

**POWER RELATION DYNAMICS AMONG ACTORS IN THE GROUNDNUTS
SEED VALUE CHAIN: A CASE OF KONGWA AND KITETO DISTRICTS, TANZANIA**

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EXTENDED ABSTRACT

Groundnut crop production being highly practised in semi-arid areas of Shinyanga, Tabora, Dodoma and Mtwara Regions of Tanzania, has been gradually falling. The trends show that the groundnuts production has fallen from 1.13 million tons in 2015 to less than 1 million tons in 2017. The production of groundnuts like any other crops depends on seed availability while constraints associated with seed availability have altered the overall groundnut crop and its seed value chain performances. The constraints associated with the groundnut seed value chain that contribute to the poor performance of the groundnuts crop are linked with the levels of influence and importance of actors in the groundnut seed value chain. As a result of these levels, there are power relational dynamics that the chain actors exert on one another. The study aimed to identify actors in the groundnuts seed value chain, their roles, linkages and relational power dynamics in the chain as a result of the linkages they have. This study was descriptive and adopted a cross-sectional research design as it employed qualitative research methods that included semi-structured interviews with key informants. Focus group discussions were conducted to acquire in-depth information on relations and ties amongst actors that would explain the power actors possess. Data analysis involved identifying the extent of linkages in terms of importance and influence by analyzing the actor to actor two-dimensional linkage matrixes using the UCINET statistical software package integrated with the NETDRAW program. The identification of actors and their roles in the groundnuts seed value chain was done through content analysis while linkage and relational centrality measures were used to explain power relational changes in the chain set-up. All these aimed at determining the strength of relationships and interactions between actors hence explain the power that actors have in the value chain. Qualitative data obtained from semi-structured interviews were subjected to content analysis. The analysis involved breaking, comparing and categorising to identify levels, number of ties, linkages and extent of power in term of

influence and importance the identified actors have. Findings show that, there are different actors in the groundnuts seed value chain that are differentiated by jurisdictional levels (i.e. the village and district levels). The prominent actors included Researchers, Traders, Climate Department Officials, Central Government, Agro- dealer, Agro-processors and Consumers. These were found to occupy both village and district levels. On the other hand, Farmers, Extension Officers, NGOs and CBOs, Village leaders and Middlemen were only identified at the village level. Each of these actors had different roles from which they are interconnected to form a network of linkage in two aspects, namely knowledge and income that dictate the extent of linkage among actors in-term of influence and importance. This determined the power they possess through these linkages based on the number of linkages identified among identified actors. In the knowledge aspect, NGOs, CBOs, Local Government, Researchers and Traders were found to have a higher level of influence and importance in both at the district (Kongwa and Kiteto) and village (Mlali and Moleti) levels while farmers and extension officers were more influential at the village level only. The same actors showed to have a higher level of betweenness with values 100 and 88.89 respectively, compared to other actors. On the income aspect, Organisations (NGOs and CBOs), farmers and the climate department had a relatively higher power in terms of influence at the village level (Moleti and Mlali).The same was depicted by the Local Government and Agro-traders at the district levels (Kongwa and Kiteto). Results showed middlemen and farmers had a higher betweenness value, 9.524 and 14.856 respectively compared to other actors. This explained the power to connect other actors in terms of influence and importance in the chain set up. The study concluded that, the existence of power relational changes affects linkages among actors, the performance of the groundnuts seed value chain and it plays a key function in the overall performance of the groundnuts crop. It is therefore recommended that a more emphasis on actors' inclusion is improved through actors involvement in the chain set up in the

innovation platforms. This can go hand in hand with the government boosting linkages through the improvement of strategies and policies.

DECLARATION

I Gibson G. Mulokozi, do hereby declare to the senate of Sokoine University of Agriculture that this dissertation is my original work done within the period of registration that has neither been submitted nor concurrently being submitted in any other institution.

.....

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.....

Date

The above Declaration is approved by

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Dr. Goodluck Massawe (Supervisor)

.....

Date

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DEDICATION

This work is dedicated to my beloved daughters, Paris and Quinn Mulokozi. May it be an inspiration to their academic excellence.

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LIST OF ABBREVIATIONS

ASARECA	The Association for Strengthening Agricultural Research in Eastern and Central Africa
ASDP	Agricultural Sector Development Programme
CBOs	Community Based Organisations
FAOSTAT	Food and Agricultural Organisation Corporate Statistical Database
FGD	Focus Group Discussion
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics.
ITC	International Trade Centre
M4P	Market Work for the Poor Approach
NBS	National Bureau of Statistics
NGOs	Non-Government Organisations
SDGs	Sustainable Development Goals
UN	United Nations
URT	United Republic of Tanzania

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Groundnut is an annual legume crop grown in more than 90 countries worldwide (Mabaya, 2016). More than half of the total number of groundnuts producing countries are found in Asia and Africa (Prasad, 2010). Groundnuts are produced to be used as a food crop, edible oil source, and for its medicinal characteristics. It is estimated that approximately 31 million tons of groundnuts were produced globally in 2001 and its market export had been increasing by 2.2% (Diop *et al.*, 2004). The area planted with groundnuts has globally increased from 16 to 25 million hectares in 2014, which explains an increase in global groundnuts harvest to 45 million tons in 2014 (Verter, 2017).

According to the International Trade Centre (ITC), China is the leading groundnut producer in the world contributing 41% of the total groundnuts produced globally (ITC, 2015). African countries contribute approximately 35% of the total groundnuts produced globally. Nigeria is the leading country in Africa as it contributes around 7% of the total groundnuts produced in the region followed by Senegal, Sudan, Malawi and Tanzania (Munsaka, 2013). Tanzania contributed about 2.9% of the total globally cultivated area leading to 1.9% of the globally produced groundnuts in the year 2011 (URT, 2012). The groundnut crop in Tanzania is highly produced in Shinyanga, Tabora, Dodoma and Mtwara Regions (Daudi *et al.*, 2018). The National Bureau of Statistics shows a national increase in the number of households involved in groundnuts production from 734 034 households in 2003 to 870 084 households in 2007 (NBS, 2006), to 1,131,217 households in 2017 (NBS, 2018). Despite the fact that the household numbers involved in groundnuts production have been increasing, the overall groundnuts yield in Tanzania has declined from 1.8 million tons in 2015 to 550 000 tons in 2017 (FAOSTAT, 2017). It is with this

trend of production decline that government has dedicated its efforts to improve groundnuts production through checking the constraints associated with the crop alongside with its value chain and improvement of the groundnut sub-seed sector is amongst the efforts (Katundu *et al.*, 2012).

In the context of agricultural development, value chains have subsequently been used to explain the performance of a crop(s) from the production stage to the consumption stage. Value chains explain the involvement of different actors and their respective activities in sequence as they bring up any product from its simple to a complex form. This has been a useful way to understand how the world of production, buying and selling in terms of marketing works (Cuddeford, 2014). Value chains consist of actors and their respective activities that improve products while linking commodity producers to processors and markets, which has also been the case for agricultural products (William *et al.*, 2014). Value chains perform best when actors in a particular value chain cooperate to produce higher-quality products and generate more income for all participants along the chain. As opposed to the simplest kinds of value chains in which producers and buyers exchange only price information, the interrelation amongst them involves decision making processes with respect to the value chain of the commodity they are involved in (Norton, 2014).

Interdependence among actors enhances the value chain functioning as it not only closely links them, but also enables them to involve with each other across the chain. The network created through the actors' involvement and interdependence has been a necessary condition for adoption and diffusion of incentives for the value chain development and stability (Deloit, 2013). On the other hand, interdependence and involvement among actors are highly influenced by power exerted in their relationships and decision making that all contribute to the capacity of effective participation. Defined as the ability to

influence others, power could be derived from various sources including positional authority, professional status, knowledge and skills, control over resources and physical abilities (Barasa *et al.*, 2016). Thus, actors in the value chain; regardless of the levels, space and interests of their interaction; exert power over each other and in particular, in decision making, in acquiring information and in enhancing or influencing others along the value chain (Van Lieshout *et al.*, 2017). The results of power change amongst actors in a value chain could contribute to increased productivity and its benefits since productivity and its associated benefits depend on a well-designed, linked chain of actors and their roles in any value chain.

The groundnuts value chain in developing countries is highly associated with market production and input constraints (Darlgen and Phiri, 2019). While the marketing constraints can be solved by factors associated with obtaining quality products, the input constraints can be solved by acquiring quality and certified seeds. Highlighting the groundnuts seed value chain as a pivotal incentive could also play part in solving the inputs constraints hence helping in the increase of groundnuts production. In Tanzania efforts to develop efficient seed systems and seed value chain have been evident. This has been done through the Tropical Legume III project implemented by the International Crops Research Institute for Semi-arid Tropics. The efforts led to the establishment of functional innovation platforms as the means to build groundnut seed value chain (ICRISAT, 2019). This is due to the fact that the seed chain covers actors and the process of activities from the use of plant genetic resources to the marketing or distribution of seed of a specific variety and a certain type of quality to farmers (Audet-Bélanger *et al.*, 2013). This study will check how power dynamics among actors in the groundnuts seed chain can influence and improve the groundnuts seed value chain.

1.2 Problem Statement

The groundnut crop value chain in most developing countries like Tanzania, is understood to be constrained by many factors. These factors can be traced right from the production stage which highly depends on seeds availability, prices and other associated factors (Devi *et al.*, 2017). Agricultural development and productivity in Tanzania depend on a well-developed seed sub-sector which comprises both the formal and informal parts, all aiming at availability and accessibility of quality seeds (Munsaka, 2014). The former part of the sub-sector comprises seed breeders, producers, retailers, wholesalers, and the governmental bodies while the latter focuses on farmers (Mabaya, 2017). All these mentioned actors form a chain that is activity-intergrated. Through these activities, linkages are formed hence ensuring a stable and functioning value chain from the linkages formed (Ojiewo *et al.*, 2020).

The groundnuts seed value chain in Tanzania has been highly constrained by markets, seeds liberalization and policies thus contributing to its poor performance. The extent of effects of these constraints can be explained by the gradual fall in groundnuts production in Tanzania from 1.13 million tons in 2015 to less than 1 million tons in 2017 (FAOSTAT, 2017; Katundu *et al.*, 2012). The constraints associated with the groundnut seed value chain are on the other hand linked with the influence and importance levels between actors. Hence an evaluation of power relations existing amongst the core actors of the groundnuts seed value chain could explain how power dynamics contribute to performance of the groundnut seed value chain. Currently, there are no studies that have tackled power dynamics in the groundnut seed value chain. Available studies have been focusing on the efforts to improve groundnut varieties, disease control and improving productivity (Monyo, 2007; ICRISAT, 2014), but less is explained about the groundnut seed value chain and the influence of power dynamics among its actors.

This study assesses how power dynamics in terms of influence and importance among actors in the groundnuts seed value chain affect relational linkages. Also, the study explores the necessary steps to enhance the groundnuts seed value chain and the ultimate increase in groundnut production.

1.3 Study Justification

This study is useful to academicians, scholar and other researchers as it enhances the existing knowledge on crop value chains. The study will also contribute to the attainment of the first and second Global Sustainable Development Goal (SDGs) that are ending any kind of poverty and attaining zero hunger a cause of undernourishment respectively (UN, 2015). The findings of this study will play part in the improvement of the agricultural sector through its contribution to the attainment of the objective of Tanzania's second National Strategy for Growth and Reduction of Poverty that entails an improvement in production and agricultural intensification as means to counteract household poverty (URT, 2018). Furthermore, the study sets its goal in alignment with the second Agricultural Sector Development Strategy which was put forward to address low production of crops that also go parallel with groundnuts production (URT, 2016). This way, the findings of the study will provide answers that could assist in better value chain improvement strategies. Moreover, the study finds will provide the researchers, the government and other actors with recommendation that will help to improve and strengthen the groundnut seed value chain.

1.4 Objectives

1.4.1 Overall Objective

The overall objective of this study is to assess how power dynamics amongst actors in the groundnut seed value chain affects their relationships and roles while exploring the necessary steps to enhance the groundnuts seed value chain.

1.4.2 Specific Objectives

Specifically, the study aims to;

- i. Identify the main actors and their roles in the groundnuts seed value chain;
- ii. Assess the knowledge linkages and actors relations among actors involved in the groundnuts seed value chain; and
- iii. Determine income linkages and power relations on the income aspect among actors in the groundnuts seed value chain.

1.5 Research Questions

The specific research objectives will be guided by three research questions aimed to answer:

- i. Who are the main actors of the groundnuts seed value chain in the study area?
- ii. What are the knowledge linkages and power relations between actors in the groundnuts seed value chain?
- iii. What is the extent of income relational linkages in the groundnuts seed value chain, among the identified chain actors?

1.6 The Study's Theoretical Framework

The study fits in two modular theory-building efforts which at some point is coherent with the global governance theory. The modular building theory explains the development of

the global value chain as opposed to value chain governance. It combines the general concepts in linking and convection to explain the linkage of micro-level determinants and dynamics of exchange at individual value chain nodes but also a meso-level. Also, it explains how and to what extent these linkage characteristics travel up- and down-stream in the value chain hence a functional value chain (Ponte and Sturgeon 2014). The theory derives an important explanation about how and why inclusion and exclusion take place at chain levels among actors, and with what outcomes. However, the theory has weakness which is that it is more operational at the level of individual transactions, value chain nodes, and bi-lateral relationships, not at the level of overall chain governance. Second is the actor interface theory that explains and argues that power dynamics tend to fracture social systems along interfaces that differentiate one group from another based on their power differences. The interfaces occur at points where varied and conflicting social fields or life-worlds intersect, forming the stage where power dynamics are manifested (Barasa et al. 2016).

The theory explains the necessity of power in value chain governance with relation to space where actors exercise their powers but also aims to explicate the types and sources of organisational discontinuities while giving a way forward to transform them. However, the theory is constrained by the fact that it is more focused on solving discontinuities among actors and not linkage since it is based on the actors' behaviors (Hebinck et al., 2001). From the two theories, the actors interface analysis theory is applicable for this study since the study is aimed to see the linkage between actors with respect to their powers in the groundnut seed value chain. The linkage comes with the influence of power exerted by actors regardless of their levels.

1.7 The Study's Conceptual Framework

The framework shows the relationship between the dependent and independent variables (Adom *et al.*, 2018). The independent variable of this study is the power dynamics that are possessed among actors in the value chain. Indicators of power can be traced through, influence and importance on enabling factors, decision making, linkage and relationships, access to resources and information among actors they possess alongside the value chain. With the dependent variable of the study being the groundnuts value chain, the extent of power dynamics among actors will be measured through assessing the relationships and the mentioned indicators between actors of the value chain since the value chain depend on well-linked actors' relationships.

The independent variables comprise background variables that are goals, interests, and perspectives that influence the level of space and forms of power amongst the actors in the value chain. The background variables set a ground for the existence of the indicators mentioned as they depict the extent and balance of power among actors. The extent, change and balance of power among actors that are depicted through the mentioned indicators which influence of background variables eventually lead to enhanced production and marketing which all these are nodes of the value chain. Through that linkage, a stable rigid and functional value chain results as an outcome of power dynamics among actors that have a balanced ability on mentioned indicators with regards to the background variables thus enabling effective linkages amongst themselves.

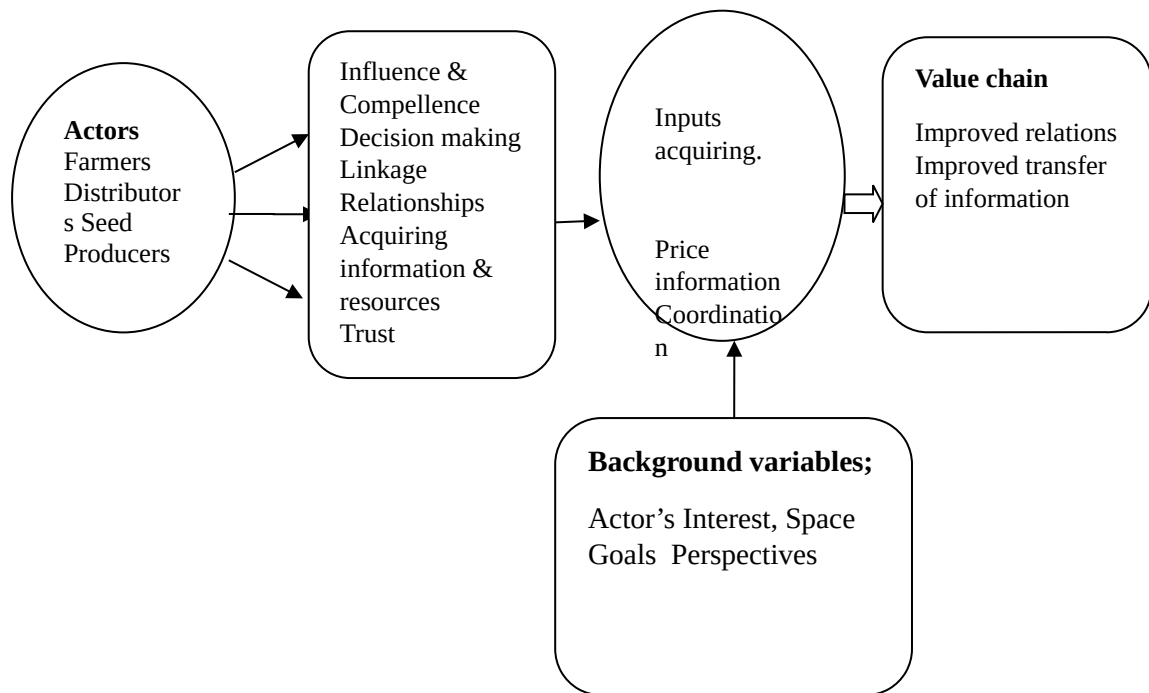


Figure 1.1: Conceptual framework for the study on the power dynamics among actors in the groundnuts seed value chain

1.8 General Methodology

1.8.1 Description of the Study Area

The study was carried out in Kongwa and Kiteto Districts found in Dodoma and Manyara Regions, respectively. The two districts were selected because they are found in the semi-arid zone thus being conducive for groundnuts production. Kiteto District has the 30 196 agricultural households in the region involved in smallholder agriculture with about 28% of its area used for agricultural activities (URT, 2012). Groundnuts production in the district comes second after sunflower in oil crops produced in the area (URT, 2012). Kongwa, on the other hand, has 37 852 households involved in agriculture making 57% of the total households in the district (URT, 2016). Groundnuts produced in the district accounts for 20% of the total groundnuts produced in the region (NBS, 2018).

1.8.2 Research Design

This study adopted a cross-sectional design which facilitates the assessment of different groups of people with specific characteristics and allows data collection at a single point in time (Kothari, 2004). The design has the advantage that it can be done fairly quickly and cost-efficient (Toledo-Pereyra, 2012).

1.8.3 Sample Size and Sampling Technique

The study population involved farmers, seed producers and distributors, seed retail and wholesale sellers (traders), organisations (NGOs and CBOs), agricultural extension officers from wards, Researchers and, local and central government leaders from villages and districts sampled. From the study area, a total of two wards, and two villages from two districts, Kiteto and Kongwa were purposively sampled. One village was selected randomly from each ward.

The heterogeneous purposeful sampling technique was used to select key informants to obtain a range of cases with relevant knowledge on the groundnut seed value chain. The key informants comprised of twenty two (22) participants, that included four Village leaders from both villages, eight researchers, and ten members of the innovation platform that included input suppliers, farmers, NGOs and CBOs, Middlemen, Climate Department Officials and Traders. Their involvement based on the knowledge and experience of the groundnuts production and value chain.

Focus groups discussions (FGDs) with farmers and other actors identified in the Innovation platform portfolio were used to generate information relevant to this study. The sampling technique employed in obtaining the FGD participants was homogeneous purposive sampling whereby a group of farmers and other identified actors with the same

knowledge, traits, experience and understandings were selected. A total of 4 FGDs were conducted, involving members of the innovation platform but also ensuring a fair involvement of both sex categories in the study.

1.8.4 Data Collection

Primary data was collected using a structured questionnaire copies of which were administered to members of the innovation platform in the sampled wards with respect to the roles they play in the value chain. In-depth interviews were held with key informants, guided by the semi-structured interview guide, and FGDs held, guided by a checklist of questions. Each FGD involved between 8-10 participants. The number of chosen participants was favoured since it guarantees to gain enough insights on a variety of perspectives and small enough not to become disorderly (Nyumba *et al.*, 2018). Secondary data was obtained from records related to groundnut seed value chain and government publications, Tropical Legume III reports and innovation platform meeting reports.

1.8.5 Data Analysis

Data analysis was done using content analysis with regards to the first objective while data related to the second and third objective was analysed using UCINET by analyzing the two dimensional actors ties matrix. UCINET is a statistical package used to explain organisational relations and linkages. The NETDRAW program embedded in the package was used to generate relationship maps between actors from the relational matrix created in the data collection process. Statistical centrality measures that included betweenness, degrees and closeness were used to address data related to the third objective of the study while the remedies suggested by respondents also involved content analysis to come up with the best recommendations.

1.9 Organisation of this Dissertation

This dissertation is organized into four chapters. The first chapter consists of the general introduction of the overall theme studied, offering a introductory description of this dissertation. The chapter presents and justifies the need for this dissertation covering; the background, problem statement, objectives, the justification of the study, theoretical framework and the general methodology. Chapter two contains a publishable manuscript which covers the first and second objective of the study. The objectives involve the identification of the groundnut seed value chain actors and the knowledge power relational linkages. Chapter three contains a publishable manuscript which covers the third objectives that involves determining the extent of income power relational change linkages among actors in the groundnut seed value chain. Lastly, chapter four contains the study's general conclusions and recommendations.

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CHAPTER TWO

2.0 POWER RELATIONS AND KNOWLEDGE LINKAGES AMONG ACTORS IN THE GROUNDNUTS SEED VALUE CHAIN IN CENTRAL TANZANIA

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Abstract

This study aimed at assessing power relation change and knowledge linkages in the groundnuts seed value chain in the study area. Specifically, the paper identified the groundnuts seed value chain actors involved, their roles, but also assessed their power relations in terms of influence and importance in the knowledge aspect. The study was descriptive and employed a cross-sectional design whereby primary data was collected through focus group discussion and key informant interview while secondary data was obtained from records related to the groundnut crop and its value chain from sampled districts covered by the Tropical Legumes III project. Using the UCINET statistical package for network analysis, the study revealed several actors that are prominently found at the village level and those at the district level. From the two levels, Consumers, Farmers, Researchers, and Organisations (NGOs and CBOs) were found to fit in both village and district levels. NGOs, CBOs, Local Government, Researchers and Traders were found to have a higher level of influence and importance in knowledge linkages compared to other actors at both district and village levels. The study also revealed that farmers, NGOs and CBOs had a high betweenness at the village level meaning that these actors had the power to interconnect other actors in the village set up due to the level of

influence and importance they have. NGOs, CBOs, Traders, Researchers and Local Government depicted a high value of linkages compared to other actors at the district level. This is an indication of a higher level of influence in knowledge generation and exchange. The study concludes that despite the existence of a diverse number of chain actors in the groundnuts seed value chain, there are knowledge linkages that are highly dependent on the number of ties actors have. Incidentally, this dictates the level of influence and importance these actors have hence power over other actors. It is recommended that power relation interventions through the innovation platforms by the government and other involved stakeholders should focus on the inclusion of less powerful actors or the involvement of other important actors such as policy-makers and seed certifiers and producers.

Keywords: Actors, power relation, knowledge linkage, value chain, groundnut, seed, value chain.

2.1 Introduction

Value chains have been looked at globally, as a vehicle by which new forms of production, technologies, logistics, labour processes, organisation relations and networks are introduced (Trienekens, 2011). This has been the positive outcome of globalisation intensifying the necessity of having a commodity, product or service chain that involves multiple engagements. Based on pricing and cost structure in value adding-activities, value chains consist of producers, input suppliers, operations, processors, retailers and buyers that all play part in bringing a product or service from its conception to the final market (Kumar and Pradesh, 2016). The general aim is and has always been to add value while creating and strengthening a competitive advantage that leads to mutual benefits for all actors involved in the value chain.

The involvement of different actors and their respective activities in sequence has been a useful way to understand how the world of production, buying and selling in terms of marketing works. This is because the product or service involved is brought from its simple to a complex form (Cuddeford, 2014). Just like other value chains in other sectors, agricultural value chains consist of actors and their respective activities that improve products while linking commodity producers to processors and markets (William *et al.*, 2014). These value chains perform best when actors in a particular value chain cooperate to produce higher-quality products and generate more income for all participants along the chain. As opposed to the simplest kinds of value chains in which producers and buyers exchange only price information, the inter-relationship amongst them involves decision making processes for the value chain of the commodity they are involved in (Norton, 2014).

Interdependence among actors enhances the functioning of the value chain as it is not only closely linking them, but also enables them to engage with each other across the chain. The network created through actors' involvement and interdependence has been a necessary condition for the adoption and diffusion of incentives for value chain development and stability (Deloit, 2013). On the other hand, interdependence and involvement among actors are highly influenced by power exerted in their relationships and decision making that all contribute to the capacity of effective participation. Defined as the ability to influence others, power could be derived from various sources including positional authority, professional status, knowledge and skills, control over resources and physical abilities (Barasa *et al.*, 2016). Thus, actors in the value chain, regardless of the levels, space and interests of their interaction; exert power over each other in decision making, in acquiring information and in enhancing or influencing others (Van Lieshout *et al.*, 2017). The results of power change amongst actors in a value chain could contribute to

increased productivity and its benefits since the latter depends on a well-designed, linked network of actors and their roles.

The groundnut value chain in developing countries is highly associated with input and output market constraints as opposed to the developed countries (Darlagen and Phiri, 2019). According to the International Trade Centre (ITC), China is the leading groundnut producer in the world contributing 41% of the total groundnuts produced globally (ITC, 2015). African countries contribute approximately 35% of the total groundnuts produced globally. Nigeria is the leading country in Africa as it contributes around 7% (FAOSTAT, 2017; Katundu *et al.*, 2012) of the total groundnuts produced in the region followed by Senegal, Sudan, Malawi and Tanzania. In 2015, Tanzania contributed to approximately 5% of the total groundnuts produced in Africa (Daudi *et al.*, 2018). It is evident that the most common attribute of all best groundnuts producing countries is a performing groundnuts seed value chain (Elias, 2018).

Crop production as a vital node in the value chain with other chain nodes is highly dependant on material, knowledge and income inputs in the whole value chain set-up for its utmost stability. From this perspective, the groundnuts seed value chain unlike other seed crops in Tanzania has not been performing well due to various factors. Among these factors, knowledge inputs and linkages levels in the groundnuts seed value chain contribute to instability and underperformance of the groundnuts crop (Mwalongo *et al.*, 2020). On the other hand, the gradual fall of groundnuts production and poor performance of the entire value chain has hinged on power change and relations among chain actors. While acquiring quality inputs including certified seeds could help combat the production and marketing problem, there is a high need to address the constraints associated with power change and the knowledge relations among actors. This can be

achieved by assessing the level, space and roles of actors in the value chain. Since the groundnut seed value chain constraints are linked with the influence and knowledge relationship between actors, improving the groundnuts seed value chain will in turn improve groundnut crop production. Also, it will help to solve the input constraints associated with the crop hence enhance productivity and the general performance of the groundnut crop. The objective of the study was, therefore, to identify the groundnuts seed value chain actors involved, their roles and assess the power relations and linkages in the knowledge aspect among the identified actors in the groundnut crop seed value chain.

2.2 The Concept of Power Relations in a Value Chain

In global value chains, power can be defined as the degree of control over something. It is a fundamental aspect of examining the chains and production networks (Gereffi *et al.*, 2005). From a broader theoretical perspective, the power involving coercion and control is explained as an incentive taken by an actor to indirectly or directly compel or impose certain will on another actor in a particular set-up (Dallas *et al.*, 2017). According to the world economic forum, power dynamics set the tone of any human interaction. Since it is used in value chains, the extent of power possessed by actors in any value chain is based on the actors' access to resources and control that determines the level of acceptance and expectation of the power distributed and used amongst themselves (Guo, 2014). Explained with different dimensions that include visible and invisible, the dynamism of power in global value chains can be conceptualized as both structural and relational. While the structural perspective of power explains how intrinsic characteristics of specific actors give them power over others, relational perspectives of power explain how power is mobilized and exercised (Choksy, 2015). These include decision making, awareness of the actors' rights, ideologies adopted, values and behavioural relations with others. Thus the concept of power relational dynamics applies to this study in the sense of how actors

have control over information accessing and knowledge sharing. Also, the concept gives a connection to how the value chain actors through knowledge sharing enhance their linkages with other actors or ensure they benefit in the value chain set-up.

2.3 Groundnuts Production and Seed Value Chain in Tanzania

Groundnut crop has been among the dominant crops in the semi-arid parts of Tanzania. While it has been produced in both small and large scales, the crop has been dominant in Tabora, Shinyanga, Dodoma and Mtwara Regions. The crop is grown for both food and income generation whereby the number of households involved has increased in number over years (URT, 2018). While production of the groundnuts crop in Tanzania has had peak results, currently, the production trend has been falling. In Tanzania, the Annual Agricultural Sample Survey for 2017 indicated that despite the groundnuts being highly produced in the semi-arid areas there has been a gradual fall in its overall production. The production trends traced from 2008 shows that the annual production increased from 340 770 to 810 000 tonnes in 2012, to 1.13 million tonnes in 2015 but gradually falling to 216 433 tonnes in 2017 (URT, 2018). The decline in production can be attributed to production constraints, with drought being one of the challenges. This has altered the improvement of the living standards of the rural poor (Owusu-Adjei *et al.*, 2017).

The economic advantage of groundnuts has not been with production alone, but also its final products that depend on the value addition process on the products or inputs, that are associated with the crop itself for nutritional and economic purposes (Mwatawala and Kyaruzi, 2019). Such products and inputs include the seeds used in the production of the crop. The seed systems can either be formal or informal but it is a fact that the formal seed system for most crops has proven to be more advantageous (Kiambi and Mugo, 2016). It is proven so since the formal seed system has contributed over half of the quality crops

produced, including groundnuts in countries where groundnuts production is accelerating. The groundnuts seed value chain depends highly on its actors which has been the case for all crops as explained in the Tanzania Seed Sector Assessment (ASARECA, 2014). Like any other seed crop chain, the groundnuts seed value chain depends on a better linkage of actors (ICRISAT, 2017).

2.4 Actors in the Groundnut Seed Value chain

Agricultural crops value chain including the groundnuts crop value chains encompasses a range of activities performed by actors that are required to bring a product or service from its raw state to end-use. The actors involved include input suppliers, primary producers (farmers), wholesalers (agents and traders) processors, extension officers, research institutions, manufactures, wholesaler, retailers and the government (Okpaire, 2019). These actors are subsequently involved in the crop seed value chains too although most of them fit on the production node of the particular crop value chain. This is because the seed fit in the production node due to being one of the inputs in production. In the groundnuts seed value chain, actors such as seed producers, seed certifiers, distributors, processors, the government, and consumers are prominent. Other actors that fit in the groundnut seed value chain are also prominent in the general crop value chain but only differentiated by linkages (Stein and Barron). Through these linkages that can be vertical or horizontal, actors perform their different activities with respect to their positions, power, space and motives as individuals or organisations (Emana and Nigussie, 2011). This has led to a successful establishment of platforms that create room to discuss challenges and constraints facing them and how they can be addressed simply because through a correlated range of activities, actors must be supported by outward services from designated identities to make them effective (Hellin and Meijer, 2006) and keeping the value chain functional but also ensure effective linkages (Bitzer, 2015).

2.5 Theoretical Framework

The study is guided by the actor interface theory that explains and argues that power relations and changes in a structural set-up tend to fracture social systems along interfaces that differentiate one group from another based on their power differences. The theory sheds knowledge on the discontinuities, linkages and interactions associated with actors with different rationalities in a social situation (Gerharz, 2018).

This structural approach defines the structure, autonomy and rationalities of local actors and how these actors are shaped by unequal and changing power relations. As such, it paves the way to understanding the aspects of knowledge linkage and power relations among actors in the groundnut seed value chain. The interfaces occur at points where varied and conflicting social fields or life-worlds intersect, forming the stage where power is manifested (Barasa *et al.*, 2016). Focusing on the groundnut seed value chain, the theory can be used to explain how power relations among actors affect the performance of the chain but also shed light on how power possessed by actors through influence and importance lead to relation changes across the value chain.

Despite the theory's importance in guiding this study, it is constrained by the fact that it is more focused on solving discontinuities among actors and not linkage since it is based on the actors' behaviour (Hebinck *et al.*, 2001). Since the study aim was to determine knowledge linkage between actors with respect to their power relations in the groundnut seed value chain, data collection based on the number of relations and ties with actors was crucial. This helped in the identification of the nature and extent of power among actors that can be used to define the continuity or discontinuity of that particular tie among actors as a remedy to the constraints associated with the theory and improvement of the groundnuts seed value chain as well.

2.6 Methodology

The study was carried out in Kongwa and Kiteto Districts of central Tanzania embedded within the innovation platforms established as part of the Tropical Legumes III project. The innovation platforms aimed to improve and build groundnuts seed value chain in Tanzania (ICRISAT, 2019). In theory, platforms enable the members to articulate their needs and work together to achieve a common goal on equal terms. Kongwa and Kiteto districts were purposely selected because they are found in the semi-arid zone and are said to be the most agricultural productive districts in the regions of Dodoma and Manyara respectively (URT, 2016). Kiteto District has 30 196 agricultural households in the region involved in smallholder agriculture and 28% of its land area is under agricultural activities while Kongwa District, on the other hand, has 37 852 households involved in agricultural production (URT, 2016).

This study is descriptive and adopted a cross-sectional research design. This study approach facilitates the assessment of different groups of people with specific characteristics and it allows data collection at a single point in time fairly fast (Toledo-Pereyra, 2012). The study employed qualitative research methods whereby primary data was collected through focus group discussion and semi-structured interview with Key Informants. Secondary data was obtained from records related to the groundnut crop and its value chain from sampled districts covered by the Tropical Legumes III project in Kongwa and Kiteto districts. These helped to acquire in-depth information and dissect the extent of relations and ties amongst actors that would explain the power they possess in terms of influence and importance.

The study population constituted of members from three clusters: i) Research (participants from ICRISAT, TARI Hombolo and Makutupora), ii) at Village level, 2 FDG conducted

in Mlali and Moleti; and iii) at District level with innovation platform members drawn from Kongwa and Kiteto. These were identified from the portfolio of key stakeholders who are members of the Kongwa and Kiteto innovation platforms. The heterogeneous purposeful sampling technique was used to select key informants to obtain a range of cases with relevant knowledge on the groundnut seed value chain. Key Informants involved researchers from TARI Hombolo and Makutopora, Village leaders from Mlali and Kongwa villages, and members of the innovation platform from the Kongwa and Kiteto Districts.

Mlali and Moleti villages were purposively sampled from Kongwa and Kiteto districts. Focus group discussions (FGDs) with the identified actors within the innovation platform from Kongwa and Kiteto District in the ICRISAT portfolio were conducted to understand who are the key actors, what are existing interrelationships between these various actors, their interests and the sort of influence each has in the interaction web. Social network data was collected using a Net-Map method using a novel social network mapping method that included an assessment of actors' influence and goals (Hauck *et al.*, 2013). The homogenous purposive sampling technique was employed to obtain the FGD participants. In total, four FGDs were conducted in the entire study area with each comprising between 8-10 participants from which the data collected involved content analysis. The same procedure was used to analyse data collected during semi structured interviews. The number of participants guaranteed efficiency to gain enough insights on several issues of importance in the study (Nyumba *et al.*, 2018). Secondary data was obtained from reports, journals, government publications and other records related to groundnut crop and its seed value chain from sampled districts offices and the ICRISAT Tropical Legume III project.

2.7 Findings and Discussion

2.7.1 Actors in the Groundnuts Seed Value Chain and their Roles

The study divulges a web of actors with different relationships distinguished by levels and activities they engage themselves in. Despite their distinguishing roles in the value chain, these actors are separated by the levels they fit in the chain, i.e. the district level and the village level. It was also found that some actors fit in both levels (i.e. district and village) as shown in Table 2.1, due to horizontal linkages among actors. According to Stein and Baron (2017), this kind of linkages plays a vital role in ensuring cooperation is maintained. At the village level in Mlali and Kongwa, a group of eight actors were identified. These included; farmers who are the owners of the production process, traders who coupled with farmers manage farm level processes of production and link the product of these processes to the consumer or processor. According to Stiring *et al.*, (2013), traders play a vital role in ensuring a growing production and demand to emerging and existing markets while farmers are obliged to satisfy the consumers demand.

Other actors were extension officers who offer support to farmers in the production process; support organisation such as Non-Government Organisations (NGOs) and Community-Based Organisations (CBOs) that facilitate productivity through networking and collaboration among other actors. These Organisations play the role of facilitating a multi- stakeholders' platform that in turn ensure players involved interact (De-Janvry *et al.*, 2019). Other actors were village leaders; researchers; middlemen and traders who link farmers with consumers and markets. Furthermore, the study revealed that actors at the village level were fewer compared to those at the district level. According to Mmasa and Msuya (2012), fewer chain actors at a particular set-up affect the performance of the chain since there will be inadequate information sharing and decision making due to fewer actors.

Table 2.1: Actors and their roles in the groundnuts seed value chain at the village level

Actors at the village level	Roles
Farmers	Manage the farm level process that involves producing, packing and delivering to middlemen, traders, or processors
Extension Officers	Help farmers enhance productivity. Helping farmers organize and benefit from economies of scale. Build farmers with the capacity to identify and engage with appropriate markets.
NGOs and CBOs	Marketing the produce. Facilitating productivity through ability enhancement. Networking and collaboration of farmers and other actors.
Village leaders	Understand the social issues in a village set up. Mandated with organizing farmers for technology dissemination, adoption and information sharing at the village level.
Middlemen	Link farmers with buyers (processors/consumers) Buy the farmers' produce to make a profit.
Researchers	Generating new knowledge on better production practices for farmers. Giving information to other actors on market requirements and from the research field. Transfer of innovative information to actors involved in the value chain.
Traders	Link producers with markets or buy farmers' produce.

While researchers link academic outputs for improvement in production, extension officers play a vital role in production by ensuring the build the farmers capacity through agricultural advisory services and middlemen link farmers and markets or traders. The advisory services are important to ensure production is improved (Ferris and Irwin, 2016) while markets links ensure middlemen play an intermediary role through market channels they have with bulk buyers. This acts as a form of security to farmers when they have bigger produce to sell (Chigusiwa *et al.*, 2013).

Table 2.2: Other actors and their roles in the groundnuts seed value chain at the district level

Actors at the district level	Roles
Local Government	Enforce the policies, laws and tax collection set by the central government
Central Government	Creates and passes laws, policies aimed to enhance production, markets, infrastructure and agricultural development
Consumers	End-users of products and services produced/offered by all actors in the chain
Agro- dealers	Distribution of agricultural inputs that include seeds, fertilizers, equipment and fertilizers.
Agro-processors	Introduce innovation and entrepreneurship skills. Generating higher production volumes. Increasing export and distribution of income across boundary set up
Climate Department Officials	Share weather broadcast important for producing, transporting of produces to other actors.

At the district level, as shown in table 2.2 above, an increased number of actors was observed due to the increase in activities involved and coverage of the area. The identified actors involved agro-dealers and processors who play a role in input distribution and increase export and distribution of income across the boundary set-up. According to the report by IFDC (2011), agro-dealers are important in the chain as the chances of input access to farmers are intensified by their existence in the chain set-up. The agro-processors whether big or small expand production by improving quality of produces.

The Local and Central government play a supportive role in the chain as it was also found in the district level. The support is found through research, quality control policy enforcement, infrastructural improvement and developing strategies and laws that aim to improve production and other activities along the chain (Nicholson, 2019).

The climate department plays a vital role as it shares meteorological information for crops production including the groundnuts crop. Climate assessment is an important attribute to the production node (Mwongera, 2019), in the value chain hence the importance of the climate department at the district level. It is through the identified level that actors involved tend to share and have access to the same information hence exchange the same experiences and solve the same problems through linkages (Lee and Tkachi-Kawasaki, 2018). The identified actors fall in the chain adhering to the nodes of the chain as shown below in Figure 2.1.

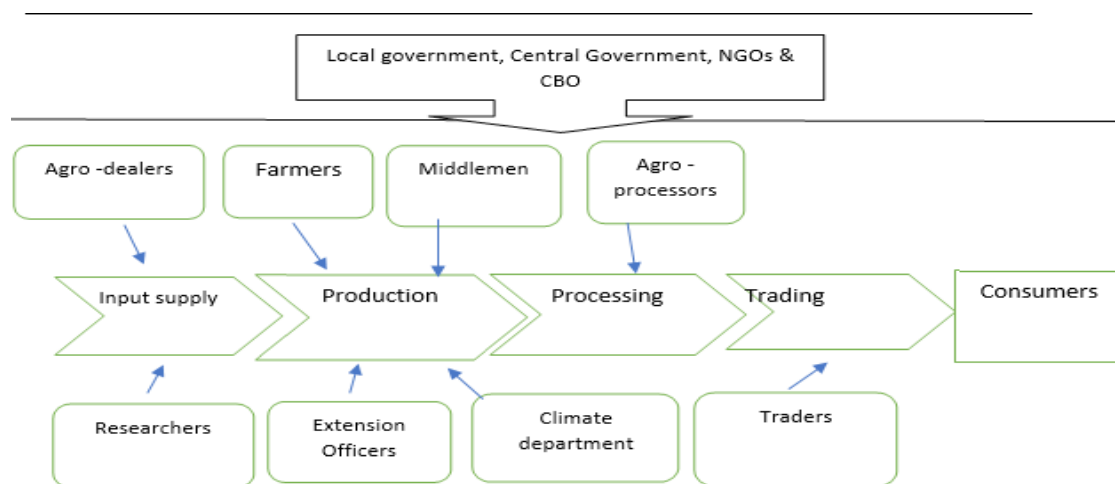


Figure 2.1: The value chain map of identified Actors in the Groundnuts seed value chain

2.7.2 Power Relations and Knowledge Linkage among Value Chain Actors

The study findings show that there are relations among actors in exchange for knowledge along the groundnut seed value based on the number of ties among actors. These relations among actors vary from village to district levels due to the number of actors involved in both levels. In Molet village, farmers, extension officers and village leaders had a higher number of ingoing and outgoing ties compared to other actors (Figure 2.2). Considering the density of incoming and arrows as shown in figure 2.2, the mentioned actors were

powerful in terms of influence and importance in exchange of knowledge than other actors. It is through these ties and relations that diffusion of knowledge is maximized. This is supported by Falayi *et al.*, (2020), who explains that the multi-relational ties among actors ensure an improved network structure in a given setup. It is explained further that actors sharing the same attributes are more likely to collaborate (Nohrstedt and Bodin, 2019). Figure 2.2 illustrates the linkages density among actors in the groundnuts seed value chain in Mlali Village.

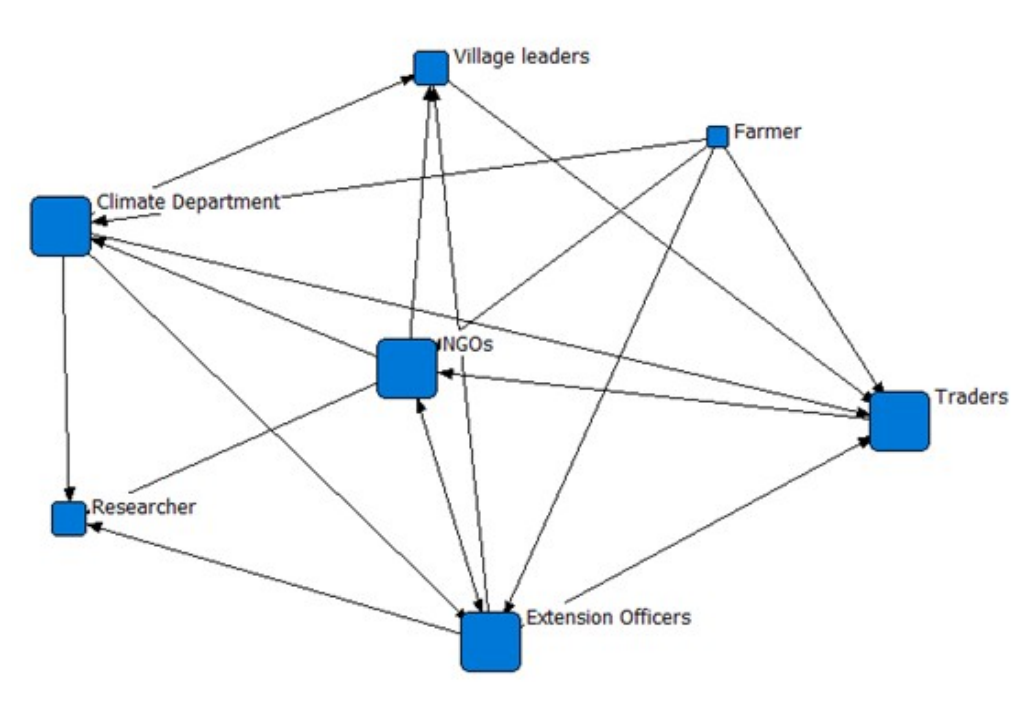
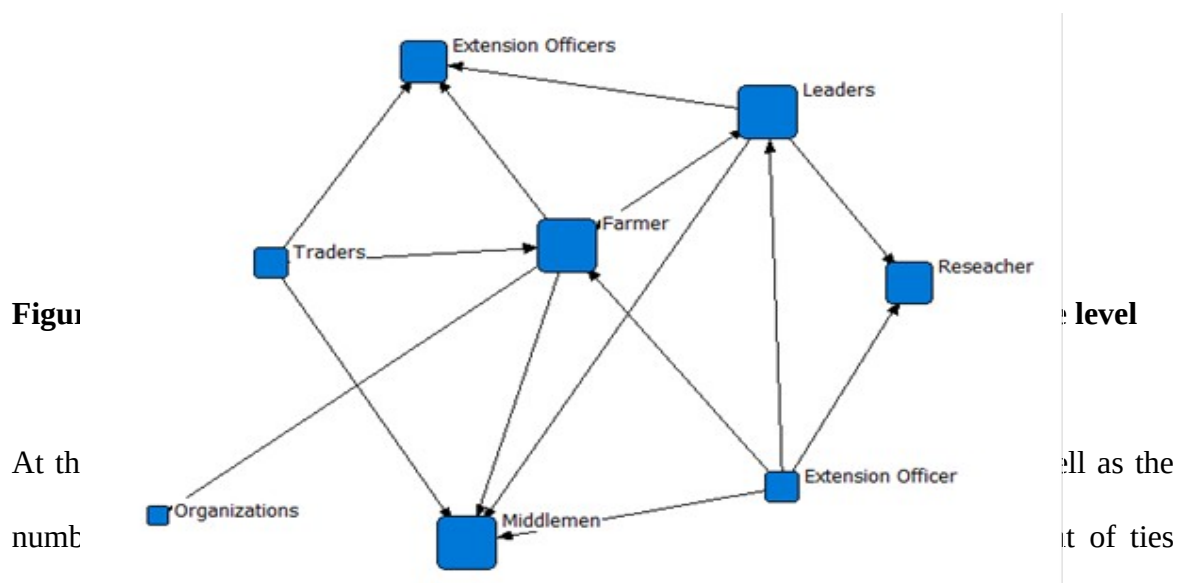


Figure 2.2: Knowledge linkage interaction density among actors at the village level (Mlali village)

The linkage of actors in Mlali is illustrated in the linkage map using the Netdraw software to show the number of linkages and level of importance and influence using the node sizes. The results show that farmers, climate department, extension officers and village

leaders had higher outdegree/outgoing ties with other actors depicting them to be influential actors in the village set up as the result of interactions among these actors (Figure 2.2).

According to Snijders *et al.*, (2013), the joint participation of actors goes together with interactions that can either be one or two-node network. At the same time, the middlemen in Mlali Village exerted a higher number of ingoing ties with other actors. Apart from middlemen, farmer and extension officers showed a relatively higher number of ingoing ties too hence showing a level of importance compared to other remaining actors. This is an indication that extension staff in Mlali are viewed as very important, an implication that the level of agricultural activities in this village is very high and requires high demand for agriculture-related services as well. This is an important aspect in the actor social networks since it is through these relationships that potential partners interact to exploit benefits of scope and economies of scale, resulting in pooled benefits from multiplex ties (Ferriani *et al.*, 2013).



among actors at the district level. From the actors identified in the groundnuts seed value chain at the district level, NGOs, CBOs, local government, researchers, transporters, traders and agro-dealers had a higher number of outgoing ties with other actors. This is an indication of influence due to a higher level of interrelationship in knowledge transfer

among the actors, thus a multi-directional flow of information that forms a basis for knowledge diffusion and feedback mechanism. It is argued that ties dictate interactions and increased interaction result to knowledge sharing that is an output of innovation (Huang and Li, 2020). At the same time, traders, researchers, framers, NGOs, CBOs, consumers and transporters showed a higher number of incoming ties in that order hence showing the extent of the need for information from other actors to support their activities within the value chain. To provide evidence to this, a platform member in the key informant interview argued that;

“..... we are too close to the community and non-government organisations that devote their efforts to ensure we are educated and with knowledge regarding proper nutrition to our kids and one of the crops they emphasize on is groundnut crop. The information they commonly share goes beyond nutrition inasmuch as the present seed varieties, agronomic practices and so forth. Their presence supplements the extension officers and the local government efforts.” (Innovation Platform Key informant Interview on 17th July 2020 at Kongwa District).

Actors with larger node sizes have a higher level of influence and importance compared to other actors, while actors with smaller node size have no much control along with the value chain set-up. According to Pereira *et al.*, (2016), the interrelationship among actors is dependent on the origin of influence that determines the level of interactions and social dependencies among actors. Since there was no difference in the number of actors identified at the district level (Kongwa and Kiteto) as it was at the village level (Mlali and Moleti), the interaction Figure 2.4.

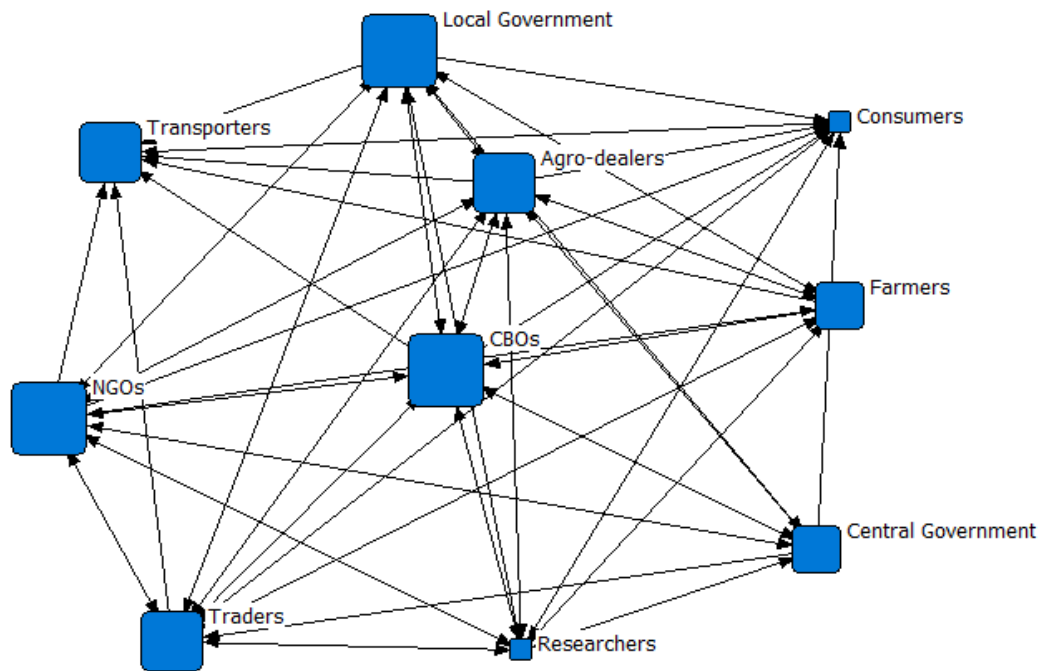


Figure 2.4: Knowledge linkage interactions among actor at the district level

2.7.3 Extent of Power Linkages among Actors in the Value Chain

Power linkages among actors in the groundnuts seed value chain were assessed based on two centrality measures, i.e. Degree and Betweenness that were both performed using UCINET software. These centrality measures betweenness, indegrees and outdegrees were used to identify actors' powers in terms of who is influential, important and peripheral. Besides, they were used to determine the direction of linkage among actors in terms of knowledge in the value chain as shown in Table 2.3.

Table 2.3: Centrality measures on power linkages among actors in the groundnuts seed value chain

Level	Actors	Normalized Indegree	Normalized Outdegree	Normalized rmBetweenness
Village	Farmers	57.143	71.429	10.000
	Climate Department	28.571	71.429	1.071
	Researchers	57.143	71.429	1.667
	Extension Officers	57.143	71.429	1.667
	NGOs & CBOs	71.429	71.429	13.095
	Traders	71.419	28.571	12.5
	Village leaders	57.143	14.286	0.476
	Middlemen	0.000	0.000	0.000
District	NGOs	88.889	100.000	2.216
	CBOs	88.889	100.000	2.216
	Local Government	88.889	100.000	2.216
	Researcher	100.000	88.889	4.563
	Traders	100.000	88.889	2.216
	Transporters	77.778	88.889	2.216
	Agro-dealers	88.889	88.889	0.827
	Farmers	88.889	77.778	1.587
	Central Government	44.444	77.778	0.000
	Consumer	88.889	44.444	0.628

As observed in both levels in Table 2.3, the study revealed that farmers and organisations (NGOs & CBOs) had a high betweenness at the village level. This means, these actors had the power to interconnect other actors in the village set-up. The same actor had a higher value in terms of normalized indegree and outdegree clearly depicting the level of power in terms of importance and influence at the village. According to Alarcão and Neto (2016), actors who are more likely to receive and share knowledge or information are those with a high number of paths and a greater degree of centrality measures in the network. On the other hand, NGOs, CBOs, Traders, Researchers and Local Government depict a high value of indegrees and out degrees compared to other actors at the district set up. The higher in-degree and out-degree values depicted among these actors are indications of a higher level of influence in knowledge generation and exchange linkages compared to other actors in

both district and village levels. To provide evidence to this, a platform member in the key informant interview said that;

“...we highly depend on the relations we have despite some of us being found in remote areas. The few times that we come together basically under arranged farmers and other stakeholders’ platforms, knowledge is shared regarding the challenges and opportunities that are within the common activities we do despite the objectives we differently have. Of course, the level of information we share differs due to the financial muscle differences between us. Traders and organisations seem to be informed than us” (Innovation platform members focus group discussion, 13th July, 2020 at Mlali Village).

This implies that, they are important actors who would be key in increasing social interactions leading to value chain improvement and successful functioning (Lowitt *et al.*, 2015). Middlemen in the chain are the less important or influential actors in the groundnut seed value chain as they do not show any number of ties with other actors or any betweenness with other actors as far as knowledge linkage is concerned. Middlemen are normally perceived to be responsible for service provision but negatively viewed to build assets for themselves. This denotes how weak these actors are in relation to knowledge transfer and their influence in the seed value chain. Todo *et al.* (2016) reported that weak ties among important actors such as middlemen prevent information and knowledge diffusion. However, this can be explained by the fact that the role of middlemen in the seed value chain (quality seed) is very minimal as opposed to their role in the grain value chain (food grain).

2.8 Conclusions and Recommendations

The study concludes that there is a difference in influence and importance among actors in the groundnuts seed value chain which defines the extent of power possessed by identified actors in the study area. The variations observed in relations among actors dictate the extent of knowledge relations while the extent of knowledge highly matches with the number of ties the actor has. Furthermore, the value chain set-up level contributes to the knowledge linkages since it dictates the number of actors involved. Comparing both levels, variation in ties among actors observed were found to be high at the district level as opposed to the village level.

It is therefore evident that there is greater knowledge linkage among actors at the district level compared to village levels due to the number of ties observed. Several actors including NGOs and CBOs were influential and important in knowledge transfer/brokering making them more powerful than other actors. However, it is important to ensure all actors are important and influential at their node of influence for the stability and performance of the crops value chain. This can be achieved by ensuring the inclusion of all actors in the innovative platforms developed regardless of their contribution. While the study clearly shows the knowledge linkages and explains the nature and extent of power relations in the chain set-up, it contributes to the guiding theory by its findings. If the highlighted constraints are worked upon, improved and continued linkages will emerge as a result. It is with these findings, actors' roles in all levels need to be incentivized to increase the number of linkages in the knowledge aspect. These linkages aspect improvement coupled with other linkages aspects such as income and material linkages among actors will result in an improved and functional groundnut seed value chain.

It was evident that some of the actors were not well integrated into the groundnut seed value chain and the innovation platform. Thus efforts are needed to address this gap towards ensuring competitiveness and benefits to all actors in the knowledge aspect of the value chain. It is therefore imperative to pay attention to knowledge linkages by incentivizing actors for interconnectedness, cohesiveness and collective action. This will have far-reaching effects in improving the weak groundnut seed value chain translating to securing livelihoods. It is therefore recommended that these innovative platforms be extended further and more inclusive to ensure that the actors at the national level are included. This will in turn contribute to technology adoption and diffusion herein referred to as improved varieties and quality seed.

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References

CHAPTER THREE

3.0 INCOME LINKAGE AS AN ASPECT OF POWER RELATIONS AMONG CHAIN ACTORS IN THE GROUNDNUTS SEED VALUE CHAIN IN KONGWA AND KITETO DISTRICTS, TANZANIA.

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Abstract

The study identified actors and evaluated income linkages and power relational dynamism exerted among chain actors in the groundnuts seed value chain. Primary data was collected through focus group discussion and interviews employed while secondary data was obtained from records related to the groundnut crop and its value chain. Data analysis was done using UCINET, a statistical package for network analysis to determine the centrality measures and explanation of the level of influence and importance among chain actors. The study findings showed that with respect to village and district levels, Organisations (NGOs and CBOs), farmers and the climate department had a relatively higher power in terms of influence in Mlali and Moletti villages. Local Government and Agro-traders were dominant in terms of influence at the district levels (Kongwa and Kiteto). The study revealed that farmers and middlemen had the highest relative normalized betweenness compared to other actors in both districts set up (Kongwa and Kiteto) and village levels meaning they are powerful due to their importance in the value chain setup. Besides, Organisations (CBOs and NGOs) and Extension Officers showed a relatively higher value of normalized betweenness compared to other actors at Moletti village. The study findings emphasize the need to ensure inclusion and improvement of income linkages both

vertically and horizontally with other actors for a stable functional groundnuts seed value chain.

Keywords: Income linkages. Power relations, Actors. Groundnut seeds, Value chain.

3.1 Introduction

Value chains have been useful to explain and understand how the world of production, buying and selling works. The value chain involves all key participants and their roles in the value addition of a particular product or service (Cuddeforl, 2014). Falling back from the early 1980s, value chains are not anything tangible but a series of activities performed by chain actors who tend to be individuals or organisations that produce, process, transport, and sell or buy a product or service. This means that the product or service is owned at some stage in the chain whereby an exchange or a relationship invested between these actors keeps the value chain working (Bitzer *et al.*, 2015). Since its introduction, value chains have extended to various applications, including being the object of fast-growing literature in economics and management which has been the case too in agricultural products (Zamora, 2016). The general concept behind value chains has been focused on improving the quality of a particular service or product via carried out activities, leading to a pushed competitiveness amongst activity performing individuals (Simatupang *et al.*, 2017).

In the context of agricultural development, value chains explain the performance of a crop(s) from the production stage to consumption. This, therefore, reflects different actors and their respective activities in sequence to bring up an agricultural product or service from its simple to a complex form (Cuddeforl, 2014). The performances highly depend on vertical and horizontal linkages among actors as they are vital for innovations that go

beyond income merits. The horizontal linkages involve actors who look forward to accomplishing a common goal and with beneficial independence, trust and resource pooling. On the other hand, the vertical linkages focus on interactions among actors at different levels (Herrmann *et al.*, 2015). The horizontal and vertical linkages differ in the sense that the former involves competition unlike the latter. Despite the differences observed in these linkages, understanding the power exerted by these actors as the result of these linkages helps to contextualize the structural and relational dynamism they have over each other. It is from this context, actors' relations in value as a result of intrinsic characteristics evaluation, focusing on how power mobilization and exercising in their relations leads to actors' influence and importance is understood. (Choksy, 2015).

The groundnut value chain in developing countries including Tanzania is highly associated with input and output market constraints as opposed to the developed countries (Darlagen and Phiri, 2012). While China is the leading groundnut producer in the world contributing 41% of the total groundnuts produced globally (ITC, 2015), African countries led by Nigeria contribute approximately 35% of the total groundnuts produced globally (FAOSTAT, 2017; Katundu *et al.*, 2012). Other leading groundnuts producers in the region include Senegal, Sudan, Malawi and Tanzania (Munsaka, 2013). In Tanzania, despite recording higher groundnuts yield, recent reports show a decline in yields from 1.8 mill tons in 2015 to 214 433 in 2017 (URT, 2018). Despite the groundnut crop being highly cultivated in the semi-arid regions of Shinyanga, Tabora, Dodoma and Mtwara Regions (Daudi *et al.*, 2018), and a national increase in the number of households involved in groundnut production by 2017, tracked back in 2003 (734 034 households) to 2007 (870 084) households and 1,131,217 households in 2017 (URT, 2018). However, the yields have been inversely proportional. The reasons for the decline fall in a wide range of factors ranging from agronomic practices to value chain actors' related factors. Focusing

on-chain actors' factors, relations, and coordination among actors is key to the performance of the value chain and any crop at large (Oddone *et al.*, 2014). These relations can be identified by levels and activities of actors, but also the social network which determines power relations associated among themselves in terms of influence and importance.

The income distribution plays a bigger role in ensuring actors cooperate or compete as they perform their activities (Barayandema *et al.*, 2017). Through value chain analysis, the involvement of actors, and their activities from production to consumption give insights on the challenges and constraints that inform the improvement of the performance (Stein and Barron, 2017). This is important to ensure a performing value chain through the synergistic interaction of actors for mutual benefits.

Like any other seed crop chain, the groundnuts seed value chain would depend on a better linkage of actors to identify and resolve the challenges they face collectively (ICRISAT, 2014). The value chain consequently becomes integrated through the firm-level of chain actors (Webber, 2007), with more income gap and benefit distribution; and these affect the level of influence and importance among the chain actors (Owusu-Adjei *et al.*, 2017). To ensure a performing value chain the income relation extent among actors need to be identified because they create a window for power exertion in the chain set up. The objective of this study, therefore, was to determine the gaps in income linkage extents and power relations among actors in the groundnuts seed value chain.

3.2 The Groundnuts Seed Value Chain Actors

The groundnut seed value chain comprises different actors acting at different levels. These include; farmers, input suppliers, agro-dealers, processors, producers, traders, exporters, transporters, policymakers, local and central government leaders and consumers

(ICRISAT, 2014). In a general context, farmers make the most population in the chain due to their role in the production process in both small and large scale farming. They are the target for seed producers, input suppliers, agro-dealers research makers and policymakers. The input suppliers are the centre of agriculture innovation and productivity as they play the role of offering product extension and advisory services that are vital for production such as seeds, fertilizers and pesticides and their proper usage (Alex, 2019). Traders, processors and exporters play a marketing role, adding value to crops produced by farmers and transferring produced or processed crops. Policymakers, local and central government exert their efforts in ensuring productivity and market environments are supportive through policies and laws but also enforcing them to other actors involved (Mofya-mukuka and Shipekesa, 2013).

3.3 Performance of the Groundnuts crop in Tanzania

Groundnut crop is among the dominant crops in the semi-arid parts of Tanzania. It is produced on both small and large scales, in regions of Tabora, Shinyanga, Dodoma and Mtwara for both food and income purposes (URT, 2012). This, in turn, contributes to the boosting economies in areas produced thereby improving standards of living of the rural poor especially women (Owusu-Adjie *et al.*, 2017). The production trends traced from 2008 show that the annual production of the crop increased from 340 770 to 810 000 tonnes in 2012.

The versatility of the crop has made it more advantageous to those engaged in its production. While it is edible when raw and advantageous for its nutritional qualities, the crop's economic advantages cannot go unnoticed (Monyo *et al.*, 2012). Value addition on the products or inputs and services that are being obtained from or linked to the crop has proved that the crop benefits all those involved directly or indirectly with the crop thus, all

challenges facing these actors should be cleared to make it more advantageous (Cucagna and Goldsmith, 2016). The National Bureau of Statistics in Tanzania shows a national increase in the number of households involved in groundnuts production from 734 034 households in 2003 to 870 084 households in 2007 (URT, 2012). This could be explained by the increased extension services, improved infrastructure and accessible agricultural inputs as it was the main focus in the first and second Agricultural Sector Devolvement Plan (ASDP I & II) (URT, 2016). Despite the double increase in the annual production of the crop the production trend as depicted by FAOSTAT show a decline in production from 2015 to 2017 where production plummeted from 1.8 million tonnes to 214 433 tonnes, respectively (FAOSTAT, (2017); URT, 2018).

3.4 Income Linkages and Power Dynamics among Value Chain Actors

Value chains are all about stakeholders interactions where actors exchange or transfer knowledge, money and information in a value addition sequence. Other than the exchange, satisfying the consumers' demands and profit-making are the goals in value chain interaction. These interactions highly depend on effective participation and linkages among the chain actors (Cuddeford, 2014). As much as profit-making and satisfying the end-users are important, the distribution of income in the chain set up to all stakeholders involved cannot be ignored. This is because the income distribution in the chain dictates the improvement of the value in terms of influence and importance of each chain actor involved (Guritno, 2018).

According to Seville *et al.*, (2011), long term relationships among chain actors influence net profits and choice-making due to income linkages among actors themselves. Grouped as vertical or horizontal, linkages are inextricably intertwined within a value chain since they set a foundation for trust and compliance among actors within a particular value

chain. These linkages can be formal or informal but mostly informal since they involve a domain of social capital where trust plays a vital role (M4P, 2008).

While vertical linkages are observed among actors along the chain at different levels, horizontal linkages are relationships among actors at the same level. As actors interact/link- up to pursue their collective or individual interests, their struggles turn into a dynamic power interplay (Vij *et al.*, 2019). Since it is used in value chains, the extent of power possessed by actors in any value chain is based on the actors' acceptance and expectation of the power distributed and used amongst themselves (Guo, 2014). The dynamism of power in global value chains can be conceptualized as both structural and relational. While the structural perspective of power explains how intrinsic characteristics of specific actors give them power over other actors, relational perspectives of power explains how power is mobilized and exercised (Choksy, 2015).

3.5 Theoretical Framework

The study is guided by the actor interface theory which argues that power dynamics tends to fracture social systems along interfaces that differentiate one group from another based on their power differences. These power relational changes/differences determine who controls factors of production, output and outcome governed by context-specific socio-cultural factors that lead to economic benefits (Coles and Mitchell, 2011). The income factors are explicit components of production that pull together or disintegrate relations among chain actors based on equalities they possess making them exert power visibly or invisibly among each other in a particular commodity chain (Brewer, 2011). The interfaces occur at points where varied and conflicting social fields or life-worlds intersect (Barasa *et al.*, 2016).

The theory explains the necessity of power in value chain governance with relation to space where actors exercise their powers. Also, the theory aims to explicate the types and sources of organisational discontinuities, factors for pull or push of relations as much the remedies towards the constraints associated. Focusing on the groundnut seed value chain, the theory can be used to explain how income linkages affect the performance of the chain due to power relations among actors.

Its concepts explain the necessity of power in value chain governance with relation to income-based space where actors exercise their powers but also aims to explicate the types and sources of organisational discontinuities while giving a way forward to transform them. Despite the theory's importance in guiding this study, it is constrained by the fact that it is more focused on solving discontinuities among actors and not linkage since it is based on the actors' behaviour (Hebinck *et al.*, 2001). Since the study aims to determine both income linkage between actors concerning their power relations in the groundnut seed value chain, data collection is based on the number of relations and ties with actors. This helped to identify the nature and extent of power among actors that can also be used to define the continuity or discontinuity of particular ties among actors.

3.6 Methodology

The study was carried out in Kongwa and Kiteto Districts of Central Tanzania that were implementation areas of the Tropical Legumes III project. It is through this project that an innovation platform was created to bring together stakeholders and actors in the groundnuts seed value chain. The aim was to create effective groundnuts seed systems and a value chain. In theory, platforms enable the members to articulate their needs and work together to achieve a common goal on equal terms. The districts were selected because they represent the area in which the Tropical Legumes III project operated under the

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). The project goal is to improve the functionality of the groundnut value chains towards transforming key production systems in the area. These districts are found in the semi-arid zone thus being eligible for groundnuts production. Kiteto District has the third-largest number of agricultural households (30 196) in the region involved in smallholder agriculture whereby 28% of its land area is under agricultural activities. Kongwa district, on the other hand, has 37 852 households involved in agricultural production (URT, 2016).

This study was descriptive and adopted a cross-sectional research design. This study approach facilitates the assessment of different groups of people with specific characteristics and allows data collection at a single point in time fairly fast (Toledo-Pereyra, 2012). The study employed qualitative research methods. Qualitative methods used included semi-structured interviews with key informants and Focus Group Discussions to acquire in-depth information to dissect the extent of relations and ties amongst actors that would explain the power they possess in terms of influence and importance.

The study population constituted of members from three clusters: i) Research (participants from ICRISAT, TARI-Hombolo and Makutupora); ii) at Village level, two meetings conducted in Mlali and Moletu and iii) at District level with innovation platform members drawn from Kongwa and Kiteto Districts. These were identified from the portfolio of key stakeholders who are members of the Kongwa and Kiteto innovation platforms. The heterogeneous purposeful sampling technique was used to select key informants to obtain a range of cases with relevant knowledge on the groundnut seed value chain. Key Informants involved researchers from TARI Hombolo and Makutupora, Village leaders from Mlali and Kongwa villages, and members of the innovation platform from the Kongwa and Kiteto Districts.

Mlali and Moleti villages were purposively sampled at the village level from both districts, i.e. Kongwa and Kiteto respectively. Focus group discussions (FGDs) with the identified actors from the ICRISAT portfolio were conducted to understand who are the key actors, what are existing interrelationships between these various actors, their interests and the sort of influence each has in the interaction web. Social network data was collected using a Net-Map method using a novel social network mapping method that includes an assessment of actors' influence and goals as proposed by Hauck *et al.* (2013). The homogenous purposive sampling technique was employed to obtain the FGD participants. In total, four FGDs were conducted in the entire study area with each comprising between 8-10 participants. The number of participants guaranteed efficiency to gain enough insights on several issues of importance in the study (Nyumba *et al.*, 2018).

The social network data related to income linkages among actors objective was analysed using UCINET statistical software package integrated with the NETDRAW program. The statistical package is essential in analyzing social network data and its embedded program is essentially used in drawing social network maps/diagrams. Actors and members of the innovation platform were requested to respond based on income linkages with other actors, thus their responses were denoted as (1 = There is linkage) and (0 = No linkage). These denotations were used to analyse and explain the ingoing (indegree) or level of influence and outgoing (outdegree) or level of importance as features of power amongst these actors. The social network analysis was conducted to calculate the degree of centrality, strength of relationships and interactions between actors. Further, more qualitative data obtained from semi-structured interviews were subjected to content analysis that involved breaking, comparing and categorizing to add value to social network data analysed by the UCINET software.

3.7 Findings and Discussion

3.7.1 Income linkages Extents among Actors in the Groundnuts Seed Value Chain

The vertical and horizontal income relations/linkages from the study finding indicate a wide diversity of actors in the groundnut seed value chain income relations. Diversity plays a bigger role and influence the power relations that actors have with each other in the chain. The ingoing (indegree) or level of influence and outgoing (outdegree) or level of importance that are vertical and horizontal ties respectively, were variably observed. These variabilities have been used to explain the level of power relations among actors based on the income aspect amongst the identified actors. The income ties variabilities were high at the village level as opposed to the district where variabilities are explained by a smaller total of income ties in the two villages as shown in Table 3.1 and Table 3.2.

The results show that extension officers and traders have a relatively higher number of horizontal income linkages/ties at the village level, hence influential compared to other actors. According to Odunze (2019), horizontal integrations lead to higher income, market channels and improved participations clearly showing how horizontal linkages among actors benefit those with a higher number of ties in the chain set up. These benefits are high only when these linkages involve more actors contrary to what was observed in the study area (Pera *et al.*, 2019). Table 3.1 shows income vertical and horizontal linkages among actors in Molet Village.

Table 3.1: Income linkage between actors in the groundnuts seed value chain at Moletli village

	Farmer	Extension officer	Organisations	Village Leaders	Middlemen	Researchers	Traders	Totals
Farmer	-	0	0	0	0	0	0	0
Extension Officer	0	-	0	1	1	1	0	3
Organisations	1	0	-	0	1	0	0	2
Village leaders	0	0	0	-	0	0	0	0
Middlemen	0	0	0	0	-	0	0	0
Researchers	0	0	0	0	0	-	0	0
Traders	1	1	0	0	1	0	-	3
Totals	2	1	0	1	3	1	0	-

1= There is linkage, 0 = There is no linkage

Farmers on the other hand had a relatively high number of vertical linkages compared to other actors in Moletli, hence showing a higher level of importance compared to other actors, as opposed to Mlali Village where a relatively higher number of horizontal linkages was observed. This is an indication of the extent of power farmers have since they dictate terms or activities towards other actors or cooperation with other actors. This aligns with the findings by Herrmann *et al.* (2015) who argue that farmers aggregative benefit as an outcome of the collaboration is a key aspect associated with vertical linkages. Table 3.2 shows income vertical and horizontal linkages among actors in Mlali Village.

**Table 3.2: Income linkage between actors in the groundnuts seed value chain at
Mlali Village**

	Farmers	Climate Department	Researchers	Middlemen	Extension	Village leaders	NGOs	Traders	Totals
Farmers	-	0	0	1	1	0	1	1	4
Climate Dept	0	-	0	0	0	0	0	0	0
Researchers	0	0	-	0	0	0	0	0	0
Middlemen	1	0	0	-	0	0	0	0	1
Extension	0	0	0	0	-	0	0	0	0
Village leaders	0	0	0	1	0	-	0	0	1
NGOs	0	0	0	0	0	0	-	0	0
Traders	0	0	0	0	0	0	0	-	0
Totals	1	0	0	2	1	0	1	1	-

1= There is linkage, 0 = There is no linkage

At the district level, it was found that the number of actors in the chain was relatively higher compared to the village level. It was further found that NGOs, CBOs and Consumers have a relatively higher number of horizontal income ties, an indication of more power in terms of influence compared to other actors. Described as the anchors, the organisations identified in the chain set up i.e NGOs and CBOs link different actors, an indication of their power in the value chain setup (Quak, 2019). These organisations tend to hold a powerful position along the value chain, thus are also referred to as lead firms (Nguni, 2015)

Table 3.3: Income linkage between actors in the groundnuts seed value chain at the district set-up

	Farmers	NGOs	CBOs	Researchers	Local Government	Central Government	Consumers	Transporters	Traders	Agro-dealers	Total
Farmers	-	0	0	0	1	0	0	1	0	1	3
NGOs	1	-	0	1	0	1	0	1	1	1	6
CBOs	1	0	-	1	0	1	0	1	1	1	6
Researchers	0	0	0	-	0	0	0	1	0	0	1
Local gvt	0	0	0	0	-	0	0	0	0	0	0
Central gvt	0	1	0	1	1	-	0	1	0	0	4
Consumers	1	0	0	0	1	1	-	1	1	1	6
Transporters	0	0	0	0	1	0	0	-	0	0	1
Traders	1	0	0	0	1	1	1	1	-	1	6
Agro-dealers	0	0	0	0	1	1	0	1	0	-	3
Total	4	1	0	3	6	5	1	8	3	5	-

1= There is linkage, 0 = There is no linkage

Consecutively, transporters and the local government showed to have a relatively higher number of ingoing ties thus showing to be with a higher level of importance in the value chain set up. This conveys that transporters and the local government are more powerful due to the level of importance they have to possess compared to other actors based on the number of ties/linkages they have with other actors. According to Khan and Ghalib (2012), local government performing service-oriented roles hence explaining the position it has and the power it is within the value chain set up.

3.7.2 The extent of Power Linkages Assessment among Actors in the Value Chain

Characterizing the position of actors' power relations in the groundnuts seed value chain was also done by analyzing the centrality measures (Degrees and betweenness). The centrality measured determined using the UCINET statistical package, aided in identifying stronger, intermediate and weaker actors in the value chain in terms of influence and

importance. Furthermore, these measures helped in identifying the direction of interactions specifically on the income aspect.

The betweenness centrality measure was used to measure the potential vertex and identify the extent of a vertex in a network (Raghavan *et al.*, 2014). This measure was used to show how an actor connects other actors. This role indicates power in a value chain set-up. According to Hafner-Burton & Montgomery (2012), betweenness centrality demonstrates the notion of power among actors in a particular set-up.

Table 3.4: Centrality measures on power linkages among actors in the groundnuts seed value

Level	Actors	Normalized betweenness	Normalized OutDegree	Normalized InDegree
Moleti	Traders	0.000	50.000	0.000
	Extension			
	Officers	6.667	50.000	16.667
	Organisations	3.333	33.333	16.667
	Farmers	0.000	0.000	33.333
	Middlemen	0.000	0.000	33.333
	Researchers	0.000	0.000	0.000
	Village leaders	0.000	0.000	33.333
	Centra			
	Government	20.000	44.444	55.556
Kongwa and Kiteto	NGOs	12.500	66.667	11.111
	Agro- dealers	10.119	33.333	55.556
	Traders	7.500	66.667	33.333
	Transporters	7.500	11.111	88.889
	Farmers	1.994	33.333	44.444
	Consumers	0.556	66.667	11.111
	CBOs	0.000	66.667	0.000
	Researchers	0.000	11.111	33.333
	Local			
	Government	0.000	0.000	66.667
Mlali	Farmers	14.856	57.143	14.286
	Middlemen	9.524	0.000	0.000
	Researchers	0.000	0.000	0.000
	Climate			
	Department	0.000	14.286	28.571
	Extension			
	Officers	0.000	0.000	14.286
	Village Leaders	0.000	14.286	0.000

Organisations	0.000	0.000	14.286
Traders	0.000	0.000	14.286

The study findings ascertained that farmers and middlemen had the highest relative normalized betweenness compared to other actors and this was the same in both the districts and at village levels. At Mlali village, Organisations (CBOs and NGOs) and Extension Officers showed a relatively higher value of normalized betweenness compared to other actors at Moletti village. This implied that higher power to connect other actors hence high relational power. To provide evidence to this, a participant in the key informant interview said;

“..at a bigger extent, the organisations in our villages help us a lot to link us with markets of the products we have and provide knowledge regarding the best practices in production. This has helped us improve in terms of production but also helped us with markets. In the past few years, it was hard to even add value to the crops we produce including groundnuts because we didn’t have the skills until the Organisations started reaching out. They have built us with knowledge and linked us with customers” (Key informant Interview in 21st July 2020 at Kiteto District).

As observed in the groundnuts seed value chain, a high normalized betweenness value ascertained in CBOs and NGOs (Mlali), Farmers and Middlemen (Kiteto & Kongwa Districts) show how these actors influence others and their importance in the chain set up. The power they possessed results in connecting other actors in the value chain hence having a relatively higher power on the flow/share of resources and information that is income-linked.

Nevertheless, both indegrees and outdegrees as centrality measures used showed the strength of actors in terms of connections with other actors as explained by Cadini *et al.*, (2008). From the study findings, traders and extension officers showed to have a higher number of outdegrees thus a higher influence level compared to other actors at Moleti Village while farmers occupied the same position at Mlali Village. At the district level, Organisations (CBOs and NGOs), Traders and Consumers showed to have a higher number of outdegrees hence depicting their power by having a relatively higher influence level compared to other actors. This was also mentioned in the FGD with an innovation platform members who said;

“based on the interactions we have with other actors, we interact more with extension officers who often do farm visits at our farms in the villages and traders. The interactions are more at Kongwa and Kiteto districts where we go to sell our products. Probably because they are more urbanized compared to Moleti. Even when we do not meet traders, it is easier to have our produces sold compared if only we choose to have our produces sold at the village market.” (Focus Group Discussion 23rd July 2020 at Moleti Village).

This centrality measure is always normalized by the maximum number of neighbours a node can have. The values associated with this dimension show the level of importance and influence in a particular set-up hence clearly shows how influential these actors are as explained by Seuring and Mueller (2008) about the outcome of greater outdegrees and indegrees in a network.

On the other hand, income indegrees, as opposed to income outdegrees, show the rate of importance based on the number of connections/ties or links between an actor and other actors. The study findings show that farmers and middlemen at Moleti Village and

Climate Department officials at Mlali Village have a greater number of indegrees compared to other actors in the respective village setups. The indegrees observed depict a relatively higher power in terms of importance compared to other actors with respect to income ties in the groundnut seed value chain set-up. The same is depicted at the district level where the local government has higher income ties followed by Agro- traders hence proving to be powerful by exerting a higher level of importance at the district set up compared to other actors. Actors with zero income indegrees or outdegrees mean that they do not have ties hence the weakest in terms of importance and influence. At the village level, researchers fell under this group with zero total ties and betweenness. This shows that they are less influential and of importance hence less powerful. According to Devaux *et al.*(2018), the reason that researchers are less important and influential in the seed value chain set-up at lower levels, is their activities unmatching the actual requirements of other actors in such levels. Another factor lingers around the fact that researchers are focused on expanding new technologies and not linking the new technologies with the needs of other actors.

3.6 Conclusion and Recommendation

Income linkages are vital in ensuring actors improve the overall value chain. However, these linkages should be maintained to ensure that all actors benefit while minimizing faults that would weaken the value chain. The study found out that income linkages among actors were generally poor and controlled by few chain actors who are connected both vertically and horizontally. Differing in terms of levels and the roles they play, actors like middlemen proved to more important at the village level, whereas farmers were more influential. This was contrary to the district level where organisations and traders fill that position. Improvement strategies on income tie among actors should be focused on ensuring all actors in the chain have relatively equal influence and importance aligned

with both vertical and horizontal ties. To achieve this outcome, sustainable market-led strategies, supportive public and private partnerships should be enforced while ensuring actors involved are educated through inclusive collective training.

Taking researchers as an example, it was also evident that fewer ties in the chain as observed prove the existence of exclusion of some actors in the chain. This in turn affects the groundnuts chain in general, as far as the adoption of new groundnuts seeds varieties and technologies that are vital in production intensification are concerned. To ensure the groundnuts seed value chain is stable and performing, modifications should be directed to ensure the inclusion of all actors identified. This should go hand in hand with the modification space for actors to occupy in terms of influence and importance in the chain set up in other aspects such as material and knowledge aspects. This will ensure all actors are interconnected and closely linked. By doing this all the actors involved will have their linkages improved thus positively affect the value chain hence improve both the groundnuts seed value chain and the groundnut crop in general.

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CHAPTER FOUR

4.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

4.1 Summary and Conclusion of Major Findings

This dissertation sets three major objectives as part of examining the relationship dynamics among actors in the groundnuts seed value chains. These objectives were set into two manuscripts, where the first manuscript aimed at identifying actors and knowledge linkages among actors in the groundnut seed value chain. The second manuscript examined the income linkage among actors as relational power dynamics aspect. This chapter gives combined highlights that emerged in the dissertation specifically on the two manuscripts.

Methodologically, primary data was collected from key actors in the groundnuts seed value chain. The study resulted from the efforts put forward from the innovation platforms created in the implementation of the Tropical Legumes III project that aimed at improving the groundnuts production and performance through seed systems and the seed value chain. This being the case, the involvement of all actors in the crop's seed value chain in the study aimed to evaluate how relational power change among these actors affects the performance of the crop on key aspects that are knowledge and income aspects. Generally, the first manuscript shows that there is a bigger number of actors in the district than the village where NGOs, CBOs, local government, researchers and traders have a higher level of influence and importance in knowledge linkages compared to other actors at both district and village levels. This clearly showing actors at the production level are less powerful compared to actors in other nodes.

The second manuscript showed the power relation dynamics on the income aspect among actors in the chain. Supplementing the relational data with qualitative data from key

informants identified from the innovation platform by ICRISAT and FGDs, it was found that farmers and the climate department had a relatively higher power in terms of influence at the village level while the local government and agro-traders were dominant in terms of influence at the district levels (Kongwa and Kiteto). It is further found that farmers and middlemen have the highest relative normalized betweenness compared to other actors in both districts and village set up with the exception of organisations and extension officers. This means that they are powerful actors due to their importance in the value chain setup on the income aspect. This explains the difference in power possession that affects the flow of key factors that affect the performance of the groundnuts crop such as information.

Based on the study findings, it is concluded that there is notably a difference in terms of influence and importance knowledge extents among actors in the groundnuts seed value chain in the study area. The observed differences dictate the relations among actors hence determining the number of linkages an actor in the groundnuts seed value chain has with others. It is furthermore concluded that value chain level set-ups contribute to a greater extent to knowledge linkages since the number of actors vary with respect to the level set up of the value chain. It was observed that the district level had more actors as opposed to the village level thus more knowledge linkages at the former than at the latter.

On the other hand, it is concluded that income linkages are vital in ensuring a performing overall groundnut seed value chain. With the noticed poor linkages among actors in both village and district levels that are controlled by few actors, few actors were more powerful hence affecting income linkages of the whole value chain. From the study findings, middlemen were found to be more powerful in terms of importance at the village level while organisations (NGOs and CBOs) depicted the same characteristic at the district level.

4.2 Recommendations

Therefore, based on the study findings and conclusions, it is recommended to:

- i. ensure the involvement of all actors in the groundnuts seed value chain in the innovation platforms as far as the groundnut crop is concerned in both income and knowledge aspects.
- ii. put forward improvement strategies to boost linkages among actors in the chain so as to improve the groundnut seed crop and its inputs hence result in its best performance.
- iii. ensure that there are proper channels of information sharing which is a key aspect in the chain. Furthermore, recognizing actors in the groundnuts seed value chain that will in turn help in the adoption of technologies and newly developed varieties of the groundnut seed crop.

APPENDICES

Appendix 1: Consent Form

1.1 Introduction

Good morning /afternoon/evening

My name is I am a student pursuing Master of art in Project Management and Evaluation from Sokoine University of Agriculture, Morogoro. I am conducting a research study in your area on ‘Power dynamics among actors in the groundnuts seed value chain.’ This session is to obtain your ideas/information on the topic and I will appreciate your full cooperation. I would like to assure you that the information you will share with me during the session in this interview will strictly be used for the research purpose only and not at all will your identity and the information is treated without confidentiality. Let me remind you also that during the session there are no right or wrong answers. Be free to ask when you think you haven't understood the question and I will totally understand if you choose not to get through the session. As compensation to your time, you will be given a small amount of money as a word of thanks to you.

Participant’s Agreement:

I have read the information provided above and I voluntarily agree to participate in this research and indicate my consent by writing my name and signature below:

I _____ voluntarily agree to participate in the research.

Signature of research participant: Date:

District; Ward.....

Village; Time

Appendix 2: Power Relations Study

Data capture to reflect: 1, Level of relationship 2, Space and 3 Form of relations

Understanding interrelationships between different actors in different systems (District and Village level)

1. Who are the actors

-
-
-
-
-
-

2. How are these actors linked?

Work: During FGD draw linkage maps and extract data into the 3 templates below

Knowledge linkage

	A	B	C	D	E	F	G	H	I
A									
B									
C									
D									
E									
F									
G									
H									
I									

Income/money linkage

	A	B	C	D	E	F	G	H	I
A									
B									
C									
D									
E									
F									
G									
H									
I									

Material linkages

	A	B	C	D	E	F	G	H	I
A									
B									
C									
D									
E									
F									
G									
H									
I									

3. What are the motivations

During FGD rank motivation of each actor: Scale of 1-5

	Income	Food	Knowledge				Totals
A							
B							
C							
D							
E							
F							
G							
H							
I							
J							
Totals							

Appendix 3: Key Informat Guide (Innovation Platform Members)

A; Seed Distributors;

1. Are you aware of the groundnuts seed value chain?
2. In line with the groundnuts seed value chain, please explain the nature of your work.
3. What types of seed varieties are you distributing?
4. From the varieties of seeds which one is being distributed to most farmers?
5. How long have you been distributing seeds to farmers?
6. To what volumes have you distributed seeds to farmers in the last three years?

7. What factors determine the available information and prices on the type of seeds available?
8. Who are you linked more among the groundnuts value chain?
9. In your line of work do you think you are compelled to work with some other actors against your will?
10. What determines the level of interaction/relationships you have with other actors?
11. How good are you related to other actors as you distribute your seeds to the farmers?
12. Do you think you link well other actors in the groundnut seed value chain?
13. How important are linkages and what do you do to ensure they are sustainable?
14. How many different actors are you more linked with?
15. Do you trust the actors you are involved within the groundnuts seed value chain?
16. Have the relationships and linkages change positively or negatively over time?
17. What do you think is the reason for those changes?
18. What do you think needs to change to enhance the groundnuts seed value chain?
19. What are the challenges you are facing as a groundnuts seed distributor?

B; Seed Traders (Retail and Wholesale)

1. Are you aware of the groundnuts seed value chain?
2. What's the nature of your work in relation to the groundnut seed value chain?
3. What types of seed varieties are you distributing?
4. From the varieties of seeds which one is being distributed to most farmers?
5. How long have you been distributing seeds to farmers?
6. Do you share information you have with farmers willingly?
7. To what volumes have you distributed seeds to farmers in the last three years?
8. What factors determine the available information and prices on the type of seeds available?

9. Who are you linked more among the groundnuts value chain?
10. In your line of work do you think you are compelled to work with some other actors against your will?
11. What determines the level of interaction/relationships you have with other actors?
12. How good are you related to other actors as you distribute your seeds to the farmers?
13. Do you think you link well other actors in the groundnut seed value chain?
14. How important are linkages and what do you do to ensure they are sustainable?
15. How do you ensure that the services you offer are trusted by other actors?
16. Do you trust the actors you are involved within the groundnuts seed value chain?
17. Have the relationships and linkages change positively or negatively over time?
18. What do you think is the reason for those changes?
19. What do you think needs to change to enhance the groundnuts seed value chain?
20. What are the challenges you are facing in your line of work along the value chain?

C; Agricultural Officers;

1. What is the number of groundnuts crop producing households in your respective area?
2. What is the area cultivated by groundnuts in the area?
3. What can you comment about the trend in groundnuts production in your jurisdiction?
4. Are there any policies that guide the provision and accessibilities of quality groundnuts seed to the farmers?
5. What's your role in ensuring that farmers have adequate information about seed varieties groundnuts included?
6. Have you ever met with the chain actors and talked about the challenges they face with respect to the roles they play?

7. What are the challenges facing seed acquisition from producers to farmers and how your office is dealing with the challenges?
8. Are you aware of the groundnuts seed value chain and how it works?
9. Along the chain whom do you think benefits more than others? Why?
10. Do you think the actors in the seed value chain need to have equal power in terms of decision influence and information acquisition?
11. Do you think there are actors alongside the value chain that possess power in decision making and information access?
12. If this is dealt with amongst actors, will it contribute to strengthening relations and linkage between actors hence enhancing the value chain?

D; Seed Producer:

1. Please explain the nature of your work.
2. Are you aware of the groundnuts seed value chain?
3. How related are you to other actors in the value chain?
4. Which actors are you aligned with most in the value chain and why?
5. What's the nature of linkage/relationship with the actors you are aligned more in the value chain?
6. What seed varieties have you produced in the last three years?
7. What was the push for the seed produced?
8. Is the information on the newly produced seeds varieties shared freely and accessible to other actors?
9. What's the regulatory set up in terms of seeds producing and how it affects your line of work?
10. Is there anything in terms of linkage and relationships you think should change to enhance the groundnut seed value chain?
11. What are the challenges you are facing as a seed producer?

Appendix 4: Checklist for focus group discussion

1. How linked are you with other actors in the value chain?
2. What influences the linkage and relationships with other actors in the value chain?
3. Do you think you have the ground to determine what influences the linkage with other actors along the value chain?
4. Are you having the power to access information, deciding on prices, and what to do with markets of your produces to other actors in the value chain?
5. What should be done to enhance/modify that situation?
6. Have you had the same influence in decision making and influence with regards to the groundnuts seed?
7. What are the noticed changes in groundnuts production and its seed value chain at the present in terms of linkage and actors relationships?
8. Can you explain the rate of profit with regard to the activities you do along the groundnuts value chain
9. Do you think if you improve your power in decision making influence linkage and information acquiring your roles would be improved? How?
10. What are the challenges you face in relation to the groundnuts seed value chain?