan amount. And remember that these farmers are not all located in the same place, they are dispersed.” (Respondent 8: First Bank Staff)*

Moreover, financial institutions understand the need for monitoring the use of agricultural loans but are also aware of the shortcomings of government extension services in performing this function.

*You would have thought that extension agent could have performed this monitoring exercise especially for government guaranteed loans to reduce default, but there are no laid-out mechanisms for them to do so. Maybe the private sector would be more effective in supporting monitoring activities. If there were organisations that have a network of agents on the ground, spread around Nigeria’s rural areas that specialise in monitoring farmers which allowed us to pay a bulk subscription fee to, then that would be great.” (Respondent 7: FCMB Staff)*

Individual financiers of rural farmers also recount their experience in partnering with rural farmers and the associated cost in monitoring the use of funds. It was also found that the insecurity in Nigeria due to kidnappers has also increased the transaction cost of monitoring farmers.

*“Don’t get me wrong, investing in agriculture is very lucrative and profitable but the overhead cost is high especially if you decide to closely monitor farmers’ activities, which is advisable. See, I had to travel from Abuja to Lokoja every weekend to check on the farmers I gave money to so that I do not hear any stories later about my money*

*or the crops. Starting from my first meeting with the farmers, to when they cleared the land, started planting, weeding, harvesting and sales, I had to keep travelling to monitor their activities. Besides the cost of fuel, I had to lodge in a hotel in Lokoja town then shuttle from the town village. I also enlisted the service of a police escort to follow me, you know how Nigeria is now with the kidnapping, so I have to pay police to escort me to the village and back to town.” (Respondent 37: Platform user and individual financier)*

*“If you think financing farmers is just about giving them money to farm then expecting to get your profits in a few months’ time, you are wrong. Experience will teach you that giving farmers money to farm is only one part of the total cost of funding farmers. You have to monitor farmers closely but as a result, you incur high transportation cost, cost of credit for your mobile phone to get updates, accommodation cost (in some cases) and because of how remote these farms are with their bad roads just get ready to fix your car frequently if you are driving down to these villages. Except you decided that you do not want to monitor your investment, but this can come at a huge cost to you in the end” (Respondent 17: Thrive Agric. farm agronomist and extension agent).*

*“I believe that there are many creditworthy sincere farmers out there, the issue is how to differentiate them from those who have no intention of repaying loans. I think the absence of data on farmers is making it harder for investors to know who to give money to and support monitoring activities. For instance, if there was a ‘no credit’ list of defaulters, that could be helpful in excluding those farmers. Then further efforts can be made in aggregating a list of farmers who have repaid loans from banks etc and how many times, gradually you will see that these two lists will look like a credit scoring system which financial institutions and individual investors like myself can draw from in making decisions about who to do business with. It will also provide vital information that can facilitate monitoring of loans disbursed.” (Respondent 35: Platform user and individual financier)*

*“It is not enough to lend to farmers, the question is, what structures are in place to monitor the use of finance and ensure that they can repay their loans. Do they have access to ready output markets? Can they access those input markets for improved seeds and fertilisers? Do they have access to storage and transportation*

*infrastructures? And are there monitoring structures in place. Because giving farmers money only so they can go back to use that money in a failed agricultural system is recipe for failure and loan default. This is another area where the government needs to step in, to support farmers' access to other value chain services through policies that incentivises other value chain actors to work with small farmers” (Respondent 4: Former ADP Director)*

*“I think the mistake that has been made repeatedly is failure to close the lending loop. This is what I mean by the lending loop, do not just stop at providing money for farmers, they need to be monitored throughout the entire production process until final sales of outputs. Monitoring will help expose the need for access to high quality seeds, information, storage, and markets so that they can sell and repay their loans (Respondent 10: Thrive Agric. CTO)*

Interviews with a staff from the Federal Ministry of Agriculture and Rural Development (FMARD) and a former director of the Agricultural Development Programme (ADP) also confirmed that indeed, farmers do have a reputation for not repaying loans, but this might not always be intentional and poor monitoring could also be a contributory factor.

*“Many rural farmers do not repay loans, especially government guaranteed loan, but I do not think it is always their plan not to repay. Farmers face a lot of challenges in their production endeavours such as pest and disease outbreaks and output wastage during storage. These can significantly reduce their profits. If they do not make enough money from output sales, they cannot repay their loans. Remember that they also have other expenses to attend to which still depends on the income from the sale of their outputs. Also, for the rural farmer, it is almost as though “out of sight is out of mind”, when they spend the whole farming season without a visit from the loan institution, they tend to take repayment for granted.” (Respondent 4: Ex-ADP Director)*

*The high rate of loan default among rural farmers is mainly due to poor monitoring of agricultural finance extended to rural farmers I think financial institutions and individual financiers also give farmers the leeway to default. Poor monitoring of the activities of funded farmers can make these farmers think no one is watching so they are free to spend the money as they like. There are cases where farmers use agricultural finance to pay school fees and do other businesses. If it is input finance,*

*farmers could sell the input and use the money for something else. So, I believe, poor monitoring has also contributed to farmers' mind-set of not repaying loans.”*  
(Respondent 3: FMARD staff)

Interviews also revealed that the poor repayment culture of rural farmers has been indirectly supported by the government due to failure to institute mechanisms for monitoring and farmer accountability. Therefore, farmers have transferred this poor attitude of unaccountability and loan default to other non-government loan facilities.

*“Because most agricultural loans are government supported and are not monitored, farmers are used to not repaying those loans because no one will come to ask them for it or how they spent it. This has made farmers to develop the mind-set that any form of finance coming to them is from the government which means it is free money and does not need to be repaid. I think the problem is this mind-set, it needs to be changed. As long as farmers continue to think this way, this reputation of default will persist, and it will continue to affect how agriculture is financed.”* (Respondent 2: FMARD Staff)

This statement was also corroborated during interviews with the Head of Operations of *Thrive Agric.* who spoke about *Thrive Agric's* initial experience when recruiting farmers to fund.

*“Initially, farmers thought the finance we were providing was from the government. But we had to clarify that we were not from the government, because we had heard about farmers' repayment attitude towards government loans. We had to tell them repeatedly that the finance we are providing is not from the government and this was one of our motivations to include close monitoring of farmers into our funding model.”* (Respondent 11: Head of Operations, *Thrive Agric.*)

While the remoteness of rural farms can be cited as a reason for poor monitoring of farmers loan usage (Olagunju and Adeyemo, 2007) it has also been found that most finance programmes and institutions do not have a robust strategy for monitoring the disbursing and use of agricultural loans in Nigeria. Monitoring agricultural finance usage therefore presents a gap that has emerged due to the weakness of dedicated monitoring frameworks to ensure that agricultural finance is used for the purpose for which they are disbursed and repaid (Udoh, 2008; Olowa and Olowa, 2011).

#### **4.6 Code 6: Weak Regulatory Frameworks and Poor Policy Execution**

The literature review suggests that the poor execution of agricultural finance policies and the weakness of regulatory mechanisms to govern agricultural finance activities is a major cause poor financing of rural farmers and historical misappropriation of funds to finance farmers by public office holders (Iwuchukwu and Igbokwe, 2012; Nwankwo, 2013; Fadeyi, 2018). There was a similar consensus among respondents that although these regulatory frameworks exist, they are weak and inefficient in performing institutional functions that will strengthen agricultural finance access, usage, and repayment. According to respondents 2 and 4:

*We are very good at evolving policies in this country, if you read most of our policy documents, they are well articulated and show promise, but poor execution, corruption and lack of political will to ensure that these policies are enacted and monitored has been the bane of this country. Look at the Agricultural Credit Guarantee Scheme Fund for instance, this scheme is one of the longest standing finance schemes but the most abused in terms of misappropriation of funds because regulatory frameworks are weak and there are no mechanisms to monitor the use of these funds. This is highly unsustainable. (Respondent 4, Ex-ADP Director)*

*It is not like there are no structures to regulate and govern the execution of finance policies such as those relating to the extension and use of agricultural finance, the issue is that stakeholders tasked with these regulatory roles are underfunded and underpaid. For instance, extension agents and field monitoring staff which should support the monitoring of funded farmers do not have adequate transportation to navigate rural roads. Farmers are located in diverse remote locations and it is not easy to reach them. Most of these funding schemes come with budget for monitoring but you and I know that these funds are not used for that purpose. (Respondent 2, FMARD staff, agricultural finance department)*

In addition, the weakness of regulatory frameworks was also observed to manifest in governing digital finance platforms used in crowdsourcing agricultural finance for rural farmers. As described by respondent 5:

*Even the new innovation of funding farmers through platforms is not yet sufficiently regulated. I know the innovation is still new, but these platforms are springing up rapidly and it won't be long before you get news of defrauding investors if certain checks are not put in place. As of now, the Securities and Exchange Commission is yet*

*to roll out clear cut guidelines on the procedures and requirement for crowdsourcing in Nigeria. This makes me to question the sustainability of the innovation in my opinion. (Respondent 5, IITA consultant on digital platforms)*

Platform users also showed concerns about the absence of strong regulatory frameworks to govern the emerging agro-digital finance space. According to respondent 27 and 34:

*As far as I know the SEC publicly banned crowdfunding in Nigeria since 2015 and haven't made any remark on it since then. Some investors are sometimes worried that we could wake up to a burst someday. (Respondent 27: Platform investor)*

*I don't think this space is regulated, look at what happened with the MMM platform and how many Nigeria got defrauded, if platform-based financial investments are regulated, this would not have happened. For me, I'm watching the space and not investing too much, I only select short duration investment like poultry for six months because I won't be surprised if one day, the government will just decree that these crowdsourcing platforms are illegal. (Respondent 34: Platform investor)*

Data presented in this chapter paints a picture of a vicious cycle of poor financing due to several distinct but interrelated issues. Farmers encounter problems in accessing loans from finance institutions because of stringent terms and conditions that are difficult to meet. Financial institutions are averse to lending to farmers because they tend to default on loans, farmers default on loan because they are mostly disbursed late and thus more likely to be used for non-agricultural expenses. Financial institutions encounter difficulties in processing and recovering loans from farmers due to lack of verifiable and updated data on farmers because of the associated high transaction cost in gathering these data from rural areas. As a result, farmers mostly benefit from formal credit when they are guaranteed by the government who in turn bear the cost of default when farmers are unable to pay. Where these government-guaranteed loans are inaccessible at the appropriate time, farmers have no choice but to rely on informal sources that are not always available and tend to cost higher in terms of interest rates. Overall, the problems in financing agriculture identified in the literature review resonated with the problems discussed by respondents. In the next chapter, the research case study is presented and data on the extent to which the platform attempts to address the problems identified in this chapter are also outlined.

## **Chapter 5 – Case Study: The Emergence of *Thrive Agric*'s Digital Platform for Financing Agriculture**

Yin (2012) prescribes that a case study should be presented clearly by adopting exhibits, sections, and tables to give the reader an opportunity to draw independent interpretation of the data presented. This chapter aims to answer research question two that seeks to understand how digital platforms evolve within markets characterised by weak or absent institutions. The chapter starts with a description of the research's case study - *Thrive Agric*. – a digital start-up that developed a digital platform in 2017 to facilitate agricultural financing of small farmers in Nigeria. In this single case study research, data collected were coded into 3 codes. First, code 7 reveals the operational process of *Thrive Agric*'s digital platform (section 5.1). Second, code 8 illustrates the institutional setting and stakeholder mapping of the agricultural finance market within which *Thrive Agric*. operates (section 5.2). Finally, code 9 captures *Thrive Agric*'s role in addressing problems with agricultural financing in Nigeria (section 5.3).

### **5.1 Code 7: *Thrive Agric*'s Digital Platform**

*Thrive Agric*.<sup>49</sup> is an indigenous agricultural finance digital start-up established in 2017 by two young Nigerian entrepreneurs. The platform was developed to intermediate between agricultural investors and rural farmers who need finance. *Thrive Agric*'s digital platform uses a crowdfunding model to source finance from various individuals (the crowd) and institutional investors (Banks and other financial institutions). This section first describes *Thrive Agric*'s. platform in terms of its online and offline components in 5.1.1, then tells the story of how *Thrive Agric*. has evolved within the agricultural finance market due to the presence of institutional voids in 5.1.2. Data presented in this chapter draws from interviews with *Thrive Agric*'s. platform owners, staff members, platform users, funded farmers (maize and poultry), agricultural stakeholders, and the researcher's observation over six months of participatory observation.

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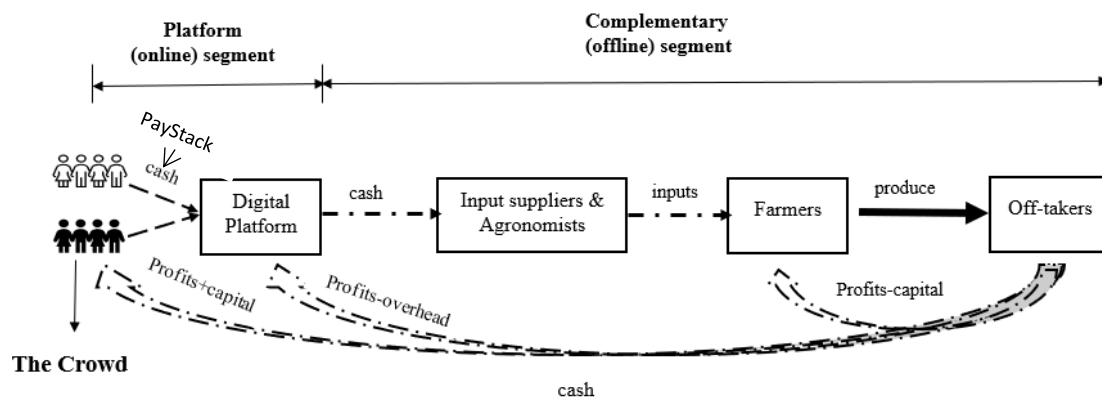
<sup>49</sup> <https://www.thriveagric.com/>



### 5.1.1 Platform Description

*Thrive Agric's* business model and value chain are made up of two distinct but co-dependent segments. These are the *online segment* and the *offline segment*. *Thrive Agric's* online segment adopts a digital platform solution to support accessing, distributing, and repaying agricultural finance. However, the online finance model business relies on an offline (complementary) segment that is made up of all other value chain activities from commodity production down to final sales to off-takers<sup>50</sup>. The offline segment therefore ensures that the finance sourced through the digital platform is repaid to investors by supporting funded farmers to produce the right quality and quantity of commodities and ensuring that these commodities are sold in profitable markets to obtain the projected financial outcomes for all parties involved. The linkages between the online and offline segments are represented in *Thrive Agric's* value chain in Figure 8 below.

**Fig 8: *Thrive Agric's*. Value Chain Showing Financial Flows between the Online and Offline Segments**  
(Source: Author's field research, 2018/2019)



### 5.1.2 The Online Segment

*Thrive Agric's* online segment consists of three major components: (1) A digital platform which is the primary channel through which investment funds are crowdsourced; (2) The crowd who are individuals and institutions who engage with the platform as investors in agricultural enterprises and (3) a third-party payment platform (PayStack) which facilitates investors financial transactions.

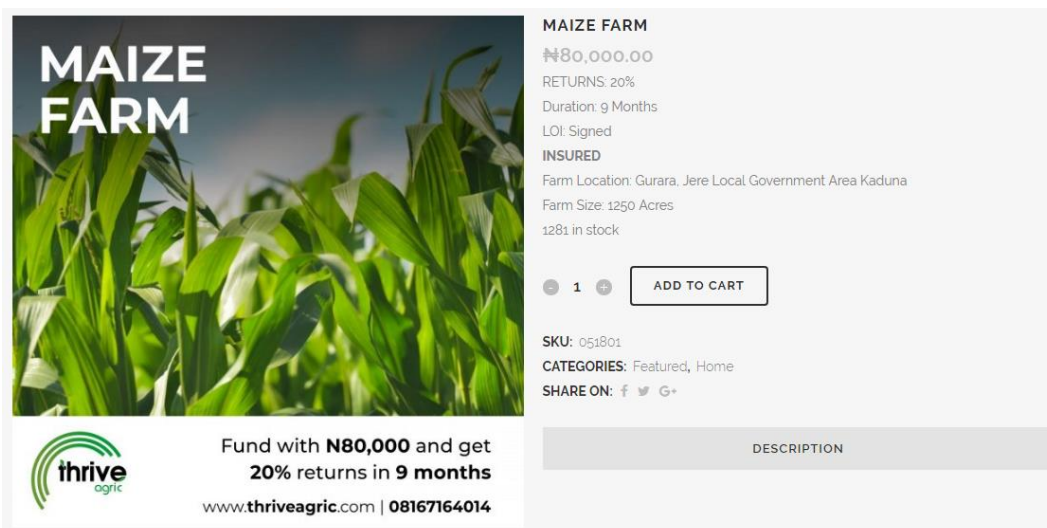
<sup>50</sup> Off-takes are large scale processors and Fast-Moving Consumer Goods Companies (FMCGs)

## The Digital Platform

*Thrive Agric's* digital platform (web and mobile application) serves as an online space for accessing information on agricultural investment options and performing investment transactions. These agricultural investment options are advertised as purchasable 'farm units' with a price tag and include information on the location of farms and return on investment (ROI) and duration of investment (see Figure 9). Typically, an investment cycle could range from six to ten months depending on the type of farm enterprise (see Table 17). The platform also provides potential investors other information such as the level insurance cover on farms and investor's capital, terms, and conditions of conducting business with *Thrive Agric*. contact information and office address. Information access on the platform is supported by embedded live chat functionality for real-time engagement with a customer care representative. The first version of the digital platform was developed in 2017 by *Thrive Agric's* CTO (respondent 10) who describes the platform as similar to other conventional e-commerce platform that facilitates buying and selling of commodities.

*"Think of an e-commerce platform where you pick an item, it goes into your cart and then you pay at check-out. It is the same principle. We setup the platform based on this assumption – that someone should be able to come online, choose a crop that cost 95,000 naira (173.24 GBP) for instance with the expectation of a 15% return after a specified period. To facilitate online payments, we partner with an online payment platform called Paystack which allows investors to complete payments with their debit cards". (Respondent 10: Thrive Agric. CTO)*

**Fig 9: Snapshot of *Thrive Agric's* Digital Platform-Enabled Crowdsourcing Webpage**  
(Source: *Thrive Agric's* website, 2018)



**MAIZE FARM**  
N80,000.00  
RETURNS: 20%  
Duration: 9 Months  
LOI: Signed  
**INSURED**  
Farm Location: Gurara, Jere Local Government Area Kaduna  
Farm Size: 1250 Acres  
1281 in stock

1 ADD TO CART

SKU: 051801  
CATEGORIES: Featured, Home  
SHARE ON: f t G+

Fund with **N80,000** and get **20% returns in 9 months**  
www.thriveagric.com | 08167164014

DESCRIPTION

**Table 17: Summary of Enterprise Information Provided on *Thrive Agric*'s Platform***(Source: Author's Research, 2018/2019)*

Type of Enterprise	Cost Per Farm Unit (Naira)	Cost Per Farm Unit (GBP) <sup>51</sup>	Percentage ROI (%)	Investment Cycle (months)
Ram Fattening	50,000 - 75,000	91-137	8	4
Okra	302,000	551	27	4
Poultry	10,000 - 85,000	18-155	7 - 16	3 - 6
Groundnut	80,000	146	20	5
Pepper	210,000	383	30	5
Cattle Fattening	150,000 - 178,500	274-326	20	6
Cowpea	96,000	175	22	6
Sorghum	260,000	474	25	6
Watermelon	319,000	582	27	6
Tomatoes	77,000	140	15	7
Rice	56,500 – 110,000	103-201	18 - 20	6 - 9
Soybeans	47,600 – 210,000	87-383	20 - 25	6 - 10
Maize	62,000 – 205,000	113-374	20 – 27	5 - 9

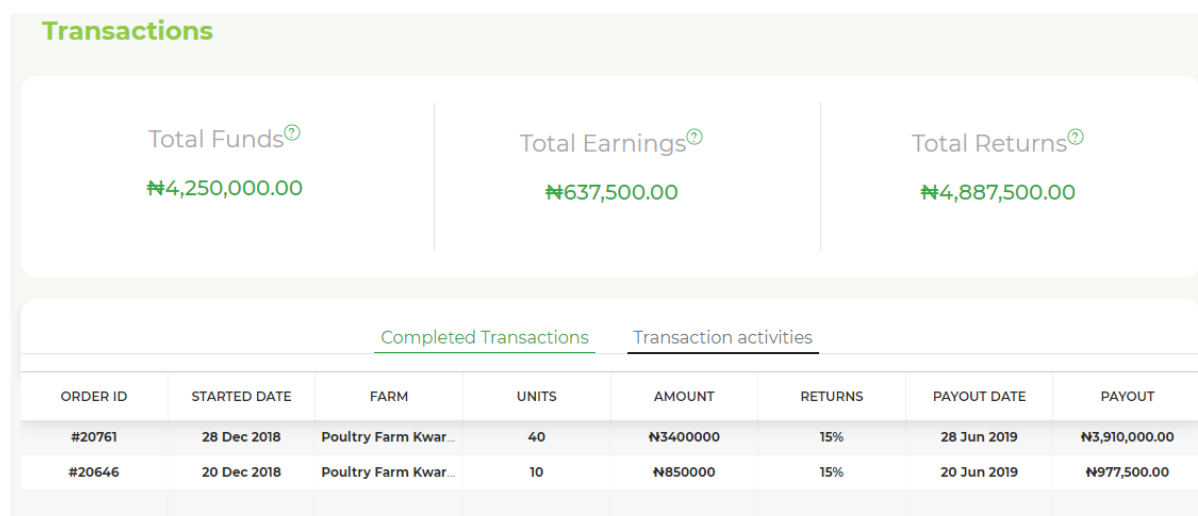
The second important function of the platform is that it provides a personalised dashboard through which investors can monitor their investment portfolio from the time of initial investment to the time of final payments (see Figure 10). This dashboard provides investors with a breakdown of the total amount of funds invested, expected ROI, expected date of repayment of capital and ROI, and a summary of transaction history showing past and current farm investments.

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<sup>51</sup> 1 GBP = 548.37 Naira

**Fig 10: Screenshot of Dashboard for Monitoring Investments on *Thrive Agric's*. Digital Platform**

(Source: Investors<sup>52</sup> Dashboard on *Thrive Agric's* website, 2019)



To invest in a farm or farms using the platform, investors also known as farm subscribers (or the crowd) are required to create a user account. This entails providing their personal details such as name, email address, residential address, and bank details, after which they can proceed to select the type of farm enterprise and number of farm units to purchase. Selected farm units are transferred to a ‘shopping cart’ where the investment summary can be viewed. Payments for selected farm(s) is performed at checkout, in Nigeria’s currency (Naira), using a debit card through a third-party payment digital payment platform called *Paystack*<sup>53</sup>. Alternatively, payments can be performed through bank transfer to Thrive Agric’s business account. Subscribers receive email alerts with key milestones on their farms such as growth stages, fertiliser application, and harvest. Subscribers also have the option of visiting farm locations to monitor investment progress.

### ***The Crowd***

The ‘crowd’ comprises individuals and institutions also known as ‘subscribers’ who invest in rural agricultural enterprises through the platform. Although, the platform is open to subscribers within and outside Nigeria, statistics show that the highest percentage of subscribers is within Nigeria (Figure 11). Even those who invest from outside Nigeria, tend to be of Nigerian descent with close ties to the country. This is especially because of the requirement that stipulates that investors must have a Nigerian bank account through which

<sup>52</sup> Screenshot obtained from researcher’s experiment using family members to investment in farms through *Thrive Agric's*. platform

<sup>53</sup> <https://paystack.com/>

they can receive payments at the end of the investment cycle, coupled with the fact that transactions through the platform can only be performed using Nigeria's local currency – the Naira. As explained by Respondent 10,

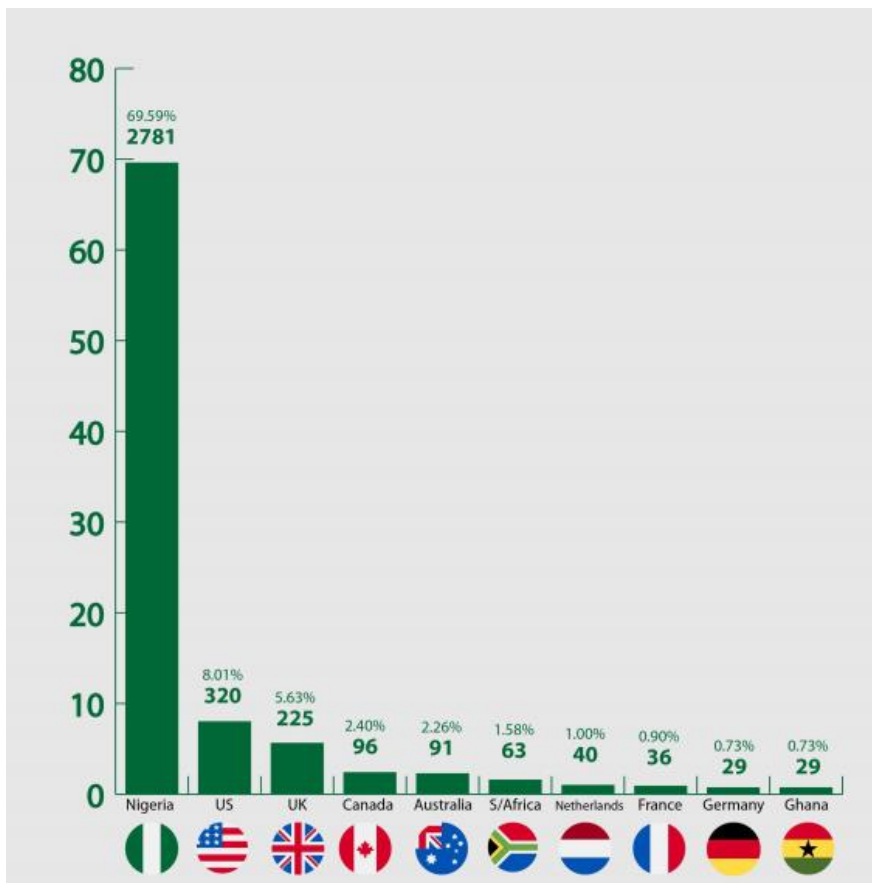
*“Our platform intentionally provides services to people who have a Nigerian Bank Account because of fluctuations in foreign exchange rates. Secondly, the platform is currently targeted at people in Nigeria who want to help develop the sector but still open to those outside Nigeria with ties to Nigeria. However, we are looking to partner with other platforms which will allow people invest and get paid back in other currencies like the dollar.”* (Respondent 10: Thrive Agric CTO)

According to the founders, one of the key contributions of their platform to agricultural financing is the creation of a space through which new entrants into the agricultural finance market can participate. Respondent 9 explained that:

*“There are investors who have never been able to invest in agriculture until now. It's like we have created another finance institution without a building per se and it is made up of funds pulled from many individuals and institutions who provide agricultural finance.”* (Respondent 9: Thrive Agric. CEO)

Therefore, it was deduced that these investors (or subscribers) represent an emerging agricultural finance institution that is becoming increasingly organised due to the adoption of a digital platform to structure the aggregation and repayment of finance.

**Fig 11: Geographic Distribution of Thrive Agric’s Investors (*the crowd*).**  
 (Source: Author’s field data, 2018)



Thrive Agric’s subscribers have increased exponentially from the first year of developing the platform in 2017 (500 people) until the end of field data collection in 2019 (10,000 people) as opposed to the slower increasing in farm subscriber’s pre-platform where they sourced from less than 10 people.

### ***The Third-Party Payment Platform***

*Thrive Agric.* partners with a third-party payment platform called Paystack that is embedded within the platform to facilitate online payments using a debit card. Payments are performed at the end of the transactions, like any other online shopping transaction. Payments for farm units can also be performed through online bank transfers or physical depositing of the money into *Thrive Agric*’s bank account where the option of online payments through PayStack is not possible.

### **5.1.3 The Offline (*Complementary*) Segment**

In this case study, the *offline (complementary) segment* of the business comprises all other aspects of the business that are performed to ensure that money aggregated from the online

segment is paid back at the stipulated time; that contractual agreements with off-takers are fulfilled and that farmers received the finance required and agreed returns at the end of the investment cycle. The need to develop a robust offline segment for the agricultural finance business was borne out of lessons learnt from participating in agricultural value chains as new entrants before the development of the digital platform. The founders revealed that it was understood that farmers' inability to access finance was not due to the absence of finance sources but mostly due to farmers' inability to meet eligibility criteria for loans and repay loans. Farmers, on the other hand, are unable to repay loans because they lack access to high quality inputs, information on good agricultural practice, information on market quality and quantity standards and information on prevailing market prices. As a result, Thrive Agric realised the importance of embedding an offline segment into their business model to ensure that finance extended to farmers are being used to acquire good quality inputs and outputs are being sold in profitable markets. According to Respondent 9

*“We do not stop at ensuring that farmers have access to finance, we also needed to ensure they can repay these loans. To achieve this, we support the backward integration of value chains we fund by providing access to the right inputs, information, and markets, thereby completing the loan cycle from lending to repayment. I think by working towards the goal of ensuring that farmers produce the right crops, with the right inputs, at the right time and selling to the right markets, we automatically help de-risk agriculture for potential investors.” (Respondent 9: Thrive Agric. CEO)*

The offline segment of Thrive Agric's business takes care of the backward integration of value chains for commodities they fund farmers to produce. It comprises of actors and institutions supporting farmers to produce the right quality and quantity of outputs required by processors so that ultimately, crowdsourced agricultural finance and ROI's can be repaid to farm subscribers. The operations manager, Respondent 11, describes the offline segment as the “*back-end*” of the platform, explain that:

*“At the back end, we have both on-field operations; off-field operations and business development staff. Off-field operation coordinates all the activities of Thrive Agric, which is where we have personnel in charge of procurement, IT, advertisement and social media, communications, key operation staff that run the day-to-day business operations. On-field operations handle operations from farmer on-boarding, inputs,*

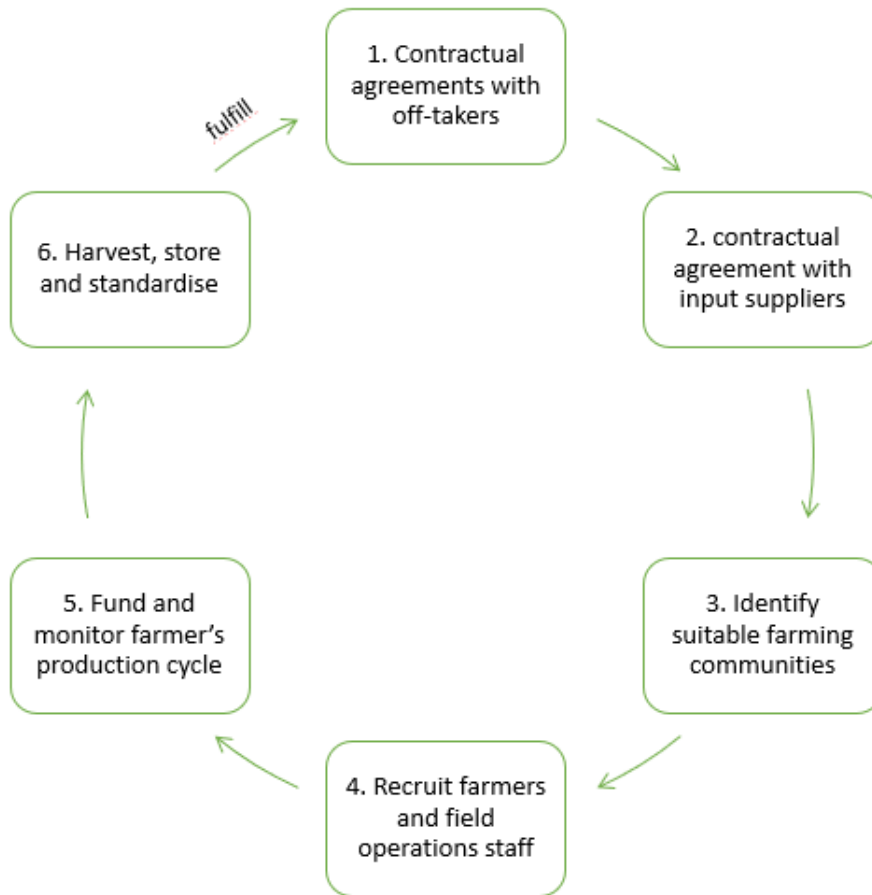
*agronomic practices, harvest, storage, and sales. At the point of sales of our product, the business development staff takes over, they oversee running the produce.ng platform. They also work on signing MoU's beforehand. The main objects of the on-fields operations are to ensure farmers get inputs at the right time, of good quality and attain high yield". (Respondent 11: Thrive Agric. head of operations)*

Figure 12 below is an illustration of Thrive Agric's offline operational process.



**Fig 12: Thrive Agric's Offline Operational Process.**

(Source: Author's field research, 2018)



*Thrive Agric.* disburses agricultural finance to farmers in the form of input finance. Their preference for input financing is borne out of two major reasons. First is because a major challenge faced by farmers is poor access to high quality inputs (Abdallah, 2016). This challenge has resulted in low quality and quantity of outputs and ultimately, low prices of products in markets (Dorward et al., 2009). Farmers' lack of access to high quality inputs mainly stems from lack of finance to purchase inputs on one hand, and on the other hand, preference of input suppliers to sell to large scale buyers. Second is the reputation of farmers in diverting cash finance to other non-agricultural purposes often resulting in failure to repay loans. *Thrive Agric's* efforts to address these two issues through crowdsourcing finance to purchase large volumes of high-quality inputs from accredited input suppliers. According to Respondent 11:

*"The business development team who oversees input sourcing negotiates with input supplies to obtain different samples of seeds, fertiliser and agro-chemicals. We run our own laboratory tests on these inputs to be sure they contain what they claim are their composition. We also make profits from supplying inputs to farmers, since we*

*can buy bulk, we purchase and sell to farmer at a lower rate than they will get in the market but at a mark-up on the exact price we purchase it for.” (Respondent 11: Thrive Agric. head of operations)*

Input distribution is performed and supervised using a multi-level approach that starts from mapping out each farmer’s field to determine the exact quantity of input required. This is followed by clustering farmers into groups and appointing a farmer to lead the group. The lead farmer collects inputs on behalf of the entire group from the warehouse and he/she is held accountable for input usage and output remittance. Both the lead farmer and the farmer-cluster are supervised and monitored by an assigned field agent who pays routine visits to each farm from the start to the end of the production cycle. The field agent reports to the operations manager who oversees the entire field operations of Thrive Agric. These steps are followed to ensure accountability among farmers through close on-farm monitoring. As explained by Respondent 11:

*“Once inputs are supplied to the warehouse, farmer groups come in with their procurement slip, which states that they have been cleared to receive input. Inputs are disbursed to group leaders and not to individual farmers. Inputs are also distributed based on agronomic phases – planting, fertilising, chemical application – to avoid side-selling. The group leader takes custody of inputs and distributes to farmers in the cluster. As part of the on-boarding process, each farmer signs an agreement which is shared with the law enforcement agencies we work with” (Respondent 11: Thrive Agric. head of operations)*

Farmers funded by *Thrive Agric.* do not have any direct contact with the digital platform, nor do they know the platform exists. Farmers believe that *Thrive Agric.* is an organisation that partners with farmers by providing inputs and then buys off their goods at an agreed price after harvest. *Thrive Agric.* fund every step of the production process including land mapping, land clearing, input supply, extension support, weeding, and harvest. Respondent 11 explained that:

*“After farmers are clustered and on-boarded, next the field is cleared, in clearing a field, we use google map to check that the farm is not on a flood plain. Once the farmers’ field has been identified as suitable for farming, the farmer is considered ready to collect inputs. On the input side, once Thrive Agric. has mapped out all the farmers’ fields, we know what the total hectares of land we are working with and how*

*much seeds the farmer will need to sow. We provide the exact quantity of seeds and closely monitor farmers' usage of the seeds through lead farmers and field agents".*  
(Respondent 11: *Thrive Agric.* Head of Operations)

*Thrive Agric.* works with several large-scale input companies, Respondent 11 listed some of these companies that include:

*"Syngenta (agrochemicals); Flour Mills; Wacot, Notory (confirm spelling), Amo, Olam, Vital feeds, Farm Synergy, Chi; Ensaco veterinary services, Afex (market data, also partnered with us to input finance some smallholder farmers in Kaduna for sorghum and soybeans); we are partnering with Flour Mills of Nigeria to produce maize and soybeans."* (Respondent 11: *Thrive Agric.* Head of Operations).

*Thrive Agric.* establishes contractual agreements with major off takers in Nigeria prior to funding farmers, to hedge against market price fluctuations thereby ensuring that farmers are assured of profitable markets post-production. According to Respondent 11:

*"The first step is identifying and engaging in contractual agreements with off-takers. For instance, some contracts we have had are to supply Sona Breweries with maize and soybeans, flour mills with maize, soybeans, sorghum. Once the terms are agreed we obtain and LPO's and sign off MoU's. It is this LPO that informs the number of farmers that we will fund and how much we crowdsource. Some of our off takers include Stallion rice offtake rice, flour mills of Nigeria offtakes rice, soybeans, sorghum, Sona (spelling) breweries offtake grains (sorghum, soybeans); Amo and Tagini offtake birds, CHI and NPG, dainty (spelling) offtake birds; Elephant group offtake grains and Dangote offtakes rice."* (Respondent 11: *Thrive Agric.* Head of Operations)

Therefore, the type, quality and quantity of produce required by off takers is what determines the amount of money to crowdsource, the number of farmers to fund and location of farming communities to engage. According to Respondent 10:

*"Off-takers drive Thrive Agric's value chain. Thrive Agric's farmers produce to meet specific demands of off-takers because they are our market. So, we do not produce what we like and then go out to look for markets, but we secure a market first, then we produce to meet the market's demand. Off-takers determine the number and type of farmers we work with; the type of input we purchase to distribute to our farmers, the*

*type of agricultural enterprises we fund; and the location of farmers we fund because some off takers don't even want to buy from certain states (regions) of Nigeria. For instance, some off-takers will not buy soybeans coming from Benue state due to quality issues.” (Respondent 10: Thrive Agric. CTO)*

A key requirement in meeting off takers output specification is to identify the right communities to produce the desired commodities. Respondents 11 and 10 explain that:

*“Nigeria has varying agro-climatic zones with distinct soil profiles which support the production of different crops. The agro-climatic condition of a given region can influence the quality and quantity of commodity output. Therefore, it is key to first identify the best region to produce the desired crop or animal before identifying farmers to recruit.” (Respondent 11: Thrive Agric. Head of Operations)*

Furthermore, ensuring that the offline segment of the business works efficiently depends on Thrive Agric’s ability to identify and recruit credible farmers and other skilled value chain actors that includes operations staff tasked with monitoring and supporting farmers before, during and after production. Describing the recruitment process, the operations manager explained that,

*“After the info session and buy-in by the community, the next step is to identify all that is needed to make our operations work, both hard and soft skills, including farmers, key influencers, security personnel, warehouse managers, monitoring agents – that is, we need to recruit field officers, supervisors, input and logistics people, farmer services personnel who will be in charge of farmer monitoring, on-boarding, form filling, input distribution and getting the farmers cleared for input distribution, farm monitoring and extending agronomic practices to farmers, data collection personnel – to collect farmers’ data, data on their field, agronomic data (yield); finance and administration personnel, trainers who will train farmers, recruit and train the lead farmers. Lead farmer write exams and are also interviewed; the field officers also undergo an aptitude test and interview”. (Respondent 11: Thrive Agric. Head of Operations)*

*“To determine creditworthy farmers to fund, we start from the community level through meetings with village heads, farmer-group leaders, market group leaders and trade union leaders to inform them about our finance model. These leaders rally round farmers within the community and identify those farmers with leadership*

*potential. These farmers who have been identified are made lead farmers and trained on how to on-board other farmers into their cluster. Lead farmers identify farmers who they know are legitimate to become members of their cluster and the farmer on-boarding process begins.”* (Respondent 11: *Thrive Agric*. Head of Operations)

#### **5.1.4 Platform Business Evolution**

This sub-section covers *Thrive Agric*'s platform evolution, providing a background understanding of *Thrive Agric*'s platform emergence within a market characterised by institutional weaknesses. As *Thrive Agric*'s digital platform has been up and running since 2017, primary data collected on the platform evolution was coded into two phases. These are: the pre-platform phase (before 2017) and the Platform phase (2017-2019)<sup>54</sup>.

At the end of this section, Figure 18 presents a timeline of *Thrive Agric*'s platform evolution showing growth in numbers of farmers funded, number of investors, and number of partnerships.

##### **Pre-platform Phase**

The pre-platform phase describes the period of iterative learning as the founders of *Thrive Agric*. engage with the agricultural finance market as new entrants before the development of a digital platform. Interviews with the founders revealed that this phase consisted of several sub-phases which began with problem identification and scoping of the agricultural finance market; informal experimentation of agricultural financing; formal trial of crowdsourcing agricultural finance; and modifying their approach to agricultural finance by using a digital platform - presented in Figure 13 below.

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<sup>54</sup> The research data collection ended in 2019 therefore, data presented in the post-platform phases covers 2018-2019

**Fig 13: Sub-Phases Identified in the Pre-platform Phase**

*Source: Author's field research (2018/2019)*



### ***Problem Identification and Informal Experimentation***

The motivation to enter the agricultural finance market came from a personal and business standpoint. From a personal standpoint, the CEO of Thrive Agric. is an indigene of Benue state, a state known to produce the widest variety of staple crops due to its soil and agro-climatic characteristics that favour agricultural production (Ajon and Anjembe, 2018). However, the full potential of agriculture in Benue state as a major source of income and livelihoods for farmers and other value addition agribusinesses remains largely untapped (Umeh et al., 2013; Abah and Petja, 2015; Mbah et al., 2017). This was also the findings from a preliminary situation analysis - carried out by the founders who agreed with the research conducted by Umeh et al. (2013); Abah and Petja (2015) and Mbah et al. (2017) that despite Benue state's reputation as one of the highest producers of staple crops, farmers in Benue state remained amongst the poorest in Nigeria.

The founders claimed that the first problem with agricultural production and development they identified was the long chain of intermediation between rural farmers and end users of agricultural commodities. According to Respondent 9 and 10:

*“I was concerned that Benue State<sup>55</sup> which is known as the ‘food basket of the nation’ still has so many poor farmers. The farmers in Benue State were not doing well financially, however, I realised that the middlemen who buy from them seemed to be making all the profit when they transport these products to Lagos<sup>56</sup> to sell. So, my thought was ‘let us narrow the gap between small farmers and end markets.’”*  
(Respondent 9: Thrive Agric. CEO)

*“Farmers always find a way to sell their produce, but the question is ‘at what cost? We found that a typical farmer has up to five middlemen between him and the final consumer. There is the person who comes to his farm at harvest and buys the farmers’ produce, that person is taking it to the local market within the community, someone in the local market buys it and takes it to a bigger market and in that bigger market there is probably a “trade man” – someone from Lagos or Ibadan who gathers from many sellers and delivers to someone who has an LPO (Local Purchase Order) – or a contract with a company in need of that produce, he trades with that person and the person who has the LPO finally sells to the processing company”* (Respondent 10: Thrive Agric. CTO)

This finding brought about the idea of reducing the long chain of intermediation to enable farmers make more profits from their efforts. Therefore, the founders started an agricultural commodity aggregation business in 2015. The business entailed gathering rice and soybeans from several rural farmers in Benue state, to supply directly to large processors in Lagos state. Respondent 9 explained that:

*“Almost immediately after graduation we started thinking about how to solve some of the issues farmers encountered that made them remain poor. Coincidentally, we had a friend whose father had a soybean processing facility, and he needed a large volume of soybeans. So we aggregated soybeans from many farmers in Benue State and supplied directly to the processing plant. This reduced the six-man chain of intermediaries to a one-man intermediation and enabled the soybean farmers to earn up to three times more in profits than they would have normally earned.”*  
(Respondent 9: Thrive Agric. CEO)

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<sup>55</sup> Benue State: One of the 36 state in Nigeria location in the North-central geo-political zone known for its conducive agro-climate which supports a wide variety and volume of agricultural products consumed in Nigeria (R<sub>1</sub>)

<sup>56</sup> Lagos State: The commercial centre of Nigeria. Formerly the Capital of Nigeria

Subsequent attempts to expand the aggregation business exposed other problems in value chain coordination. First was the issue of quality standardisation due to the use of different varieties of saved seeds and lack of finance to purchase high quality improved seeds.

According to Respondent 9:

*“Different farmers used different seed varieties which yield different size, colour and taste of the final product. This was mainly because farmers lacked finance to buy better quality seeds and had to rely on seeds they have save from previous harvests. However, the processors we sold to needed uniform products to guarantee continued quality standards of their final products”.* (Respondent 9: Thrive Agric. CEO)

Second was the adoption of poor agronomic practices which influenced the quality of outputs especially because different farmers used their own indigenous knowledge and management techniques on their respective fields. Respondent 10 explained that:

*“What we realised is that farmers were not visited by extension agents. As a result, they were unaware of new farming techniques which could improve yields, coupled with the fact that farmers are not willing or financially able to employ private extension agents or even search for improved techniques using their mobile phones”.* (Respondent 10: Thrive Agric. CTO)

Third was the issue of trust and absence of traceability mechanisms which meant that farmers could get away with breaching contractual agreements without any consequence. The founders explained that without proper traceability systems in place, they were unable to identify and penalise dubious farmers. According to Respondent 9

*“Farmers had the tendency to act dubiously if proper monitoring structures are absent. We had a situation where we ran into huge losses because some farmers half-filled their soybean bags with brown stones and topped it up with the soybeans. This affected our trust for farmers and the processors trust for us”.* (Respondent 9: Thrive Agric. CEO)

Fourth was the issue of meeting quantity demands of processors who need large volumes of agricultural outputs frequently. They found that the issue of low output quantity was mainly because of poor access to finance to purchase improved inputs which yield higher quality outputs. In addition, there was also the issue of post-harvest losses due to poor storage and



transportation both of which required significant financial investment. As explained by Respondent 10:

*“Farmers simply do not produce enough to meet the needs of local industries in Nigeria and the ultimate reason is due to lack of finance. As a result, these industries prefer to import from global markets, limiting farmers’ chances of participating in such profitable value chains. Even when farmers meet quantity requirements at a given point in time, there is no assurance of consistency in supply to meet subsequent demands.”* (Respondent 10: Thrive Agric. CTO)

Particularly, this issue of farmers’ poor access to finance emerged as a reoccurring problem embedded in constraints experienced by farmers that the founders partnered with. Therefore, although their business model did not set out to address problems with financing rural agriculture, the founders soon realised that without addressing the underlying issue of farmers’ access to finance, their business of aggregating from farmers and supplying to processors will continuously be impeded by issues with output quality, quantity, and uncertain frequency of supply. Therefore, on reflection, Respondent 9 and 10 realised that:

*“The issue of low income and slow development of rural agricultural value chains was beyond reducing the length of the intermediation chain and providing access to markets, but a combination of several other interconnected factors which had placed rural farmers at a disadvantage among other value chain actors.”* (Respondent 9: Thrive Agric. CEO)

*“Central to farmers’ inability to access profitable markets was the issue of poor access to finance. Lack of finance meant that these farmers could not produce the right quality and quantity required by processors because they could not afford to purchase the right quality of inputs such as seeds, fertiliser and agro-chemicals which will ultimately lead to higher quality and quantity of outputs. This was how the idea to help farmers to access finance was birthed.”* (Respondent 10: Thrive Agric. CTO)

### ***Formal Trialling of Agricultural Financing***

Following the identification of poor access to finance as a central problem faced by farmers in producing optimally, the founders therefore decided to expand their agribusiness to include sourcing finance to fund farmers. They discovered that although there were several formal sources of agricultural finance such as commercial bank loans; government finance

programmes; and funding from development finance institutions, farmers lacked access to these finance sources for several reasons. According to Respondent 9 and 10:

*“Farmers lacked money to fund their farms because banks do not find them creditworthy. Banks find it challenging and expensive to verify information provided by farmers on their loan application forms. The lack of verifiable data such as farmers’ biodata; farm location and coordinates; cash flow; farm records; socio-economic status has contributed to the aversion of financial institutions to extending credit to rural farmers.”* (Respondent 9: Thrive Agric. CEO)

*“We found that farmers did not get finance because of the perception that agriculture is too risky; people do not trust farmers because of their track record of loan default, farmers do not have records about them, no one really knew them and being an ‘unknown’ entity, it was harder to trust them. Improving transparency and trust in lending to farmers was a primary goal of setting up the platform”.* (Respondent 10: Thrive Agric. CTO)

*“The first issue is poor farmer identity. To financial institutions’, farmers are ‘unknown entities’. Rural farmers lack identity in the sense that it is not easy to get accurate data on who they are. You cannot rely on cooperatives for this information because anyone can register a cooperative and forge a list of farmer-members. Even when you go to the federal ministry or the local government office, the data they have is outdated and not reliable. This has become widely known in the investment space as one of the reasons for loan default and that is why people are weary of investing in farmers”.* (Respondent 10: Thrive Agric. CTO)

According to the founders, their interaction with commercial banks revealed that, financial institutions tend not to invest in verifying farmers’ information due to high transaction cost in capturing farmers’ data. Respondent 10 claimed that:

*“We found out that the transaction cost to be incurred by banks in verifying farmers’ information sometimes exceeds the loan amount requested by a farmer. Therefore, lending to small farmers is unprofitable to banks.”* (Respondent 10: Thrive Agric. CTO)

The founder's first idea to support farmers in accessing agricultural finance was to serve as intermediaries between commercial banks and farmers by collecting loans on-behalf of a group of farmers to fund their production activities. However, as new entrants into the agricultural market, the founders also encountered difficulty in accessing finance from financial institutions due to issues of trust. This gave them first-hand experience of some of the barriers encountered by farmers in accessing agricultural finance. According to Respondent 10:

*“We went to a commercial bank and presented our business plan to fund farmers; this was however not received favourably at the bank. They said they have had several experiences with people claiming they have farmers to fund but these proposals turned out to be scams. To cut the long story short, banks were not willing to fund farmers through us at that time”.* (Respondent 10: Thrive Agric. CTO)

Therefore, the second option was to seek alternative sources of finance outside the prevailing conventional sources. In doing so, they decided to crowdsourcing investment funds from their social networks, specifically from family, friends, and former university colleagues.

According to Respondent 9:

*“In our first attempt to crowdsource funds, we wanted to fund farmers to produce watermelons, so I reached out to a couple of close friends from school. I needed 400,000 naira (729.43 GBP), so I gathered 100,000 naira (182.36 GBP) from each of my four friends. We first started by using WhatsApp group chat as a crowdfunding platform and I kept them updated with photos from the farm at each growth stage until harvest”.* (Respondent 9: Thrive Agric. CEO)

With the 400,000 sourced from their social network, the founders were able to purchase high quality seeds, fertiliser, and agro-chemicals. They also provided agro-advisory services and financed land clearing activities. With close monitoring throughout the production process, the founders were able to ensure that farmers did not divert inputs (side-selling) and production techniques were uniform across farms. This ensured that at the end of the production season, yields exceeded expected output and the founders were able to meet quality and quantity specifications of off takers; and paid both farmers and investors.

According to Respondent 9:

*“Our first trial of farming with crowdsourced funds went well, we promised very outrageous ROIs to our investors, and I was able to pay both capital and ROI to them, even though we did not make any profit for ourselves. This motivated my friends to want to re-invest immediately. Also, our four friends told others about the success of their investment, and more people became interested, so we decided to give it another go but this time around with even more people.”* (Respondent 9: Thrive Agric. CEO)

### ***Re-scoping the Problem and Identifying a Solution***

Understanding the importance of finance to agricultural management decision provided a whole new perspective on the founders’ agribusiness model. According to the founders, the crowdfunding model of aggregating finance provided a channel through which they could break down barriers to farmers’ accessing agricultural finance and marked the beginning of their participation in rural agricultural finance markets. Participating as finance intermediaries between rural farmers and investors also enabled the founders to assume a strategic position in understanding the market. According to Respondent 10:

*“From our point of view, we saw the agricultural finance market as consisting of two groups of people. On the one hand, there are large numbers of rural farmers who need finance but are unable to access finance due to barriers imposed by conventional finance institutions and also due farmer-imposed issues relating to lack of trust and poor loan repayment reputation. On the other hand there were a large number of people who have money to invest but were unaware of investment opportunities and averse to investing in agriculture due to fear of losing their money in case of production failure or untrustworthy farmers”.* (Respondent 10: Thrive Agric. CTO)

This once again brought to light the issue of poor intermediation in rural agricultural finance markets in Nigeria and the understanding that agricultural finance problems are multifaceted and require a holistic approach that extends beyond simply providing finance. There was also the need to solve problems associated with repaying loans that would improve trust and confidence in doing business. According to Respondent 10

*“There were some factors which resulted in farmers’ failure to repay loans such as poor monitoring of farmers to ensure they use the money for agriculture, poor access to markets to sell final products, absence of support to farmers in selling-off outputs*

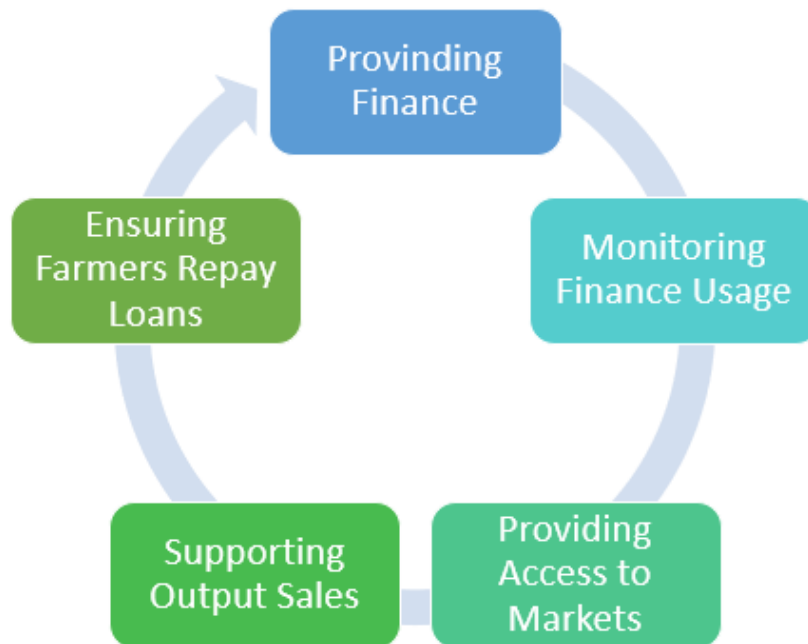
*for instance providing market information, storage facilities, transportation facilities and standardisation advice, and ensuring that farmers actually pay their loans after receiving the money.” (Respondent 10: Thrive Agric. CTO)*

This shaped their understanding of the finance cycle which according to the founders, starts with providing finance but continues with monitoring farmers to ensure they can repay loans, providing access to profitable markets for the sale of outputs after production and finally, repaying loans. This is illustrated in figure 14 below. According to Respondent 9:

*“I believe that the failure of finance institutions to follow these steps has led to high rates of loan default and supported the vicious cycle of fear of lending to farmers. These steps are very important because agriculture is different from other sectors in Nigeria, therefore a one-size fits all model of lending would not work with agricultural lending. That is why we adopted this finance cycle as our model of lending to farmers and it worked in our initial trials.” (Respondent 9: Thrive Agric. CEO)*

**Figure 14: Agricultural Finance Cycle**

*Source: Author's field research (2018/2019)*



Therefore, in re-scoping the problem and developing a solution to improve farmers' access to finance, the founders identified 'poor intermediation' in agricultural finance markets as a major problem hampering farmers' access to finance and ultimately resulting in poor incomes. The solution they evolved was to function as intermediaries along each link in the agricultural finance cycle (Figure 14). Furthermore, identifying the huge potential to meet the finance needs of farmers through aggregating funds from investors, the founders saw the need to expand their crowdsourcing business beyond their social network. In doing so, they adopted WhatsApp as a platform to communicate with potential investors and provide information on agricultural investment opportunities. However, the use of WhatsApp as an intermediation platform proved challenging especially because of data protection issues as new investors were averse to sharing their contact details with other investors on the group. As a result, they had to evolve other means of managing investors while aggregating finance. According to Respondent 9:

*“Using WhatsApp had its challenges; some people wanted to invest but did not want to join the WhatsApp group, so I had to use emails, phone calls and other messaging platforms (Facebook) to accommodate those individual needs”. (Respondent 9: Thrive Agric. CEO)*

Using several platforms to engage with investors however segmented the business resulting in complexities in managing investors. This birthed the development of a singular digital platform known as *Thrive Agric*. to serve as a one-stop shop for individuals and institutions with an interest in financing rural agricultural enterprises.

### **Platform Phase**

The platform inception phase covered the first year of scaling-out the agricultural financing business using a bespoke digital platform to intermediate between agricultural investors and rural farmers. The justification for creating the platform was three-fold. First was the fact that there were an increasing number of people who relied on the convenience of digital platforms to perform several day-to-day transactions such as banking, retail, and education amongst other activities (Koskinen et al., 2019). As a result, there was an already existing large group of people inclined to adopting platforms for financing agriculture if the opportunity arises. According to Thrive Agric's CEO (Respondent 9):

*“There was a growing number of young people who were excited about agriculture who wanted to participate one way or the other. Agriculture is now a big buzz in Nigeria; people are beginning to understand that if it is done right, agriculture can be very profitable. A large percentage of these people are familiar with the use of web and mobile applications, so it was easy for them to engage with our platform”.*  
(Respondent 9: Thrive Agric. CEO)

The digital platforms therefore attempted to remove barriers to new entrants' participation in agricultural finance market by providing a digital alternative to financing agriculture and accessing finance for agriculture.

*“The good thing about using a platform is that we can aggregate finance from anywhere in the world. Right now, we have investors from over 10 countries worldwide. So the platform removes time and location barriers to sourcing finance.”*  
(Respondent 9: Thrive Agric. CEO)

Second was the possibility of accessing additional finance sources beyond the conventional formal sources. This novel source of finance is from individuals who possess idle cash but who lacked knowledge, skill, and time to identify credible agricultural investment channels. This exposed a gap in agricultural financing for which the founders deemed it suitable to bridge using a digital platform. According to respondent 10:

*“On one hand we had people with spare cash who were interested in agriculture but who did not want to directly engage in agricultural activities, on the other hand we had rural farmers who have land and skills to perform production activities but who lacked finance. Building the platform was the creating the perfect marriage between these two groups. We felt that building a platform will allow people to invest in agriculture, to track their investment, and give them the feeling that they own a farm without doing any of the hard work associated with farming”.* (Respondent 10: Thrive Agric. CTO)

Third was for business scaling-out purposes. *Thrive Agric.* needed a more suitable platform to meet the needs of their increasing number of agricultural financiers. WhatsApp did not sufficiently provide investors with all the functionalities they needed to securely invest in agriculture. Therefore, building the platform was an organic business progression as WhatsApp was no longer convenient for the business expansion strategy According to respondents 9 and 10:

*“We started with our close friends and used WhatsApp to communicate. When we saw that the crowdfunding model worked on this small scale, we wanted to expand beyond our circle of friends. So, we figured that the best way to let the world know about our intermediation business was first, posting on social media and creating a bespoke website for investing in agriculture.”* (Respondent 9: Thrive Agric. CEO)

*“The platform made it fast for us to raise capital to fund farmers by digitising the process of investing in agriculture with just a few clicks. Our platform makes it easy for people to invest in farms anywhere and anytime without leaving their current location. We made people understand that through the platform you can invest in agriculture and receive updates on your investment, you can connect with farmers, and you can connect with us easily as cost-effectively.”* (Respondent 10: Thrive Agric. CTO)

Fourthly, the founders believed that adopting a platform solution to agricultural financing would increase transparency in information delivery and improve investors’ confidence in financing agriculture. Through the platform, investors have access to information about the business, such as business partners, the identity of platform staff, and the business model, and can obtain information about agricultural enterprises available for investment. As explained by Respondent 10:



*“Those who invest through our platform have access to all the information they need about the business. If you look at the platform, you can see our partners and even our staff members there. Many people go further to verify our identity on LinkedIn to be sure they are dealing with legit people, so they know who to hold accountable if at all the need arises.”* (Respondent 10: Thrive Agric. CTO)

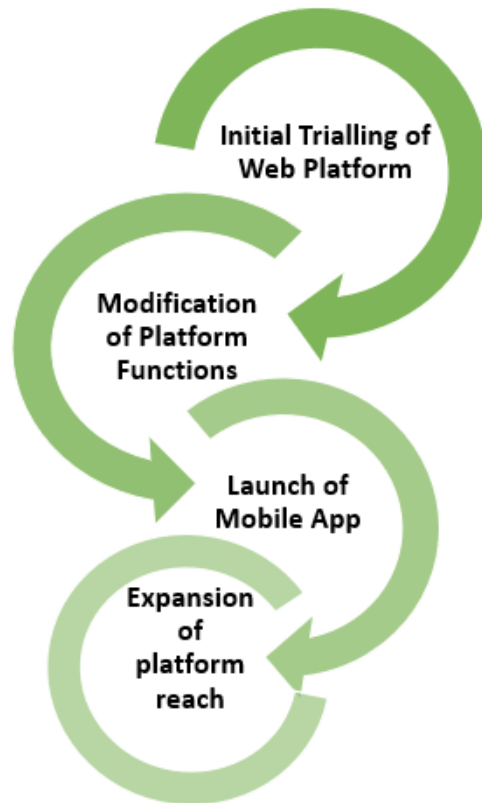
This claim was also verified by Respondent 26, a respondent who had invested in agriculture through the platform, who explained that:

*“Before I invested, I did my due diligence. I checked their online platform and saw that the partner with Leadway assurance, and I saw some of the organisations that have sponsored the business. I also checked the profiles of the CEO and CTO on LinkedIn as well as the profiles of some of their staff members using the names I saw on the website. This gave me confidence to invest in agriculture through Thrive Agric’s platform”.* (Respondent 26: Platform investor)

Three sub-phases were observed within the platform phase (see Figure 15). These are: the initial trialling of the web platform (website); modification of platform functions; and launch of mobile application. These sub-phases also reveal lesson learnt by the platform owners, opportunities, and challenges in operating a platform business within an environment characterised by weak intermediating institutions.

**Fig 15: Sub-Phases Identified in the Platform Phase**

*(Source: Author's field research, 2018/2019)*



***Initial Trialling of Digital Platform (2017)***

In 2017, the founders developed a bespoke web platform for crowdsourcing agricultural finance. The primary aim of the platform was to serve as a one-stop shop that provides information to individuals who want to invest in agriculture to enable investors identify and fund farms through a simple stepwise process similar to performing conventional online shopping transaction (Figure 16).

**Fig 16: Stepwise Investment Process on *Thrive Agric*'s. Platform**

(Source: *Thrive Agric*'s online platform, 2019)



According to the founders, this first year of using the platform was regarded as a trial year to understand user needs, user engagement, how other stakeholders within the agricultural finance market will interact with the platform and to identify areas for improvement. In terms of user engagement, within the first year, the founders recorded about 500 users who invested in agriculture through the platform. While this was a significant increase in the number of investors compared to pre-platform investor numbers, according to the founders, this was still quite low when compared with the number of smallholder farmers in Nigeria who needed funding.

To understand the nature of the initial trialling of the platform, data was gathered from interviews with platform users. Their responses fell into three broad categories relating to issues of trust in digital platforms, platform functionalities and harnessing emerging opportunities for platform innovations in agriculture.

### ***Motivation for Using the Platform***

Interviews captured platform users' motivation for investing in agriculture through the platform. These responses were categorised into the following reasons: ease of making investment, diversifying investment portfolio, social entrepreneurship, competitive ROI, information provided, reduction in transaction cost of investing in agriculture, information provided through the platform; and linkage to credible agricultural enterprises.

The ease of performing investment through the platform was a re-occurring factor motivating many platforms users, especially for investors who had prior experiences investing in agriculture through non-digital means.

*“The ease of making payment was a plus, I didn’t have to go anywhere like to the bank or to the village to look for a farm by myself to invest in. I did the whole investment using my phone and debit card; and the fact that the investment was made in agriculture gladdens my heart.”* (Respondent 20: Platform investor)

*“The platform makes investment very easy. I simply select a farm and the number of units I want, then I pay with my card and that's it. I then add my bank account details in my profile and I get my returns at the said time. It's easy. Performing the transaction for my other agricultural investment is quite cumbersome. There’s more paperwork plus trips to the bank, I also need a witness to co-sign and all of that. This is not the case with digital platforms; investments are made in a matter of clicks, so easy.”* (Respondent 21: Platform investor)

*“I found the process very easy and straight forward even easier that when I invest in treasury bills. Anyone who knows how to use a smart phone or computer can figure it out. The steps are clear and easy to follow. Thrive Agric puts up the farms which are broken down into units, you can choose the number of units you want to buy and pay using your card or by bank transfer. It is very easy and clear.”* (Respondent 23: Platform investor)

*“The platform made it very easy, you just sign up on the platform, pay for farms, put in your email address, put in your account details and when you get credited; you can see it on your dashboard. I paid online by card through Paystack.”* (Respondent 26: Platform investor)

*“Using a digital platform to perform agricultural investment is very convenient, effective and efficient. In fact, I think it has made agriculture ‘cool’. Check out other sectors in Nigeria, not many of them have evolved to the point where you can invest from the comfort of your home, yet agriculture which has been the least when it comes to appeal or opportunity to invest has gone ahead of other sectors in terms of the channel of investment. The digital platform allows you to pay for farms using your debit card. I made all my investment using my mobile phone, sometimes I’ll even be on the go or in transit from work while I’m doing this. It is just too easy. I can confidently say that without the use of the digital platform for transaction, I may not have invested. The stress of maybe going to a bank or filling out forms would have*

*taken away the appeal to invest. The convenience is definitely a major driving force for me.*” (Respondent 32: Platform investor)

The perceived developmental contribution of investing in agriculture through digital platforms was also a motivation for some investors who believed that investing in agriculture was a contribution to rural farmers and agricultural development.

*“I thought it had a good social impact because it is used to empower local farmers.* (Respondent 22: Platform investor)

*I was looking for a reliable investment vehicle and an opportunity to invest right. Contributing to food production stood out from my list of options.* (Respondent 27: Platform investor)

*I also feel it has the potential to contribute to the economic development of the country.*” (Respondent 23: Platform investor)

*I liked the idea of crowdsourcing funds to enable farmers.*” (Respondent 28: Platform investor)

*I've always had interest in agriculture, and I was looking for somewhere to invest the 'free' money I had at the time so when I got to know about Thrive Agric I decided to give them a try.* (Respondent 31: Platform investor)

*What impressed me especially was the empowerment aspect of their model not just the return on sponsorship. They are empowering small farmers who do not have money to farm, they are also helping young investors with investment opportunities in agriculture.* (Respondent 32: Platform investor)

*“I also considered the fact that since it was being used for agriculture, and I couldn't directly participate in agriculture at that time, I could remotely participate through the platform.* (Respondent 36: Platform investor)

*I was also impressed that the investment was channeled toward local agricultural development.* (Respondent 37: Platform investor)

Other respondents, especially first-time investors in agriculture, used the platform to diversify their investment portfolio due to the competitive rate of returns offered on the platforms.

*“The returns were above what I expected to get from other investment markets at that time.” (Respondent 20: Platform investor)*

*“The rate of returns looked good, and I had spare cash I wasn’t using at the time, so I decided to give it a try.” (Respondent 21: Platform investor)*

*“For getting multiple streams of income and to diversify my investments; the returns were attractive, and I didn’t have any agricultural investment so I thought I should give it a shot. (Respondent 22: Platform investor)*

*...The interest rate, I had money I wanted to save, and I figured that I could use Thrive to save it and make some interest on it. (Respondent 26: Platform investor)*

*I like the returns, I had cash I didn’t need to spend immediately, the return period on the investment was short (6 months) I was sure that by December I will have my cash back. (Respondent 30: Platform investor)*

*Another reason was the good financial returns it offers instead of leaving my money in the bank, it was a way of gaining some return after a few months.” (Respondent 23: Platform investor)*

*“It meets my investment need, when I have any floating cash, I can invest and get some returns. Especially for the short duration investments like poultry farms with are just 6 months. I can plan, fix my money and get some additional returns later.” (Respondent 24: Platform investor)*

*I thought it was a viable investment opportunity, I wanted to diversify my investment portfolio and I saw that the interest rate offered is better than the mutual fund accounts I currently have. (Respondent 25: Platform investor)*

*I found the returns quite attractive, and I did some research on the company and my findings showed that they are reliable, and I also went to their office in Abuja to be sure it really existed. (Respondent 37: Platform investor)*

*Many other financial instruments like treasury bills didn't give as good interest rates as Thrive Agric. provided. Money markets rates were also dipping. (Respondent 38: Platform investor)*

## ***Trust Issues***

Building trust in investing in agriculture through a digital platform was a reoccurring response among some platform users interviewed. This was especially because on one hand, it was a relatively new innovation which required the transfer of cash to a virtual entity which investors have not had previous contact with. On the other hand, Thrive Agric's web platform was launched in the wake of an online Ponzi scheme called Mavrodi Mundial Moneybox (MMM)<sup>57</sup> which resulted in huge financial losses among many Nigerians. As a result, there was a general lack of trust and confidence in online investment transaction among Nigerians. According to respondent 9 and 10:

*“There were tonnes of questions when we started, our platform was new, people were sceptical, it was the year in Nigeria where the famous MMM pyramid scheme resulted in loss of money by many Nigerians, so many people were sceptical about investing with us because they thought it was another MMM scheme.”* (Respondent 9: Thrive Agric. CEO)

*“In the first year of putting the platform in place, getting people to trust the system was a bit of a challenge because we found out that people had invested in other sectors through similar online schemes and lost their money in the past. So, introducing our platform required that we prove that it was legit, and this did not come easy”* (Respondent 10: Thrive Agric CTO)

*“The first year was tough in terms of platform engagement, we got calls from people, asking questions, some even asked for documents to prove our legitimacy, we had potential investors come to our office in Abuja to ensure that we were real. With our low staff strength at that time, it was hard to keep up, but we had to keep reassuring people that we are legit to the point that we offered farm visits to those who wanted to see the farms and farmers themselves. Also, with Nigeria's reputation for international fraud commonly called 419, creating a website for a business where money will be collected from people sounded alarm bells for fraud. So, investors from within and outside Nigeria were sceptical about our business.”* (Respondent 9: Thrive Agric. CEO)

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<sup>57</sup> Mavrodi Mundial Moneybox (MMM) Ponzi scheme marketed as a mutual help fund where investors expect up to 30% return on investment. The scheme crashed in December 2016 after running for one year thereby freezing the account of over 2.4million Nigerians who never go their money back. This result in huge financial losses and even suicides among some Nigerians

*“Initially I was a bit skeptical, I wanted to be sure it wasn't MMM. After reading about the Thrive Agric’s business on their website, saw pictures of what they do on Instagram and the fact that the farmlands were even insured, I finally decided to take the risk. (Respondent 35: Platform investor)*

*“I made some enquires about them and their model. I called them to ask for more information about their business model, their insurance and all their processes and sent a friend in Abuja to verify their office to be sure they actually exist and just to put a face to the business. I discovered that they are not a Ponzi scheme. (Respondent 32: Platform investor)*

*“The only scary part is that these platforms are new. We do not know what will happen tomorrow, that’s if this is another MMM type of investment that gives you profit initially then crumbles after a while.” (Respondent 35: Platform investor)*

*“When you try to sell the idea of crowdfunding to other people, this is one of the fears that are raised, people wonder what will happen if the website just closes down like the famous Ponzi scheme called MMM.” (Respondent 36: Platform user)*

As a result, the founders had invested more effort in understanding the entire process of the agricultural value chain to enable them to provide detailed information to investors about both the online and offline segments; including giving investors the option of visiting their farms and engaging with funded farmers. According to respondent 10:

*“We had to learn more about agriculture, which was not part of our educational background, to be able to educate people more about how this was not a ‘Ponzi scheme’. We had to explain to investors where exactly their money was going to, who is using it, how it is being used, who we will sell to and how they will get their returns”. (Respondent 10: Thrive Agric: CTO)*

Aside earning the trust of new investors, the issue of trust also extended to identifying the right farmers to fund. This was important because the failure of farmers’ to deliver the required output would negative impact the ability of *Thrive Agric.* to repay investors. This will inadvertently affect the credibility and trustworthiness of the platform. This issue of identifying suitable and trustworthy farmers was explained by respondent 9, who claimed that:



*“Employing the right manpower was also an issue, getting the right structure in place to run a profitable out-grower system was challenging. For you run a successful out-grower programme, there are two basic things you must get right: the farmers and getting the right inputs to the farmers, after that, you are now faced with recovery. Now, in getting the right farmers, these farmers have enjoyed interventions from government, which to them is like their share of the national which they have no plans to pay back. We need to ensure that we get the right set of farmers who understand that this is a business, this is not government money, that we partnering with them to do this business. Changing their mind-set about the nature of fund we provide was a challenge initially bu we have worked on that and most of our farmers are responsible.”* (Respondent 9: Thrive Agric. CEO)

This statement was also supported by respondent 10, who explained that:

*“One of our main challenges was identifying the right farmers to fund. For instance, we want to work with maize farmers; where do we find them, what are the regions where maize grows optimally. We had issues with identifying trustworthy farmers who are able to give us the best yields in terms of being motivated, being there to manage their farms and adhering to our recommended agronomic practices.”* (Respondent 10: Thrive Agric. CTO)

On the other hand, it was necessary to identify trustworthy off-takers who will honour their contract to purchase the volume of output agreed upon and pay the amount of money agreed on. This was to ensure that on the platform-side, investors receive their investment capital plus profits at the right time so that ultimately, the platforms’ credibility and investors’ trust in funding agriculture through the platform will increase. According to respondent 10:

*“We also had challenges identifying key stakeholders to partner with. We figured that for our business to grow over time, we need to build strong partnerships not just with people funding farmers but with all actors along the entire value chain including farmers, input suppliers and off-takers. Through some acceleration programmes we attended, we were able to establish linkages with some key stakeholders in several regions of Nigeria and we were able to leverage on these linkages and partnerships to establish our operations with trustworthy value chain actors in these regions”.* (Respondent 10: Thrive Agric. CTO)

Overcoming trust-related issues required a multifaceted approach depending on the nature of issue encountered. In terms of improving investor's trust in funding farms through the platform, in the first year, the business relied on valuable partnerships with renowned credible organisations to boost their credibility among investors. According to respondent 11:

*“Partnering with governments and with reputable private establishments gave us that level of credibility and we were able to surmount that challenge”.* (Respondent 11: Thrive Agric. head of operations)

Secondly, the founders had to ensure that investors' capital and ROIs were paid at the stipulated time to avoid a bad reputation that could influence trust.

*“Everyone who has funded a farm through our platform since its inception has received their full returns back. We have repeat funders who invest through our platform multiple times within a year.”* (Respondent 11: Thrive Agric. head of operations)

### ***Platform Functionalities***

The first version of the platform was developed by the Chief Technical Officer of *Thrive Agric*. Whose educational training entailed programming. The first version provided basic functions such as advertising farm units, aggregating information about farm investment, and an embedded third-party payment platform for users to pay for farms without leaving the platform. Therefore, the initial version of the web platform attempted to address agricultural finance issues relating to access to information about agricultural investment opportunities and performing investment transactions securely and conveniently. According to respondent 10:

*“The first version of the web platform was basic, we wanted to provide functionalities which we felt were primary to supporting users in their investment, then use feedback from users in the next update”.* (Respondent 10: Thrive Agric. CTO)

Describing his experience of using the platform in the first year, Respondent 32 explained that:

*“The first time I use the platform in 2017, the platform worked well for me, especially in providing detailed information about farms I could invest in. Before now, getting this type of information in one place was not possible, or at least, I did not know of*

*any other channels where I could find this type of information. The only thing that was absent which I felt would help with monitoring of investment was a dashboard tailored to each user where you can see your transaction summary, this was however provided in the updated version of the platform later on". (Respondent 32: Platform investor)*

In terms of improving accessibility to investments, Respondent 24 recounted the fact that there was no mobile application for investment in the first year.

*"The web platform was fine, but I felt that an innovation like this should be supported by a mobile application which improved accessibility to the platform business. I prefer mobile app because I feel they are more secure, and I am more comfortable storing my personal information on the mobile app than logging in through a web platform. There was no mobile application in the first year when I started to invest."* (Respondent 24: Platform investor)

### ***Harnessing Partnership Opportunities to Improve Platform Visibility***

As a start-up, *Thrive Agric.* was able to benefit from some acceleration programmes in the platforms' inception period. These are Google's launch pad for start-ups; Ventures Platform acceleration and mentorship programme; and Telefonica innovation hub (Wayra). These acceleration programmes were instrumental to linking *Thrive Agric.* to valuable partnerships with large-scale off-takers for farmers' produce; and partnerships with other platform-enabled business to improve the sustainability of their businesses, scale-out their reach and visibility within the emerging agri-digital space as well as within the agricultural finance market.

According to respondent 9:

*"Through our engagement with Ventures Platform and Google Launch Pad, we got introductions to the Central Bank of Nigeria for a partnership to input financing some smallholder farmers as a pilot. We also got partnerships with some private companies like Dangote, Sona Breweries, Elephant group, Olam and Amo to offtake large quantities of outputs from the farmers we finance. These partnerships basically increased our visibility and helped us scale-out. We were able to expand rapidly because the volume of products we were commissioned to supply which also meant that we had to increase the number of farmers we funded to meet the needs of off-takers"* (Respondent 9: *Thrive Agric.* CEO)

As a platform business, *Thrive Agric.* took advantage of opportunities to partner with other platform-enabled businesses in Nigeria such as Hello Tractor, PayStack, and PiggyVest. *Thrive Agric.* also engaged in other partnerships that enabled the platform business to extend their reach across agricultural finance markets and commodity value chains.

*“We partnered with Hello Tractor to provide tractor services to funded farmers in Dogon Daji. We partnered with PayStack to enable investors perform online payments on Thrive Agric’s website using debit cards; and we partnered with PiggyVest to attract more online investment to agriculture.”* (Respondent 11: *Thrive Agric.* Head of Pperations)

*“We had a demo day through which Ventures Platform (VP) helped with linkages with off-takers, input suppliers and some institutional investors such as banks. We would have otherwise had difficulty connecting with these people without the support of VP, this was amazing. These were the main events that really helped us in the first year. We partnered with Nestle, Unilever, Golden penny and these number keep increasing. Currently we have about 54 off-takers we are working with. When we started it was very low, we had 7 off-takers. We also have some partnerships around building technologies; we attended different event where we met with developers who we have partnered with to build technologies not just on the platform end but also on the farmer-end. We also have partnerships with financial organisations too. We started with less than 100 farmers at the beginning of the first year and by the end of the first year we were funding about 5000 farmers.”* (Respondent 10: *Thrive Agric.* CTO)

These partnerships were pivotal to the emergence of the digital platform in three ways. First was by improving the visibility of the digital platform. Most of these partnerships were reported in newspapers<sup>58</sup>, blogs<sup>59</sup>, press releases, and radio programmes that gave *Thrive Agric.* free press coverage and independent verification of their existence and legitimacy. This also helped raise awareness of the platform beyond the normal social media platforms that the business subscribed to for publicity. Second was by supporting linkages between the digital and non-digital segments of the business thereby ensuring the complete cycle of agricultural finance can be completed starting from lending to the final repayment of funds to

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<sup>58</sup> <https://businessday.ng/agriculture/article/covid-19-ocp-africas-agribooster-set-to-support-75000-farmers-in-planting-season/>

<sup>59</sup> <https://medium.com/thrive-agric/our-big-question-every-time-is-one-of-how-do-we-innovate-around-more-farmer-challenges-to-improve-1dbef664bec8>

investors. As previously discussed in the pre-platform phase of this section and illustrated in Figure 8. Third was by building investors trust in the platform business especially because these partners were already established names within the agricultural, finance and several business sectors thereby improving the credibility of *Thrive Agric*'s. business.

### ***Modification of Platform Functions (2018)***

Feedback from the initial trialling of the digital platform revealed that an updated version of the platform that provided additional functionalities for monitoring farm investment was needed. As a result, in 2018, a bespoke user dashboard was included in the platform design to enable users monitor their investments. The dashboard, which has been previously illustrated in Figure 10 of section 5.1.1, provides users with a summary of past and current investments performed, date of investment, expected date of returns, and number of units invested in. The dashboard is still supported with email notifications of key milestones reached on farms invested. According to respondent 25 and 30:

*“The dashboard provides a structure for investment traceability which I felt was more binding than a transaction receipt, at least I can take this to the bank or to court as proof that I invested and if I do not get paid by the stated due date, it can also serve as evidence in court.”* (Respondent 25: Platform investor)

*“The dashboard was a welcome innovation which helped me feel like I had more control over my investment, I did not have to call the Thrive Agric office to find out about upcoming payments anymore, all I had to do was log into my account and the information I needed was there.”* (Respondent 30: Platform investor)

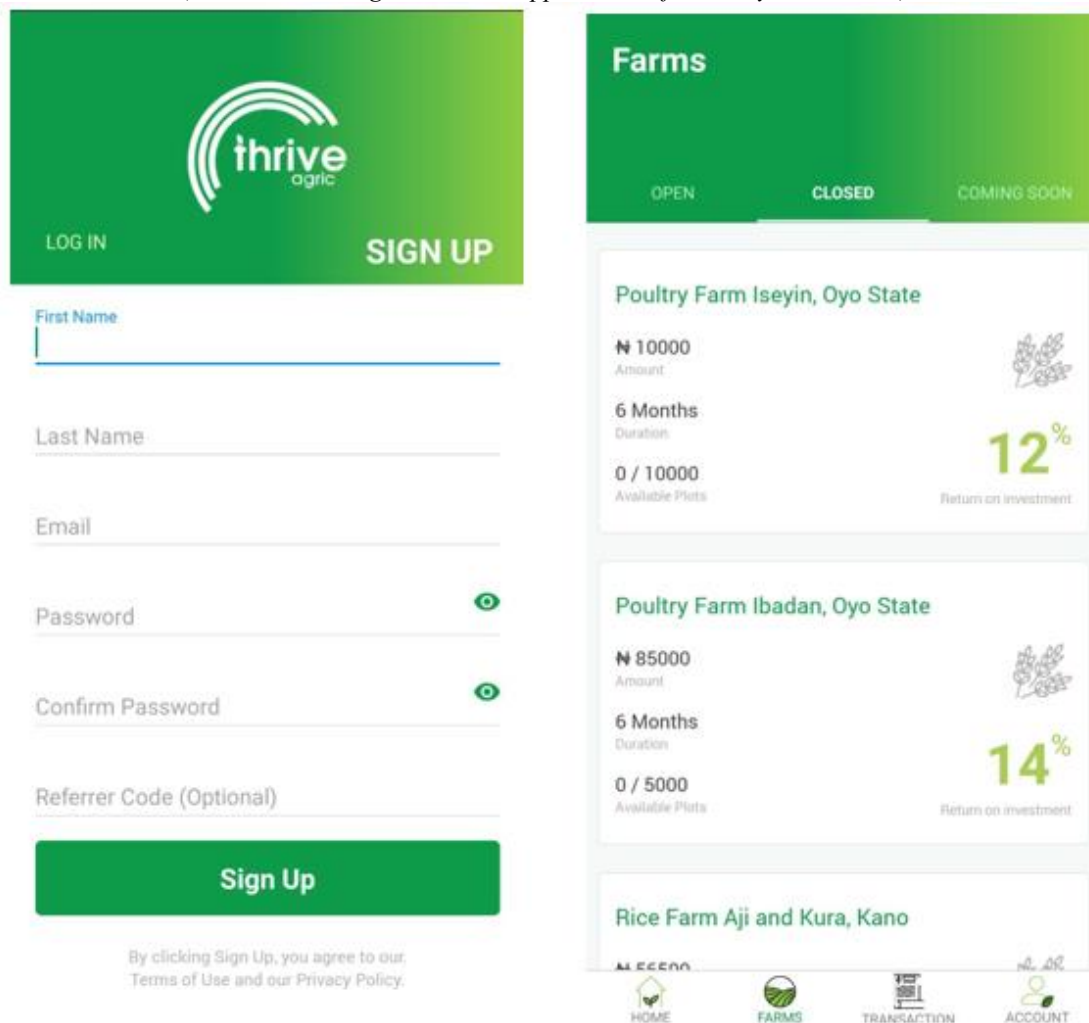
Further discussions concerning monitoring investments through the platform revealed that the founders regarded this functionality as ‘novel’ and believe that poor monitoring is one of the key constraints to investing in agriculture in Nigeria. Respondent 10 explained that:

*“This is especially beneficial to most of our investors who have 9-5 jobs and are more accustomed to conducting most of their banking and shopping transactions online. The dashboard shows a timeline from the day of investment to the day of final payment, number of farm units invested in and expected outcome.”* (Respondent 10: Thrive Agric. CTO)

### ***Launch of Mobile Application (2019)***

In 2019, a mobile application was launched to support agricultural investments (see figure 17). Although the web and mobile applications provide the same functionalities, the web app differs from the mobile app in the sense that with the web application, users can access information on farm investment and *Thrive Agric.* without creating an account, while the mobile application requires that users create an account by submitting personal details before being granted access to investment information.

**Fig 17: Thrive Agric’s Mobile App: Sign-up Page and Enterprise Information Page**  
 (source: Thrive Agric’s mobile application<sup>60</sup> from Play Store, 2019)



***Growth in Number of Platform Users and Farmers Funded (2017-2019)***

Crowdsourcing through a digital platform provided the business with a special niche within the agricultural sector. The benefits of adopting a platform solution to facilitate the aggregation of agricultural finance are three-folds; increase in the number of individuals and institutions investing in agriculture; increase in the number of partners working to improve agricultural financing; and increase in the number of farmers funded through finance sourced from the platform.

The first year of deploying the platform was riddled with ‘teething problems’, but the platform still recorded about 500 new users. Although this number is generally low when compared with the number of small farmers who require funding, it shows that there was still

<sup>60</sup> <https://play.google.com/store/apps/details?id=com.thriveAgric123>

some level of acceptance within the agricultural finance market. According to Respondent 27:

*“A platform which facilitates agricultural investment is long overdue in a country where agriculture is one of the fastest growing sectors. So many young Nigerians are currently interested in agriculture but want various options to participate, especially for those of us without land. Using a digital platform for agricultural investment appeals to our demographic. That is why as soon as I found out about Thrive Agric through a friend, I decided to invest. The platform made investing so easy and I have been investing since 2017 till now.”* (Respondent 27: Platform investor)

First was the exponential increase in the number of investors financing rural agriculture through *Thrive Agric*’s platform compared with using WhatsApp and other social medial platforms. Within the first year of developing the platform, the number of investors grew from four people (pre-platform crowdsourcing) to over 500 investors (platform crowdsourcing) in 2017, and then to 2,000 investors in 2018 and about 10, 000 investors in 2019. This also translated to an increase in the number of farmers funded from 5 (pre-platform crowdsourcing) to 100 farmers in 2017; and then 11,000 farmers in 2018 and over 35,000 farmers in 2019 (see Table 18 and Figure 18). Respondent 9 believes that this increase was because of adopting a bespoke digital platform to facilitate agricultural finance.

*“The rapid growth in the number of investors and funded farmers from 2017 to 2019 shows that adopting a platform solution served as an accelerator in our agricultural financing business.”* (Respondent 9: *Thrive Agric*. CEO)

**Table 18: Growth in Number of Investors and Farmers Pre- and Post-Platform**

*Source: Author’s field research (2018-2019)*

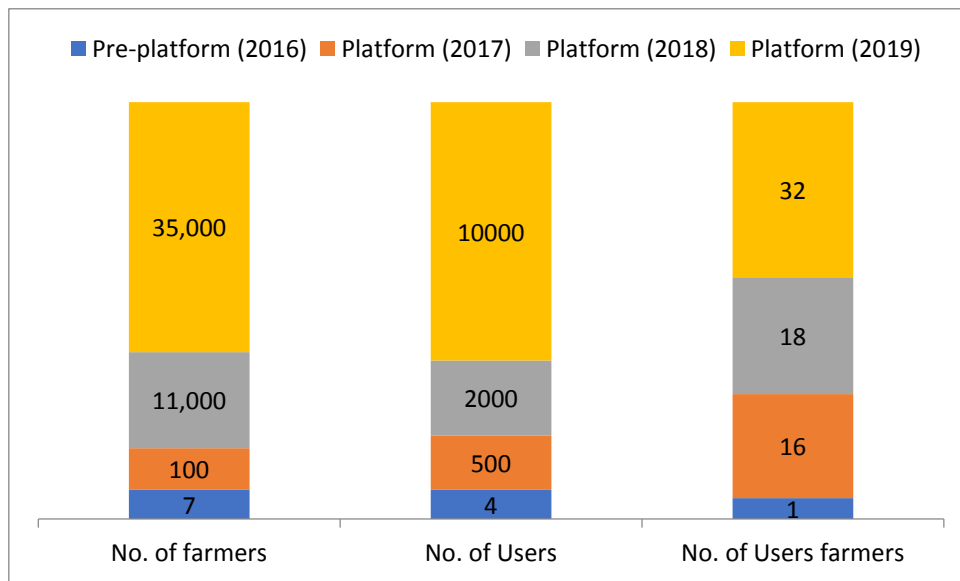
<b>Period</b>	<b>Number of Investors</b>	<b>Number of farmers funded</b>
Pre-platform (2016)	4	5
Platform (2017)	500	100
Platform (2018)	2000	11,000
Platform (2018-2019)	10,000	35,000

The difference in the numbers of investor pre and post deployment of the platform is evidence that the use of a digital platform has the potential to attract more finance to agriculture than without a digital platform.



**Fig 18: Growth Trends from Pre-platform to Platform Phase**

(Source: Author's field research, 2018/2019)



Interviews with respondents revealed that the increase in the number of investors in agriculture due to the deployment of a digital channel for investment was mainly due to three reasons. First, digital platforms enable anytime and anywhere access to information on investment opportunities. According to respondent 36:

*“With my mobile phone, I can get real time information about new farm investments on the go, in fact, as soon as I get a notification of an opened farm, I can decide there and then if I want to invest or not and take action without having to disrupt my plans for that day. I have even invested while sitting in a cab from my office to my house before.”* (Respondent 36: Platform investor)

Second, it reduces the transaction cost and the stress of performing agricultural investments thereby making it more profitable for investors. According to respondent 16:

*“Honestly, if I had to go by myself to a remote village to identify these farmers and fund them directly, I would definitely not give a second thought to investing in agriculture. Just think about the transportation cost, and the time it will take to travel to see farmers and get back, coupled with the insecurity on Nigerian roads these days due to the rampant kidnapping. I would definitely not invest in agriculture without a digital platform”.* (Respondent 16: Platform investor)

Third, it provides a channel through which larger numbers of investors can be coordinated. Comparing the number of investors pre-platform and post platform (2017-2019) and consequently, the number of farmers funded in these two periods, there is an evident exponential increase in the number of investors and farm investments managed through the platform. According to the respondent 9:

*“When we were using WhatsApp and other micro platforms, coordinating investments was quite disorganised and this affected the number of investors we could manage at any given time. Some people did not mind joining the WhatsApp group, while others did not want their phone number and other data shared with people they did not know. This was totally understandable but resulted in us adopting different means to meet the needs of different investors.”* (Respondent 9: Thrive Agric. CEO)

The growth in the number of platform users was also driven by the increased visibility Thrive Agric. gained through recognitions from reputable individuals and independent third-party agents. In the first year of the platform, Thrive Agric. got some notable recognition by the Vice President of Nigeria for their effort in financing rural farmers<sup>61</sup>. According to respondent 9:

*“We had the honour of being recognised by the vice president of Nigeria for our work in financing rural farmers and connecting farmers to profitable large-scale buyers of agricultural commodities.”* (Respondent 9: Thrive Agric. CEO)

Other channels through which their platform was recognised was through opinion pieces<sup>62</sup>; local news channels<sup>63</sup>; blogs<sup>64</sup> providing independent ranking of agricultural investment platforms in Nigeria, and Radio shows. According to respondent 25:

*“I first heard about Thrive Agric. on a radio show called Business Express on smooth fm Lagos. Before the show I never knew I could invest in agriculture through a digital platform. On the show, the presenter talked about the work Thrive Agric. was doing with small farmers in Nigeria. This made me feel like they were a legit business for them to be recognised on Radio like that, it convinced me to invest.”* (Respondent 25: Platform investor)

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<sup>61</sup> <https://businessday.ng/agriculture/article/where-banks-dread-to-tread/>

<sup>62</sup> <https://guardian.ng/opinion/driving-sustainable-growth-in-nigerias-agricultural-sector-2/>

<sup>63</sup> <https://punchng.com/edo-govt-firms-train-1000-beekeepers/>

<sup>64</sup> <https://technext.ng/2020/03/04/from-farmcrowdy-to-thrive-agric-here-are-6-agric-investment-platforms-with-healthy-risk-and-roi-levels/>

Furthermore, there was increased confidence in investing in agriculture through the platform that contributed to the growth in numbers of platform users. According to some platform investors, the common reason for apprehension towards investing in agriculture was due to:

*“The fear of losing investment capital to untrustworthy farmers.”* (Respondent 37: Platform investor)

*“Lack of information and poor communication between investors and farmers.”* (Respondent 26: Platform investor)

*“Poor visibility of investment due to the remoteness of most rural farms.”* (Respondent 31: Platform investor)

*“High cost of accessing information and updates on progress which usually involves physically travel to rural farms.”* (Respondent 22: Platform investor)

*“Absence of structures to monitor investment remotely especially because most investors engage in white-collar jobs in the city and lack the time to travel to rural areas to monitor their investments.”* (Respondent 28: Platform investor)

These constraints have also been confirmed in interviews with platform owners who had previous experience in investing in agriculture using non-digital<sup>65</sup> channels. According to respondent 10:

*“We know how important it is for investors to have confidence that they won’t lose their capital that is why we continually provide investors with information on the farms they invest in such as: when seeds have been planted; when the farm has been sprayed, when fertilizer application takes place and other events relating to the production process. We also created an investors dashboard for monitoring investment.”* (Respondent 10: Thrive Agric. CTO)

## **5.2 Code 8: Institutional Setting and Stakeholder Mapping**

To iterate, in line with the research’s conceptual approach and context (agricultural finance markets), the conceptualisation of institutions goes beyond understanding institutions as ‘organisations’ but also conceptualising institutions as ‘market facilitating functions’ which when absent, creates “institutional voids” (Khanna and Palepu, 1997). Chapter 2 described

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<sup>65</sup> In this research, non-digital channels have been identified as all other forms of investing in agriculture without the use of digital platforms.

the formal and informal organisations that perform intermediating functions of aggregating and distributing agricultural finance thereby matching demand and supply of agricultural finance; facilitating financial transactions between the demand and supply segments of agricultural finance markets; and information provision on available finance, type of finance and eligibility criteria for accessing agricultural finance. Chapter 4 goes further to provide empirical data that illustrates those areas where these institutional functions in financing agriculture are failing thereby resulting in voids.

This section aims to map out the institutional landscape of agricultural finance market with respect to agricultural finance digital platforms. The aim of this section is to identify institutions around digital platforms and their stake within the emerging agri-digital finance space. Mapping the institutional landscape and identifying stakeholders who influence platform emergence was carried out during interviews with platform owners and agricultural sector stakeholders. This is described in detail in section 5.2.2 and illustrated in Figure 19.

### **5.2.1 Institutional Setting**

The institutional setting within which *Thrive Agric's* platform operates consists of a wide range of institutions that directly and indirectly influence the platform's business operations and overall emergence within the agricultural finance space. Data reveals that within this space exists formal and informal institutions which are the incumbent finance providers for agriculture; new entrant individual investors whose presence is creating a new form of formalised financial institution through crowdsourcing, and which has been enabled by deploying digital platforms for agricultural finance sourcing. The institutions and stakeholders around *Thrive Agric's* platform are presented in table 19 below.

**Table 19: Institutions and Stakeholders around Thrive Agric's Platform**

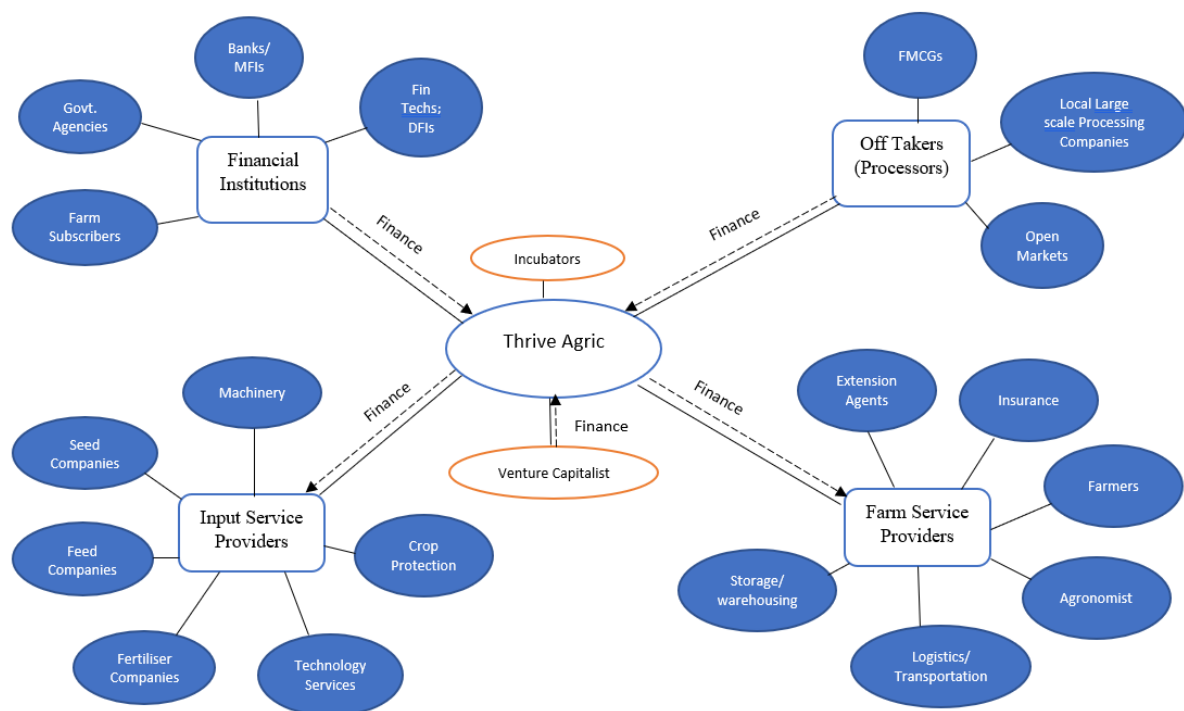
*Source: Author's field research (2018/2019)*

Category	Institutions/ Stakeholders	Role	Stake/Interest
Financial Institutions (incumbent)	Government Agencies: NIRSAL; CBN; BoA; BoI	Provide development finance (cash and inputs).	Profit through interest rates; Development of the agricultural sectors; Increase in rural livelihood and poverty alleviation.
	Institutional Investors: Commercial Banks, Micro-lending platforms and fin-techs	Provide lump sum investment facilities.	Returns on investment; and Data on farmers.
	NGO's and Development Finance Institutions	Provide finance; Partnerships.	Returns on Investment; Partnerships and collaborations; Meet development programme milestones; data for annual reports; farmers' data.
	Insurance companies	Provide insurance cover for investors' capitals and agricultural enterprises.	Insurance premiums- large numbers of aggregated farmers to insure; Farmers' data.
	Informal Finance Institution (village moneylenders)	Provide agricultural finance to farmers who are unable to access finance from formal sources.	High profits from high interest rates within shorter durations.
Financial Institution (new entrants)	Venture Capitalist and Angel investors	Provide funding to set-up and maintain agricultural finance platforms.	Part-ownership of the agro-finance business; Profit.
	Individual investors (Farm Subscribers)	Represent a new type of financial institution within the space that provides crowdsourced funds.	Profits in the form of returns on investment.
	FinTechs	Platform enabled financial institutions providing micro and macro finance to individuals and business also providing online savings services. For instance, RentNow, PiggyVest, PayLater.	Profits in the form of returns on investment.
<b>Online Support Functions</b>			
Incubators	Development Agencies; Private sector business (Google and Y-combinator); Mentors; Trainers	Provide training, mentorship, and seed funding to support the setting up and growth of start-ups.	Part-ownership; recognition; agricultural finance development.
Third party digital platforms	PayStack and RAVE	Providing online support and partnerships such as facilitating online payments (PayStack and RAVE) and partnerships for micro-lending.	Profit; Data.
Internet service providers	MTN; Globacomm, SMILE network.	Provide internet services for agro-finance platforms.	Profit from internet subscription.
<b>Offline Support Functions</b>			
Off-takers	AMO, Dangote, Golden Penny, Nestle.	Large-scale processing companies providing ready markets for farm produce.	Profits; Sustainable source of inputs for processing.
Input suppliers	Seed companies; Feed companies; Fertiliser companies; Crop protection product companies (Agro-chemicals); technology service providers (Drones).	Provide large volumes of high-quality inputs.	Profit; Ready market for their products.
Farmers	Out-grower farmers and Direct labour farmers.	Agricultural production, producing raw materials for processing companies.	Agricultural finance; Access to markets; Increased profit; Increased productivity; improved economic status; employment.
Farmer Service Providers	Extension Agents; Field officers; warehouse service providers, transporters.	Provide supporting services from pre-production to post-production stages.	Profit; Employment.
Government regulatory bodies	Security and Exchange Commission.	Provide guidelines and regulations to govern the operations of agricultural finance platforms.	Regulation and Control.

## 5.2.2 Institutional and Stakeholder Mapping

The previous section identifies and describes institutions that influence platform operation and emergence. The aim of this section is to map out the position of *Thrive Agric*'s digital platforms in relation to these institutions to understand their interconnected and influence on the platform. Institutional mapping exercise was carried out in *Thrive Agric*'s headquarters in Abuja (see figure 19). Participants include the CEO (respondent 9); CTO (Respondent 10); Operations Manager (Respondent 11), Field Operations Staff (Respondent 12), and the Researcher. The mapping exercise shows that agricultural finance markets are not only made up of financial institutions but also other supporting institutions and stakeholders. It also shows how the digital platform is situated within a rather complex and interconnected finance market and illustrates how platforms serve as intermediaries that facilitate the flow of finance between the demand and supply sides of agricultural finance markets.

**Fig 19: Map of Institutions around *Thrive Agric*'s. Agri-finance Digital Platform**  
(Source: Author's field research, 2018/2019)



The mapping exercise revealed that financing rural agriculture through *Thrive Agric*'s platform goes beyond the provision of finance but extends to ensuring effective linkages with other aspects of the agricultural value chain. As a result, institutional voids in other non-financial segments of the value chain could have a direct impact on bridging institutional voids in agricultural finance markets. The institutional map also shows the flow of finance to

and from *Thrive Agric.* and illustrates the broader networks in agricultural financing through the digital platform which transcends the linear provision of finance to farmers and repayment of finance depicted in non-digital finance models.

The overarching role of financial institutions is to fund farmers (cash or input) and seed-fund digital platforms with the aim of earning returns in the form of interests, or with the aim of fulfilling development goals by increasing the income and livelihood of rural farmers. These financial institutions include government agencies that provide development finance for agricultural activities at low interest rates; International or non-governmental organisations that also provide development finance in the form of input and cash finance packages; commercial banks (institutional investors) that use the platform as secure channel to invest in small farmers; and fintech's and venture capitalist that provide micro and macro finance to individuals and business. Currently, a new financial institution known as 'the crowd' have been included into the category of financial institutions. The Crowd is made up of individual investors who use the platform to fund rural farmers.

However, the mapping revealed that aside these financial institutions; there are two groups' institutions that support agricultural financing through digital platforms. The first group supports the online segment of the platform and includes training and business development institutions such as incubators and mentorship programmes; third party-platforms that facilitate investment transaction on agricultural finance platforms and internet service providers. The second group supports the offline segment of the platform and includes the off-takers; input suppliers, farm service providers and the farmers. Finally, government regulatory bodies such as the Securities and Exchange Commission provide guidelines which govern the performance of crowdsourcing and other digital investment transaction. The functions of these institutions and roles of institutional stakeholders have been previously described in chapter 2.

*Thrive Agric.* places their platform business at the centre of the map due to their role in coordinating finance flows between participating institutions. As finance intermediaries, finance flow from financial institutions to *Thrive Agric.* in the form of cash. This cash is then transferred to input service providers and farm service providers to be converted into inputs and services. These inputs and services form the finance package that *Thrive Agric.* extends to farmers to support their production activities. At the end of the production cycle, farmers deliver outputs to *Thrive Agric.* as payment for input and service finance provided. *Thrive*

*Agric.* who also serves as intermediaries between farmers and markets (off-takers) to sell farmers outputs which facilitates the repayment of investors' capital and ROI.

Describing the institutional map and *Thrive Agric*'s role in agricultural finance markets, Respondent 10 further explained that:

*“Thrive Agric. is the meeting point of all these institutions. Thrive Agric. starts by building a relationship with off takers who represent the end market for agricultural produce. Thrive Agric. also serves as the linkage between off takes and farmers by managing the demand and supply interactions between the two groups. To fulfil off takers demands, Thrive Agric. partners with financial institutions and individual investors to acquire the required finance to invest in quality inputs and trustworthy farm service providers. In return Thrive Agric. provides financial institutions and investors with returns on investment and farmers' data; provides farmers with profits; provide off takers with high quality outputs and provides input suppliers with a market for their inputs and farm data. Overall, Thrive Agric. provides a platform to facilitate interactions between all institutions within the market resulting in increased efficiency in agricultural value chains and reducing the cost of business transactions.”* (Respondent 10: Thrive Agric CTO)

Explaining *Thrive Agric*'s positioning at the centre of institutional map respondent 9 explained that:

*“I think what we have done is to make stakeholders understand that the agricultural finance market extends beyond just financial institutions. From the map you can see that financial institutions are only one part of the broader institutional framework. I think the narrow-mindedness in which agricultural finance markets has been viewed is one of the causes of its slow development. When you understand that there are other key institutions like off-takers, input suppliers and farm services that need to be taken into consideration, it makes planning agricultural finance interventions more holistic than just focusing on only the provision of finance”.* (Respondent 9: Thrive Agric. CEO)

### **5.3 Code 9: Thrive Agric's Role in Addressing Problems with Agricultural Financing**

*“We found that there were several reasons why farmers were not getting finance for their production activities. Firstly, banks were tired of farmers defaulting, secondly,*



*farmers did not have all the information they needed to access bank loans which added to making loan application processes cumbersome and these banks also did not have enough information on farmers to help them process farmers' loans. This is what has caused the high transaction cost banks complain about, it basically a problem of lack of information to establish farmers' identities.” (Respondent 10: Thrive Agric. CTO)*

This section presents data that illustrates *Thrive Agric*'s perception of how the platform has emerged in response to issues with agricultural financing (described in chapter 2 and 4). To iterate, in chapter 2, these problems were coded into the following categories: Information asymmetries, high transaction costs, lack of trust and poor creditworthiness of farmers, weak regulations, and poor execution of agricultural finance policies, poor contract enforcement, and weak monitoring of disbursed finance. Data collected however revealed that *Thrive Agric* attempts to address four out of the six problems with financing agriculture. These problems are information asymmetries, high transaction costs, lack of trust and poor creditworthiness of farmers, and poor monitoring of disbursed agricultural finance. Data is presented in the subsequent sections.

### **5.3.1 Addressing Problems with Information Asymmetries**

As described in section 5.1, *Thrive Agric*'s information day serves as an opportunity for farmers to get first-hand information about *Thrive Agric*'s agricultural finance package. This enables all interested farmers to gain equal access to information directly from the finance source, thereby reducing information asymmetries described by respondents in section 4.1. Furthermore, *Thrive Agric*'s decision to organise the information day within farmers' local communities is to reduce the transaction cost in travelling to accessing information about their agricultural finance model, as described by respondent in section 4.2 who claim that farmers need to make several journeys from their villages to banks in urban and peri-urban areas to access information and follow-up with loan applications. Interviews with respondents 59, 64, 69 captures their perception of the reduction in information cost associated with accessing finance through *Thrive Agric*.

*“What I like about this loan we get from Thrive Agric. is that their office is a walking distance from my house. I do not even have to spend money to take bike or keke to get there and I can go there as many times as I want to get information about the next*

*loan season. It is better than travelling all the way to the bank in town.” (Respondent 64: Maize farmer)*

*“The good thing about this Thrive Agric’s loan is that when they organise the meeting to inform you about the loan, all of us go there and we can hear for ourselves. You do not have to wait for anyone to come and tell you what they said. They even get people who speak our local language, so we understand everything they are saying. When it is time to fill the form, there are people there to help us without us paying any money for their help. They even use fellow farmers like us to organise the application, so it is very easy and straightforward for us.” (Respondent 69: Maize farmer)*

*“There have been other organisations come to our cooperative to tell us about a loan that they are giving farmers, but after that day, it is not easy to contact them because they are either in the city or in another state. With Thrive Agric’s own, they have an office within our local community, so you do not have to spend time and money travelling too far, you just go to their office and talk to them, it really makes things a lot easier for us. Another thing is that because they come and stay in the local community we get to know them very well. So, it’s not that they know us only, but we also know them very well and know that they are not going to cheat us.” (Respondent 59: Poultry farmer)*

Data gathered from platform users covered their experience of using the platform in terms of information provision and the decision to invest in agriculture through the platform. Some platform users without prior experience in investing in agriculture claimed that:

*For the sake of investing, the information provided on the website was sufficient for me to decide whether to invest or not. On their website, there is a photo of the farm, the cost of purchasing one unit, the ROI and the expected date of receiving my returns. They even tell you where the farm is located and how many units of the farm are available. There is information about the insurance company they use which is Leadway Assurance. The information on the platform was my main driver for investing in agriculture. (Respondent 23: Platform investor)*

*The information they gave on the platforms was too useful, it was everything, honestly, I was just interested in the interest rate, but the other information provided was useful. On thrive Agric’s platform you see a banner that gives the cost of investment of each farm, interest rate, time and the amount of money so I can use this*

*information to check how much I have to spare and then decide if I want to invest or not. (Respondent 26: Platform investor)*

*The information on Thrive Agric's website combined with what I learned about the founders from LinkedIn was instrumental to my investing in agriculture. I definitely would not have invested if I did not have access to this information (Respondent 28: platform investor)*

*I have most of my investment in oil and gas, this is my first time investing in agriculture and I must say that my confidence was boosted by the nature of information provided on Thrive Agric's platform. I also did call to put a voice to the business but yes, the information was very instrumental to my decision to diversify into agriculture (Respondent 33: Platform investor)*

*I never thought I would ever invest in agriculture. To be honest, until now, I've always viewed it as one of those venture that fail which is why farmers are poor. However, Thrive Agric. changed this mindset. I didn't know them prior to my investment; I saw an ad on Twitter and visited the website. The information they provided on the farm units was very detailed and gave me a sense of confidence to invest. I just did a few units at first as a trial and expanded my investment when I received my first payment. (Respondent 37: Platform investor)*

*I have always had an interest in agriculture. I felt that one day I would like to own my own farm, but I did not know how or where to start from. I heard about Thrive Agric. on Radio and my interest was locked in. I visited their website and to my surprise all the question I had in mind were answered, I decided there and then to invest, and I have been investing in agriculture through the platform since then. (Respondent 35: Platform investor)*

*The information from digital platforms is more structured, although it's generic, it is still sufficient for me to make my investment decisions. With the platform, they tell you the anticipated ROI, even though the non-digital platforms give information on ROI, you depend more on trust for non-digital than digital, because the digital platform has more reach in terms of number of platform users, in the case of a default, there is a greater chance of investors joining forces to demand their pay, unlike the non-digital where it might be just one investor investing in one farm. For the non-digital,*

*you have to go all the way to the farm, physically to meet the farmer.* (Respondent 36: Platform investor)

However, some respondents believed that information provision through the platform was incomplete due to the absence of information on the rural farmers (themselves) who sought finance from investors rather than farm enterprises aggregated by *Thrive Agric.* as ‘farm units’.

*“The only issue I have with the information provided on Thrive Agric’s platform is that it is tailored to their own farms. What I mean is if I want to invest in yam farmers for instance and they have not identified yam farmers they want to fund, you won’t see any yam farms on the platform. But this does not mean that there aren’t yam farmers in Nigeria to fund, but just that Thrive Agric. isn’t funding them at that time.”* (Respondent 31: Platform investor)

*“What I was expecting is a platform where I can choose the farmers I want to fund, but that is not the case with Thrive Agric., they have a group of farmers they are crowdfunding for, but this excludes other farmers who need finance but are not represented on their platform. So, we are almost forced to fund who they want us to fund.”* (Respondent 42: Platform investor)

*“I have a background in agriculture and have worked with farmers as part of my job in the past, what I know is that I have faith in Thrive Agric. because I believe they fund farmers. But the way the information is provided on the platform can mean that these funds can go anywhere. The farm units are generic, not belonging to any farmer. I know at the backend they are farmers who they are gathering money for, but on the platform, it does not seem that way. If there were pictures and information of actual farmers that would have been better. That being said, for the platform to actually contribute to developing farmers, then it should be open directly to farmers in need of finance and not to the group of farmers Thrive has identified to fund. An individual farmer in need of finance should be able to go to their office, create a profile on their website, agree on the profit sharing and get financed directly. That will be actual crowdfunding.”* (Respondent 39: Platform investor)

Another common finding from interviews with platform users is that the choice to invest in agriculture through the platform was because investing in rural agriculture through non-

digital channels is still unstructured - without any clearly defined procedure or set out rules of engagement between farmers and investors. This makes it difficult for new entrant investors to participate in agricultural financing and further accentuates the problem of information asymmetries. However, some respondents are of the opinion that the provision and packaging of information on *Thrive Agric's* platform has provided a structured approach to agricultural investment which was previously absent. As explained by respondents 25, 31, 38 and 40:

*There is no blueprint or laid down procedure for individuals who want to participate in agricultural finance markets, it is all man for himself. That is why it is quite easy to get duped*". (Respondent 25: Platform investor)

*"Before Thrive Agric., when I think about investing in agriculture, I wonder where to start from. How do I identify farmers to invest in? What should be the nature of the partnership? How much should I invest? How do I monitor their activities given the distance between me and farmers? Can I trust these farmers? Honestly, it was very daunting trying to answer these questions, and there was no way for me to answer these questions without incurring a lot of cost. However, with Thrive Agric., all these barriers do not exist because the platform has resolved most of these problems that investors like me face when trying to invest in agriculture."* (Respondent 31: Platform investor)

*"Lending to agriculture through digital platforms is currently one of the easiest investment options in Nigeria in terms of the information provided on the steps involved in completing your transaction. I literally do not have to leave my house to invest in agriculture because everything can be done online, from the payments to final collection of profits."* (Respondent 29: Platform investor)

*"What these platforms are doing in terms of supporting those who want to invest in agriculture is quite impressive. It is making agriculture "look cool" to the younger generation, at the same time attracting more funds to the sector. 10 years ago, it would have been difficult to fund agriculture due to the lack of information and clarity on how to go about the process. But these platforms have made agriculture look like any other investable economic sector."* (Respondent 40: Platform investor)

*"Thrive Agric. and other digital platforms working in this space have packaged agriculture in such a way that it is easily sellable. Even a novice who has no prior knowledge of agriculture can easily subscribe to an agricultural investment and can*

*understand what it entails to make these investments due to the nature of information provided on the platform.” (Respondent 38: Platform investor)*

Therefore, there is the perception that information provided on the platform has facilitated the organisation of agricultural enterprises into investment packages thereby bringing some structure into agricultural financing and opening the sector to more investors.

### **5.3.2 Addressing Problems with High Transaction Costs**

Another factor limiting farmers’ access to available finance from individual investors is the high transaction cost of investing in rural agricultural as described in chapter 2 and 4. Drawing from the platform description in section 5.1, it is evident that the major functionality of *Thrive Agric’s* digital platform is the facilitation of investment transactions between investors and rural farmers. Platform users describe their transaction experience in investing in agriculture through *Thrive Agric’s* digital platform.

*The platform makes investment very easy and cheap. I simply select the farm and the units I want then pay with my card and that's it. I then add my bank account details in my profile and I get my returns at the said time. It's easy. Performing the transaction for my other agricultural investment is quite cumbersome and expensive. There's more paperwork plus trips to the bank, I also need a witness to co-sign and all of that. This is not the case with digital platforms, investments are made in a matter of clicks, so easy. (Respondent 21: Platform investor)*

*The provision made on the platform for investment purposes was sufficient for me to make my transactions. Without this platform, investing in agriculture would have been more challenging because I would have had to personally go out and find partners; farmers and investors, as well as the market for the final produce, decide on what agricultural enterprise to invest in and all that. I would have had to conduct a feasibility study, gather investment funds and also look for how to payout my partners. However, with the platform, payment for farms was via bank transfer but this was not due to the failure of the platform but due to restriction on the volume of transaction from my account. Receiving my ROI was also via bank transfer. Not having to come in contact with the farmers myself was an advantage, especially for someone like me who works in the formal sector, without the time to personally carry out these investment transactions myself. (Respondent 37: Platform investor)*

*I found the process very easy and straight forward even easier than when I invest in treasury bills. Anyone who knows how to use a smart phone or computer can figure it out. The steps are clear and easy to follow. Thrive Agric. puts up the farms which are broken down into units, you can choose the number of units you want to buy and pay using your card or by bank transfer. It is very easy and clear. The only cost you have to bear is the cost of internet subscription which I always have to pay for anyway.* (Respondent 23: Platform investor)

*Investing in agriculture using Thrive Agric's platform has been seamless so far. From the process of registering on the platform, to the different payment options when you want to invest, to the process of getting back your capital plus returns. I haven't had issues so far. This opinion was formed from my interaction with them in less than a year. Hence why I keep saying 'so far'. I don't want to get ahead of myself. Using a digital platform makes things easy especially for agriculture, digital platforms have made agricultural investment look like you are investing in other formalised sectors like banking, oil and gas and other industries.* (Respondent 25: Platform investor)

*Without a platform like Thrive Agric., I would not invest in agriculture at all, I'd rather save my money in a bank because I can't manage the stress of getting land, getting labour, input and so on to run my own farm. I'm also trying to run my own personal business (not in agriculture), so investing in agriculture to me is something passive, which I also consider beneficial.* (Respondent 26: Platform investor)

*Thrive offers way better returns than regular banks savings which is capped at around 10% per annum. You can get a turnover 4 times or more in a year with Thrive. That is also very important. I mean, I can invest from anywhere if I have an internet connection. In carrying out the transaction itself, it is very easy, especially when compared with my other investments without a digital platform, where I would have to do a bank transfer, I have had instances where I had to use the ATM to withdraw raw cash and give my friend for our agricultural investment. Using a platform is so much neater and stress-free, everything happens on the platform, and you can complete the transaction at a go without having to leave your home.* (Respondent 27: Platform investor)

*I can't even imagine what it would have been like if I had to go out there to find a farmer to invest in. For someone like me, I don't like stress, I would not invest in*

*agriculture if there was no platform like this to simplify things. Using the platform made transaction very easy. I am not interested in agriculture per se, but if I had to do the transaction myself, physically, I would never invest in agriculture. The digital platform made it so easy, I just used my card to pay after selecting the number of farms I wanted to purchase, and that was it.” (Respondent 33: Platform investor)*

*With my investment in fish farming where there is no platform that aggregates all the details of my transaction, the way I make payments is by bank transfer to the person. With the digital platform, I do my payment through PayStack or whatever integrated financial services they have. So, I don't have to have the account number to transfer money, all the payment is done within the platform with my debit card. There was a time I wanted to make an investment and I didn't have my card with me, but because I had my card details stored on the site, investing was just a click away because I didn't have to do a bank transfer as I would normally do for the non-digital investment. So the convenience of being able to take advantage of new investment opportunities quickly and remotely is an advantage for using the digital platform. (Respondent 36: Platform investor)*

The literature review in section 2.4.2 and data presented in section 4.2 revealed that late disbursement of agricultural finance was as a result of the high transaction cost incurred by financial institutions in processing agricultural loans and verifying information provided on loan applications. In scoping phase of *Thrive Agric's* evolution (section 5.1) it was identified that farmers also have a higher tendency to default on loans when these loans are not utilised efficiently. It was revealed that poor utilisation of loans stems from late disbursement of funds, purchasing poor quality inputs which yield low outputs, mismatch between anticipated and actual cost of inputs and outputs, and low profits from final sales of outputs. Therefore, to improve farmers' ability to utilise loans efficiently and repay, *Thrive Agric.* adopted an input finance model whereby finance is disbursed in the form of inputs rather than cash.

*“Like I told you about when we aggregated soybeans from many farmers in Markudi for a large processor in Lagos, we ran into huge losses due to the variations in varieties and quantity of stones farmers added to their soybean bags. That was when we decided that it is better to give farmers finance in the form of inputs so that the output will be uniform, and closely monitor their use of these inputs. If you give cash*



*finance, they will all buy different varieties and when we aggregate to sell, we will have standardisation issues.” (Respondent 9: Thrive Agric. CEO)*

*Thrive Agric.* also aims to disburse inputs early and deliver these inputs directly to farmers in their communities. Data indicates that this reduced the transportation costs incurred by farmers in accessing finance and ensures that farmers do not miss the production season.

*“We work with the seasonal clock and the specifications of our off-takers. That’s why we cannot afford to give farmers inputs late. Any delay will have a huge impact on agreed outputs and delivery dates which will negatively affect our contractual agreements with off-takers.” (Respondent 11: Thrive Agric’s Head of Operations)*

*“You cannot even compare the time it takes to get loan from banks with the time it takes to get inputs from Thrive Agric. Thrive Agric. follows a seasonal arrangement with us because they already have a market waiting. So, we are all funded together and in time so we can meet the deadline.” (Respondent 46: Poultry farmer)*

*“We get input right in our communities without having to travel anywhere. In fact, our lead farmer collects the inputs on our behalf and shares it to us. I can walk down from my house with a wheelbarrow to get my inputs without spending any money.”*

*“Inputs are shared according to the farm activity we are performing, when it is time to plant, we get the seeds, when it is time to fertilise we get the fertiliser. This also helps us to plant at the same time and harvest at the same time. Also, the input come early so we don’t miss the planting season.” (Respondent 67: Maize farmer)*

*“We have had instances where the inputs did not come when we expected. After clearing our pens, we had to wait a while before the inputs arrived. The only thing is that poultry farming can be done all year round; we do not wait for rain. But we usually plan our cycles to fit as many production cycles as we can per year, so late input delivery can affect our yearly profit if not manage well.” (Respondent 59: Poultry farmer)*

Data therefore revealed that the provision of input finance to farmers within their local communities represented a significant reduction in transportation and time costs to farmers. Also, farmers have taken notice of *Thrive Agric’s* effort to provide inputs in time, in most cases, which has enabled them to meet production timelines.

### 5.3.3 Addressing Problems with Lack of Trust and Poor Creditworthiness of Farmers

Data presented in section 4.3 highlighted that one of the key constraints to farmers' accessing finance from financial institutions and individual financiers is difficulty in identifying credible farmers to invest in. In the bid to change the narrative that rural farmers are not creditworthy and also support the identification of credible farmers for funding, *Thrive Agric.* developed a model for identifying credible farmers to. This model was based on the premise that if concerted efforts are made to develop an identity profile and develop credit histories of rural farmers, it could potentially open the sector to alternative sources of finance outside conventional finance source. Moreover, conventional financial institutions could leverage on the availability of information on creditworthy farmers to build their confidence in lending to rural farmers. According to respondent 10:

*“For investors to be encouraged to fund rural farmers, I think an independent organisation should perform the function of identifying credible farmers through data collection and farmer identity profiling. People do not really believe that government data is credible. So if the government starts performing this function, it might still not be trusted. Banks will not do it because it is expensive. Although it is greatly beneficial for all actors performing agricultural finance activities, as of now, there is no organisation or actor dedicated to performing this function within the agricultural finance market and it is left for private individuals or businesses like Thrive Agric. to carry out this function for the farmers we work with.”* (Respondent 10: Thrive Agric's CTO)

As discussed in section 5.1, *Thrive Agric.* developed a multi-step process for identifying farmers to fund and ascertaining their credibility status. Respondent 11 provides a detailed description of the process for farmer identification and credibility ascertaining which is performed prior to extending agricultural finance to rural farmers. This process is also interlinked with providing information to farmers about *Thrive Agric's* loan package that farmers have described as significantly reducing the transportation and time cost in accessing information and reducing information asymmetries among farmers and between farmers and finance providers.

*“First we identify communities which produce the crops we need to supply off-takers by asking experts in the field such as extension agents. Some communities are already widely known as the best place to produce certain crops. For instance, Kaduna is a*

*maize hub, within Kaduna we have Saminaka and Rigi'ana as places with good weather and soil condition for maize. Next, we identify the total hectares of land currently under cultivation for that crop and the estimated number of farmers in the community. Next, we visit the community heads to introduce ourselves and explain our business model. After which we take permission to organise an information session where we can meet with village group leaders like women leaders, youth leaders, farmer-group leaders and farmers in general. During the information session, we talk about what we can offer farmers, answer any question they have and gather information on their current practices, input suppliers and markets for their outputs. This info session is organised in their local language, so we enlist the services of translators". (Respondent 10: Thrive Agric's CTO)*

Farmers are the first and most important stakeholders in any agricultural value chain. However, recruiting trustworthy farmers who are committed to producing outputs that meet off-takers requirements is a cumbersome but pivotal process required to ensure that finance crowdsourced from the crowd is repaid. *Thrive Agric.* recruits farmers through a process called *on-boarding*. Before the on-boarding process commences, *Thrive Agric.* adopts three key criteria to determine credible farmers to be on-boarded. First is the ability of the farmer to provide a guarantor within the community. Respondent 9 explained that:

*"If no one in a community wants to guarantee a farmer, it is a red flag, This is the same pattern that works with commercial banks who always require a guarantor for agricultural or non-agricultural loans. So we have modified this pattern such that it suits rural farmers. For instance, we ask their community chief if he is willing to pay the loan if his community member fails to pay, if he says yes, we ask him how he will pay. These are the kinds of questions we ask to determine who we can work with."* (Respondent 9: *Thrive Agric's* CEO)

Second is farmers' willingness to participate in the equity contribution scheme that entails that each farmer contributes a portion of the total loan amount as an equity deposit which is paid back to the farmer at the end of the production cycle. Respondent 11 explains that:

*"We initiated an equity contribution scheme whereby each farmer pays up-front 10% of loan amount. We believe that any farmer who cannot pay 10% of the total loan amount might likely not have a re-payment mind set and we won't be willing to work with such a farmer"* (Respondent 11: *Thrive Agric's*. Head of Operations)

Third is information verification, which is a process whereby Thrive Agric verifies the existence of guarantors, farmers' field location, and farmers' house address. Respondent 10 explained that:

*“We carry out land verification activities. Our field officers go round to verify that the farmers own the lands they claim they own, that the land is an arable land not a land filled with trees where he cannot farm. We map the land, and we verify from the community head that this farmer is truly a community member who owns the farm. We also do soil testing to ensure the soil is suitable for agricultural production.”*  
(Respondent 10: Thrive Agric's CTO)

Thrive Agric. uses a category of farmers known as lead farmers to support the farmer recruitment process. These lead farmers are identified based on recommendations by the community leaders and trained on the processes of recruiting farmers. Lead farmers are influential individuals who are known and respected in the community as serious and dedicated farmers. According to Respondent 11:

*“Lead farmers are important to our farmer recruitment process because they know and understand farmers within their community more than anyone else does. Once the recruiting and training of lead farmers is done, the next step is to recruit the farmers themselves. Farmer recruitment is done by the lead farmers, each lead farmer is required to recruit 3-5 farmers to form a cluster, and the lead farmer collects registration forms for all farmers in the cluster who have pay 500 naira (0.91 GBP) for the registration form. The lead farmer is also responsible for ensuring that the form is filled and returned to Thrive Agric. with the registration fee. The lead farmer is also in charge of collecting the equity contribution from each cluster member after forms are filled and farmers' data have been collected, that is, farmers' bio-data and geographic data”.* (Respondent 11: Thrive Agric's Head of Operations)

Once a farmer has been accessed as eligible for funding, the main on-boarding process begins. In describing the on-boarding process, Respondent 9 and 10 explained that:

*“The farmer on-boarding process entails getting to know the farmers better on a one-on-one basis. We basically gather the sort of information banks will need from farmers to extend loans to them. We do this by adopting a KYC (know your customer) approach, we gather all data we possibly can including socio-economic data like how many children they have, what other economic activity they engage in asides farming,*

*we gathered these data using questionnaires then transferred them to our digital platform for data aggregation”.* (Respondent 10: *Thrive Agric*'s. CTO)

*The goal is to help farmers develop a credit history which they can use to access loan from financial institutions. We are still working on a system for that* (Respondent 9: *Thrive Agric*'s. CEO)

*Thrive Agric.* on-boards two categories of farmers. The first category consists of out-grower farmers who own land and are provided input finance to cultivate their own land. The second category is made up of direct labour farmers whereby *Thrive Agric.* identifies a community, rents a large parcel of land, then divides this land into smaller parcels that are then allocated to farmers who are input financed to produce on the land. *Thrive Agric.* uses the direct labour system model in Jere Community, Kaduna, Nigeria where they rent 325 hectares of irrigated farmland for large-scale maize production using funds crowdsourced from their platform. The farmland is divided into blocks of 10 hectares and farmers within the community are employed to manage each block of farm. Unlike the out-grower model, the farmland belongs to *Thrive Agric.* and farmer engagement is through direct employment for wages.

*Thrive Agric*'s model for credibility enhancement has boosted the confidence of financial institutions in lending to farmers through the platform and providing insurance cover for platform-funded farmers

*We currently have two banks which have started lending to farmers through us. Leadway Insurance Company now provides insurance coverage for our farmers because they know these are real farmers who have legitimate farm businesses.”* (Respondent 9: *Thrive Agric*'s CEO)

Through *Thrive Agric*'s stepwise model for credibility enhancement, investors have increased assurance that they are investing in creditworthy farmers. Platform users provided their opinion on their reliance on *Thrive Agric.* to link them with credible farmers to fund.

*“For me, I’m just glad that I do not have to go through the process of looking for farmers myself to fund. I have heard bad stories of people losing their money because they partnered with dubious farmers. Thrive Agric. does the background checks in identifying credible farmers, so I do not have to worry about that.”* (Respondent 27: Platform investor)

*“Like I told you before, my experience with investing in farmers was very bad because I did not get my money back so you can imagine the relief I feel knowing that someone else does the job of finding reliable farmers for me to fund.”* (Respondent 32: Platform investor and individual financier)

*“It’s not easy identifying good trustworthy farmers to invest in. I have first-hand experience. It is hit and miss in most cases. Thrive Agric. does the hard work of identifying these farmers for us to invest in and so far, I can say that they are credible because I have received all my returns from the platform.”* (Respondent 35: Platform investor and individual financier)

*“I am very certain that I am being linked to credible agricultural investments because I have taken advantage of the farm visit opportunity provided by Thrive Agric. to visit a couple of farms I invested in. Being able to interact with farmers and experience some of their farming activities was worthwhile, and definitely added to my assurance that the agricultural enterprises advertised were credible, especially after my bad experience in investing in agriculture through my relative.”* (Respondent 41: Platform investor and individual financier)

Another means through which *Thrive Agric.* has improved the credibility of its farmers is through ensuring that loans are recovered and repaid to investors, and ensuring that farmers receive the agreed profits. The recovery phase is extremely critical to the business as it determines whether *Thrive Agric.* can fulfil its contractual agreement with off-takers and repay investment funds crowdsourced through the platform. According to Respondent 11:

*“When farmers bring in their produce to the warehouse, we check the level of pebbles; we do a moisture test, and varietal purity to check if the grains are clean, and we also check the weight. We do these to ensure we meet quality and quantity specifications stated in our MoU. If the quality is not up to standard, farmers are penalised, or we reject the produce. Their equity contribution is paid after recovery. During recovery, we follow-up on an individual farmer basis, if the farmer defaults, we take it up with the lead farmer, if the lead farmer cannot handle this issue, we take it up with the community leader, and if the community leader is not able to address it, we take it up with the law enforcement agencies and the court. So far, we have been able to handle recovery issues at the farmer and lead farmer level. Once recovery is*

*done, we supply off-takers, and we store what is left to sell later when prices are higher.* (Respondent 11: *Thrive Agric*'s. Head of Operations)

Profit sharing is performed after recovery. However, farmers can keep whatever produce is left on their farm after the loan amount is collected. These farmers have the option of selling the remaining output to *Thrive Agric*. at the ongoing market price. Farmers can also decide to sell leftover produce in the open market, or keep for family consumption. According to Respondent 11:

*“Once the farmer is done paying the loan value, in the form of output priced at the prevailing market price, and the interest on the loan, which is usually about 15% - also in produce not cash - they can decide to sell whatever produce they have left over to Thrive Agric. or not. We look at the profit that was made from the partnership, the arrangement is that the farmer takes 70% and Thrive Agric takes 30% or 60% depending on the nature of negotiation carried out during the information session at the beginning of the cultivation season. As soon as farmers bring in their produce to the warehouse, their equity contribution is paid to them in full. Once loans are paid off, profit sharing begins. If farmers exceeded the agreed volume of produce, they are free to use the remaining produce as they see fit.”* (Respondent 11: *Thrive Agric*'s. Head of Operations)

Repayment of crowdsourced funds with profits are carried out after final sales to off-takers following a payment schedule that is determined by the date in which investment was made on the platform. This date is shown on the investor's dashboards (on the platform) on the day of investment. The effectiveness of closely monitoring farmers' use of inputs, providing extension information, and providing access to ready markets is evidenced in the fact that *Thrive Agric*'s. has recorded 100% loan recovery from all farmers funded and has paid all investor's<sup>66</sup> capital and ROIs from platform inception to the end of data collection in 2019.

Furthermore, platform investors with experience in investing in agriculture through non-digital channels compare the rate of recovery in both channels.

*“I already told you of my experience with investing in agriculture through my uncle. I didn't get my money back and I will never try it again. This is my fifth season*

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<sup>66</sup> All platform users interviewed had received their payments for the previous investment, only pending payments were for investment which had not reached the maturity date. This information was also cross checked with *Thrive Agric*'s finance officer who claim all investors had received their money.

*investing through Thrive Agric., I always get my money back.”* (Respondent 41: Platform investor and individual financier)

*“So far, I will say recovery with Thrive Agric. is perfect, no stories at all, I just get my credit alert in my bank. Unlike what I told you before about the investment I and my friends did. Till today no hope of getting our money back.”* (Respondent 32: Platform investor and individual financier)

*“I have gotten all my money back from Thrive Agric., recovery was seamless, and nothing compared with when I invested in agriculture directly”.* (Respondent 35: Platform investor and individual financier)

*“After investing through Thrive Agric., I do not think I will ever make the mistake of investing directly in any farmer, even my closest relative. Believe me it is not worth the stress and trouble. From my experience, if you invest in farmers by yourself, you won’t get your money back, just get ready to dash them the money.”* (Respondent 27: Platform investor and individual financier)

*“The rate of returns from Thrive Agric. is competitive when compared with investment from other sectors, but with my experience in investing in farmers, I know that you can realise up to 100% returns if things are done right. Agriculture is very lucrative.”* (Respondent 30: Platform investor and individual financier)

As shown in table 18 as of 2019, data gathered from *Thrive Agric.* shows that through the platform, over 35,000 farmers across 13 agricultural value chains have been funded since the inception of the platform in 2017. These are Ram fattening, cattle fattening, Rice, Maize, Poultry, Soybeans, Tomatoes, Okra, Sorghum, Watermelon, Cowpea, Groundnut, and Pepper. Pre-platform, the founders funded 5 farmers; in the first year of the platform (2017) they funded 100 farmers; in the second year (2018) they funded 2000 farmers while in the third year (2019) they funded about 35,000 farmers.

#### **5.3.4 Addressing Problems with Weak Monitoring of Disbursed Finance**

The low recovery rate of most agricultural loans has been cause for concern for financial institutions and individual investors interested in funding rural farmers (Owuor and Shem, 2012). *Thrive Agric.* believes that the low rate of agricultural loan recovery is due to lack of monitoring loan usage which will ensure that farmers utilise agricultural finance for the intended purpose. According to *Thrive Agric’s* management, funded farmers are closely



monitored throughout the production process starting from the on-boarding stage down to final aggregation of outputs after harvest. This is to ensure that farmers are using disbursed inputs properly by adopting the right agronomic practices and also to avoid side-selling of inputs. As a result, *Thrive Agric.* invests heavily in employing and training field-operation staff who reside within these farming communities from the beginning to the end of the production cycle. These field-operation personnel include farm cluster heads, private extension agents, field supervision agents, chief agronomist, and warehouse staff. As explained by Respondent 11:

*“We have all our field staff on ground to monitor farmers, including our extension agents and agronomists who in addition, provide advice, and ensure farmers follow our recommended agronomic practices. Our field agents are mobilised with motorbikes to ensure they can pay regular visits to farmers’ farms, if there is a red flag in any farm; this is raised through the Open Data Kit platform. The monitoring phase continues till harvest but during the monitoring phase, data is continually being collected from farmers so that we can understand trends in each farmer’s field for future use.”* (Respondent 11: *Thrive Agric.*’s. head of operations)

*Thrive Agric.* also takes into cognisance the existing socio-cultural institutions within communities when selecting areas to recruit farmers and when adapting strategies for monitoring farmers’ activities. In most rural communities, the village head is the chief lawmaker and law enforcer, as a result, adopting urban systems of control will not be as effective as these local institutions. Therefore, *Thrive Agric.* identifies and works with village heads; group leaders and local vigilante groups in all communities where funded farmers are located to support monitoring and contract enforcement efforts. Respondent 10 explained that:

*“We found out that farmers listen to their local leaders more than to anyone else. In fact, we use these local leaders to identify legitimate farmers and enforce contracts with farmers. We also identify and work closely with their local security agencies, cooperatives, market leaders, and youth leaders depending on the Intel we get on who these farmers respect the most.”* (Respondent 10: *Thrive Agric.*’s CTO)

Input usage is also closely monitored to ensure farmers do not misuse hazardous chemicals and dispose containers unsafely. According to Respondent 12:

*“Before farmers collect their inputs from the warehouse, we organise a product knowledge day for the farmers. This is to ensure that farmers understand the input they are using, the agronomy and the hazards of using such inputs. Especially for toxic chemicals they need to know how to dispose the containers of these toxic chemicals.”* (Respondent 12: Thrive Agric. staff – Operations Team Member)

Harvesting indicates the end of the production cycle and beginning of the loan recovery phase during which farmers are required to repay loans in the form of *outputs* realised from their farms. This is another period where *Thrive Agric.* heightens their monitoring activities to ensure that farmers perform harvesting operations following the right techniques and also to ensure that farmers do not divert products for personal use before repaying their loans. As explained by Respondent 12,

*“Once it is time for harvest, we already have a projected yield to be obtained from each field; we heighten the level of monitoring at harvest because we do not want to give room for side-selling of outputs. For instance, we have had a recovery issue with a group of farmers in our tomato operation where one farmer for some reason could not submit the expected quantity of outputs to repay his loan. Farmers in his cluster started using their extra tomatoes to help the member of the group who was in debt to pay off and to avoid default. Defaulting will affect their eligibility for the next cycle of partnership with Thrive Agric. This is one of the advantages of clustering farmers in groups; it serves as a support system for farmers and promotes group accountability.”* (Respondent 12: Thrive Agric. staff – operations team member)

*Thrive Agric.* also monitors the sales of final outputs by providing farmers with access to final markets and overseeing the standardisation and sale of commodities to facilitate loan repayment. These markets are identified and secured even before the production season commences to give both farmers and investors the assurance that target profits will be realised.

*“We aim to take the burden of the farmers in sourcing for inputs and markets. We provide everything, seeds, feed, medication, fertilisers, pesticides, extension service, veterinary services, transportation, and storage. These are the things that take farmers time and money and reduce their profits. The farmer’s duty is to produce, and at the end of production we aggregate and sell, then take out the loan amount and share the profit with the farmers.”* (Respondent 9: Thrive Agric. CEO)

*“Our input finance model has improved farmers access to higher value markets because farmers are producing using improved inputs provided by us and producing uniform outputs which are desired by off-takers. That is why even before we finance farmers, we have a market for their output because we are able to control quality and quantity issues which previously excluded farmers from profitable markets.”*  
(Respondent 10: Thrive Agric. CTO)

*“I like that Thrive Agric. already had a market even before we start production. Once the birds are ready, they organise the transportation to the abattoir and to the end market. When the sale is finalised, we get our profit after they deduct the loan.”*  
(Respondent 58: Poultry farmer)

Overall, these monitoring strategies have ensured that all funds crowdsourced through the platform have been repaid, as at the end of data collection in 2019.

*I can confidently say that we have not had any farmer who was unable to repay his or her loan because of production failure or any issues. Even when there was almost a case like this, other farmers within the cluster contributed from their surplus output to help the farmer meet his output obligation.* (Respondent 11: Thrive Agric’s. head of operations)

This chapter sought to describe *Thrive Agric’s* online and offline operations to reveal how the platform emerged in Nigeria’s agricultural finance market where institutional voids exists. The data revealed that problems with agricultural financing have presented entrepreneurial opportunities for platforms like *Thrive Agric.* which are not only able to facilitate farmers access to finance, but also provides complementary offline support which enables farmers to repay loans. On the side of institutional and individual financiers, adopting a platform solution in performing rural agricultural investment has provided the much-needed structure which was lacking within the agricultural investment space. Moreover, it was revealed that monitoring the use of agricultural finance facilitates loan repayment which in turn improves farmers’ credibility to investors. Therefore, data presented provides an understanding of the contribution agricultural finance platform to addressing agricultural finance problems in Nigeria.

## **Chapter 6 - Digital Platforms for Financing Agriculture and the Implications for Agricultural Development**

This chapter discusses data presented in chapters four and five in light of the research questions. In chapter four, the data presented addressed research question one – *what are the current institutional problems in financing agriculture in Nigeria and how do they manifest as institutional voids?* While chapter five presented data that addressed research question two – *how are digital platforms emerging in response to institutional voids in financing agriculture?* In this chapter, section 6.1 presents a summary of key findings from chapters 4 and 5. Section 6.2 discusses the institutional problems in financing agriculture in Nigeria (research question 1). Section 6.3 discusses the emergence of digital platforms to address institutional voids in agricultural financing but also discusses the maintenance of some institutional voids by agricultural finance platform businesses (research question 2). Finally, section 6.4 re-visits Khanna and Palepu’s concept of institutional voids to ascertain the extent to which the concept explains the emergence of a digital platform as institutional intermediaries that bridge voids in financing agriculture in a developing country context.

### **6.1 The Manifestations of Problems in Financing Agriculture as Institutional Voids in Agricultural Finance Markets**

Well-functioning financial systems drive economic development by reducing the risks of performing transactions in finance markets (Adesoye and Atanda, 2012). In these well-functioning financial system, financial resources are readily available for small, medium, and large-scale entrepreneurial activities and infrastructural developments due to the presence of efficient mechanisms for aggregating, distributing, and monitoring financial transactions thereby providing the facilities for businesses to contribute to economic development (Barreti and Mutambatsere, 2008). Failures of financial systems to perform these functions reveal the weakness of intermediaries that result in high transaction costs, poor access to finance and ultimately, the under-development of an economy (Kydd and Dorward, 2004).

Khanna and Palepu (2010) describe emerging markets as ‘*transactional arenas*’ characterised by the absence or weakness of supporting intermediaries which constrain contracting parties from efficiently engaging in financial transactions. This description is representative of the Nigerian agricultural finance market because it has been argued that the Nigerian financial system is unable to support rapid economic growth because it lacks efficient intermediating institutions required to facilitate financial transactions of

counterparties thereby reducing transaction costs and information asymmetries (Adesoye and Atanda, 2012).

The literature review (chapter 2) revealed that the poor performance of agricultural finance markets in developing countries manifests in various forms. First is the ineffective matching of demand and supply of finance due to lack of data to facilitate loan processing activities of financial institutions. Second is the lack of trust among market players especially between smallholder farmers and financial institutions. Third is the high transaction cost in processing agricultural loans which tend to be small when compared to non-agricultural loans. Fourth is the weakness of institutions tasked with monitoring the use of agricultural loans. Fifth is the weakness of contract enforcement institutions which result in high rate of loan default and increased aversion of formal financial institutions to lending to rural agriculture (Kydd and Dorward, 2004; Barreti and Mutambatsere, 2008; Famogbiele, 2013; Mickiewicz and Olarewaju, 2020)

These problems with financing agriculture in developing countries have thus been described as manifestations of institutional voids which have emerged due to absence or weakness of intermediating institutional arrangements to facilitate efficient transactions in financing agriculture (Barreti and Mutambatsere, 2008; Mickiewicz and Olarewaju, 2020). As described in the research's conceptual framework in chapter 2, Institutional voids emerge due to the absence or weakness of six key intermediating institutional functions which are required to facilitate market transactions (Khanna and Palepu, 1997). The absence of these institutional functions creates market uncertainties that discourage growth as market participants struggle to consummate transactions in a transparent and profitable manner (Gao et al., 2019). To iterate, these intermediating institutional functions are summarised below:

1. Credibility enhancement which is the performance of independent certification activities to verify the legitimacy of market actors.
2. Information analysis which is the analysis of information on market actors, thereby reducing information asymmetries and improving transparency within markets.
3. Aggregation and distribution which is the matching of market demand and supply, at low cost, thereby reducing associated transaction costs.
4. Transaction facilitation which is the provision of low cost channels for the exchange of commodities (goods, services, and information). This increases market efficiency due to the reduction of the costs of performing business transactions.

5. Regulation and other public policy which create appropriate regulatory frameworks and enabling environment for actors to transact.
6. Adjudication which entails the resolution of disputes regarding law and enforcement of private contracts.

Primary data presented in chapter four described the problems in financing agriculture in terms of the issues that constrain the accessing, disbursing, utilising, repaying, and recovery of agricultural finance. The aim of this section is to use primary data backed with literature to provide a contextual understanding of how problems in financing agriculture manifest as institutional voids in a developing country setting. This will lay the foundation for discussing the emergence of digital platforms in performing intermediating function to address problems with agricultural financing in weak institutional environments. The structure of this section therefore follows the research's conceptual framework on institutional voids (Khanna and Palepu, 2010).

#### **6.1.1 Absence of Credibility Enhancers**

Credibility enhancement can improve market efficiency by reducing the cost of identifying and verifying farmers' identities (Gao et al., 2019). Primary data presented in section 4.3 revealed that farmers suffer poor access to agricultural finance due to two main factors which undermine their credibility. First is the issue of farmers' poor repayment reputation which has made investors to distrust farmers; and second is the issue of lack of data about farmers to support farmer identification, traceability, and loan monitoring. Table 20 summarises the manifestations of weak credibility enhancers; *Thrive Agric's* efforts in addressing this void; areas where *Thrive Agric.* maintains certain manifestations of this void; and the outcome of *Thrive Agric's* activities in attempting to address issues with weak credibility enhancement.

**Table 20: Summary of Findings on *Thrive Agric*'s Efforts in Addressing Weakness in Credibility Enhancement**

(Source: Author's research, 2018/2019)

<b>Manifestation of Institutional voids in Agricultural Finance Markets</b>	<b>How <i>Thrive Agric</i>. Fills Institutional Voids in Agricultural Finance Market</b>	<b>VOIDS MAINTAINED BY <i>Thrive Agric</i>'s Intermediation</b>	<b>Outcome of <i>Thrive Agric</i>'s. Intermediation in Addressing institutional Voids</b>
Lack of trust for farmers resulting in poor access to agricultural finance.	Offline credibility enhancement of rural farmers through an extensive background checks, starting from the community level down to the business household levels. Data collection activities improve farmers' access to agricultural finance.	<i>Thrive Agric</i> . only enhances the credibility of the farmers they fund (which is a small number). They do not provide independent verification for rural farmers overall. This still excludes trustworthy farmers who are outside the influence of the platform.	Increased trust and confidence in investing in agriculture through the platform evidenced in the growing number of platform users (see figure 18).
High transaction costs performing credibility checks and monitoring agricultural loans.	Offline identification of credible farmers and monitoring of funded farmers through a network of agents, thereby reducing the cost incurred by institutional and individual financiers in performing credibility checks on farmers.	<i>Thrive Agric</i> . only performs credibility checks and monitoring activities for their agricultural investments. They do not provide independent verification for rural farmers overall or provide monitoring services for agricultural investments outside those advertised on their platform. This still excludes legitimate farm businesses and investors outside the influence of platform.	Reduction in transaction cost for both lenders and borrowers.
High rate of loan default.	Offline provision of access to final markets and the management of the entire output sales process which ensures that farmers have the means of repaying their loans.	<i>Thrive Agric</i> 's finance model focuses on reducing default on loans accessed through the platform and not all agricultural loans in general.	Zero loan default by funded farmers resulting in investors receiving their capital plus profits, thus increasing the credibility of <i>Thrive Agric</i> 's funded farmers.
Reliance on informal finance sources which have high interest rates and lower volumes of loanable funds.	Provision of a new alternative source of finance to farmers within their local communities' thereby expanding localised source of finance.	N/A	Respondent farmers' reduction in the reliance on informal finance institutions

Trust is a prerequisite for developing business relations and building the resilience of finance markets (Tomasic and Akinbami, 2011). The '*lack of trust*' in Nigeria's agricultural finance market was reflected in narrations of respondents on '*farmers poor repayment reputation*'

which became a re-occurring statement among individual financiers, financial institutions, and even farmers (Respondents 2, 3, 4, 7, 8, 10, 27, 32, 35, 41, 47, 69, 51). Data presented in section 4.3.1 revealed these respondents believe that there is a prevailing mind-set among farmers that agricultural credit, from any formal channel, whether in the form of cash and inputs, is '*their share of the national cake*' (Respondent 2, 7, 10, 11, 32). The literature also argues that this mind-set has become a norm among rural farmers to the extent that it has undermined the creditworthiness of those rural farmers who might be able to repay loans (Nwachukwu et al., 2010; Eze et al., 2010). Due to farmers' reputation for loan default, farmers lack access to most formal loan facilities (Respondent 4, 8, 10, 47). In fact, most banks will only finance farmers who are guaranteed by the government (Respondent 7, 8) (Eze et al., 2010; Nwosu et al., 2010).

Furthermore, historically, agricultural finance has been managed and administered through government supported mechanisms such as credit guarantee schemes and subsidised input finance programmes which often lack mechanisms for monitoring farmers' use of finance (Respondent 3, 4, 7, 8, 63). This has resulted in poor accountability among farmers and fostered the '*hand-me-down*' mentality whereby farmers feel entitled to free finance (Respondent 3, 4, 7, 8, 10, and 63). Government guaranteed loans have therefore been blamed for encouraging farmers' default in the sense that these loan facilities remove the consequence of farmers' failures to repay because the government bears up to 75 percent of the amount in default in most cases (Respondent 7, 8). Moreover, the absence of the collateral prerequisite for farmers lending up to 100,000 naira (182.36 GBP), coupled with weak monitoring mechanisms further encourages loan diversion (Respondent 3, 4, 7, 8, 63). This finding has also been supported by the extant literature on farmers' access to agricultural finance which argues that farmers' reputation of poor loan repayment has contributed to an unfavourable agricultural finance environment which has created barriers to accessing agricultural finance by rural farmers (Udoh, 2008; Nwosu et al., 2010; and Ijioma and Osundu, 2015).

Interviewed farmers however claimed that this *reputation* is not representative of the realities on the ground. Some respondents claimed that this widely propagated narrative of 'farmers' habitual loan default' is true but it is as a result 'a few bad eggs' and in some cases caused by actors who are not farmers but disguise as farmers to obtain agricultural loans without the intention of repaying (Respondent 47, 51, 60, 69). Consequently, this negative representation has adversely affected the chances of trustworthy farmers in accessing finance from formal



institutions. Moreover, the cycle of mistrust and poor access to finance persists due to lack of concerted effort by financial institutions and regulatory institutions to identify and hold defaulting farmers accountable, for instance, as suggested by respondent 35, financial institutions should create a *'no credit list'* of defaulting farmers as opposed to branding rural farmers as *credit unworthy*. This will however require a collaborative effort between institutions that hold data on those farmers who have received loans such as commercial banks, the Federal Ministry of Agriculture and Rural Development, the Central Bank through several executing parastatals such as the Nigerian Incentive Risk-based Sharing system for Agricultural Lending (NIRSAL), Bank of Agriculture, and Bank of Industry (Respondents 1, 8, 10). In theory, these institutions should be responsible for performing credibility verification activities that differentiate trustworthy farmers from those who default, thereby supporting new and existing actors in agricultural finance markets to identify credible farmers to fund.

Furthermore, the question of who should perform credibility enhancement of farmers presented another layer of complexity. Respondents from financial institutions interviewed argued that credibility enhancement should be the task of the Federal Ministry of Agriculture and Rural Development (FMARD). This is because the FMARD has the institutional capacity to aggregate, analyse, and store information about farmers through their widespread local government departments, and further verify farmers' identities through the existing network of agricultural extension agents in rural areas (respondent 7 and 8). The justification of this claim was that the highest volume of loans disbursed to farmers is through government finance schemes (respondent 7 and 8). Therefore, the government should have performed credibility enhancement activities to identify legitimate and creditworthy farmers and make this information available in public spaces for other investors to access (Respondent 7, 8, 10). However, the FMARD argues that financial institutions should perform credibility checks as part of the existing procedure for loan processing (Respondent 1) while private sector actors such as agricultural finance digital platform insist that credibility enhancement should be performed independent of both the government and financial institutions to ensure transparency and efficiency in the credibility enhancement process (Respondents 10).

Performing credibility enhancement function could therefore serve as an entrepreneurial opportunity if performed efficiently and monetised (Gao et al., 2019). Consequently, the absence of a consensus on who should perform credibility enhancement of rural farmers in agricultural finance markets further buttresses the presence of this void and the need for

credibility enhancers in agricultural finance markets. However, because these institutions have failed to perform credibility verification functions, the aversion of lending to rural farmers persists. This finding is in line with findings from the literature which argues that financial institutions (commercial banks) and agricultural development finance institutions are responsible for determining the creditworthiness of farmers before extending loans. This will reduce loan default and change the prevailing narrative that farmers are not creditworthy (Nwachukwu et al., 2010; Nwosu et al., 2010 and Ijioma and Osundu, 2015).

In the absence of credibility enhancers, market players will need to identify credible actors to transact with which increases the transaction cost of performing business in such markets (Mair and Marti, 2009). However, Gao et al. (2019) argue that in weak institutional environment where credibility enhancers are absent, ‘*reputation*’ can serve as a meta-resource which offers a degree of confidence in performing transactions in such environments. However, in agricultural finance markets where farmers lack a good reputation to mitigate against the impact of absent credibility enhancers, the ultimate implication is poor access to finance from formal institutions.

### **6.1.2 Weak Information Analysing Institutions**

The literature review revealed that actors on the demand and supply side of agricultural finance markets require information to facilitate their investment decisions (Ololade and Olagunju, 2013; Mallum, 2016). Primary data presented in section section 4.1 supports this claim because it was found that farmers are unable to make informed decisions regarding the suitability of different finance options available to them (Respondents 63, 64, 67, and 71). Farmers also lacked information on the various forms of available finance (cash or input finance), the application process and eligibility criteria; interest rate and repayment duration; and the location of financial institutions providing the finance (Respondents 63, 67, 68, 70, 71, 72). On the supply-side, financial institutions are unable to make informed decisions on farmers’ loan applications (Respondents 1, 3, 7, 8, 10, 56); and individual investors find it difficult to identify viable farm enterprises and credible farmers to invest in (Respondents 32, 53, 27, 41). Ani (2019) also cited poor access to information on agricultural finance opportunities and eligibility requirements as barriers to accessing the *commercial agriculture credit scheme* in Nigeria. This also builds on findings by Badiru (2010); Eze et al., (2010); and Nwosu et al. (2010) who establish a positive correlation between access to agricultural finance information and access to agricultural finance. Table 21 summarises the

manifestations of weak information analyzers, *Thrive Agric*'s efforts in addressing this void, areas where *Thrive Agric*. maintains certain manifestations of this void and the outcome of *Thrive Agric*'s activities in attempting to address issue with weak information analysis.

**Table 21: Summary of Findings on *Thrive Agric*'s Efforts in Addressing Weakness in Information Analysis**

(Source: Author's research, 2018/2019)

<b>Manifestation of Institutional voids in Agricultural Finance Markets</b>	<b>How <i>Thrive Agric</i>. Fills Institutional Voids in Agricultural Finance Market</b>	<b>VOIDS MAINTAINED BY <i>Thrive Agric</i>'s. Intermediation</b>	<b>Outcome of <i>Thrive Agric</i>'s. Intermediation in Addressing institutional Voids</b>
Information asymmetries and high transaction cost in accessing information (on both demand and supply sides).	Online provision of information to investors on viable agricultural enterprises, including location of farms, duration of investment, and expected percentage ROI. Offline provision of information to farmers on the model of agricultural financing (input financing) through community level information day in local languages. Provision of information on improved farming techniques to ensure higher yields.	Information provided is tailored to the platform business and not representative of smallholder agricultural investments opportunities outside the influence of the platform.	Provision of aggregated information on various agricultural investments.  Breaking down barriers to accessing agricultural investments especially among the younger generation who are willing to invest but constrained by time, skill, and poor access to land.
Adverse incorporation of farmers who have unequal access to information hence limited access to finance.	Farmers receive information about <i>Thrive Agric</i> 's loan first-hand from <i>Thrive Agric</i> .	Farmers still have the potential to be adversely incorporated since information provided by <i>Thrive Agric</i> . is limited to their type of funding source.	Creation of an alternative agricultural finance institution with new rules governing the extension of credit to small farmers and the repayment of loans.
Increased reliance on informal information sources such as farm gate middlemen who distort information to improve their bargaining power.	Offline provision of information to farmers on the model of agricultural financing (input financing) through community level information day in local language.	Farmers do not know about the existence of a digital platform or know what information is presented on the platform; they also do not have information on investors and the amount of funds crowdsourced.	Funded farmers have access to information on <i>Thrive Agric</i> 's. funding directly from <i>Thrive Agric</i> . without the influence of opportunistic middlemen who might want to hoard information

Conventionally, farmers should obtain information through radio, television, and print media, however, with poor electricity infrastructure and power supply in rural areas, accessing information through radio and television remains a challenge; while illiteracy serves as a barrier in accessing information through print media (Obidike, 2011; Silong and Gadanakis, 2019). Interviews with farmers revealed that institutional intermediaries that should provide agricultural finance information include agricultural extension agents, local government

agricultural officers, and financial institutions (Respondents 3, 8, 63, 68, 71). However, it was found that due to the inconsistency in field visits from extension agents and agricultural officers, these information sources are unreliable for prompt information on agricultural finance opportunities (Respondents 3, 8, 71); while accessing information directly from financial institutions poses significant financial and time costs to farmers (Respondents 63, 65, 70). Therefore, farmers interviewed mostly relied on farm gate intermediaries, cooperatives, and fellow farmers for information on agricultural finance (Respondents 44, 49, 50, 53, 57, 63, 66, 68, 69). Interviews with farmers also revealed that some farmers who gained access to information on agricultural finance opportunities tend to protect this information from other farmers due to the mind-set that they stand a better chance of accessing finance if there is less competition (Respondents 49, 53, 57). This finding is however inconsistent with literature on peer-to-peer information sharing among farmers which portrays farmers as *sharers* and not *hoarders* of information (Opara, 2008; Sani et al., 2014).

This study also found that another source of information on agricultural finance is through off-takers who aggregate produce from individual farmers and cooperatives (Respondents 66, 67, 68, 71). However, it was revealed that there was a tendency for off takers (processors) who engage in contract farming arrangements with farmers to adversely select farmers with poor access to agricultural finance information (Respondents 67, 71). It was deduced that these off takers leverage on the knowledge that farmers lack access to information on alternative sources of finance and therefore have no other choice but to accept contract-farming agreements that might be less profitable to farmers in the long-run. Furthermore, farmers tend not to question the viability or legitimacy of institutions and individuals who seem to be providing finance for their production because they think these institutions are doing them a favour (Respondent 67 and 71). Moreover, farmers lack the resource and skills required to search, extract, and analyse information about financial sources to differentiate between those that are favourable and those that are not (Respondent 11). This finding is supported by Bijman (2008) and Ofuoku and Agbamu (2016) whose research outlines that an effect of weak information intermediaries is the exposure of farmers to unfavourable contract arrangements that perpetuates the vicious cycle of poverty and underdevelopment among rural farmers. Furthermore, research on factors influencing farmers' access to agricultural finance argues that the lack of information and presence of information asymmetries in rural

agricultural finance markets persists due to poor transparency in information delivery in rural areas (Imhanlahimi and Joseph, 2010; Egwu, 2016; Ademola, 2019).

Moreover, it was found that due to lack of formal education among rural farmers, there was a tendency to rely on intermediaries to perform information analysis functions that simplify the cumbersome loan application procedures adopted by formal financial institutions. Interviews with farmers revealed these intermediaries supported farmers in filling out application forms due to their inability to read and write (Respondent 8, 65, 70, 72). The data showed that these intermediaries include bank staff, educated community or family members who charge a fee for their services (Respondent 65, 69, 70). However, these intermediaries have also been described as unreliable due to their failure to support farmers in gaining timely access to financial services. The problems with these intermediaries include charging remarkably high fees (Respondent 72); demanding a percentage of the loan amount (Respondent 65); guaranteeing farmers' access to finance upon payment for premium services but failing to secure these funds on-behalf of farmers (Respondent 70). Therefore, accessing agricultural finance through intermediaries is expensive and unprofitable in the long-run.

Furthermore, the data also revealed that farmers face problems in effectively utilising agricultural finance due to poor access to information in input and output markets. These information asymmetries manifests as middlemen having better bargaining power than farmers due to the information they possess and farmers' inability to estimate the cost of inputs and outputs in loan applications (Respondent 12 and 48). Consequently, poor access to information on the prevailing market price of inputs and outputs results in a financial shortfall when purchasing inputs and lower profits from the sale of final produce in output markets (Respondents 12 and 48). This finding is in line with research by Mgbenka et al. (2016) which argues that input and output markets in developing countries are characterised by price volatility and rural farmers are largely unable to mitigate against price fluctuations due to lack of information and lack of adequate finance to cover price differences (between projected and actual). Other research on the impact of market price on farmers' ability to utilise and even repay loans posits that the high cost of inputs influences farmers' decisions to purchase lower quality and quantity of inputs which inadvertently results in lower quality outputs which are priced lower in markets (Uduji et al., 2019). Therefore, with lower profits than anticipated, farmers have a higher tendency to default on loans. It has therefore been recommended that farmers need access to market price information prior to applying for

loans and need support in connecting to profitable markets for the sale of final produce to facilitate loan repayments (Okorie, 1986; Badiru, 2010; Agada et al., 2018).

Moreover, financial institutions, and individual investors require information to facilitate the identification of farmers and to establish their creditworthiness. This information includes farmers' bio data, loan repayment history, type of farm enterprise, location of farmers' fields; and information that supports the determination of the profitability of investing in rural farmers such as market prices for final outputs (Respondents 8, 30 and 42). The data in section 4.1 suggests that although there are existing institutional mechanisms which should aggregate, analysis and distribute this data, information on farmers held by these institutions is disaggregated, incomplete, difficult understand and outdated (in some cases) due to the weakness of these institutions in performing information analysis functions (Respondent 1, 8, and 10). The data also reveals that there is a consensus among agricultural financiers that efforts should be made to aggregate farmers' data and create a credit profile for farmers to support loan processing procedures (Respondents 1, 7, 8, and 10). However, as with the case of credibility enhancement discussed in 6.1.1, there is uncertainty as to who should take ownership and pay for performing information analysis functions in agricultural finance markets. The result of the weakness of information analysers is that agricultural finance markets have become expensive for participants thereby discouraging new entrants from investing in the sector (Respondent 26, 33, and 37. High-cost markets tend to be unprofitable for participants and often results in survival of the fittest and opportunism whereby those who can access information use this information to take advantage of those who lack information (Adomi et al., 2004; Famogbiele, 2013).

### **6.1.3 Weak Transaction Facilitating Institutions**

Well-functioning transaction facilitating institutions should provide a platform for exchange of commodities (goods, services, and information) at a low cost (Khanna and Palepu, 1997). These institutions increase market efficiency by providing support functions for consummating market transactions (Droulliard, 2017). Financial institutions face various challenges in processing loan applications, disbursing finance, and recovering loans from farmers. First, to disburse finance, these institutions must process application forms to determine the eligibility of farmers for loans (Famogbiele, 2013). Interviews with staff from two commercial banks revealed that financial institutions incur high transaction costs in

processing rural farmers' loans which are mostly small amounts<sup>67</sup> when compared to loans to other sectors (Respondent 7 and 8). These transaction costs include: (1) transportation costs incurred in verifying the identities of farmers and farm location; and (2) time costs in terms of time spent travelling and time spent processing loan applications (Respondent 7 and 8). These transaction costs result in the low profitability of extending loans to rural farmers (Ibrahim and Alieroo 2012; Ademola 2019). Efforts to reduce transaction costs by financial institutions often cause delay in disbursing funds or rejection of loan requests entirely (Respondent 8). This was corroborated with data from interviews with farmer respondents (Respondents 52 and 61) which confirmed that agricultural loans tend to be disbursed late, and in most cases, after the entire production season is over. These findings agree with the broader literature on issues with agricultural financing which attribute late disbursement of finance to high transaction costs that often leads farmers to divert these funds to non-agricultural purposes (Okorie, 1986; Oladeebo and Oladeebo, 2008; Anyiro, C.O. and Oriaku, 2011; Akpan et al., 2014; Silong and Gadanakis, 2019).

Interviews with farmers revealed that in addition to the intermediation costs incurred in accessing information, discussed in section 6.1.2, farmers incur other transaction costs in accessing finance that significantly decreases final profits. These costs are transportation and time costs in travelling to and from financial institutions to collect and return application forms, and to follow-up on loan applications. Farmers revealed that sometimes, the estimated aggregated transaction cost in accessing formal finance was almost as high as the expected profits from the loan (Respondents 55, 62 and 70). This was because farmers are unable to anticipate the number of journeys and the amount of time spent in pursuing loan applications. This finding is also in-line with literature on the cost of accessing agricultural finance in Nigeria which reveals that the high transaction cost associated with agricultural loans has negatively influenced the profitability of agricultural financing with broader implications to the development of the sector (Eze et al., 2010; Igwe and Egbuson, 2013; Osebeyo and Aye, 2014).

It was also found that agricultural cooperatives perform intermediation functions that reduce the individual transaction cost in accessing agricultural finance per farmer (Respondent 43, 49, 56 and 57). This also results in the reduction of transaction cost in processing the loan as the financial institution circumvents paying visits to each farmers' field, but just one visit can be carried out to evaluate the collateral provided by the cooperative and verify the legitimacy

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<sup>67</sup> Less than 100,000 naira (approximately 191GBP)

of the organisation. This significantly reduces the transaction cost on both the financial institution and farmers, thereby increasing the overall profitability of financing agriculture. The advantage of cooperative intermediation was also evident in the reduction of activities that tend to increase the overall transaction cost of individual farmers accessing finance. First is the timely disbursement of funds that reduced the number of journeys to and from banks (Respondent 43, 49 and 54). Second is that uneducated farmers are protected from opportunistic intermediaries who claim they can facilitate farmers' access to agricultural finance for a fee (Respondents 43 and 57). Third is that cooperatives provide supporting structures for sales of final produce thereby supporting farmers in repaying loans (Respondent 56 and 57).

However, accessing finance through cooperative intermediation also poses its own set of limitations such as receiving less than the desired loan amount due to the cooperative's model for re-distributing finance, favouritism and other bureaucratic bottlenecks that result in some farmers not gaining access to loans (Respondent 43). Moreover, these cooperatives sometimes charge farmers higher interest rates than was fixed by the disbursing bank, and as a means of earning some income for the cooperative (Respondent 49).

Transaction costs are indicative of the nature of the financial market, the higher the transaction cost, the lower the market efficiency and participation due to high cost of intermediation (de Gui-Abiad, 1991). The data revealed that the current state of agricultural finance market in Nigeria is one of low participation by investors due to the high cost of intermediation. Due to high transaction cost in financing rural farmers, financial institutions, individual financiers, and new entrant farmers, prefer to invest in other non-agricultural sectors instead of in agricultural (Respondents 7 and 8). Therefore, Pingali et al. (2015) argues that high transaction cost pose barriers to entry into agricultural finance markets that have negative implications to rural and agricultural development. On the farmers-side, to mitigate against some transaction cost, farmers sell to farm gate intermediaries at lower prices than would have been obtained in open markets. However, farmers choose this option to eliminate the deduction of storage and transportation cost from their overall profits which will inadvertently influence their ability to repay loans (Respondents 12, 65 and 72) (Eze et al., 2010; Igwe and Egbuson, 2013; Osebeyo and Aye, 2014). Table 22 summarises the manifestations of weak information analysers, *Thrive Agric's* efforts in addressing this void, areas where *Thrive Agric.* maintains certain manifestations of this void and the outcome of *Thrive Agric's* activities in attempting to address issues with weak transaction facilitation.



**Table 22: Summary of Findings on *Thrive Agric*'s Efforts in Addressing Weakness in Transaction Facilitation**

(Source: Author's research, 2018/2019)

<b>Manifestation of Institutional voids in Agricultural Finance Markets</b>	<b>How <i>Thrive Agric.</i> Fills Institutional Voids in Agricultural Finance Market</b>	<b>VOIDS MAINTAINED BY <i>Thrive Agric</i>'s INTERMEDIATION</b>	<b>Outcome of <i>Thrive Agric</i>'s Intermediation in Addressing institutional Voids</b>
<p>High costs (monetary and time) of performing financial transactions and low profitability in performing business transactions in agricultural finance markets.</p>	<p>Online facilitation of payments for farm units through third party payment platform – Paystack.</p> <p>Offline provision of finance to farmers in their local communities reducing travel and time cost in accessing finance.</p>	<p>Payments to consummate transactions restricted to using the Naira, thereby excluding investments in foreign currencies serving as a barrier to global participation in financing Nigerian rural farmers by foreign investors.</p> <p>Transaction facilitation is limited to only transactions relating to funding farmers identified by <i>Thrive Agric.</i> and not all rural farmers in general.</p> <p><i>Thrive Agric.</i> only facilitates transactions of farms for which they crowdsource finance. Investors who need transaction facilitation service outside farm investment on their platform are excluded.</p>	<p>Reduction of transaction costs incurred by individual and institutional investors in financing agriculture thereby increasing investors' interest and the profitability of financing rural agriculture.</p>
<p>Poor access to profitable agricultural markets and increased reliance on opportunistic farm gate middlemen whose goal is to make high profits to the detriment of small farmers.</p>	<p>Provision of ready markets even before funds are disbursed to farmers thereby eliminating the need for farm gate buyers and their associated lower profits.</p>	<p>Market access is strictly limited to farmers who have been funded by <i>Thrive Agric.</i> Other farmers in need of connections to high profit markets are excluded.</p>	<p>Increased ability to repay loans; building a credit history of loan repayment; continuous funding by <i>Thrive Agric.</i></p>

#### **6.1.4 Weak Aggregating and Distributing Institutions**

As described in chapter 4, the primary function of agricultural finance institutions is to aggregate finance in the form of savings and distribute finance to borrowers (Mkpado and Arene, 2007; Adesoye and Atanda, 2012). Primary data presented in chapter 4 supported by the literature review in chapter 2 makes it clear that farmers' poor access to finance is not due to the absence of finance mechanisms established to extend finance to farmers, but due to institutional failures in distributing finance to rural farmers (Obilor, 2013). Financing agriculture is different from financing other economic sectors in Nigerian (Eze et al 2010). This is because rural farmers have unique socio-economic and socio-cultural characteristics that shape their business practices, land acquisition practices, access to productive resources, education, and agribusiness performance (Ibrahim and Aliero, 2012). However, most financial institutions fail to consider these unique characteristics in extending finance to agriculture but adopt a one-size fits all approach to lending across all sectors - including agriculture (Atieno, 2001).

The evidence from the interviews shows that the terms and conditions for lending to small farmers do not align with their particular realities (Respondent 55, 62, 63, 64, 70 and 72). It is therefore not surprising that most farmers fail to meet the eligibility criteria for formal loans (Respondents 63, 64 and 72). This finding is in line with Atieno (2001) who argues that the stringent terms and conditions imposed by financial institutions serves to protect these institutions from financial losses especially for high-risk loans such as agricultural loans. Olubiyo and Hill (2003) also added that financial institution such as commercial banks are businesses that are accountable to shareholders, therefore, lending to high-risk ventures such as rural agriculture needs to be done amidst a safety net to protect banks from undue losses. For instance, the agricultural credit guarantee scheme whereby the Nigerian government serves as a guarantor for farmers' loan which gives commercial banks a degree of coverage against total loss from defaulting farmers (Respondent 7 and 8). However, the guaranteeing of farmers by the government has still not resulted in the expected improvement in commercial bank lending to agriculture due to persistent loan default (Adetiloye 2012).

Lawal and Abdullahi (2011) have also attributed the lack of commercial bank branches in rural areas to the low rate of farmers' access to formal loan facilities and the high dependence on informal sources of finance. The creation of microfinance banks as a policy response to facilitating finance aggregation from local communities and finance distribution to small and

medium-scale enterprises (including agriculture) was expected to improve farmers' access to finance by bringing financial institutions physical closer to rural areas (Oluyombo, 2007; Acha and Acha, 2012; Unam and Unam, 2013). These microfinance banks were also expected to support the reduction of transaction cost in accessing finance and addressing issues associated with applying for loans from conventional commercial banks such as the late disbursement of funds and other complicated application procedures (Anyanwu, 2002; Eze et al., 2010). However, interviews with poultry farmers attempting to access finance through microfinance banks revealed quite similar scenarios with accessing finance from conventional financial institutions - in terms of late disbursement of funds and bureaucratic bottlenecks (Respondents 55, 61 and 70) thus defeating the purpose of establishing these microfinance banks in Nigeria. Table 23 summarises the manifestations of weak information analysers, *Thrive Agric's* efforts in addressing this void, areas where *Thrive Agric.* maintains certain manifestations of this void and the outcome of *Thrive Agric's* activities in attempting to address issue with weak aggregation and distribution.

**Table 23: Summary of Findings on *Thrive Agric*'s Efforts in Addressing Weakness in Aggregation and Distribution**

(Source: Author's research, 2018/2019)

<b>Manifestation of Institutional voids in Agricultural Finance Markets</b>	<b>How <i>Thrive Agric.</i> Fills Institutional Voids in Agricultural Finance Market</b>	<b>Voids Maintained by <i>Thrive Agric</i>'s Intermediation</b>	<b>Outcome of <i>Thrive Agric</i>'s Intermediation in Addressing institutional Voids</b>
High transaction costs in accessing high value markets resulting in high-cost markets which are not profitable for small farmers to participate.	Online aggregation of information for investors and aggregation of finance from investors.  Offline aggregation and distribution of input finance to farmers and outputs for off-takers/markets.	Related to transaction facilitation, farm enterprises for which finance is aggregated for are those pre-determined by <i>Thrive Agric.</i> and not independent farm units of farmers in general. Same with the information aggregated which are tailored to capture only farm units created by <i>Thrive Agric</i> 's model for clustering farmers.	<i>Thrive Agric</i> ' platform is a one-stop shop for investors seeking agricultural investment opportunities.  <i>Thrive Agric.</i> is able to secure contractual agreement with large-scale seed suppliers to aggregate and distribute inputs to small farmers who would otherwise not have access to these improved inputs as individuals.
Dependence on informal opportunistic middlemen who aggregate at the lowest possible cost from farmers but re-distribute at high prices to earn higher profits than farmers.	Final outputs are aggregated, standardised and sold to large-scale off-takers, reducing the interference of multi-stage intermediation which significantly reduce farmers' profits.	<i>Thrive Agric.</i> is still a middleman which negotiates on behalf of farmers. Farmers are not present during negotiations and although they are able to verify the ongoing market price for their products, exclusion from negotiation activities leaves room for farmers to be excluded from higher profits earned from their efforts.	Market assurance; quality assurance; profit assurance.

### 6.1.5 Weak Regulating and Public Policy Institutions

Chapter 4 outlined the various agricultural finance policies and institutions that govern agricultural financing in Nigeria. However, large-scale failures of agricultural finance programmes have been ascribed to loan default; poor programme continuity; misappropriation of funds; and weak monitoring mechanisms (Eze et al., 2010; Iwuchukwu and Igboke, 2012; Nwankwo, 2013). The slow development of the agricultural sectors has

been attributed to the weakness of agricultural policy institutions and regulatory frameworks in executing and monitoring agricultural finance programmes (Ofana et al., 2016; Fadeyi, 2018). As described in chapter 4 the overarching regulatory institution in agricultural finance market is the Central Bank of Nigeria which is supported by other public institutions such as the Federal Ministry of Agriculture and Rural Development (FMARD), the Bank of Agriculture, and other Agricultural Development Programmes (ADPs) (Eze et al., 2010). In Agricultural finance markets, the CBN prescribes laws that govern the allocation of interest rate; rules for accessing, disbursing, utilising, and recovering loans; consequences for default; sanctions on financial institutions; and contract enforcement procedures (Sanusi, 2012).

One of such policies to improve farmers' access to finance is the creation of micro finance banks (discussed in section 6.1.4) to support the aggregation and distribution of finance to small and medium scale enterprises especially those located in rural and peri-urban areas. However, the data shows that microfinance banks have not effectively solved the problem of farmer's poor access to finance in Nigeria, as they seem to perpetuate the limitations of conventional commercial bank lending to farmers (Respondents 55, 61 and 70). Other policies to subsidise lending to rural farmers, such as through single digit interest rates have taken effect (Respondent 7, 8 and 65) (Eze et al., 2010; Sanusi, 2013) however, it has been argued that the high transaction cost in accessing this 'single digit interest loans' still outweigh the gains this policy promises, as accessing agricultural finance remains expensive to small farmers (Ibrahim and Aliero, 2012). It has also been argued that single-digit interest rates have ultimately favoured the relatively smaller group of large-scale Nigerian farmers, through *elite capture*, as they are able to meet loan eligibility criteria more readily, thereby gaining access to large volumes of loans at low interest rates (Agwu and Mbah, 2008; Michael et al., 2018).

Moreover, the weakness of fiscal policy frameworks to incentivise rural farmers' participation in agricultural markets such as increased taxation on staple food imports creates problems in loan repayment (Lawal et al., 2018). Therefore, there is an increased burden on the government to pay 75% of the loan amount in default, after the commercial bank exhaust all options in loan recovery (Eze et al., 2010). In 2020, the President of Nigeria increased the capital of the ACGSF from 3 billion Naira (5,470,716.20 GBP) to 50 billion Naira (91,178,603.35 GBP), extending the use of this fund to include financing farm machinery and other value chain activities such as storage, processing, and transportation (Nweze, 2020). However, without addressing institutional failures in timely disbursement of funds,

monitoring the use of funds, and improving access to profitable markets for the sale of final outputs, problems with agricultural financing will perpetuate despite the increase in available finance for rural farmers.

Furthermore, there is the failure of government to effectively execute policies that seek to increase the budgetary allocation to agriculture (Oyinbo et al., 2013; Shuaib et al 2015). Agriculture receives a small percentage of the national budget which falls short of fulfilling the requirements of the Maputo declaration on agriculture and food security which the Nigerian government signed along with other African governments in 2003 (Okon and Christopher, 2018). The Maputo agreement prescribes that governments of African countries should allocate at least 10 percent of their annual national budget to agriculture (Maputo 2003). Table 24 provides evidence of the Nigerian government’s failure to execute this policy showing that since 2011 the highest budgetary allocation to agriculture was 2 percent of the national budget in 2018 with the lowest allocation of 1.3 percent in 2020.

**Table 24: Budgetary Allocation to Agriculture from 2011-2021.**

*Source: The Budget Office of the Federation (2021)*

<b>Year</b>	<b>% Of total budget</b>
2011	1.8
2012	1.6
2013	1.7
2014	1.4
2015	0.9
2016	1.3
2017	1.8
2018	2.0
2019	1.56
2020	1.34
2021	1.73

Therefore, the weakness of regulatory and policy efforts in agricultural finance stems from lack of political will to fund the sector to the weakness of these institutions in enforcing existing policies which have the potential to improve the growth of the sector and alleviate rural poverty (Ademola 2019).

### **6.1.6 Weak Adjudicating Institutions**

The role of adjudicators in agricultural finance markets, as described in chapter 2, entails enforcing contractual agreements and settling disputes between farmers and financiers. Data presented in chapter 4 revealed that it was common for formal institutions to rely on the police and other legal institutions for adjudication purposes (Respondent 7). However,

individual financiers, especially those with family ties to farmers, relied on informal actors such as village heads, farm group leaders, community vigilante groups and in some cases, family heads (Respondents: 27, 32, 35 and 41). Even those who did not have these social connections with farmers were weary of involving formal adjudicators to prevent frictions with community members that could escalate to violence (Respondent 32 and 35). Informal adjudicators have therefore gained power due the greater success in settling disputes and enforcing contractual agreements between farmers and financiers in the presence of weaker formal adjudicators (Respondent 9). Also, the authority of informal adjudicators is further amplified due to the reliance on these actors by development finance organisation in identifying reputable farmers within their community to participate in agricultural development programmes (Respondent 44, 68 and 69). However, this fragmentation of adjudication in agricultural finance markets between formal and informal institutions brings about increased risk in investing in agriculture (Atieno, 2001). New entrants into agricultural finance markets must therefore evolve their own means of ensuring contract enforcement or risk incurring losses due to weakness and unsuitability of existing adjudicating institutions (Respondents 27, 32, 35 and 41).

Despite their effectiveness, there was evidence of skewed judgement of these informal adjudicators in favour of farmers, in the sense that informal adjudicators tend to plead on behalf of the 'poor farmer' who has a 'family to feed'. This, perhaps, is due to the mind-set that these financiers live in the city, have better lives, and should therefore be understanding when it comes to dealing with a rural farmer who is not as well-off (Respondents 27, 35 and 41). The biased sentiments of adjudicators expose the weakness of these intermediaries in enforcing accountability, justice, and fairness in rural finance markets. Literature on rural agricultural finance agrees with findings on the weakness and of adjudicating institutions in intermediating between farmers and agricultural financiers that has resulted in poor contract enforcement in agricultural finance markets with broader negative implications to agricultural financing and the development of the sector (Aryeetey, 1997; Eze et al., 2010; Njogu et al., 2018).

The weakness of formal adjudicators is further evidence in the case of government guaranteed loans, where the government serves as adjudicators and contract enforcers between farmers and financial institutions (Udoh, 2008; Eze et al., 2010). As described in chapter 4 and section 6.1.5 government guarantee schemes for agricultural financing through commercial banks are one of the most abused sources of agricultural finance by farmers who

are aware that the government would support loan repayment in cases of default (Respondent 4, 7, 8 and 10). For loans not guaranteed by the government, commercial banks have mechanisms for contract enforcement that include enlisting the services of the police to confiscate the collateral or other valuable properties of the defaulter (Okorie and Iheanacho, 1992). However, even when farmland is confiscated from farmers, there is evidence that these farmers often return to their farmland to cultivate the next planting season due to absence of monitoring mechanisms to ensure adherence to default penalties. The failures of adjudicators in supporting loan recovery efforts breeds lack of trust which negatively impacts investor's participation in agricultural finance markets (Barreti and Mutambatsere, 2008). Furthermore, the perception that agriculture in developing countries like Nigeria is high risk has been fuelled by weakness of contract enforcement mechanisms in agricultural finance markets (Respondent 4, 7, 8, 10, 27, 32, 35 and 41). This has reduced the number of lenders in the market and raised barriers to accessing available finance (Aryeetey, 1997). These barriers usually manifest as stringent terms and conditions, and high interest rates, which excludes high-risk borrowers such as small farmers (Atieno, 2001).

### **6.1.7 Weak Monitoring Agencies**

Another institutional void observed in agricultural finance market which was not included in Khanna and Palepu's framework is the absence of *monitoring agents* to follow-up with farmers in receipt of agricultural finance. This is to ensure that funds disbursed by financial institutions are used for agricultural purposes and repaid. Udoh (2008) and Olowa and Olowa (2011) describe poor monitoring arrangements in agricultural finance markets as the primary cause of loan diversion and default among rural farmers. Primary data presented in section 4.5 provides evidence that poor monitoring of rural farmers' usage of agricultural loans has fuelled the high rate of loan default thereby undermining loan recovery efforts (Respondent 3, 4, 7 and 10). As a result, Olomola and Gyimah-Brempong (2014) emphasise the need for robust structures dedicated to monitoring the use of agricultural finance, as this will facilitate agricultural loan recovery.

Although financial institutions recognise the importance of loan monitoring in facilitating loan recovery, they fail to monitor loan usage due to the high transaction cost associated with performing monitoring activities (Respondents: 4, 7, 8 and 9) (Salami et al., 2013). However, there is evidence that with close monitoring, coupled with the provision of information and market support, farmers are more likely to repay loans than when there is an absence of



monitoring efforts (Respondents: 11, 17 and 35). It was suggested that financial institutions should leverage on the wide reach of agricultural extension agents through the federal ministry of agriculture to monitor financed farmers (Respondent 11). However, the extension system in Nigeria is currently weakened by poor road infrastructure, poor funding, and lack of motivation (Agwu et al., 2008; Issa, 2017). Financial institutions also recognised the limitations of partnering with government extension agents and therefore preferred the option of collaborating with private sector extension agents. However, there is still the limitation of the geographic coverage of these private extension agents when compared with government extension agents (Respondent 7 and 8). It was therefore evident through interviews that the absence of monitoring agents in agricultural finance markets has created opportunities for rural farmers to divert (both cash and input) finance with direct consequence to loan repayment. These findings are in line with Ojiako and Ogbukwa (2012) and Adegbite (2009) who posit that without close monitoring of farmers in receipt of agricultural finance, poor repayment of agricultural loans will persist to the detriment of the development of the sector at large. Table 25 summarises the manifestations of weak monitoring agencies, *Thrive Agric*'s efforts in addressing this void, areas where *Thrive Agric*. maintains certain manifestations of this void and the outcome of *Thrive Agric*'s activities in attempting to address issue with weak monitoring.

**Table 25: Summary of Findings on *Thrive Agric*'s efforts in Addressing Weakness in Monitoring**

(Source: Author's research, 2018/2019)

<b>Manifestation of Institutional voids in Agricultural Finance Markets</b>	<b>How <i>Thrive Agric</i>. Fills Institutional Voids in Agricultural Finance Market</b>	<b>Voids Maintained by <i>Thrive Agric</i>'s. Intermediation</b>	<b>Outcome of <i>Thrive Agric</i>'s. Intermediation in Addressing institutional Voids</b>
Diversion of agricultural finance to non-agricultural activities thereby increasing the possibility of loan default.	Offline monitoring of farmers through a multilevel system starting from high level farm management to lower-level peer-to-peer monitoring through lead farmers.	Monitoring structure (manpower) put in place by <i>Thrive Agric</i> . cannot be employed by other financiers for their personal agricultural investment. That is, <i>Thrive Agric</i> 's monitoring mechanism is not standalone, but linked with the business and therefore does not support the broader issue of absent monitoring agencies in agricultural finance .markets.	Full recovery of all loans disbursed to farmers funded with crowdsourced funds.  Increased accountability of funded farmers through farmer clustering.

## **6.2 The Emergence of Digital Platforms to Address Institutional Voids**

This section discusses *Thrive Agric*'s platform emergence in terms of its role in addressing institutional voids constraining farmers and investors in participating in agricultural finance markets. The section also discusses areas where institutional voids are maintained by *Thrive Agric*'s digital finance business and the implications of *Thrive Agric*'s offline complementary segment to broader debates on platforms for development. The section concludes with discussions on scaling-up opportunities and challenges experienced by the platform business in its efforts to finance rural agriculture.

### **6.2.1 Enhancing Farmers' Credibility through Monitoring and Improved Loan Recovery**

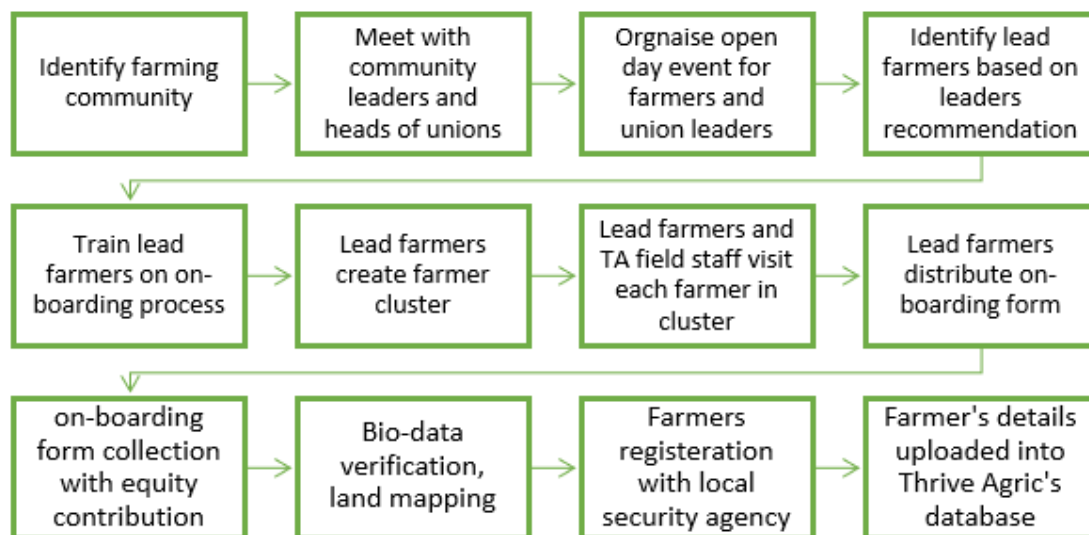
Ascertaining the credibility of farmers who seek agricultural finance poses a reoccurring problem to formal financial institutions and individual financiers of agriculture (Respondent 1, 4, 7, 8 and 10). As the literature review reveals, without mechanisms to efficiently differentiate between credible and non-credible farmers, risk aversion towards lending to farmers persists, contributing to poor financing of the sector and the vicious cycle of poverty among rural farmers (Eze et al., 2010). Data presented in section 4.3 and discussed in section 6.1.1 revealed that farmers' poor reputation towards loan repayment significantly affects their access to agricultural finance (Respondents 2, 3, 4, 7, 8, 10, 27, 32, 35, 41, 47, 69 and 51). Drawing from the research's case study - *Thrive Agric*. – and the discussion in section 6.2.1 and 6.2.7 it was also understood that the absence of traceability systems coupled with absence of data to support farmers' identification presented avenues for rural farmers to go unmonitored thereby increasing the risk of low recovery of agricultural loans (Respondent 10).

Discussions in section 6.2.1 revolved around farmers' poor reputation and the need for reputation building through credibility enhancement activities. It was also suggested that independent actors could potentially build the reputation of rural farmers by supporting them to repay loans which will ultimately build investors' confidence in funding rural farmers (Respondent 4 and 10). The data also revealed that it is imperative to closely monitor funded farmers in addition to creating traceability systems to distinguish between those who pay and those who do not (Respondent 10, 47 and 56). Ultimately, this will facilitate the development of farmers' credit history and support financial institutions in making decisions on farmers' loan applications (Respondents 1, 8, 10 and 35).

However, it was found that credibility enhancement of rural farmers will attract significant financial investment which the government and financial institutions are unwilling to bear (Respondent 1, 8, 10 and 11). Moreover, lesson learnt from government agricultural finance schemes support primary evidence that incomplete identity and credibility verification of loan beneficiaries contributes to poor loan recovery (Oparinde et al., 2017). Therefore, in the absence of existing structures for credibility verification of farmers, *Thrive Agric.* evolved a model for farmer identification that has served as a channel for credibility enhancement of those rural farmers who are funded through the platform (Figure 20).

Data presented in section 5.1.1 which describes *Thrive Agric.*'s offline operations show the rigorous process of farmer identification and credibility checking adopted in identifying the farming community to fund, recruiting and training lead farmers who are then responsible for the clustering of farmer beneficiaries, contribute to *Thrive Agric.*'s overall identity and credibility check of farmers. *Thrive Agric.* further formalises their credibility enhancement process by incorporating socio-cultural institutions which govern farmers' behaviours such as community leaders, farm group leaders and local vigilante organisations for the enforcement of contractual agreements between actors (Respondents 9, 10, and 11).

**Figure 20: Multi-stage Model of Credibility Enhancement Developed by *Thrive Agric.***  
 (Source: Author's research, 2018/2019)



Four key findings emerge from *Thrive Agric.*'s credibility enhancement activities. First is that continuous loan repayment facilitates the enhancement of rural farmers credibility.

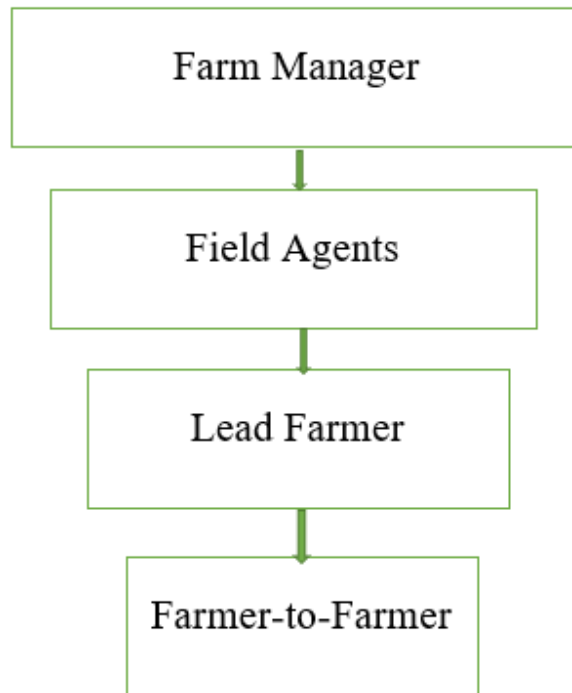
Discussions in section 6.2.1 and section 6.2.7 reveal that farmers' have poor credibility due to

failure to repay loans, and some causes of farmers' failure to repay loans are the absence of monitoring structures to check farmers' usage of agricultural finance and the absence of additional support to ensure that outputs realised are converted to profits. Therefore, from *Thrive Agric's* case, there is evidence that credibility enhancement of rural farmers can be achieved not only through close monitoring of farmers' use of finance but in combination with the provision of supporting structures (high quality inputs, information, and markets) to ensure rural farmers can realise high outputs and are able to repay loans (Respondent 8, 9, 10, 46, and 58). Without access to markets, and facilitation to access these markets such as transportation and storage, the gains of increased output will be lost to farmers who will suffer low profits due to sale of commodities at farm gate prices to opportunistic intermediaries (Ume et al., 2018). Data presented in section 5.3 illustrates the value chain of support received by *Thrive Agric's* funded farmers from pre-production to final sales to ensure loan repayment (Respondent 10). Loan repayment builds the confidence of investors to fund the sector.

Figure 20 shows *Thrive Agric's* pathway for tracing farmers through mapping and verifying farmer identities, hence creating the foundation for credibility enhancement. Furthermore, data presented in section 5.3 describes *Thrive Agric's* multi-level process for monitoring farmers starting at the farmer-level through peer-to-peer monitoring to the farm manager level which provides higher lever managerial surveillance (respondent 10) (see figure 21).

**Fig 21: Thrive Agric's. Multi-Level Model for Monitoring Farmers**

(Source: Author's research, 2018/2019)



Second key finding on credibility enhancement of rural farmers is the importance of harnessing existing socio-cultural institutions in mapping farmers' identities and creating farmers' credit profile (Respondent 11). Involving community leaders, union leaders, and other leadership structures within these communities establishes farmers' ties to the community and provides a clearer pathway for farmer traceability. These socio-cultural institutions also serve as adjudicators between financiers and farmers in case of loan default. These efforts to link farmers to their communities through socio-cultural institutions have been ignored by most government supported agricultural finance schemes thereby resulting in poor 'on the ground' identification of credible farmers. This finding is supported by (Ozor and Nwankwo, 2008) who emphasise the importance of mainstreaming local institutions into rural development programmes schemes to improve farmer identification and forge a hierarchy of accountability among rural actors.

The Third key finding from *Thrive Agric's* credibility enhancement model is that credibility enhancement attracts (financial and time) cost to rural farmers and the enhancer. This is primarily because the process of data gathering for farmer identification is an offline process which requires physical human effort in aggregating, verifying and analysing farmers' data. Some respondents argue that the sort of data which can support credibility enhancement activities already exist across various agricultural and financial institutions in Nigeria

(Respondents 1, 7, 8, and 10). However, these data are disaggregated, incomplete and obsolete in some cases and would require concerted effort in making sense of it (Respondent 10). For *Thrive Agric.*, there is a business case for credibility enhancement as it is incorporated as part of the process of providing funds to farmers. Therefore, some finance crowdsourced from the platform is used to fund the process illustrated in figure 22. This means that *Thrive Agric.*'s credibility enhancement is not an open process as it is currently performed for only a closed group of farmers selected by *Thrive Agric.* for funding and not open to all rural farmers. This brings into question the scalability of the model beyond the platform and if indeed it contributes to agricultural development through void filling. It can however be argued that credibility enhancement is not the primary function of the business but an ad-hoc activity which is required for successfully providing and recovering finance. However, the advantage is that there are plans to allow farmers who have a credit history from *Thrive Agric.* financing scheme to extract this information for use in subsequent loan applications outside the platform (Respondent 9).

The fourth key finding is that the data provided evidence that some individual and institutional financiers now prefer to lend to farmers through *Thrive Agric.* than to lend directly to farmers because of the *Thrive Agric.*'s model credibility enhancement (Respondents 26, 32 and 36). This was revealed in scenarios where respondents from financial institutions and individual financiers' compare their experience with lending to rural farmers directly (non-digitally) and through the platform. The consensus among investors who had experience in investing independently and through *Thrive Agric.* is that they have the assurance that farmers being funded through the platform are credible, but most farmers invested in directly without performing the level of credibility checks performed by *Thrive Agric.* tend to default (Respondents 32, 35, 27 and 41). A possible explanation could be that due to the inclusion of socio-cultural institutional leaders into farmer identification processes, farmers are more aware of the stakes of default and tend to adhere more strictly to terms of their contract as opposed to when farmers perceive that the investor has not aligned with these socio-cultural institutions that govern farmers' behaviour. However, the resultant effect of enhancing the credibility of these farmers is that other financial institutions such as insurance companies now provide insurance cover for farmers funded by *Thrive Agric.*, as of 2018, two banks began lending to rural farmers through *Thrive Agric.* and more platform users were recorded as repeat investors through the platform (Respondent 9).

Although Nigeria is still a long way from efficiently mapping farmers' identities (Respondents 1, 7, 8 and 10), *Thrive Agric.* has however developed a model for credibility enhancement of rural farmers which can potentially be scaled-out to the wider group of rural farmers nationwide. Therefore, drawing from the case study *Thrive Agric.*, it is evident that the possibility to build farmers' reputation to present them as 'credible' for funding does exist but requires a concerted effort by both farmers and credibility enhancers over time.

### **6.2.2 Aggregating and Distributing Agricultural Finance and Information**

The primary aim of adopting a platform solution for financing agriculture is to reduce spatial and temporal barriers in aggregating and distributing agricultural finance and agricultural finance information (Respondent 9, 10). The research observes an interlinkage in intermediating functions performed to address institutional voids due to weak aggregators and distributors, weak transaction facilitators and weak information analysis. That is, in facilitating the performance of agricultural financing transactions, *Thrive Agric.* is also able to address voids with emerge due to weak aggregators, distributors, and information analysers. Therefore, although Khanna and Palepu's description of the functions of market intermediaries are standalone, it is possible for some institutional functions to be performed together due to the use of digital platforms in developing countries (Heeks et al., 2021).

Section 6.2 already discussed the correlation between high transaction costs and information asymmetries and its impact on both farmers and financial institutions in financing agriculture. Data from the case study description in chapter 5 revealed that *Thrive Agric's* platform addresses two major issues that emerged due to the weakness of transaction facilitators and information analysers in agricultural finance market. First is the high cost of financing rural farmers that is linked to the high cost of accessing information on farmers and high transaction costs in accessing the farmers themselves. Second is the absence of information on rural agricultural investment procedures that poses barriers to potential agricultural financiers who often choose to invest in other sectors with more structured investment procedures.

Digitising agricultural investment procedure addresses problems with high transaction and information cost due to the functionality of digital platforms that allows the aggregation of agricultural finance information and its distribution to a wider audience. *Thrive Agric's* digital platform aggregates and distributes agricultural finance information to potential investors at a low-cost by leveraging on the widespread adoption of smart devices for day-to-

day online activities that have become a norm among many Nigerians. This reduces the high cost of accessing information due to investors travelling to rural areas to access information about farmers and to perform investment transactions. As evidenced through the case study – *Thrive Agric.* – the platform provides information to anyone who has access to a smart device and internet connection (Respondent 10). For most investors, the option to access agricultural investment information digitally contributed to their decision to invest in rural agriculture (Respondents 23, 26, 28, 32, 33, 36 and 37)

The digitalisation of agricultural financing also creates new procedures for investing in agriculture that were not available pre-platform. Moreover, the functionality of embedding payment systems into digital platforms further reduces the transaction cost of performing online transactions when compared to offline transactions. Adopting a digital platform for agricultural investment leverages on existing non-agricultural procedures for ‘online transactions’ which allows selection of ‘*purchasable options*’ and payments to take place through the same online platform. By mimicking the online shopping model, a new system for investing in agriculture has emerged which bypasses the need for investors to physically access farmers to gather information and make decisions on investing. Moreover, digitising agricultural finance processes enables *Thrive Agric.* to aggregate finance from many investors across diverse spatial and temporal scales and rapidly distributes agricultural finance information to investors at the same time. Therefore, harnessing an already existing innovation to create new model for agricultural financing takes advantage of existing digital infrastructures (internet, digital devices, and cost of mobile data) thereby reducing the overall cost agricultural investment through platforms.

### **6.2.3 Institutional Voids Maintained by Digital Platforms**

Section 6.3.1 and 6.3.2 discuss *Thrive Agric.*'s model for credibility enhancement, farmer monitoring, aggregating, and distributing finance, analysis of information, facilitation of transactions through their digital platform and offline complementary intermediation activities. However, the research identified certain areas where some institutional voids are maintained due to the use of digital platform and due to *Thrive Agric.*'s model for offline intermediation. First is that some information asymmetries are maintained. *Thrive Agric.*'s platform investors have more information about farmers and the investment capital sourced through the platforms for farmers than funded farmers have about investors and the volume of agricultural finance crowdsourced to finance them. Figure 2 in section 5.1.1 shows a



snapshot of information provided on the platform for investors. Through the platform, investors can access information on the number of farm unit available and cost per unit which provides an understanding of the total volume of finance crowdsourced for a group of maize farmers, for instance. It also shows the location of the farm; provides investors with information on the percentage returns; and gives investors the opportunity to visit these farmers. However, farmers are not aware of the existence of the platform, nor do they have any information of the amount crowdsourced and the percentage ROI received by investors. Information given to farmers is limited to the finance procedure, the volume of finance disbursed to each farmer, which is in proportion to farm size, and the percentage profits earned by each farmer after final sales of outputs. Such information asymmetries open avenues for adverse selection of farmers based on their lack complete information on the entire investment procedure and lack of access to the platform to ascertain they nature of information provided to investors. This finding is in-line research by Udoka et al. (2016) and Mogues and Olofinbiyi (2020) which argue that in developing country agricultural financing environments those with superior knowledge have the power to influence the allocation of resources within the sector. They argue that this influence could result in inequalities in accessing the gains of agricultural finance opportunities with negative implications to farmers' incomes and livelihoods.

On the other hand, some information asymmetries exist between the platform and investors. That is, the only information provided on the platform is for agricultural enterprises that have been created by *Thrive Agric.*, and not by independent agricultural enterprises owned by rural farmers seeking finance. Figure 2 section 5.1.1 illustrates a typical advertisement for investors to finance agriculture by purchasing farm units, as described in section 5.1, a farm unit does not represent a farmer, the advertised farm unit, is *Thrive Agric's* method for packaging the agricultural investment into purchasable entities. Therefore, the platform is not an independent source of information for new entrant investors who seek information on all available farm enterprises to invest in because it is tailored to crowdfunding for farm units created by *Thrive Agric.* through their own model of aggregating farmers (Respondent 31, 39 and 42). Furthermore, while investors receive information on key milestone from invested farms, the exact breakdown of the use of investors finance is not provided. For instance, expenses incurred in performing credibility enhancement activities and monitoring farmers. As a result, there is still an imperfect knowledge of the entire agricultural finance procedure on both the demand and supply sides of the platform's finance business. These information

asymmetries have been blamed for the diversion of crowdsourced funds for agriculture to other non-agricultural ventures which some digital finance platforms like PorkMoney have allegedly leveraged on to initiate Ponzi schemes (Olubajo, 2021). These information asymmetries have also bred distrust in finance platform businesses to the detriment of rural farmers who can benefit from the alternative source of finance provided through platforms.

Second is the issue of credibility enhancement of farmers to build investors' confidence in funding agriculture. As discussed in section 6.2.1, *Thrive Agric.* model for credibility enhancement only applies to farmers who are funded by the platform. Information about their 'credible farmers' is not yet in public domain and cannot be accessed by anyone who independently seeks farmers to invest in. This locks-in investors to the platform who could potentially earn higher returns and offer farmers higher profits by investing directly (Respondent 30). Therefore, new entrant investors and even financial institutions, who do not want to invest in agriculture through the platform, still face the problem of identifying creditworthy farmers to invest in. On the other hand, farmers who want to seek finance from other institutions cannot yet use their credit histories with *Thrive Agric.* to access finance outside the influence of *Thrive Agric.* Although data presented in section 6.3.1 (Respondent 10) suggests that the goal is to enable farmers use their credit history to access finance from independent sources, but at the time of data collection, this was not the case.

#### **6.2.4 The Implications of Thrive Agric's Offline Complementary Segment on Addressing Institutional Voids**

The case study – *Thrive Agric.* – reveals that the success of crowdfunding for rural agriculture in Nigeria is hinged on the existence of an offline complementary segment that support the backward integration of agricultural value chains. This backward integration supports farmers in building credibility, utilising crowdsourced finance for production, providing access to end markets, and ultimately facilitating loan repayment. Through this offline segment, *Thrive Agric.* attempts to address institutional voids that manifests as absent credibility enhancers, weak information analysers (on the farmers-side), weak aggregators (and distributors), and absent monitoring agencies. The inclusion of non-digital complementary activities to support the digitisation of some institutional functions in addressing institutional voids in developing countries has also been described by Heeks et al. (2021) as *human intermediation* which is essential to performing market processes which cannot be digitised but which are required for the success of digital platform intermediation activities.

The case study description in Chapter 5 shows that the online segment of Thrive Agric's agricultural finance model mainly deals with the aggregation of finance through crowdsourcing and the provision of investment information to platform subscribers (the crowd). These two main functions of the digital platform directly address institutional voids relating to the weakness of aggregating and distributing intermediaries for both finance and information, especially for actors on the supply-side of the agricultural finance market. However, the data shows that other intermediating functions which result in the bridging of institutional voids due to weak credibility enhancers (discussed in section 6.2.1), weak monitoring agents and weak information analysers (for actors on the supply-side) are performed offline. In fact, it would seem as though most of the intermediating functions which bring about the bridging of institutional voids are performed offline - with the platform simply serving as a medium for consummating transactions between investors and the platform business.

Therefore, in as much as *Thrive Agric.* is branded as a digital agricultural finance business, it is worth recognising the boundaries within which the digital platform directly contributes to agricultural development. Given the current nature of the use of digital platform for agricultural development in most developing regions like Nigeria, there seems to be a limit to the extent to which digital platforms can fully address problems with agricultural development. In the case of this research, agricultural development problems relating to addressing institutional voids through platforms significantly rely on offline intermediation to complete the chain of activities which result in the successfully financing of farmers and repayment of investors. For instance, the case study shows that the credibility enhancement of farmers, agricultural finance distribution, monitoring of farmers' use of agricultural finance, recovery of agricultural finance and intermediation between farmers and input suppliers are strictly offline activities not performed through the digital platform.

The broader platforms for development literature present scant debates on the role of the offline segment of platform-enabled businesses which support the operation of digital platforms in developing regions (Omulo et al., 2020; Lakeman and Lay, 2019; Koskinen et al., 2019; Bonina et al 2021). Most research tends to focus on the digital platform, presenting a narrative that the development contribution is almost entirely due to the platform without much attention given to activities performed offline. The case study revealed that the fact that the full value chain of Thrive Agric's agricultural finance business and intermediation functions is not completed online through the platform is mainly because of the

characteristics and nature of relationship between Thrive Agric. and the various actors involved in Thrive Agric's agricultural finance 'value chain'; the nature of Thrive Agric's agricultural finance model (input finance); and the digital infrastructural divide between urban and rural areas. This brings to light questions on how debates on platforms for development which are emerging from developing regions are currently presented. Even among developing country researchers (Babarinde et al., 2021), there tends to be a tendency to leave out the offline segment of digital platform business models in developing regions perhaps in the bid to fit into the prevailing narrative that platforms are able to efficiently intermediate between actors, which is mostly true in developed country settings. However, this research exposes the limitations to the use of the digital platform in bridging institutional voids, hence the reliance on the offline segment of the business to perform vital intermediating functions which contribute to agricultural development.

The implication of the reliance on an offline complementary segment is that, from a developing country agricultural development perspective, research and debates on platform for development should not follow a straight-jacket angle of focussing on the platform alone but take into cognisance the role of activities performed offline which result in the successful performance of online functions. From the case of Thrive Agric, this research argues that the agri-finance business model adopted is that of a platform-enabled business which has the platform at the centre of finance sourcing and information provision for investors (just one of many other actors) but significantly relies and invests in developing an active offline segment for intermediation between the platform business and all other actors within their agricultural finance space.

Following prevailing debates on platforms for development which tend to focus on the digital platform (Koskinen et al., 2019; Bonina et al 2021; Heeks et al., 2021; Nicholson et al., 2021), the broader implications for development which arise from *Thrive Agric's* online-offline model is that as long as there are actors who do not have access to the platform segment but who benefit or provide benefits to the platform segment, there will always be the need for an offline segment to link those actors (directly or indirectly) to the platform. Secondly, from the case study it was observed that, this offline segment is made up of the largest group of actors (farmers) who also are also the focus of most debates on agricultural development due to their pivotal role in food production in developing countries. This further buttresses the point that, the offline segment should also take centre stage in platform for

development debate especially because of the importance of actors who make up this segment.

### **6.2.5 Scaling-Up *Thrive Agric*'s Digital Financing Model**

As shown in table 18, *Thrive Agric.* showed significant growth both in the number of farmers funded and the number of platform investors between 2016 and 2019 (the end of data collection). Although the model adopted by *Thrive Agric.* in funding farmers and repaying investors seems to solve vital problems with the financing of agriculture in Nigeria, especially through the bridging of institutional voids, the pathway for growth and increased scaling-up of the model to reach more farmers was a concern during the period of data collection. Between 2018 and 2019, the number of farmers funded rose to 35,000 from 5 funded farmers in 2016 while the number of investors rose to 10,000 in 2018/2019 from 4 investors in 2016. While this can be considered as significant growth, given the number of rural farmers in Nigeria, this is still a very small percentage of farmers reached. To attain a significant impact on agricultural development, the founders (respondent 9 and 10) argue that the most rapid and sustainable means to scale-up their agricultural finance model would involve two aspects: (1) government buy-in and partnership with the government to support the execution of agricultural finance programmes set up by the government; and (2) working with commercial banks to facilitate continuous lending to rural farmers.

First, government buy-in and partnership is important to the success of digital platform agricultural financing in Nigeria because the government has broadest means of reaching rural farmers through its network of state and local government ministries and government employed extension agents. However, what the government lacks is a sustainable means of delivering agricultural finance programmes such that these programmes achieve the desired goal of improving the financing of agriculture and contributing to rural and agricultural development (Eze et al., 2010). Furthermore, the federal government can also partner with platform-enabled businesses like *Thrive Agric.*, to perform credibility enhancement activities which will support the identification of creditworthy farmers instead of following the current model of collateral provision (and the associated transaction costs) as a means of proving farmers' loan eligibility. This will further support the development of a credit scoring system through the aggregation of data on farmers' loan behaviour data. Moreover, the government can also leverage on the extensive training scheme developed by *Thrive Agric.* for their field

agents to train extension agents on monitoring farmers' use of disbursed funds to improve the sustainability of government finance programmes.

Second, for partnerships with commercial banks to facilitate continuous lending to rural farmers, commercial banks can learn from the success of the few commercial banks that have started leveraging on *Thrive Agric's* model for financing farmers. This could also be a means of improving the efficiency of extending loans from agricultural finance programmes which the federal government has rolled-out in partnership with these commercial banks. For instance, the Agricultural Credit Guarantee Scheme Fund (ACGSF) can piggyback on *Thrive Agric's* growing partnerships with commercial banks to extend loans to credible farmers. Ultimately, this could increase the flow of finance to the sector, support commercial banks in overcoming their aversion to lending to farmers, and facilitate *Thrive Agric's* goal of scaling-up their financing of more rural farmers across Nigeria.

### **6.3 The Developing Country Context: Revisiting Khanna and Palepu's Concept of Institutional Voids**

This research's conceptualisation of institutional voids in financing agriculture in Nigeria, initially outlined in section 2.4, attempted to map the linkage between agricultural finance problems and institutional voids. This aimed to illustrate the suitability of institutional voids as a conceptual lens to answer the research questions, specifically understanding how digital platforms can serve as a channel through which institutional voids in financing agriculture can be bridged.

Data collected during the fieldwork for this research aimed at understanding the problems with financing agriculture from the standpoint of farmers, as well as public and private sectors agricultural stakeholders (section 4.3). Supported with the extant literature on agricultural financing in Nigeria, these problems have been further examined through the lens of the research's conceptual framework to understand the manifestation of agricultural finance problems as institutional voids (section 6.2). Armed with a contextual understanding of institutional voids in Nigeria's agricultural finance market, the research sought to identify efforts by *Thrive Agric's* agricultural finance digital platform to address these institutional voids amidst the current issue of low innovation adoption and under development in Nigeria's agricultural sector (sections 5.3 and 6.3). As this research applies the concept of institutional voids to a developing country agricultural finance market which differs from the market environment which Khanna and Palepu derived their conceptual definition of market

intermediaries and voids, it is therefore imperative that I revisit the conceptualisation of institutional voids. This will enable the research to examine the extent to which Khanna and Palepu's conceptual descriptions explain the contextual realities of institutional voids in Nigeria's agricultural finance market.

Firstly, this research identified an additional important institutional void in agricultural finance market that has resulted in poor recovery of agricultural finance with detrimental effects on farmers' access to finance. This void is the *absence of monitoring agents* to follow-up with recipients of agricultural finance to ensure borrowed funds are utilised for agricultural purposes and can be repaid. The weakness of monitoring agencies in agricultural finance markets in Nigeria has been discussed in section 6.1.7 and widely discussed in academic literature as a major cause of the high rate of loan default and diversion of agricultural finance to other non-agricultural activities (Adeyinka et al., 2015; Ibrahim and Mukhtar, 2015; Inegbedion et al., 2018; Ademola, 2019). This has contributed to the widespread aversion of financial institutions and individual investors to lending to rural farmers (Ameh and Andrew, 2017). Ideally, the providers of finance should also perform monitoring activities; however, although this function exists within most financial institutions, their performance is weak (Adeyinka et al., 2015). Difficulties in performing monitoring activities has been attributed to the remoteness of rural farms; high transaction cost in performing monitoring activities and nonchalance of financial institutions especially in cases where these institutions are disbursing government guaranteed loans (Nwaru et al., 2004; Mokhtar et al 2012). Building on the literature, the importance of these monitoring agencies was further supported by primary data that showed an increase in the repayment of agricultural loans when monitoring agents are deployed to monitor the use of finance by farmers in receipt of funds sourced through *Thrive Agric's* digital platform (Respondent 9, 10 and 11).

Secondly, in re-visiting the conceptual framework, the research has identified that indeed, the six institutional functions identified by Khanna and Palepu are weak in Nigeria's agricultural finance markets. However, the research recognises that while Khanna and Palepu's concept provides a description of these intermediating institutional functions as they apply to developed country contexts, it is important, for current and future research, to provide a contextualised description of these market institutions to facilitate the identification of institutional voids that are present in developing country agricultural finance markets. Therefore, table 26 below provides a re-definition of the institutional functions as they apply

to the context of a developing country agricultural finance market (Table 9 section 2.6), in light of findings from this research and the literature review.

**Table 26: Re-defining the Roles of Institutional Intermediaries within a Developing Country's Agricultural Finance Market**

(Source: Author's research, 2018/2019)

<b>Institutional voids</b>	<b>Khanna and Palepu's Conceptual Description</b>	<b>Contextual Description (agricultural finance markets)</b>
Credibility Enhancers	Perform independent certification functions to verify the credibility of market actors.	Reputation builders who prove the creditworthiness of rural farmers thus supporting rural farmers in building credibility and developing a credit history which can be used as evidence of loan repayment to access finance from formal finance institutions.
Information Analysers	Gather and analyse information on market actors, thereby reducing information asymmetries, and improving transparency within markets.	Actors who gather, analyse and present agricultural finance information and agricultural investment opportunities in the form which can be understood by actors (farmers and investors), through a medium which is accessible to different groups. This also includes intermediaries which support farmers with information loan application procedures and fill out application forms on behalf of farmers.
Transaction facilitation	Provide a platform for the exchange of commodities (goods, services, and information) at a lower cost thereby increasing market efficiency and reducing transaction cost.	Actors who reduce the cost of accessing finance (demand) and funding farmers (supply) thereby increasing financial flows from investors to rural farmers.
Aggregators and distribution	Match market demand and supply, at low cost, thereby reducing associated transaction costs.	Actors who gather finance from diverse sources and distribute finance to farmers, thereby matching the demand and supply of agricultural finance (cash and input finance).
Regulators and Public Policy	Create policies and enforce regulations.	Actors who create policies and enforce regulations which seek to improve farmers' access to finance and provides access to markets to support farmers in repaying loans.
Adjudicators	Resolve disputes between actors.	Actors who resolve disputes between actors in agricultural finance markets and ensure that contracts are upheld.
Monitoring agents	<i>Not applicable</i>	Actors who follow up with loan beneficiaries to ensure that loans are being utilised for the purpose for which they were disbursed with the aim of closing the gap between loan repayment (farmers) and recovery (individual investors and financial institutions).



Through this research, it is evident that in Nigeria's agricultural finance market, Khanna and Palepu's description of credibility enhancers should be extended beyond the verification of claims made by farmers on applications or during contract negotiations with individual investors to include *reputation building* of farmers preferably by independent actors who can ensure farmers can repay loans. Due to the historic problem of loan default, this research shows that the reputation of rural farmers is a major determinant in most agricultural funding and investment decisions; and farmers' bad reputation has influenced the flow of investment to the agricultural sector. This research's case study - *Thrive Agric.* - also establishes that reputation building requires a concerted effort by farmers and credibility enhancers; requires significant financial investment in working with farmers within their rural communities; and also requires repeat lending to farmers who repay to build a credit repayment history over a period of time. The research case study - *Thrive Agric.* - also shows how investments in rural farming can increase steadily when investors have confidence in funding the sector.

The problem of information asymmetries on both the demand and supply side of agricultural finance markets further makes it evident that the role of information analysers in agricultural finance markets should be conceptualised beyond "collecting and analysing information about market actors". This research has shown that information analysing functions in agricultural finance markets should also include analysing information about the market itself including market opportunities and processes for harnessing such opportunities such as available credit opportunities, loan application procedures, agricultural investment channels and information about farmers and financial institutions – which is also an aspect of credibility enhancement. Furthermore, an important form of information analysis, as identified from the case study, which improves farmers' ability to repay loans, is the provision of tailored agricultural production related information such as weather forecast; pest and disease management information; improve agronomic techniques to increase yields; and markets information.

This research also shows that transaction facilitators in agricultural finance markets can be identified as those who reduce the cost of farmers accessing and repaying finance while also reducing the cost of financial institutions and individual financiers in extending finance to rural farmers. Therefore, transaction facilitation does not necessarily have to take place in a linear scale as described by Khanna and Palepu in the sense that both sides of the market do not have to come together on one platform to transact. In agricultural finance markets, the focus is on the reduction of transaction cost and not so much on the nature or location of

interaction between both sides of the markets. The case study *Thrive Agric.* showed that unlike other conventional digital platform transactions where the two sides come together to transact independent of the platforms influence, transactions between farmers (demand-side) and investors (supply-side) does not take place on the digital platform in the sense that investors are platform users while farmers are not. However, there is still a reduction in transaction cost in investing in agriculture through the platforms, and a reduction in the transaction cost incurred by farmers in accessing finance through *Thrive Agric.* even though these two groups never come together to transact. Therefore, from the case study *Thrive Agric.*, we understand that transaction facilitators in agricultural finance markets perform an active role in reducing transaction cost by bearing the burden of some of this cost as opposed to the implication that transaction facilitators perform a somewhat passive role of simply ‘*providing a platform for exchange*’ in Khanna and Palepu’s conceptual definition.

The research identified aggregators and distributors in agricultural finance market as those who gather information and finance and distribute these information and finance to different actors using the appropriate distribution channels. Although this function stands alone in Khanna and Palepu’s conceptual framework, in agricultural finance markets, it is intertwined with transaction facilitation and information analysis functions. This is because the case study *Thrive Agric.* shows that in performing transaction facilitating functions which aims at reducing transaction cost, the digital platform is used as a channel to aggregate finance at low-cost from investors, thereby reducing the cost of investing directly in rural farmers. On the other hand, farmers access finance at a low cost because crowdsourced funds are distributed to farmers directly in their local communities in the form of inputs. In the same vein, information on various agricultural investment opportunities is aggregated for investors to access through the platform while on the farmers-side, tailored information on the nature of funding, market prices, agricultural techniques are aggregated and distributed to farmers during preliminary stages of farmer identification and credibility enhancement processes.

Finally, an additional institutional void identified by this research which is the *weakness of monitoring agents* shows that the number of institutional voids may vary depending on the nature and location of the market. While other finance markets within developing countries might not require close monitoring of actors, agricultural finance markets prove to be different in the sense that the evidence from the research’s case study supported by the literature, shows that in the presence of monitoring agents, rural farmers are more likely to repay agricultural loans than in the absence of monitoring agents. The literature on

agricultural financing in Nigeria also begs for the creation of monitoring mechanisms especially with regards to government agricultural finance to follow-up with recipient farmers to reduce the incidence of loan diversion (Ojiako and Ogbukwa, 2012; Olomola and Gyimah-Brempong, 2014; Ofana et al., 2016; Fadeyi, 2018; Orji et al., 2020). However, the case study shows that while closely monitoring the use of finance can significantly reduce loan default, providing access to ready markets will also contribute to farmers' overall ability to repay loans.

Finally, the analysis in this section shows the linkage between the performance of intermediating functions by *Thrive Agric*'s digital platform. The data collected from this study shows that credibility enhancement of farmers requires information analysis. This is because developing the credit histories of farmers entails the aggregation and analysis of farmers' biodata, geospatial data, farm records, and credit data. Transaction facilitation and monitoring requires the aggregation and analysis of farmers' information to improve the efficiency of loan disbursement and recovery - at a low cost. Therefore, by performing these individual but interconnected functions, digital platforms can potentially provide a holistic means through which institutional voids in financing agricultural can be addressed.

## **Chapter 7 - Conclusion and Recommendations**

This chapter presents a summary of the research's findings in light of the research questions posed in chapter 1. To iterate, the research questions are: *what are the institutional problems with financing agriculture in Nigeria and how do they manifest as institutional voids? How are digital platforms emerging to bridge institutional voids in financing agriculture in Nigeria? And what are the implications for development that arise due to the use of digital platforms for agricultural financing in Nigeria?* In this chapter, section 7.1 summaries the findings from answering the research questions, section 7.2 outlines the research's contribution, while section 7.3 proffers recommendations for emerging platforms for agricultural financing in developing countries and suggestions for future research.

### **7.1 Summary of Key Findings**

#### **7.1.1 What are the Institutional Problems with Financing Agriculture and How Do They Manifest as Institutional Voids?**

The literature review and primary data revealed that the problems with financing agriculture in Nigeria stem from institutional failures in agricultural finance markets. These institutional failures have been linked to problems with financing agriculture including information asymmetries; high transaction cost, lack of trust and poor creditworthiness of farmers, weak regulatory frameworks and poor execution of agricultural finance policies; poor contract enforcement and weak monitoring of disbursed agricultural finance. The linkages between Khanna and Palepu's institutional voids and these problems in financing agriculture are illustrated in figure 4 and summarised below:

1. ***Absent credibility enhancers*** required to improve farmers' creditworthiness such as supporting farmers in building a credit history which can be used as evidence of loan repayment to access finance from formal finance institutions. Absence of credibility enhancers has resulted in the high rate of loan default due to lending to farmers who are not creditworthy and an aversion to lending to rural farmers, even those rural farmers who are willing and able to repay loans.
2. ***Weak information analysers*** required to gather, analyse and present agricultural finance opportunities to farmers and investors through accessible channels. This also includes intermediaries which support farmers with information on loan application procedures and fill out application forms on behalf of famers. The weakness of information analysers has resulted in information asymmetries and adverse selection

of rural farmers by opportunistic financiers; poor access to formal sources of finance by farmers which often have lower interest rates; poor knowledge of profitable investment opportunities by potential financiers thereby reducing financial flows to the sector from alternative sources. On the side of financial institutions, weak information analysis increases transaction costs in verifying farmers' identities during loan application processing thereby resulting in late disbursement of funds and outright rejection of loan applications in some cases.

3. ***Weak transaction facilitators*** required to reduce the cost of financing rural farmers and reduce the cost of accessing agricultural finance by intermediating between the demand and supply sides of agricultural finance markets. The weakness of transaction facilitators in agricultural finance markets has reduced the flow of finance from investors to farmers due to high costs that tend to outweigh profits from agricultural investments.
4. ***Weak aggregators and distributors*** required to facilitate the gathering of finance from investors and distribution of finance to farmers, thereby efficiently matching the demand and supply of agricultural finance. Also, weakness in aggregating and distributing information on available agricultural credit options to farmers and distributing information on available agricultural investment opportunities to investors.
5. ***Weak regulators, inefficient policy formulation and execution*** required to ensure that the lending activities of financial institutions, including agricultural finance digital platforms, are properly regulated; and to formulate policies to encourage the flow of finance to the agricultural sector.
6. ***Weak Adjudicators*** required to resolve disputes between farmers and lenders and to facilitate the enforcement of contracts in agricultural finance markets.
7. ***Weak Monitoring agents*** required to follow-up with loan beneficiaries to ensure that loans are being utilised for the purpose for which they were disbursed with the aim of closing the gap between loan repayment (farmers) and recovery (individual investors and financial institutions).

The weakness of these intermediaries has created institutional voids which have resulted in the low-level of investment in the agricultural sectors and consequently, the slow rate of rural and agricultural development in Nigeria.

### 7.1.2 How are Digital Platforms Emerging to Bridge Institutional Voids in Financing Agriculture?

There has been a steady rise in the number of digital platforms for agricultural finance in Nigeria. These platforms have been developed to aggregate finance from individuals, and in some cases, institutional investors through crowdsourcing to fund rural farmers. This research adopted *Thrive Agric.* as a single case study to understand how digital platform emerge in a developing country market characterised by institutional voids. It was found that digital platforms are developed as an entrepreneurial response to poor agricultural financing in Nigeria. These platform owners are young entrepreneurs who have evolved methods for addressing problems with farmers' access to finance and investor's access to credible rural agricultural investment opportunities. *Thrive Agric.*'s platform shows evidence that digital platforms can address institutional voids that arise due to the weakness of intermediating institutions in performing credibility enhancement; transaction facilitation; information analysis; aggregation and distribution; and monitoring. The research also revealed that agricultural finance platforms are also able to bridge these voids by developing an offline complementary segment to facilitate functions relating to credibility enhancement of farmers, aggregation and distribution of information and inputs for farmers, and monitoring of agricultural finance sourced through the digital platform. Specifically, *Thrive Agric.* bridges institutional voids through:

1. ***Credibility enhancement of rural farmers:*** *Thrive Agric.*'s has developed a bespoke model for credibility enhancement which entails an extensive background check on farmers, starting from the community level down to household level. This has improved investor's confidence to finance agriculture hence improving farmers' access to agricultural finance (figure 20 section 6.2.1). Prior to the development of the platform, identifying credible farmers to invest in was the responsibility of investors which increased the transaction costs of financing rural farmers. Failure to ascertain the credibility of rural farmers before funding their farm enterprise increases the likelihood of loan default.
2. ***Information analysis and information provision to farmers and investors:*** This is performed through face-to-face information day programmes organised at the local community level to provide information to farmers on *Thrive Agric.*'s finance model. On the investor's side, information on agribusiness investment is provided on the digital platform to enable investors make informed decisions (section 5.1, figure 2).

Information search represents another cause for the high transaction cost in financing agriculture. Prior to *Thrive Agric*'s entrance into the market, information search for both farmers and investors posed significant transportation and time cost. However, this cost has been significantly reduced due to the platform (for investors) and information day in local communities (for farmers).

3. ***Transaction Facilitation for both investors and farmers:*** The digital platform facilitates the performance investment transactions for platform users. While on the farmers' side, *Thrive Agric.* facilitates transactions between farmers and input suppliers, insurance companies, extension agents, large-scale off-takers and financial investors. Prior to the creation of *Thrive Agric*'s platform, investors would have to travel to rural areas to perform these investment transactions resulting in high transportation and time costs. On the farmers' side, most farmers were excluded from input and output markets due to their small-scale of production and poor product quality. Farmers also incur transaction cost in accessing finance from formal financial institutions often located in urban areas; and incur intermediation costs in performing loan application procedures.
4. ***Aggregation and Distribution of finance and information:*** *Thrive Agric.* uses a digital platform to gather finance for farmers because finance aggregation is performed easier and quicker from many people across different geographic locations. The digital platform also facilitates the transmission of information to larger audiences in real time. Offline, *Thrive Agric.* adopts an input finance model to aggregate inputs from large-scale input companies and re-distribute in small quantities to rural farmers. Prior to the development of the platform, there was no structure for individual agricultural financing of rural farmers. The platform has provided an easy investment procedure that facilitates finance aggregation from investors and repayment of investment capital and interest.
5. ***Monitoring farmers use and repayment of agricultural finance:*** *Thrive Agric.* has developed a multi-level model to monitor the use of finance by rural farmers and facilitate recovery of finance (figure 21, section 6.2.1). Through close monitoring, *Thrive Agric.* has recorded zero incidence of loan default among farmers funded through the platform.

Therefore, through this research it is evident digital platform such as *Thrive Agric.* which are currently operating in the agricultural finance market are leveraging on the presence of

institutional voids to establish their business processes and introduce new models for bridging voids due to the weakness of information analysers, transaction facilitators, aggregators and distributors, credibility enhancers and monitoring agents.

### **7.1.3 What are the Implications for Agricultural Development that Arise Due to the Use of Digital Platforms for Agricultural Financing?**

The research revealed that the use of digital platforms to democratise access to agricultural finance is accompanied by benefits and dis-benefits that influence their developmental outcomes in Nigeria's rural agricultural sector. The major contribution of agricultural finance digital platforms to rural and agricultural development is the potential to bridge institutional voids that constrains rural farmers' access to agricultural finance by creating new and more efficient processes that facilitate individuals and financial institutions to finance agriculture. This research showed that crowdsourcing of agricultural finance for rural farmers presents an alternative source of formal finance that is characterised by lower transaction cost for both farmers and investors. The reduction of transaction cost in accessing and disbursing finance is a significant contribution to agricultural development, as this constitutes a key reason for the low level of investment in the sector. Moreover, the creation of new structures for individuals to finance agriculture through digital platforms is another significant developmental benefit because idle cash sourced from individuals has proven to result in over 1-million-dollar investment in rural agriculture since 2015. Without digital platforms, this cash could have remained in banks as savings or invested in other sectors of the economy.

However, the use of digital platform for agricultural financing also results in negative outcomes for agricultural development. First is the fact that due to technical barriers and financial constraints, farmers are excluded from digital platforms and therefore unaware of the processes and total amount of finance being crowdsourced. The implication of this lack of knowledge is that it creates avenues for poor accountability of platforms to farmers and even adverse selection of 'farmer beneficiaries. Secondly, between 2015 and 2019, there was an absence of defined policy frameworks to govern the use of digital platforms for agricultural finance. This lack of clearly established policy frameworks questioned the sustainability of platform-enabled models in continuously providing agricultural finance for rural farmers and created avenues for the diversion of funds gathered for agricultural finance to other non-agricultural ventures, and even Ponzi schemes leveraged on the rapid adoption of the innovation to dupe unsuspecting agricultural investors (Soreh, 2017; Augustine, 2019).



However, from January 2020, The Securities and Exchange Commission (SEC) in Nigeria became active in the crowdsourcing space by establishing regulations to improve the transparency of crowdsourcing activities; and to legalise crowdfunding as a legitimate activity governed by a defined policy framework (SEC, 2020). In SEC's new regulations, agricultural finance digital platforms fall under the category of Digital Commodities Investment Platforms (DCIPs) which is defined as “*a digital platform which links investors to sponsor specific agricultural commodities projects for a return*” (SEC, 2020). DCIPs must register with SEC but they are exempted from having a “*paid-up capital*” of 100 million Naira (182,357.21 GBP). The implication of the exemption from this minimum paid-up capital is that agricultural finance platform, which are mostly start-ups and lack the capacity to raise up to 100 million naira (182,357.21 GBP) can still participate in crowdfunding activities to finance farmers. This will ultimately have direct positive impact on farmers' access to finance. However, the issue of investors' protection is vaguely covered by the new SEC rules, as there are no clear guidelines for recovery of investment funds in cases where DCIPs fail. This still presents a layer of complexity and uncertainty for agricultural investors through DCIPs that has negative implications for farmers who have come to rely on digital platforms as a primary source of agricultural finance.

## **7.2 Research Contribution**

This research provides three key contributions. First is a contextual understanding of institutional voids in a developing country agricultural finance market and a re-definition of the roles of institutional intermediaries in a developing country market context. Second is the identification of an additional institutional void - *the absence of monitoring agents* - in Nigeria's agricultural finance market, which is a void not included in Khanna and Palepu concept of institutional voids; and third is contributing to the nascent conceptualisation of digital platforms intermediating functions in bridging institutional voids in agricultural finance markets in Nigeria.

First, Khanna and Palepu's conceptual framework on institutional voids provides a description of institutional intermediaries and institutional voids from the perspective of emerging and developed markets. This research applies this framework in identifying institutional voids in Nigeria's agricultural finance markets – *a developing country context* – and goes further to redefine these institutional functions and voids based on the realities of the problems in financing agriculture. This research contribution will facilitate future research

in the identification of institutional voids within agricultural and non-agricultural sectors of developing countries.

Second, Khanna and Palepu's conceptual framework on institutional voids describe six markets institutions which when absent or weak result in the emergence of voids. This research revealed that the six institutional voids described by Khanna and Palepu are present in Nigeria's agricultural finance market. However, an additional institutional void, which is the weakness of monitoring agents, was identified as a crucial intermediation function required to ensure loan recovery. The performance of monitoring activities in agricultural finance market is weak and non-existent in some cases as evidenced in the prevalence of loan diversion to non-agricultural purposes and the consequent high rate of loan default among rural farmers.

Third, the research revealed that digital platforms are being used to facilitate intermediating activities that are necessary to bridge the gap between the demand and supply of agricultural finance. These intermediating activities take place both online and offline to ensure that finance sourced online to support offline-farming activities is repaid to investors. This reveals the importance of an offline intermediation segment of the platform business which is usually not emphasised in most platforms for development research. As discussed in chapter section 6.2 and summarised in section 7.1.2 in performing these intermediating activities, these platforms bridge institutional voids which are created due to the weakness of transaction facilitators, Information analysers, aggregators and distributors, credibility enhancers and monitoring agents.

Therefore, digital platforms have simplified the process of agricultural investment such that farmers can be funded within minutes using a mobile device. By breaking down barriers to participating in agricultural finance markets, digital platforms have increased financial flows from a large number of individual financiers to rural farmers which was previously challenging to manage. Nigerians in Diaspora are also able to participate in agricultural finance markets because rural agriculture is now considered a lucrative business venture. Digital platforms have further improved the visibility of rural farming by portraying rural agriculture as the 'next big thing'.

Furthermore, digital platforms have created new and more efficient procedures for processing, disbursing, and recovering agricultural finance that differ from conventional finance institutions. Thus, some conventional financial institutions are beginning to leverage

on these new processes created by digital platforms to extend and recover finance from rural farmers. The resultant effect is that there is more available finance for farmers to perform their production activities. Interviews revealed that prior to investing in agriculture through digital platforms, most investors left their funds in bank as ‘savings’ which earn little returns. Also, primary and secondary data revealed that the return on investment offered by agricultural finance digital platforms is competitive when compared to investment in other economic sectors.

The research findings also show the disruptive potential of digital platforms. It was observed that for individual financiers there is an increased possibility for investing in agriculture through digital platforms to gradually replace other conventional (non-digital) channels of investment as evidenced in interviews with platform investors who have experience investing in agriculture non-digitally. Most of these respondents no longer invest in agriculture non-digitally showing evidence of a displacement of non-digital investment activities by digital financing. Second is the change in the mind-set of new entrant investors who have no prior experience of investing in agriculture especially due to the impression that agriculture was not a viable investable venture. However, with the digitising of agricultural investment processes, investors are able to engage with agricultural financing as they would other non-agricultural investments thereby increasing investor buy-in. This indicates that digital platforms have disruptive potentials but the extent to which these small pockets of disruptive impacts can gain traction and create broader impacts depends on the ability of agricultural finance platforms to gain wider adoption and become institutionalised within the agricultural sector through government buy-in. While the regulatory frameworks put in place by the SEC has legitimised crowdfunding for agriculture, these platforms could become even more disruptive if the government established partnerships with digital platforms to leverage on these platforms existing models for bridging institutional voids. The research observed that without this high-level buy-in, digital platforms would struggle to achieve the scale that can make significant contribution to addressing institutional voids in financing agriculture. What they can achieve, at best, is isolated cases of supporting small clusters of farmers, as is the case currently.

### **7.3 Recommendations for Emerging Agricultural Finance Platforms in Nigeria**

Agricultural finance digital platforms are emerging in an environment that presents several entrepreneurial opportunities especially through bridging institutional voids. Drawing from

the case study, primary evidence is presented on how platforms currently address voids that constrain agricultural financing both on the side of investors and farmers. However, digital platforms can perform intermediating functions within agricultural finance markets to further address institutional voids at a larger scale than the current isolated intermediation cases in financing agriculture. This will however require agricultural finance platforms to collaborate to bring about the much-needed development in the agricultural sector.

First, these platforms should evolve independent structures to aggregate and analyse finance data generated from farmers to create credit profiles on funded farmers. These credit profiles will provide the foundation for developing farmers' credit histories that will facilitate financial institutions and individual financiers to extend credit to farmers - outside the influence of platforms. This will further democratise agricultural financing by giving farmers and investors more power in deciding what institutions to access finance from, and which farmers to fund respectively. Moreover, this will reduce information asymmetries that lead to adverse selection of farmers on the one hand and the funding of farmers are not creditworthy, on the other hand.

Second, in building investors' confidence in financing agriculture through platforms, digital platforms need to improve the transparency of their activities. The SEC's new regulations on crowdfunding which stipulates that DCIPs cannot crowdfund for other non-agricultural investment was a welcome regulation which has ensured that funds crowdsourced for agriculture are not diverted to other non-agricultural investments. This has however, resulted in many agricultural finance platforms exiting the space, and thereby raising questions as to the nature of their activities, and if many of these platforms were indeed funding agriculture (Ojewale, 2021). While this is speculative, it has further strengthened the lack of trust for crowdfunding platforms among Nigerians (Augustine, 2019). Therefore, although agricultural finance platforms have huge potential to facilitate agricultural finance, more effort needs to be made in providing investors with information on how funds are used outside the core funding of farmers. For instance, finance used for credibility enhancement activities, training field management staff, monitoring activities and other ad hoc activities should be declared to investors for the sake of transparency.

Finally, the impact of agricultural finance platforms in addressing institutional voids is weakened by the nature of voids they maintain and those they create. Agricultural finance platforms need to support farmers in gaining some level of digital finance literacy in the

sense that farmers need to be aware of the nature of data platforms collect about them and how they (farmers) can use this data to access finance from other sources. Currently, voids due to weak information analysers are maintained by agricultural finance platforms due to certain information asymmetries that exist between platforms and farmers especially due to the educational barriers that constrain farmers from gaining digitally packaged information. Therefore, concerted efforts should be made to reduce these asymmetries. Farmers need to know that these platforms exist and understand the crowdsourcing process and their role at the centre of this process. This would further democratise information access, thereby improving how platforms reduce information asymmetries in agricultural financing.

## Reference

- Abah, R.C. and Petja, B.M. (2015) The socio-economic factors affecting agricultural development in the lower river Benue Basin. *Journal of Biology, Agriculture and Healthcare*, 5(24): 84-94
- Abdallah, A.H. (2016) Does credit market inefficiency affect technology adoption? Evidence from Sub-Saharan Africa. *Agricultural Finance Review*. 74(4): 494-511
- Abdulsamad, A., Brun, L. and Gereffi, G. (2013) Realizing the Potential of African Agriculture: Innovations and Market Access for Smallholder Farmers. Duke University, Center on Globalization, Governance & Competitiveness.
- Abubakar, N.H. and Dasuki, S.I. (2018) Empowerment in their hands: use of WhatsApp by women in Nigeria. *Gender, Technology and Development*, 22(2): 164-183.
- Acha Ikechukwu, A. and Acha, I., 2012. Microfinance banking in Nigeria: Problems and prospects. *International Journal of Finance and Accounting*, 1(5): 106-111.
- Adebayo, O.O. and Adeola, R.G. (2008) Sources and uses of agricultural credit by small scale farmers in Surulere Local Government Area of Oyo State, *The Anthropologist*, 10(4): 313-314.
- Adebisi, L.O., Jimoh, O., Asuquo, J., Osasona, K.K. and Ojediran, E.O. (2019) Effect of contract farming on poultry farming households food security in Osun State, Nigeria. *Agro-Science*, 18(1): 45-49.
- Adesoye, A.B. and Atanda, A.A. (2012) Development finance institutions in Nigeria: Structure, roles, and assessment. MPRA Paper No. 35839.
- Adetiloye, K.A. (2012) Agricultural financing in Nigeria: an assessment of the Agricultural Credit Guarantee Scheme Fund (ACGSF) for food security in Nigeria (1978-2006). *Journal of Economics*, 3(1): 39-48.
- Adeyonu, A.G. (2016) Determinants of poultry farmers' willingness to participate in national agricultural insurance scheme in Oyo State, Nigeria. *Applied Tropical Agriculture*, 21(3): 55-62
- Adjakou, O.J.L. (2021) Crowdfunding: Genesis and Comprehensive Review of Its State in Africa. *Open Journal of Business and Management*, 9(2): 557-585
- Adjognon, S.G., Liverpool-Tasie, L.S.O. and Reardon, T.A. (2017) Agricultural input credit in Sub-Saharan Africa: Telling myth from facts. *Food policy*, 67: 93-105.
- Adofu, I., Abula, M. and Agama, J.E (2012) The effects of government budgetary allocation to agricultural output in Nigeria. *Sky Journal of Agricultural Research*, 1(1): 1-5
- Adomi, E.E., Ogbomo, M.O. and Inoni, O.E. (2003) Gender factor in crop farmers' access to agricultural information in rural areas of Delta State, Nigeria. *Library Review*.
- AfDB (2005) Agriculture and Rural Institution Support Project, Appraisal Report [Online], available [https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Nigeria - Agriculture and Rural Institutions Support Project - Appraisal Reports.pdf](https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Nigeria_-_Agriculture_and_Rural_Institutions_Support_Project_-_Appraisal_Reports.pdf) [Date accessed: 15.05.2020]

- Agada, S.G., Iheanacho, A.C. and Ogbanje, E.C. (2018) Causes and measures for controlling loan default among Agricultural Cooperatives in Bune State, Nigeria. *International Journal of Environment, Agriculture and Biotechnology*, 3(5): 264449.
- Agbo, F.U. (2009) Farmers' perception of cooperative societies in Enugu State, Nigeria, *Agro-Science*, 8(3).
- Agwu, A.E., Dimelu, M.U. and Madukwe, M.C. (2008) Innovation system approach to agricultural development: Policy implications for agricultural extension delivery in Nigeria. *African Journal of Biotechnology*, 7(11).
- Agwu, A.E. and Abah, H.O. (2009) Attitude of farmers towards cost-sharing in the second national fadama development project (NFDP-II): the case of Kogi State of Nigeria. *Journal of Agricultural Extension*, 13(2).
- Agyekumhene, C., de Vries, J.R., van Paassen, A., Macnaghten, P., Schut, M. and Bregt, A. (2018) Digital platforms for smallholder credit access: The mediation of trust for cooperation in maize value chain financing. *NJAS-Wageningen, Journal of Life Sciences*, 86:77-8
- Ajon, A.T. and Anjembe, B.C. (2018) Assessment of physical and chemical properties of soils for agriculture in Yandev, Gboko, Benue State, Nigeria. *International Journal of Innovative Agriculture & Biology Research*, 6(3), pp.72-78.
- Ajoni, K., Ajakaiye, O., Oyedipe, E.O. and Babu, S.C. (2017) *Strategies for restructuring the Agricultural Research Council of Nigeria: Process, opportunities, and lessons* (Vol. 41). Intl Food Policy Res Inst.
- Ajuwon, O., Ikhida, S. and Akotey, J. (2018) Financing MSMEs (Micro Small and Medium Enterprises) in Nigeria: Implications of Transaction Costs.
- Akanni, K.A. (2007) Effect of micro-finance on small scale poultry business in Southwestern Nigeria, *Emirates Journal of Food and Agriculture*, 38-4
- Aker, J.C. (2011) Dial "A" for agriculture: a review of information and communication technologies for agricultural extension in developing countries, *Agricultural economics*, 42(6): 631-647
- Akeredolu, F. (2019) Crowdfunding in Nigeria: Investing in Agriculture, [Online] Available: <https://businessinnigeria.com.ng/crowdfunding-in-nigeria-agriculture/> [Date Accessed: 13/01/20]
- Akinleye, S.O., Akanni, K.A. and Oladoja, M.A. (2005) An appraisal of the agricultural credit guarantee scheme in Nigeria, *Journal of Agricultural Management and Rural Development*, 2(1).
- Akinlo, A.E. (2011) Policy choices and challenges in expanding access to finance for growth in rural Nigeria. *Economic and Financial Review*, 49(4): p.22.
- Akpan, S.B., Obot, U.A.D. and Essien, U.A. (2012) Government agricultural credit policy and macroeconomic fundamentals: A case study of agricultural credit guarantee scheme fund in Nigeria, *Public Policy and Administration Research*, 2(2): 61-75.
- Aladejebi, O., 2020. Crowdfunding: An Emerging Source of Raising Funds In Nigeria. *Archives of Business Review–Vol*, 8(7)

- Amankwah-Amoah, J., Debrah, Y.A. and Nuerthey, D. (2018) Institutional legitimacy, cross-border trade and institutional voids: Insights from the cocoa industry in Ghana, *Journal of Rural Studies*, 58: 136-14
- Amariles, F., Paz, O.P., Russell, N. and Johnson, N. (2006) The impacts of community telecenters in rural Colombia, *The Journal of Community Informatics*, 2(3).
- Anderson, J.R., Feder, G., Ganguly, S. (2006) The rise and fall of training and visit extension: An Asian mini-drama with an African epilogue. Policy Research Working Paper 3928, The World Bank, Washington, DC.
- Anderson, J.R., Feder, G. (2007) Handbook of agricultural economics. *Agric.Extension*. 3: 2343–2378
- Ani, N.M., 2017. *Impact Of The Commercial Agriculture Credit Scheme On The Performance Of Beneficiaries In Anambra State Nigeria* (Doctoral dissertation).
- Anyanwu, C.M. (2004) November. Microfinance institutions in Nigeria: policy, practice and potentials. In *G24 Workshop on "Constraints to Growth in Sub Saharan Africa," Pretoria, South Africa* (1-31).
- Apata, T.G., Apata, O.M., Igbalajobi, O.A. and Awoniyi, S.M.O. (2010) Determinants of rural poverty in Nigeria: Evidence from small holder farmers in South-western, Nigeria, *Journal of Science and Technology Education Research*, 1(4): 85-91.
- Aryeetey, E. (1997) Rural finance in Africa: Institutional developments and access for the poor. In *Proc. of the Annual World Bank Conference on Development Economics. Washington DC* (149-154)
- Ashwin, A.S. (2012) Bridging Institutional Voids through New Services: Case Studies and Analysis. In 2012 Third International Conference on Services in Emerging Markets (6-13). IEEE.
- Atieno, R. (2001) Formal and informal institutions' lending policies and access to credit by small-scale enterprises in Kenya: An empirical assessment (Vol. 111). *Nairobi: African Economic Research Consortium*
- Augustine, A.A., 2019. Crowdfunding and SMEs financing in Nigeria-threat and opportunities. *International Journal of Development Research*, 9(09), pp.30091-30100
- Awogbenle, C. A. & Iwuamadi, C. K. (2010) Youth unemployment: Entrepreneurship development programme as an intervention mechanism, *African Journal of Business Management*, 4(6): 831-835.
- Awojobi, O.N. (2014) Corruption and underdevelopment in Africa: A discourse approach. *International Journal of Economics, Commerce and Management*, 2(10):1-14
- Awotide, B.A., Abdoulaye, T., Alene, A. and Manyong, V.M. (2015) *Impact of access to credit on agricultural productivity: Evidence from smallholder cassava farmers in Nigeria* (No. 1008-2016-80242
- Ayele, S., Duncan, A., Larbi, A. and Khanh, T.T. (2012) Enhancing innovation in livestock value chains through networks: Lessons from fodder innovation case studies in developing countries, *Science and public policy*, 39 (3): 333-346.



- Babcock, L.H. (2015) Mobile payments: How digital finance is transforming agriculture. CTA, CGIAR.
- Badiru, I.O. (2010) Review of small farmer access to agricultural credit in Nigeria. *IFPRI Policy Note*, 25.
- Bammann, H. (2007) Participatory value chain analysis for improved farmer incomes, employment opportunities and food security, *Pacific Economic Bulletin*, 22 (3): 113-125
- Barreti C. B. and Mutambatsere E (2008). Agricultural markets in developing countries. *The New Palgrave Dictionary of Economics*, 91-95.
- Baumüller, H (2015) Agricultural Innovation and Service Delivery through Mobile Phones. *Analyses in Kenya. Faculty of Agriculture, University of Bonn, Bonn.*
- Baumüller, H. and Lohento, K. (2016) Home-grown ICT solutions in agriculture come from young entrepreneurs. *ICT Update*, 2-4.
- Bazuin, S., Azadi, H. and Witlox, F. (2011) Application of GM crops in Sub-Saharan Africa: lessons learned from Green Revolution. *Biotechnology advances*, 29(6): 908-912.
- Best, R., Ferris, S. and Schiavone, A. (2005) Building linkages and enhancing trust between small-scale rural producers, buyers in growing markets and suppliers of critical inputs. In *Beyond agriculture—making markets work for the poor. Proceedings of an international seminar*, 28: 19-50.
- BOA (2020) Bank of Agriculture. Our Products and Services [Online] available: <https://www.boanig.com/> Date assessed: 15.05.2020
- Boateng, R., Budu, J., Mbrokoh, A. A., Boateng, S, L. and Anderson, A. B. (2017) Digital Enterprises in Africa: A synthesis of current evidence, DIODE, Centre for development informatics, Global development institute
- BOI (2020) Bank of Industry Managed Funds [Online], available: <https://www.boi.ng/managed-fund/> Date Assessed: 15. 05. 2020
- Bonina, C., Koskinen, K., Eaton, B. and Gawer, A. (2021) Digital platforms for development: Foundations and research agenda. *Information Systems Journal*, 31(6): 869-902
- Bouman, F.J. (1995) Rotating and accumulating savings and credit associations: A development perspective, *World development*, 23(3): 371-384.
- Boyatzis, R. (1998) Transforming qualitative information: Thematic analysis and code development. Thousand Oaks, CA: Sage.
- Braun, V., and Clarke, V. (2013) Successful qualitative research: A practical guide for beginners. London, England: SAGE.
- Budget Office of the Federation (2021) Sectoral Budgetary Allocations [online] available: <https://www.budgetoffice.gov.ng/index.php/resources/internal-resources/budget-documents/2021-budget> [Date accessed: 22/11/2021]
- Bukht, R. and Heeks, R. (2018) Digital economy policy in developing countries, DIODE, Centre for development informatics, Global development institute

- Busenitz, L.W., Gomez, C. and Spencer, J.W. (2000) Country institutional profiles: Unlocking entrepreneurial phenomena. *Academy of Management journal*, 43(5): 994-1003
- Byerlee, D., De Janvry, A. and Sadoulet, E. (2009) Agriculture for development: Toward a new paradigm. *Annual. Review Resource Economics*, 1(1): 15-31.
- Calderón, C. and Servén, L. (2010) Infrastructure and economic development in Sub-Saharan Africa. *Journal of African Economies*, 19: 13-87.
- CBN (2017) Report of Activities Under the Agricultural Credit Guarantee Scheme Fund [Online] available: <https://www.cbn.gov.ng/Documents/acgsf.asp> Date accessed: 19.05.2020
- CBN (2020a) About CBN [Online] Available: <https://www.cbn.gov.ng/AboutCBN/> Date accessed: 18.08.2020
- CBN (2020b) Agricultural credit [Online], available: <https://www.cbn.gov.ng/devfin/acgsf.asp> Date accessed: 18.08.2020
- Cerdán-Infantes, P., Maffioli, A. and Ubfal, D. (2008) The impact of agricultural extension services: The case of grape production in Argentina. Office of Evaluation and Oversight (OVE). Inter-American Development Bank. Washington, DC
- Chavula, H.K. (2014) The role of ICTs in agricultural production in Africa, *Journal of Development and Agricultural Economics*, 6(7): 279-289
- Choake, J (2019) Drones: Supporting precision agriculture in Africa [Online], Available: <https://www.cta.int/en/digitalisation/all/article/drones-supporting-precision-agriculture-in-africa-sid056dfe62d-f646-4925-9849-46ef8fa5dd72> [Date accessed: 17/12/19]
- Cohen, L., Manion, L., and Morrison, K. (2011) *Research methods in education* (7th ed.). New York, NY: Routledge.
- Constantinides, P., Henfridsson, O. and Parker, G.G. (2018) Introduction—platforms and infrastructures in the digital age.
- Crabtree, B., and Miller, W. (1999) A template approach to text analysis: Developing and using codebooks. In B. Crabtree & W. Miller (Eds.), *Doing qualitative research* (pp. 163-177.) Newbury Park, CA: Sage.
- CTA (2019) The Digitisation of Africa's Agriculture [online] Available: [The Digitalisation of African Agriculture Report launch \(cta.int\)](#) [Date Assessed: 09/08/2020]
- Daly, J., Kellehear, A., and Gliksman, M. (1997) *The public health researcher: A methodological approach*. Melbourne, Australia: Oxford University Press.
- David-West, O. and Evans, P.C. (2016) The rise of African platforms: A regional survey. *The Emerging Platform Economy Series*, (2)
- David-West, O., Umukoro, I.O. and Onuoha, R.O. (2018) Platforms in Sub-Saharan Africa: startup models and the role of business incubation. *Journal of Intellectual Capital*.
- David-West, O., Muritala, O. and Umukoro, I.O. (2019) SME techno-entrepreneurship: drivers and barriers in sub-Saharan Africa. In *Handbook of Research on Techno-Entrepreneurship*, Third Edition. Edward Elgar Publishing.

- Davis, B., Di Giuseppe, S. and Zezza, A. (2017) Are African households (not) leaving agriculture? Patterns of households' income sources in rural Sub-Saharan Africa. *Food policy*, 67:153-174.
- Dawson, N., Martin, A. and Sikor, T. (2016) Green revolution in Sub-Saharan Africa: implications of imposed innovation for the wellbeing of rural smallholders, *World Development*, 78: 204-218.
- De la Torre-Castro, M. and Lindström, L. (2010) Fishing institutions: Addressing regulative, normative and cultural-cognitive elements to enhance fisheries management. *Marine Policy*, 34(1): 77-84
- de Laiglesia, J. (2006), "Institutional Bottlenecks for Agricultural Development: A Stock-Taking Exercise Based on Evidence from Sub-Saharan Africa", OECD Development Centre Working Papers, No. 248, OECD Publishing, Paris, <https://doi.org/10.1787/671788081061>.
- de Reuver, M., Sørensen, C. and Basole, R.C. (2018) The digital platform: a research agenda. *Journal of Information Technology*, 33(2): 124-135
- Deichmann, U., Goyal, A. and Mishra, D. (2016) Will digital technologies transform agriculture in developing countries?. The World Bank.
- Demenongu, T.S., Yahaya, M. and Jiriko, R. (2018) Assessment of farm inputs distribution under the e-wallet scheme in Benue State, Nigeria. *International Journal of Agricultural and Food Research*, 6(2)
- Dialoke, I. and Veronica, M.I. (2017) Policy formulation and implementation in Nigeria: The bane of underdevelopment. *International Journal of Capacity Building in Education and Management*, 3(2): 22-27.
- Diao, X., Headey, D. and Johnson, M. (2008) Toward a green revolution in Africa: what would it achieve, and what would it require?. *Agricultural Economics*, 39: 539-550.
- Diao, X., Hazell, P. and Thurlow, J. (2010) The role of agriculture in African development, *World development*, 38(10): 1375-1383.
- DiMaggio, P. J. (1988) 'Interest and Agency in Institutional Theory', in L. Zucker (ed.) *Research on Institutional Patterns and Organizations: Culture and Environment*, 3-22. Cambridge, MA: Ballinger.
- Doh, J., Rodrigues, S., Saka-Helmhout, A. and Makhija, M. (2017) International business responses to institutional voids. *Journal of International Business Studies*, 48(3): 293-307
- Dorward, A.R., Kirsten, J.F., Omamo, S.W., Poulton, C. and Vink, N. (2009) Institutions and the agricultural development challenge in Africa. *Institutional economics perspectives on African agricultural development*, 1: 3-34.
- Drouillard, M. (2017) Addressing voids: How digital start-ups in Kenya create market infrastructure. An entrepreneurial revolution in the making *Digital Kenya*, 97-131
- D'Silva, B.C. and Raza, M.R. (1980) Integrated rural development in Nigeria: The Funtua project, *Food Policy*, 5(4): 282-297
- Duncan, A. and Howell, J. (1992) Structural adjustment & the African farmer.

- Duncombe, R. (2016) Mobile phones for agricultural and rural development: A literature review and suggestions for future research. *The European Journal of Development Research*, 28(2): 213-235.
- Duncombe, R. and Heeks, R. (2002) Enterprise across the digital divide: information systems and rural microenterprise in Botswana. *The Journal of the Development Studies Association*, 14(1): 61-74.
- Dwivedy, N. (2011) Challenges faced by the Agriculture Sector in Developing Countries with special reference to India. *International journal of rural studies*, 18(2)
- Eisenhardt, K.M. (1989) Building theories from case study research, *Academy of management review*, 14(4): 532-550
- Etikan, I., Musa, S.A. and Alkassim, R.S. (2016) Comparison of convenience sampling and purposive sampling, *American journal of theoretical and applied statistics*, 5(1): 1-4.
- Etonihu, K.I., Rahman, S.A. and Usman, S. (2013) Determinants of access to agricultural credit among crop farmers in a farming community of Nasarawa State, Nigeria, *Journal of Development and Agricultural Economics*, 5(5): 192-196
- Evbuomwan, G.O. and Okoye, L.U. (2017) Evaluating the Prospects of the Anchor Borrowers Programme for Small Scale Farmers in Nigeria, *International Farm Managers Congress*, 1-10
- Eze, C.C., Lemchi, J.I., Ugochukwu, A.I., Eze, V.C., Awulonu, C.A.O. and Okon, A.X. (2010) *Agricultural financing policies and rural development in Nigeria* (No. 352-2016-18042)
- Fadeyi, O.A. (2018) Smallholder agricultural finance in Nigeria: literature review on the research gap. *International Journal of New Technology and Research*, 4(8), p.263014.
- Fafchamps, M. (2003) Market institutions in sub-Saharan Africa: Theory and evidence. MIT press. <https://pdfs.semanticscholar.org/11f1/5b6fbeca30e9bb0f033b82b6fe013d1dd311.pdf>
- Fagerberg, J. and Srholec, M. (2008) 'National innovation systems, capabilities and economic development', *Research policy*, 37(9): 1417-1435.
- Famogbiele, A. (2013) The challenges of agricultural finance in Nigeria: Constraints to sustainable agricultural and economic revival, *International Journal of Business and Social Research (IJBSR)*, 3(5): 234-244
- FAO (2002) The role of agriculture in the development of Least-Developed Countries and their integration into the world economy [Online], Available: <http://www.fao.org/3/a-y3997e.pdf> [Date accessed: 15/12/2019]
- FAO (2021) Nigeria at a Glance. <http://www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/>
- Fereday, J. and Muir-Cochrane, E. (2006) Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development, *International journal of qualitative methods*, 5(1): 80-92.
- Fink, Arlene (2003) *The survey handbook*. Thousand Oaks, CA: Sage.

- Fisher, M., Abate, T., Lunduka, R.W., Asnake, W., Alemayehu, Y. and Madulu, R.B. (2015) Drought tolerant maize for farmer adaptation to drought in sub-Saharan Africa: Determinants of adoption in eastern and southern Africa, *Climatic Change*, 133(2): 283-299.
- Flaherty, K., Ayoola, G., Ogbodo, J. and Beintema, N. (2019) Nigeria--recent developments in agricultural research. *Gates Open Res*, 3(119): 119
- Folawewo, A.O. and Olakojo, S.A. (2010) Determinants of agricultural exports in oil exporting economy: Empirical evidence from Nigeria, *Journal of economic theory*, 4(4): 84-92
- Foster, C., Graham, M., Mann, L., Waema, T. and Friederici, N. (2018) Digital control in value chains: Challenges of connectivity for East African firms, *Economic Geography*, 94(1): 68-86.
- Fue, K., Geoffrey, A., Mlozi, M.R.S., Tumbo, S., Haug, R. and Sanga, C. (2016) Analyzing usage of crowdsourcing platform Ushaurikilimo' by pastoral and agro-pastoral communities in Tanzania, *International Journal of Institutional Technology and Distance Learning*, 13: 3-19.
- Furuholt, B. and Matotay, E. (2011) The developmental contribution from mobile phones across the agricultural value chain in rural Africa. *The Electronic Journal of Information Systems in Developing Countries*, 48(1): 1-16.
- Gao, C., Zuzul, T., Jones, G. and Khanna, T., 2017. Overcoming institutional voids: A reputation- based view of long- run survival. *Strategic Management Journal*, 38(11), pp.2147-2167.
- Gbandi, E.C. and Amissah, G. (2014) Financing options for small and medium enterprises (SMEs) in Nigeria, *European Scientific Journal*, 10(1)
- GBÍGBÍ, T.M. (2019) Why Worry About Informal Moneylenders Patronage? A Research Agenda: Evidence From Delta State, Nigeria. *Black Sea Journal of Agriculture*, 2(2): 71-78
- Gibson, K. (2020) Bridging the digital divide: Reflections on using WhatsApp instant messenger interviews in youth research. *Qualitative research in psychology*, 1-21.
- Gill, P., Stewart, K., Treasure, E. and Chadwick, B. (2008) Methods of data collection in qualitative research: interviews and focus groups, *British dental journal*, 204(6): 291.
- Gokmenoglu, K.K., Bekun, F.V. and Taspinar, N. (2016) Impact of oil dependency on agricultural development in Nigeria, *Journal of Economic & Management Perspectives*, 10(2): 151-163.
- Gollin, D., Parente, S. and Rogerson, R. (2002) The role of agriculture in development , *American economic review*, 92(2): 160-164
- Graeub, B.E., Chappell, M.J., Wittman, H., Ledermann, S., Kerr, R.B. and Gemmill-Herren, B. (2016) The state of family farms in the world, *World development*, 87: 1-15.
- Groves, R. M., Fowler, F. J., Couper, M. P., Lepkowski, J. M., Singer, E. and Tourangeau, R. (2004) *Survey methodology*. Hoboken, NJ: John Wiley & Sons.
- GSMA (2020) Agric-Tech in Nigeria: Opportunities and Challenges [Online], Available: <https://www.gsma.com/mobilefordevelopment/wp->

[content/uploads/2020/04/AgriTech\\_in\\_Nigeria\\_Investment\\_Opportunities\\_and\\_Challenges1.pdf](#) [Date Accessed: 17/11/2021]

Haile, M. (2005) Weather patterns, food security and humanitarian response in sub-Saharan Africa, *Philosophical Transactions of the Royal Society of Biological Sciences*, 360(1463): 2169-2182.

Heeks, R. (2003) Most eGovernment-for-development projects fail: how can risks be reduced? *iGovernment Working Paper Series*, IDPM, University of Manchester, UK.

Heeks, R. (2017) Decent work and the digital gig economy: a developing country perspective on employment impacts and standards in online outsourcing, crowdwork, etc. *Development Informatics Working Paper*, (71).

Heeks, R., Eskelund, K., Gomez-Morantes, J.E., Malik, F. and Nicholson, B. (2020) Digital Labour Platforms in the Global South: Filling or Creating Institutional Voids?. *Digital Development Working paper* No. 86

Heeks, R., Gomez-Morantes, J.E., Graham, M., Howson, K., Mungai, P., Nicholson, B. and Van Belle, J.P. (2021) Digital platforms and institutional voids in developing countries: The case of ride-hailing markets. *World Development*, 145: 105528

Hinings, B., Gegenhuber, T. and Greenwood, R. (2018) Digital innovation and transformation: An institutional perspective, *Information and Organization*, 28(1): 52-61.

Holloway, I., and Todres, L. (2003) The status of method: Flexibility, consistency and coherence. *Qualitative Research*, 3: 345-357.

Hounkonnou, D., Kossou, D., Kuyper, T.W., Leeuwis, C., Nederlof, E.S., Röling, N., Sakyi-Dawson, O., Traoré, M. and van Huis, A. (2012) An innovation systems approach to institutional change: smallholder development in West Africa, *Agricultural systems*, 108: 74-83.

Hox, J.J. and Boeije, H.R. (2005) Data collection, primary vs. secondary. *Encyclopedia of social measurement*, 1(1): 593-599

Ibrahim, S.S. and Aliero, H.M. (2012.) An analysis of farmers' access to formal credit in the rural areas of Nigeria, *African journal of agricultural research*, 7(47): 6249-6253

Idachaba, F.S. (2019) Agricultural research in Nigeria: Organization and policy. *Policy for agricultural research*, 333-362

Ifejika, P.I., Asadu, A.N., Enibe, D.O., Ifejika, L.I. and Sule, A.M. (2019) Analysis of social media mainstreaming in E-extension by agricultural development programmes in North Central Zone, Nigeria. *Journal of Agricultural Extension and Rural Development*, 11(4): 78-84.

IITA (2019) IITA's mobile app to track cassava seeds now in Tanzania, [Online], Available: <http://bulletin.iita.org/index.php/2019/01/09/iitas-mobile-app-to-track-cassava-seeds-now-in-tanzania/> [Date Accessed: 13/01/20]

Ika, L. and Saint-Macary, J. (2014) Why do projects fail in Africa?. *Journal of African Business*, 15(3): 151-155

- Imaenyin, N.I. (2015) Agriculture in Nigeria: identifying opportunities for increased commercialization and investment, *Вестник евразийской науки*, 7(1): 26.
- Inegbedion, H., Inegbedion, E., Asaleye, A., Obadiaru, E. and Asamu, F. (2020) Use of social media in the marketing of agricultural products and farmers' turnover in South-South Nigeria. *F1000Research*, 9(1220): 1220
- Innocent, Y. and Adefila, J.O. (2014) Farmers' cooperatives and agricultural development in kwali area council federal capital territory Abuja, Nigeria, *international Journal of humanities and social science*, 4(7): 1.
- Ironkwe, A.G., Nwakor, F.N. and Onuegbu-Johnson, F.N. (2020) Issues and Prospects of Agricultural Technology Development and Dissemination Systems in Nigeria. *JCCR/ Journal of Community & Communication Research*, 75-83
- Irungu, K.R.G., Mbugua, D. and Muia, J. (2015) Information and Communication Technologies (ICTs) attract youth into profitable agriculture in Kenya. *East African Agricultural and Forestry Journal*, 81(1): 24-33.
- Issa, F.O., 2017. Overview of the Challenges to Agricultural Extension Practice, Research and Technology Development and Transfer in Nigeria. *Journal of Sustainable Development*, 7(1): 70-77.
- Iwuchukwu, J.C. and Igbokwe, E.M (2012) Lessons from agricultural policies and programmes in Nigeria. *Journal of Policy & Globalization*, 5:11
- James, J. (2010) Mechanisms of Access to the Internet in Rural Areas of Developing Countries, *Telematics and Informatics*, 27(4): 370-376.
- Jansen, H. (2010) The Logic of Qualitative Survey Research and its Position in the Field of Social Research Methods, *Qualitative Social Research*, 11(2)
- Jimoh Ibitoye, S. (2012) Assessment of the levels of awareness and use of agricultural insurance scheme among the rural farmers in Kogi State, Nigeria. *International Journal of Agricultural Science, Research and Technology in Extension and Education Systems*, 2(3): 143-148.
- John, M.A. and Dankawu, M.U. (2018) Effect of Agriculture on poverty reduction in Nigeria: A multifaceted approach using principal component analysis. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 23(6): 35-43.
- Johnston, B.F. and Mellor, J.W. (1961) The role of agriculture in economic development, *The American Economic Review*, 51(4): 566-593
- Jorgensen, D.L. (2015) Participant observation. Emerging trends in the social and behavioural sciences: An interdisciplinary, searchable, and linkable resource. 1-15
- Jowett, A., E. Peel, and R. Shaw. 2011. Online interviewing in psychology: Reflections on the process. *Qualitative Research in Psychology* 8 (4):354–69.
- Khanna, T. and Palepu, K. (1997) Why focused strategies may be wrong for emerging markets, *Harvard business review*, 75: 41-54.
- Khanna, T. and Palepu, K.G. (2005) Spotting institutional voids in emerging markets

- Khanna, T. and Palepu, K.G., 2010. *Winning in emerging markets: A road map for strategy and execution*. Harvard Business Press
- Kidane, W., Maetz, M. and Dardel, P. (2006) Food security and agricultural development in sub-Saharan Africa. FAO, Subregional Office for Southern and East Africa, Rome.
- Kimenyi, M., Adibe, J., Djiré, M. and Jirgi, A.J. (2014) The impact of conflict and political instability on agricultural investments in Mali and Nigeria. *Working Paper 17* (Africa Growth Initiative, 2014).
- Kirui, O.K., Okello, J.J., Nyikal, R.A. and Njiraini, G.W. (2013) Impact of mobile phone-based money transfer services in agriculture: evidence from Kenya. *Quarterly Journal of International Agriculture*, 52(892-2016-65177): 141-162.
- Koskinen, K., Bonina, C. and Eaton, B. (2019) Digital platforms in the global south: foundations and research agenda. In International Conference on Social Implications of Computers in Developing Countries, *Springer*, 319-330
- Kydd, J. and Spooner, N. (1990) Agricultural market liberalization and structural adjustment in sub-saharan Africa. *Oxford Agrarian Studies*, 18(2): 65-79.
- Kydd, J. and Dorward, A. (2004) Implications of market and coordination failures for rural development in least developed countries. *Journal of international development*, 16(7): 951-970.
- Lakemann, T. and Lay, J., 2019. Digital platforms in Africa: The "Uberisation" of informal work
- Lawal, W.A. and Abdullahi, I.B. (2011) Impact of informal agricultural financing on agricultural production in the rural economy of Kwara State, Nigeria, *International Journal of Business and Social Science*, 2(19): 241-248
- Lwoga, E.T. (2010) Bridging the agricultural knowledge and information divide: The case of selected telecenters and rural radio in Tanzania. *The Electronic Journal of Information Systems in Developing Countries*, 43(1): 1-14.
- Madugu, A.J. and Bzugu, P.M. (2012) The Role of Microfinance Banks in Financing Agriculture in Yola North Local Government Area, Adamawa State, Nigeria, *Global Journal of Science Frontier Research Agriculture and Veterinary Sciences*, 12(8): 31-35.
- Magesa, M.M., Michael, K. and Ko, J. (2014) Agricultural market information services in developing countries: A review, *International Journal of Information and Communication Research*, 4 (7): 264-273
- Mair, J. and Marti, I. (2009) Entrepreneurship in and around institutional voids: A case study from Bangladesh. *Journal of business venturing*, 24(5), pp.419-435
- Maputo (2003). Comprehensive African agriculture development(CAADP) [Online] Available: <https://www.nepad.org/caadp> [Date Accessed: 19 April, 2021]
- Mbah, E.N., Amah, N.E. and Onwusika, A.I. (2017) Prospects of rural youth participation in family farming in Benue State, Nigeria: Implication for policy. *International Journal of Sustainable Agricultural Research*, 4(3): 77-86.



- Mbiti, I. and Weil, D.N. (2015) Mobile banking: The impact of M-Pesa in Kenya. In African Successes, Volume III: Modernization and Development, University of Chicago Press, 247-293.
- Meijer, S.S., Catacutan, D., Ajayi, O.C., Sileshi, G.W. and Nieuwenhuis, M. (2015) The role of knowledge, attitudes and perceptions in the uptake of agricultural and agroforestry innovations among smallholder farmers in sub-Saharan Africa. *International journal of agricultural sustainability*, 13(1): 40-54
- Michael, A., Tashikalma, A.K. and Maurice, D.C. (2018) Agricultural inputs subsidy in Nigeria: An overview of the growth enhancement support scheme (GESS). *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 66(3): 781-789.
- Mickiewicz, T. and Olarewaju, T. (2020) New venture evolution of migrants under institutional voids: Lessons from Shonga Farms in Nigeria. *International Small Business Journal*, 38(5): 404-423
- Miles, M. and Huberman, A. (1994) Qualitative data analysis. Thousand Oaks, CA: SAGE.
- Miller, T. and Bell, L. (2002) Consenting to what? Issues of access, gate-keeping and 'informed' consent. *Ethics in qualitative research*, 53-69.
- Mingers, J. (2004). Re-establishing the Real: Critical Realism and Information Systems. In: Mingers, J. & Willcocks, L. (eds.) *Social Theory and Philosophy for Information Systems*. Chichester, UK: John Wiley & Sons Ltd.
- Minot, N. (2011) Contract farming in sub-Saharan Africa: opportunities and challenges. In *policy seminar: 'Smallholder-led Agricultural Commercialisation and Poverty Reduction: How to Achieve It* (pp. 18-22).
- Misaki, E., Apiola, M., Gaiani, S. and Tedre, M. (2018) Challenges facing sub-Saharan small-scale farmers in accessing farming information through mobile phones: A systematic literature review. *The Electronic Journal of Information Systems in Developing Countries*, 84(4):12034
- Mkpado, M. and Arene, C.J. (2007) Effects of democratization of group administration on the sustainability of agricultural micro credit groups in Nigeria, *International Journal of Rural Studies*, 14(2)
- Mogues, T. and Olofinbiyi, T. (2020) Budgetary influence under information asymmetries: Evidence from Nigeria's subnational agricultural investments. *World Development*, 129, p.104902
- Munyua, H. (2007) ICTs and small-scale agriculture in Africa: a scoping study, [Online], Available: <http://agris.fao.org/agris-search/search.do?recordID=GB2013201719> [Date accessed: 13/01/20]
- Mwambi, M.M., Oduol, J., Mshenga, P. and Saidi, M. (2016) Does contract farming improve smallholder income? The case of avocado farmers in Kenya. *Journal of Agribusiness in Developing and Emerging Economies*
- Nambisan, S., Siegel, D. and Kenney, M. (2018) On open innovation, platforms, and entrepreneurship. *Strategic Entrepreneurship Journal*, 12(3): 354-368.

- Nchuchuwe, F.F. and Adejuwon, K.D. (2012) The challenges of agriculture and rural development in Africa: the case of Nigeria. *International Journal of Academic Research in Progressive Education and Development*, 1(3): 45-61
- Ndemo, B. and Weiss, T. (2017) Making sense of Africa's emerging digital transformation and its many futures. *Africa Journal of Management*, 3(3-4): 328-347.
- Ndjeunga, J. and Bantilan, M.C.S. (2005) Uptake of improved technologies in the semi-arid tropics of West Africa: why is agricultural transformation lagging behind?. *Electronic Journal of Agricultural and Development Economics*, 2(1): 85-102
- Ngigi, M.W., Okello, J.J., Lagerkvist, C., Karanja, N. and Mburu, J. (2010) Assessment of developing-country urban consumers' willingness to pay for quality of leafy vegetables: The case of middle- and high-income consumers in Nairobi.
- Nicholson, B; Nielsen, P. and Saebo, J. (2021) Digital Platforms for Development. *Information Systems Journal*. <https://doi.org/10.1111/isj.12364>
- Njuguna, E.M., Liani, M.L., Beyene, M. and Ojiewo, C.O. (2016) Exploration of cultural norms and practices influencing women's participation in chickpea participatory varietal selection training activities: A case study of Ada'a and Ensaro districts, Ethiopia. *Journal of Gender, Agriculture and Food Security*, 1(3): 40-63
- Nkundabanyanga, S.K., Kasozi, D., Nalukenge, I. and Tauringana, V. (2014) Lending terms, financial literacy and formal credit accessibility. *International Journal of Social Economics*, 41 (5): 342-361
- Nnadi, F.N., Chikaire, J., Echetama, J.A., Ihenacho, R.A., Umunnakwe, P.C. and Utazi, C.O. (2013) Agricultural insurance: A strategic tool for climate change adaptation in the agricultural sector. *Net Journal of Agricultural Science*, 1: 1-9
- Noor, K.B.M. (2008) Case study: A strategic research methodology, *American journal of applied sciences*, 5(11): 1602-1604.
- North, D. C. (1990) *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press
- Nwachukwu, I.N., Alamba, C.S. and Oko-Isu, A. (2010) Determinants of institutional credit repayment performance among farmers in Afikpo North LGA of Ebonyi State, Nigeria, *Advances in Agriculture & Botany*, 2(3): 279-284
- Nwagu, K., Okanya, O.C. and Okafor, M.C. (2021) Impact of Digital Finance Technologies on Agricbusiness Development in Nigeria. *REVISTA GEINTEC-GESTAO INOVACAO E TECNOLOGIAS*, 11(4): 1729-1750.
- Nwankwo, O. (2013) Agricultural financing in Nigeria: An empirical study of Nigerian agricultural co-operative and rural development bank (NACRDB): 1990-2010, *Journal of Management research*, 5(2): 28-44.
- Nwaru, J.C., Essien, U.A. and Onuoha, R.E., 2011. Determinants of informal credit demand and supply among food crop farmers in Akwa Ibom State, Nigeria. *Journal of Rural and Community Development*, 6(1)

Nweze, 2020 Funding Options for Agriculture in Nigeria Expands with 50 billion Naira Scheme [online]. Available: <https://www.salaamgateway.com/story/funding-options-for-agriculture-in-nigeria-expands-with-n50-bln-scheme> [Date assessed: 15/07/2021]

Nwosu, F.O., Oguoma, N.N.O., Ben-Chendo, N.G. and Henri-Ukoha, A. (2010) The agricultural credit guarantee scheme: its roles, problems, and prospects in Nigeria's quest for agricultural development. *Researcher*, 2(2): 87-90

Nwosu, F.O., Okorji, E.C., Nweze, N.J., Orebiyi, J.S., Nwachukwu, M.O. and Ibekwe, U.C., (2014) Loan accessibility and repayment performance of livestock farmers under the agricultural credit guarantee scheme fund in southeast, Nigeria. *Developing Country Studies*, 4(6): 63-69.

Obasi, P.C. (2015) Evaluation of the performance of agricultural lending schemes in Nigeria. *European Journal of Agriculture and Forestry Research*, 3(2): 52-63

Obilor, S.I. (2013) The impact of commercial banks' credit to agriculture on agricultural development in Nigeria: An econometric analysis. *International Journal of Business, Humanities and Technology*, 3(1): 85-94.

Oboh, V.U. and Ekpebu, I.D. (2011) Determinants of formal agricultural credit allocation to the farm sector by arable crop farmers in Benue State, Nigeria. *African Journal of Agricultural Research*, 6(1), pp.181-185

Ofana, O.G., Efefiom, E.C. and Omini, E.E. (2016) Constraints to agricultural development in Nigeria. *International Journal of Development and Economic Sustainability*, 4(2), pp.19-33

Ofuoku, A.U. and Agbamu, J.U. (2016) Maize contract farming experience in Delta State, Nigeria. *Journal of Northeast Agricultural University (English Edition)*, 23(1): 65-73

Ogunlela, V.B. and Ogungbile, A.O. (2006) Alleviating rural poverty in Nigeria: A Challenge for the National Agricultural Research. Tropentag Conference

Ogunlela, Y.I. and Mukhtar, A.A. (2009) Gender issues in agriculture and rural development in Nigeria: The role of women. *Humanity & social sciences Journal*, 4(1): 19-30

Ojenike, J. O. and Olowoniyi, A. O (2013) 'Estimating Growth in Investment of Micro and Small-Scale Enterprises in Nigeria', *Asian Economic and Financial Review* 3(1): 111–23.

Ojewale, C. (2021) Farmcrowdy,, Others Exit Crowdfunding Before Regulations Begin. [Oline], Available: <https://businessday.ng/agriculture/article/farmcrowdy-others-exit-crowdfunding-before-regulation-begins/> [Date Accessed: 13/08/2021]

Ojiako, I.A. and Ogbukwa, B.C. (2012) Economic analysis of loan repayment capacity of smallholder cooperative farmers in Yewa North Local Government Area of Ogun State, Nigeria. *African Journal of Agricultural Research*, 7(13): 2051-2062

Okeke, C.C. and Ikponmwoosa, A. (2012) Factors hindering the accessibility of agricultural credit by farmers in Edo State, Nigeria. *Journal of Agriculture and Social Research (JASR)*, 12(1): 142-148

Okon, E.B. and Christopher, A.O. (2018) Agricultural expenditure, Maputo Declaration Target and agricultural output: A cased study of Nigeria. *International Journal of Economics, Commerce and Management*, 4(7), pp.516-531

- Okorie, A. and Iheanacho, A.C. (1992) Agricultural loan recovery strategies in a developing economy: A case study of Imo State, Nigeria, *African Review of Money Finance and Banking*, 195-202
- Okotie, S. (2018) The Nigerian Economy Before the Discovery of Crude Oil, *The Political Ecology of Oil and Gas Activities in the Nigerian Aquatic Ecosystem* (71-81). Academic Press.
- Okunlola, F.A., Osuma, G.O. and Omankhanlen, E.A. (2019) Agricultural finance and economic growth: Evidence from Nigeria. *Business: Theory and Practice*, 20: 467-475.
- Olagunju, F.I. and Adeyemo, R. (2007) Determinants of repayment decision among small holder farmers in Southwestern Nigeria, *Pakistan Journal of Social Sciences*, 4(5): 677-686.
- Olagunju, F.I. and Adeyemo, R. (2008) Evaluation of the operational performance of the Nigerian agricultural credit cooperative and rural development bank (NACRDB) in South-Western Nigeria. *International Journal of Agricultural Economics & Rural Development*, 1(1): 1-15
- Olaitan, M.A. (2006) Finance for small and medium enterprises: Nigeria's agricultural credit guarantee scheme fund, *Journal of international farm management*, 3(2): 30-38
- Olajide, O.T., Akinlabi, B.H. and Tijani, A.A. (2012) Agriculture resource and economic growth in Nigeria. *European scientific journal*, 8(22)
- Olayiwola, L.M. and Adeleye, O.A. (2005) Rural infrastructural development in Nigeria: Between 1960 and 1990—problems and challenges. *Journal of Social Sciences*, 11(2): 91-96
- Ololade, R.A. and Olagunju, F.I. (2013) Determinants of access to credit among rural farmers in Oyo State, Nigeria, *Global Journal of Science Frontier Research Agriculture and Veterinary Sciences*, 13(2): 16-22
- Olomola, A. S. (2010) "Enhancing productivity, income and market access of rural producers in Africa: the case of contract farming in Nigeria." In *A Paper presented at the Inaugural National Science Foundation (NSF) Joint Workshop of the African Economic Research Consortium (AERC) and the International Growth Center (IGC) held in Mombassa, Kenya*, 157-166.
- Olomola, A.S. (2010) Models of contract farming for pro-poor growth in Nigeria. *IPPG Briefing Note*.
- Olomola, A. (2018) Financial Stimulus And Performance of the Commercial Agricultural Credit Scheme (CACS) in Nigeria. International Conference for Agricultural Economist
- Olowa, O.W. and Olowa, O.A. (2011) Issues, Problems and Policies in Agricultural Credit: A Review of Agricultural Credit in Nigeria, *Bangladesh e-Journal of sociology*, 8(2): 286-295
- Oloyede, J. A. (2008) 'Informal Financial Sector, Savings Mobilization and Rural Development in Nigeria: Further Evidence from Ekiti State of Nigeria', *African Economic and Business Review*, 6(1): 35–63
- Olubajo, O. (2021) Exclusive: Interpol declares Gloria Osei, husband wanted for investment fraud [Online], Available: <https://gazettengr.com/exclusive-interpol-declares-gloria-osei-husband-wanted-for-investment-fraud/> [Date Accessed: 03 December 2021]

- Olubiyo, S.O. and Hill, G.P. (2003) Beyond the Risk Factor: Bank Lending to Small-Scale Peasant Farms in Nigeria. *African Review of Money Finance and Banking*, 5-22
- Olubiyo, S.O. and Hill, G.P. (2005) An assessment of the operation of agricultural insurance scheme in Nigeria. *Savings and Development*, 293-312.
- Oluyombo, P. (2007) Developing microfinance banking in Nigeria. *Babcock Journal of Management and Social Sciences*, 6(1): 126-134
- Omulo, G. and Kumeh, E.M., 2020. Farmer-to-farmer digital network as a strategy to strengthen agricultural performance in Kenya: A research note on 'Wefarm' platform. *Technological Forecasting and Social Change*, 158, p.120120
- One World Nations Online (2021) Administrative Map of Nigeria [Online], Available: <https://www.nationsonline.org/oneworld/map/nigeria-administrative-map.htm> [Date Accessed: 26 March 2022]
- Oniyishi, L. O., Arene, C. J. and Ifiorah, C. M. (2015) An analysis of Interest rate deregulation as a policy instrument for stimulating agricultural finance and growth in Nigeria. *Nigerian Journal of Agricultural Economics*, 5(61-71)
- Onuche, U., Adejoh, S.O. and Adah, O.C. (2015). Analysis of willingness to pay for agricultural extension services by rural small-scale fish and crops producers in Kogi State, North Central Nigeria: Imperative for sustainable agricultural development. *Asian Journal of Agriculture and Food Sciences*. 3(4): 380-387.
- Oparinde, L.O., Amos, T.T. and Adeselu, M. (2017) Influence of agricultural credit guarantee scheme fund (ACGSF) on fishery development in Nigeria. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, 17(1): 323-332.
- Orji, A., Ogbuabor, J.E., Anthony-Orji, O.I. and Nkechi Alisigwe, J. (2020) Agricultural financing and agricultural output growth in developing economies: any causal linkage in Nigeria?
- Orok, A. and Ayim, S. (2017) The impact of agricultural credit guarantee scheme fund on agricultural sector development in Nigeria. *International Review of Management and Business Research*, 6(3): 1104-1116.
- Osabohien, R., Osabuohien, E. and Ohalet, P. (2019) Agricultural sector performance, institutional framework and food security in Nigeria. *Bio-based and Applied Economics*, 8(2): 161-178.
- Owuor, G. and Shem, A.O. (2012) *Informal Credit and Factor Productivity in Africa: Does Informal Credit Matter?* (No. 1007-2016-79559).
- Oyinbo, O., Zakari, A. and Rekwot, G.Z. (2013) Agricultural budgetary allocation and economic growth in Nigeria: implications for agricultural transformation in Nigeria. *Consilience*, (10): 16-27
- Ozien, A.O. (1992) Some Problems of Agricultural Development in Sub-Saharan Africa. *Indian Economic Review*, 99-110
- Pingali, P.L. (2012) 'Green Revolution: Impacts, limits, and the path ahead', Proceedings of the National Academy of Sciences, 109(31): 12302-12308.

- Pinstrup-Andersen, P. and Shimokawa, S. (2007) Rural infrastructure and agricultural development. *ABCDE*, 175.
- Poulton, C., Kydd, J. and Dorward, A. (2006) Overcoming market constraints on pro- poor agricultural growth in Sub- Saharan Africa, *Development policy review*, 24(3): 243-277.
- Prinsloo, T. and De Villiers, C. (2016). Traceability systems in Swaziland and Namibia: Improving access to markets with digital information. In 2016 IST-Africa Week Conference, *IEEE*, 1-13
- PwC (2017) Transforming Nigeria's agricultural value chain [Online], Available: <https://www.pwc.com/ng/en/assets/pdf/transforming-nigeria-s-agric-value-chain.pdf> Date Accessed: 25/03/2020
- Raheem, W.M. and Bako, A.I. (2014) Sustainable rural development programmes in Nigeria: Issues and Challenges. *Asian Journal of Science and Technology*, 5(9): 577-586
- Rahji, M.A.Y. and Fakayode, S.B. (2009) A multinomial logit analysis of agricultural credit rationing by commercial banks in Nigeria. *International Research Journal of Finance and Economics*, 24(91): 97-103.
- Rahman, R. and Fong, J. (2016) Innovate for agriculture: Young ICT entrepreneurs overcoming challenges and transforming agriculture, CTA [Online], Available: [https://cgspace.cgiar.org/bitstream/handle/10568/91708/1924\\_PDF.pdf?sequence=3&isAllowed=y](https://cgspace.cgiar.org/bitstream/handle/10568/91708/1924_PDF.pdf?sequence=3&isAllowed=y) [Date Assessed: 16 May, 2018]
- Rex Uzonna, U. (2013) Technological Innovation Capacity: Impact Factors in National Agricultural Research Organisations in Nigeria. *Asian Journal of Agriculture and Rural Development*, 3(393-2016-23981): 163-168
- Ricciardi, V., Ramankutty, N., Mehrabi, Z., Jarvis, L. and Chookolingo, B. (2018) How much of the world's food do smallholders produce? *Global food security*, 17: 64-72
- Riddell, J.B. (1992) Things fall apart again: structural adjustment programmes in sub-Saharan Africa. *The journal of modern African studies*, 30(1): 53-68
- Robertson, T.S. (1967) 'The process of innovation and the diffusion of innovation, *The Journal of Marketing*, 14-19.
- Rogers, E.M (1995) *Diffusion of Innovations*, The New York Free Press
- Saenger, C., Torero, M. and Qaim, M. (2014) Impact of third-party contract enforcement in agricultural markets—A field experiment in Vietnam. *American Journal of Agricultural Economics*, 96(4): 1220-1238.
- Salami, A., Arawomo, D.F., Kayizzi-mugerwa, S. and John, C. (2013) Empirical analysis of agricultural credit in Africa: Any role for institutional factors. *African Development Bank Group*, 192: 1-28.
- Sanga, C.A., Phillip, J., Mlozi, M.R., Haug, R. and Tumbo, S.D. (2016) Crowdsourcing platform 'Ushaurikilimo' enabling questions answering between farmers, extension agents and researchers. *International Journal of Instructional Technology and Distance Learning*, 10(13): 19-28.

- Sanga, C. (2018) e-Agriculture promising practice UshuariKilimo information system web and mobile phones for extension services in Tanzania. *Food and Agricultural Organisation of the United Nations*, 12, 1–7
- Sani, L., Boadi, B.Y., Oladokun, O. and Kalusopa, T. (2014) The generation and dissemination of agricultural information to farmers in Nigeria: A review. *Journal of Agriculture and Veterinary Science*, 7(2): 102-111
- Sanusi, S.L. (2012) The Role of Development Finance Institutions in Infrastructure Development: What Nigeria can Learn from Bndes and the Indian Infrastructure Finance. In *3rd ICRC PPP Stakeholders Forum, Lagos, Nigeria* (18).
- Sanusi, L.S. (2013) Banks in Nigeria and national economic development: A critical review
- Saunders, M., Lewis, P. and Thornhill, A. (2007) *Research Methods for Business Students* (Harlow: Pearson Educated Limited).
- Schaffnit-Chatterjee, C., Lanzeni, M.L., AG, D.B. and Hoffmann, R. (2014) Agricultural value chains in Sub-Saharan Africa. From a development challenge to a business opportunity. Deutsche Bank Research, Frankfurt.
- Scott, W. R. (1995) *Institutions and Organizations*. Thousand Oaks, CA: Sage.
- Scott, W. R. (2001) *Institutions and Organizations*. Thousand Oaks, CA: Sage, 2nd ed.
- SEC (2020) Exposure of Proposed New Rules to the Rules and Regulations of the Commission [online] Available: <https://sec.gov.ng/effective-date-of-the-crowdfunding-rules/> [Date Assessed: 29 April, 2021]
- Seibel, H. D (2004) *Microfinance in Nigeria: Origins, Options and Opportunities*. Köln: University of Köln.
- Sekumade, A.B. (2009) The effects of petroleum dependency on agricultural trade in Nigeria: An error correlation modeling (ECM) approach, *Scientific Research and Essay*, 4(11): 1385-1391.
- Shaibu, U.M., Ibitoye, S.J., Ibrahim, M.K. and Ya, S. (2020) Modeling the Factors that Influence Farmers' Participation in Agricultural Insurance Scheme in Kogi State, Nigeria: Implications for Agricultural Policy. *Nigerian Agricultural Policy Research Journal (NAPReJ)*, 7(2237-2021-1448): 36-41
- Shobande, O.A. (2018) Rural Financing for Economic Development in Africa: Context and Reality, *Annals of the University of Craiova, Economic Sciences Series*, 1(46).
- Shuaib, I.M., Igbinosun, F.E. and Ahmed, A.E. (2015) Impact of government agricultural expenditure on the growth of the Nigerian economy. *Asian Journal of Agricultural Extension, Economics & Sociology*, 23-33.
- Smale, M., Nagarajan, L., Diakite, L., Audi, P., Jones, R., Grum, M. & Wetzien, E. (2009) Tapping the potential of village markets to supply seed in semi-arid Africa: A Case Study Comparison from Mali and Kenya. Draft Conference paper.
- Smith, I. (2018) Promoting commercial agriculture in Nigeria through a reform of the legal and institutional frameworks, *African Journal of International and Comparative Law*, 26(1): 64-83.

Soreh, W.C. (2017) Awareness and attitude towards Crowdfunding in Nigeria. *International Journal of African and Asian Studies*, 36:1-8.

Spencer, D.S., (1996) Infrastructure and technology constraints to agricultural development in the humid and subhumid tropics of Africa, *African Development Review*, 8(2): 68-93.

Statista (2021) Contribution of agriculture to GDP in Nigeria from the 3<sup>rd</sup> quarter of 2019 to the 1<sup>st</sup> quarter of 2021. <https://www.statista.com/statistics/1193506/contribution-of-agriculture-to-gdp-in-nigeria/>

Technoserve (2019) Can drones change Africa's agricultural future, [Online], Available: <https://www.technoserve.org/blog/can-drones-change-africas-agricultural-future-2/> [Date accessed: 30/02/2019]

Thornton, P.K., Jones, P.G., Ericksen, P.J. and Challinor, A.J. (2011) Agriculture and food systems in sub-Saharan Africa in a 4 C+ world. *Philosophical Transactions of the Royal Society* 369 (1934): 117-136

Tollens, E. (2006) Market information systems in sub-Sahara Africa: challenges and opportunities (No. 1004-2016-78858)

Toluwase, S.O.W. and Apata, O.M. (2011) Impact of Farmers' Cooperative on Agricultural Productivity in Ekiti State, Nigeria, *Greener Journal of Agricultural Science*, 3(1): 63-67

Tomasic, R. and Akinbami, F. (2011) The role of trust in maintaining the resilience of financial markets, *Journal of Corporate Law Studies*, 11(2): 369-394

Trienekens, J.H. (2011) Agricultural value chains in developing countries; a framework for analysis. *International food and agribusiness management review*, 14(2): 51-83.

Tsan, M., Totapally, S., Hailu, M. and Addom, B.K. (2019) *The Digitalisation of African Agriculture Report 2018–2019*. CTA [Online] Available: <https://www.cta.int/en/digitalisation-agriculture-africa> [Date accessed: 21/07/2021]

Udoh, E.J. (2008) Estimation of loan default among beneficiaries of a state government owned agricultural loan scheme, Nigeria, *Journal of Central European Agriculture*, 9(2): 343-352.

Udoka, C.O., Mbat, D.O. and Duke, S.B. (2016) The effect of commercial banks' credit on agricultural production in Nigeria, *Journal of Finance and Accounting*, 4(1): 1-10

Udry, C. (1990) Credit markets in Northern Nigeria: Credit as insurance in a rural economy. *The World Bank Economic Review*, 4(3): 251-269.

Uduji, J., Okolo-Obasi, E. and Asongu, S., (2019) Farmers' food price volatility and Nigeria's growth enhancement support scheme.

Uduji, J.I., Okolo-Obasi, E.N. and Asongu, S.A. (2019) Electronic wallet technology and the enabling environment of smallholder farmers in Nigeria. *Agricultural Finance Review*.d

Ülkümen, G. and Cheema, A. (2011) Framing goals to influence personal savings: The role of specificity and construal level, *Journal of marketing research*, 48(6): 958-969.



- Ume, S.I., Ezeano, C.I. and Obiekwe, N.J. (2018) Analysis of determinant factors to loan repayment among broiler farmers in Enugu State, Nigeria. *International Journal of Environmental and Agriculture Research (IJOEAR)*, 9: 2454-1850
- Umeh, J.C., Ogah, J.C. and Ogbanje, C. (2013) Socioeconomic characteristics and poverty among small-scale farmers in Apa Local Government Area of Benue State, Nigeria. In *International Conference on Food and Agricultural Sciences, IPCBEE, IACSIT Press, Singapore*, 55: 106-111.
- Unam, M.J. and Unam, F.J. (2013) Promoting production capabilities of small-scale manufacturing business through microfinance banking in Nigeria. *JORIND*, 11(2): 43-50
- Uzonwanne, M.C. (2015) Economic diversification in Nigeria in the face of dwindling oil revenue. *Journal of Economics and sustainable development*, 6(4): 61-67
- Verschuren, P. (2003) Case study as a research strategy: some ambiguities and opportunities, *International Journal of Social Research Methodology*, 6(2): 121-139.
- von Bismarck-Osten, Matthias, Understanding Strategic Decisions of Digital Agricultural Platform Companies: Six Case Studies of Sub-Saharan African Platforms (2021). ZEF Working Paper Series 2021, Available at SSRN: <https://ssrn.com/abstract=3849193> or <http://dx.doi.org/10.2139/ssrn.3849193>
- Wanjohi, L.M. and Moturi, C.A. (2018) Smartphones supporting monitoring functions: Experiences from sweet potato vine distribution in sub-Saharan Africa. *Digital Technologies for agricultural and rural development in the Global South*, 14-24.
- Ward, P.S., Florax, R.J. and Flores-Lagunes, A. (2014) Climate change and agricultural productivity in Sub-Saharan Africa: a spatial sample selection model, *European Review of Agricultural Economics*, 41(2): 199-226.
- Warren, M. (2007) The digital vicious cycle: Links between social disadvantage and digital exclusion in rural areas. *Telecommunications Policy*, 31(6-7): 374-388.
- WEF (2019) Ghana's farmers are using drones to boost crop yields – here's how [Online], Available: <https://www.weforum.org/agenda/2019/10/ghanas-farmers-drones-boost-crop-yields/> [Date accessed: 07/12/19]
- Wenner, M.D. (2010) Credit risk management in financing agriculture (No. 18 (10)). International Food Policy Research Institute (IFPRI).
- World Bank Data (2019) Agriculture, Forestry, and Fishing, Value Added (% of GDP) [Online], Available: <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?view=chart> [Date Accessed: 15/12/2019]
- World Bank (2019) Agriculture Overview. [Online], Available: <https://www.worldbank.org/en/topic/agriculture/overview> Date assessed: 20/10/2019
- World Bank (2020) World Bank Commercial Agricultural Development Project [Online], available: <https://projects.worldbank.org/en/projects-operations/project-detail/P096648?lang=en> Date Accessed: 15.05.2020
- Yin, R. K. (2009). Case Study Research: Design and Methods (4 ed.). Thousand Oaks, California, USA: Sage Publications.

Zainal, Z. (2007) Case study as a research method. *Jurnal kemanusiaan*, 5(1).

Zuofa, T. (2014) Project failure: The way forward and panacea for development, *International Journal of Business and Management*, 9(11).

## Appendix 1: Key Informant Interview Guides

### Guide for Platform Users

#### Platform Business Description:

1. How will you describe your platform (mission and aims)?
2. Who are your target users?
3. How does your platform work (the operational process)?
4. How many platform users do you have?
5. What is their geographic spread (where are they located) by number?

#### Platform Evolution

1. What is your role in *Thrive Agric.*?
2. How long have you been working with *Thrive Agric.*?
3. How would you describe the pre-platform phase of your business?
4. What motivated you to start the platform?
5. What challenges did you face in setting up the platform? (Registering, internet, developing the software, costs, time) i.e. what went well, what didn't go well?
6. How would you describe the first year of your platform business in terms of its operation within the context of agriculture in Nigeria? (with dates where necessary (opportunities identified, partnerships, funding, training/incubator programmes, staffing, challenges, supporting and constraining policies, lessons learnt)
7. How would you describe your platform beyond the first year (new opportunities identified, new and existing partnerships, funding, training/incubator programmes, staffing, challenges, supporting and constraining policies, lessons learnt etc.)

#### Non-platform segment of platform business

1. What activities take place in the non-digital platform segment of your business relating to agriculture?
2. Why are these activities not platformised?
3. What challenges do you encounter in operating the non-digital platform segment of your business (in relation to agriculture)?
4. What opportunities exist in digitising the non-digital platform segment of your business?
5. What constrains exists in digitising the non-digital platform segment of your business?
6. What is the linkage between the digital and non-digital segment of your business?

#### Stakeholder mapping – Answer same questions for platform and non-platform side

1. Who are your key partners/collaborators/investors on the platform side (then on the non-platforms side?)
2. What is the nature of partnership with these stakeholders?
3. Are your partners and collaborators new or existing stakeholders in agriculture?

4. What are your partners' goals (stake)/interests in your platform business?
5. What sectors do your partners belong to: Public; private businesses; international NGO; local NGO etc.?
6. Which collaboration/partnership has been most beneficial to the development of the platform/business?
7. Where have problems with collaboration/ partnership been encountered?

#### Institutional Voids/Agricultural Finance Problems

1. Does your platform address problems with access to information on agricultural finance opportunities? If yes, How?
2. Does your platforms address problems with high transaction cost in financing agriculture? If yes, How?
3. Does your platform address problems with lack of trust and poor creditworthiness of farmers? If yes, How?
4. Does your platforms address problems with poor contract enforcement between farmers and financiers? If yes, How?
5. Does your platform address problems with late disbursement of agricultural finance? If so, How?
6. Does your platform address problems with weak regulations and poor execution of agricultural finance policies? If yes, How?

Are there any other problems with agricultural finance which your platform address which have not been captured during this interview?

#### **Institutional Voids and Problems in Agricultural Financing?**

##### *Platform Owners (General) - Thrive*

1. In general, can you describe your understanding of the agricultural (finance, information and training) market scenario before your platform was introduced?
2. In your opinion, what challenges exists in Nigeria's agricultural markets in general?
3. In general, how do you think digital platform can address the challenges you have mentioned?
4. Based on your experience as a platform in agricultural (finance, information or training) markets, what are the key opportunities for agricultural (financing, information provision and training) using digital platforms (and challenges)
5. What will you say your platform has brought into these markets you have previously described?
6. What institutions exists in the agricultural finance market before your platform came into existence?
7. How would you describe the interaction between your platform and existing institutions and actors in the same markets you operate in?
8. Have you observed the displacement of any actors, institutions (cultural, norms etc) due to the introduction of your platforms to these markets?

Void 1 – Information provision (Analysis and Advice): institutions that gather and analyse information of market actors, thereby reducing information asymmetries and improving transparency within markets

#### Information needs

1. What forms of agricultural information does your platform provide?
2. Who are the target users of the information you provide?
3. Before your platform, how did your target users obtain information which your platform currently provides?
4. What gaps in agricultural information sourcing (and provision) did you identify that needed to be filled before setting up your platform?
5. What has changed in terms of how information needs are met in (finance, information and training markets) due to the introduction of your platform?

#### Information sourcing

1. How do you source your information?
2. What other sources of agricultural information (actors and institutions) still exist in the markets/value chains you operate in?
3. What has changed in agricultural (finance, training, information) markets as a result of your platform being a source of information?

#### Information channels

1. Before your platform, how was information disseminated in the markets you operate in?
2. Did these other information dissemination channels provide information to the same groups you currently provide information for?
3. Why did you choose a digital platform model to disseminate information as opposed to alternative information channels?
4. What has changed how information is disseminated in (finance, training, information) markets as a result of your platform being an information channel?
5. How does your platform provide information differently than these other sources of agricultural information?

Void 2 – Credibility Enhancement - institutions which perform independent certification functions to verify the credibility of market actors

1. How does your platform verify that its users/beneficiaries are legitimate/credible individuals to conduct business transaction with?
2. How does your platform verify that its partners and collaborators are legitimate/credible individuals to conduct business transaction with?
3. How does your platform ensure transparency and trust between the user groups it brings together?
4. Did you observe any challenges in verifying the legitimacy/credibility of individuals in the market you operate in before developing the platform?

5. Did you develop the platform to meet these challenges specifically or was credibility verification and unintended outcome of developing the platform?
6. Before your platform, how did market players determine the legitimacy or individuals or groups they transacted with?
7. How has your platform changed how market players verify the legitimacy/credibility of individuals or groups they transact with?
8. Have you observed any outcomes from the use of your platform for verifying legitimacy/credibility of actors in the markets you operate in?
9. Are there other gaps in credibility enhancement which you have observed but do not yet meet through your platform?
10. Why doesn't your platform fill those gaps yet?

Void 3 – Aggregation (including distribution) - institutions that match market demand and supply, at low cost, thereby reducing associated transaction costs

*Platform owners*

1. What aspects of agricultural markets is your platform involved in?
2. Who are the actors on the demand side and on the supply side?
3. How does your platform match demand and supply in these agricultural (finance, information, training?) markets?
4. Before your platform how were these demand and supply functions met by other institutions?
5. What gaps in matching demand and supply did you identify before setting up your platform?
6. Why did you choose a platform solution to address these gaps in demand and supply?
7. What gaps have you identified but are not yet met by your platform? and why?

*Are there any agents or institutions which have been replaced by your platform?*

Void 4 – Transaction facilitation - institutions that provide the means for exchange of commodities (goods, services and information) at a lower-cost thereby increasing market efficiency and reducing transaction cost

*Platform Owners*

1. What transactions in agricultural markets is your platform involved in?
2. How does your platform facilitate these transaction agricultural markets?
3. Before your platform how were these transactions performed?
4. What transaction gaps did you identify before setting up your platform?
5. Why did you choose a platform solution to address these gaps in performing transactions?
6. What gaps have you identified but are not yet met by your platform? and why?
7. Are there any agents or institutions which have been replaced by your platform?

Other voids

1. Based on the challenges you mentioned earlier, how will you describe previous efforts (before your platform) to address them?
2. What are the challenges and opportunities in mainstreaming digital platforms to address these platforms? (digital platform in general, doesn't have to be the respondent's platform)
3. How does your platform currently address these challenges?
4. What has changed as the result of using your platform to address these challenges?
5. Which of these challenges previously mentioned are not currently addressed by your platform and why?

## **Appendix 2: Interview Guide for Maize Farmers and Qualitative Survey Questions for Poultry Farmers**

1. Before you started accessing finance from *Thrive Agric.*, what was your source(s) of finance? Please give details about each source of finance.
2. How did you get information about these sources of finance? Please explain in detail
3. Did you face any challenge(s) in accessing finance from these sources? If yes, please explain in detail
  - Do you think poor access to information influences your ability to access finance?
  - Do you think high transaction cost influences your ability to access finance?
  - Do you think lack of trust and poor creditworthiness of farmers influences your ability to access finance?
  - Do you think poor contract enforcement between farmers and financiers influence your ability to access finance?
  - Do you think poor government regulations and poor execution of agricultural finance policies influences your ability to access finance?
  - Do you think poor monitoring of finance given to farmers influences your ability to access finance?
4. How did you get information about *Thrive Agric's* agricultural finance? Please explain in detail?
5. What would you say are the difference between your previous source of finance and obtaining finance from *Thrive Agric.*? Please explain in detail
6. Do you face any challenge in obtaining finance from *Thrive Agric.*?



### Appendix 3: Respondent List

Respondents	Respondent code
<i>Subject matter specialist</i>	
FMARD Staff ICT department Staff	R1
FMARD Staff Agricultural Finance department	R2
FMARD Staff Agricultural Extension Department	R3
Ex-ADP Director	R4
IITA Consultant on digital platforms	R5
Financial institution -Leadway Assurance Staff	R6
Financial institution - Commercial bank staff (FCMB)	R7
Financial institution: Commercial Bank Staff (First Bank of Nigeria)	R8
<i>Agricultural Finance Digital Platform stakeholders</i>	
<i>Thrive Agric.</i> CEO (Uka Eje)	R9
<i>Thrive Agric.</i> CTO (Ayodeji Arikawe)	R10
<i>Thrive Agric.</i> Head of Operations (Obaka Ikani)	R11
<i>Thrive Agric.</i> Operations Team Member of Staff (Adeyei Odunola)	R12
<i>Thrive Agric.</i> Growth Team Member of Staff (Charles Isidi)	R13
<i>Thrive Agric.</i> Growth Team Staff (Faith Ogaragbe)	R14
<i>Thrive Agric.</i> Commercial Team Member (Samira Bello)	R15
<i>Thrive Agric.</i> Finance Team Member (Seun Ojeikhodion)	R16
<i>Thrive Agric.</i> Farm Agronomist and extension agent (John)	R17
Farmcrowdy agricultural finance staff	R18
Growsel agricultural finance platform CEO	R19
Platform investor (and non-digital investors)	R20
Platform investor (and non-digital investor)	R21
Platform investor	R22
Platform investor	R23
Platform investor	R24
Platform investor	R25
Platform investor	R26
Platform investor (and individual financier)	R27
Platform investor	R28
Platform investor	R29
Platform investor (and individual financier)	R30
Platform investor	R31
Platform investor (and individual financier)	R32
Platform investor	R33
Platform investor	R34
Platform investor (and individual financier)	R35
Platform investor	R36
Platform investor (and Individual financier)	R37
Platform investor	R38

Platform investor	R39
Platform investor	R40
Platform investor (and individual financier)	R41
Platform investor (and individual investor)	R42
<i>Rural Farmers Funded by Thrive Agric</i>	
Poultry Farmer	R43
Poultry Farmer	R44
Poultry Farmer	R45
Poultry Farmer	R46
Poultry Farmer	R47
Poultry Farmer	R48
Poultry Farmer	R49
Poultry Farmer	R50
Poultry Farmer	R51
Poultry Farmer	R52
Poultry Farmer	R53
Poultry Farmer	R54
Poultry Farmer	R55
Poultry Farmer	R56
Poultry Farmer	R57
Poultry Farmer	R58
Poultry Farmer	R59
Poultry Farmer	R60
Poultry Farmer	R61
Poultry Farmer	R62
Maize Farmer	R63
Maize Farmer	R64
Maize Farmer	R65
Maize Farmer	R66
Maize Farmer	R67
Maize Farmer	R68
Maize Farmer	R69
Maize Farmer	R70
Maize Farmer	R71
Maize Farmer	R72
<i>Other non-finance food/agricultural platforms</i>	
CEO of Chowberry	R73
CEO of Verdant	R74
CEO Probity Farm	R75
CEO Agroversity	R76
CEO ReLeaf	R77
Staff of FeedCalculator	R78