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Impact Assessment of Making Markets Work for the Poor (M4P) approach: Evidence from Linking Smallholder Farmers to Processor, Nigeria

MASTER'S THESIS

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Declaration

I hereby declare that I have done this thesis entitled "Impact Assessment of Making Markets Work for the Poor (M4P) approach: Evidence from Linking Smallholder Farmers to Processor, Nigeria" independently, all texts in this thesis are original, and all the sources have been quoted and acknowledged by means of complete references and according to Citation rules of the FTA.

In Prague, April 26th, 2018

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Acknowledgements

Abstract

This study assesses the impact of Making Markets Work for the Poor (M4P) approach to facilitating farmer-processor linkage on the income of smallholder farmers in sub-Saharan Africa. It draws evidence from a case of facilitating alternative guaranteed market for smallholder tomato farmers linked to a processing factory in Kaduna state in Nigeria through a DFID funded project implemented between 2012 to 2017. A multi-stage convenience sampling technique was used to collect data using structured survey questionnaire from 126 smallholder tomato farmers that sold their produce to the processing factory and 121 smallholder tomato farmers as a control group. Data was analysed by descriptive statistical tools and Double-Difference (DD) estimator. The results describe the major factors affecting smallholder farmers income in the study area as poor access to competitive and guaranteed markets or commercial off-takers of farm produce. The Double-Difference estimate reveals that there was a positive impact on the income of smallholder farmers who participated in the M4P processor-linkage initiative. The study concludes that facilitating market linkage by using the M4P approach can have a positive impact on the income of smallholder farmers.

Key words: Market access, development intervention, income, tomato, Double Difference estimator.

Table of Contents

List of tables

List of figures

List of the abbreviations used in the thesis

AMIS	Agricultural Markets Information Services
BDS	Business Development Services
BEAM	Building Effective and Accessible Markets
COMCEC	Committee for Economic and Commercial Cooperation of the Organization of the Islamic Cooperation
CSO	Civil Society based Organizations
DCED	Donor Committee for Enterprise Development
DD	Double Difference
DFID	Department for International Development
ENABLE	Enhancing Nigerian Advocacy for a Better Business Environment
FAO	Food and Agriculture Organization
FFVDAN	Fresh Fruits and Vegetable Dealers Association of Nigeria
FIT-SEMA	FIT Small Enterprise Media in Africa
FSD	Financial Sector Development
GDP	Gross Domestic Product
GEMS	Growth and Employment in States
GMED	Growth-Oriented Microenterprise Development
IFAD	International Fund for Agriculture Development
KADP	Kaduna state Agricultural Development Program
KBDS	Kenya Business Development Services
KHDP	Kenya Horticulture Development Project
MADE	Market Development in the Niger Delta
MAP	Market Assistance Programme
M4M	Markets for Meghri

M4P	Making Markets work for the Poor
MSE	Medium Scale Enterprise
MUSIKA	Making Agricultural Markets Work for Zambia
NGO	Non-governmental organization
NFI	Net Farm Income
PEPE	Private Enterprise Programme Ethiopia
PIND	Partnership Initiatives in the Niger Delta
PROPCOM	Promoting Pro-Poor Opportunities in Commodities and Service Markets
PSD	Private sector development
PSIG	Poorest States Inclusive Growth
PSP4H	Private Sector Innovation Programme for Health
RAIN	Revitalizing Agricultural/ Pastoral Incomes and New Markets
REACT	Renewable Energy and Adaptation Climate Technologies
RLDP	Rural Livelihood Development Programme
USAID	United States Agency for International Development
USD	United States Dollars
VCD	Value chain development
SDC	Swiss Agency for Development and Cooperation

Definition of key terms

Approach: A set of principles, frameworks and good practice points to guide both analysis of a market system and actions to bring about change (DFID & SDC 2008c).

Core function: The central set of exchanges between providers (supply-side) and consumers (demand-side) of goods and services at the heart of a market system. The medium of exchange can be financial or non-financial (such as through accountability mechanisms) (DFID & SDC 2008c).

Facilitation / facilitator: Action or agent that is external to a market system but seeks to bring about change within a market system to achieve the public benefit objective of systemic change (DFID & SDC 2008c).

Impacts: Results targeted by an M4P project.

Intervention: a defined package of temporary activities or actions through which facilitators seek to affect change in a market system (DFID & SDC 2008c).

M4P: the making markets work for the poor or market development approach (DFID & SDC 2008c).

Market system: The multi-player, multi-function arrangement comprising three main sets of functions (core, rules and supporting) undertaken by different players (private sector, government, representative organizations, civil society, etc) through which exchange takes place, develops, adapts and grows. A construct through which both conventionally defined markets and basic services can be viewed (DFID & SDC 2008c).

Market player: Organizations or individuals who are active in a market system not only as suppliers or consumers but as regulators, developers of standards and providers of services, information, etc. This therefore may include organizations in the private and public sectors as well as non-profit organizations, representative organizations, academic bodies and civil society groups (DFID & SDC 2008c).

Outreach: Number of beneficiaries reached by an M4P project through its interventions (DFID & SDC 2008c).

Pro-poor growth: Pro-poor growth in M4P means a sector or a product specific value chain's ability to create employment, increase income and livelihood of the poor people (DFID & SDC 2008c).

Rules: formal (laws, regulations and standards) and informal (values, relationships and social norms) controls that provide a key input in defining incentives and behaviour in market systems (DFID & SDC 2008c).

Supporting functions: a range of functions supporting the core exchange helping the market to develop, learn, adapt and grow including, for example, product development, skills enhancement, R & D, coordination and advocacy (DFID & SDC 2008c).

Sustainability (M4P definition): the market capability to ensure that relevant, differentiated goods and services continue to be offered to and consumed by the poor beyond the period of an intervention (DFID & SDC 2008c).

Systemic change: Change in the underlying causes of market system performance – typically in the rules and supporting functions – that can bring about more effective, sustainable and inclusive functioning of the market system (DFID & SDC 2008c).

Systemic constraints: The core problem that is addressed by an M4P intervention. Systemic constraints are different from market symptoms. Low productivity is a symptom while unavailability and poor quality of raw materials is one of the underlying constraints feeding to the market symptom (DFID & SDC 2008c).

1.   Introduction

A recent fact sheet by FAO, highlighted that smallholder farmers in sub-Saharan Africa use 80% of the arable areas available to produce up to the same percentage of food supply in the region. Albeit, their economic competitiveness in the global scheme dwindles with rising competition from highly mechanized large-scale farms. Thus, they either face extinction by losing sight of being market-oriented and return to the primordial subsistence farming driven by survival instincts or resiliently adapt into simple but aggregated blocks with the potential of economically thriving beyond statistical predictions (FAO 2012). It is evident that there are some factors impeding smallholder farmers from harnessing this inherent potential to achieve economic competitiveness.

Most studies in literature have asserted that smallholder farmers face several constraints that affect their income. Whilst some authors affirm the challenges surrounding production (Wordofa & Sassi 2014; Tembachako et al. 2015), others agree that factors such as: lack of access to adequate and efficient marketing facilities (Salami et al. 2010), poor access to market (Zhou et al. 2013), high transaction costs (Ebata & Hernandez 2017), post-harvest loss as a consensus challenge discussed in the recent side event at the 44th session of the Committee on World Food Security (Hiwe 2017), to highlight a few out of the inexhaustible list.

Despite these challenges, a few successes have been documented in literature showing how facilitating market linkages for farmers have led to the economic benefits of farmers (Zhou et al. 2013). Also, claims of farmers tapping into modern markets have been highlighted to raise rural families out of poverty as shown, for instance in a recent study of linking smallholder farmers to markets on extensive and intensive margins: evidence from Nicaragua (Ebata & Hernandez 2017) conforming with studies conducted in different regions (COMCEC 2014; FAO 2014; Maspaitella et al. 2018).

Although, marketing constraints arise from several factors like; lack of access to agricultural market information, distance from markets and fluctuating prices. This is supported by a study conducted in South Africa on the marketing constraints facing emerging small-scale pig farmers in Gauteng province, highlighted the challenge of lack

of access to high-value reliable markets amongst other factors (Antwi & Seahlodi 2011). In the same study, it was observed that three percent of the farmers surveyed were only able to sell to high-value markets like commercial processors even though these farmers were evaluated to be offering premium quality products. Thus, accessing high-value markets is a challenge.

The importance of accessing high-value or guaranteed steady markets for smallholder farmers living in rural areas cannot be overemphasized. More evidence from South Africa in the study of factors affecting marketing of vegetables among small-scale farmers in North West province, claimed that poorly developed village markets and inadequate access roads amongst others are some of the prominent marketing constraints (Matsane & Oyekale 2014).

It has also been found that, there are some economic benefits associated with linking farmers with commercial off-takers, processors, high-value markets or any other form of new markets. These benefits span from reducing costs in the form of mitigating or protecting farmers from post-harvest losses to generating alternative market access for opportunities to increase income. Although, this comes with its own challenges such as meeting higher standards in these new markets. These new markets offer the opportunity for smallholder commercialization – a gateway to exiting the poverty circle (Zhou et al. 2013).

(Ebata & Hernandez 2017) opined that, to facilitate smallholder farmers – especially the poor in rural communities – access high-value markets through linkages, development organizations should collaborate with policymakers to this end. This recent recommendation builds on the existing literature where other authors stated that; development agencies and non-governmental organizations (NGO) can further facilitate market access by proffering simple solutions such as production technology upgrades, stakeholder communication, access to market information and value chain development (Carletto et al. 2011; Dethier & Effenberger 2012).

In recent times, a lot of projects and programs have been sponsored by many donor agencies to implement initiatives facilitating market linkages for smallholder farmers and rural households due to its inherent potential (Bignebat & Vagneron 2011; IFAD 2012; Stoian et al. 2012; Ebata & Hernandez 2017). This potential might be the possibility for

pro-poor impact to increase income, create jobs and invariably improve the livelihood standards of rural households. More than half a decade ago, some authors (Jaffee et al. 2011; Stoian et al. 2012) claimed that there were little empirical studies documented in the ongoing academic dialogue on linking farmers to markets through development project interventions. Even though there was no sufficient reason for this, speculative thoughts might be that there was insufficient available data to draw empirical conclusions from. Although, (Humphrey & Navas-Alemán 2010) offered recommendations for implementing linkage interventions in specific market systems with appropriate approaches – like making markets work for the poor – that may be well suited or supported by other approaches. The effectiveness of project initiatives by most development agencies, civil society based organizations (CSO) and non-governmental organizations (NGO) on moving smallholder farmers from the subsistence level to the commercial level through facilitating market linkages was observed by (Carletto et al. 2011) for non-traditional crops in Guatemala, (Ebata & Hernandez 2017) in their recent study on linking smallholder farmers to markets drawing evidence from Nicaragua, asserted that there has been silence with regards to empirical claims or investigations on the type of interventions suitable for market linkage and for what crops.

Thus, due to this gap in the current academic dialogue and the existing views that lack unequivocal empirical support, this study will probe into the Making Markets Work for the Poor (M4P) approach for linking smallholder farmers to processors drawing up evidence from the linking tomato farmers to processing factory initiative implemented by the UK DFID funded Growth and Employment in States project (GEMS4) implemented in Nigeria from 2012 to 2017 which is in line with the recommendation by (Ebata & Hernandez 2017) to explore the market linkage interventions implemented by different donor- funded projects on different crops in different cultural and geographical contexts.

2.   Background

2.1.   Market system approaches

Over the years, development agencies, governmental parastatals, donor agencies, civil society based organizations (CSOs), non-governmental organizations (NGOs), and non-for profits have all been involved in addressing major market constraints in different sectors and cultural contexts. (DFID & SDC 2008a) described the initial approach of development practice as stepping into the market system to deliver the missing necessity or temporarily replacing the dysfunctional actor in the system to achieve quick results through direct interventions. Sometimes these direct interventions can be the provision of subsidies, materials, cash or playing advisory roles. This approach emphasizes on filling "the gap" directly to solve the challenge at hand. Albeit, it has been recorded by a DFID review, that the results of such direct interventions have been limited in terms of impact, number of target beneficiaries reached, sustainability and efficiency (DFID & SDC 2008a). It was also established in the same DFID report that evidence drawn from the application of direct intervention in various fields such as agriculture, finance, health, water and sanitation, have all shown to have failed in reaching large-scale pro-poor impact and majorly achieved short-term market disruption rather than long-term systemic change.

The flaws of direct interventions were obvious to development practitioners from the late 1990s in business development services (BDS) which at the time was a unique concerted effort to addressing constraints and was coordinated by the Donor Committee for Enterprise Development. There was a little shift in the process of delivering business development services from the previous direct interventions support. The focus was to facilitate markets rather than continuously give direct support to market actors in form of materials, cash and advices. Furthermore, Other traditional approaches used by development practitioners such as livelihoods analysis have been useful over the years in comprehending and recognizing who the poor are in the market system. Also, another old development approach known as the value chain analysis has been further used to show added value across the entire value chain. Even these two traditional development approaches have their own inherent flaws such as; the inability to effectively depict the

added value with respect to the overall market system around the core value chain (Elliot et al. 2008). Thus, does not give proper direction for the exact point of entrance for implementing a development intervention and place less emphasis on the requisite for sustainability (DFID & SDC 2008a).

To achieve an all-round market focused impact and reduce the ravaging threat of poverty, value chain interventions got overtly famous in the past few decades. A review of thirty donor-funded value chain interventions was carried out based on detailed research and assessment of their causal impact on poverty reduction was methodologically investigated by (Humphrey & Navas-Alemán 2010). The study, established that most of the projects investigated did not measure if their poverty reduction objectives prior to project implementation were achieved. Thus, this left a fuzzy notion due to the unavailable empirical evidence if value chain interventions are the cause of the change observed, directly impact the poor and efficient in terms of value for money basis. Furthermore, the review recommended that there are peculiar situations that require the use of the value chain approach and those where other approaches such as M4P may be more suitable.

(DFID & SDC 2008a) recommended that development practitioners or other intervention agents should try and address the shortcomings of placing beneficiaries such as smallholder farmers in the agricultural context in the entire market context. Thus, shifting from answering the traditional questions of "how can interveners solve problems?" to asking more relevant market system centred questions: "why isn't the market environment providing solutions?" to these challenges and "How can I address the constraints that prevent it from effectively doing so?" Not until in recent times, addressing market system constraints that affect the entire system have not been put in the frontline of development interventions. On the contrary, giving direct assistance to individual actors or groups have been the main championed cause to the detriment of sustainable systemic change.

"M4P can Place the poor within market systems, identify the systemic constraints affecting their participation, focus interventions accordingly, strengthen systemic analysis of value chains and provides stronger guidance for intervention" according to a publication by DFID and SDC (2008a).

2.2.   M4P in theory

M4P has been recorded to be a relevant approach in addressing the issue of poverty where interveners play a facilitative role to develop the entire market system to work inclusively with a strong focus on achieving sustainable large-scale pro-poor impact (Elliot et al. 2008). Thus, the conceptual framework of M4P rests on a thorough understanding of the market system – which is beyond just the value chain of a commodity but also considers other functions such as the supporting and rules functions. According to a recent publication by DFID and SDC (2008c) "market system can be described as a multi-player, multi-function arrangement comprising three main sets of functions (core, rules and supporting) undertaken by different players (private sector, government, representative organizations, civil society, etc.) through which exchange takes place, develops, adapts and grows." A construct through which both conventionally defined markets and basic services can be viewed.

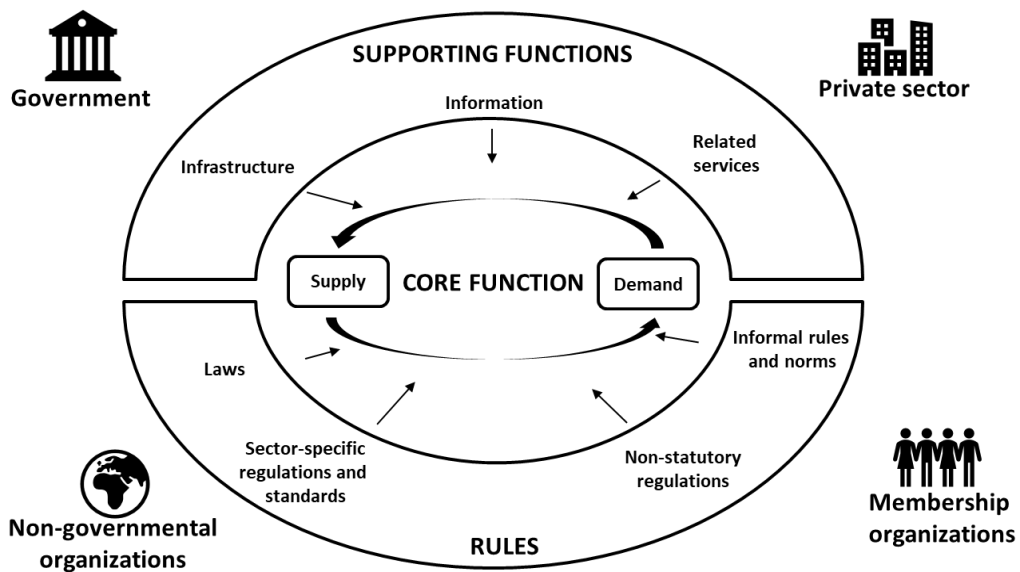Figure 1: Stylized view of the market system
Source: Elliot et al. 2008

Figure 1 is a simple sketch of a market system showing the three main functions. The core function representing the central value chain where the exchange of value (supply and demand) happens. It also shows the supporting function that focuses on informing and communicating which are actions typically carried out by governments

and private sector players who often than not provide infrastructure and other related services respectively. Lastly, is the rules and regulation function where institutions enforce laws, sector-specific standards as well as informal rules and norms.

It is worthy to note that M4P approach which is mainly championed by DFID and SDC overlaps with other market systems approaches. Other market system approaches are well documented in literature such as: USAID inclusive market systems development and value chain development (VCD) approaches (Humphrey 2014). It has been established that the M4P approach is geared towards helping development agencies and governments to alleviate poverty by addressing systemic constraints that impede the proper functioning of an entire market to achieve sustainable pro-poor large-scale impacts in different sectors. The approach implementers claim that it can and has been applied to both economic and social contexts such as; agriculture, finance, business environment, livelihoods, water, health and education (DFID & SDC 2008b). M4P tries to address the root cause of market constraints that aim to improve the lives and livelihood of the poor on the long run as enterprise owners (through increased profit margins, higher yields and better market access), consumers and employees (Ruffer & Wach 2013).

A recent literature review on market systems approaches summarized various schools of thoughts on the underlining guidelines of M4P as "a useful practical intervention tool and a well-defined set of practices for market systems development that is a set of time-limited catalytic interventions to stimulate systemic change which aims at increasing impact through replication and crowding in" (Humphrey 2014). Thus, to be able to implement the M4P approach either in a project, programme or intervention, development practitioners must place emphasis on the thorough understanding of the market system through detailed analysis to identify constraints impeding the system, from functioning effectively and efficiently. Authorities in literature have outlined the main characteristics of M4P as compared to other market system development approaches as it aims at achieving; sustainable, large-scale systemic change through the facilitative roles of the development agents (DFID & SDC 2008a, 2008b, 2008c; Elliot et al. 2008; Ruffer & Wach 2013; Humphrey 2014). In theory, the conceptual framework of the M4P approach appears to be a feasible long-lasting solution to development challenges especially in complex market systems. Nonetheless, there are still areas subject to scrutiny and debate regarding consensus agreement on market system analysis and how the

different actors in the system interact prior to intervention implementation. Furthermore, when there are various interventions designed to resolve myriad challenges impeding proper market functioning, in what order are these interventions implemented and who determines the order and what are the underlying justifications pre-empting the order? "how are interventions prioritized, and according to which criteria?" (Humphrey 2014).

2.3. M4P in practice

A few number of projects and programme intervention have been implemented using the M4P approach ranging from different sectorial focus and cultural contexts in Asia and some boarders of Europe: From one of the oldest and longest (15 years) implemented M4P project Katalyst, 2003 implemented in Bangladesh to boost the competitiveness of farmers and small enterprises by facilitating changes in services, inputs and product markets; to Growth-Oriented Microenterprise Development Program (GMED), 2004 carried out in India to reduce poverty by improving the growth prospects of MSEs in four subsectors (urban solid waste management; fruits and vegetables; maize; and organically certifiable food products; to Enter-Growth, 2005 a project implemented in Sri Lanka to improve market access, create a more conducive policy, legal and regulatory environment for MSEs; to Alliances project, 2008 implemented in Georgia to improve the incomes of poor rural households by helping small- scale livestock farmers gain better access to markets, information, services and technologies; to Poorest States Inclusive Growth (PSIG), 2008 carried out in India to ensure that poor and vulnerable people in low-income states (especially women) benefit from economic growth through better access to financial services; to Markets for Meghri (M4M), 2009 implemented in Armenia to generate a sustainable increase in the production and profitability of small-scale producers of figs, persimmons and pomegranates in the Meghri region; to Samriddhi project in Bangladesh, 2010 which was initiated to contribute to the sustainable wellbeing and resilience of the poor and extreme poor through economic empowerment in the agricultural and crafts sector; to Samarth – Nepal, 2011 a project established to increase the incomes of 300,000 farmers and small-scale entrepreneurs active in rural markets by an average of £80 per year and lastly in Asia the Vietnam Business Challenge Fund, 2012 aimed at providing catalyst funds to the private sector for innovative and pro- poor

projects to create jobs and improve income for the poor in the agricultural value chain, low-carbon growth, and infrastructure development sectors (Bano et al. 2016).

More development intervention foot prints using the M4P approach can be seen on the sub-Saharan African terrain: From FIT-SEMA, 1999 in Uganda by establishing small business-focused radio programmes to act as channels of information and serve as platforms for discussion, enhancing the voice of rural entrepreneurs; to FinMark Trust, 2002 implemented in southern Africa designed to making financial markets work for the poor by working with policy-makers to promote greater integration of financial services across Southern Africa addressing constraints that are restricting access to financial products and services among the poor; to KBDS/KHDP, 2003 implemented in Kenya to increase rural households' incomes by increasing the productivity of smallholders growing targeted fruits and increasing agricultural trade in local and export markets amongst others; to FSD Kenya, 2005 which was implemented to catalyse and achieve impact throughout the financial sector, with the aim of generating sustainable improvements in the livelihoods of the poor; to RLDP, 2008 which was carried out in Tanzania to make market systems work better for the welfare of rural producers in Tanzania's central corridor through the use of contract farming systems, improve farmers' access to inputs and advisory services in the production of cotton; to Revitalizing Agricultural/ Pastoral Incomes and New Markets (RAIN), 2008 a project implemented in Ethiopia to increase and diversify the asset base of food-insecure households via immediate economic opportunities and the development of high-impact agricultural and non-agricultural markets; to Renewable Energy and Adaptation Climate Technologies (REACT), 2010 carried out in East African countries to stimulate private sector investment in developing low-cost, clean energy and climate change technologies and services, such as solar power, biomass energy, irrigation and crop insurance products for smallholder farmers; to Making Agricultural Markets Work for Zambia (MUSIKA), 2012 implemented to ensure that agricultural inputs, services and output markets work better for the benefit of smallholder farmers; Private Enterprise Programme Ethiopia (PEPE), 2012 that supported private sector development by improving firms' access to finance and addressing market and government failures in identified priority sectors; to Kenya Market Assistance Programme (MAP), 2012 aimed to reduce poverty by enabling poor people to benefit from better functioning markets, and building greater awareness among

influential decision-makers of how markets can work better for the poor and lastly to Private Sector Innovation Programme for Health (PSP4H), 2012 that was implemented to facilitate private investment in the provision of healthcare products and services to the working poor (Bano et al. 2016).

A bulk of the recent application of the M4P approach in sub-Saharan Africa was implemented across different sectors in Nigeria ranging from: health, media, infrastructure, real estate, construction, transport, business environment reforms, rural markets and agriculture (Bano et al. 2016). In 2012, the Support to National Malaria Program in Nigeria went through a policy reform to shift from direct price support by handing out free malaria prevention commodities to identifying and addressing market systems constraints for demand creation of anti-malaria commodities through the M4P approach (George et al. 2014). At the inception of a business environment reform programme in Nigeria, Enhancing Nigerian Advocacy for a Better Business Environment (ENABLE), there was shift to implementing the programme using the M4P approach as soon as it was obvious that in order to "improve the policy and regulatory environment for doing business", there was a need to work with all major stakeholders within the business environment thus focusing on addressing systemic constraints (DFID 2014). Also, the Growth and Employment in States: GEMS3 project was implemented in the same sector to support the business environment through improved land, tax and investment reform, address systemic issues relating to this and promote investment. Similarly, but in a different sector, the GEMS2 project aimed to raise incomes, create employment and improve working conditions in the construction and real estate sector by facilitating proper positioning of major market players through capacity development for improved access to skill (GEMS Nigeria 2014). Furthermore, a couple of development projects have been implemented in the agricultural sector in the Nigerian context using the M4P market system approach from 2004 to 2017. From implementing the PROPCOM project that focused on increasing smallholder farmers access to tractor services through Promoting Pro-Poor Opportunities in Commodities and Service Markets (DFID 2011). To GEMS1 project that was designed and implemented to increase growth, income and employment, "especially for poor men and women, in meat and leather markets" (GEMS Nigeria 2014) to Market Development in the Niger Delta (MADE) and Partnership

Initiatives in the Niger Delta (PIND) which were implemented using the M4P approach (Bano et al. 2016).

Although, efforts have been made by donor agencies and implementing partners to document these projects' achievements although, there have been limited academic studies conducted to evaluate the impact of using the M4P approach and this creates a gap in the present development dialogue. It is worthy to highlight that some authors acknowledged that M4P "is not a panacea and there are still areas of debate over its application" (DFID & SDC 2008a).

2.4. GEMS4 farmer-processor linkage initiative

The DFID funded £16.8 million Growth and Employment in States 4 (GEMS 4) project managed by Coffey International Development, a Tetra Tech Company was designed sequel to a market system analysis of the wholesale and retail sector – an essential driver of Nigeria's GDP – that underscored the challenges within different value chains. The project was implemented using the M4P approach to facilitate systemic change for pro-poor economic growth. One of the working principles for implementing the GEMS4 project was to facilitate proper alignment of major market players such as; business associations, service providers, producers, retailers, wholesalers, processors, smallholder farmers in the market system, linking them together to unlock opportunities for mutual benefits on the long-run, which is in line with the principles of the M4P approach as catalysing the relationships of important market system actors (DFID & SDC 2008a; GEMS4 2012; Coffey International Development 2018). The project implemented different sectorial interventions – mobile money, feed finishing, micro retailing, skin quality for leather products, waste management, rice and tomato value chains – and crosscutting interventions such as; access to finance and women's economic empowerment (GEMS4 2012).

In the tomato value chain, GEMS4 project linked smallholder tomato farmers to two processing factories – Ikara and Dangote processing factories – located in Kaduna and Kano states respectively. Also, GEMS4 was able to map out all the tomato clusters in twelve states of Nigeria (BEAM Exchange 2017). It is worthy to note that, GEMS4 also facilitated the functioning of an old processing factory – Ikara processing factory –

by engaging the private sector company interested in leasing the dilapidated government owned factory. GEMS4 acted as a mediator during the negotiation period between the two parties and guaranteed the private sector investor to link enough smallholder tomato farmers to the factory to ensure that it gets the required tons of tomatoes for processing daily during the glut period of tomato production.

The glut period was identified by GEMS4 as the peak period of tomato production (January – April) in Nigeria when there is an excess supply of fresh produce in the traditional open fresh market. During this period, smallholder farmers suffer a significant loss due to poor post-harvest management and surplus produce in the market which invariably drives the price of tomatoes down thus leading to reduced incomes. It was also identified that the surplus in the market existed at the peak seasons due to limited number of alternate markets where smallholder farmers can sell their fresh produce to spread their customer base and reduce the high (45% annual tomato waste in Nigeria) loss incurred (GEMS4 2016). Also, other factors such as lack of appropriate post-harvest handling practices, timely harvesting in line with ripeness standard of tomatoes, poor storage and transportation materials were identified as major constraints contributing to the huge loss recorded in the value chain.

The farmer-processor linkage initiative implemented in Kaduna state by the GEMS4 project team was done after the processing factory commenced operation under the legal lease by the private sector company. Farmers were mobilized from most local government areas within and outside Kaduna state. The only criteria for linking smallholder farmers was that they need to be cultivators of tomato and willing to explore the idea of selling their fresh produce to alternative markets outside the traditional open fresh market. The study focused on tomato farmers as this vegetable contributes to a certain degree the average meal of Nigerians especially lunch and it is generally cultivated by smallholder farmers in the Northern part of the country. The farmer-processor linkage was highlighted as a case study as it was a major intervention that contributed to the overall pro-poor impact of the project activities. Other business linkages were facilitated by GEMS4 such as linking a retail ready sauce manufacturer to smallholder farmers through the Fresh Fruits and Vegetable Dealers Association of Nigeria (FFVDAN) a business association that aggregates fresh vegetables through the Lagos-Northern corridor of the country. This established relationship was evaluated to continue post-

GEMS4 intervention a proof of improving market system functions through linkages (GEMS4 2017). This is in tandem with implementing M4P interventions to create a facilitative change in "relationships of market actors in order to: improve target market systems, and create the conditions for markets to be continuously strengthened after the M4P 'intervention' is completed" (Ruffer & Wach 2013).

2.5. Facilitating access to alternative markets

Although in recent years, most development agencies implement interventions within the Nigerian context using the M4P approach with the aim of increasing farmers' income and creating jobs in rural areas. Although there have been researches conducted to probe into factors affecting farmers' income to help facilitating agencies focus on areas of intervention (Bhagat & Dhar 2012; Matsane & Oyekale 2014; Mukwevho & Anim 2014; Tembachako et al. 2015). Pieces of evidence drawn from southern Africa argues that lack of access to profitable markets affects the income of farmers and prevent them from escaping the poverty cycle (Mukwevho & Anim 2014). The authors went on to provide a tangible reason such as distance between high-value markets and farms, in turn, limits small-scale farmers located in rural areas from selling their fresh produce to these markets located in urban residences. This distance coupled with other challenges such poor road networks and the scattered spatial location of smallholder farmers in most rural areas often discourage commercial off-takers or high-value markets from sourcing fresh produce from farmers. (Tembachako et al. 2015) further corroborated this in a study which highlighted that inability to access and penetrate lucrative markets amongst others is a major economic challenge that smallholder tomato farmers face in the study area. Thus, it is essential for the poor especially those located in the rural areas to have better access to markets in order to move above the poverty line.

In a recent study that examined the effect of small-scale farmers participation in selling to supermarkets in Indonesia, concluded that there is a positive impact on the incomes of participant farmers (Slamet et al. 2017). Another evidence from Indonesia showed that the income of vegetable farmers was positively correlated to high-value market participation (Maspaitella et al. 2018). Therefore, overcoming marketing constraints is critical for small-scale farmers to access lucrative markets (Baloyi 2010).

Even though accessing high-value markets offer untapped opportunities as well as challenges for smallholder farmers.

Surmounting these potential challenges might lead to exploring further possibilities of generating income for smallholder farmers and promoting enterprise development in rural areas (Osmani & Hossain 2016). A study about linking smallholders to markets: determinants and impacts of farmer collective action in Kenya a country located in the heart of sub-Saharan Africa reveals that, despite the huge potential locked up in high-value markets this still remains untapped by smallholder banana farmers (Fischer & Qaim 2012). The challenges impeding smallholder farmers from accessing high-value markets have been theoretically and empirically explored in literature such as lack of appropriate facilitation to assist farmers to meet and maintain the high standard requirements of these markets (Royer et al. 2016). Also, lack of access to current high-value market information such as price (Gyau et al. 2014).

Thus, overcoming these challenges might require using policy tools alongside acting on the willingness of private sector players when linking smallholder farmers to processors or commercial markets with an aim of raising the poor in rural areas above the poverty line. Even though farmer-processor linkages are more sustainable on the long run if driven by private business establishments, it has been highlighted in literature that depending only on private interventions may exclude the poor farmers in the collaboration process thus, leading to further marginalization of the poor (Jaffee et al. 2011; Whitfield 2012). Thus, to achieve pro-poor economic growth, smallholder farmers need the collective assistance of all stakeholders to address systemic constraints and maximize commercialization opportunities (Zhou et al. 2013).

Although, some studies have evaluated the impact of linking farmers to – processors, high-value, alternative guaranteed, commercial off-takers – markets on farmers' income (Henson et al. 2008; Jaffee et al. 2011; IFAD 2012; Zhou et al. 2013; Ruffer & Wach 2013; Ebata & Hüttel 2015; Royer et al. 2016; Ebata & Hernandez 2017; Venkatesh et al. 2017; Slamet et al. 2017; Maspaitella et al. 2018). These evaluations are often seen to have two primary purposes: improving project or programme implementation or proving effectiveness or inefficiency of the implemented project or programme. Evaluations or assessments essentially used for "improving" project

implementations, usually focus on addressing questions like "how?" and "why?" the observed change has occurred. Furthermore, the project can be implemented in a better way by learning from documented successes and challenges (Osorio-Cortes & Jenal 2013; Ruffer & Wach 2013).

In this light, the main contribution of this study is to prove and hopefully make recommendations to improve the M4P approach with emphasis on facilitating market access for smallholder farmers with evidence from the recent farmer-processor linkage initiative implemented by GEMS4 project. These findings might form and inform other development interventions geared towards replicating this market system approach for future application in different cultural context and crops (Ruffer & Wach 2013).

3. Aims of the Thesis

The main aim of the thesis was to assess the impact of Making Markets Work for the Poor (M4P) approach on the income of smallholder farmers in sub-Saharan Africa. The evidence was drawn from a case of external facilitation of alternative guaranteed market for smallholder tomato farmers by linking them to a processing factory in Kaduna state, Nigeria.

In line with the literature repository gap, insufficient empirical evidence and recommendations from recent studies, this study will probe into the Nigerian context with respect to tomato smallholder farmers to address this specific question:

- Does linking farmers to – processors, high-value, alternative guaranteed, commercial off-takers – markets using the M4P approach have any significant impact on farmers' income?

Specific objectives of the study were:

1. To describe the major factors affecting smallholder farmers' income in Nigeria.

2. To assess the impact of M4P approach on farmers income, evidence from a farmer-processor linkage initiative implemented in Nigeria.

3.   Methods

The causal research applies the quasi-experimental nature of investigation using a mixed – quantitative and qualitative – method to collecting data from a mixed group of respondents. This provided an opportunity for in-depth understanding through the triangulation of these quantitative and qualitative data. Quantitative data was collected once based on retrospective reference period from farmers who sold fresh produce to the tomato processing plant and from those who did not sell to the processor using structured questionnaire. While, qualitative first-hand experiential data was also collected through personal interviews – using structured interview guidelines – with key informants in the market system to further probe into the perceived perceptions of factors affecting smallholder farmers income within the study area.

3.1.   Study site

The study was carried out in Giwa, Zaria, Soba and Ikara local government areas in Kaduna state – one of the thirty-six states in Nigeria as shown in figure 1. Kaduna state is in the North-west geo-political zone and Northern Guinea Savanna vegetation zone of Nigeria. The state's topography provides a suitable plain for subsistence and commercial farming all year round with occasional irrigation during the dry season.

Nigeria is the 14th largest producer of tomatoes in the world with Kaduna state having an output potential to produce 666,561 tons and 1,095,513 tons of tomatoes during the wet and dry farming seasons respectively. There are approximately 81,940 smallholder farmers cultivating different varieties of tomatoes - from local to open pollinated to hybrid varieties - in Kaduna state as documented in a recent mapping of tomato clusters in northern Nigeria (GEMS4 2017). The same report noted that approximately 792,933 tons of tomatoes were estimated to be lost due to poor post-harvest management. Also, with this estimated level of potential output and the degree of post-harvest loss recorded in Kaduna state, the report also suggested that the ideal number of processing plants that will be able to mop up the excess tomatoes produced during the glut season, ought to be eight tomato processing factories. Apparently, there is only one processing factory located in the state as at the time this study was carried out. This

processing factory is Ikara Tomato Processing Factory Located in Ikara Local Government Area in Kaduna state.
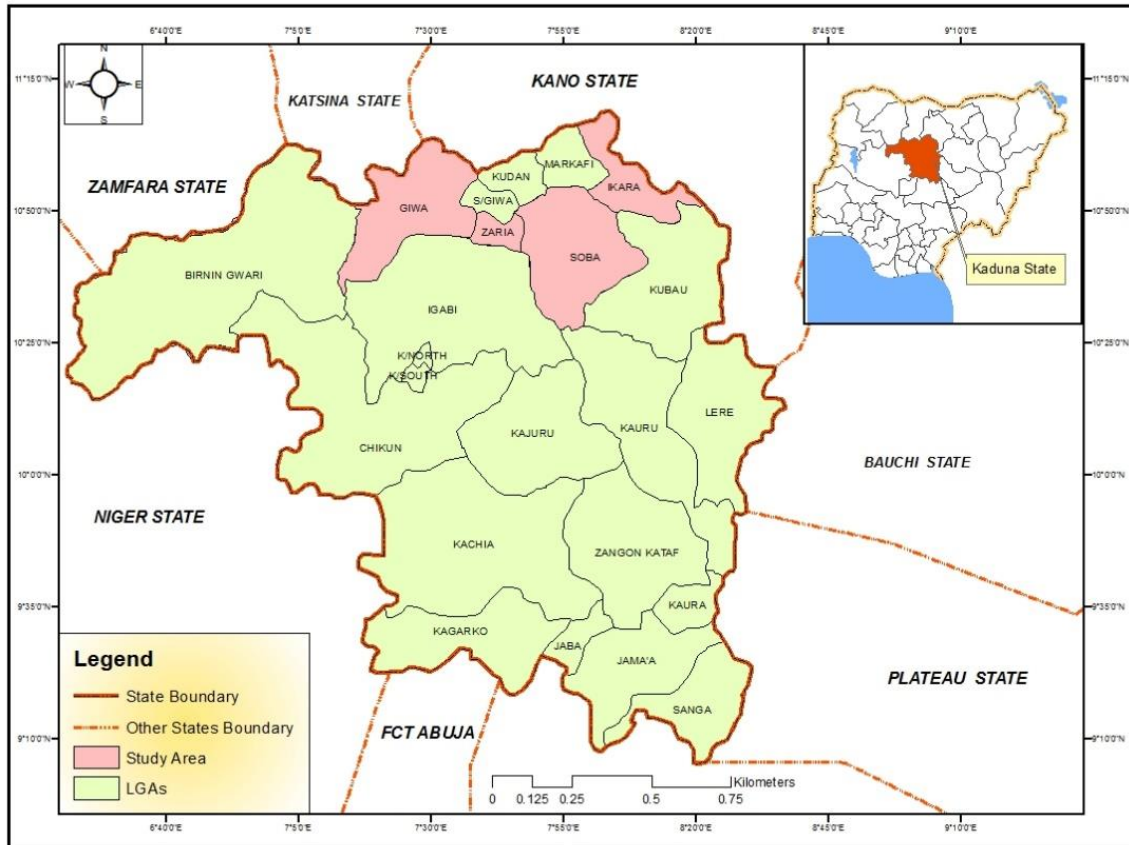
Figure 2: Map of selected state – Kaduna – and the study areas; Giwa, Zaria, Soba and Ikara
Source: Field Survey, 2017

3.2.　　　Target groups and study sample

Primary data was collected from various respondents such as farmers and key informants (development practitioners) from different sectors in the tomato value chain. These sectors include; the public or government sector (Kaduna State Agricultural Development Programme), private sector and non-profit sector (GEMS4 project). The development practitioners selected were project implementers, agricultural researchers and extension agents.

It is imperative for the study to collect data from the three functions – the core, supporting and rules – of the market system as described in the theoretical review of the M4P approach. The respondents selected are a representation of these functions in the tomato market system. The respondents from the GEM4 project represent the supporting function and is a direct representative of the agent in the market system who is implementing the M4P approach. The respondents selected from the Kaduna State Agricultural Development Programme represent a part of the government enforces sector-specific rules and standards. Finally, the farmers and other private sector players such as workers in the tomato factory were surveyed to represent actors within the core function of the market system. Multi-stage random sampling technique involving four stages was used to select the different respondents that were surveyed. The cluster sampling technique was used in the first stage to group different states in Nigeria into; states where GEMS4 project was implementing the M4P processor-linkage initiative for smallholder tomato farmers and Non-M4P intervention states. Then simple random sampling was used to select Kaduna state and the process was repeated for the selection of Local Government Areas before a convenient sample was drawn out of the smallholder tomato farmers who were participants and non-participants of the M4P processor-linkage initiative in the study area. Also, a convenient sample was drawn to select the key informants across the organizations from three sectors – governmental, private and non-governmental sectors.

Furthermore, a total number of 15 key informants were surveyed: 5 respondents from GEMS4 project comprising of the business development coordinators, intervention managers, results measurement manager and the group intervention manager for linking tomato farmers to processor initiative, 5 respondents from Kaduna State Agricultural Development Programme comprising of extension officers and the programme manager and 5 respondents from the private sector comprising of factory workers, agricultural researchers and extension agents. These key informants were interviewed to get qualitative data for a deeper understanding of market constraints and factors affecting smallholder farmers income within the study area. This method is also in line with similar recent empirical studies where key informants were interviewed to reveal deeper insights (Henson et al. 2008; Ayanwale et al. 2013; Ebata 2015; Ebata & Hernandez 2017; Slamet et al. 2017; Maspaitella et al. 2018).

A total of 247 farmers were interviewed using questionnaires with questions structured into three sections: socio-economic characteristics, tomato farming costs and revenue, factors affecting smallholder farmers income. (refer to appendix 2 and appendix 3 for questionnaire details). This sample size of 247 respondents was surveyed comprising of 126 participant farmers in the M4P processor-linkage initiative i.e. farmers who sold fresh tomatoes to the tomato processing factory and 121 non- participants in the initiative i.e. farmers who did not sell to the factory, over a data collection period of three months (August to October 2017). It is worthy to note that the sample size selected was not enough to represent the total population of 81,940 tomato farmers reported to be present in the study area by (GEMS4 2017) because on calculating the ideal sample size on a 95% confidence level and at a confidence interval of 6, the estimated sample size should be 266 farmers. Thus, the sample size used in the study was short of 19 farmers.

Regarding the socio-economic characteristics comparison between participant and non-participant farmers in the M4P processor-linkage initiative, data – age, gender, education, household size, transportation, access to credit, farming experience, training received – collected was analysed using descriptive statistics such as; estimated means and mean-comparison $P(T<=t)$ two-tail t-test as shown in Table 1.0. This method was used by similar empirical studies described in the literature review (Ebata 2015; Ebata & Hüttel 2015; Ebata & Hernandez 2017). The variables were defined as shown in the table with dummy variables such as; transportation representing if the farmers transport their fresh produce to the nearest market centre, access to credit if they have access to any credit facility and training received if they attended a one-day agricultural capacity building in the previous year. Other socio-economic factors such as; main occupation (which was operationalized as farming, civil/public servant, trading, artisan and student) and main income source (which was operationalized as livestock rearing, crop/vegetable gardening, fishing, remittance, pension, formal employment, casual employment, business, combination of any above) showed that the most frequent answer for the two groups of farmers as farming and vegetable gardening respectively.

The comparison revealed that household size, transportation, access to credit and training received were significant at 5% level of probability. While other socioeconomic characteristics such as: age, gender, educational level and years of farming experience are seen to be insignificant at 5% probability level. Table 1.0 shows that there is no significant

difference between the socio-economic characteristics of the two groups of farmers surveyed.

Table 1.0: Socio-economic comparison between research and control group of farmers in the M4P processor-linkage initiative

Socio-economic characteristics of farmers	PLP (n=126) $\bar{Y}_1$	PLN (n=121) $\bar{Y}_2$	Difference $\bar{Y}_1 - \bar{Y}_2$	t-Test
Age (years)	40.50	35.50	00.18	00.16
Gender (1=male; 0=female)	09.80	09.40	00.04	00.18
Education ([0] No formal [1] Primary [2] High [3] Senior high [4] Tertiary)	01.59	01.79	-00.20	00.18
Household size (number of people)	15.18	10.69	04.49	00.00**
Transportation (1=yes; 0=no)	00.67	00.90	-00.23	00.00**
Access to credit (1=yes; 0=no)	00.22	00.10	00.12	00.01**
Farming experience (years)	17.30	15.99	01.31	00.17
Training received (1=yes; 0=no)	00.75	00.68	00.07	00.24**

Note: PLP and PLN denotes participant group of farmers who sold to the processing factory and non-participant group of farmers who did not sell to the factory respectively. n represents the number of respondents surveyed. The column Difference ($\bar{Y}_1 - \bar{Y}_2$) shows if the mean differences between processor-linkage participants (PLP) and processor-linkage non-participants (PLN) are statistically significant based on a mean-comparison P(T<=t) two-tail t test, as ** denotes Significance at 5% level of probability. While, $\bar{Y}_1$ denotes the mean of farmers who sold to the processing factory, $\bar{Y}_2$ denotes the mean of farmers who did not sell to the processing factory and $\bar{Y}_1 - \bar{Y}_2$ denotes the difference in mean for the two groups.

3.3. Data collection

Primary data was collected from the sample size of smallholder farmers and from the key informants in the tomato market system using structured questionnaire and interview guides (see appendix 3) respectively. For the first objective, regarding the perception of various respondents on the factors affecting farmers income, which was operationalized via a structured Likert scale ranging from 1 to 5; with [1] Strongly disagree, [2] Disagree, [3] Neither disagree nor agree, [4] Agree, [5] Strongly agree. Respondents were asked to rank on a Likert scale, eight major factors affecting Smallholder farmers income. These factors are: poor access to competitive markets, poor access to commercial off-takers, poor access to quality inputs, limited access to technology, limited access to modern agricultural knowledge and practice, limited access to extension advice and services, limited access to agricultural markets information services (AMIS) and inconsistent agricultural policies. For the second objective, the net farm income (NFI) of tomato farmers was used as an indicator for measuring the impact

21

of the M4P processor-linkage intervention as used in a similar study by (Sarma et al. 2016). NFI measured in this study shows directly the income generated from selling only tomatoes and to improve reliability of data indirect and multiple questions was used to source data about total revenue and total cost; planting cost (labour, seeds, fertilizer and pesticide), harvesting cost (labour, baskets and miscellaneous), cost incurred for selling to the open fresh market(ropes, baskets and transportation) and cost incurred for selling to the processing factory (returnable plastic crates rental). Examples of such questions are; What area of land (in Hectares) did you cultivate for tomatoes in the dry seasons of 2015 and 2016? On average, what is the cost of renting 1 hectare of land in the dry seasons of 2015 and 2016? On average, what did 1 basket of your harvested tomatoes weigh (in Kilograms) in the dry seasons of 2015 and 2016? How many baskets of tomatoes did you harvest in the dry seasons of 2015 and 2016? On average, how many baskets of tomatoes from your harvest did you NOT sell because your household consumed, or you gave as a free will gift to relatives in the dry seasons of 2015 and 2016? On average, before sale, how many baskets of tomatoes gets damaged after harvesting and taking to the open market for sale? Also, historical and randomness threat was mitigated by the one-time data sourced from farmers to get before and after sales figures to the processing factory.

The method for data collection was triangulated using one-on-one administering of questionnaires to farmers, focus group discussions with key informants at the KADP and in-depth interviews with other key informants surveyed. Also, the selling price claimed by farmers who sold to the processing factory was double checked with the factory database and with the project officer who mobilized farmers during the implementation of the processor-linkage initiative using the M4P approach.

It is worthy to note that one of the lead researchers for this study was formerly a part of the GEMS4 Project and has an in-depth knowledge of the M4P processor-linkage initiative which is a recommended quality for an independent evaluator as supported by (DFID 2013) stating that "whilst independence on the part of an evaluator is desirable for objectivity, for M4P evaluation, it is equally important that the evaluator has in-depth knowledge of interventions and context, given the complex nature of the programmes and markets."

3.4.   Data analysis

The overall representation of the mean value of the perceptions of respondents captured during the survey was described quantitatively and qualitatively by simple descriptive statistics – using charts, tables as well as quotes from interview sessions and focus group discussions with key informant, revealing in-depth understanding of how these factors affect smallholder farmers income with respect to the cultural context, market system dynamics and tomato value chain.

The second objective, compared and estimated the difference in the net farm income between the participants and non- participants of the processor-linkage intervention, to assess the impact of the M4P initiative on the farmers income in the study area.

The difference-in-difference (double difference) estimator was used to analyse the impact of the processor-linkage intervention on the incomes of smallholder tomato farmers. This method is commonly used to estimate unbiased causal effects in a quasi-experimental nature of investigation with retrospective reference period. Lechner (2010) recommends this method of unbiased estimation when treatments applied in interventions like this do not affect the population at the same time and in the same way. This method has a strong empirical footing in literature and have been used over a period for similar studies conducted in different cultural contexts (Blundell & Costa Dias 2009; Janvry et al. 2011; Ike 2014; Ebata & Hernandez 2017).

The practical hedge that difference-in-difference method offers in estimating causal effects is that it nets out any extra visible or latent changes that have a fixed impact – which does not vary with time – on an indicator (like how hardworking or intelligent a farmer is) or that shows popular trends equally affecting the population (like price or disease epidemic) (Ravallion et al. 2005; Ayanwale et al. 2013; Sarma et al. 2016) In principle, the double-difference estimator method can be used to assess project impacts without using Propensity Score Matching (PSM) and will produce unbiased estimates of impacts as long as these assumptions hold (Ayanwale et al. 2013).

In this study, the difference in the net farm incomes between the participant and non-participant farmers was compared and used to estimate the impact of the processor-linkage initiative using the M4P approach in the study area.

The model specification for the net farm income is as follows:

NFI = TR – TVC – TFC --- (1)

Where:

NFI = Net Farm Income

TR = Total Revenue

TVC = Total Variable Cost

TFC = Total Fixed Cost

Note: % change in income $= \frac{income\ after - income\ before}{income\ before} \times 100$-------------- (2)

DD = (YPLP$_1$ – YPLP$_0$) – (YPLN$_1$ – YPLN$_0$) ------------------------------- (3)

Where:

YPLP$_1$ = NFI of farmers who sold to the processor after the M4P intervention started;

YPLP$_0$ = NFI of farmers who sold to the processor before the M4P intervention started;

YPLN$_1$ = NFI of farmers who did not sell to the processor after the M4P intervention started;

YPLN$_0$ = NFI of farmers who did not sell to the processor before the M4P intervention started.

3.5.   Limitations of the study

It is known that farmers have a variety of income sources at their disposal from financial farm income to in-kind income to off-farm income. Thus, this limits the validity of measuring net farm income as the only indicator of farmers livelihood. Also, the reliability of data on income is limited especially by the fact that the study relied on the memory of smallholder farmers due to the retrospective reference period of the research and unavailability of detailed farm records by the respondents. Although, this reduced the risk of matching data gathered on income before and after the processor-linkage initiative.

The question addressing the main income source during data collection highlighted how important vegetable cultivation is to farmers in the study area.

Conversely, new primary data collection reduced the risk of bias if the study had depended solely on a secondary data internally collected and provided by GEMS4 project who was responsible for linking these smallholder farmers to the processor in the first place.

Although, to also counter check the data provided by the smallholder farmers and increase the reliability of our measurement, the questionnaire was structured in a way to avoid direct questions relating to household sizes and income by using indirect multiple questions to source data from respondents. For example, questions like; how many wives do you have? How many children do you have? Are there any other family relatives staying with you? If yes, how many relatives stay with your family? All sum up to estimate the household size. Also, questions like; on average, what did 1 basket of your harvested tomatoes weigh (in Kilograms) in the dry seasons of 2015 and 2016? How many baskets of tomatoes did you harvest in the dry seasons of 2015 and 2016? On average, how many baskets of tomatoes from your harvest did you NOT sell because your household consumed, or you gave as a free will gift to relatives in the dry seasons of 2015 and 2016? On average, before sale, how many baskets of tomatoes gets damaged after harvesting and taking to the open market for sale? Where required in calculating income without asking the farmers directly (see appendix for more details). Furthermore, quantitative data received from farmers were indirectly confirmed during the focus group discussion with the staff of KADP and interviews with other key informants.

Also, as stated earlier in calculating the sample size, the population was underrepresented and short of 19 farmers. The convenience sampling technique used might have influenced the results although, the quality of the data collected was refined and the risk of bias reduced as the data collection method was triangulated and key informants were chosen from three different – government, private and non-governmental – sectors.

4.   Results

4.1.   Major factors affecting smallholder farmers income

The result in Table 2.0 shows the mean value of perception of respondents on major factors affecting smallholder farmers' income in the study area. Compared with other groups, GEMS4 Project, private sector and farmers who participated in the M4P processor-linkage initiative strongly agreed that the major factors affecting smallholder farmers' income in the study area are poor access to competitive markets and commercial off-takers.

Table 2.0: Mean value of perception of respondents on major factors affecting smallholder farmers' income

Major factors affecting farmers' income	GS (n=5)	GEMS4 (n=5)	PS (n=5)	PLP (n=126)	PLN (n=121)
Poor access to competitive markets	3.67	4.60	4.50	4.52	4.09
Poor access to commercial off-takers	3.83	4.60	5.00	4.21	3.97
Poor access to quality inputs	2.67	4.20	3.25	4.35	4.08
Limited access to technology	3.17	3.80	2.75	4.28	3.69
Limited access to modern agricultural knowledge & practice	2.50	4.00	2.50	4.11	3.65
Limited access to extension advice & service	2.67	4.00	3.00	4.11	4.09
Limited access to Agric Markets Information Services (AMIS)	2.67	3.60	2.00	4.17	3.93
Inconsistent agricultural policies	3.00	3.20	1.75	4.15	4.10

Source: Field Survey, 2017

Note: GS, GEMS4, PS, PLP and PLN denotes respondents from the government sector, GEMS4 project, private sector, participant group of farmers who sold to the processing factory and non-participant group of farmers who did not sell to the factory respectively with n representing the number of respondents surveyed. The table is an overall representation of the perceptions of respondents captured during the survey using the Likert scale ranging from 1 to 5; with [1] Strongly disagree, [2] Disagree, [3] Neither disagree nor agree, [4] Agree, [5] Strongly agree.

While, all the respondents from the government sector and the farmers who did not sell to the tomato processing factory only agreed that poor access to competitive markets and commercial off-takers is a major factor affecting smallholder farmers income in the study area. Compared with other groups, the two farmer groups surveyed and GEMS4 project agreed that poor access to quality inputs, limited access to technology, agricultural market information services, modern agricultural knowledge and practice, extension advice and services are major factors affecting farmers' incomes. The

respondents from the government sector neither agreed nor disagreed that inconsistent agricultural policies are a major factor affecting smallholder farmers income while the two farmer groups showed a contrary perception to this.

Interview with a key informant who works at the Ikara processing factory firmly disagreed with the fact that inconsistent agricultural policies was a major factor affecting smallholder farmers income, especially about tomato farmers. He placed a strong emphasis on the nature of tomato market as he described that "while in the traditional fresh market, prices were high in the morning as freshly harvested tomatoes from the farm get to this market early in the morning thus, the quality in terms of firmness was high. Although, prices dwindled rapidly as the hours of the day went by due to the perishable nature of tomatoes. Thus, this was identified as a major cause of post-harvest loss as farmers lacked access to cold storage facilities or hygienically rapid solar powered drying machines." This was also mentioned during the focused group discussion with key informants at KADP and they unanimously agreed that linking tomato farmers to the processing factory has been seen to reduce losses during the peak period of harvest.

4.2. Comparing the net farm incomes of participant and non-participant farmers in the M4P processor-linkage initiative

Average total costs, total revenues and net farm incomes of the participant and non-participant farmers before and after the M4P processor-linkage initiative are presented in table 3.0. The table also shows in detail the average planting costs that capture; labour, seeds, fertilizer and pesticides used. Also, the table presents the average harvesting cost that includes; labour baskets and miscellaneous. Other costs incurred for selling tomatoes to the open fresh market and to the processing factory such as ropes, baskets, transportation and returnable plastic crates rent are also shown in table 3.0. During an interview session with the GEMS4 business development coordinator who worked on the farmer-processor linkage initiative commented that "she observed as farmers complained about increased overhead costs for those who sold to the processing factory as they had to pay for extra labour in sorting and grading tomatoes to meet the

factory's quality standard". Some participants in the focus group discussion at KADP remarked on this and added: "some days when the processing factory stopped operation due to maintenance or technical breakdown, farmers had to wait endlessly at the factory gate and sometimes have to return rejected tomatoes home after incurring the transportation cost." The average cost of renting a piece of land to cultivate tomatoes was used as the major fixed cost incurred by both participant and non-participant farmers in the M4P processor-linkage initiative as shown in the table.

Furthermore, revenues from tomato sold to the open fresh market and tomato sold to the processing factory are also presented in table 3.0. The estimated net farm income, the difference in the net Farm income of both the participant and non-participant Smallholder farmer's (before and after) the M4P processor-linkage initiative and the double different (DD) estimate in the net Farm income are all shown in table 3.0.

The participant farmers in the M4P processor-linkage initiative i.e. farmers who sold directly to the processing factory had an average net farm income of 75,962 Naira and 130,628 Naira respectively before and after being linked to the processing factory. While, farmers who did not sell their fresh produce to the processing factory had an average net farm income of 75,432 Naira[1] (209.7 USD) and 101,661 Naira (282.62 USD) respectively. The results indicate an increase in the net farm income for the two farmer groups. The percentage change in net farm income for the participant and non-participant farmers before and after the initiative are 72% and 35% respectively as shown in table 3.0.

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[1] Exchange rate: 1 USD = 360 Naira

Table 3.0: Double difference estimates of the impact of M4P processor-linkage initiative on the income of participant farmers

	Item description	PLP (n=126)		PLN (n=121)	
		Before (Naira)	After (Naira)	Before (Naira)	After (Naira)
a	Planting cost: labour, seeds, fertilizer and pesticide	131,623	146,739	132,693	138,973
b	Harvesting cost: labour baskets and miscellaneous	36,897	56,138	39,281	48,597
c	Cost incurred for selling to the open fresh market: ropes, baskets and transportation	73,651	82,563	74,087	79,375
d	Cost incurred for selling to the processing factory: returnable plastic crates rental	0,0000*	54,630	0,0000*	0,0000*
e	Total Variable Cost (a + b + c + d)	242,171	340070	246,061	266,945
f	Fixed cost: Land rent	20,560	24,893	19,851	25,508
g	**Total Cost (e + f)**	**262,731**	**364,963**	**265,912**	**292,453**
h	Revenue from tomatoes sold to the open fresh market	338,693	260,638	341,344	394,114
i	Revenue from tomatoes sold to the processing factory	0,0000*	234,953	0,0000*	0,0000*
j	**Total Revenue (h + i)**	**338,693**	**495,591**	**341,344**	**394,114**
	Net Farm Income (j - g)	**75,962**	**130,628**	**75,432**	**101,661**
	Difference in NFI before and after M4P PL initiative	54,666		26,229	
	Percentage change in NFI	72%		35%	
	Double Difference estimate in NFI before and after M4P PL initiative (DD)		28,437		

Note: PLP and PLN denotes processor-linkage participant group of farmers who sold to the processing factory and processor-linkage non-participant group of farmers who did not sell the factory respectively. While * denotes that there was no transaction cost or revenue because the processing factory had not started operation. Thus, farmers could not supply fresh tomatoes. DD estimate was done using Microsoft Excel.

5.   Discussion

In this study, we investigated the impact of making markets work for the poor approach (M4P) by drawing evidence from linking smallholder tomato farmers to processing factory. Furthermore, respondents such as development practitioners in the government sector, private sector players within the tomato value chain, GEMS4 project implementers, participant and non-participant farmer's in the M4P processor-linkage initiative were surveyed to describe their perception on factors affecting smallholder farmers income in the study area.

The results show that poor access to competitive market and commercial off-takers such as a processing factory – especially regarding perishable fresh produce like tomatoes – is a major factor affecting smallholder farmers income in the study area. Three groups out of the five groups (GEMS4 project implementers, private sector actors and farmers who sold to the processing factory) of all respondent's survey strongly agree that poor access to competitive markets and poor access to commercial off-takers are major factors affecting smallholder farmers income in the study area. While, the remaining two groups (development workers from the government sector and farmers who did not sell to the processing factory) of all respondents surveyed only agree that these two factors – poor access to competitive market and commercial off-takers – are major market constraints for smallholder tomato farmers in the study area. These two factors were ranked highest as having the strongest impact on smallholder farmers income.

The GEMS4 project Group Intervention Manager for the rice and tomato initiatives, corroborated the above findings during an interview session. He further buttressed his argument by stating that "smallholder farmers lack access to alternative higher-value markets, lack proper information regarding quality parameters required by high-value markets and commercial off-takers such as processing factory, poor supply chain logistics operation and poor post-harvest handling techniques which invariably leads to lower demand for their fresh produce and in turn handicaps rural enterprise development." Also, the programme manager, Kaduna state Agricultural Development Program during an interview session strongly affirmed that "due to the perishable nature of tomato and the sensitivity to price speculations in the tomato value chain, there is a need to facilitate access to guaranteed markets or commercial off-takers either by linking

smallholder tomato farmers to processing factories or retail chains… there must be someone that must be ready to buy these perishable products and that guarantees production and income for the farmer."

It is worthy to note the slight difference in perception to –access to competitive market and commercial off-takers – between those farmers that sold to the processing factory and those that did not sell to the factory. This might be one of the underlying reasons why the control group did not sell their tomatoes to the factory, as they saw no strong need for a commercial off-taker. Thus, it is recommended that the success story from the linkage intervention can be communicated to bring about a possible behavioural change within other farmers. Alternatively, as shown in table 1.0 the two groups of farmers differ by not transporting their fresh tomatoes to the respective local open-air fresh market. As GEMS4 Planning and Results Manager pointed out during an interview session "this might be another reason why the non-participant farmers did not sell to the factory, by trying to avoid incurring extra transportation cost to reduce their overheads and since the factory did not provide transportation services to facilitate tomato deliveries to the factory gate." Furthermore, unavailable means of transporting tomatoes to the processing plant is another possible explanation which is consistent to a similar finding in a study on factors affecting the marketing of tomatoes in Zimbabwe (Tembachako et al. 2015).

GEMS4 project implementers and all farmers surveyed agree that access to quality inputs, limited access to technology, agricultural markets information services (AMIS), extension services, modern agricultural knowledge and practice, affect smallholder farmers income in the study area. This is consistent with the findings that extension services and access to information are key factors affecting smallholder farmers to access markets and invariably their income in India by (Bhagat & Dhar 2012). Also, evidence from two studies conducted in South Africa also corroborates the findings (Matsane & Oyekale 2014; Mukwevho & Anim 2014)

The study shows an interesting result that all 247 farmers surveyed, perceived that accessing inputs, technology, extension services, agricultural markets information services, modern agricultural knowledge and practice affects their income. Thus, there is a possibility that these farmers access these set of factors in bundles or together which is

31

consistent to the finding of (Chaminuka et al. 2008) in their study on how emerging farmers in South Africa access and use service infrastructure as a bundle and not separately.

As stated by the GEMS4 project Group Intervention Manager, "farmers could not supply to the processing factory before the M4P farmer-processor linkage initiative because the processing factory was not operational at the time." The result revealed (table 3.0) that the total costs for the participant and non-participant farmers were approximately the same before the M4P processor-linkage initiative but, increased in the following year. Although, the total cost for farmers who sold to the processing plant was higher compared to the control group. This increased cost on the participants' side was due to the extra transactional costs incurred in selling to the processing factory such as; labour costs (including loading and off-loading trucks), transportation, purchase of baskets or renting returnable plastic crates, purchase of ropes and additional costs for disposing of factory rejected tomatoes. This was also observed in recent studies that some extra requirements for participating in market linkages for smallholder farmers might lead to increased overheads (Ebata 2015; Ebata & Hüttel 2015; Ebata & Hernandez 2017). This can be likened to the findings of (Waithaka et al. 2007; Tembachako et al. 2015) in their study that investigated factors affecting the use of fertilizers and manure by smallholders in Kenya and factors affecting the marketing of tomatoes in Zimbabwe respectively. This is also in line with the findings from (Antwi & Seahlodi 2011) that "farmers who sell processed animals face high transactional costs" in their study of marketing constraints facing emerging small-scale pig farmers in South Africa. Thus, with the growing evidence of increased transactional costs as an emerging challenge for smallholder farmers accessing high-value markets, development efforts should be directed at mitigating this problem. Solutions such as encouraging collective actions like the formation of farmer groups and facilitating service providers such as returnable plastic crate rentals should be explored to reduce transactional costs.

Overall, the results show that there was a corresponding increase in the net farm incomes of both participant and non-participant one year after the M4P farmer-processor linkage. The double difference estimate revealed the net farm income before and after the processor-linkage initiative is 28,437 Naira or 79.05 USD (37%) difference between the net farm incomes of the participant and non-participant farmers after the initiative. This

difference can be attributed to the revenue gotten from tomatoes sold to the processing factory. This implies that there is a positive impact of the M4P farmer- processor linkage initiative on farmers income as shown in table 3.0. This is consistent with most recent empirical studies drawing evidence from Nicaragua where smallholder bean farmers where linked to markets and Indonesia with small-scale vegetable farmers' participation in modern retail market channels (Ebata & Hüttel 2015; Ebata & Hernandez 2017; Slamet et al. 2017). It is worthy to note that, the processing factory management disclosed to the GEMS4 Business Development Coordinator that "the daily price for tomatoes was disseminated to farmers via the telephone early in the morning and this daily price fluctuated depending on the market forces in the local fresh open-air market that day. Thus, supplying to the processing factory was more of a guaranteed high value market for smallholder farmers." Even though the fixing of tomato price was stated to be controlled by market forces, but ultimately this was a subjective executive decision by the processing factory management which had no consensus or regulatory influence by any established governing body or organization. De facto, the freedom of the processing factory management to change prices, this is invariably regulated by the market system as farmers will not sell to the factory under unfavourable price conditions and they will alternatively channel their fresh tomatoes to the local open-air market. Thus, the factory needs the farmers but not as much as the farmers need the factory – since it is just another alternative market for farmers. Although, to better avail farmers the opportunity to access more alternative guaranteed high-value markets, more processing plants can be constructed by the government and private sector since there is an increasing demand for tomato in Nigeria and beyond.

It is also worthy to note that though the result Show a positive impact or contribution from M4P farmer-processor linkage on smallholder tomato farmers income, it is recommended that further studies should investigate into prospective interventions addressing transactional costs of farmers tapping into high-value markets such as collective action of smallholder farmers. Also, comparative studies can be done to further understand the advantages of M4P farmer-processor linkage to other forms of market linkages like contract farming drawing evidence from different cultural contexts and on different crops which is also in line with the recommendation from a recent study (Ebata & Hernandez 2017).

Furthermore, the study investigated the perception of respondents on the major outcome of interest when implementing an M4P initiative or project during interview sessions. It was found that 60% of respondents surveyed chose that the major outcome of interest when facilitating an M4P initiative or project for smallholder farmers will be to achieve pro-poor impact to increase incomes and jobs. While 20% of the respondents chose that addressing market constraints will be their major outcome of interest and 10% of the respondents opted for achieving sustainable change through alignment of market actors and large-scale impact in terms of the highest number of people reached as their outcome of interest when facilitating an M4P initiative or project for smallholder farmers respectively.

Further limitations to this study is the plausible demerits of using only the Double Difference estimator method to analyse the impact of the M4P farmer-processor linkage on the income of farmers. This method is vulnerable to biases emanating from how differing initial conditions or characteristics can influence the subsequent outcome changes over time. Even though no single evaluation tool can claim to be ideal in all circumstances, as recommended by a study, likely biases can also be reduced by combining with other methods such as Propensity Score Matching (Ravallion et al. 2005).

Although, to achieve systemic and sustainable impact on smallholder farmers income by facilitating market linkage interventions, necessary support will be needed to facilitate this from a policy level such as placing a quota limit on the importation of tomato paste into the country to stimulate private sector investment in establishing more processing factories. This is also in line with recommendations from recent studies (Jaffee et al. 2011; Whitfield 2012; Ebata 2015).

6.   Conclusions

The main aim of the research was to assess the impact of making markets work for the poor approach by drawing up evidence from implementing a DFID funded project that facilitated a processor-linkage intervention of linking smallholder tomato farmers to a processing factory in Nigeria.

The respondents described the major factors affecting the smallholder farmers in the study area as poor access to competitive and guaranteed markets or commercial off-takers of farm produce. The double difference estimate revealed that there was a positive impact on the incomes of smallholder farmers who participated in the M4P farmer-processor linkage initiative. This further attest to the relevance of M4P approach to reduce the burden of unemployment and boost rural enterprise development by facilitating interventions that address market constraints.

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Appendices

List of the Appendices:

Appendix 1: Questionnaire for farmers (Non-participant)

*These questionnaires have been designed to execute a research purposely for academic work. The reseasrcher is **Pius Hiwe** a student pursuing masters degree in International Development and Agricultural Economics at the Czech University of Life Scieces. The main objective of the research is to assess the impact of Making Markets Work for the Poor (M4P) Approach to Agricultural Development in Nigeria. All information provided will be used solely and exclusively for academic purpose and would be treated with the necessary confidentiality it deserves. Information provided would be used to make sound empirical analysis and also suggest policy recommendations that would help prove and improve the M4P apporach as well as farmer's socio-economic well being and promote rural enterprise development in the region. The entire interview will take nearly forty-five minutes of your time and you are kindly requested to provide honest and genuine answers within your possible best.*

Questionnaire Number		Enumerator		
State		L.G. A		
Community		Name of Compound		
Respondent		Phone No.		
Date			Time	

SECTION 1: SOCIO-ECONOMIC CHARACTERISTICS

1. Age of Respondent

[1] Less than 20 years   [2] 21-30 years   [3] 31- 40 years

[4] 41-50 years   [5] 51-60 years   [6] 61+ years

2. Sex of Respondent   [1] Male   [2] Female

3. Religion [1] Christianity   [2] Muslim   [3] Traditionalist [4] Others

4. Marital Status [1] Married   [2] Single   [3] Divorced   [4] Widowed

5. Educational Background   [0] No Formal Education   [1] Primary Education

[2] High school   [3] Senior High School/Technical/Vocational   [4] Tertiary

6. Main occupation [1] Farming   [2] Civil/Public Servant   [3] Trading   [4] Artisan [6] Student   [7] Other (specify)

_____

7. Main income source [1] livestock rearing   [2] Crop/vegetable gardening   [3] Fishing [4] Remittance [5] Pension [6] Formal employment [7] Casual employment [8] Business [9] Combination of any above [7] Other (specify)

_____

8. Are there other sources apart from farming that contribute to the revenues of your family?   [1] yes   [2] no

9. If yes, can you select one out of the under listed additional sources?

[1] Remittances from family members [2] Government service or pension [3] Profit from other non-agri-business [4] Outside job of other family members in the household [4] Other sources Please specify

_____

10. How many wives do you have_____

11. How many children do you have? _____

12. Are there any other family relatives staying with you? [1] yes   [2] no

13. If yes, how many relatives stay with your family?

_____

14. Household size_____

15. Where did you sell your fresh tomatoes in **2015**? [1] Farm gate [2] Local market [3] Aggregators/wholesalers [4] factory/processing plant [5] others

16. Where did you sell your fresh tomatoes in **2016**? [1] Farm gate [2] Local market [3] Aggregators/wholesalers [4] factory/processing plant [5] others

17. Do you transport your farm produce to the marketing centres? [1] Yes   [2] No

18. Do you have proper road network to transport your produce to the marketing centres?   [1] Yes   [2] No

19. How far is the road network from you're your farm to the marketing centres in kilometres? _____

20. Do you have access to credit facilities? [1] Yes   [2] No

21. How many years have you been involved in active farming?

_____

22. Have you attended any form of agricultural training before **2016**? [1] Yes [2] No

23. Do any Agricultural Extension Officers visit you? [0] None [1] Once a week   [2] Once a month   [3] Other
(specify)_____

SECTION 2: INCOMES OF PARTICIPANT AND NON-PARTICPANT FARMERS OF ACCESS TO MARKETS INTERVENTION USING THE M4P APPROACH.

S/N	QUESTIONS	NON-PARTICIPANT FARMERS	
		2015	2016
24	What area of land (in Hectares) did you cultivate for tomatoes in the dry seasons of 2015 and 2016?		
	On average, what is the cost of renting 1 hectare of land in the dry seasons of 2015 and 2016?		
	Estimated cost of land rent (**For Enumerator**)		
25	On average, what did 1 basket of your harvested tomatoes weigh (in Kg) in the dry seasons of 2015 and 2016?		
26	How many baskets of tomatoes did you harvest in the dry seasons of 2015 and 2016?		
	On average, how many baskets of tomatoes from your harvest did you NOT sell because your household consumed, or you		

	gave as a free will gift to relatives in the dry seasons of 2015 and 2016?		
	On average, before sale, how many baskets of tomatoes gets damaged after harvesting and taking to the open market for sale?		
	Estimated number of baskets sold **(For Enumerator)**		
27	What costs (in Naira) did you incur in planting tomatoes in the dry seasons of 2015 and 2016? Labour (farm hands) Seedlings Tractor/Harrowing Fertilizer Pesticide Others (Please specify)		
	Total cost incurred for planting **(For Enumerator)**		
28	What costs did you incur in harvesting tomatoes in the dry seasons of 2015 and 2016? Labour (farm hands) Baskets Transportation Others (Please specify)		
	Total cost incurred for harvesting **(For Enumerator)**		
29	What costs (in Naira) did you incur in selling tomatoes to the OPEN MARKET in the dry seasons of 2015 and 2016? Labour costs (including loading and offloading truck) Transportation		

	Baskets		
	Purchase of leaves		
	Purchase of ropes		
	Others (Please specify)		
	Total cost incurred for selling tomatoes to the OPEN MARKET **(For Enumerator)**		
30	On average, how much (in Naira) did you sell 1 basket of tomatoes to the OPEN MARKET in the dry seasons of 2015 and 2016?		

SECTION 3: FACTORS AFFECTING SMALLHOLDER FARMERS INCOME

31. In your opinion, do you think it is more profitable selling to OPEN MARKET compared to PROCESSING PLANT? [1] Yes   [2] No

32. If yes, why?

_____
_____
_____
_____

33. If no, why?

_____
_____
_____
_____

34. In your opinion, considering major challenges or market constraints affecting smallholder farmers income, which of the following factors do you think affects your income the most? (**Rate from 1 to 5; [1] Strongly disagree, [2]Disagree, [3]Neither disagree nor agree, [4]Agree, [5] Strongly agree**):

A.) Poor access to competitive markets [1] [2] [3] [4] [5]

B.) Poor access to guaranteed markets or commercial off-takers of farm produce [1] [2] [3] [4] [5]

C.) Poor access to quality agricultural inputs [1] [2] [3] [4] [5]

D.) Limited access to technology [1] [2] [3] [4] [5]

E.) Limited access to modern agricultural knowledge and practices [1] [2] [3] [4] [5]

F.) Limited access to extension advice and services [1] [2] [3] [4] [5]

G.) Limited access to current agricultural markets information [1] [2] [3] [4] [5]
H.) Inconsistent agricultural policies [1] [2] [3] [4] [5]

THE END

THANK YOU FOR YOUR TIME, PATIENCE AND PARTICIPATION.

Appendix 2: Questionnaire for farmers (Participant)

*These questionnaires have been designed to execute a research purposely for academic work. The reseasrcher is **Pius Hiwe** a student pursuing masters degree in International Development and Agricultural Economics at the Czech University of Life Scieces. The main objective of the research is to assess the impact of Making Markets Work for the Poor (M4P) Approach to Agricultural Development in Nigeria. All information provided will be used solely and exclusively for academic purpose and would be treated with the necessary confidentiality it deserves. Information provided would be used to make sound empirical analysis and also suggest policy recommendations that would help prove and improve the M4P apporach as well as farmer's socio-economic well being and promote rural enterprise development in the region. The entire interview will take nearly forty-five minutes of your time and you are kindly requested to provide honest and genuine answers within your possible best.*

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[6] Student   [7] Other (specify)

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7. Main income source [1] livestock rearing   [2] Crop/vegetable gardening   [3] Fishing
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_____

8. Are there other sources apart from farming that contribute to the revenues of your
family?   [1] yes   [2] no

9. If yes, can you select one out of the under listed additional sources?

[1] Remittances from family members [2] Government service or pension [3] Profit
from other non-agri-business [4] Outside job of other family members in the household
[4] Other sources Please specify

_____

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20. Do you have access to credit facilities? [1] Yes [2] No

21. How many years have you been involved in active farming?
_____

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	On average, how many baskets of tomatoes from your harvest did you NOT sell because your household consumed, or you gave as a free will gift to relatives in the dry seasons of 2015 and 2016?		
	On average, before sale, how many baskets of tomatoes gets damaged after harvesting and taking to the OPEN MARKET for sale?		
	On average, before sale, how many baskets of tomatoes gets damaged or rejected after harvesting and taking to the PROCESSING PLANT for sale?		
	Estimated number of baskets sold **(For Enumerator)**		
27	What costs (in Naira) did you incur in planting tomatoes in the dry seasons of 2015 and 2016? Labour (farm hands) Seedlings Tractor/Harrowing Fertilizer Pesticide Others (Please specify)		
	Total cost incurred for planting **(For Enumerator)**		
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	Total cost incurred for selling tomatoes to the OPEN MARKET (**For Enumerator**)		
30	On average, how much (in Naira) did you sell 1 basket of tomatoes to the OPEN MARKET in the dry seasons of 2015 and 2016?		
31	What costs (in Naira) did you incur in selling tomatoes to PROCESSING PLANT in the dry seasons of 2015 and 2016? Labour costs (including loading and offloading truck) Transportation Baskets Purchase of leaves Purchase of ropes Additional costs incurred for disposing rejected tomatoes (if any) Others (Please specify)		

	Total cost incurred for selling tomatoes to the PROCESSING PLANT **(For Enumerator)**		
32	On average, how much (in Naira) did you sell 1Kg of tomatoes to the PROCESSING PLANT in the dry seasons of 2015 and 2016?		

SECTION 3: FACTORS AFFECTING SMALLHOLDER FARMERS INCOME

33. What has been your experience selling tomatoes to processing plants during the dry season in 2016?

_____

_____

_____

_____

34. Why did you decide to sell to processing plants?

_____

_____

_____

_____

35. In your opinion, do you think it is more profitable selling to OPEN MARKET compared to PROCESSING PLANT? [1] Yes   [2] No

36. If yes, why?

_____

_____

_____

_____

37. If no, why?

_____

_____

_____

_____

38. In your opinion, considering major challenges or market constraints affecting smallholder farmers income, which of the following factors do you think affects your income the most? (**Rate from 1 to 5; [1] Strongly disagree, [2]Disagree, [3]Neither disagree nor agree, [4]Agree, [5] Strongly agree**):

A.) Poor access to competitive markets [1] [2] [3] [4] [5]

B.) Poor access to guaranteed markets or commercial off-takers of farm produce [1] [2] [3] [4] [5]

C.) Poor access to quality agricultural inputs [1] [2] [3] [4] [5]

D.) Limited access to technology [1] [2] [3] [4] [5]

E.) Limited access to modern agricultural knowledge and practices [1] [2] [3] [4] [5]

F.) Limited access to extension advice and services [1] [2] [3] [4] [5]

G.) Limited access to current agricultural markets information [1] [2] [3] [4] [5]
H.) Inconsistent agricultural policies [1] [2] [3] [4] [5]

THE END

THANK YOU FOR YOUR TIME, PATIENCE AND PARTICIPATION.

Appendix 3: Structured interview guideline for key informants

*These interview guide have been designed to execute a research purposely for academic work. The reseasrcher is **Pius Hiwe** a student pursuing masters degree in International Development and Agricultural Economics at the Czech University of Life Scieces. The main objective of the research is to assess the impact of Making Markets Work for the Poor (M4P) Approach to Agricultural Development in Nigeria. All information provided will be used solely and exclusively for academic purpose and would be treated with the necessary confidentiality it deserves. Information provided would be used to make sound empirical analysis and also suggest policy recommendations that would help prove and improve the M4P apporach as well as farmer's socio-economic well being and promote rural enterprise development in the region. The entire interview will take nearly forty-five minutes of your time and you are kindly requested to provide honest and genuine answers within your possible best.*

Respondent			
State		Contact	
Years of Experience in Development Sector			
Number of Projects Implemented/Designed			
Date		Time	

SECTION 1: FACTORS AFFECTING FARMERS' INCOME

1. Do market system constraints affect smallholder farmers' income?

2. What are the major market system constraints affecting farmers' income in the Nigerian agricultural context?

3. In your opinion, considering major market constraints affecting smallholder farmers' income in the Nigerian agricultural context, how would you rate the following in terms of the degree at which they affect smallholder farmers' income? **(Rate from 1 to 5; [1] Strongly disagree, [2] Disagree, [3] Neither disagree nor agree, [4] Agree, [5] Strongly agree):**

A.) Poor access to competitive markets [1] [2] [3] [4] [5]

B.) Poor access to guaranteed markets or commercial off-takers of farm produce [1] [2] [3] [4] [5]

C.) Poor access to quality agricultural inputs [1] [2] [3] [4] [5]

D.) Limited access to technology [1] [2] [3] [4] [5]

E.) Limited access to modern agricultural knowledge and practices [1] [2] [3] [4] [5]

F.) Limited access to extension advice and services [1] [2] [3] [4] [5]

G.) Limited access to current agricultural markets information [1] [2] [3] [4] [5]

H.) Inconsistent agricultural policies [1] [2] [3] [4] [5]

4. Which of the above factors will you give the highest priority to when designing or implementing interventions?

5. In your opinion, which of the following facilitation point of interest will have a (short and long term) positive impact on smallholder farmers income? And why?

o Facilitating access to competitive markets

o Facilitating access to guaranteed markets or commercial off-takers of farm produce

o Facilitating access to quality agricultural inputs

o Facilitating access to technology

o Facilitating access to modern agricultural knowledge and practices

o Facilitating access to extension advice and services

o Facilitating access to current agricultural markets information

o Formulating consistent agricultural policies

SECTION 2: MAKING MARKETS WORK FOR THE POOR (M4P) OUTCOME OF INTEREST

6. Which of the under listed is the major outcome of interest when designing or implementing an agricultural development project or intervention using the M4P approach? And why?

[1] Large-scale impact in terms of the highest number of people reached

[2] Addressing market constraints through facilitation

[3] Achieving sustainable change through alignment of market actors

[4] Achieving pro-poor impact to increase incomes and jobs

THE END

THANK YOU FOR YOUR TIME, PATIENCE AND PARTICIPATION.

Appendix 4: Data collection pictures