

UNIVERSITY OF CAPE COAST

SOCIAL NETWORKS AND RURAL AGRICULTURAL DEVELOPMENT IN
SELECTED RURAL COMMUNITIES IN THE CENTRAL REGION OF GHANA

BY

FREDERICK KOOMSON

THESIS SUBMITTED TO THE INSTITUTE FOR DEVELOPMENT STUDIES
OF THE FACULTY OF SOCIAL SCIENCES, COLLEGE OF HUMANITIES
AND LEGAL STUDIES, UNIVERSITY OF CAPE COAST IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR AWARD OF DOCTOR OF
PHILOSOPHY DEGREE IN DEVELOPMENT STUDIES

FEBRUARY 2015

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Name: Frederick Koomson

Signature..... Date.....

Supervisors' Declaration

We hereby declare that the preparation and presentation of this thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Name: Prof. Charles Kweku Brown

Signature..... Date.....

Co-Supervisor's Name: Prof. Dr. Elizabeth Tuider

Signature..... Date.....

ABSTRACT

The study set out to examine the utilisation of social networks among rural farmers in four rural communities in the Central Region of Ghana. Data were collected from 327 alters who were constituted via the egocentric approach based on eight(8) accidentally selected egos, and analysed with tools from SPSS (Version 21). Data were presented using frequency tables and percentages. The Kruskal Wallis and the median tests were used to test the differences in the communities with respect to their network size and density. The relationships between the variables of interest were tested using the Chi-square test of independence. The study found that resources that flow across networks are important for rural agricultural development. Besides the resources that flow across networks, the social support function of networks, exchange of tangible and intangible agricultural resources also favour rural agriculture. It also became evident that chiefs, unit committee chairpersons, pastors, assembly persons, unit committee members and community elders played important roles in mobilising groups and networks. It was also found that observational learning is key in the adoption of technologies among rural farmers as they learn about new technology by observing their neighbours and other people in their network.

It is recommended that, since farmers observe other farms and farmers in order to access information on new technologies, policies that aim at the introduction of new agricultural technology should consider model farms to enable farmers to observe how the technology works. Also, policy makers should pay more attention to the social support functions of networks since they favour agricultural development. Last, key persons in the mobilisation of networks should be part of policies that aim at developing rural agriculture.

ACKNOWLEDGEMENTS

My first appreciation goes to the Director of the International Centre for Development and Decent Work (ICDD), and the German Academic Exchange Service (DAAD) for giving me a Guest Lectureship Position in the University of Kassel, Germany in 2010 and the subsequent award of a three-year Ph.D scholarship. I would also like to sincerely acknowledge my supervisors, Prof. C. K. Brown of the Institute for Development Studies, University of Cape Coast and Prof. Dr. Elizabeth Tuidier, Department of Sociology, University of Kassel for their comments and suggestions which were extremely helpful in improving the thesis. My third appreciation goes to Prof. J. V. Mensah, Dr. Francis Enu-Kwesi, my mentor, and Dr. Akua Britwum for the encouragement and support they gave me throughout this learning process.

Julius, Ransford, Sabina and Elizabeth also contributed greatly during the data collection stage of this work. I also thank Dr. Joseph Boateng Agyenim for offering suggestions in the agricultural development aspects of the study. The acknowledgements will not be complete without thanking the senior members and staff of the Institute for Development Studies. My final appreciation goes to my lovely children and wife who endured my absence from home during my travels to Germany and other ICDD partner universities.

DEDICATION

To the memory of my late parents, Rev. John Koomson and Mrs. Kate
Baaba Abokomah Koomson

TABLE OF CONTENTS

Content	Page
DECLARATION	ii
ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
DEDICATION	v
TABLE OF CONTENTS	vi
LIST OF TABLES	x
LIST OF FIGURES	xiii
LIST OF ACRONYMS	xiv
CHAPTER ONE: INTRODUCTION	
Background to the study	1
Statement of the problem	8
Objectives of the study	9
Research questions	10
Scope of the study	10
Significance of the study	10
Limitations of the study	11
Operational definition of terms	11
Organisation of the thesis	12
CHAPTER TWO: REVIEW OF RELATED LITERATURE	
Introduction	14
Theoretical considerations of the study	14

Social exchange theory	14
Network theory	24
Approaches to social network analysis	38
Measuring social networks	42
Perspectives and dimensions of social capital	46
Social networks and social capital	65
Aspects of rural agricultural development	77
Social networks and rural agricultural development	83
Conceptual framework for social networks and rural agricultural development	112
Summary	115
 CHAPTER THREE: METHODOLOGY	
Introduction	119
Study area	119
Research approaches in social network studies	124
Study design	132
Study population	134
Sampling procedures	134
Sources of data	136
Data collection instruments	136
Pre-test of field instruments	137
Fieldwork	138
Ethical considerations	141
Data processing and analysis	142

**CHAPTER FOUR: ROLE OF SOCIAL NETWORK CHARACTERISTICS
IN RURAL AGRICULTURAL DEVELOPMENT**

Introduction	144
Profile of respondents	144
Network structure	149
Content of networks	153
Functions of networks	157
Summary of findings on network characteristics	169

**CHAPTER FIVE: MOBILISATION AND UTILISATION OF SOCIAL
NETWORKS AMONG RURAL FARMERS**

Introduction	172
Mobilisation and utilisation of social networks among rural farmers	172
Summary of mobilisation and utilisation of social networks	193

**CHAPTER SIX: SOCIAL NETWORKS, COMMUNITY
CHARACTERISTICS, LOCAL CONDITIONS AND RURAL
AGRICULTURAL DEVELOPMENT**

Introduction	195
Community characteristics, local conditions and rural agriculture	195
Social networks and rural agriculture	206
Summary of social networks, community characteristics, local conditions and rural agricultural development	240

**CHAPTER SEVEN: SUMMARY, CONCLUSIONS AND
RECOMMENDATIONS**

Introduction	244
Summary	244
Key findings of the study	245
Conclusions	251
Recommendations	254
Contribution to knowledge	256
Areas for further research	256
BIBIOGRAPHY	257
APPENDICES	
A: Interview schedule on social networks and rural agricultural development	293
B: Community profiling guide	304
C: Interview guide for key informants	305
D: Table for determining sample size from a given population	306

LIST OF TABLES

Table		Page
1	Homans behaviourist proposition	19
2	Distribution of the study population by district and community	134
3	Sampling distribution of farmers by community	136
4	Sex distribution of respondents by community	145
5	Age distribution of respondents by community	146
6	The Kruskal Wallis test of differences in network sizes	150
7	Network size by community	150
8	The Kruskal Wallis test of differences in network density	151
9	Network density by community	152
10	Resources exchanged within networks	154
11	The intensity of the types of resources exchanged in networks	156
12	Aims of exchange relationships	157
13	The likelihood to ask neighbours for money when broke	159
14	The likelihood that people would ask neighbours to help them in their farm if they were sick	161
15	Benefited from labour assistance	162
16	Volunteerism in community activities	163
17	People who did not participate in community activities were sanctioned	164
18	People made fair contribution to community activities	165
19	Key persons in the resolution of issues of daily life	167
20	Triggers that brought people together	173
21	Public/private events/settings that brought people together	174

22	Distribution of events/settings by community	176
23	Events and the estimated number of people that attended	177
24	Persons/leaders noted for mobilising groups/networks	181
25	Factors that contributed to leadership within groups and networks	183
26	How respondents maintained network ties	185
27	Qualities expected from network members	186
28	Factors that would contribute to the destruction of networks	187
29	Benefits derived from groups and associations	190
30	Distribution of formal agricultural associations/groups	191
31	How the agricultural groups and associations had improved the activities of members	192
32	Distribution of key resources in the study communities	197
33	The extent of togetherness in the communities	199
34	Ever experienced low crop yield	200
35	Reasons for low crop yields	202
36	Coping strategies of respondents	203
37	Ever suffered post harvest losses	204
38	How respondents' secured household consumption after suffering from post harvest losses	205
39	Discussion of farm-related activities/issues with friends and neighbours	208
40	Distribution of whether respondents observed other farmers in their farms by community	209
41	Information received on how to improve farm	211

42	Type and sources of specific information on farm management practices	212
43	Use of new agricultural technology by community	214
44	Use of specific agricultural technology by type of community	215
45	The sources of new technologies by community	216
46	Conduct of on-farm experiment by respondents	217
47	The type of on-farm experiment by community	218
48	Sharing of newly acquired knowledge with other farmers	220
49	Benefits received by respondents when their friends visited them on their farm	221
50	Membership in a market cooperative	224
51	Sources of information about market prices of farm produce	225
52	Credit sales by respondents	226
53	Persons to whom produce were sold on credit	227
54	Purchase of farm inputs on credit	227
55	Sources of purchased farm inputs	228
56	Available sources of credit to respondents	229
57	Persons/institutions whom respondents would lend to	231
58	The need for credit by community	232
59	Attempts made to secure credit	233
60	Success in securing credit	235
61	Relationship between network size and yield	238
62	Relationship between network size and income	238
63	Relationship between network density and yield	239
64	Relationship between network density and income	240

LIST OF FIGURES

Figure		Page
1	Conceptual framework for social networks and rural agricultural development	114
2	Map of the Assin South District showing Kwaata and Ahomaho	125
3	Map of the Twifo-Hemang-Lower Denkyira District showing Adugyaa and Kyirenkum	126
4	Marital status of respondents	147
5	Religion of respondents	148
6	Type of sanctions for deviants of group norms	168
7	The outcome of allowing non-conformists to go unpunished	169
8	Marketing of farm produce	223
9	Sources where respondents secured credit	234
10	Crops grown by respondents	236

LIST OF ACRONYMS

GPRS	Ghana Poverty Reduction Strategy
ICDD	International Centre for Development and Decent Work
IMF	International Monetary Fund
MGDs	Millennium Development Goals
MoFA	Ministry of Food and Agriculture
PAMSCAD	Programme of Action to Mitigate the Social Cost of Adjustment
SAP	Structural Adjustment Programme

CHAPTER ONE

INTRODUCTION

Background to the study

Globally, extreme poverty has been viewed as a rural phenomenon despite increasing urbanisation. Out of the 1.2 billion extreme poor people, 75 percent live in rural areas (Ravallion, Martin, Chen & Sangraula, 2007) and, for the most part, they depend on agriculture, forestry, fisheries and related activities for survival (Anriquez & Stamoulis, 2007). Because of the association between rurality and poverty, some countries have even defined the poor as rural. As a result, the effort towards poverty reduction has largely been concentrated in rural areas where the majority of the poor live. Anriquez and Stamoulis have noted further that the battle to achieve the global society's slated objectives on hunger and poverty reduction will be won or lost in the rural areas of developing countries. For example, progress towards Millennium Development Goal (MGD) 1 in the East and South-East Asia has been associated with rapid agricultural growth in rural areas (Audinet & Haralambous, 2005).

In order to develop rural agriculture, the mobilisation and organisation of capital is vital. Among the types of capital identified to bring about rural agricultural development are physical, natural, financial, human and social capital (Callon, 1991). It is important to note that all the types of capital play significant roles in the development discourse. This is because they act as structures upon which development occurs. In effect, all the types of capital need to be in place or function in order for the development goal of poverty

reduction to be met.

However, earlier attempts at rural agricultural development were focused mainly on physical, financial, human, and natural capital. This led earlier rural development projects to have much more narrowly tailored goals benefiting some sections of the society, with little or no concerns for future generations (Buam, 2007). While natural, physical, financial and human capitals play significant roles for rural agricultural development and poverty reduction, the constant failures of many rural development programmes indicate that additional factors deserve consideration (Buam, 2007).

In the 1990s, social aspects of development became popular among development practitioners. Writers such as Bourdieu, Coleman, Putnam (social capital), Granovetter, Burt, Lin (social networks) were very instrumental on how social interactions contribute to development. For example, the theory of the strength of weak ties (Granovetter, 1973) shows that loosely connected people benefit from access to unique, non-redundant information and knowledge which often lead to low transaction cost. Burt (1992) also added that social networks enable people achieve higher economic outcomes and are associated with positive and beneficial outcomes. In his view, strong ties which bond members are important for one to access weak ties which serve as bridges. It has also been found that people who rely on diverse heterogeneous networks, such as migrant farmers, benefit from the spiral of diverse information, innovations and new technology that are critical for farm development (Spielman, Davis, Negash & Ayele, 2008).

The society, culture, institutions and the system can be understood by looking at the set of social interactions that occur within them (Tilly, 1984).

As Wright (1997) notes, networks set a context within groups, formal organisations, and institutions for those who work in or are served by them, which, in turn, affects what people do, how they feel, and what happens to them. Important insights about the structure of rural economies and the design of appropriate rural development policies are gained by the recognition that people are embedded within social networks (Udry & Conley, 2004). This is because social network analysis assumes that relationships are important. It maps and measures formal and informal relationships to understand what facilitates or impedes the knowledge flow that binds interacting units (Serrat, 2009).

Social networks have three distinct characteristics, according to Pescosolido (2011). These distinct characteristics may vary in terms of structure, content and function. Structure, which targets the physical aspects of the network, is often defined in terms of size, density, or types of relationships. Content, as a network characteristic, is concerned with what flows across the network ties. Wasserman and Faust (1999) have noted that content serves as channels for the transfer of material and non-material resources. These resources may include attitudes and opinions, as well more tangible experiences and collective memory (Emirbayer & Goodwin, 1994). Among the functions that networks can serve are emotional support, instrumental aid, appraisal and monitoring (Pearlin & Aneshensel, 1986).

According to Larsen (2008), social capital, in the form of social networks, is essential for the development of rural agriculture. This is because social networks have important functions for channelling and facilitating adaptation, as the transfer of knowledge about adequate natural

resource management techniques depends, among other things, on social relations (Winkels & Adger, 2002). Similarly, Udry and Conley (2004) have argued that social interactions have been shown to play an important role in technology adaptation decisions with rural agriculture. Empirical studies have demonstrated that social networks do significantly influence the adoption decision of individual farmers (Baerenklau, 2005; Mutuschke, Mishra & Qaim, 2007). In the course of agricultural activities, farmers interact among themselves to fulfil different kinds of needs, such as getting advice regarding cultivation, obtaining appropriate seeds and plants, and getting tools and implements (Jana, Bandyopadhyay & Choudhuri, 2013).

According to Isaac, Erickson, Quashie-Sam and Timmer (2007), farmers who lack the means to acquire farming knowledge from formal sources often rely on information within their social networks and transfer information through social interactions (Conley & Udry, 2001). In addition, the effectiveness of farmers' networks in spreading information regarding agricultural activities becomes vividly evident in migrant farming communities when one arrives as an outsider in a remote village of a developing country (Mutuschke, 2008). Thus, the socially based process of learning farming and management practices often relies heavily on social relationships in the larger farming community and informal network structures (Davidson-Hunt, 2006).

Social networks have also been linked to the sustainable use of resources and also play a vital role in reducing poverty. Political influence and security of access to land in rural areas often flow through networks. Likewise, net financial inflows among rural farmers are usually small but

largely follow well established paths between individuals with deep social connections (Udry & Conley, 2004). This argument is supported by the network theory which describes information creation and subsequent transfer via personal networks and has a history of linking social ties with access to knowledge and information (Davidson-Hunt, 2006).

According to Audinet and Haralambous (2005), the effects of agricultural growth on poverty are specific to the local context, and the effects are stronger where agriculture is important to the livelihoods of the rural poor. The authors further note that, in countries or communities where the incidence of poverty is very high, agricultural development has the largest effect on overall poverty reduction.

The history of rural development in Ghana dates back to the colonial era following the establishment of the Department of Social Welfare and Community Development in 1946. This department mostly “concentrated on the construction of community centres, social clubs and youth centres as a basis for welfare work” (Brown, 1986, p.202). This approach has been referred to as the Community Development Approach which tried to harness the talents, potentials and capabilities of community members to help improve their livelihoods and to reduce poverty, especially rural poverty.

It, however, became inevitable in the 1970s that the reduction of rural poverty could be achieved with the development of rural agriculture. As a result, various strategies were outlined to mechanise agriculture which included: improved agricultural extension services, improved feeder roads network, better organized cooperative movement (an indication of social capital), experimental farms, seed distribution nurseries, availability of farm

machinery, better storage facilities in the rural areas and the accessibility to credit (Brown, 1986).

In the 1980s, several development strategies were put in place to salvage Ghana's declining economy, with emphasis on developing rural agriculture which was seen as the pivot of Ghana's economy. It is pertinent to note that the strategies in the 1980s did not differ much from those of 1970s or earlier development strategies. The International Monetary Fund introduced Structural Adjustment Programmes (SAP) in many developing countries, including Ghana, in 1983. The SAP came with its associated social problems, and before the programme could come to an end, another Programme of Action to Mitigate the Social Costs of Adjustment (PAMSCAD) was introduced to help solve the social problems created by the SAP.

By the beginning of the 1990s unemployment and poverty were widespread, and, as a result, the World Bank and the IMF realised the missing link in their wholesale development programmes for developing countries. However, owing to external shocks in the form of fluctuating world prices of Ghana's primary products as well as increasing crude oil prices, coupled with the political instability, Ghana became just another heavily indebted poor country (Buam, 2007).

In order to reduce the incidence of poverty and unemployment, Ghana put in place Vision 2020 and the Interim Poverty Reduction Strategy. The implementation of the two strategies met considerable challenges in part due to unrealistic strategies and inadequate financing. In 2002, comprehensive policies were put in place to support growth and poverty reduction over a

three-year period (from 2002-2004), with the aim of effective economic management and wealth creation. The goals of Ghana Poverty Reduction Strategy (GPRS 1) were to: ensure sound economic management for accelerated growth; increase production and promote sustainable livelihoods; direct support for human development and the provision of basic services. The strategy also aimed to provide special programmes in support of the vulnerable and the excluded; ensure good governance and increased capacity of the public health sector; and ensure active involvement of the private sector as the main engine of growth and partner in nation building.

In 2006, the government of Ghana launched its second strategy for poverty reduction and economic growth dubbed “Growth and Poverty Reduction Strategy, (GPRS II)”. The emphasis of GPRS II was on growth, including policies and strategies that would enable Ghana to attain middle income status of a per capita of \$1000 by 2015. Specifically, the strategy aimed at macroeconomic stability, accelerated private sector-led growth, vigorous human resource development and good governance and civic responsibility (Ghana, 2006).

The economy of Ghana is made up of the formal and the informal sectors. The informal sector, which is mainly agricultural, is located in rural areas. The rural areas in Ghana have poor road networks, poor infrastructure, poor health facilities, low incomes and low standard of living. The primary occupation in the rural areas is mainly agricultural and agriculture-related enterprises. According to Britwum, Ghartey and Agbesinyale (2006), Ghanaian agriculture is mainly subsistence and is carried out by peasant farmers who own small family plots.

The agricultural sector has three main sub-sectors. These are the agro-processing, cash crop and the food crop sub-sectors. Even though the sector contributes about 36.6 percent to GDP and employs about 56.2 percent of the labour force, productivity in the sector is low and the majority of the poor are found in the rural informal sector, whose livelihoods depends on agriculture. Out of the rural poor, food crop farmers have the highest incidence of poverty. According to Britwum et al. (2006), food crop farmers in Ghana constitute about 59 percent of the rural poor and they live in the four poorest regions of Ghana - Upper East, Upper West, Northern and Central Regions - with agriculture being more diverse in Northern and Central Regions. Based on the high incidence of poverty among rural farmers in Ghana, many rural development experts have suggested that any effort to reduce rural poverty and to bring about rural development should target rural farmers.

Statement of the problem

The vast literature on social networks and various empirical studies on social networks reiterate the importance of social networks to rural development with special emphasis on rural agricultural development. However, most of these empirical studies on social networks and rural development have focused primarily on proof of concept, that is, whether the networks matter (Sabatini, 2006; Zuwarimwe & Kirsten, 2011). Few studies have pushed further by looking at the importance of the characteristics of social networks among rural farmers and how specific network characteristics matter. In addition, very little is known in Ghana on how rural farmers utilise social networks in the various stages of their agricultural activities. Studies

on social networks among farmers in Ghana (Emmanuel et al 2012; Kinderen 2012; and Udry and Conley 2004) have used the social capital approach using mainly case studies involving cooperatives and other agricultural groups and associations. Moreover, few studies push the methodological frontiers by examining the complexities of social networks in relation to rural farmers and network characteristics (Matuschke, 2008) as well as local conditions within which rural farmers operate (Zuwarimwe & Kirsten, 2011). The study intends to narrow these research gaps by examining how rural farmers mobilise and utilise social networks for their agricultural activities.

Objectives of the study

The general objective of the study was to examine the utilisation of social networks among rural farmers in four rural communities in the Central Region of Ghana. Specifically, the study sought to:

1. Examine the role social network characteristics play in agricultural development in the selected communities;
2. Examine the mobilisation and utilisation of social networks among rural farmers in the selected communities;
3. Determine the relationships among social networks, community characteristics, local conditions and rural agricultural development; and
4. Make recommendations for the improvement of rural agriculture.

Research questions

In order to address these objectives, the following research questions were posed:

1. What roles do social network characteristics play in agricultural development in the selected communities?
2. How do rural farmers in the selected communities mobilise and utilise social networks for their agricultural activities?
3. What relationships exist among social networks, community characteristics, local conditions and rural agricultural development?

Scope of the study

The study was confined to farmers from four selected rural agricultural communities in the Assin North and the Twifo-Heman-Lower-Denkyira Districts in the Central Region of Ghana. The study acknowledged the problems associated with social network studies, especially when it comes to sampling. As a result, the study limited itself to ego-networks where a sample was taken to represent rural farmers. Rural agricultural activities were examined in terms of: access to credit for agricultural activities, output, access to and exchange of information, innovation, technology adoption and transfer, access to market and risk management.

Significance of the study

It is hoped that the study will help policy makers to develop policies for rural agricultural development in Ghana. It is anticipated that this will eventually improve standard of living and bring about sustainable

development in rural areas.

The findings from the study will also provide information to academics, researchers, and students on how to improve the livelihoods and standard of living of the rural poor. Most importantly, the study will identify the characteristics of social networks that are important for rural agricultural development. This will help Community Based Organisations, Non-governmental Organisations and Agricultural practitioners to know the specifics in terms of informal networks among farmers in rural areas.

Limitations of the study

Even though the study acknowledges that there are many rural communities which have similar characteristics of interest as the selected communities, resource constraints did not allow all of them to be included in the study. Also, because the study was limited to ego-networks, the researcher could not cover all the networks of respondents, especially those outside the selected communities.

Operational definition of terms

The following operational definitions, as used in the text, were derived after a thorough review of literature.

Social capital: Resources embedded in social networks which are accessed and used by actors (Lin, 2001).

Social networks: Structure of relationships linking social actors (Marsden, 2000).

Rural area: An area is considered rural if the population is less than 5000.

These communities have poor infrastructural network and their dominant occupation is agriculture.

Rural agriculture: Rural agriculture is defined in terms of yield, access to and exchange of information, access to credit, marketing of farm produce and risk management.

Organisation of the thesis

The thesis is organised into seven chapters. Chapter One provides an introduction to the thesis. It covers the background discussion to the problem, the statement of the problem, the objectives and the research questions of the study. Other aspects of the introductory chapter are the scope of the study, the significance of the study, the limitations and the operational definition of terms. Chapter Two harmonises related works on the theoretical underpinnings of the study as well as empirical and conceptual issues underscoring social networks and rural agricultural development in Ghana. The chapter is divided into sections to address how social network is mobilised and utilised; the types of social networks and social capital in the agricultural sector; the relevance of social networks to rural agriculture; and the relationships among social networks, community characteristics, local conditions and rural agricultural development.

Chapter Three begins with an introduction that summarises the methodology adopted for the study. Issues covered in the methodology include a discussion of the competing paradigms in research on social network analysis (qualitative, quantitative and the mixed methodologies) and

the study design. The chapter also deals with a description of the study area, target population, sampling procedures, sources of data, data collection instruments, the fieldwork, ethical considerations and data processing and analysis.

Chapter Four presents a discussion on the profile of respondents and network characteristics in the study communities. The role of the network characteristics in the study communities is also examined. In Chapter Five, issues concerning how rural farmers mobilise and utilise social networks for their agricultural activities are discussed. Chapter Six explores the relationships among social networks, community characteristics, local conditions and rural agricultural development. Chapter Seven, the final chapter, presents the summary, conclusions, recommendations, contribution to knowledge and the areas for further research.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter reviews the theoretical underpinnings of social networks and rural development as well as concepts emanating from the theories. Also discussed in the chapter is empirical evidence on how rural farmers mobilise and utilise social networks for their agricultural activities. The final section of the review presents discussion on the conceptual framework for social networks and rural agricultural development.

Theoretical considerations of the study

The theories that inform the study are the social exchange theory, the network theory. The discussion of the social exchange theory has been centred on Homans (1961), Blau (1974) and Emerson (1981). The discussion under network theory is structured around definitions, types, perspectives, theoretical roots and measurements.

Social exchange theory

Social exchange theory is based on the premise that human behaviour or social interaction is an exchange activity (Homans, 1961) involving both tangible and intangible goods. It is a commonly used theoretical base for explaining the behaviour of individuals with respect to the exchange of goods and services (Blau, 1964). The exchanges involve cost and rewards. This has been recognised by Coleman (1990) as a phenomenon that permeates all

social life. The basic assumption of the exchange theory, according to Blau (1994), is that individuals establish and continue to establish social relations on the basis of their expectations that such relations will be mutually advantageous. Blau (1994) notes that the initial impetus for social interaction is provided by the exchange of benefits, intrinsic or extrinsic, independently of normative obligations.

According to the exchange theory, individuals regulate their interactions with other individuals based on a self interest analysis of the cost and benefits of such interaction. That is, people most often than not, seek to maximise their benefits and minimise their cost when exchanging resources with others (Molm, 2000). These benefits can be tangible or intangible since individuals often engage in an interaction with the expectation of reciprocity (Gouldner, 1960). Social exchange is composed of actions of purposive actors that presuppose constellations of their interest and resources (Zafirovski, 2005). According to Zafirovski, the processes of exchange is governed by reciprocal relations, and these processes help sustain reciprocal social relations or the mutual gratification between individuals. In such exchanges, people help others with the general expectation of some future returns and in order to maximise the resources gained, individuals may build social relationships with others by sharing their resources (Liang, Liu & Wu, 2008). It is, however, important to note that there are many perspectives of the exchange theory, some of which are discussed below.

Before the 1950s, exchange theory was limited to dyadic (two) relationships. This was exemplified in the work of Thibaut and Kelly (1959), which focused on interaction and its consequence for the dyad. This

perspective of the exchange theory suggests that exchange relations between two actors generate cost and reward and the relationship becomes better the more each actor produces behaviour that generates positive outcome. If both persons are able to produce their maximum rewards for the other at minimum cost to themselves, the relationship will not only provide each with excellent reward-cost positions but will have the additional advantage that both persons will be able to achieve their best reward-cost positions at the same time (Thibaut & Kelly, 1959). This suggests that any two actors in the rural agricultural sector who happen to be in a relationship may have better rewards if they produce behaviours that are rewarding.

A critical analysis of the theory of Thibaut and Kelly (1959) reveals three important aspects for the development of exchange theory (Molm & Cock, 1995). The first key concern is about power and dependence. Thibaut and Kelly (1959) see power as deriving from the ability of one actor in a relationship to affect the quality of outcomes attained by the other actor. They differentiate between two types of power. The first is 'fate control', which occurs when actor A can affect the outcomes of actor B regardless of what B does. The second is 'behaviour control' which Thibaut and Kelly (1959) have noted that actors can make it desirable for behaviour to be changed in a relationship. It is important to note that in a dyad or relationship between two actors, the actors are dependent on the relationship and this can affect the power each has over the other to some degree. The mutual dependence, therefore, limits the amount of power one can exercise over the other (Ritzer, 2000).

As can be seen in the discussion, exchange between members is very important for a lasting relationship between parties. This is because exchange involves rewards and cost and this often coerce members to conform to the norms governing the interactions. When members conform to association norms they are often better rewarded. In this case, trust becomes vital as each member is expected to produce behaviours that will not constrain others from putting up a good behaviour. In the agricultural sector, individuals can enter into dyad relationships where they pool resources to improve their farms and livelihoods.

Thibaut and Kelly (1959) developed the idea of comparison level and comparison level of alternatives which serve as standards for the evaluation of outcomes in exchange relationships. Comparison level is the standard by which an actor determines whether a relationship is attractive or satisfactory and is usually based on what actors consider desirable from a relationship (Ritzer, 2000). Ritzer further explains that relationships that are above the comparison level are deemed satisfying and those that fall below are considered unsatisfying.

The third key concept, identified by Thibaut and Kelly (1959, p.13), is the notion of 'outcome matrix'. Outcome matrix, according to Thibaut and Kelly, is a way of visually depicting all the possible events that may occur in the interaction between two actors. They explain that in a relationship there are costs and rewards which form axes in the behaviour repertoires of the actors. Within each cell of the matrix is entered the "outcomes, in terms of rewards gained and costs incurred, to each person of that particular portion of interaction (Thibaut & Kelly, 1959, p. 13).

Another perspective of the exchange theory can be traced to the work of George Homans. According to Homans (1969), exchange theory is set on fundamental propositions, which deal with at least two interacting individuals. Homans took a psychological position of exchange between two individuals but recognised that individuals are not isolated beings, rather they are social beings that spend considerable portion of time interacting with other people. It is important to note that as individuals interact with each other, they exchange ideas and other information which can be beneficial to them. It is also recognised that at times the interactions can bring negative benefits if information and ideas exchanged are detrimental to society.

Homans gave five propositions which include the stimulus proposition, the value proposition, the deprivation-satiation proposition, the aggression-approval proposition and the rationality proposition. When these propositions are put together they demonstrate how individuals profit from their actions (Homans, 1974). In other words, individuals design their conduct such that the value of the rewards gained in an exchange are greater than the costs incurred in forgoing the rewards associated with an alternative line of behaviour. Table 1 captures a summary of Homans five propositions.

In summary, Homans' exchange theory centres on an individual profit seeker who is rational, especially when it comes to taking decisions that border on choosing from alternatives (Table 1). Homans theory is, however, weak on mental states (Abrahamson, 1991; Mitchell, 1978) and large-scale structures (Ekeh, 1974). This stems from the over-reliance of his theory on dyad relationship which takes a micro perspective of the exchange theory. Despite

Table 1: Homans behaviourist proposition

The Stimulus Proposition	If the previous occurrence of a particular stimulus has been the occasion on which an individual's action has been rewarded, then the more similar the current stimulus is to the past one, the more likely the person is to repeat the action.
The Success Proposition	The more often an action is followed by a reward, the more likely a person will repeat the behaviour.
The Value Proposition	The more valuable a particular reward is to a person, the more often he will perform a behaviour so rewarded.
The Deprivation-Satiation Proposition	The more often in the recent past an individual has received a particular reward, the less valuable any further unit of that reward becomes (and following the value proposition, the less likely the person is to perform the behaviour for which he was so rewarded).
The Frustration-Aggression Proposition	If a person's action receives a punishment he did not expect, or if the person does not receive the reward he did expect, he will become angry and more likely to exhibit aggressive behaviour, the results of which will become more valuable to him.

Source: Homans, 1974

these weaknesses, Homans argued that large-scale structures can be understood if people adequately understand elementary social behaviour. He contended that exchange processes are identical at the individual and societal levels, although Homans granted that at the social level, the way the fundamental processes are combined is more complex (Homans, 1974).

The relevance of Homans theory to the study is that exchange is a social network activity. That is, when people engage in exchange activity they directly involve themselves in some form of network. The theory also assumes that actors in the agricultural sector for instance, are rational and will choose networks that will give them the best of rewards when they find themselves in exchange relationships. The theory suggests further that people will repeat rewarding actions; will attach importance to valuable rewards as against less valuable rewards. This situation produces social capital as rational decisions taken in relationships will result in positive rewards to members. It is, however, pertinent to note that exchange goes beyond the micro level to a macro level. This deficiency was, however, corrected by Blau's analysis of the exchange theories which focused on exchange at the macro level.

One other perspective of exchange theory that looks at exchange at the macro level was developed by Peter Blau. Homans' theory of exchange is strong in analysing exchange at the micro level and weak at the macro level exchange. Blau (1964) went beyond the micro level interaction and focused on the understanding of social structure on the basis of an analysis of the social process that governs the relations between individuals and groups. Blau was concerned with how social life becomes organised into increasingly complex structures of associations. It must be noted that the complex structures of social

organisation develop certain norms, values and cultures and it is out of these norms, values and cultures that social capital emerge. Coleman (1990) has noted that all social relations and social structures facilitate some forms of social capital. Through these structures actors establish relations purposefully and continue when these structures and relations continue to provide benefits.

Even though Blau was silent on the power of groups and the issues of ideology regarding mutuality, dependence, positionality, power and influence as well as values, norms and attitudes, his analysis of exchange may give rise to all these which though intangible can enable members access tangible resources. Blau (1964) conceptualises exchange theory as a stage sequence which starts from interpersonal exchange and ends at social change. According to Ritzer (2000), personal exchange transactions between people give rise to differentiation of status and power, which leads to legitimisation and organisation, which, in turn, sow the seeds of opposition and change. These steps have implications for social capital creation and rural development with reference to agricultural development. In rural communities, personal exchanges between people create trust among the members and due to the dependence of members on each other, these exchange transactions may bring social capital which can lead to the differentiation of status and power (Dahlman, 1980). The individual at the receiving end often complies with the one at the giving end. However, the personal exchange transaction which results in differential status and power often gives rise to the formation, legitimisation and organisation. It is out of these organisations that social capital is created for change in the livelihoods of members which collectively leads to development (Sorensen, 2000). This means that social capital can

enable people have access to financial capital and other forms of capital which can result in the improvement of the lives of members.

In 1972, Emerson developed an integrative perspective of the exchange theory by extending exchange theory and research from micro to macro levels of analysis through the study of exchange network structures. The central theme of Emerson's exchange theory is power and behaviourism. Emerson (1981) outlined three core assumptions of exchange theory. According to Emerson, people for whom events are beneficial tend to act rationally so such events occur and because people eventually become situated with behavioural events, such events come to be of diminishing utility and more importantly the benefits that people obtain through social process are dependent on the benefits that they are able to provide in exchange. These assumptions by Emerson are of great importance to the development of the social capital theory. That is, if people realise that being part of a group will give positive rewards they will act rationally for such an event to occur. The assumptions also draw on the theory of diminishing marginal utility. These principles often help sustain groups so that the maximum reward is received from being part of a group.

Emerson (1972) has noted that exchange at the macro level could involve either individuals or collectivities. Emerson was particularly concerned with the exchange relationships among actors. Cook, Gillmore and Yamagishi (1983) have expatiated on Emerson's collectivities of an exchange network theory and have argued that valued resources are distributed among individuals or collective actors and that there is a set of exchange opportunities among all actors in the network. Cook et al. (1983) further note that these exchange

opportunities that exist among all actors make them connected to one another in a single network structure. These components of the exchange theory informed the theory of social capital. The components suggest that exchange opportunities exist among groups and associations and these make resources available to the members of groups and associations. Information is easily accessed by members and resources are distributed among members. These are possible because of the strong group culture and the network available to members.

Cook et al. (1983, p. 277) have summed up exchange network as a specific social structure formed by two or more connected exchange relations between actors. Cook et al. (1983) have said that the connection between exchange relations is of great importance and is critical to linking exchange between two actors to more macro phenomena. It is clear that each exchange relation is embedded within a larger exchange network consisting of two or more such relationships. These networks and connectedness make resources available to those who would not have gotten access to. That is, people become better off or save resources for which they would have spent for not belonging to any group. This is made possible through group networking and connectedness that create resources for group members. What is crucial, according to Ritzer (2000), is the contingent relationship between group members in exchange relationships.

It is, however, important to note that social exchange can be negative or positive. Discussions from Molm (1991) suggest that social exchange can be negative where one serves to inhibit the exchange in the other or where there is lack of cooperation among members of a group and this happens when

exchange in one positively affects the exchange in another (Ritzer, 2000). In situations where social exchange is positive social capital is produced. However, social capital theorists have suggested that the resources derived from being part of a group and association result from the trust, the networking and the connectedness embedded in the culture of the group (Buam, 2007).

Network theory

A network consists of a set of actors or nodes along with a set of ties, edges or relations (Katz, Lazer, Arrow & Contractor, 2004) of specified types that link them (Borgatti & Halgin, 2011). The nodes may take different forms: individuals, groups, organisations or societies. The ties, however, depend on the level of analysis. The ties connect the actors, which yields a particular structure, with the nodes occupying positions within the structure. Across network studies, the actors or the nodes have been variously defined as individuals, groups, companies or even countries. The relationship or a tie is a flow of resources that can be material or non-material (Wasserman & Faust, 1999). The resources, according to Williams, Durrance and Mann (2008), might include social support, emotional support, companionship, time, information, expertise, money, business transaction and shared activity. Resources shared across ties are generally finite, according to Williams et al (2008), and therefore scarce. Because resource flow generally attenuates as it travels from node to node, an actor's position influences his or her access to resources.

Networks are different from groups, in that networks do not have natural boundaries and not all networks are connected. A disconnected network

is “one in which some nodes cannot reach certain others by any path” (Borgatti & Halgin, 2011, p. 2). Social network, on the other hand, is a “structure of relationships linking social actors” (Marsden, 2000, p. 2727). In explaining the focus of network theory, Wellman (1983) has stated that network analysis starts with the simple, but powerful, notion that the primary business of sociology is to study social structure and, in studying structures, an analysis of the pattern of ties that link members becomes paramount. This analysis requires a search for deep structures and patterns beneath the often complex surface of social system. Actors and their behaviour are seen as constrained by these structures and this can occur at both the micro and macro levels.

According to Ritzer (2000), one distinctive aspect of network theory is that it focuses on a wide range of micro to macro structures. The actors may be people (Wellman & Wortley, 1990) but they also may be groups, corporations, (Baker, 1990), and societies. Links occur at the large-scale, social-structural level as well as at microscopic levels. Granovetter (1985) describes such micro-level as actions embedded in the concrete personal relations and structures (or networks) of such relations. Based on this, social network analysis concentrates on the study of ties among and between actors that are not sufficiently bonded and densely knit to be termed groups (Wellman, 1983).

The network theory concerns itself with the study of the structure of relationships between basic elements that make up a system. Marginally, the theory reduces a system into a set of objects called nodes and a set of relationships called edges or ties that link the nodes together. Nodes are the individual actors within the networks and ties are the relationships between

actors. Holistically, network theory postulates that the attributes of individuals are less important than their relationships and ties with other actors within a network (Barnes, 1954).

According to Barrett (2005), individuals can be characterised as possessing nested identities that lead to salience, identification and alienation at multiple levels. In this respect, an individual plays multiple roles in society. One can be a father, a son, a husband or a wife, a sibling, an alumnus of a formal educational institution, a member of a church, a farmer, a member of a political party, a soccer fan and a member of a community association. In playing these roles, the individual interacts and the identity of the individual invites other actors in the network.

Networks vary with respect to the ties that link the nodes. Katz, Lazer, Arrow and Contractor (2004, p. 308) have classified ties to include:

communication ties, such as who talks to who, or who gives information or advice to who; formal ties, such as who reports to who; affective ties, such as who likes who or who trust who; and material ties or work flow ties, such as who gives money or other resources to who. Others include proximity ties, such as who is spatially or electronically close to who; and cognitive ties, such as who knows who.

Borgatti and Halgin (2011) have reduced these classifications to two. These are: state ties and event ties. State ties can be categorised into kinship ties, role-based ties, cognitive ties or affective ties (Borgatti & Halgin, 2011). Irrespective of the category of state ties, they have continuity over time due to their open-ended persistence. Event type ties, on the other hand, can be

counted because of their discrete and transitory nature. Examples of event type ties are e-mail exchanges, phone conversations and transactions. Some researchers (Dubini & Aldrich, 1991; Ebers, 1997) have named these ties as recurring pattern of ties.

Ties may be directional or non-directional (Katz et al., 2004). For example, if A attends a meeting with B, such relationship can be termed as directional. On the other hand, if A gives advice to B and A also gets advice from B, this is a non-directional tie. Ties may also vary in content and medium and also in signs, ranging from negative to positive (Katz et al., 2004). The general nature of the network theory means that there are many potential applications of this technique to many natural, physical and social systems. It may be applied to ecosystems and community food webs; gene regulatory; the World Wide Web and internet; governance structures as well as social networks (Wade, 2005).

As seen already, there are many types of social network ties. However, the strength of a tie, according to Marquardt, Moller and Buctienrieder (2012), is formed by a combination of the amount of time, the emotional intensity, the intimacy or mutual confiding, and the reciprocal services that characterise the tie. Granovetter (1983) gives a distinction between strong and weak ties. According to Granovetter, strong ties link people and other close friends, and weak ties link people and other mere acquaintances. The strength of weak ties theory works on two main premises. First, the stronger the ties between two people, the more likely that their worlds will overlap. That is, social networks are transitive. This means that if for example, X and Y are connected through strong ties and Y and Z also

have a strong tie, the probability that Z will have at least a weak tie with X is very high. Freeman (1979), for example, has called this relationship of transitivity as g-transitivity. Granovetter's (1973) argument has been supported by McPherson et al. (2001) on the basis of homophily that people who have similar characteristics tend to relate well. That is, if X is similar to Y and Y is similar to Z then it is more likely that Z will be similar to X (Borgatti & Halgin, 2011).

The second premise on which Granovetter's strength of weak ties theory is built is that bridging ties, which are weak ties, are a potential source of novel ideas. Bridging ties, according to Granovetter (1973), are ties that link people to others who are directly connected. The idea, according to Borgatti and Halgin (2011), is that weak ties serve as bridges that enable people to access information that is not already circulating among their strong ties (close friends).

Granovetter (1973) cautions that people should not ignore the strength of weak ties because they prevent isolation and allow for individuals to be better integrated into the larger society. As Ritzer (2000) notes, people who do not have weak ties would find themselves isolated in a tightly knit group and will lack information about what is going on in other groups as well as in the larger society.

Others have classified ties into communication ties, formal ties, material or work flow ties, cognitive ties, electronic, proximity and affective ties (Katz, Lazer & Contractor, 2004). Communication ties examine who talks to who or who gives information or advice, while formal ties look at the formal channels of reporting. Also, affective ties concentrate on who likes

who, or who trust who compared with material or work flow ties that encapsulate the exchange of resources. In addition, cognitive ties deal with ‘who knows who’; and proximity ties are related to spatial and electronic associations (Katz, Lazer & Contractor, 2004).

Wellman (1983) and Pescosolido (2011) have noted that network theory works on a number of core principles. Although it may be a loose conglomeration of work, network theory does seem to rest on a number of principles and these principles are very important for members to reap the benefits associated with being in the network. First, social actors shape their everyday lives through consultation, information and resource sharing, suggestion and support as well as nagging from others (White et al., 1976). As a result, people’s behaviour can best be predicted by studying the web of relationships in which they are embedded and not by examining their drives, attitudes, or demographic characteristics (Wellman, 1998). This is because people’s web of relationships can shape their behaviour. Pescosolido (2011) has noted that, as people depend on others to shape their behaviour, the behaviour they put up can be explained from the group in which they belong. Network interactions influence beliefs and attitudes, as well as behaviour, action and outcomes.

Second, because it is difficult to understand people’s behaviour in isolation and also in segments, the focus should be on the relationship between units and not on the units themselves. Third, analytic methods must not hinge on the conventional assumption of independence. In order to ensure independence among units, a population or sample must be defined relationally and not categorically. Fourth, understanding a social system

should go beyond a mere aggregation of the dyadic ties. This is because the flow of resources and information between two actors depends more on their relationships to all the actors. Fifth, groups sometimes have fuzzy rather than firm boundaries. This is so as individuals generally have cross-cutting relationships to a multitude of groups (Pescosolido, 2011).

Ritzer (2000) has also identified some principles of the network analysis. According to Ritzer, ties among actors are usually symmetrical in both content and intensity and must be analysed within the context of the structure of larger networks as the structuring of social ties leads to various kinds of non-random networks. In addition, the existence of clusters leads to the fact that there can be cross linkages between clusters as well as between individuals. There are also symmetric ties among elements in a system, with the result that scarce resources are differentially distributed; and the equal distribution of scarce resources leads to both coloration and competition. In this case some groups will band together to acquire scarce resources collaboratively, whereas others compete and conflict over resources.

From the above principles, one can notice that network theory has a dynamic quality with the structure of the system changing with shifting patterns of coalition and conflict (Rosenthal et al, 1985). In this view, poor people can organise themselves into groups to enable them access scarce resources. Each individual will bring to the group a unique quality that will be beneficial to all the members in the group. In this respect, individuals will, most of the time, consider the creation of ties as an investment in the accumulation of social resources or social capital (Katz, Lazer & Contractor, 2004) and they deploy this social capital and reap returns on their investment

in the form of opportunities from which they can profit (Lin, 2001). Networks can have structural holes which individuals can capitalise on to maximise their social capital. According to Burt (2001), individuals take advantage of structural holes in the network to invest their social capital, and this is usually done by connecting others that are not directly connected. The return on their investment accrues from their ability to broker the flow of knowledge and information between those who are not directly connected (Katz, Lazer & Contractor, 2004).

Burt (1992) has developed a more integrative network theory by articulating a schism within action theory between the ‘atomistic’ and ‘normative’ orientations. The atomistic orientation assumes that alternative actions are evaluated independently by separate actors so that evaluations are made without reference to actors, whereas the “normative perspective is defined by separate actors within a system having interdependent interest as social norms generated by actors socialising one another” (Burt, 1992, p.5). Burt further explains that the ability of people to mobilise resources from networks does not only depend on the number of contacts they have but more importantly on the structural holes from which they access information. According to the theory, people who have more structural holes are likely to receive more non-redundant information at any given time and they are also seen as a source of new ideas than those with few structural holes (Borgatti & Halgin, 2011). There are, however, different perspectives of the network theory and each perspective explains the potency of networks to make resources available to its members.

Aside from Bart's integrative network theory, there are other perspectives that express the potency of networks to generate externalities. One of the perspectives of social network analysis, which draw on the theories of exchange and dependency, stresses that, in order for a relationship to be sustained overtime, payoffs are very important (Homans, 1950). Homans' proposition was echoed by Emerson (1972) that the possibility of individuals or groups to exchange valued resources depends on the large scale network relationships. According to Cook (1997), these dependencies constitute the glue that binds members of groups and associations together. In this case, individuals' motivation to create ties is based on their ability to minimise their dependence on others from whom they need resources they can offer (Katz, Lazer & Contractor, 2004).

Another influential perspective of the network theory draws on the theories of mutual interest and collective action. The crux of this perspective is that "mutual interest and possibility of benefits from coordinated action" (Maxwell & Oliver, 1993, p.2) is often considered to be more important than self-interest. The calculus of mutual interest or collective action suggests that individuals often create ties and unite into groups not because they want to pursue self-interest. Instead, the motivation to forge ties and form groups is often to maximise their collective ability to leverage resources and mobilise for collective action in their environment (Katz, Lazer & Contractor, 2004).

The fourth perspective draws on the family of cognitive theories. Two of such theories are the theory of transactive memory systems and the theory of cognitive consistency. According to the theory of transactive memory, groups have their skills and expertise with which they develop

communication networks that help them to identify and leverage the skills of expertise of others in the group (Moreland, 1999). These network ties facilitate flow of knowledge within the group, thereby reducing the need for each group member to possess skills available elsewhere in the group (Katz, Lazer & Contractor, 2004). The cognitive consistency, on the other hand, stresses that people usually become friends if they have similar evaluation of an object (Heider, 1958). The object could be a third party in a communication network (Holland & Leinhardt, 1975). Katz, Lazer and Contractor (2004) have captured an aphorism of the cognitive as people like to be friends with friends of their friends, and tension usually occurs when their friends are not friends with one another.

The final perspective of the network theory tries to explain group communication on the basis of homophily. According to this perspective, members of a group are more likely to create communication ties with other group members who they deem to be similar. In explaining the potential of this perspective to produce social capital, Brass (1995, p.51) has posited that “similarity is thought to ease communication, increase predictability of behaviour, and foster trust and reciprocity”. These attributes promote social capital.

It can be seen from the above theoretical discussion that actors find themselves in a social structure. In this social structure, the actions of actors are constrained by the norms of the group, and because the actions of individuals can be constraining and at the same time enabling, each actor tries to put up behaviours that will attract positive rewards. In this case, the group interest tends to overshadow the individual interest. It is important to note

that the choices actors make is a reflection of the behaviour they put up in exchange relations. The more positive behaviour they put up, the more the group benefits, and the more negative behaviour they put up, the more the group suffers. This is because negative behaviour destroys trust. As a result, social capital is created based on the exchange relations between and among actors while exchange is possible when a rational choice to put up a rewarding behaviour is made.

It is, however, important to note that, when actors decide to conform to the norms of an association, their actions and choices collectively affect the group positively and this produces social capital upon which people draw resources. Johnson (2003) has noted that social networks are the medium through which social capital is created, maintained and used.

Theoretical roots of the social network perspective

There are multiple schools of thought or, as Monge and Contractor (2003) have termed it, “families of theories”, within the different social network perspectives. These theories try to give explanations to why people create, maintain, dissolve and possibly reconstitute network ties (Katz et al., 2004). Among these theories are: “theories of self-interest; theories of social exchange or dependency; theories of mutual or collective interest; cognitive theories; and theories of homophily” (Katz et al., 2004, p. 313).

Social network researchers who belong to the family of rational self-interest assume that people form dyadic and group ties in order to maximise their personal preferences and desires. The origin of this school can be traced to Coleman (1998) who showed that when actors operate out of self-interest,

there emerges the basis for a social system. It is important to note that, even though actors try to maximise their individual self-interest, their actions are constrained by their interdependent relationships with each other. According to Katz et al. (2004), this form of relationship imposes limits on the behaviour of actors and, thus, regulates the extent of self-seeking. The bottom line is that the limits constrain and shape the behaviour of actors and also counterbalance the increased access to resources each actor gets through the other.

Through the formation and sustenance of social ties, individuals are able to access resources. Some authors have referred to the resources generated through social ties as social capital (Bourdieu & Wacquant, 1992; Lin, 2001). From a self-interest perspective, because actors in a structure continuously interact, they create social capital from which they are expected to deploy and reap returns of their investment in the form of opportunities from which they can profit. A window for doing this is by taking advantage of structural holes in a network (Burt, 2001).

The second school of social network researchers has its roots in the theories of social exchange and dependency. Notable among them are Homans (1950) and Emerson (1972). According to Homans (1950), people establish ties primarily because of the exchange of valued resources. The social exchange theory is based on the premise that human behaviour or social interaction is an exchange activity (Homans, 1961) involving both tangible and intangible goods. It is a commonly used theoretical base for explaining the behaviour of individuals with respect to the exchange of goods and services (Blau, 1964). The exchanges involve cost and rewards. This has

been recognised by Coleman (1990) as a phenomenon that permeates all social life. The basic assumption of the exchange theory, according to Blau (1994), is that individuals establish and continue to establish social relations on the basis of their expectations that such relations will be mutually advantageous. Blau (1994) notes that the initial impetus for social interaction is provided by the exchange of benefits, intrinsic or extrinsic, independently of normative obligations.

Unlike the theory of rational self-interest and the theory of exchange and dependency, the third network perspective draws on theories of mutual interest and collective action. The premise of the theory of mutual interest and collective action is that “mutual interests and the possibility of benefits from coordinated action” (Marwell & Oliver, 1993, p.2) take precedence over individual self-interest (Katz et al., 2004). One of such theories of collective action is Samuelson’s (1954) public goods theory which explains the economics of collective versus private ownership of material infrastructure.

Public goods theory tries to find reasons to why group members contribute to the creation and maintenance of public goods to the benefit of all members. The calculus of mutual interest, according to Katz et al. (2004, p. 315), “suggests that individuals will create ties and coalesce into groups not because it maximises the self-interest of any individual within the group or even the exchange value between individuals in the group”. However, the urge to forge ties and form a group is to maximise their collective ability to leverage resources since a public good has the impossibility of excluding other members of the group (Hardin, 1982).

The fourth network perspective belongs to the family of cognitive theories. Among the cognitive theories, the theory of transactive memory system and the theory of cognitive consistency are relevant to social network studies. These theories explain why group members create and maintain their network ties. The theory of transactive memory, for example, explains how group members with different expertise and skills develop communication networks that enable them to identify and leverage the skills and expertise of others in the group (Moreland, 1999). As Katz, et al. (2004, p. 315) have noted “these network ties facilitate flow of knowledge within the group, thereby reducing the need for each group member to possess skills or expertise available elsewhere in the group”.

The fifth network perspective explains why people with similar traits are more likely to be associated than those with different characteristics. On the basis of homophily, people are more likely to create communication ties with others they deem to be similar. In colloquial terms, “show me your friend and I will tell you your character” or “birds of a feather flock together”. In Brass’ (1995, p. 51) view, “similarity of thought increases predictability of behaviour which, in turn, fosters trust and reciprocity”. These benefits derived from homophily can help business activities to foster. Studies on homophily have generally been centred on age, gender, education, prestige, social class, tenure and occupation. Among the exponents are Carly (1991), Coleman (1957) and Ibra (1995). In some situations, group members classify their similarity based on variables like age, race and sex (Turner & Oakes, 1989). One of the benefits of homophily is that when members of a

group perceive themselves to be similar, conflicts among members are reduced and group satisfaction is enhanced (Katz, et al., 2004).

Approaches to social network analysis

The future directions of social network research in the social sciences, according to Pescosolido (2011), lie in the different ways in which the idea of social network ties has been incorporated in research. There are different approaches to social network analysis and research with their associated complexities. The approaches have been characterized by differences in theoretical starting points, data requirements, and methods of data collection. Four of such approaches have been identified by the literature. These are: the complete or full network approach; the local or ego-centered approach; the social support approach; and the social capital approach.

Often referred to as the purest approach, the complete or full network approach attempts to describe and analyse the whole network system considering all the ties in a network system (Pescosolido, 2011). Social network researches that have used this approach often consider all the ties among the study population allowing for a mapping of the overall social structure. Studies conducted by Padgett and Ansel (1993) and Bearman et al. (2004) used this approach. However, the full network approach is only possible when the study population is known and can be delineated (Wasserman & Faust, 1994), that is, when it is possible to list all the elements in a social structure and data collected from all the members of the population (Pescosolido, 2011). Another shortcoming of the full network approach is

that it is often difficult to achieve a 100 percent response and completion rate, making this approach less feasible.

Another approach to social network studies is the local or ego-centered. Unlike the full network approach, the ego-centered approach is typical. According to Pescosolido (2011), the ego-centered approach focuses on a set of social actors who are defined as the sample. In collecting data using the ego-centered approach, researchers concentrate on gathering network information from the standpoint of the social actors within the network (Marsden, 2005). This approach takes its inspiration from the fact that it is impossible, for example, to include all individuals in a large community in social network studies. Owing to this shortcoming, studies that have used the ego-centered approach recommend researchers to ask each social actor about his/her ties. In most cases, ties are defined in terms of, for example, who respondents are friends with, loan money to, or receive money from.

It must be pointed out that the selection of the focal persons from which network information is evolved is very important for this approach. Various sampling procedures have been used. Pescosolido (2011), for example, has recommended purposive sampling, while others have used random sampling or deliberate sampling.

A third approach to studying social networks, the social support approach, comes from a social psychological rather than a structural perspective. As Thoits (1995) has noted, social support is the most frequently studied psycho-social resource and has been documented to be a powerful influence, for example, in occurrence of and recovery from life problems.

While social support is seen primarily as resources available from families, friends, organisations and other actors, researchers tend to use a summary of social integration strategy, by looking less at social network structures (Barrera, 1986). Emanating from a concern with actors' responses to stressful situations, social support is considered a social reserve that may either prevent or buffer adverse events that occur in people's lives (Pearlin & Aneshensel, 1986).

Social networks represent one component of social support (House, Landis & Umberson, 1988). In contrast, the structural perspective tends to see social support as a possible type of tie (Pescosolido, 2011), a resource that flows over ties, or content that may or may not occur (Faber & Wasserman, 2002). However, the social support tradition does not ignore structure altogether, noting that indicators of structural support, like the organisation of individual ties in terms of size and density, are important (Barrera, 1986). Yet, the focus in this approach is on sustaining qualities of social relationships (Hainess, Beggs, & Hurlbert, 2002). Questions normally asked by researchers using this approach border on whether respondents have/had enough support on everyday life issues or critical events. Questions have often targeted perceived social support, that is the belief that love, caring, and assistance are potentially available from others or received support, the actual use of others for caring, and assistance. The truth is that, social support research has documented that perceived support is more important than actual support received (Turner & Marino, 1994). Cohen and Wills (1985) have suggested that the simplest and most potent indicator is

whether individuals report that they have a single intimate tie in which they can confide.

The fourth approach is the social capital tradition. According to Monge and Contractor (2003), the ideas underlying the investigation of social capital were introduced in the 1980s to refer to resources that accrue to social actors from individuals to nations as a result of networks (Lin, 2000). According to this tradition, individuals participate in social groups and derive benefits as a result. In Lin's (2000) view individuals invest in and use the resources embedded in social networks because they expect returns of some sort. Lin further notes that resources are not equally available to all individuals but are differentially distributed across groups in society.

It is, however, important to note that some authors have contended that the social capital approach to social network studies brings no novel ideas to the network perspective but offers a more appealing conceptual garb (Etzioni, 2001; Wilson, 2001). The social capital approach to social network studies has three distinctive aspects. The first is that social capital has been popularised to describe the state of civil society or differing geographical areas (Rahn, 2004) and to relate to large public issues. Second, social capital focuses attention on the positive qualities of social ties, downplaying the potential dark sides of social networks (Pescosolido, 2011). As Edwards and Foley (2001, p.230) have noted, social capital comes in three "flavours"- good, better and best". From a social network perspective, this aspect is, perhaps, the most troubling. This is because the emphasis on only positive contents limits the theoretical importance of ties. Third, the social capital approach has broadened the appeal of a network perspective to those in other

social science disciplines outside sociology. In addition, this approach has provided sociability that is parallel to human capital and this has reinforced the sociological thesis that social interaction can have powerful effect on actors (Pescosolido, 2011). What is more, social capital theorists often talk about the cost and benefits of establishing ties, as well as how and why actors deliberately construct or maintain ties in the service of creating opportunities for resources.

Measuring social networks

In every social structure, there exist social networks. The networks of relationships, according to Laumann et al. (1983), are there to be discovered by researchers. However, social network relations can have very different contents which are important to the development of organisations in different sectors of the economy (Nelson, 2001). Researchers, over the years, have studied social networks by looking at both formal and informal relations (De Lange, Agneessens & Waeye, 2004). Most studies on social networks have measured network relations using five main indicators. De Lange, Agneessens and Waeye (2004, p. 356) have identified such indicators as “information, support, companionship, hindrance and superficiality”. Each of these relations is believed to have an influence on how actors perform.

Issues on information in social network studies are related to advice network which concerns knowledge sharing and knowledge creation (Cross, Borgatti & Parker, 2001). According to Cross et al. (2001), people tend to exchange information in their every day interactions. Some of the information contains advice that helps improve business activities. That is,

people tend to exchange solutions, validation and meta-knowledge. The advice, according to De Lange, et al. (2004, p. 356), may consider “those situations in which one turns to colleagues for finding a solution for a specific work related problem one is not able to solve himself or herself”.

In other situations, people present their own solutions to colleagues in order to receive confirmation of their work, and this helps in the validation of information. Unlike validation that deals with the confirmation of existing knowledge, meta-knowledge, according to De Lange et al. (2004), enables actors to obtain useful information about which experts to contact, where to obtain relevant documents, and how to find data. In rural agriculture, however, meta-knowledge encapsulates obtaining useful information of agricultural extension services, where to obtain relevant planting materials, where to obtain information on credit availability and how to apply relevant technologies. In addition, farmers can cooperate with each other in order to exchange information on a regular basis. When people cooperate, a stronger and more long-term relation exists than when they are in an advice relation (Lazega, 2001). De Lange, et al. (2004) added that, in any social structure, it is expected that relations that concern advice and cooperation will have a substantial influence on characteristics of actors leading to satisfaction and performance.

Another variable used in social network studies is social support. Social support of actors has a strong influence on job performance and job satisfaction. Social support, according to van der Poel (1993), encompasses emotional support, instrumental support and social companionship. Emotional support, according to Bernard, et al. (1990), is support received

from just a few intimates. These intimates may be friends. In measuring emotional support, researchers often ask for where one receives support for his/her work or private life. Social companionship, as a dimension of social support, is measured by the frequency of participation in social activities outside the work context (De Lange et. al, 2004). Reciprocity is usually a component of such relations. It should be recognised that social companionship can have a negative effect on the performance of actors, especially when some actors do not get along with each other. Such conflict situations can influence the activities of actors and affect individual performance (Sparrowe et al., 2001).

The emotional and social support dimensions of social networks are embedded in what Bernard et al., (1990) call global network. The global network, unlike the emotional and social support networks, is well defined. The global network consists of all the people known to individuals, given a suitable definition of “knowing”. The method of eliciting this network consists of probing informants to recall the names of all the people they can remember (Poole & Kochen, 1978). Another method is to present an informant with a representative list of last names and to ask all the names of persons that the informant can remember from his/her own network having those last names. Bernard et al., (1990) have warned that these techniques aimed at eliciting global networks only elicit proxies for global networks.

This realist position of social network enables researchers to develop questions to help elicit information necessary for social network studies. This has been complemented by the nominalist position that very simple questions like “whom do you share information with” is enough to generate social

network. The popularity of collecting social network data survey techniques has grown with attention being focused on assessing the quality of measurement.

However, the decision regarding how to measure the relationships between actors is vital for any social network studies. According to Thaden and Rotolo (2009), researchers that use the survey method to collect data on social networks face some key decisions. Wasserman and Faust (1995, p. 46) earlier identified two of such key decisions. “First, does the researcher provide the respondents with a list or roster of actors or allow the respondents to use free call? Second, does the researcher allow a fixed maximum number of alters or open-ended number of choices for respondents to make when identifying alters”.

It must be pointed out that there are advantages and disadvantages associated with the roster, the free call as well as limiting the actors with respect to the number of alters. Thaden and Rotolo (2009) have observed that the primary difficulty in utilising the roster format remains the potentially challenging task of creating an exhaustive list of all the actors in a social network. Thaden and Rotolo (2009) went on to say that, for some research settings, a complete roster can be constructed and applied with relative ease, especially when the number of actors is limited. In such cases, a respondent can be presented with an entire list of people in the network and then the researcher can ask the respondents to identify with whom the respondents shares a particular relationship.

However, in other situations, a respondent might be asked to identify a limited number of people with whom he/she discusses important issues.

Alternatively, a respondent might be provided with an initial question without an upper limit on responses, but subsequent follow-up questions might ask information about only some of the alters the respondent has mentioned. This measurement approach has been found to be problematic. Holland and Leinhardt (1973) have suggested that, by the number of choices a respondent can make, an inherent bias may be present which can lead to measurement errors.

Perspectives and dimensions of social capital

Social capital has been identified in many forms by several writers. The unifying factor of the definitions is that they essentially incorporate teamwork and shared interests, which are very imperative components of social capital. Social capital was first introduced into social research by Hanifan (1916). Hanifan explained social capital as those intangible substances, such as goodwill fellowship, sympathy, and social intercourse among the individuals and families who make up a social unit. After Hanifan, the idea of social capital disappeared for several decades until it was reinvented in the 1950s by Sealy, Sim and Loosely (1956), and in the 1960s and 1970s by Homans (1961), Jacobs (1961) and Loury (1977), and later, by Coleman (1988) and Putnam, (1993). Despite the immense amount of research on it, however, the definition of social capital has remained elusive (Durlauf & Fafchamps, 2004).

In order to operationalise the concept of social capital for the study, it is pertinent to discuss a number of definitions that have been proposed by some of the most influential researchers on social capital. In the view of

Coleman (1990, p.304) "...social organisations constitute social capital, facilitating the achievement of goals that could not be achieved in its absence or could be achieved only at a higher cost". According to Putnam (1993, p. 167), "...social capital...refers to features of social organisation, such as trust, norms, and networks that can improve the efficiency of society". According to Fukuyama (1997), social capital is simply the existence of a certain set of informal rules or norms shared among members of a group that permit cooperation among them. The sharing of values and norms does not in itself produce social capital because the values may be wrong. Fukuyama also notes that the norms that produce social capital must substantially include virtues like truth-telling, the meeting of obligations, and reciprocity. Putnam (2000) explains social capital as the connections among individuals - social networks and norms of reciprocity and trustworthiness that arise from them.

Other writers, including Ostrom (2000, p.176), explain "social capital as the shared knowledge, understandings, norms, rules and expectations about patterns of interactions that groups of individuals bring to a recurrent activity". Lin (2001, pp. 24-25) has explained social capital

as the resources embedded in social networks and accessed and used by actors for action. Thus, the concept has two important components. It represents resources embedded in social relations rather than individuals, and access and use of such resources reside with actors.

According to Bowles and Gintis (2002), social capital generally refers to trust, concern for one's associates, a willingness to live by the norms of one's community and to punish those who do not conform to the norms.

Based on the definitions of social capital, Durlauf and Fafchamps (2004) have identified three main underlying ideas. First, social capital generates positive externalities for members of a group; second, these externalities are achieved through shared trust, norms, and values and their consequent effects on expectations and behaviour; and third, shared trust, norms and values arise from informal organisations based on social networks and associations. They conclude that the study of social capital is that of network-based processes that generate beneficial outcomes through norms and trust.

The social capital of a society, according to Grootaert and Basteler (2001), includes the institutions, the relationships, the attitudes and values that govern interactions among people and contribute to economic and social development. Practically, the selection and development of social capital, according to Grootaert (1998), can proceed on two lines: First, according to the breadth of relationships and institutions involved; and second, based on the types of impact social capital has on the development process, in which key dimensions are growth, equity, and poverty alleviation.

Strong social norms and beliefs, which are embedded in social capital, are associated with a high degree of closure of the social network. This encourages compliance with local rules and customs and reduces the need for formal controls. For instance, clan-type organisations with strong shared norms benefit from lower monitoring costs and higher commitment.

Furthermore, frequent interactions among groups permit faster dispute resolution and prevent the accumulation of grievances. Thus, the trust network can transmit more sensitive and richer information than other types of networks because of the solidarity it engenders (Krackhardt & Hanson, 1993).

Linkages or networks, provide the necessary condition for access to and use of embedded resources (Lin, 2001). They provide links to people or groups further up or lower down the social ladder. It consists of vertical relations with formal institutions and organisations, which is the level of trust between farmers and extension agents or the staff of government agencies. Lin, however, cautioned equating social networks with social capital as this may be conceptually flawed. In spite of this shortcoming, Burt (2001) has noted that sparse or open network may facilitate access to better or more varied resources of information, control or influence.

It is clear from the forgoing discussion that there are numerous definitions of social capital and this is the result of how scholars view the concept of social capital. The literature on social capital suggests many perspectives of social capital, some of which are now discussed in the text.

Perspectives on social capital

According to Woolcock and Narayan (2000), the literature on social capital and development is expanding rapidly, making it essential to identify the various perspectives that are emerging. Basically, they have identified four of such perspectives. These perspectives or views are: the communitarian, network, institutional and the synergy perspectives. While

each perspective makes a significant contribution to social capital and rural development, Woolcock and Narayan find that one of the perspectives, the communitarian perspective, enjoys the strongest empirical support, and is in the best position to articulate a coherent multi- disciplinary research agenda. It is also able to propose a realistic set of policy recommendations pertaining to poverty reduction.

The communitarian perspective of social capital analyses poverty by stressing the centrality of social ties in helping the poor manage risk and vulnerability, thereby reducing poverty. As Dordick (1997) notes, the poor have something to lose, namely each other. The communitarian perspective, according to Woolcock and Narayan (2000), equates social capital with local level organisations, which include associations, clubs, and civic groups. The measurement of the communitarian view is centred on the number and density of groups in a given community, implying that social capital is inherently good, that more is better, and that its presence always has a positive effect on a community's welfare.

There are two main dimensions of social capital at the community level. These are, according to Woolcock and Narayan (2000), intra-community ties and extra-community social networks. Also known as bonding social capital, intra-community ties are high in poor villages and groups that are closely knit as it gives them a sense of identity and common purpose. However, bonding social capital has been found to disadvantage those outside the in-group, for example outcast. Extra-community networks also known as bridging social capital are weak ties that exist usually outside the in-group. According to Woolcock and Narayan, these two ties are needed

to avoid making tautological claims regarding the efficacy of social capital for rural development.

However, proponents of the communitarian views on social capital have ignored its important downsides (Portes & Landolt, 2000). Most of the times, it is possible for communities or networks to be isolated, parochial or working at cross-purposes to society's collective interest (eg. Ghettos, gangs, drug cartels). In such situations, productive social capital is replaced by perverse social capital which hinders development (Rubio, 1997).

The second perspective, the network perspective, stresses the importance of vertical as well as horizontal associations between people, and relations within and among other organisational entities such as communities, groups and firms. These two forms of social capital have come to be called "bonding" and "bridging" social capital (Gittell & Vidal, 1998). Astone, Marie, Nathanson, Schoen and Kim (1999) have build on the work of Granovetter (1973) and recognise that intra-community ties otherwise known as strong ties are needed to give families and communities a sense of identity and common purpose. From this, one can conclude that there must be two basic dimensions of social capital at the community level, namely 'strong' intra-community ties ("bonds") and 'weak' extra-community networks ("bridges"). At the macro-level, however, the type of bond is different as social capital is built in institutions. This view also stresses that without inter-community ties that cross various social divides, for example those based on religion, class, ethnicity, gender, and socio-economic status, strong horizontal ties can become a basis for the pursuit of narrow sectarian interest (Woolcock & Narayan, 2000). Based on this, the network view on social capital attempts

to account for both its upsides and downsides.

A third perspective of social capital, the institutional perspective, argues that the validity of community social networks and civil society is largely the product of the political, legal and institutional environment. Whereas the communitarian and network perspectives largely treat social capital as an independent variable giving rise to positive and negative outcomes, the institutional view instead puts the emphasis on social capital as a dependent variable. The argument is that the very capacity of social groups to act in their collective interest depends crucially on the quality of the formal institutions under which they reside (North, 1990), and the emergent qualities, such as high levels of “generalised trust”, in turn, correspond to superior rates of economic growth (Woolcock & Narayan, 2000). Woolcock and Narayan stress that the performance of states and firms themselves depends on their own internal coherence, credibility and competence and their external accountability to civil society.

A number of studies have been carried out using the institutional perspective as a theoretical underpinning. These studies include Skocpol (1996); and Tandler (1997). Even though a number of empirical and methodological questions have been raised about these studies, one cannot begrudge their findings that rampant corruption, frustrating bureaucratic delays, suppressed civil liberties, vast inequality, divisive ethnic tensions, and failure to safeguard property rights are being increasingly recognised as major impediments to generating greater prosperity. In countries where these conditions prevail, there is little to show for well-intentioned efforts to build schools, hospitals, roads and communication infrastructure, and to encourage

foreign investment (World Bank, 1998). It is, however, important to note that the institutional view on social capital is strong in addressing macro policy concerns and this strength is also a weakness in that it lacks a micro component.

A fourth perspective on social capital, which attempts to integrate the networks and institutional views, is the synergy perspective. The synergy perspective traces its intellectual antecedents to comparative political economy and anthropology. Evans (1995, 1996), one of the primary contributors to this view, has concluded that synergy between government and citizens' action is based on complementarity and embeddedness. Complementarity refers to mutually supportive relations between public and private actors, and is exemplified in frameworks of rules and laws which protect rights to associate, or more humble measures, such as the provision of transport by the state to facilitate exchanges in community associations. Embeddedness refers to the nature and extent of the ties connecting citizens and public officials. In developing these ideas further, Woolcock (1998), and Narayan (1999) integrate the core ideas of bridging social capital and state functioning, arguing that different combinations result in different outcomes, whether at the community, district, regional or national level.

It is important to note that networks, associations and related norms based on everyday social interactions can lead to the collective good of the citizens, whereas networks and associations consisting of primary social groups without cross-cutting ties lead to the betterment of only those groups (Narayan, 1999). In spite of the advantages that bonding social capital has, it sometimes provide opportunities for members in that group and reinforces

pre-existing social stratification, prevent mobility of outcast or those who are part of the group, deepens poverty of non-members and become the bases of corruption and co-option of power by the dominant social group. Also, social capital has some latent functions and these as epitomised in societies where bonding social capital is very high with low bridging social capital. These societies are likely to be characterised by “social exclusion and polarisation at the best, and at the worst by corruption, violence and [stagnation of development] where the majority copes by depending on informal social mechanisms for livelihoods and insurance” (Nayaran, 1999, p. 15).

Aside from the communitarian, synergy, networks and the institutional views on social capital identified by Woolcock and Narayan (2000), a search of the literature has identified three other perspectives of social capital. These are the transnational, the expansionist and the minimalist, perspectives. The transitional perspective hinges on collective action. In line with this view, once social capital is created within a relevant social structure, it benefits all individuals within the structure. Social capital is not like physical and human assets, where their benefits are solely accrued to the person who invests in them. Owing to its collective nature, the loophole of this view is the tendency for it to culminate in potential under-investment. Another implication of the transitional perspective is that most forms of social capital are created or destroyed as a by-product of other activities. Examples of some social capital forms are the potentials for information that inherent in social relations, norms and effective sanctions, authority relations, appropriate social organisations and intentional organisations (Coleman, 1990).

With respect to the expansionist view, individuals will not voluntarily tackle a whole host of jointly beneficial projects in the private and public spheres because they wait for others to take the costly actions needed to benefit them all. For this reason, collective action problems have been shirking within private firms as a lower rate of entrepreneurial activity, as an inability to provide local public good and as the likelihood that common pool resources will be overharvested or destroyed, instead of being harvested at an optimal level. Therefore, overcoming collective-action problems often require the imposition and enforcement of rules from outside by external authorities. However, solutions that rely on external authorities can lead to an attempt to impose uniform rules that may not recognise local conditions. Furthermore, imposed uniform rules not only fail to mobilise local level social capital in solving concrete problems, but may also result in a total destruction of already existing social capital (Ostrom, Gardner & Walker, 1994).

Going by the expansionist perspective, social capital is primarily in the form of shared norms, common knowledge and rules-in-use that emphasize the means of solving collective action problems that the appropriators of relatively small-scale and common pool resources encounter. The appropriators of small-scale common pool resources such as forests, irrigation systems, ground water basins, inshore fisheries, can communicate and interact with one another in a localised physical setting. Thus, they can teach who to trust, reflect on the effects of their actions on one another and on the resource, and how to organise themselves to gain benefits and circumvent harm. The shared norms and patterns of behaviour that the

appropriators develop overtime are forms of social capital, with which they can build institutional arrangements for resolving common pool resource dilemmas (Ostrom, 1990).

The minimalist usage of social capital is often found in social network analysis. Going by this view, social capital is understood as individuals' access to favourable personal networks. In this case, social capital belongs to an individual at the expense of others. It is one's relationship with friends, colleagues and more general contributions that one can maximise the human and financial capital one already possesses. A group of individuals (business firm) can possess social capital collectively. Nevertheless, in the minimalist understanding of social capital, possession by collective persons is viewed as a corporate actor competing against other corporate actors who equally possess social capital. It is a sum of the network connections by group members that can be used to achieve the group's goals (Burt, 1992).

Putnam (2000) has argued that the expectations of mutual trust that are generated from communication and continuous interaction and the capacity for group members to create their own rules and establish the means of monitoring the sanctioning of the rules, constitute fundamental factors that help individuals to solve their collective action problems. This notwithstanding, McGinnis (2000) notes that lessons drawn from the study of small-scale communities cannot be directly applied in more complex and larger scale collective-action situations. However, if individuals facing such problems are also participants in overlapping organisational arrangements that can help generate information about successful efforts to govern

common pool resource situations, then they can have a better chance of testing, modifying and improving their rules.

Understanding the importance of social networks does not imply that external authorities should always stay away from local problems. The key role of the public authorities lies in providing accurate and reliable information to the individuals, while allowing them to devise their own institutional arrangements to cope with the specific problems that may arise within the institution. External authorities also help local appropriators or citizens by providing complementary endogenous systems of monitoring and sanctioning. Thus, appropriate policies involve the provision of fair and inexpensive conflict resolution mechanisms, rather than the imposition of rule making and rule enforcement by external officials on the one hand and complete neglect on the other hand (Lyon, 2000).

In summary the perspectives of social capital portray different dimensions and levels of social capital. These perspectives are avenues by which individuals can explore to establish relationships with people who share similar interest with them or possess divergent views.

Levels and dimensions of social capital

Social capital has been located at the level of the individual, the informal social group, formal organisation, community, ethnic group and nation (Bankston & Zhou, 2002). There are divergent views with regard to the levels of social capital. Some authors have identified social capital at the individual level, and others have a more dynamic view. Kilby (2002) has stated that social capital exists within levels or scales. Adler and Kwon

(2002) support this opinion by stating that social capital sources lie in the social structure within which the actor is located. Thus, social capital can be thought of as having an individual and an aggregate component.

Social capital can be produced by the government, non-governmental organisations, local societal actors and external actors in the civil society, in combination and isolation (Huntoon, 2001). Soubeyran and Weber (2002) posit that social capital can be created through repeated exchange and face-to-face contacts, which is facilitated by geographic proximity. It belongs to a group and can be used by a group or individuals within a group (Sander, 2002). Brewer (2003) states that although social capital was originally conceived as a community-wide concept, it should be observable at the individual level. The general consensus in the literature is that social capital is identifiable from the individual to the national level. However, it is clear that social capital is evident at any level, if and only if, there is identification and belonging.

One way to classify social capital is based on its function: bonding and bridging social capital. Groups are bonded to facilitate cooperation and collective action among members, while bridging improves group members' access to external organisations, such as markets, NGOs and government. Since market access enhances income opportunities, bridging social capital is certainly critical for community development in the era of globalisation. In addition, projects and services provided by NGOs and government give income opportunities for people. Some authors have suggested that bridging social capital needs to be increased for the benefit of the poor (Narayan, 1999). Furthermore, the presence of social capital in a community or for an

individual may lead to positive outcomes. One of such outcomes is the facilitation of collective action. If an individual trusts other individuals, he/she is more willing to participate in collective actions within the community in which he/she resides (Grootaert & Bastelaer, 2002).

Social capital has been categorised into structural and cognitive forms, which are based on whether it is inclusive of socio-economic institutions and networks or relates to individual states of mind. The structural form of social capital emphasizes the relationships between human behaviour and organisations. It includes rules, social networks, associations, institutions, roles, procedures and precedents. It comprises informal and formal organisational structures in a community and also refers to the ways in which motivated recipients gain access to actors with desired sets of knowledge or intellectual capital (Nahapiet & Ghoshal, 2000).

As regards the cognitive form of social capital, it focuses more on the psychological side of an individual. It indicates norms, shared values, reciprocity, solidarity, attitudes, trusts and beliefs. It recognises that exchange occurs within a social context that is created and sustained through ongoing relationships. Similar to the notion of community practice, cognitive social capital refers to the shared meanings that are created through stories and continual discussions within a specific, often clearly defined group. These shared meanings are self-reinforcing in that participation in the community is contingent upon a priori understanding of the context, coupled with the continual contribution to these on-going dialogues. Thus, structural and cognitive forms of capital are complementary (Brown & Duguid, 1991).

The Organisation for Economic Cooperation and Development (OECD, 2001) has argued that there has been much debate over the various forms that social capital takes. However, one fairly straight forward approach divides it into three main categories. Woolcock and Narayan (2000) identified two of the three categories as ‘bonds’ and ‘bridges’; the third category is linkages or networks. Bonds are strong intra-community ties that provide links to people based on a sense of common identity, such as family, close friends and people who share culture or ethnicity. The bonding perspective focuses on the collective actor’s internal characteristics. The premise of this perspective is at the group level and discusses how to develop social capital as a collective asset that leads to better group outcomes. However, bridges are weak extra-community ties that stretch beyond a shared sense of identity, for example to distant friends, colleagues and associates. According to Woolcock and Narayan, both bonds and bridges are needed to avoid making tautological claims about the efficacy of social capital.

The third category, often referred to as linkages or networks, provides the necessary condition for access to and use of embedded resources (Lin, 2001). They provide links to people or groups further up or lower down the social ladder. It consists of vertical relations with formal institutions and organisations, which is the level of trust between farmers and extension agents or the staff of government agencies.

There are also relational aspects of social capital that are concerned with underlying normative dimensions that guide exchange relationship behaviours. Norms exist when the socially defined right to control an action is not held by the individual actor, but instead is held by others (Coleman,

1990). Therefore, norms represent a degree of consensus and, hence, are a powerful fragile form of social capital. Specifically, norms of trust lead to enhanced cooperation, which, in turn, leads to increased trust. Similarly, reciprocity is an obligation, which when satisfactorily fulfilled, can lead to further reciprocal arrangements (Nahapiet & Ghoshal, 2000).

Under reciprocity norms, Ostrom (1998) has canvassed that reciprocity involves a family of strategies in collective action situations which include the effort to identify who else is involved as well as an assessment of the likelihood that others are conditional co-operators. It may also include a decision to cooperate initially with others if they are trusted to be conditional co-operators or a refusal to cooperate with those who do not reciprocate as well as punishment for those who betray trust. Reciprocity also entails the provision of privileged access to resources by donors, in the expectation that they will be fully repaid in the future, although the timing and form of repayment are unspecified at the time of the exchange (Ahn, 2000). Nevertheless, Newell, Edelman, Scarborough and Swan (2000) have posited that though the norm of reciprocity is the most widely discussed norm with respect to social capital, other normative dimensions are also important.

The structural, cognitive and relational forms of social capital operate in conjunction with the opportunity for combination and exchange in an organisation to occur. This culminates in the creation of a new intellectual capital, which is associated with organisational effectiveness and value creation (Nahapiet & Ghosal, 2000). Macro (national), meso (regional and community) and micro (household or individual) are other forms of social

capital that are classified based on the level of economic structure that social capital affects (Krishna & Uphoff, 1999; Uphoff, 2000).

Grootaert and Bastelaer (2002) have postulated that structural capital includes rules, social networks, roles and procedures that facilitate mutually beneficial collective action by lowering transaction costs, coordinating efforts, creating expectations, making certain outcomes more probable and providing assurance of how others will act. Cognitive social capital, on the other hand, refers to norms, values, attitudes and beliefs, which create and reinforce positive interdependence of utility functions and which also support mutually beneficial collective action. However, the roles of both forms of social capital are quite similar and will not only facilitate and support collective action, but also reduce information and enforcement costs. Narayan and Cassidy (2001) identify a range of dimensions of social capital which include group characteristics, generalised norms, togetherness, everyday sociability, neighbourhood connections, volunteerism and trust.

Networks and memberships, social trusts, collective action, solidarity and mutual support are alternative dimensions of social capital, but are solely related to community development. Networks and memberships constitute one dimension of structural social capital. Regarding networks, the size, internal diversity and the extent of assistance in case of trouble are measured as the standards (Fafchamps & Minten, 1999). On the other hand, when analyzing membership, the number of groups and associations, the frequency of joining group activities, the extent of involvement in groups and the membership diversity are used as parameters for measuring group membership (Narayan & Pritchett, 1999). In a nutshell, network and

membership have positive effects on the well-being of community dwellers and community development (Kawachi, Kennedy & Glass, 1999).

A network is an interconnected group of people who usually have an attribute in common. At a micro level, families and groups of friends exhibit network characteristics. An individual may be part of separate networks of relationships based on his or her religion, neighbourhood, recreational preferences, vocation, gender, parental status, politics, race and national grouping. Each of these groupings may come with different norms and levels of mutual obligation or expectation. They may generate different levels of generalised trust towards others within or outside the groupings (Woolcock & Narayan, 2000).

Social trust is a dimension of cognitive social capital and the basis for all social institutions. It is integral to the idea of social influence, as it is easier to influence or persuade someone who is trusting. Holistically, trust is belief or confidence in the honesty, goodness, skill or security of a person or an organisation. In sociology, it is a relationship between actors and involves the suspension of disbelief that one actor will have towards another actor or idea. In particular, it is the act of getting one actor to think that the other person or idea is benevolent, competent, good or honest. The existence of trust among a group of individuals can often be explained as a result of other forms of social capital, such as norms of reciprocity, networks, rules and institutions (Moazami, 2006).

Trust is a particular level of the subjective probability with which an agent assesses that another agent or group of agents will perform particular actions. Thus, it allows the trustor to take an action involving the risk of loss,

if the trustee does not perform the expected action. This gives an opportunity for the trustor and trustee to enhance their welfare. Theoretically, the subjective belief of a trustor can be independent of an objective condition. This is because one can falsely trust someone who is not trustworthy and experience losses. Trust as a subjective belief cannot be sustained in the long run, unless it is verified frequently enough by the behaviour of the trusted. Thus, when a society experiences a high level of trust, it means that its people are quite trustworthy (Gambetta, 2000).

Trust makes social life predictable, creates a sense of community and makes it easier for people to work together. It can act as a trigger for the effective utilisation of human capital. Its existence among members facilitates exchange and combination of ideas that can be recognised as key processes for the creation of new knowledge (Misztal, 2001). Uslaner (2002) divides trust into moralistic and strategic trust. Putting faith in strangers is moralistic trust, while having confidence in people you know is strategic trust. Uslaner also distinguishes between particularised trust, such as trust for a fellow association member and generalised trust, the idea that most people can be trusted (Uslaner, 2002).

Trust also consists of complex sub-dimensions such that many questions are usually asked respondents to gauge the level of social trust. Responses to questions are combined into a single or several composite indices using statistical tools such as factor analysis (Narayan & Cassidy, 2001). Usually, the extent of trust is assessed by responses to questions regarding trust for people, and the extent of carefulness in dealing with others (Grootaert, Narayan, Jones & Woolcock, 2003). Besides these questions, it is

also possible to measure the level of trust by asking whether specific people, such as government officials and extension workers, can be trusted or not.

Brehem and Rahn (1997) have pointed out that interpersonal trust enhances civic engagement, measured by membership in groups, and confidence in politics. This suggests that cognitive social capital, such as trusts and norms, influences structural social capital. Carpenter (2002) opines that self-reported survey is the most congruous and conventional approach to measure trust. The survey is a good method to collect behavioural data because, ordinarily, respondents would not respond falsely to questions such as how many social activities one participates in.

However, when using survey data, three types of bias are of concern, namely: hypothetical bias, idealised personalised bias, and incentive compatibility. Nevertheless, a growing amount of evidence has been elicited in experimental economics that suggests that the measurement of social capital could culminate in misleading results. This notwithstanding, Carpenter (2002) posits further that incentive compatibility can be used to acquire truthful responses of social capital. Carpenter suggests the complementarities between economic experiments and incentive compatibility and also proposes the simultaneous use of both techniques for the adequate understanding of social capital.

Social networks and social capital

Intuitively, the basic idea of social capital is that a person's family, friends and associates constitute an important asset that can be called on in times of crisis, enjoyed for its own sake and leveraged for material gain.

What is true for individuals also holds for groups. Communities that are endowed with a diverse stock of social networks and civic associations are in a stronger position to confront poverty and vulnerability, resolve disputes and take advantage of new opportunities. Social networks include the family, formal and informal associations and groups (Varshney, 2001).

It is natural that social networks, as social security nets, are indispensable in rural areas of poor countries where insurance and credit markets are usually missing, and consequently, people invest a lot of time and money in social capital building in the form of ceremony and ritual (Grootaert, 1998). In this way, people try to establish good relationships with others so that they can obtain help in case of urgency (Sakuri, Furuya & Futakuchi, 2006).

Social capital is accumulated between two individuals through their mutual interaction and reciprocity. It constitutes a capital asset for the individual and consists of some aspects of social structure that facilitate certain actions of the individuals who are within the structure. This relationship, in turn, develops trust between individuals that enables them to generate returns in future (Coleman, 1990). Coleman (1990), Woolcock (1998), Sobel (2002), Robinson and Flora (2003), and Castle (2003) have identified various components of social interaction, namely: individual versus individual; individual versus institution and organisation; group and community versus group and community; and institution and organisation versus institution and organisation.

Individuals interact with organisations through their members by the allocation of resources that accumulate social capital between them.

Individuals make investment through interaction and reciprocity with organisations that generate social capital. This develops a level of trust among individuals and institutions or organisations. Trust in people is the belief that they are honest and sincere and will not deliberately do anything that is harmful. Studies of trust provide another example of the importance of institutions. Levels of trust determine the degree to which one is willing, for example, to extend credit or rely on the advice and actions of others (Sobel, 2002).

Interaction among communities and community members by allocation of time and money accumulates social capital among them. The social capital that is embodied within communities is the relations within a group, including the social norms and sanctions, mutual obligations, trust and information transmission (Coleman, 1990). Woolcock (1998) argues that poor communities need to generate social ties that extend beyond their primordial groups, if developmental outcomes are to be achieved. Institutions or organisations also interact with other institutions or organisations directly or indirectly through their members. Individuals on behalf of their institutions or organisations make investments through interaction and reciprocity with other institutions or organisations. Social capital generates reciprocity between institutions or organisations in order to develop their mutual trust (Turner, 1999).

A person must be related to others to possess social capital. This is because it is those others, not the individual, who are the actual source of their advantage. Social capital can be thought of as “know-who”. It is about everyone people now know, everyone people knew and everyone who knows

people even though people do not know them (Burt, 1992). Social capital is unplanned in that it arises out of day-to-day interactions. It is not held by individuals or organisations, but it is found in the nature of relationships. Thus, the characteristics of social capital correspond closely to social interaction patterns, such as physical proximity, occupational affiliation, mutual interests and informal relationships rather than to any planned strategic approach of a particular organisation. Exchange occurs within a social context that is created and sustained through ongoing relationships. As such, meaningful communication is sustained through ongoing dialogue of shared meanings among parties (Edelman, Bresnen, Newell, Scarbrough & Swan, 2002).

Portes (1998) differentiates two sources and consequences of social capital. One source is consummatory, which is derived from socialisation processes in families, kin networks, class and occupational groups. The other source is instrumental, entailing purposive exchanges based on expectations of reciprocity. The outcomes of these sources can be either positive or negative. Positive outcomes operate through and include social control or norm observance, family support and benefits mediated through extra-familial networks. These affect a broad range of outcomes, such as education, income, health, the performance of firms and collective action at the community level. The positive benefits of solidarity networks can also be seen in the opening up of economic and employment opportunities within ethnic groups, poverty reduction, increased gender and racial equality (Portes, 1998).

There are, however, negative consequences of consummatory and

instrumental processes. These consequences could be powerful networks that restrict access to economic and employment opportunities that curtail an individual's freedom and lay excessive claims on successful group members. Successful individuals may sometimes be driven to break off ties from a larger ethnic group. The negative impacts of social capital are also manifested in powerful and tightly knit social groups that are not accountable to citizens at large, practise corruption and cronyism (Fletcher, 1998).

Associations, voluntary cross-cutting networks and related norms, based on everyday social interactions, culminate in the collective good of citizens. In spite of the fact that networks and associations, which consist of primary social groups lead to the betterment of only those groups, primary social group solidarity is the foundation on which societies are built. However, their impact is contingent on their resources and power. When power between groups is asymmetrically distributed, it is cross-cutting ties and the linkages between groups that become very critical to economic opportunities and social cohesion (Rodrik, 1997).

Cohesive family, clan or tribal groups lay the foundation for social and economic well being. However, it is only when these groups develop ties with other social groups that societies can build cohesive webs of cross-cutting social relations. Though primary groups and networks undoubtedly provide opportunities to those who belong, they also reinforce pre-existing social stratification, prevent mobility of excluded groups, minorities or poor people and become the bases of corruption and co-optation of power by the dominant social groups (Fedderke & Klitgaard, 1998). Social capital is established through membership in a group, which provides each of its

members with a backing of collectively owned capital, a credential, which entitles them to credit. The volume of social capital possessed by an individual depends on the size of the network connections people can effectively mobilise and on the volume of the capital, be it economic, cultural or symbolic, that people possess in their own right by each of those to whom they are connected. The network of relationships is the product of investment strategies by individual or collective actions, consciously or unconsciously aimed at establishing or reproducing social relationships that are directly usable in the short or long term. This implies that contingent relations, such as those of the neighbourhood, workplace or even kinship, will be transformed into relationships that are at once necessary and elective. This culminates in durable obligations subjectively felt which include feelings of gratitude, respect, and friendship, or institutionally guaranteed rights (Bourdieu & Wacquant, 1992).

Durable obligations and institutionally guaranteed rights are achieved through the alchemy of consecration, the symbolic constitution produced by social institutions and endlessly reproduced through the exchange of gifts and words (Rose, 1999). This encourages, presupposes and produces mutual knowledge and recognition. In a group, mutual knowledge and recognition reaffirms the limits of the group. That is to say, the limits beyond which the constitutive exchange in the form of trade, commensality and marriage cannot take place. Each member of a group is, thus, instituted as a custodian of the limits of the group. This is because the definition of the criteria of entry is at stake, as in each new entry a new group member can modify the group by modifying the limits of legitimate exchange through some form of

misalliance (Halpern, 2005).

Bisin and Guaitoli (2006) add that it is quite logical that the preparation and conclusion of marriages, for example, should be the business of an entire group and not of the agents directly concerned. Through the introduction of new members into a family, clan or club, the whole definition of the group with respect to its fines, boundaries, and identity is put at stake, exposed to redefinition, alteration and adulteration. On the contrary, Bartolini and Bonatti (2007) have argued that, in modern societies, families may lose the monopoly of the establishment of exchanges that could eventually lead to lasting relationships like marriage. This notwithstanding, families can continue to control these exchanges, while remaining within the logic of liberty, through all the institutions that are designed to favour legitimate exchanges and exclude illegitimate ones by producing occasions, such as rallies, cruises, hunts, parties, and receptions in places, such as smart neighbourhoods, select schools, and clubs; and practices, including smart sports, parlor games, and cultural ceremonies.

The reproduction of social capital presupposes an unceasing effort of sociability, a continuous series of exchanges in which recognition is endlessly affirmed and re-affirmed. Social capital entails an expenditure of time and energy and so directly or indirectly of economic capital. The expenditure of time and energy may not be profitable or even conceivable unless one invests a specific competence like knowledge, which is an acquired disposition (Betz, 2008). People can also invest in an acquired disposition to acquire and sustain this competence, which are integral parts of social capital. This is one of the factors that explain the profitability of this labour of accumulating and

maintaining social capital in proportion to the size of the capital. Likewise, people are sought after for their social capital, and because they are well known, and are worthy of being known, they do not need to make an acquaintance of all their acquaintances. Thus, persons are known to more people. With such popularity, when an individual's work of sociability is exerted, it is highly productive (Betz, 2008). Every group has its more or less institutionalised forms of delegation in the hands of a single agent or a small group of agents. This delegation enables a group, a family, a nation, an association, or a party to concentrate the totality of its social capital. The delegation is granted plenipotentiary powers by group members to represent the group, speak and act in its name. With the aid of this collectively owned capital, the delegation can exercise power that is incommensurate with the agent's personal contribution (Berggren, Elinder & Jorhadl, 2007).

At the most elementary degree of institutionalisation, the head of the family, eldest or most senior member for instance, is tacitly recognised as the only person entitled to speak on behalf of the family group in all official circumstances. However, in this case, diffuse delegation requires the leader to step forward and defend the collective honour, when the honour of the weakest members is threatened (Bartolini & Bonatti 2007). The institutionalised delegation, which ensures the concentration of social capital, also has the effect of limiting the consequences of individual lapses. This can be accomplished by explicitly delimiting responsibilities and authorising the recognised spokesmen to shield the group as a whole from expelling or excommunicating the embarrassing individuals (Berggren et al., 2007). If internal competition for the monopoly of legitimate representation of the

group is not to threaten conservation and accumulation of capital, which is the basis of the group, the members of the group must regulate the conditions of access to the right to declare oneself a member of the group. Above all, a group member must establish his or herself as a representative of the whole group, thereby committing the social capital of the whole group. The title of nobility, which is an excellent form of the institutionalised form of social capital, guarantees a particular form of social relationship in a lasting way (Brunner & Strulik, 2002).

Social capital can be perpetuated through social bonds. Friends and families can help people emotionally, socially and economically. People can secure jobs through personal contacts rather than through advertisements. Such support can be very significant in countries where the rule of law is weak or where the state offers few social services. A clan can fund the education of relatives, find them work, and look after orphans and the elderly (Kenworthy, 1997). Similarly, social capital can be generated through formal and informal associations. Wiig (2003) asserts that a household's involvement in village associations is one mechanism by which social capital can be established at the local level. Examples of such associations are funeral societies, farmers and parent/teacher associations, cooperatives, and saving and craftsmen societies. In traditional craftsmen communities, associational relationship is an essential part of village life.

Social capital is sustained by access to broader sources of information and improves information's quality, relevance and timeliness. Network ties help actors to gain access to information about job opportunities and innovations (Fernandez & Weinberg, 1997). Burt (1997) further opines that

social capital enables brokering activities that bring information from other actors to the focal actor. However, the extent to which this brokering activity relies on a reciprocal outflow of information depends on the entire network and the diffusion of information (Lin, 2005).

Strong social norms and beliefs, which are embedded in social capital, are associated with a high degree of closure of the social network. This encourages compliance with local rules and customs and reduces the need for formal controls. For instance, clan-type organisations with strong shared norms benefit from lower monitoring costs and higher commitment. Furthermore, frequent interactions between groups permit faster dispute resolution and prevent the accumulation of grievances. Thus, the trust network can transmit more sensitive and richer information than other types of networks because of the solidarity it engenders (Krackhardt & Hanson, 1993).

For the broader aggregate, the positive externalities associated with a collective actor's internal solidarity include civic engagement at the societal level and organisational citizenship behaviour at the organisational level. Internally, associations instil in their members habits of cooperation, solidarity and public-spiritedness. These habits, in turn, spill over into members' involvement with other associations and, more broadly, into a higher level of generalised trust (Putnam, 1993).

In as much as social capital is instrumental for development to abound, it equally has its drawbacks that can culminate in its demolition. Social capital has the propensity to foster behaviour that worsens rather than improves economic performance; act as a barrier to social inclusion and

social mobility; polarise rather than unite communities or societies; facilitate rather than reduce crime; and perpetrate education underachievement and health-damaging behaviour (Fine, 1999).

According to Locke (1999), the loss of objectivity can become a dark side of social capital. The loss of objectivity is a function of actors becoming deeply embedded in an existing network. This can lead to the exclusion of new actors or ideas that may be potentially beneficial. In relating Locke's loss of objectivity to social capital, Fukuyama (2002) argues that companies and organisations can suffer if they have the wrong sort of social capital, such as relationships between colleagues that are too inward-looking, and fail to take account for what goes on in the wider world. Grootaert and Bastelaer (2002) have also postulated that the presence of conflict within a village, neighbourhood or larger area, for example, is often an indication of an absence of trust or an appropriate structural social capital to resolve conflicts.

There are important interaction effects that also limit the effectiveness of utilising a social capital approach. In situations where groups have developed shared set of understandings, strong norms of trust and reciprocity, they are also likely to have developed strong and multiple social linkages (Lin, 2005). These linkages may facilitate knowledge movement within groups, but at the same time can also create a strong and potentially damaging barrier around groups. This will shield group members from possible beneficial knowledge and information that is outside the boundaries of a defined community. This strong barrier makes it difficult for community members to access information outside the focal group. This may also culminate in skewed perceptions in that, once individuals are fully

indoctrinated into the community, they may not perceive the possible benefits of search activities outside of the groups' boundaries (Newell, Edelman, Bresnen, Scarborough & Swan, 2000).

Social ties can be a liability as well as an asset. At the institutional level, many countries and organisations have nepotism laws, in explicit recognition that personal connections can be used to discriminate unfairly, distort and corrupt. Everyday language and life experience teach that the social ties of individuals can be a blessing and blight, while those that they do not have, can deny them access to key resources (Portes & Sensenbrenner, 1993). Erickson (1995) supports this assertion by identifying the paradox that every feature of social structure can be social capital in the sense that it produces desired outcomes, but can also be a liability in the sense that it produces unwanted results. In this case, the kinds of groupings and associations which can generate social capital always also carry the potential to exclude others.

Begley and Tan (2001) have elaborated on the procedures for establishing and building social capital in the Singapore society. The population of Singapore comprises 76.5 percent Chinese, and this explains their predominance as businessmen. The Chinese, as with most other Asian cultures, place great importance on a person's place in the social hierarchy. The family business enterprise is the central business organisation in Chinese societies. In such situations, reputation capital becomes important. A feature that links societies in Asia is *guanxi*. The word *guanxi* translates into networks, connectedness and friendship with reciprocal obligations. It is through such networks that a person, who is of a lower rank, can approach

another person who is higher in rank for a favour or assistance. Given the Confucian tradition, those outside the Chinese culture, such as a prospective foreign joint venture partner, would not even fit in the hierarchy and, therefore, would find it difficult to become part of the network (Begley & Tan, 2001).

The presence of conflict between individuals in a community is an indicator of the lack of trust and social capital. Moazami (2006) argues that perpetual conflict, slowly but certainly destroys social capital. This was discovered among farmers in Arak County in Iran. The pertinent causes of disagreements and conflicts among co-farmers were the possession of lands of other farmers unlawfully by a specific group of farmers, the uneven distribution of irrigation water, and permitting livestock to graze on the lands of other farmers. This notwithstanding, most of the disputes were settled by elders and village councils. These institutions were instances of social capital of a community that traditionally settles disputes that arise among farmers (Moazami, 2006).

Aspects of rural agricultural development

There are various aspects of rural agricultural development. These include access to resources, output, access to and exchange of information, access to market, risk management, and adoption of technology. Access to resources for rural agriculture is low in many rural agricultural communities. In a study by Okonya and Kroschel (2014) on the use of selected productive resources among sweet potato farmers, they found that households had very low access to both agricultural information and credit. On the access to

agricultural information, they suggested the use of local languages and mass media as the means to disseminate integrated sweet potato management messages.

Stiglitz (1985) has argued that, though economic decisions are made under conditions of uncertainty, their uncertainty could be minimised through the provision of information. Incomplete information has led farmers to make production decisions resulting in lower profitability and a decrease in net social welfare. It has also been noted that a significant investment in collection and provision of data to primary farmers yields social returns which far exceed the extra costs related to the data provision (Hayami & Peterson, 1972 cited in Fred, 2011). However, complete and reliable information has been recognised by economists as crucial in making welfare maximising decisions, especially among rural farmers (Fred, 2011).

Fred (2011) undertook a study on factors influencing access to agricultural information. The study revealed that access to information was influenced by farmer experience, education, gender and type of agriculture practiced. In particular, 28.1 percent of the farmers obtained their information from other farmers. Demonstration plots and farmer workshops were some perceived effective sources of disseminating information. The study also found that marketing specialists (25.3%) and production specialists (24.2%) were the most useful sources for marketing decisions. Also, interpersonal specialists (37.9%) as well as marketing specialists (25.9%) were the most useful sources of information for production decisions.

Several studies show that television and radio constitute the main channels used by farmers to obtain relevant information needed for the

running of their farming businesses (He & Zou, 2006; Zhao, 1998). However, other traditional approaches, such as conversation with friends and relatives, were likely to be mostly experience or hearsay information (Zhao, 1998) and were commonly used in rural areas (He & Zou, 2006). Okwu and Umoru (2009) also revealed that farmers in Nigeria obtained their information from their husbands and fellow women farmers, in addition to mass media and extension personnel, which confirms He and Zou's (2006) traditional approaches of obtaining information.

In Kenya, the major local sources of agricultural knowledge for farmers include extension services, neighbours, family, markets and community-based organisations. Also, non-governmental organisations, churches, community meetings, family and agricultural companies are other sources of information (Rees et al., 2000). In Uganda, alternative sources of agricultural information for farmers are the information and visual centres that produced pocket books, leaflets, and posters (Mubiru & Ojacor, 2001).

It has been observed that access to information enables farmers to reduce risk and increase yield. Food self-sufficiency has mostly been the first priority of many smallholder farmers. However, nearly all farmers are connected to the market economy which may consist mainly of selling a cash crop to a local marketing agency, or buying or selling food crops in a local market. The setting of prices, by many governments for farmers, has been below realistic market levels. Also, the deductions of taxes from food or cash crops can have serious effects in reducing farmers' incentives to produce (Ker, 1995). In situations where the government provides ready market for

farm produce with realistic prices, farmers are motivated to look for alternative ways of increasing yield.

Information and knowledge are words that have been used interchangeably, although these are different but linked concepts. According to Davenport et al. (1998), knowledge is information combined with experience, context, interpretation, and reflection. It is a high-value form of information that is ready to apply to decisions and actions. Hedja (1999) defines knowledge as a range of information gained from experience about technology, environment and farming-related conditions. In the view of Sunasee and Sewery (2002), knowledge is the human expertise stored in a person's mind, gained through experience, and interaction with the person's environment. Ermias (2007) defines knowledge as information in the context to produce an actionable understanding.

Samuel (2000) has explained agricultural information as the data for decision-making and as a resource that must be acquired and used in order to make an informed decision. Umali and Schwartz (1994) classifies agricultural information into two broad groups: pure agricultural information, and agricultural information inherently tied to new physical inventions. Pure agricultural information refers to any information without reference to a specific physical technology, while agricultural inventions are those that come in the form of agricultural inputs, management technologies facilitating farm management, and marketing and processing equipment.

From the above definitions, one can conceptualise agricultural information as both agricultural messages via extension and embodied in agricultural technologies and shared between the actors in the agricultural

extension system. Knowledge can also be defined as a range of “information gained from interaction and information combined with experience, and it is organised and interpreted by the human mind with confident understanding for the purpose of decisions and actions” (Tadasse, 2008, p.8).

There are various types of knowledge, depending on its functions and its carrier systems, such as agricultural knowledge and management knowledge. Knowledge also varies depending on cultural, social, and economic factors. The type of knowledge people have is dependent on factors such as “age, sex, occupation, labour division within the family, enterprise or community, socio-economic status, experience, and environment” (Tadasse, 2008, p.9). In essence, knowledge creation and transfer can be affected by cultural, social, and economic factors. Information and knowledge are central to innovation promotion. The quest to increase yield by exploring existing information and knowledge drives the pace for innovation promotion. Channels of information are important in diffusion of agricultural innovations. According to Tadasse (2008, p.16), “other sources of information, such as mass media and neighbour farmers in the area, are also important in the diffusion of agricultural innovations.” However, innovation and adoption of new agricultural technology depends on a number of factors which include financial resources as some technologies are expensive.

Financial resources remain crucial in acquiring the necessary tools and equipment for farm management. The pace of modernisation and production for the market gradually requires the purchasing of more inputs, such as fertilizers, crop-protection chemicals, and machinery. However, capital investments in the form of fencing and water supplies often tend to

remain minimal for all but the wealthiest farmers (Ker, 1995). Poor farmers may resort to loans in order to adopt new technologies. However, Eicher and Baker (1982) have questioned the real need for credit in many situations. In spite of this, the general impression is that there seems to be a positive correlation between farmers' willingness to apply inputs such as fertilizers or insecticides and the provision of credit (Ker, 1995). According to Ker (1995), any workable credit policy for farmers should correspond to an increase in production and income more than the amount loaned plus interest, and whether they are likely to be able and willing to repay the credit.

Badiru (2010) reviewed existing knowledge on small-scale farmers' access to credit with particular focus on conditions for accessing credit, the maximum credit provided, repayment of credit, other factors limiting access, and the impact of credit on small-scale farmers in Nigeria. He concluded that small-scale farmers have relatively more access to informal and semi-formal credit institutions than to formal credit institutions, in spite of the higher volume of credit at the disposal of formal institutions.

Reyes et al. (2012) analyzed the factors that determine productivity of fruit and vegetable growers in central Chile, focusing especially on the effect of short-term credit on farm productivity for market-oriented farmers. Their results showed that

short-term credit does not have an effect on farm productivity, while factors, such as education and the type of activity, do. Their results suggested that other providers of credit, such as informal credit institutions, may relax short-term constraints in rural financial markets in Chile (Reyes et al., 2012, p.2).

Social networks and rural agricultural development

This section discusses the relationship between social networks and rural agriculture. The section begins with a conceptual review of social networks and rural agriculture, followed by a discussion on social networks, access to information and knowledge transfer. Other aspects of rural agricultural development discussed in the section include: access to resources; access to market; risk management; technology adoption; and output and productivity.

Conceptual review on social networks and rural agriculture

The discussion on social network and rural development has often been limited to social network and rural agriculture (Murdoch, 2000). The reason is that rural agriculture is the most significant user of rural land and land is a key maker of rurality (Marsden, Murdoch, Lowe, Munton, & Flynn, 1993). Social networks in the agricultural sector have been limited to vertical networks even though some studies have pushed beyond the frontiers of vertical networks. A study of vertical networks in rural areas looks at the way by which rural agriculture is incorporated into a much broader set of processes which exist beyond rural areas. The second set of network approach in rural agricultural areas is concerned with horizontal forms of rural development that looks at the integration of non-agricultural rural economies into a set of processes that straddle both urban and rural areas (Marsden et al., 1993). Murdoch (2000) has argued that this network form is relevant to rural development because it is concerned with the new networks of innovation and learning. Networks of innovation and learning are central

to rural agricultural development in particular and economic development in general.

The discussion on vertical networks in the rural agricultural sector has often been subsumed under commodity chain. Commodity chains clearly highlight many of the themes that are important in understanding how social networks interact with rurality in the context of rural agricultural development (Murdoch, 2000). According to Murdoch (2000), the stages of food chain are production, processing, retailing and final consumption, and social network analysis in every stage of the food chain focuses on actors, connections and spatial reach.

Friedland et al. (1991) have developed a mode of analysis that looks at a set of relations typically constructed around different agro-food commodities. According to Buttel, et al (1991), most studies on agro-food chains look at the nature of the production process; the social and economic organisation of food production; the use and management of labour; the role of scientific research and extension activities; and the organisation of marketing and distribution activities. While the agro-food chain clearly highlights the complex socio-natural composition of contemporary food networks (Murdoch, 2000), it tends to see these as always and necessarily composed in line with particular power relations (Busch & Juska, 1997). Despite the wealth of valuable insights that generated in the commodity chain literature, a sense of disquiet surrounds its treatment of rurality. Whatmore and Thorne (1997), for instance, have argued that food networks be understood as social composite of the various actors that go into their making. They further suggested that a greater understanding of agro-food

networks can be gained if one moves away from the one-dimensional perspective of political economy and looks a little more closely at actor-network theory which, they believe, holds more potential in understanding how social networks and their socio-natural constituents come to hang together through time and space (Murdoch, 2000).

Actor network theory examines the complex composition of social networks and seeks to understand how networks gain their strength and how they achieve their scope (Murdoch, 2000). Like commodity chain analysis, the actor network approach tends to see networks as sets of power relations with their power lying within the links that bind the actors and entities together (Latour, 1986). Unlike the commodity chain approach, the actor network theory believes power is exercised by complex association of social, natural and technological factors. It is in this context that Callon (1991, p.139) used the term “techno-economic networks” to describe “a co-ordinated set of heterogeneous interaction of actors that develops, produces, distributes and diffuses methods of gathering goods and services”. Based on this, Murdoch (2000) has posited that the shape and composition of a social network is not given simply by its socio-economic components but by all the linkages between all the enrolled entities.

Goodman (1999) has pointed out three areas of research which illustrate the complex way in which social networks interact with rurality: food scares, biotechnology, and organic production. These three areas of research raise important issues for the conduct of rural agriculture and rural development. First, food scares have had a profound effect on the traditional mainstay of rural agriculture. Murdoch (2000) used the case of UK to

substantiate this where British beef producers were hit hard by the loss of export market for beef, resulting in agricultural crisis. Second, biotechnology poses a profound challenge for traditional producers as the introduction of biotechnological entities tends to weaken the effectiveness of rural agricultural development strategies as traditional economic structures may struggle to cope with new technologies (Murdoch, 2000). Third, the focus on organic production is part of a wider movement to strengthen the place of farmers in food chains by highlighting issues of quality (Murdoch et al. 2000).

It is important to note that these areas of research illustrate the significance of the nature in the food chain. Murdoch et al (2000) have also indicated that network must interact with the socio-natural conditions that pre-exist in rural areas. As Murdoch and Miele (1999) have noted, that rural is frequently regarded as “natural” and any promotion of natural resources will stimulate a re-embedding of the networks in these areas.

Social networks, access to information and knowledge transfer

Information networks are used for four main purposes, namely: to identify and contact clients; access market information; access inputs; and to obtain technical and financial assistance (Gonzalez, Johnson & Lundy, 2002; Lofourcade, 2002). The most common use of information networks is to identify and make contacts with potential clients. These clients could either be friends of friends or acquaintances of farm owners or managers. In some cases, the use of personal contacts is more systematic. Personal contacts are particularly important in opening doors. However, they are not significant to

maintain clients, when farmers are deficient in terms of quality, price or volume. Clients that have been obtained through personal contacts have sometimes been lost because farmers did not meet requirements (Barham et al., 1992).

Information about markets, prices and products can be obtained via networks of personal contacts. Though there are few cases of purely personal relationships yielding these kinds of benefits, it is common to see farmers and firms, for example, getting information from other actors in the supply chain. This demonstrates the multipurpose nature of supply chain relationship (Fafchamps & Mintin, 1999).

With regard to access to inputs, agricultural producers who supply firms with raw materials are either friends, friends of friends or acquaintances of the owners at the time they began supplying the firm. Former employees of agribusinesses or technical assistance of organisations establish businesses based on contacts they have made with producers and other suppliers. These relationships provide information and open doors, but are not sufficient to guarantee good long-term working relationships unlike performance and trust (Gonzalez et al., 2002).

Sakurai (2002) determined the effects of farmers' network groups on their access to information and market opportunities for their produce. These investigations were done in Miyoshi and Tomiura, two rural areas in Japan. Farmers created networks to exchange information and, more importantly, establish linkages among themselves. This culminated in the formation of agribusiness networks. Analyses from the research disclosed that these networks instigated the establishment of farmers' association for joint

negotiation with travel agencies to improve their customer service of farm produce. The accumulation of agribusiness facilities related to local foods in railway stations was another outcome of the constituted networks (Sakurai, 2002).

Katungi, Edmeades and Smale (2006) investigated the interactions between social networks, gender and information exchange in rural Uganda. Within the framework of farmer-to-farmer models, Katungi et al conceptualised the informal information diffusion process to comprise social capital accumulation and information exchange. They further assumed that each agent participated in information exchange with a fixed (predetermined) level of social capital. Also examined was how the endowments of social capital influenced information exchange, paying close attention to gender differences. A multinomial logit model was used to analyse multiple participation choices of information exchange confronted by farmers. Findings demonstrated that social capital was an important factor in information exchange, with men generally having better access to social capital than women (Katungi et al., 2006).

Social network analysis has been developed to understand how actors relate in a specific social context. The relationship between the actor and the social structure helps in understanding how people position themselves in the network and how actors' position influences their access to information and other resources (Clark, 2006). Agricultural information, according to Demiryurek (2010), is an important factor which interacts with land, labour, capital and managerial ability in the production process. The productivity of these factors of production can arguably be improved by the relevant, reliable

and useful information and knowledge.

Goswami and Basu (2011) conducted a research on the influence of information networks on farmer's decision-making in West Bengal to study the spread of chilli and wheat cultivation among farmers of some selected villages. Data were collected through structured questionnaire and were analysed by socio-metric technique. The fractional ranking of the network scores of farmers was compared with their relative earliness and adopting chilli and wheat cultivation. The results of the study showed that most of the farmers who had higher network scores were earlier adopters. They also found a string of factors that operate at the community level. Their conclusion was that information networks are necessary to the understanding of diffusion process of agricultural innovations at the micro level.

According to Conley and Udry (2001), the information about the proper use of new technology passes informally between farmers. Farmers experiment with varying levels of inputs intensity. They discussed the results of their experiments with a restricted set of peers. For example, Udry and Conley (2004) found that a given farmer will begin to use more fertilizer after a neighbour with whom he is linked in an information network uses high amounts of fertilizer and achieves surprisingly high profits. Udry and Conley (2004) posit that farmers who are strongly connected with many farmers learn the contours of new technology than those who are poorly connected.

Udry and Conley (2004) examined social networks among farmers in the Eastern Region of Ghana. The study used detailed data on economic activities and social interactions between people living in four villages in Ghana. It became evident from the study that economic development in the

selected communities was shaped by the networks of information, capital and influence that permeated these communities. The study also found that functional network connections, like the information on credit, labour and land interactions, were strongly influenced by background variables like geography and family history. In addition to these underlying social variables, Udry and Conley (2004) suggested that data on exogenously changing factors that influence the costs or benefits of connections are vital for the analysis of transitions. For example, new market opportunities, new technologies, or changes in the returns to different kinds of assets provide sources of variation in the creation or collapse of network links.

Access to knowledge on farm management practices is essential for the maintenance of productive agroforestry systems. Farmers who lack the means to acquire farming knowledge from formal sources often rely on information within their informal social networks (Isaac, Erickson, Quashie-Sam & Timmer, 2007). Based on this Isaac et al. (2007) examined advice network structures by using kin relationships, community involvement, and imitation, as attributes to characterise structural positions. They then investigated the consequences of such structure on farming practices in cocoa agroforestry systems in Ghana. From the findings, farmers in both core and peripheral structural positions indicated that they observed fellow farmers and subsequently adopted their practices. Of highly sought farmers, 84 percent used external information, predominately from government institutions, thus functioning as bridging links between formal and informal networks. Both external and farmer-derived sources of knowledge of agroforestry practices were transferred through informal advice networks,

providing available information throughout the farming community, as well as a foundation for community-based adaptive management.

Crona and Bodin (2006) analysed the example of a community in a coastal seascape in Kenya that faced an overexploitation of fish resources and a lack of collective action to counter this problem. Their hypothesis was that this lack of collective action was due to different structures of communication networks. Using information on a full social network (i.e., a village census) and SNA techniques (i.e., a sociogram of the strength of relationships between different occupational groups), the authors established that communication about natural resource management (NRM) occurred within occupational networks. Fishermen, who used the same gear type, discussed NRM techniques, but other occupational groups in the community did not. Therefore, network structures within the community hindered information transfers and, consequently, collective community action. The authors concluded that homogeneity within groups may lead to faster knowledge transfers. Yet, if a group is too homogeneous, knowledge may not spread, because it is inaccessible by outside sources. The authors also looked at positions of influential leaders within groups and found that the characteristics of these leaders were essential in coordinating successful group action.

Overall, Crona and Bodin (2006) showed that SNA offers valuable tools for identifying and illustrating positions within groups and may, therefore, be a useful method for analysing collective actions and the bottlenecks to it. However, in looking only at the structure of networks, the study by Crona and Bodin (2006) did not establish the actual impact of

network characteristics on NRM practices in the community. Moreover, they did not control for other characteristics, such as those found at the local level, that may influence adoption. Yet, this information is particularly relevant for policy targeting, because some characteristics may be more significant than others.

Another study by Raini, Zebnitz and Hoffmann (2005) aimed to determine why the adoption of integrated pest management (IPM) techniques within Kenya's tomato sector is low. To answer this question, the authors looked at social networks of IPM stakeholders, farmers, government, agro-dealers, extension agents, in the tomato sector. Using illustrations of networks, as well as network measures, the authors established that the network of stakeholders exhibited a very low density. They concluded that, for this reason, information flowed slowly through the network, thereby inhibiting a faster diffusion of IPM techniques. By using SNA, the authors were able to illustrate bottlenecks to information flows, but they were unable to include other factors that may have significantly influenced adoption. Moreover, the study did not estimate the actual impact of social networks on the adoption of IPM. Therefore, the results are indicative rather than conclusive.

Social networks and access to resources

Various studies have shown that social networks enable farmers to access resources from formal and informal sources. In an assessment study undertaken by Pantoja (2000) in India to compare two sets of farmers' (group and non-group members) access to loans, the revelations were that farmers

who belonged to groups could easily access and repay their loans compared to their counterparts who did not belong to groups. In repaying borrowed money, the proportion of non-group farmers that had not made any payments was considerably higher than group counterparts. Membership in groups motivated farmers to make reasonable partial payments more often than their colleagues who were not group members. Farmers could benefit from credit facility among its members. Around 35.5 percent responded that their groups had helped by permitting access to credit from the savings of its members. Some farmers (21.7%) reported having taken out loans from banks, thanks to the credit linkage with local commercial banks that their groups had established (Pantoja, 2000).

In terms of the range of credit support, further discoveries were that 31.9 percent of the farmers received loans of less than Rs. 1,000, while 26.1 percent of the farmers received the next highest amount of between Rs. 2,000 and Rs. 5,000. The credit amount was used to meet different requirements, such as children's education, purchasing cattle and expenses for agricultural activities. The perception of the difference on credit facility offered by groups and local moneylenders was also sought. Some respondents (46.4%) disclosed that the interest rate of money lenders was very high, while 21.7 percent believed that the interest rate charged by farmers' groups was less. Other respondents (12.3%) felt that groups provided a suitable repayment schedule that could easily be followed by members, while 5.8 percent reported that moneylenders treated borrowers very badly and indulged in harassment for the repayment of loans (Pantoja, 2000).

In a study carried out in Yahalegethera and Palugama, Sri Lanka, to

determine the relationship between social networks and household income, Uphoff and Wijayaratna (2000) found that for relatively poor households, the relationship between social networks and household income was positive, but for relatively rich households, the relationship was negative. This implies that among relatively poor households, social networks was important to enhance household income, complementing physical and human capitals. However, such an effect was diminishing as household income level increased. Uphoff and Wijayaratna's (2000) findings were contrary to the results of the Department of Census and Statistics (DCS) (2003) in Sri Lanka. Conversely, the DCS found that the involvement of inhabitants in most Sri Lankan rural communities in non-governmental and external organisations, as well as their relationship with government officers, did not have any positive impact on their household incomes. The activities of non-governmental organisations were carried out in some villages, while other villages had activities such as women empowerment, credit societies, non-alcohol societies, religious and environmental group activities. Their non-positive impact on household income was, however, not expected since their goals were to strengthen household networks with the outside world (DCS, 2003).

Dissanayake (2001) examined the impact of household social capital endowments on the level of household income in 32 villages in Sri Lanka. Dissanayake constructed a social capital index, using a weighted sum of indices of six dimensions of social capital. The six dimensions used were: household's involvement in existing village-level associations; internal connectedness in traditional and informal groups; household mutual contributions to neighbour welfare; household societal friendship and group-

based collective activities; household personal relationships with government officers; and household utilisation of village public goods, such as schools, health and community centers, cooperative societies, roads and the extent of networking with external organisations.

The DCS (2004) reported further that the Sri Lankan villagers' involvement in associations and societies did not have any significant effect on their household incomes. This was because the most popular associations in the villages were funeral societies, which rather pooled resources for sharing in an emergency situation. However, focus group discussions revealed that these associational relations were often destroyed by political interferences. For example, Samurdhi societies were highly politicized, and financial and non-financial benefits of Samurdhi recipients were directly linked to the associational relationship with different political clientele. This tendency was considered to be the reason for the non-significant effect of social networks on household incomes (DCS, 2004).

Zuwarimwe and Kirsten (2011) explored the nexus of social networks and small-scale rural non-farm enterprises development. Specifically, the study established how the role of kinship, social groups, membership of organisations and links and contacts maintained with individuals affected the various stages of rural non-farm enterprise development. A mixed approach designs strategy that combined positivistic and phenomenological approaches was used to gather data from 130 entrepreneurs who were purposively selected. It became evident from the findings that enterprises showed heavy reliance on strong social networks with friends and relatives for start-up capital but not capital for expansion. Respondents, however, relied on

business networks for expansion capital. This is the limitation of strong social networks in mobilising external resources. The study further found a positive relationship between social groups and contacts with individuals and enterprise value. The study concluded that greater participation in financial associations exposes respondents to more information that is associated with an increased enterprise value.

With respect to income, Harris (2001) has reported that, in India, social networks played a role in influencing farmers to save much of their earned income. This was depicted in a study to ascertain the contribution of social capital to farmers' attitude towards money. The discoveries were that most farmer groups in India on meeting days often arrived at a consensus on the amount they could save every month. The amount that every farmer in a group was obliged to pay was decided on meeting days, taking into account the amount that even the poorest person should be able to pay without much difficulty. Among farmers who did not belong to groups, 73.95 percent of them did not have the habit of personal savings.

Harris (2001) further found that landless farmers significantly failed to meet the monthly saving requirements. Farmers that owned wet and dry lands were able to pay the requisite amount of savings without any lapses, compared to their counterparts who had only one type of land. In the case of owners of wetland, 94.7 percent of them saved regularly, while 89.5 percent owners of dry land saved. Farmers who defaulted payments normally requested for the provision of grace time, but in most of the cases, the group asked the defaulters to pay a nominal amount as a fine. Although there were some defaulters, the survey results clearly showed that group membership

among farmers spurred them to save up their earned income, compared to farmers who did not belong to groups (Harris, 2001).

Social networks and access to market

Studies conducted by Gonzalez et al. (2002) in Columbia to ascertain the influence of social networks in enabling firms to establish contacts with potential clients revealed that a group of investors, who owned a dairy product firm in Cartagena, used its contacts in the urban areas for market development. Furthermore, the investors' friendship with bus drivers, culminated in the formation of a cheese factory in Ubaté, as a frequent rest stop for long distance buses that travelled to the North of Colombia from Bogota in the Southern part of the country. A similar research examined the role played by social capital in accessing market information in the Antioquia region of Colombia (Lofourcade, 2002). Findings showed that a regional distributor of fruits suggested the production of a powdered version of sugar cane to a sugar cane processing firm. This suggestion was geared towards creating a success story for the firm, considering the fact that this product was high in demand in the region (Lofourcade, 2002).

In the Miyoshi and Tomiyama hamlets of Japan, Sakurai (2002) examined ways by which social networks can enhance farmers' access to markets. Findings from the study showed that farmers' markets grew into large-scale, complex facilities, in which local cultural events were held and many farmers brought a variety of products. Thus, farmers' markets developed as an economically important marketing channel. Medium and

small-scale markets also emerged and provided fresh products for consumers. Women farmers' groups founded food processing facilities that processed foods, such as fruit jam, soybean, curd, rice cake and pickles. These activities created a new marketing channel and gave residents an opportunity to reconsider the value of traditional foods in the rural areas (Sakurai, 2002).

Building sustainable market-oriented farmer cooperatives was the rationale for government support to four farmers groups for mango production and marketing that were established in 2002 in the Mekong Delta region of Southern Vietnam. Cuong and Thevenot (2001), Rankin and Russell (2002), and The International Labour Office Cooperative Branch-ILOCB (2002) revealed this in a survey to investigate the impact of social networks on the livelihoods of mango farmers in the region. To accomplish government's goal, bonding social capital was created through the initial formation of four groups. Two groups of new mango farmers with common interest in solving production problems at the local level were formed, as well as two groups of established mango farmers interested in the production and marketing of their fruits. This capital was then mobilised to different extents to develop bonding and linking social capital, as the groups sought out alternative business opportunities and new customers for their fruits. Further linking social capital was developed with the Southern Fruit Research Institute (SOFRI) and other state agencies, as three of the four groups decided to formalise their organisation and register officially as a recognised cooperative business under law (Cuong & Thevenot, 2001).

Research findings disclosed by Rankin and Russell (2002) depicted that this amalgamation enabled the cooperative to generate income. The

income was predominantly gained through the signing of a supply contract with a Japanese company to deliver fruit to a state-owned processing plant for the production of frozen mango slices for export. In order to fulfil the contract, the cooperative began to take on the role of a wholesaler, and fruits were bought from members and non-members in local and surrounding communities with a guaranteed price of 10 per cent higher than the current market price. Farmers were reportedly happy with this arrangement, as the cooperative provided a market for smaller, lower class and fresh fruit for processing (Rankin & Russell, 2002).

The cooperative later established a small retail mango shop close to the members' village to sell three classes of high quality, boxed and branded fresh fruit directly to consumers. The cooperative also grew from a simple farmer organisation focused on improving production techniques and access to technical and market information for members, to relatively complex business operations engaged in retailing, branding, wholesaling and supply contracts for fruit processing. This notwithstanding, communication between the democratically elected cooperative management board and the farmer members decreased as business activities expanded. There was declining involvement of members in decision-making and no dividends were returned to shareholders. Regardless of this, strong local level government support continued, with much guidance given to linking the cooperative management board to emerging business opportunities (International Labour Office Cooperative Branch, 2002).

Najafi (2003) also deciphered that trust among farmers had a positive and significant effect on their willingness to participate in collective

activities, though its effect was not very considerable. This was by virtue of the fact that land consolidation in Iran was seen as a collective action in which different stakeholders were involved. Thus, if farmers decided to engage themselves in such an exercise, then it was implicit that trust was prevalent between themselves and the extension officers. Another most important agricultural collective activity at the village level was the maintenance and upkeep of the water system. In rural areas in Iran where the quant water system was the main source of water, villagers were collectively responsible for the maintenance of the system. They contributed their time and money to this activity. Therefore, their participation signified the existence of trust among themselves (Najafi, 2003).

Sakurai et al (2006) have examined the effects of marketing activities on participant farmers in the Miyoshi and Tomiyama hamlets in Japan. First, farmers were found to have created new direct-marketing channels from farms to consumers and this gave farmers a source of income. Second, farmers were given diverse opportunities to conduct community-related businesses. Small and large-scale markets, for instance, enabled farmers to sell local products. Farmers of varied groups (part-time, elderly, women or new residents) participated in the activities and enjoyed economic and social benefits. Third, a rural-urban linkage was gradually constructed through these marketing activities. Since many urban residents visited the markets, farmers learned the needs of consumers directly and could improve growing or processing methods. Urban people also realized the value of rural communities through direct and intimate communication with farmers (Sakurai et al, 2006).

Social networks and risk management

Associations, groups and firms can engage in some type of collective production or processing. Firms, including cooperatives and small family firms, have hierarchical organizational structures and strict divisions of labour. However, some firms can process collectively (Fafchamps & Minten, 1999). An instance of collective production can be seen in Ubate in Colombia, where a handful of women came together to establish a jam and jelly business. This group of women processed fruits collectively into jams and jellies and shared the benefits equally among them. Nevertheless, the firm appeared not to have been profitable and lost over 80 percent of its members, in spite of being located in a community with a long history of community social activism (Gonzalez et al., 2002).

Moazami (2006) examined the effects of collective action in the management of risks in farmers' groups in Arak County in Iran. Nearly half of the farmers whose views were sampled agreed that most people who farmed together always thought about their welfare. However, 41 percent of farmers disagreed with the opinion of their counterparts. The farmers posited that altruistic feelings were common in the past. Though many of them were poor then, it was felt that they were more generous than their descendants (Moazami, 2006). Nearly 61 percent of the farmers who were further interviewed agreed that most co-farmers came to their aid if they needed help. The larger the number of co-farmers the likely it was for members in the network to receive help in times of need even though a fifth of the farmers depended on their immediate family for assistance (Moazami, 2006).

Gallego and Mendola (2011) examined labour migration and social networks participation in Southern Mozambique. The main objective of the study was to investigate how social networks in poor developing settings were affected if people migrated. Using a household survey from two southern regions in Mozambique to test the role of labour mobility in shaping participation in groups and inter-household cooperation by migrant-sending households in village economies at origin, it was found that successful migrants engaged more in community-based social networks than unsuccessful migrants.

Social networks and technology adoption

Innovation is essentially a social process in which people learn about new ideas and adapt and use them through their interactions with others (Douthwaite, 2002). As a result, innovations generally arise out of a network of actors and relationships (Conway & Steward 1998). Darr and Pretzsch (2007) presented a study on social networks based on full network data from two rural communities in Kenya and Ethiopia. In light of the fact that farmer groups were increasingly favoured by extension services as a means of innovation promotion, the authors aimed to determine what influence group characteristics have on the innovativeness of individual farmers. To do this, they analysed the adoption of intercropping and farm woodlot innovations by members of different farmers' groups. Individual innovativeness scores were calculated based, on the number and complexity of innovations adopted.

Using SNA techniques, the authors calculated measures, such as network density and the number of out-directed ties for farmers' groups. In a

final step, these measures, in addition to other group measures and individual characteristics, were regressed on innovativeness scores using a general linear model. The authors found that structural network variables had a significant and positive effect on the innovativeness of group members and, consequently, the group. Interestingly, the authors also established that, in the case of farm woodlot adoption, more innovative groups tended to be characterised by a top-down leadership with powerful management boards and weak member participation in offsetting up the group's agenda.

The findings by Darr and Pretzsch (2007) were in contrast to those obtained in the Crona and Bodin (2006) study that cohesive groups with active exchanges of information and collaboration among its members led to higher diffusion of innovations. However, even though the study by Darr and Pretzsch is informative and based on an extensive data set, it does not account for the fact that farmers may actually group together because they are innovative. If this is the case, a simultaneity problem, as described in Manski (2000), could evolve, and derived results may be biased and inconsistent.

Hartwich et al. (2007) compared how different knowledge management schemes influence innovation behaviour of smallholder farmers in Bolivia. The authors compared a top-down approach with a more bottom-up approach that promotes innovation via a network of technology providers, farmers, and private sector agents. Using a case study approach and collecting quantitative and qualitative data from farmers and their information providers, the authors found that farmers who participated in network-related extension schemes had higher adoption rates of modern technologies than did farmers who participated in more traditional extension

systems. The study is one of only a few that employs network characteristics in an estimation framework. Using Tobit models, the authors estimated the impact of a farmer's connectedness on adoption behaviour. Yet farmers' networks were defined somewhat widely. They included not only other farmers, but also researchers, extension agents, non-governmental organisations, input buyers, and transporters. Such a wide definition makes it difficult to interpret estimation results and to pin down the actual impact of each network agent on adoption. As a consequence, the design of policies that aim to stimulate adoption becomes very complex.

In a study on reciprocity among farmers: application of social network analysis, Jana, Bandyopadhyay and Choudhuri (2013) used data from two farming villages, Madhya-Utter and Astabiri, to show how farmers used social networks in their agricultural activities. Agricultural activities were defined in terms of choice of seeds and/or plants to be sown, use of tools or implements used for cultivation and advice or suggestion regarding cultivation. A standardized graph theoretic measure of reciprocity was then applied to carry out social network analysis. It became evident from the survey that values of reciprocity measures for seeds/plants, and tools/implements exchange were more than the advice giving, and that the measure of network of agricultural activities as a whole was also greater than the network of social aspects (Jana et al., 2013).

Social networks, output and productivity

Furuya and Sakurai (2005) investigated the role of social capital in market development by selecting the domestic milled rice market in Ghana.

Specifically, Kumasi, the second-largest city in Ghana, was earmarked for the investigation. One of the interesting observations on millers in the Kumasi area was that they constituted two groups. Millers in the urban area of Kumasi city established few clusters, while millers in the satellite towns or villages were isolated. Millers in the city were members of a millers' association. Thus, they were in a community that fostered social capital. On the contrary, millers who were in the towns and villages never participated in community activities. The presence and absence of social capital by both groups had an impact on their quality of milled rice. The physical quality of rice produced by the millers in the Kumasi clusters was better than those produced by their competitors in the rural areas. The content of establishment of the price and quality relationship was facilitated by low information costs among millers in the clusters. Bridging social capital was developed between the millers and farmers. This form of social capital together with low information cost in the clusters made it easy to enforce contracts and, hence, allow millers in the clusters to provide credit to farmers.

In the Kuala Selangor district in Malaysia, Ali and Mansor (2006) ascertained the contribution of community activities and farmers' involvement in organisations to their yield levels of rice. Analyses from the research showed that the frequency of attending community activities and duration of involvement in organisations contributed to farmers' yield levels. For example, with the addition of one instance of attendance of community activity, the farmers' yield was seen to increase by about 0.06 ton per hectare. Counter-intuitively, in the same district, engaging in a farmers' group and manning a position in the group was seen to cause a decline in rice

production. Furthermore, membership in organisations was also found to have a negative effect on production. Two respondents who were not members of any farmers' organisation achieved relatively higher yields. Out of 13 respondents with membership in more than five organisations, 30 percent had annual yields of less than 10 tons per hectare. This poor performance among those who were active in community activities could be due to less time and energy devoted to farming. The other reason is that some organisations offer alternative income-generating activities, thus forfeiting some income from farming (Ali & Mansor, 2006).

Similarly, Rahmah (2004) assessed the effects of social trust on farmers' rice yields in Malaysia. Eight respondents indicated that they had absolute trust in everybody, yet still, they were not as productive, in terms of yields, compared to those who had reservations on trusting everybody. Thus, the majority of farmers who obtained high yields limited their trust to very few people. On the contrary, the respondents who extended their trust were probably more simple people who were less motivated and had less competitive spirit (Rahmah, 2004).

Manandhar (2000) assessed the viability of social networks, in the form of social capital, built on diversity within groups that was used by a state-owned enterprise in Nepal to enhance its performance. As a measure to enhance and build social network, the enterprise digressed from social network, based on homogeneity to the formation of heterogeneous groups. Formerly, the enterprise employed workers who hailed from the same village or locality. This homogeneity not only provided some social cohesion, but it also created tremendous productivity problems, owing to mass absenteeism

during the time of festivals which temporarily led to the closure of the enterprise's units.

With the employment of workers who hailed from heterogeneous groups, workers and managers re-organised work to curtail mass absenteeism. They also implemented an incentive scheme to reduce other forms of absenteeism, bringing it down from 15 percent to 8 percent. The enterprise introduced a bold new initiative to recruit women machine operators, a position which was traditionally occupied only by male workers. Owing to these strategies, the company increased its daily output to 24 percent. Other benefits included increased productivity, enhanced company goodwill, increased quality, enhanced worker job security and increased workforce discipline. However, the employees felt that further progress could have been made if groups had been further fragmented; if there had been greater awareness of the advantages of having social dialogue; a greater commitment on the part of management to share decision making power (Manandhar, 2000).

Singapore's productivity and economic development was enhanced through the social capital of its people through social networks. This disclosure was made by Tan (2006) in the course of determining the effects of social capital on the country's productivity. The social norms of mutual help that existed between members of the ethnic groups in early Singapore enabled the provision of assistance to the needy among those groups. The Chinese, Arabs and Indians provided assistance to the needy members of their groups and built their communities. Furthermore, trust was fostered between employees in their trade unions and employers through the tripartite

employment relations under the National Wages Council (NWC). Wage negotiations were entered into annually under the auspices of the NWC since 1972. The social capital that was established over the years enabled smooth relations in Singapore, without the incidence of labour unrest, strikes or work stoppages, all of which augured well for productivity (Tan, 2006).

There are two different yet complementary aspects of productivity improvement that social networks and social capital can facilitate. The first aspect is the economic gains captured from the efficient information diffusion facilitated by social relations and from efficient transactions between actors or parties guarded by trust and norms. The second refers to learning and intellectual capital. The first type of economic gain is regarded as static synergistic creation or allocative efficiency (North, 1990). The other aspect of productivity improvement refers to learning and intellectual capital creation through internal and external cooperative behaviours that are supported by social capital. Nahapiet and Ghoshal (1998) refer to this type of dynamic economic gain as adaptive efficiency and suggest that social capital should be an important factor in culminating in a successful development of intellectual capital.

Sims (2006) argues that social capital is built on trust. The key mechanisms for building trust are communication and cooperation. Trust, communication and cooperation are interdependent and mutually reinforcing. Owing to this interrelationship, the elements of social capital form either a vicious circle, with high social capital or a vicious one with low social capital. Consequently, the vicious circle of low social capital directly harms productivity by diverting human capital away from more productive

functions. Firms with low social capital cannot take full advantage of the valuable information their workers possess. Workers, for example, resist transmitting bad news if they fear being punished or sharing good news, and if they believe that they will not benefit. In particular, workers will not risk suggesting improvements, if they do not stand to gain, if the suggestion proves useful, but stand to lose, and if it ultimately does not work.

Low social capital negatively affects productivity by forcing managers to use controlling strategies, which reduce the firm's flexibility and pre-empts it from making the best use of modern production management methods, which rely on greater autonomy for teams of workers. Control requires more rigid and formal procedures, which leaves the firm vulnerable in the face of changes in demand or increases in competition. An enterprise must be solid yet able to absorb movement in markets through flexible production methods. Controlling management strategies, based on the absence of trust, robs an enterprise of valuable flexibility. Flexibility is especially important for team-based production methods. In an environment with high social capital, a work team can improve its production methods without seeking managerial approval because management trusts the team's judgment and motives (Burt, 2001). Social capital that is curtailed impairs the functioning of teams. Teams with high levels of trust are more open to discussion, develop more innovative and original solutions, solve their problems more effectively and are less inclined to engage in behaviour, which disrupts the work environment (Dirks, 1999). The level of social capital influences how motivation is translated into group performance. In firms with high levels of social capital, team members focus more on joint efforts to yield high

performance. Motivation in firms with low social capital is transformed into individual efforts, which results in poor performance among groups (Costa, 2003).

Low social capital also harms productivity indirectly, by diminishing the quantity and quality of human capital. Firms that are stuck in a low social capital trap have lower rates of investment in skills development, are less able to take advantage of the skills of their workforce and have lower transmission of skills among workers. Skills are of no value unless workers are sufficiently motivated to use them, and good communication channels exist within the firm to ensure the best match between the skills, which the firm needs in various positions and the skills its workforce possesses (Lee, 2006).

Good relationships often enhance labour productivity through the facilitation of communication among peers with diverse backgrounds. Asymmetry of information is always in existence, even between various divisions within the same firm. Thus, it is vital for any firm to take into account the effectiveness of the network relationship among workers. Nevertheless, there could be cases in which social ties among peers may work against the entire performance of a firm. Under such circumstances, exclusive social ties exist and may have negative implications. Intangible factors, such as motivation, creativity, engagement, vision, attitudes, values at individual level, openness, transparency, value-based and a vision-focused management style, contributes to the development of a productive corporate culture. Since improvement is primarily a social change process, the existence of trust between management and staff, on the one hand, and among the staff, on the other hand, plays a critical role in formulating and

implementing improvement plans (Sims, 2006).

Productivity, social networks and social capital have an interactive influence on each other. Workers and professionals need to mobilise others' support and advice well beyond the hierarchical structure of an organisation, in order to get things done. This can be accomplished through a synthesis and coordination of different employees and departments, in order to direct their efforts towards the common goals of an organisation. Thus, cooperation and coordination require the active participation of employees in various departments across various levels (Gabby & Leenders, 1999).

Productivity improvement is primarily a social change process. The change in the process, structure, products, services and other factors of improvement are fundamentally the contribution of the creative abilities, knowledge, attitude, habits and skills of people. The application of productivity improvement tools and techniques and effective implementation of solutions is a function of the commitment of the people concerned (Nahapiet & Ghoshal, 2000).

During the process of investigation, alternative ways of doing things may evolve, and upon implementation, many problems are encountered. The concerned actors normally turn to others, who might have encountered and solved similar problems within and without the organisation, for help and assistance. A replication of better ways of doing things and the application of benchmarking are accepted strategies of improving productivity. However, building positive relationships facilitates the acquisition of information on what is happening in other organisations and departments. Often, the

experience of others, interpersonal relations and networks also prove to be useful in meeting this end (Lesser, 2000).

Societies and organisations have different social norms. To some extent, organisations reflect the norms prevalent in society. In the context of productivity, the specific norms that are prevalent in an organisation have an impact on its level of performance and growth rates. These organisational social norms are the respect for merit, concern for external stakeholders, solving problems, sharing information, providing feedbacks, and abiding by the rules and regulations of a company. Some organisational norms include professional honesty, coaching and advising juniors, adherence to quality standards by doing one's best and learning. Degree of cooperation and coordination, providing help to others at the professional and personal level, openness and action orientation are other norms that can boost a group's or an organisation's performance level and rates of growth (Burt, 2001).

Conceptual framework for social networks and rural agricultural development

The conceptual framework creates a synergy among the main variables underpinning the study, namely: social networks and rural agricultural development. Figure 1 shows the nexus between social networks and rural agriculture.

From Figure 1, it is clear that social networks have many characteristics. These characteristics vary in terms of structure, content and function. The structure of a network targets the physical aspects of the

network defined in terms of size, density, and types of relationships. The structure of a network influences patterns of decisions in agricultural activities.

Content is concerned with what flows across network ties. It serves as channels for the transfer of material and non-material resources. Among the resources that flow across networks are information, time, expertise, money, and shared activities. In the agricultural sector, access to information borders on knowledge creation and sharing, which relates to information on planting materials, credit and application of relevant technology. Others include getting advice regarding cultivation, obtaining appropriate seeds and getting tools and farm implements.

The functions of networks include social support; companionship; appraisal; and monitoring. While social support encompasses emotional support and instrumental support, companionship is measured by the frequency of participation in social activities outside the work context. In monitoring, networks watch, discipline or regulate social actors (Pearlin & Aneshensel, 1986), while appraisal targets network assistance in evaluating a problem. Through the interplay of network structure, content and function, resources are generated and mobilised for rural agricultural activities. Some of these resources or benefits include access to and exchange of information, innovation promotion, access to credit for farm activities, natural resource management and mutual help. These positive externalities contribute to rural agricultural development.

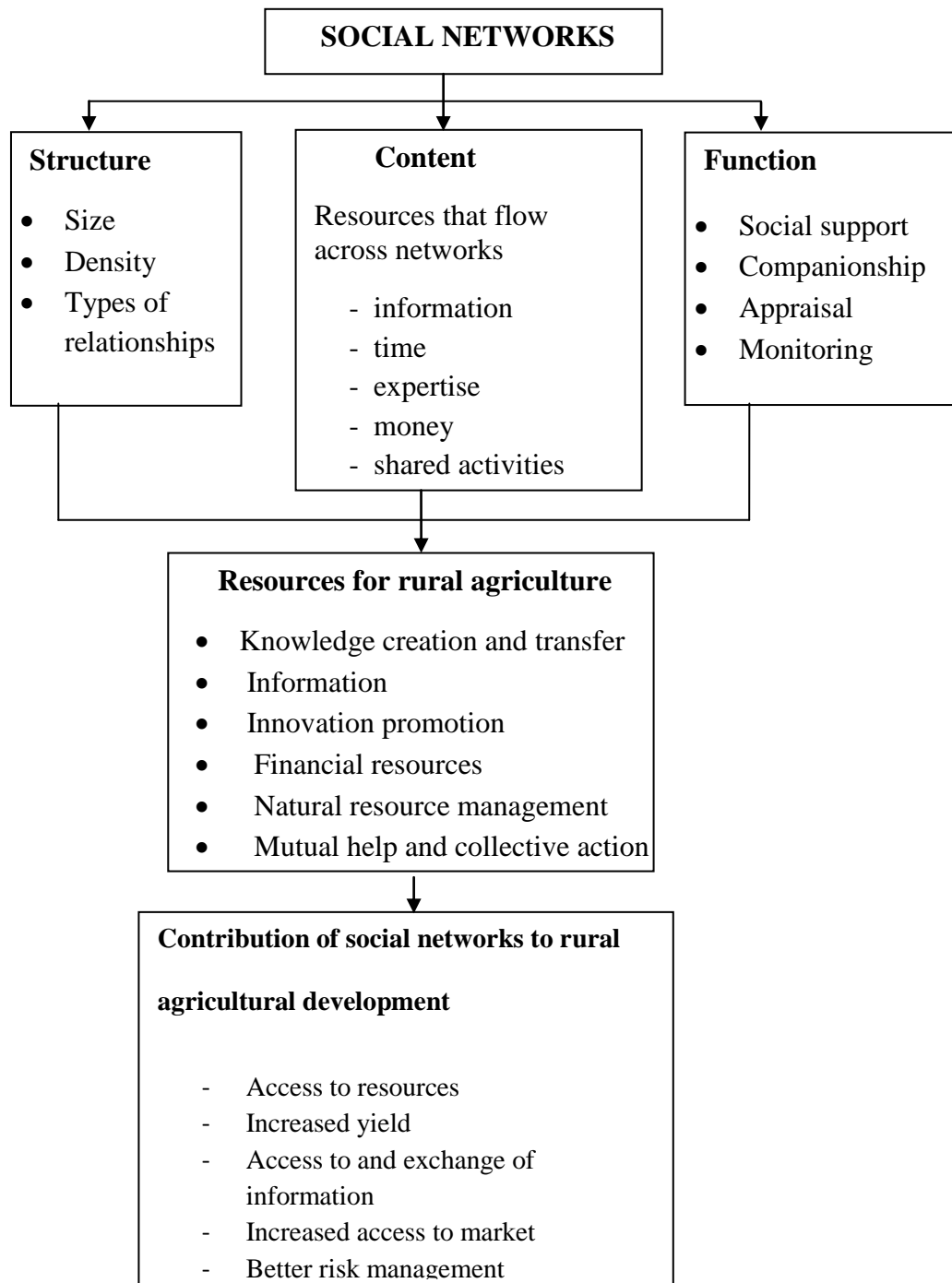


Figure 1: Conceptual framework for social networks and rural agricultural development

Source: Author's construct, 2013

Summary

A review of the relevant theoretical, conceptual and empirical works unearths that social network is formed through mutual and continuous interactions, physical proximity, trust, reciprocity, shared interests and socialisation. Social networks consist of a set of actors or nodes with a set of ties, edges or relations. The actors may be individuals, groups, organisations or societies. The relationship or the tie flow material and non-material resources. These resources include social support, emotional support, companionship, time, information, expertise, money, business transaction and shared activity. Resources shared across ties are generally finite and scarce and the position of actors influences how much resources they can access from the network.

It became evident from the review that networks are different from groups in that networks do not have natural boundaries. An actor in a network plays different roles and by playing these roles, the individual interacts and the identity of the individual invites other actors in the network. More importantly, social networks vary with respect to the ties that link the nodes. Among the ties identified to distinguish networks are communication ties, formal ties, affective ties, material ties, proximity ties and cognitive ties. These ties can be grouped into two main types: state ties and event ties. Kinship ties, role based ties, cognitive ties or affective ties are examples of state ties. State ties have continuity over time because of their open ended persistence. Event type ties on the other hand include email exchanges, telephone conversations and transactions. These ties are direct and transitory and because of that they can be counted.

The strength of a tie is formed by the combination of the amount of time, the emotional intensity, the intimacy or the mutual confiding and the reciprocal services that characterize the tie. These characteristics of the strength of a tie can make it strong or weak. Strong ties link people and other close friends and relations while weak ties link people and other mere acquaintances. Where as strong ties make actors' world overlap, weak ties are a potential source of novel ideas.

The review further showed that social network work on a number of core principles. First, social actors shape their everyday lives through consultation, information and resource sharing, suggestion and support. Second, because it is difficult to understand people's behaviour in isolation, and also in segments, researchers often focus on the relationship of units and not the units themselves. Third, in order to ensure independence among units, a population or a sample must be defined relationally and not categorically. Fourth, in order to understand social relations it is important to go beyond a mere aggregation of the dyadic ties. Fifth, groups sometimes have fuzzy rather than firm boundaries. From these principles, it is learnt that social networks have dynamic quality with the structure of the system changing and shifting patterns of coalition and conflict.

One other important issue that became clear from the review is that social networks can have structural holes which individuals can capitalise on to maximise their social capital. This is achieved when actors are able to broker the flow of knowledge and information between those who are not directly connected.

With regard to the approaches to social network studies, the literature

revealed four main approaches in which the idea of social networks has been incorporated in research. The approaches are: the complete or full network approach; the local or the ego-centered approach; the social support approach; and the social capital approach. The full network approach describes and analyse whole network system by considering all tie in a network system. The ego-centered approach focuses on a set of social actors who are defined as the sample. The social support approach is seen primarily as resources available from families, friends, organisations and other actors. Researchers often tend to use a summary of social integration strategy by looking less at social network structures. The social capital tradition focuses on the resources that accrue to social actors from individuals to nations as a result of networks.

In studying social networks, researchers look at both formal and informal relations. Most studies on social networks have measured network relations using broad indicators like information, support, companionship, hindrance and superficiality. Issues on information in social network studies are related to advice networks which concern knowledge creation and knowledge sharing. Social support encompasses emotional support and instrumental support. Companionship is measured by the frequency of participation in social activities outside the work context.

In the agricultural sector, discussion on social networks have been limited to vertical networks even though some studies have pushed beyond the frontiers of vertical networks. Those researchers that push beyond vertical networks have been concerned with horizontal networks because horizontal networks look at the integration of non-agricultural rural economies into a set

of processes that straddle both urban and rural areas. More importantly, horizontal networks are concerned with new networks of innovation and learning which are central to rural agricultural development.

Finally, various indicators have been used as proxies for agricultural development. Among the indicators are transfer of knowledge, access to information and information exchange, development of and accessibility to market, risk management and access to credit. Other variables include technology adoption, natural resource management, promotion of innovation and mutual help and collective action.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter discusses the research procedures adopted for the study. It begins with the description of the study area and a review of the competing research paradigms, followed by a description of the study design. These are followed by discussion of the target populations, and sampling procedures. The last sections deal with data sources, instruments for data collection, fieldwork, data processing and analysis as well as ethical considerations of the study.

Study area

The study took place in some selected rural communities in the Central Region of Ghana. Ghana, a West African country that lies between latitudes 5°, 36 minutes north and 0°, 10 minutes east. From the coast, the country extends inland to latitude 11° north, covering a distance of 672 kilometres from south to north. It has a total land area of 239, 460 square kilometres. The distance across the widest part from east to west measures about 536 kilometres. To the east of Ghana lies Togo, on the west is La Cote d'Ivoire, and on the north is the Republic of Burkina Faso.

Ghana's population was estimated to be 25, 824, 920 million in 2012 (Ghana Statistical Service, 2015), with a growth rate of 2.4 percent. Temperatures are high, with little variation from year to year. Average

maximum temperatures are highest in March over most of the country and average minimum temperatures are lowest in August and December. Rainfall in Ghana is markedly seasonal in character at all places, with great variability in monthly and yearly totals. Climatic factors, particularly rainfall, are often considered to be of the greatest importance. Much of the present vegetation is essentially related to rainfall.

About 49 percent of the people of Ghana live in rural areas with urban concentration in Accra, the capital city, Tema, Kumasi and Sekondi-Takoradi. The major occupation is farming, employing about 56.2 percent of the population (Ministry of Food and Agriculture, 2011). Farming is done on subsistence level and depends on the vagaries of the weather. The major crops produced in Ghana are cash and food crops, with cocoa being the dominant cash crop. These agricultural activities are done in all the regions in the country.

The Central Region is one of the most densely populated regions of Ghana. The region occupies a land area of 9,826 square kilometres; out of which 7,864 is cultivable (MoFA, 2007). Land is mostly owned by chiefs and families and the tenancy agreement is mainly by share cropping. The region is represented by four distinct vegetation zones. These are: mangrove swamps, coastal savannah, moist semi-deciduous forest, and the tropical rain forest.

Two communities each were selected from the Twifo-Heman-Lower-Denkyira District and the Assin South District. These districts were selected because they contribute more in terms of food and cash crop productions to the economy of the Central Region (Ministry of Food and Agriculture, 2011).

The two most populated migrant (settler) communities in the study districts were selected for the study. Also two indigenous dominated communities that produce more in terms of food and cash crop production to the economies of their districts were selected for the study. Kwaata (an indigenous dominated community) and Ahomaho (a migrant dominated community) were selected from the Assin South District, while Kyirenkum (a migrant dominated community) and Adugyaa (an indigenous dominated community) were selected from the Twifo-Heman-Lower-Denkyira District. The profile of the selected communities is discussed in detail.

Kwaata

Kwaata, an indigenous farming community, is about five kilometres from Assin Fosu. The people are mainly Assins, belonging to the Oyoko Clan. They originally migrated from Ashanti in the early 16th Century. Kwaata used to be a trading centre, playing host to many traders who travelled far and near to trade in cocoa, cola, rubber, palm oil and other foodstuffs. However, the trading activities have ceased and the community is solely into farming. The major crops grown by the farmers include: cocoa, oil palm, citrus, maize, cassava, and plantain. Formal and informal agricultural groups are organised along the crops grown in the community. Farm lands in the community are owned by families, and family heads supervise the distribution of lands.

The total population of Kwaata was estimated to be 1182 at the time of the study. Out of this number, 580 were males, while 602 were females. The adult population was estimated to be 675, using an annual growth rate of

2.4 percent (Ghana Statistical Service, 2002). The community is mainly dominated by Assins, with about 2 percent of the population being other tribes. Tuesdays and Fridays are days for communal activities. The road network in the community is good. There is a small market that serves only the locals. The community has a basic school but no health facility, public place of convenience, and community centre.

Ahomaho

Ahomaho, a migrant farming community, is about 18 kilometres from Assin Fosu. The community was about 113 years old as at 2013. In 1901, a farmer from Abirem in the Eastern part of Ghana settled in this village to do farming. The community takes its name from a rope believed to have supernatural powers. The government of Ghana, through legislation, has set aside some of the farmlands in the area as forest reserves.

The total population of Ahomaho was estimated to be 821 at the time of the study. Out of this number, 402 were males, while 419 were females. The adult population was estimated to be 469, using an annual growth rate of 2.4 percent (Ghana Statistical Service, 2002). The people of Ahomaho are farmers whose livelihoods depend on tilling the land. Among the crops grown in the area are cocoa, oil palm, cassava, plantain, citrus, maize and vegetables. The community has a school, and a clinic, which was under construction at the time of the study, but no market and community centre. The road networks in and around the community are not good and farmers often find it difficult to transport their produce to nearby market centres.

Kyirenkum

Kyirenkum is a migrant (settler) community in the Twifo-Heman-Lower-Denkyira District. The community takes its name from River Kyirenkum. The majority of the farmers come from Akwapim in the Eastern part of Ghana. The total population of Kyirenkum was estimated to be 1,043 at the time of the study. Out of this number, 511 were males, while 532 were females. The adult population was estimated to be 596, using an annual growth rate of 2.4 percent (Ghana Statistical Service, 2002). The dominant crop produced by the farmers in Kyirenkum is cocoa. Other crops, such as maize, cassava, plantain, and vegetables, are produced as well but in small quantities.

Kyirenkum has a basic school, up to the Junior High School level. Wednesdays are market days of the community. The town serves as a centre of trading activities for surrounding villages. The road networks linking the community to towns and villages were in a bad shape at the time of the study. The majority of the people are Christians, with a few Muslims. Communal activities are often organised where people volunteer to do community work.

Adugyaa

Adugyaa is an old farming community in the Twifo-Heman-Lower-Denkyira District. The people migrated from Ashanti Mampong and settled there in the 18th Century. The Chief of the community is the leader of the battalion to the Twifo Traditional Area. There are many rivers and streams close to the town. These include: River Boating, Osin, Sarpong, Buebue, Tseasadua and Abroboro. Apart from the farm lands available to farmers,

there are also virgin forests. There are several bamboo and rock deposits. Farmers in this town cultivate cocoa, oil palm and other food crops.

The people of Adugyaa celebrate Odwira festival in addition to other local festivals. Funerals, child naming, church activities and marriage ceremonies are common in the town. The town has a basic school. There is, however, no public place of convenience, community centre, market and football field. The total population of Adugyaa was estimated to be 603 at the time of the study. Out of this number, 295 were males, while 306 were females. The adult population was estimated to be 344, using an annual growth rate of 2.4 percent (Ghana Statistical Service, 2002)

Figure 2 presents the map of the Assin South District, showing Kwaata and Ahomaho, while Figure 3 presents the map of Twifo-Heman-Lower Denkyira District, showing Adugyaa and Kyirenkum.

Research approaches in social network studies

Over the years, social network analysis has been driven by quantitative research methodology, using primarily surveys and maps. Researchers using this methodological approach measure the structural properties, using sophisticated quantitative techniques (Carrington et al., 2005). In spite of the dominance of quantitative approach in exploring social network, there is also qualitatively-driven approach to social network analysis (Heath et al., 2009), which builds upon anthropology network studies (Mitchel, 1969) and generates observational, narrative and visual data on social relations by using ethnography (Trotter, 1999), in-depth interviews

(Pahl & Spencer, 2004) and participatory mapping techniques (Emmel, 2008). In the social sciences, and especially in sociology, there have been

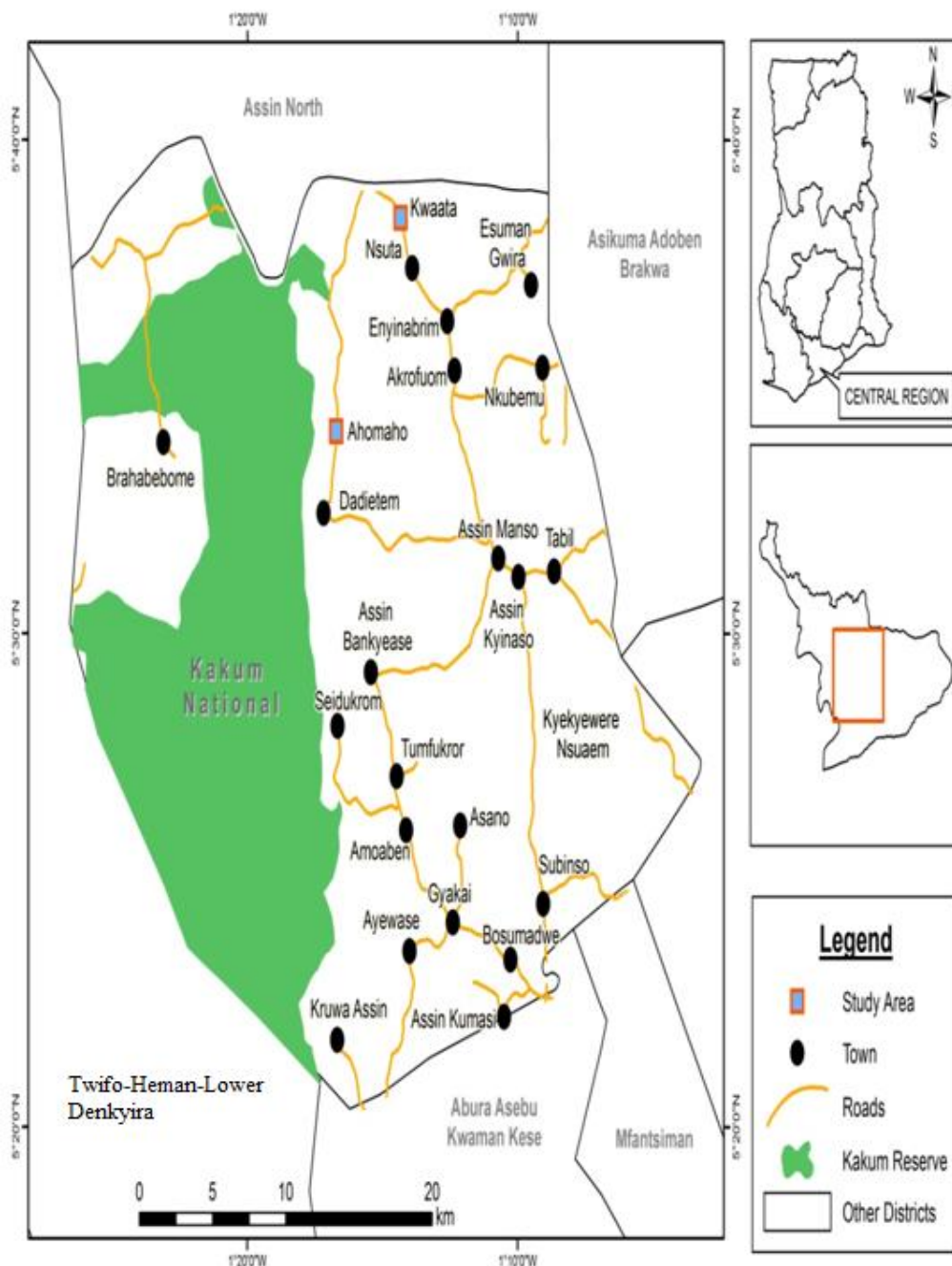


Figure 2: Map of the Assin South District, showing Kwaata and Ahomaho

Source: Department of Geography and Regional Planning, UCC, 2013

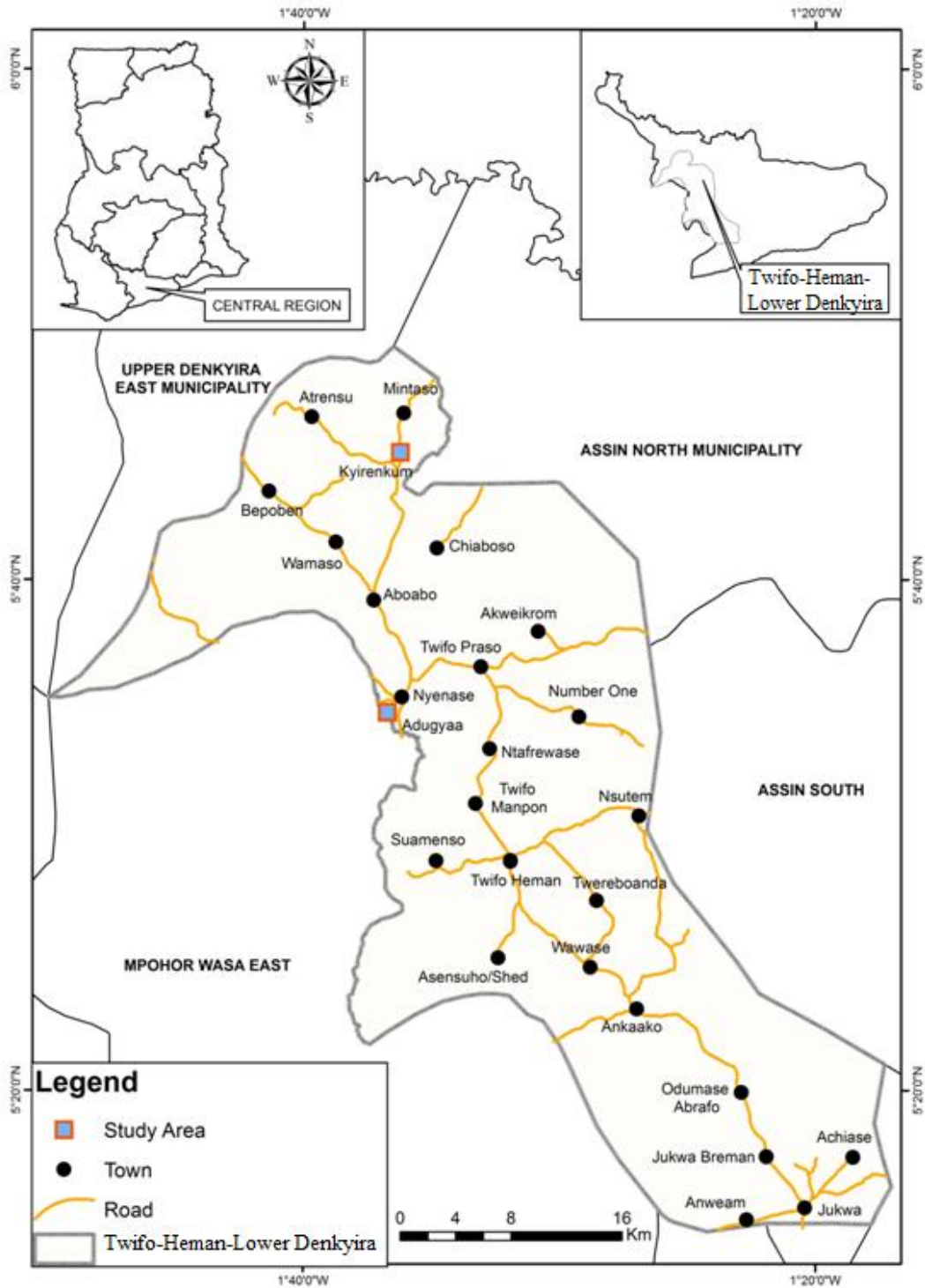


Figure 3: Map of the Twifo-Heman-Lower Denkyira District, showing Adugyaa and Kyirenkum

Source: Department of Geography and Regional Planning, UCC, 2013

theoretical calls for researchers to integrate both quantitative and qualitative approaches in social network analysis (Crossley, 2009; Edwards, 2010). Similar calls have been made in anthropology (Knox et al, 2006). The issue of combining qualitative and quantitative approaches to social network analysis is of particular interest in the wider context of debate over mixing methods in the social sciences. This is because some network analysts, according to Edwards and Crossley (2009), have argued not only that it is desirable to combine both approaches, but that social network analysis presents a specific opportunity to mix methods because of its dual interest in both the structure or form of social relations, and the interactional processes which generate these structures, and have to be understood by exploring the content and perception of the network. McLean (2007) and Clark (2007) have also supported the debate of incorporating qualitative approach in social network analysis by stressing the importance of culture, narrative, content, and context to the ways in which networks, especially those constituted by human interactions, operate and can be understood.

Qualitative and quantitative approaches are complementary rather than opposing. Qualitative approaches offer what quantitative approaches cannot. According to Edwards (2010), qualitative approaches add an awareness of process, change, content and context. For example, Peay (1980) has posited that mapping and measuring of social relations necessarily reduces them to binary categories, and questions as to the quality and/or strength of relations cannot be adequately captured by adding extra numerical detail.

However, in spite of the lead taken by quantitative measurements in

network analysis, as posited by Snijder (2001), “issues pertaining to the content, meaning and timing of ties, thus, remain, and these questions are often those of crucial importance to understanding the kind of human interaction networks studied by social scientists” (Snijder, 2001, cited in Edwards, 2010, p. 6). Edwards further notes that a mixed-method approach enables researchers to both map and measure network properties and to explore issues relating to the construction, reproduction, variability and dynamics of network ties, and crucially, in most cases, the meaning that ties have for those involved.

Qualitative social network analysis has been less interested in resource exchange, and more interested in exploring the lived experience of social networks (Emmel & Clark, 2009); what passes through network (Crow, 2004); and the spatial embedding of network ties (Clark, 2007). It also examines the consequences of network dynamics for inequality in social life (Heath et al., 2009). Social network analysis either requires data on the whole network, in which case boundaries of the population of interest must be drawn, or upon personal networks where all the ties of the individual ego are recorded with the ties between their alters (Edwards, 2010). These are called ego-networks. Qualitative social network analysis often focuses upon personal networks (ego-networks) rather than whole networks, raising important questions about how the boundaries of social networks can be drawn.

Various methodological approaches and strategies have been employed in qualitative social network analysis to generate and analyse relational data (Edwards, 2010). For example, anthropological studies, such

as those of the early Manchester School of Social Network Analysis, popularised the use of ethnography in social network research (Trotter, 1999). Ethnographic methods have also been used in a study on networks communities and neighbourhood (Emmel & Clark, 2009). The study employed personal social networks in Leeds and adopted a range of qualitative methods to look at how social networks are experienced and how they are embedded in spatial and temporal contexts.

Among the methods that have been employed in qualitative social network research are: “participant observation; walking interviews; diaries of communicative practices; and participatory visual mapping techniques. Participatory mapping is employed within the context of an in-depth interview and is used as a name generating tool” (Edwards, 2010, p.8). In participatory mapping, for example, the participant is asked to freely create a visual map of their social network using pens and paper (network card), and the interviewer uses this process to probe the ways in which the participant has chosen to represent their network, and their perception and experience of the network (Emmel, 2008). According to Emmel and Clark (2009), visual mapping techniques are useful because they enable participants to move from description of social practices, to their elaboration and theorisation. In addition, qualitative uses of participatory mapping have adopted the concentric circles (network cards) approach, where participants are asked to place contacts within different rings on a sheet of paper with those close to them at the centre (Pahl & Spencer, 2004).

The concentric circles approach in ego-centric network analysis mostly uses the name generator. The name generator consists of free recall

questions that elicit alters from ego's networks (Marsden, 2005). The name generator is important in network research because it is capable of measuring network tie strength between egos and alters, and between alters and alters pairs. The concentric circles, again, help the researcher to collect network data in an intuitive and easy way from respondents, lowering their burden, especially in the case of senior and less educated people, and also facilitate the incorporation of the highest possible number of network members of interest. It makes connectivity recording easier, more reliable, and more complete (Carrasco, Hogan, Wellman & Miller, 2006).

Aside from the participatory visual mapping techniques, in-depth interviews with both egos and alters have also been used in qualitative network analysis (Edwards, 2010). Heath et al. (2009), for example, sampled 16 egos and, through them, gained access to 107 interviews with alters. Importantly, this method differs from other ego-network studies (such as name-generator questionnaires) in that it does not rely solely upon ego to provide information about alters but conducts interviews with alters as well (Edwards, 2010).

In addition to the qualitative approaches to social network analysis, some researchers have used quantitative approaches. In formal social network analysis, relational data have been predominantly collated using quantitative methods, such as name-generator surveys, which produce numerical data on the presence or absence of ties and, in some cases, tie strength, such as frequency of contact (Edwards, 2010). In 1982, Fischer used this approach to gather data on the ties of egos and their alters (Fischer, 1982). This approach usually begins by asking actors to list everyone who they know. According to

Wellman (1990), respondents are, at times, asked to list a limited number of people outside their home that they felt closest to. Also less conventional, data for use in formal social network analysis can sometimes be generated by qualitative methods like observation, interviews, and archival research, where narrative data are subsequently quantified (Edwards & Crossley, 2009).

Scott (2000, p.13) has noted that “the structure of social relations can be analysed from the perspective of all actors in the network at the same time, and not just one individual perspective”. Some researchers are of the view that social networks would remain a metaphor in social research without these techniques (Knox et al., 2006). It is nonetheless the case that these quantitative approaches have achieved a position of dominance so much so that some researchers have been keen to express the value of qualitative approaches to social network analysis. Crossley (2009, p. 21) for instance, has noted that “network structure is not the whole story...and for that reason we need to supplement methods of formal network analysis with qualitative observations about what is going on within a network”. As a result, some researchers have opted for a purely qualitative approach to social network analysis (Crossley, 2009; Heath et al., 2009). However, in the main, the response has been to try to find ways to mix both quantitative and qualitative approaches in network research (Edwards & Crossley, 2009).

The numerous calls for the revival of qualitative methods in network research point to the entrenched dominance of quantitative approaches in social network analysis. Various data collection methods in network studies point to this fact (Edwards, 2010). In spite of the roots of social network analysis in ethnography, “the key method of collecting relational data in

network studies has been the name-generating survey” (Knox et al., 2006, p.119). Those researchers who have been pushing for the re-introduction of qualitative approaches are, according to Edwards (2010), also right in acknowledging the predominance of qualitative methods in analysing network data.

With respect to the above debate on using both approaches, there has been a body of social network analysis research which has combined quantitative techniques with qualitative approaches in network research. However, as Edwards (2010) argues, the approach of researchers, with respect to using mixed methods, has been varied, as has the extent to which they posit broader argument about the benefits of, or desirability of, mixed/methods approaches. Edwards further notes that one of the clearest means by which quantitative social network analysis has been combined with qualitative approaches is by adopting qualitative methods for collecting relational data. In particular, ethnographic observations and semi-structured interviews have been used as name-generators in a similar way to name-generating surveys.

Study design

Based on the arguments of the various competing paradigms of research in social network analysis, a mixed research design was chosen for the study. This is because the data collected from the study were analysed using qualitative and quantitative approaches. Variables, such as network characteristics, roles of networks, mobilisation of networks and the utilisation of networks were measured qualitatively. Other variables, such as size and

density of networks, farm size and output, were examined quantitatively.

The study design was exploratory and cross-sectional. It was exploratory because the study sought to fill empirical and methodological gaps using the ego-centred approach to social network studies. It was cross-sectional because the study measured the prevalence of all the characteristics of interest in the target population. In a cross-sectional survey research, according to Frankfort-Nachmias and Nachmias (1996), researchers usually ask a random sample of individuals to respond to a set of questions about their backgrounds, past experiences, and attitudes. The unique features of this design are that it is executed within a limited time frame, it studies the relationship between different variables at a single point in time and, as well, shows how variables affect each other. It involves a snapshot observation of a subset of a population. Cross-sectional research designs describe the current nature and conditions that exist (Sarantakos, 2005).

Different types of network relations were considered: they were forms of communication, formal and informal contacts, experience with others as well as flow of information. According to Marquardt, Mollers and Buctienrieder (2012), these relations are vital in any social network studies. The properties of networks that were considered were: network size, network density, degree of networks and network centralisation. With respect to rural agricultural development, the study considered some rural agricultural activities. They included: access to land, land preparation, planting, harvesting, storage and marketing of agricultural produce.

Study population

The study population was made up of farmers in selected rural communities in the Assin South and the Twifo-Heman-Lower Denkyira Districts of the Central Region of Ghana. The communities were: Ahomaho, Kwaata, Kyirenkum and Adugyaa. The total population in the selected communities was estimated to be 3,649, using the growth rate of 2.7 percent for the selected districts. The details of the study population are presented in Table 2.

Table 2: Distribution of the study population by district and community

District	Community	Population	
		No.	Percent
Assin South	Ahomaho	821	22.5
Assin South	Kwaata	1,182	32.4
Twifo-Heman-Lower Denkyira	Kyirenkum	1,043	28.6
Twifo-Heman-Lower Denkyira	Adugyaa	603	16.5
Total		3,649	100.0

Source: Fieldwork, 2013

Sampling procedures

The multi-stage sampling technique was applied to generate the sample size. The population was first stratified into communities. The working population in each of the communities formed the target population. The working population, according to the Ghana Statistical Service (2000), is 57.1 percent of the total population. The total working population in the

selected communities was 2,084. Krejcie and Morgan's table for the determination of the sample size for a given population was adopted to derive a sample of 327 farmers who were selected from a population of 2,084. The table computes the sample size by taking into consideration the chi-square for 1 degree of freedom, the population size, the population proportion, which is set at 0.50, and the degree of accuracy, which is set at 0.05. Proportionate sampling was then applied to generate the sample.

The egocentric approach was used to constitute the sample. First, two farmers, made up of a male and a female, were accidentally selected in each of the communities from which their networks were generated. After eliciting the network members, the snowball technique was used to select the respondents until the theoretical sample of 327 was obtained. In Ahomaho, for example, 74 farmers, made up of 44 males and 30 females were selected for the study while in Kwaata 106 farmers made up of 54 male and 52 females were selected. After the accidental sampling of the two egos, the snowball technique was used to select 72 alters of the two egos. The same procedure was applied to generate the sample for all the communities. This method is considered appropriate in social network studies (Hannemann, 2001; Scott, 2001) because, according to Marsden (1990), there are no firm guidelines with respect to sampling in egocentric approach to social network analysis. The sampling distribution of farmers by community is presented in Table 3.

In addition, three key informants were selected from each community. These informants comprised the chief, the chief farmer, and a leader of an agricultural group or association.

Table 3: Sampling distribution of farmers by community

Community	Working population	No. Sampled	Percent
Ahomaho	468	74	22.6
Kwaata	675	106	32.4
Kyirenkum	595	94	28.8
Adugyaa	344	53	16.2
Total	2,084	327	100.0

Source: Fieldwork, 2013

Sources of data

Data were collected from both primary and secondary sources. The primary sources of information were collected using an interview schedule, community profiling guide and an interview guide. Farmers and the key informants provided the primary data for the study. Secondary data were gathered from the records keeping books of the sampled farmers.

Data collection instruments

In all, three (3) data collection instruments were used for the study. An interview schedule was the main instrument used to collect data from the farmers. Aside from the interview schedule, an in-depth interview guide was also used to collect data from the key informants. The communities were profiled, using a community profiling guide.

The interview schedule was considered the most appropriate for the farmers because the level of education of the respondents was low. Questions

that were asked on the interview schedule were based on the specific objectives of the study. The interview schedule was divided into four sections. Section One focused on the background characteristics of respondents. Questions that were asked in Section Two examined the characteristics of networks in the study communities. In Section Three, questions that related to the mobilisation and utilisation of social networks among rural farmers were posed, while Section Four explored the relationships among social networks, community characteristics, local conditions and rural agricultural development.

The in-depth interview guide was used to collect data from the chiefs, chief farmers and leaders of agricultural associations. Information collected via the interview guide focused on how agricultural activities were organised; how groups and association members contributed to agricultural activities; how networks were maintained and destroyed; and how networks were mobilised among farmers.

The community profiling guide captured information on the history of the communities; religious and ethnic compositions; groups and associations and their functions; farming seasons and the state of infrastructure, such as road, telecommunication, market, health facilities, playing fields and schools. Other items on the community profiling guide were: resources in the communities, distance from community to nearest market and towns and villages, and the problems faced by the communities.

Pre-test of field instruments

Four field assistants were recruited and trained for the fieldwork. A

translator was hired to help with the translation of the items on the interview schedule and the interview guide into the local language of the respondents. The instruments were first pre-tested in Ayensudo, a farming community in the Komenda-Edina-Eguafo-Abrem Municipality. There were some problems with the translations of some of the questions. The affected questions were identified and rephrased before the actual fieldwork. The researcher made reconnaissance visits to the study communities as part of the community entry protocols.

Fieldwork

The fieldwork was done in two phases. The first phase, which involved the collection of data from farmers, started on 1st August, 2013 and ended on 13th November, 2013. Each interview lasted for about one hour, 30 minutes. The fieldwork began from Ahomaho on the 1st of August, 2013. In Ahomaho, two farmers were accidentally selected as egos, and their alters studied. The first farmer was a 46 year-old female farmer. This farmer cultivated cocoa, oil palm, cassava, plantain and vegetables. The woman was a member of the Cocoa Abrabopa Association and the Pentecost Church. She was married with six children. Two of her children were married. The male farmer, on the other hand, was 57 years old who had two wives and 10 children. This man had lived in the community from birth. According to him, he inherited several acres of cocoa from his late father. Aside from the cocoa farm inherited from the father, he had other farms which included: five acres of oil palm, three acres of cassava, and six acres of citrus. This man had been a member of the Cocoa Abrabopa Association for the past 15 years.

After the selection of the two egos, their networks were listed and the researcher, together with the field assistants, contacted those who were farmers. The alters of the alters who were involved in farming were also contacted. The process was repeated until 74 farmers were interviewed.

The second community that the researcher visited was Kwaata. Kwaata, an indigenous farming community in the Assin South District, is located on the Cape Coast-Kumasi trunk road. The caretaker chief, who also doubled as the chief farmer of the community, was the first ego to be selected. This man was 76 years old and a widower with five children. All the children lived in different communities with their partners. He was a Christian who was educated up to the secondary school level. Most of the contacts (alters) of this ego were elderly with few young ones. In addition, a 38 year-old female farmer was accidentally selected as the second ego. She was a Christian and married with three children. She cultivated maize, plantain, cassava and vegetables and also processed the husband's palm fruits into palm oil. Most of her alters were females of similar age, with some male contacts who also happened to be in the network of the husband. The woman was a member of the female association of the Christ Apostolic Church. The alters of the two egos were listed and those involved in agriculture were contacted. As was the case in Homaho, some of the networks of the alters were also contacted until the researcher had the required sample for the community.

The third community that the researcher and his team went to was Adugyaa. After observing community entry protocols, a male and a female farmer were accidentally selected to form the egos around which alters were

selected and interviewed. The female ego was 43 years old. She was married with five children. All her children were in school at the time of the interview. This woman had many contacts outside her community of residence. She was a member of the Akoafo Adamfa, an agricultural association, and a leader of the Women's Fellowship of the Methodist Church. She was into the cultivation of cocoa, cassava and maize. The male ego selected from this community was a member of the Unit Committee that sees to the development of the community. He was 40 years old and married with three children. He cultivated cocoa, oil palm, cassava, maize and plantain. The farmer was a Christian and belonged to two agricultural associations. In all 53 farmers, made up of 34 males and 19 females, were interviewed in this community.

The final community was Kyirenkum. As part of the process to get the theoretical sample of 94 for Kyirenkum, two farmers were accidentally selected to form the egos upon whom alters were sampled for the study. The first ego selected was a 47 year-old cocoa farmer who was married with six children. Two of her children were married, while the rest were in school. This farmer was an elder of the Church of Pentecost and a member of the Parent-Teacher-Association and Cocoa Abrabopa Association. Apart from engaging in agriculture, he repaired agricultural tools and equipment. Apart from cocoa, he cultivated maize, cassava and plantain. The second ego selected was a female who was married with three kids. She was 38 years old. Her husband was the linguist to the chief of Kyirenkum. Apart from cultivating mainly vegetables and cassava, she was also responsible for selling the farm produce of the husband. She was not a member of any

agricultural association but played an important role in church activities. The contacts of the two egos were listed and a sample of 94 was selected for the community, using the snowball approach.

The second phase of the fieldwork, involving the collection of mainly qualitative data, started on 5th May, 2014 and ended on 24th July, 2014. The researcher first profiled the communities, using a community profiling guide. After the profiling of the communities, in-depth interviews were conducted with the chiefs, chief farmers and the heads of agricultural groups and associations.

The major problem faced during the fieldwork was the difficulty in accessing the communities due to the poor state of the road networks in Assin Ahomaho, Adugyaa and Kyirenkum. Another problem that came up was getting the respondents to take part in the research since the data collection was done in the minor farming season. The researcher overcame this by visiting the respondents on Sundays and market days when most of the farmers did not go to farm. On the whole, even though the exercise was difficult and challenging, the experience was worthwhile.

Ethical considerations

The study methodology was subjected to official ethical considerations. The researcher ensured that the methodological approach of the study did not violate research ethics. Respondents who participated in the study were briefed on the objectives of the study and their consent sought. Under no situation was any respondent coerced to participate in the study. Strict confidentiality of the information the respondents provided was

adhered to. In addition, all protocols, with respect to community entry, were observed.

Data processing and analysis

The data from the field were coded and processed, using Version 21 of the Statistical Product and Services Solutions (SPSS) software. The information was based on the objectives and the conceptual framework of the study. An analytical approach that comprised quantitative and qualitative methods was used. The qualitative data were transcribed and analysed with respect to the conceptual themes of the study. The quantitative data were analysed using mainly tables that showed the frequency and percentage distributions of the relevant variables. The chi-square statistic test was used to explore the associations among social networks, community characteristics, extra local factors, local conditions and rural agricultural development. The Kruskal Wallis test was used to examine the difference in network sizes and densities among the communities. The relationships between networks size, density and yield and income from crops were tested using the Spearman's rank order correlation analysis.

Analysis of data was done in three chapters (Chapters Four, Five and Six). Chapter Four presents a discussion from the field findings on the profile of respondents as well as the role of social network characteristics of the networks in rural agricultural development. In Chapter Five, issues concerning how rural farmers mobilise and utilise social networks for their agricultural activities are discussed, while Chapter Six explores the

relationships among social networks, community characteristics, local conditions and rural agricultural development.

CHAPTER FOUR

ROLE OF SOCIAL NETWORK CHARACTERISTICS IN RURAL AGRICULTURAL DEVELOPMENT

Introduction

This chapter presents a discussion on the profile of respondents and the different characteristics of social networks in the study communities. A number of questions were posed to elicit responses on the dynamics of networks among rural farmers. Among the network characteristics that emerged from the study were: structure, content and function. These characteristics took many forms, which included: advice networks, market networks and support networks. These networks were used at different stages of agricultural activities. The details are presented in the discussion that follows.

Profile of respondents

The background information of respondents examined were: sex, age, marital status, religion, educational level and number of children. The details of the background characteristics of the respondents are discussed in the subsequent sections.

Sex

One of the background characteristics of respondents examined was

sex. Out of the 327 respondents, 58.7 percent were males, the rest (41.3%) were females. About 64 percent of the respondents from Adugyaa and Kyirenkum were males as compared to 59.5 percent and 50.9 percent from Ahomaho and Kwaata respectively. Among the communities, Kwaata had the highest number (49.1%) of female respondents followed by Ahomaho (40.5%), while Adugyaa had the least (35.9%). The details of the distribution of sex of respondents by community are presented in Table 4.

Table 4: Sex distribution of respondents by community

Sex	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Male	34	64.2	44	59.5	54	50.9	60	63.8	192	58.7
Female	19	35.8	30	40.5	52	49.1	34	36.2	135	41.3
Total	53	100.0	74	100.0	106	100.0	94	100.0	327	100.0

Source: Fieldwork, 2013

Age

The study also examined the age of the respondents. While the youngest respondent interviewed was 18 years, the oldest was 82 years. The mean age was 46.29 (skewness = 0.308), with a standard deviation of 13.8 years. About 50 percent of the respondents were in the 39 – 60 age-group. The rest were either below 39 years (32.9%) or more than 60 years (17.7%). With respect to the communities, the majority (61.5%) of the respondents from Adugyaa were in the 39-60 age-group, compared to 51.9 percent in Kwaata and 46.8 percent in Kyirenkum. In all the communities, less than 20

percent of the respondents were above 60 years. Table 5 captures the details.

Table 5: Age distribution of respondents by community

Age- group	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
18 - 38	11	21.2	29	41.4	34	32.1	32	34.0	106	32.9
39 - 60	32	61.5	28	40.0	55	51.9	44	46.8	159	49.4
61+	9	17.3	13	18.6	17	16.0	18	19.2	57	17.3
Total	52	100.0	70	100.0	106	100.0	94	100.0	327	100.0

Source: Fieldwork, 2013

Marital status

Apart from sex and age, the researcher also looked at the marital status of the respondents. The examination of the marital status of the respondents was necessary because of the implication it has for network size. The majority (71%) of the respondents were married. Only 1 percent of the respondents were separated. The rest were either single (9.5%), divorced (9.5%) or widowed (9%). Also, the female respondents who were married had only one partner. Multiple partners were associated with the male respondents as is it socially unacceptable for females to have multiple partners in Ghana. Figure 4 presents the details of the marital status of the respondents.

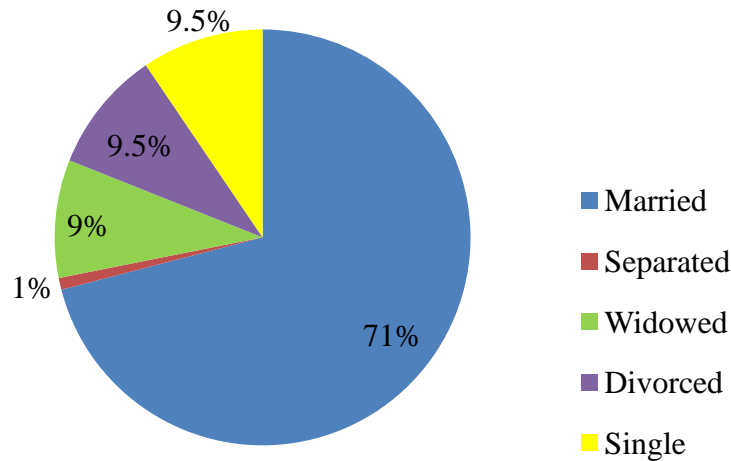


Figure 4: Marital status of respondents

Source: Fieldwork, 2013

Religion

Another background variable of respondents that was relevant to the study was the religious affiliations of respondents. It became evident that, out of 325 valid responses, the dominant religion of respondents was Christianity (88.6%). About 9 percent of the respondents were Muslims as compared to 1.8 percent that were traditionalists. Three of the respondents were not affiliated to any religion (Figure 5).

Educational level

Apart from sex, age, marital status and the religion of respondents, the study also examined the educational level of respondents. One's educational level determines, to a large extent, his/her structural holes in a social network

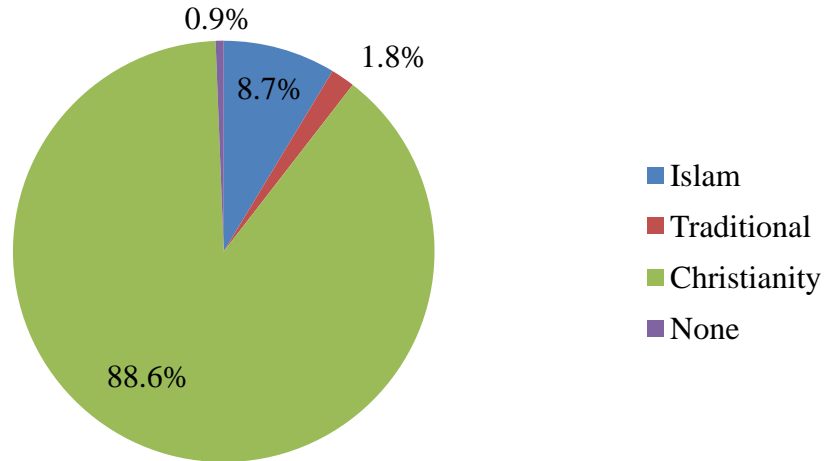


Figure 5: Religion of respondents

N= 325 because of non-response

Source: Fieldwork, 2013

(Burt, 2007). As was expected, the majority (68.5%) of the respondents were educated up to the basic level (Junior High School or Middle School). While only 2.5 percent of them had tertiary education, the rest had either no formal education (16.7%) or had secondary education (12.3%). The finding with respect to the educational level of respondents is consistent with those of Akyeampong, Roleston, Ampiah, and Lewin (2010) and Yiadom-Boakye, Owusu-Sekyere, Nkegbe, and Ohene-Yankyera (2013). In a study on access transition and equity in education, the authors found that most rural dwellers in Ghana are educated up to the basic level.

Number of children

In many rural farming communities in Ghana, the number of children one has can serve as a source of free labour. This makes many rural families

desire large family sizes. Findings from the study showed that the maximum number of children was 17, while the minimum was zero. The distribution of the number of children was not normal (skewness = 0.585 > 0.5). The median number of children was five. While most of the children of the respondents were not married, one of the respondents had 16 of his 17 children being married.

Network structure

The structure of social networks is defined in terms of the size, the density and the type of relationships in the network. In order to determine the size of the network, respondents were asked to indicate whether they have contacts with friends, family and business partners within and outside their community. Findings from the study showed that, while all the respondents had contacts within their communities, 90.6 percent of them had contacts outside their community. The rest (9.4%) had no contacts outside their community. In all, the minimum network size was three, while the maximum was 304. The median network size was 9 (skewness = 8.2), with a quartile deviation of 23.49.

The Kruskal Wallis test was used to determine the differences in the network size among the study communities. The results showed significant differences in the communities with respect to their network sizes ($\chi^2 = 12.156$, p-value = .007). Respondents from Adugyaa had the largest network sizes, followed by Kyirenkum (both communities are from the Twifu-Heman-Lower Denkyira District). The communities from the Assin South District had the smallest number of network sizes. The details are presented

in Table 6.

Table 6: The Kruskal Wallis test of differences in network sizes

Community	N	Mean rank
Adugyaa	51	163.28
Kyirenkum	90	137.27
Kwaata	65	131.19
Ahomaho	63	112.79

$$\chi^2 = 12.156, df = 3, \alpha = 0.05, p\text{-value} = .007$$

Source: Field data, 2013

The median test further showed that most of the respondents from Adugyaa and Kyirenkum had network sizes larger than the median network size of 9. In Adugyaa, 35 out of 51 respondents had network sizes of more than 9 compared to 46 out of 90 from Kyirenkum. Also, the majority of the respondents from Ahomaho and Kwaata had network sizes lower than or equal to the median network size of 9. The median test was significant at both the 1 percent and 5 percent levels of significance (Table 7).

Table 7: Network size by community

Frequency	Adugyaa	Ahomaho	Kwaata	Kyirenkum
> Median	35	22	29	46
< = Median	16	41	36	44
Total	51	63	65	90

$$\text{Median} = 9; \chi^2 = 13.519, df = 3, \alpha = 0.05, p\text{-value} = 0.004$$

Source: Field data, 2013

Aside from network size, the study also ascertained the network density among the respondents. As can be seen from Table 8, the minimum network density was 1.5, while the maximum was 151. The distribution of the network density was not normal (skewness = 8.7). The median network density was 4.0. Among the study communities, Adugyaa had the highest

Table 8: The Kruskal Wallis test of differences in network density

Community	N	Mean rank
Adugyaa	51	156.83
Kyirenkum	87	133.98
Kwaata	64	140.53
Ahomaho	63	104.70

$\chi^2 = 14.212$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .003$

Source: Field data, 2013

network density (mean rank = 156.83), followed by Kwaata (mean rank = 140.53), Kyirenkum (mean rank = 133.98) and Ahomaho (mean rank = 104.70). The Kruskal Wallis test showed that the differences in the network density among the study communities were statistically significant ($\chi^2 = 14.212$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .003$).

Further analysis was done to establish where the differences in the network density lie. This was done using the median test. It became evident from the median test that, while the majority of the respondents from Adugyaa had a network density of more than the median density (4), the majority of the respondents from the other communities had a network density either equal to or lower than four. The median test was significant at

both the 0.01 and 0.05 levels of significance (Median = 4; $\chi^2 = 13.617$, df = 3, $\alpha = 0.05$, p-value = .003). Table 9 presents the details.

Table 9: Network density by community

Frequency	Adugyaa	Ahomaho	Kwaata	Kyirenkum
> Median	32	18	31	40
< = Median	19	45	33	47
Total	51	63	64	87

Median = 4; $\chi^2 = 13.617$, df = 3, $\alpha = 0.05$, p-value = .003

Source: Field data, 2013

The types of relationships among the respondents were analysed, based on the resources that were distributed and the actors involved in the distribution. In addition, issues on the mobilisation and the utilisation of networks helped the researcher ascertain the type of relationships that existed among the networks in the study communities.

Two forms of relationships were identified. These were horizontal and vertical relationships. Findings from the study showed that respondents made more use of horizontal networks than vertical networks. The horizontal relationships were more pronounced because the respondents had similar socio-economic characteristics. Exchange of resources was usually made among agents of equivalent socio-economic status. However, there were few of the respondents who were caught up in vertical relationships. Among the powerful agents in the vertical relationships were the buyers of farm produce, religious leaders and chiefs. The findings are similar to that of Stolle (2001). In Stolle's view, horizontal networks harmonise agents of equivalent status and power, while vertical networks link unequal agents in asymmetric

relations of hierarchy and dependence.

Content of networks

The type of resources that flow across networks are vital for rural agricultural development. In social network analysis, these resources are discussed under content of networks. Content of networks is examined in terms of the resources that flow across networks. There is exchange of resources in every social structure, and the exchange of resources often improves the welfare of members. Belonging to a group or network is not enough for a person to stay in the network. However, the resources derived from being a member of a network ensure that members stay in the network. As a result, the study identified the resources usually exchanged among the networks within the study communities.

The distribution of the resources usually exchanged in networks, as presented in Table 10, shows that, out of the 367 responses, services was the most common (31.3%) resource exchanged in networks in the study communities. Some of the resources that fell under services, as explained by the respondents, included: caring for neighbour's children and helping people during funerals, weddings and child naming ceremonies. Apart from services, information was the second most mentioned resource (26.2%) exchanged among network members. Information, as learned from the respondents, related to the appropriate use of agro-chemicals, good farm practices and information on the right time to plant. These findings are similar to those of Isaac et al (2007) who found that external and farmer-driven sources of

knowledge of agroforestry practices were transferred through informal advice networks, providing available information throughout farming communities.

Table 10: Resources exchanged within networks

Resources	Frequency	Percent
Services	115	31.3
Information	96	26.2
Moral support/advice	55	15.0
Money	32	8.7
Goods (including food)	25	6.8
Labour	20	5.4
Favours	15	4.1
Farm inputs	5	1.4
Home visitation	4	1.1
Total	367*	100.0

* More than the number of respondents because of multiple responses

Source: Fieldwork, 2013

Besides services and information, it also became evident that moral support/advice (15.0%) was an equally important resource identified by the respondents to be exchanged in networks. While moral support encapsulates the spending of time with neighbours and friends during funerals, weddings and child naming ceremonies, advice related to how to improve crop yield through fertilizer application, agro-chemicals and the right breed of crops to plant. Related to moral support and advice was home visitation (1.1%), whereby families, church members, friends, neighbours and other network members visited each other.

In rural agricultural communities, exchange of goods (including foodstuffs), labour and farm inputs is essential for the development of rural agriculture. It was, therefore, not surprising for respondents to identify these as part of the resources exchanged in networks. While 6.8 percent of the responses related to the exchange of goods and foodstuffs, 5.4 percent was for labour. Farm inputs were among the least mentioned resources that were exchanged among the networks in the study communities.

It also became important for respondents to identify the extent to which these resources were exchanged among their networks. Some of the study communities exchanged one type of resources more than others. The matrix showing the extent to which resources were exchanged among networks in the study communities is depicted in Table 11.

As can be seen in Table 11, not all the resources were distributed across the study communities. The stars used demonstrate how a resource compared with other resources was exchanged among networks within and across communities. Provision of services happened to be the most common resource exchanged among networks in the study communities. However, the extent to which it was exchanged was higher in Kwaata (****) than in Adugyaa and Kyirenkum (***) and Ahomaho (**). Beside services, information as a resource was exchanged more among networks in Adugyaa, Kwaata and Kyirenkum (***) than in Ahomaho (**). Networks in Ahomaho exchanged more goods and foodstuffs than in Kwaata and Kyirenkum. Respondents from Adugyaa did not exchange goods and farm inputs. Other resources that were exchanged by networks in all the communities were money, moral support/advice as well as labour. While the extent of the

distribution of these resources was less in all the communities, networks in Adugyaa exchanged more labour than the rest of the communities.

Table 11: The intensity of the types of resources exchanged in networks

Resources	Adugyaa	Ahomaho	Kwaata	Kyirenkum
Services	***	**	****	***
Information	***	**	***	***
Goods (including foodstuffs)	-	***	*	*
Labour	***	*	*	**
Home visitation	*	-	*	-
Money	*	*	*	*
Moral support/advice	**	**	**	*
Favours	-	-	**	*
Farm inputs	-	*	*	*

Source Fieldwork, 2013

According to Dordick (1997) and Burt (2001), resources are usually exchanged with some form of aims and objectives of the exchange relationships. Respondents, therefore, indicated the most important aims of their exchange relationships. The responses to this item varied, the details of which are captured in Table 12.

The aims of the exchange relationships, as evident in Table 12, show that the expectation of reciprocity (32.1%) was the most important aim of the exchange relations. This was followed by service to the community (18.7%), as some of the respondents deemed it as a duty to offer some services to their community. Other respondents, especially those that belonged to groups and associations, mentioned the promotion of welfare of members (11.5%) and

equity (10.7%) as some of the aims of exchanging resources in their networks. While some exchanged resources unconditionally (6.9%), others expected some favours (4.6%) from their exchange relationships. These findings corroborate that of Bart (2001).

Table 12: Aims of exchange relationships

Aims	Frequency	Percent
Reciprocity	84	32.1
Service to the community	49	18.7
Promotion of welfare of members	30	11.5
Ensuring equity	28	10.7
No aim	18	6.9
Ensuring community sanitation	17	6.5
Favour	12	4.6
Moral support	7	2.7
Total	228*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Functions of networks

The functions of the networks in the study communities were analysed in terms of social support, companionship, appraisal and monitoring. Social support encapsulated tangible and intangible support that networks provided for its members. Companionship was measured by the participation in social activities outside the work context. Appraisal centred

on the evaluation of problems in the networks, while monitoring was discussed, based on the ability of the networks to regulate or discipline actors.

Social support

The social support functions of networks in the study communities were grouped under tangible and intangible support. The tangible support provided by farmers in the study communities were: finance, food and farm inputs. The intangible supports included: advice, exchange of labour, counseling, visitation and prayers.

With respect to the tangible support, the networks served as the conduit for providing finance, food and farm inputs to the actors. Regarding finance, respondents were asked to indicate the likelihood that they would ask their neighbours for money if they were broke. A two-point scale, likely and unlikely, was used. Generally, it was likely (74.3%) for the respondents to ask their neighbours for money if they were broke (Table 13). This finding is similar to that of Zuwarimwe and Kristen (2011) who found that people in rural areas often mostly relied on informal sources of credit.

The results in Table 13 show that 319 responded to the likelihood for community members to ask their neighbours for money if they were broke. As can be seen, it was likely in all the communities for people to ask their neighbours for money if they were broke. While 88 percent of the responses from Adugyaa indicated that it was likely to ask neighbours for money if they were broke, about 79 percent of the responses from Kyirenkum indicated that it was very likely for people to ask their neighbours for money. Similar responses came from Kwaata and Ahomaho. A Pearson Chi-square test of

independence showed significant differences in the community in relation to asking their neighbours for financial support when broke ($\chi^2 = 9.95$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .019$). However, it became evident that the financial exchanges among the actors were done with no interest on the monies lent. This is a common practice among rural communities and most parts of Ghana, as people view the practice of charging interest on monies lent as morally unacceptable.

Table 13: The likelihood to ask neighbours for money when broke

Likelihood	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Likely	44	88.0	48	64.9	72	70.6	73	78.5	237	74.3
Unlikely	6	12.0	26	35.1	30	29.4	20	21.5	82	25.7
Total	50	100.0	74	100.0	102	100.0	93	100.0	319*	100.0

$\chi^2 = 9.956$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = 0.019$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Among the tangible resources exchanged in networks in the study communities were farm inputs. The farm inputs were exchanged among members without any financial obligations. Also, the networks ensured that actors got access to food as the respondents could access free food from their neighbours and friends, but with reciprocal intentions.

The intangible aspects of the social support identified included: advice, labour, counselling, visitation and prayers. With regard to advice,

evidence from the study showed that the networks in the study communities relied on advice related to good farm management practices. The advice on good farm management practices, usually exchanged, was on pruning, times to plant, application of chemical fertilizers and the best breed to plant.

Another intangible support was the exchange of labour among the networks. There were two forms of these exchanges. The first involved the offering of individual labour to people who were either indisposed or upon request. The second was a traditional form of cooperation involving group action and mutual aid, based on social, ethnic and family factors. Even though respondents did not sell their labour for money, it became evident that the recipients of such assistance incurred cost, such as the provision of meals, to those who offered free labour. In order to explore this function further, respondents were asked to indicate the extent of the likelihood that they would ask their neighbours to help them in their farm if they were sick. Out of the 322 responses, 73.3 percent indicated it was likely to ask neighbours for help, while the rest (26.7%) said it was unlikely to ask their neighbours to help them in their farm if they were sick. The details of the responses in the study communities are presented in Table 14.

The distribution of the likelihood that people would ask their neighbours to help them in their farms, as depicted in Table 14, clearly shows that the likelihood was higher in Kyirenkum (83.9%), followed by Adugyaa (78.4%) than in Kwaata (60.6%). A Pearson Chi-square test of independence showed significant differences in the community in relation to the likelihood for community members to ask their neighbours to help them in their farms if they were sick ($\chi^2 = 14.635$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .002$).

Table 14: The likelihood that people would ask neighbours to help them in their farm if they were sick

Likelihood	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Likely	40	78.4	55	74.3	63	60.6	78	83.9	236	73.3
Unlikely	11	12.0	19	25.7	41	39.4	15	16.1	86	26.7
Total	51	100.0	74	100.0	104	100.0	93	100.0	322*	100.0

$$\chi^2 = 14.635, df = 3, \alpha = 0.05, p\text{-value} = 0.002$$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Aside from the likelihood of the respondents to ask their network members for help in their farms, the study further ascertained if the respondents ever received labour assistance. Findings from the study showed that the majority (84.8%) of the respondents had ever received labour assistance from friends, relatives and neighbours. The study communities, however, differed on the receipt of labour assistance for their farms.

Table 15 shows how the receipt of labour assistance was distributed across the study communities. The findings show that most of the respondents from the study communities had received labour assistance. The proportion was, however, greater in Adugyaa (96.2%) and Kyirenkum (91.4%) than in Kwaata (80.2%) and Ahomaho (74.3%). The Chi-square test of independence was used to test the significance of the differences in the receipt of labour assistance in the study communities. The differences were found to be significant ($\chi^2 = 16.013, df = 3, \alpha = 0.05, p\text{-value} = .001$). Respondents from the Twifo-Heman-Lower Denkyira District (Adugyaa and

Kyirenku) received more labour assistance than those from the Assin South District (Kwaata and Ahomaho).

Table 15: Benefited from labour assistance

Received assistance	Adugyaa		Ahomaho		Kwaata		Kyirenku		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	50	96.2	52	74.3	82	80.2	85	91.4	268	84.8
No	2	3.8	18	25.7	20	19.8	8	8.6	48	15.2
Total	52	100.0	70	100.0	101	100.0	93	100.0	316*	100.0

$$\chi^2 = 16.013, df = 3, \alpha = 0.05, p\text{-value} = 0.001$$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Counseling services, visitation and the offering of prayers for family members, friends and neighbours were other intangible social support functions of networks in the study communities. Issues that bordered on counselling included: the provision of advice on life issues, encouragement, which usually brought members together. The offering of prayer was common among those who had religious networks. Network members also visited each other. The visitation was usually among core network members, such as families, groups and associations.

Companionship

Companionship, as a function of social networks, was examined in terms of participation in social activities outside the network context. To begin with, the study explored the number of times in a month that respondents volunteered in community activities. Findings from the study

showed that the communities did not have specific days in a month in which community activities were done. Respondents indicated that, as and when needed, the community authorities called community members to offer their services. However, during the times that the services of community members were needed, the median number of times per month that respondents volunteered in community activities was four.

With respect to the question whether people volunteered or helped in community activities, 88.9 percent of the 323 responses agreed. Others either disagreed (10.2%), or were not sure (0.9%). The details are presented in Table 16. The details of the extent of agreement with people volunteering in

Table 16: Volunteerism in community activities

Extent of agreement	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Agree	52	100.0	50	67.6	92	88.5	93	100.0	287	88.9
Not sure	-		1	1.4	2	1.9	-		3	0.9
Disagree	-		23	31.1	10	9.6	-		33	10.2
Total	52	100.0	74	100.0	104	100.0	93	100.0	323*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

community activities, as shown in Table 16, clearly depict that all the responses from Adugyaa (100.0%) and Kyirenkum (100.0) agreed that people volunteered in community activities. The findings in Ahomaho and Kwaata were, however, different. Even though the majority of the responses from

Ahomaho (67.6%) and Kwaata (88.5%) agreed that people would volunteer in community activities, some of the responses from Ahomaho (31.1%) and Kwaata (9.6%) disagreed.

The researcher explored further by seeking respondents' opinion on whether people who did not volunteer or participate in community activities were criticised or sanctioned. There were 323 responses for this item. Out of these responses, 89.2 agreed that people who did not participate in community activities were sanctioned. However, the study communities differed on the view that people who did not participate in community activities were sanctioned. The details of the likelihood that people who did not participate in community service were sanctioned, as shown in Table 17,

Table 17: People who did not participate in community activities were sanctioned

Extent of agreement	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Agree	52	100.0	51	68.9	93	89.4	92	98.9	288	89.2
Not sure	-		1	1.4	2	1.9	-		3	0.9
Disagree	-		22	31.1	9	8.7	1	1.1	32	9.9
Total	52	100.0	74	100.0	104	100.0	93	100.0	323*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

clearly show that all the respondents from Adugyaa agreed that people who did not participate in community service were sanctioned. Also, the majority of the responses from Kyirenkum (98.9%), Kwaata (89.4%) and Ahomaho

(68.9%) also agreed that people who did not participate in community activities were sanctioned.

The last of the items on companionship examined respondents' opinion on whether people made fair contributions to community activities. Out of the 318 responses, 79.2 percent agreed that people made fair contribution to community activities. The rest of the responses were either not sure (6.0%), or disagreed (14.8%) that people made fair contribution to community activities (Table 18).

Table 18: People made fair contribution to community activities

Extent of agreement	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Agree	39	75.0	59	79.7	78	77.2	76	83.5	252	79.2
Not sure	2	3.8	9	12.2	5	5.0	3	3.3	19	6.0
Disagree	11	21.2	6	8.1	18	17.8	12	13.2	47	14.8
Total	52	100.0	74	100.0	101	100.0	91	100.0	318*	100.0

$\chi^2 = 11.234$, $df = 6$, $\alpha = 0.05$, $p\text{-value} = 0.081$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Within the communities, Kyirenkum had the largest proportion (83.5%) of responses that agreed that people made fair contribution to community activities. This was followed by Ahomaho (79.7%), Kwaata (77.2%) and Adugyaa (75.0%). A Pearson's Chi-square test of independence was conducted to establish the significance of the differences in the communities with respect to the extent of agreement that people made fair

contribution to community activities. At the 5% level of significance, the Chi-square result ($\chi^2 = 11.234$, $df = 6$, $p\text{-value} = .081$) showed no significant differences in the communities on their extent of agreement that people made fair contribution to community activities.

Appraisal

Appraisal, as a function of networks, is the ability of networks to evaluate a problem or act as a source of aid. Based on this, the study examined how people resolved issues of daily life in their communities. Responses from the study showed that various persons and figures were responsible for resolving issues of daily life in all the study communities. Chiefs were the most important figures, followed by elders. Also common to all the study communities were Unit Committee members and family heads. The details of the key persons in the resolution of issues of daily life are presented in Table 19.

It is obvious from Table 19 that all the communities attached importance to chiefs and elders in resolving issues of daily life. Equally important in resolving issues of daily life in Adugyaa and Ahomaho were Unit Committee members. Even though committee members were also involved in the resolution of issues of daily life in Kwaata and Kyirenkum (*) they were not as important compared to Ahomaho and Adugyaa (***)). All the communities, except Adugyaa, could rely on religious leaders to resolve conflicts. It was only in Kwaata that friends could resolve issues of daily life. However, in Kwaata and Kyirenkum it was learnt that some of the issues that bordered on criminality were referred to the law enforcement agencies.

Table 19: Key persons in the resolution of issues of daily life

Key person	Adugyaa	Ahomaho	Kwaata	Kyirenkum
Chief	****	****	****	****
Elders	***	***	***	***
Unit Committee members	***	***	*	*
Family heads	*	**	**	*
Religious figures	-	*	*	*
Police	-	-	*	*
Friends	-	-	*	-

Source Fieldwork, 2013

Monitoring

Issues on monitoring, as a function on networks, were discussed in relation to the ability of networks to discipline or regulate the behaviour of network members. Questions were posed to illicit responses on sanctions for people who deviated from norms and rules and what would make respondents lose confidence in members of their networks. First, respondents who belonged to groups and associations were asked to indicate the sanctions given to members who deviated from the norms and rules of the association. The details of the sanction are presented in Figure 6.

It is obvious from Figure 6 that, out of the 194 responses received, 51 percent indicated that those who deviated from the norms and rules of groups and associations were made to pay fines. Interviews with the heads of groups and associations indicated that the fines ranged from Ghc 2.00 to Ghc. 10.00. While 11 percent of the responses related to suspension, 8 percent indicated

that deviants were either rebuked or counseled (8%). Some of the deviants were either dismissed (10%) or their benefits withheld (5%) while others were made to sacrifice to appease gods (7%).

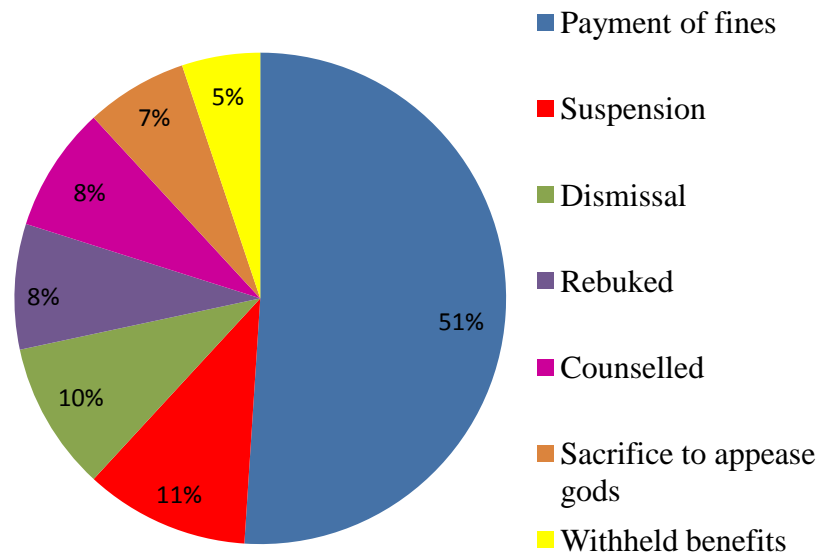


Figure 6: Type of sanctions for deviants of group norms

N=194 because of non-response

Source: Fieldwork, 2013

As part of the discussion on deviation from group/association norms and the associated sanctions, respondents' views were sought on situations where those who deviated from group norms went unpunished. Out of the 100 responses presented in Figure 7, 44.0 percent indicated that not sanctioning non-conformists would bring divisions in the group to which they belonged. The rest of the responses related to members leaving the association or group (23%), grudging among members (18%) and the eventual collapse of the group or association (15%).

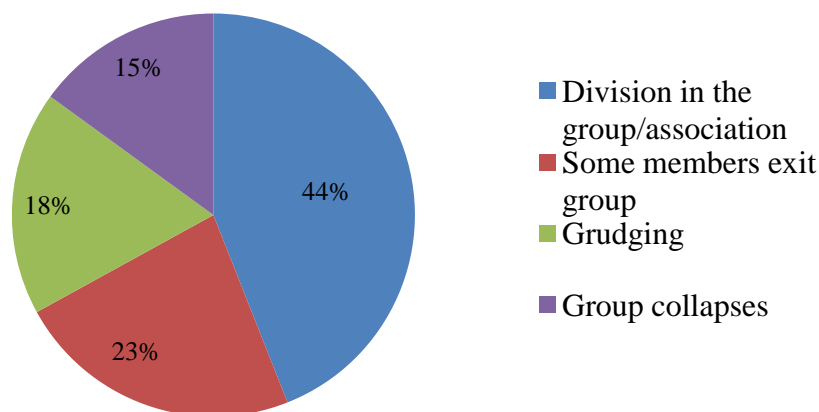


Figure 7: The outcome of allowing non-conformists to go unpunished

N = 100 because of non-response

Source: Fieldwork, 2013

Summary of findings on network characteristics

Network characteristics encompass network structure, content and function. The variables examined under network structure were size, density and the types of relationships. With respect to network size, the minimum was three, while the maximum was 304. The median network size was 9. Respondents from Adugyaa had the largest network size, followed by Kyirenkum. Both communities are located in the Twifo-Heman-Lower Denkyira District. The communities from the Assin South District had the smallest number of network sizes. The median test showed that most of the respondents from Adugyaa and Kyirenkum had network sizes larger than the median network size of 9. In Adugyaa, 68.6 percent of the respondents had network sizes of more than 9, compared to 51.1 percent from Kyirenkum. Also, the majority of the respondents from Ahomaho (65.1%) and Kwaata (55.4%) had network sizes lower than or equal to the median network size of

9.

The minimum network density was 1.5, the maximum was 151, with a median network density of 4.0. Among the study communities, Adugyaa had the highest network density, followed by Kwaata, Kyirenkum and Ahomaho. The median test showed that, while the majority of the respondents from Adugyaa had a network density of more than 4, the majority of the respondents from the other communities had a network density either equal to or lower than four.

Two forms of relationships were identified. These were horizontal and vertical relationships. Findings from the study showed that respondents made more use of horizontal networks than vertical networks. The horizontal relationships were more pronounced because the respondents were mostly of equal socio-economic status and power. Exchange of resources was usually made among agents of equivalent power and status. However, there were few of the respondents who were caught up in vertical relationships. The powerful agents in the vertical relationships were the buyers of farm produce, religious leaders and chiefs.

With respect to the resources that flowed among networks, it was clear that rendering of services, information, advice money and food were the major resources exchanged among the networks in the study communities. It also became evident that the offering of labour assistance was common in all the communities. Other resources distributed among networks in the study communities were: farm inputs, moral support and home visitation. The intent of the exchange relationships was mostly reciprocal.

The functions of the networks identified included: social support,

companionship, appraisal and monitoring. The social support functions were both tangible and intangible. With respect to the tangible support, the networks served as a conduit for providing finance, food and farm inputs to the actors. The intangible aspects of the social support identified included: advice, labour, counselling, visitations and prayers.

Regarding companionship as a function of networks, it became evident that most of the respondents volunteered and made fair contributions to community activities. Those who did not participate in community activities were sanctioned. Paramount among the sanctions was the payment of fines.

Appraisal of networks was usually done by chiefs, family heads, elders, religious leaders, Unit Committee members, religious leaders and friends. Also, networks monitored the behaviour of members by using disciplinary measures. Most (55.3%) of the responses indicated that deviants of group and association norms were always sanctioned.

CHAPTER FIVE
MOBILISATION AND UTILISATION OF SOCIAL
NETWORKS AMONG RURAL FARMERS

Introduction

The chapter examines how rural farmers mobilised and utilised social networks for their agricultural activities. It presents information on settings and events that brought people together; how respondents maintained networks ties; and the diversity of roles in networks.

Mobilisation and utilisation of social networks among rural farmers

The discussion on the mobilization and utilisation of networks centred on the triggers, settings and events that brought people together; the number of people that usually congregated for such events; and how often these events occurred. Other items in this section bordered on the type of resources exchanged in the networks; and the aims of the exchange relationships.

To begin with, the study examined the triggers that brought people together. It was found that the most common events that brought people together in all the communities were community meetings and communal labour. Also common to all the communities were Christmas festivities, church conventions and funerals. The distribution of the triggers that brought people together in the study communities are presented in Table 20.

It is obvious from Table 20 that many triggers brought people together in the study communities. With respect to community meetings and

Table 20: Triggers that brought people together

Trigger	Adugyaa	Ahomaho	Kwaata	Kyirenkum
Community meetings	***	***	***	***
Communal labour	***	***	***	***
Christmas	**	**	**	**
Church conventions	*	**	**	***
Funerals	***	**	**	**
Festivals	**	**	-	*
Marriage ceremonies	-	**	**	**
PTA meetings	-	-	*	-
Easter	**	-	-	**
Political rallies	-	**	-	-
Public education by NGOs	-	*	-	-
Conflict	-	-	-	*
Child naming ceremony	-	-	-	*

* The number of stars indicates the magnitude of the trigger

Source: Fieldwork, 2013

communal labour, the magnitude of the triggers was similar in all the communities. While political rallies and public education by NGOs were peculiar to Homaho, PTA meeting was a trigger in only Kwaata. The magnitude of child naming, public education by NGOs, political rallies and PTA meetings was not as high as funerals, community meetings and communal labour. Other triggers that became evident from the study were church conventions, Easter and Christmas celebrations, and festivals.

Table 21: Public/private events/settings that brought people together

Event/setting	Frequency	Percent
Community meetings	122	29.2
Funerals	122	29.2
Communal labour	59	14.1
Church conventions	32	7.7
Marriage ceremonies	23	5.5
Christmas festivities	15	3.6
Football matches	10	2.4
Festivals	9	2.1
Easter festivities	9	2.1
Child naming ceremonies	7	1.7
Extension services	4	1.0
Political rallies	3	0.7
Conflict	3	0.7
Total	418*	100.0

* More than the number of respondents because of multiple responses

Source: Fieldwork, 2013

In addition to the triggers that brought people together, respondents were asked to indicate the public or private settings that brought people together. Out of the 418 multiple responses, community meetings (29.2%) and funerals (29.2%) were the most common events that brought community members together. While 14.1 percent of the responses related to communal labour, only 0.7 percent each of the responses was attributed to political rallies and conflicts (public fighting) (Table 21).

Based on the findings, it became necessary to associate the events and settings with the communities. The distribution of the settings and events that brought people together in the study communities, as presented in Table 22, clearly shows that the extent to which the events and settings brought the community members together differed. While community meetings, funerals, communal labour and church conventions were common to all the communities, others were peculiar to one or two of the study communities. Even though community meetings brought people together in all the communities, the frequency of the meetings was more in Kwaata and Kyirenkum (****) than in Adugyaa (***) and Ahomaho (**). Similarly, funerals occurred more frequently in Kwaata and Kyirenkum (****) than in Adugyaa and Ahomaho (**).

In addition, Kyirenkum had the highest (****) distribution regarding communal labour, followed by Adugyaa and Ahomaho (***), while Kwaata had the least. Again, while Kwaata and Kyirenkum had the highest (****) occurrence of marriage ceremonies, followed by Ahomaho (**), marriage ceremony was not part of the popular events that brought people together in Adugyaa. Also worthy of note is that it was only in Kwaata and Kyirenkum that people came together during political rallies and public fighting respectively. Child naming ceremony was a frequent event in Kwaata and Kyirenkum (***) but not in Adugyaa and Ahomaho. The event of organising farmers for extension services was more frequent in Ahomaho (****), followed by Kwaata (**) but not in Adugyaa and Kyirenkum.

In order to explore further the events and settings that usually brought people together in the study communities, the number of people that

Table 22: Distribution of events/settings by community

Event/setting	Adugyaa	Ahomaho	Kwaata	Kyirenkum
Community meetings	***	**	****	****
Funerals	**	**	****	****
Communal labour	***	***	**	****
Church convention	***	**	**	****
Marriage ceremony	-	**	****	****
Christmas festivities	-	****	****	-
Football matches	-	****	-	***
Easter	-	****	-	-
Child naming ceremony	-	-	***	***
Extension services	-	****	**	-
Political rallies	-	-	***	-
Public fighting	-	-	-	***
Festivals	-	***	-	-

Source: Fieldwork, 2013

congregated during the events was examined. While the maximum number of people that congregated was 600, the minimum was 20. This was so because some events attracted more people, while others attracted less. The median number of people per event was 100. The details of the estimated number of people that congregated per event in the study communities are presented in Table 23.

Table 23: Events and the estimated number of people that attended

Event/setting	Adugyaa	Ahomaho	Kwaata	Kyirenkum
Community meetings	<= 200	<= 200	<= 200	<= 200
Funerals	201 - 400	<= 200	201- 400	<= 200
Communal labour	<= 200	<= 200	<= 200	<= 200
Church conventions	401 - 600	<= 200	201- 400	401 - 600
Football matches	-	<= 200	-	<= 200
Marriage ceremonies	-	<= 200	<= 200	-
Christmas festivities	-	401 - 600	<= 200	-
Festivals	-	401 - 600	-	-
Political rallies	-	<= 200	-	-
Extension services	-	<= 200	<= 200	-
Child naming ceremonies	-	-	401- 600	<= 200
Easter festivities	-	-	<= 200	-
Public fighting	-	-	-	<= 200

Source: Fieldwork, 2013

It can be seen in Table 23 that an estimated number of not more than 200 people usually attended community meetings in all the study communities. Just like the community meetings, the number of people who usually attended communal labour was 200 or less in all the communities. However, the numbers that congregated during funerals differed. While between 201 and 400 people congregated during funerals in Kwaata and Adugyaa (non-migrant communities), not more than 200 usually attended funerals in Ahomaho and Kyirenkum (migrant communities). Between 401

and 600 people congregated for church conventions in Adugyaa and Kyirenkum. The number was, however, lower in Kwaata and Ahomaho.

As discussed earlier, some of the events did not take place in all the study communities. For example, football matches/activities were not part of the events in Adugyaa and Kwaata. Information gathered from the chief of Adugyaa indicated that the football field had been used for the construction of a school building. In Ahomaho and Kyirenkum, where football matches usually occurred, the estimated number of people that watched football matches was less than or equal to 200. Christmas festivities, an event peculiar to Kwaata and Ahomaho, often attracted between 401 and 600 people in Kwaata but 200 or less people in Ahomaho. Agricultural extension meetings, which were held in Ahomaho and Kwaata, usually attracted a maximum of 200 people.

Formation and mobilisation of networks

Network formation largely depends on the socio-cultural life of communities. An examination of the formation and mobilisation of networks in the study communities clearly showed that networks in the sampled communities were organised around tribes and families, religion, neighbours, sex, markets, sports, groups and associations. The most important institutions in the mobilisation and utilisation of networks in the study communities were tribes and families. Tribes and families were vital in both the migrant and non-migrant communities. Respondents said that everyone belonged to a family and families belonged to tribes. It became evident that farming in the study community was a household activity, and family members, both core

and extended, served as a source of free labour. Family members were often mobilised for farm activities, usually during planting and harvesting periods.

Another important institution that mobilised networks for agricultural activities was agricultural groups and associations. These associations were both formal and informal. While the informal associations mainly mobilised labour for the clearing of farmlands, planting and harvesting, the formal associations usually provided logistical support (farm inputs) and education on good farm practices. Others provided market support for agricultural produce.

Aside from tribes and families and agricultural groups and associations, networks in the study community also evolved around neighbours, as people who lived close together often visited each other to share ideas on how to improve their agricultural activities. Neighbours and friends usually exchanged labour, farm inputs and advice on good farm practices, and sometimes food.

Market networks in the study communities were based on sex. Apart from the marketing of cocoa, in which marketing companies bought from farmers (mostly males), all the other crops were mostly sold by women. This division of labour, based on sex, enabled women to access more market networks than men. Whereas females were mostly responsible for selling food crops, the males specialised in the selling of cash crops and livestock. It also became evident that respondents who had more market networks were able to sell their produces faster than those with few networks. Also, market networks enabled respondents to get information related to the price of their produce.

In addition, religious groups played a part in network formation and organisation. As the communities were dominated by Christians, networks among church members were common. Exchange of labour and information was sometimes done along religious networks. In Ahomaho, for example, some of the churches often invited agricultural extension officers to educate farmers on improved farm technologies. Some church farms were also found in Kyirenkum. One other contribution of churches to networks and agricultural development was seen in the migrant communities. New migrants who had association with churches were supported with housing, land and general information on how to do farming, especially in migrant communities.

The study also found that some networks in the study communities were structured around peers. People with similar ages and interest exchanged information and other resources, compared to those with different ages and interest. Sporting activities were common, and indoors and under-tree games provided opportunities for people to discuss agricultural issues. Football clubs were sometimes hired to provide labour for agricultural activities, and this provided money for the clubs. In addition to the provision of labour, club members also often discussed agricultural issues, thereby making information on agricultural practices available.

Leadership in networks

Leadership and people on whom networks evolve are vital in network studies (Pescosolido, 2011). It was as a result of this that the researcher sought to identify people around whom networks evolved. The most

prominent among those who played leadership roles in mobilising groups and networks were chiefs, followed by Unit Committee chairpersons. Other persons and positions mentioned by respondents included pastors, Assembly persons, Unit Committee members and community elders.

The distribution of the leaders and people who mobilised groups and networks, as presented in Table 24, shows that various persons and leaders played important roles in mobilising networks. The findings show that chiefs were instrumental in mobilising groups in all the communities, especially for

Table 24: Persons/leaders noted for mobilising groups/networks

Person/leader	Adugyaa	Ahomaho	Kwaata	Kyirenkum
Chief	****	***	***	****
Unit Committee chairperson	***	****	****	***
Youth leader	**	***	***	***
Unit Committee members	**	****	****	***
Pastor	*	*	*	*
Family leader	-	*	**	**
Assembly men	*	*	*	*
PTA committee chairman	*	-	-	-
Elders	-	*	*	*
Linguist	*	*	**	-

Source: Fieldwork, 2013

community meetings (****). The extent to which Unit Committee Chairmen mobilised the communities was higher in Ahomaho and Kwaata (****) than in Adugyaa and Kyirenkum (***). Besides the Unit Committee Chairman, Unit Committee Members were also recognised as people who mobilised groups in the study communities. The recognition of these members was more in Ahomaho and Kwaata (****), followed by Kyirenkum (***) and Adugyaa (**). The study further found that youth leaders also played important roles in mobilising groups in the communities. The extent to which they mobilised groups and networks was higher in Ahomaho, Kwaata and Kyirenkum (***) than in Adugyaa (**). Other recognised leaders and persons noted for mobilising groups and networks were religious leaders, family leaders, linguists and PTA chairmen.

Inasmuch as the leaders of networks were important, the attributes of the leader and people who play key roles in networks and groups are also important. Based on this, it became necessary to examine the factors that contributed to leadership within groups and networks. It is evident in Table 25 that people could become leaders in networks by elections (30.3%). This was followed by being a head in a community (16.8%), and persons with good reputation and character (12.9%). While some groups considered one's social status (10.8%) for leadership positions, others preferred hard working and committed people to lead their group or association. Other factors that were mentioned were the level of maturity of people, their educational level, as well as their family background. The sex of the person and their income were not considered important, as they formed 0.6 percent and 0.8 percent of the responses respectively.

Table 25: Factors that contributed to leadership within groups and networks

Factors	Frequency	Percent
Elections	110	30.3
Head of community	61	16.8
Good reputation/character	57	15.7
Social status	39	10.8
Hard work/commitment	36	9.9
Education	21	5.8
Maturity	16	4.4
Family background	11	3.0
Appointment	7	1.9
Income	3	0.8
sex	2	0.6
Total	363*	100.0

* More than the number of respondents because of multiple responses

Source: Fieldwork, 2013

The diversity of roles within groups and networks is very important in determining the sustainability of groups and networks. Among the diverse roles identified in the groups, associations and the networks in the study communities were presidents, vice-presidents, secretaries, treasurers and organizers. These were the positions of most formal groups in the study communities. There were some political roles which were tenanted by

Assembly men and women and Unit committee members, pastors, church elders, deacons were some of the positions of the religious groups.

Maintenance of networks

The issue of maintaining network ties is very important for the sustenance of networks. Evidence from the study revealed that respondents maintained networks ties through various means. There was no dominant means by which respondents maintained networks ties. The results in Table 26 show that, out of the 356 responses received on how network ties were maintained, 15.7 percent related to the amicable resolution of issues. While 15.2 percent of the responses bordered on the provision of material support for network members, 12.6 percent intimated that regular conversation with network members was enough to maintain network ties. Other essential requirements necessary for the maintenance of network ties were: love among network members (9.6%), advice (8.5%), honesty (8.2%) and patience (2.8%). Respondents also indicated loyalty (2.8%), not speaking ill of members (2.8%) and ability to apologise as requirement for the maintenance of network ties. These factors, according to Putnam (2000), are part of the attributes of social capital.

As part of the discussion on the maintenance of network ties, respondents were asked to indicate the qualities that they expected members of their networks to have. Most of the essential qualities respondents expected from their network members bordered on morality (Table 27). Out of the 423 responses, 17.7 percent of them expected the network members to demonstrate love. The second most occurring attribute was hardwork

(16.1%). Respondents also expected their network members to be honest (12.3%), united (12.0%), respectful (11.8%), and generous (9.7%). Other qualities were being trustworthy (3.1%) and God-fearing (0.5%).

Table 26: How respondents maintained network ties

Ways/means	Frequency	Percent
Amicable resolution of conflict	56	15.7
Provision of material support	54	15.2
Regular conversation with members	45	12.6
Visitation	40	11.2
Love among members	34	9.6
Advice	29	8.2
Honesty	28	7.9
Understanding	19	5.3
Ability to forgive	16	4.5
Patience	10	2.8
Loyalty	10	2.8
Do not speak ill of members	10	2.8
Ability to apologise	5	1.4
Total	356*	100.0

* More than the number of respondents because of multiple responses

Source: Fieldwork, 2013

The study also examined how networks could be destroyed. Respondents were asked to indicate what could make them lose trust and

confidence in their network members. Responses depicted in Table 28 show that the reasons for losing trust and confidence in network members were mainly moral. Dishonesty (19.4%), gossiping (13.0%) and betrayal (11.1%) were among the most mentioned reasons that would make respondents lose confidence in their network members and subsequently destroy the social capital derived from networks. The rest of the reasons were: bearing false

Table 27: Qualities expected from network members

Qualities	Frequency	Percent
Love	75	17.7
Hardworking	68	16.1
Honesty	52	12.3
Unity	51	12.0
Respect	50	11.8
Generosity	41	9.7
Patience/understanding	30	7.1
Helpful	25	5.9
Wise	16	3.8
Trustworthy	13	3.1
God-fearing	02	0.5
Total	423*	100.0

* More than the number of respondents because of multiple responses

Source: Fieldwork, 2013

witness against members (9.9%), stinginess (8.6%), and disappointment (8.3%). Some of the respondents said they would part company with

people in their network when they disrespected (6.5%), insulted (4.9%) or became alcoholic (3.1%).

Table 28: Factors that would contribute to the destruction of networks

Factors	Frequency	Percent
Dishonesty	63	19.4
Gossiping	42	13.0
Betrayal	36	11.1
Bearing false witness	32	9.9
Stinginess	28	8.6
Disappointment	27	8.3
Disrespect	21	6.5
Insult	16	4.9
Misunderstanding	16	4.9
Quick temperedness	14	4.3
Alcoholism	10	3.1
Pride	7	2.2
Womanising	5	1.6
Greed	5	1.6
Murder	2	0.6
Total	324*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Groups and associations

The size of a person's network is determined by a number of factors. One of the factors is one's membership of a group or an association. In order to explore how groups and associations determined a person's network size and how being a member of a group or an association helped one's agricultural activities, respondents were asked to indicate whether they belonged to a group or an association and, if so, they should indicate the number of members in the group. The functions of such groups and associations as well as the benefits derived from the groups and associations, were also explored. It became evident that 42.2 percent of the respondents belonged to either a group or an association. Among the groups or associations that respondents belonged to were youth groups, religious groups (men and women fellowship), singing groups and fun clubs. Others belonged to agricultural associations. The associations in this category included Cocoa Abrabopa, Akuafu Adamfo, Oil palm and Citrus associations.

In exploring the membership per group or association, the findings show that most of the clans, youth and fun clubs had a large membership, compared to the other groups. For example, the minimum membership for the clubs and clans was two, the maximum was 560, with a median membership of 35 (skewness = 3.9). The minimum membership of the religious groups was two, the maximum was 120, with a median membership of 20 (skewness = 1.3). The agricultural groups, on the other hand, had a minimum membership of seven and a maximum of 200, with a median membership of 20 (skewness = 3.8).

However, the diversity of the groups and associations reflected in their functions. The religious groups and associations had similar functions which included the spiritual uplifting of members, assisting in church activities, teachings about home management and visitations. While these functions provided members with intangible benefits, other functions, such as the provision of financial support, were tangible. The functions of the youth associations included the provision of sporting activities and ensuring that members were mobilised for community sanitation activities. The agricultural groups and associations had three main functions. They included the marketing of farm produce, education on best farm practices as well as the provision of financial assistance to members.

Based on the functions of the groups and associations, the researcher explored the benefits that respondents had received since joining the groups and the associations. As shown in Table 29, about 42 percent of the benefits that the respondents derived from being members of groups and associations related to togetherness. Respondents who mentioned togetherness as the benefit derived from being a member of a group or an association posited that they were able to live with others in peace and in harmony. Other benefits indicated by the respondents included: supply of farm inputs (20.0%) visitations (16.0%), and advice (7.6%). Some of the respondents also benefited from education on good farming methods (4.4%), knowledge on farming methods (4.4%), labour assistance (3.6) financial assistance (3.6%). Marketing of farm produce (1.3%), teachings on marriage (1.3%), and moral education (0.5%) were the other benefits that the respondents derived from their groups and associations.

The study also explored the formal and informal agricultural associations and groups in the study communities. Findings of the study showed that five groups were present in the study communities. The matrix in Table 30 shows that Akafo Adamfo, a cocoa marketing company, was

Table 29: Benefits derived from groups and associations

Benefit	Frequency	Percent
Togetherness	95	42.2
Farm inputs	45	20.0
Visitation when sick	36	16.0
Advice	17	7.6
Knowledge on farming methods	10	4.4
Financial assistance	8	3.6
Labour assistance	7	3.1
Teachings on marriage	3	1.3
Marketing of farm produce	3	1.3
Moral education	1	0.5
Total	225*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

present in all the study communities. The Oil palm and the Citrus associations were present in Kwaata because of the community's dominance in the production of oil palm and citrus. Cocoa Abrabopa, a subsidiary of a cocoa marketing company, was found in Adugyaa, Kwaata and Kyirenkum.

MOFA was only present in Adugyaa.

Table 30: Distribution of formal agricultural associations/groups

Association	Adugyaa	Ahomaho	Kwaata	Kyirenkum
Cocoa Abrabopa	*	-	*	*
Akuafo Adamfo	*	*	*	*
Oil palm out growers	-	-	*	-
Citrus	-	-	*	-
MOFA	*	-	-	-

Source: Fieldwork, 2013

The study further explored how these agricultural groups and associations had helped to improve the agricultural activities of members. It can be seen in Table 31 that all the agricultural groups educated farmers on good farm practices. While Cocoa Abrabopa and Akuafo Adamfo supplied farm inputs to farmers, Oil palm associations provided financial assistance. Three groups, Cocoa Abrabopa, Akuafo Adamfo and Citrus, were involved in the marketing of farm produce. Only Cocoa Abrabopa provided farm maintenance and on-farm inspection services to its members.

Apart from the formal agricultural groups and associations, it was also found that there were some informal agricultural groups in all the communities. The minimum membership of these groups was four, while the maximum was eight. These informal groups, described by Dadson (1988) as traditional forms of cooperation involving group action and mutual aid, based on social, ethnic and family factors, were involved in providing mutual

Table 31: How the agricultural groups and associations had improved the activities of farmers

Cocoa Abrabopa	Akuafu Adamfo	Oil palm	Citrus	MOFA
Supply of farm inputs	Supply of farm inputs	-	-	-
Farm inspections	-	-	-	-
Marketing of produce	Marketing of produce	-	Marketing of farm produce	-
Farm maintenance	-	-	-	-
Education of good farm practices	Education on good farm practices	Education on good farm practices	Education on good farm practices	Education on good farm practices
		Financial assistance		

Source: Fieldwork, 2013

labour assistance to members. This is a common practice in most farming communities in Ghana where people, often friends, form groups with the aim of providing labour support. These collective activities among farmers provided several support for farmers including helping members secure credit. This finding is consistent with that of Dadson (1988) who, in a study among rural farmers in Ghana, found that farmers joined 'nnoboa', an informal farm groups, with the aim of exchanging labour, gaining access to credit, and providing some form of mechanisation.

Summary of mobilisation and utilisation of social networks

From the discussion on the mobilisation and utilisation of social networks for rural agricultural development, the study found that the most common events that brought people together in all the communities were community meetings, funerals and communal labour. Also common to all the communities were Christmas festivities and church conventions. The extent to which the events and settings brought the community members together differed. The frequency of the meetings was more in Kwaata and Kyirenkum than in Adugyaa and Ahomaho. Similarly, funerals occurred more frequently in Kwaata and Kyirenkum than in Adugyaa and Ahomaho. In addition, Kyirenkum had the highest distribution regarding communal labour, followed by Adugyaa and Ahomaho, while Kwaata had the least. The number of people that usually congregated during such events was between 20 and 600. This was partly attributed to the different types of events.

The most important institutions in the mobilisation and utilisation of networks in the study communities were tribes and families. It became

evident that farming activities in the study community was a household activity and family members, both core and extended, served as a source of free labour. Family members were often mobilised for farm activities, usually during planting and harvesting. Other institutions that mobilised networks for agricultural activities were formal and informal agricultural groups and associations. While the informal associations mainly mobilised labour for the clearing of farmlands, planting and harvesting, the formal associations usually provided logistics (farm inputs) and market support as well as education on good farm practices.

Market networks in the study communities were usually based on sex. Whereas females were mostly responsible for selling food crops, the males were mostly involved in the selling of cash crops and livestock. Religious groups also played a part in network formation and organisation. The most prominent among those who played leadership roles in mobilising groups were chiefs, followed by Unit Committee chairpersons. Other persons and positions mentioned by respondents included pastors, Assembly persons, Unit Committee members and community elders.

In relation to the maintenance of network ties, there was no dominant means by which respondents maintained networks ties. Provision of material and non-material support, as well as regular conversation with networks, was vital in the sustenance of network ties. The dominant agricultural associations were Cocoa Abrabopa and Akoafo Adamfo, both cocoa marketing companies. These agricultural groups were responsible for supplying farm inputs, marketing of farm produce, and the education of farmers on good farm practices.

CHAPTER SIX

SOCIAL NETWORKS, COMMUNITY CHARACTERISTICS, LOCAL CONDITIONS AND RURAL AGRICULTURAL DEVELOPMENT

Introduction

The chapter examines the nexus among social networks, community characteristics, local conditions and rural agricultural development. The discussion starts with the examination of the characteristics and the local conditions of the study communities. In discussing the characteristics and the local conditions, the communities are first appraised. Issues that are looked at under the characteristics and the local conditions of the communities include local infrastructure, key resources and how these resources are distributed, neighbourliness and conflict resolution mechanisms. The final section examines the relationship between social networks and rural agriculture.

Community characteristics, local conditions and rural agriculture

Community characteristics

The characteristics of the study communities were discussed in terms of ethnic composition, the state of infrastructure and the problems faced by the study communities. Ahomaho, one of the study communities was mainly dominated (90%) by the Akyems. Fantis, Gas and Dagombas formed the other 10 percent of the population. The road networks in the community were untarred but motorable. There were telephone networks, three petty shops,

two football fields, and two boreholes in the community. There were no toilet, market, and health facilities in Ahomaho. Owing to the lack of market and health facilities in the community, the people of Ahomaho relied on the health and market facilities in Assin Fosu, which is about 15 kilometres from the community.

Kwaata, a community in the Assin South District, is inhabited mainly by the Assins. With good road networks and multiple telephone networks, people of Kwaata were able to access health and market facilities in nearby towns as the community had no such facilities. There was no toilet facility in the community. Three boreholes and one dugout well served the community with water.

Adugyaa is a community inhabited mostly by the Twifos (80%) and other ethnic groups, made up of Akwapims, Ewes and Fantis. The road networks were very bad, making it difficult for the community to access market and health facilities in nearby towns as these facilities were lacking in the community. The community lacked amenities, such as play grounds, social centre, library and computer laboratory. There were three boreholes and three telephone networks in the community.

Kyirenkum, the fourth study community, was dominated by the Akwapims, forming about 70 percent of the population. The rest were Fantis, Gas and Ewes. The community got their water from three boreholes and two dugout wells. Kyirenkum had a local market, petty shops and telephone networks. The road networks linking the community to others were in a very poor state. There were no health and toilet facility as well as social centre.

Key resources in the study communities and how these resources were

distributed were examined. The key resources identified by the respondents were later confirmed by the chiefs of the communities. The common resources in all the communities were land, forest resources, streams and rivers. Other resources mentioned included rocks and bamboo. The distribution of key resources in the study communities, as presented in Table 32, clearly shows that land/forest resources, rivers and streams were available in all the communities. This was expected, as all farming communities are usually located close to rivers and streams. Besides the land/forest and rivers and streams, Adugyaa had bamboo and rocks as additional resources.

Table 32: Distribution of key resources in the study communities

Resources	Adugyaa	Homaho	Kwaata	Kyirenkum
Land/forest	*	*	*	*
Bamboo	*	-	-	-
Rocks	*	-	-	-
Rivers/streams	*	*	*	*

Source Fieldwork, 2013

In order to ascertain the distribution of the resources in the study communities, respondents explained how people accessed resources in their communities. It became evident that the distribution depended on the type of resource. With regard to rivers and streams, respondents said that both community members and outsiders had access as there were no restrictions to the use of these resources in all the communities. The community members in Adugyaa had open access to the bamboos and rocks for the construction of

their houses. Others used the bamboos to construct silos to store grains.

However, there were differences in the communities with respect to how land was distributed. Findings from the study showed that farmlands were a scarce commodity in all the study communities. The reason was that almost all the farm lands close to the communities have been tenanted. In Ahomaho and Kyirenkum (migrant communities), it became evident that the chiefs were responsible for the distribution of farmlands. It was learnt from the chiefs of these communities that the lands in the area were bought by their forefathers and this gave them the exclusive right to supervise its distribution. In Adugyaa and Kwaata, family heads were responsible for the distribution of farmlands. The reason assigned was that families owned land in those areas and the heads of the families supervised the distribution. The researcher also learned that lease and outright purchase of land were possible.

Apart from the discussion of community characteristics and the distribution of key resources, the study explored other community characteristics in terms of neighbourliness and togetherness. On the issue of togetherness in the communities, most (78.6%) of the responses indicated that the people in the study communities were close. While 15.2 percent indicated that community members were not, 6.2 percent could not tell if the people in the communities were close. The migrant communities, Ahomaho (87.7%) and Kyirenkum (86%), had the highest proportions of the extent of togetherness compared to the non-migrant communities, Kwaata (70.2%) and Adugyaa (69.2%). Based on the general responses, it became necessary to examine differences in the extent of togetherness in the study communities. A Pearson's Chi-square test of independence showed that the communities were

different with respect to the extent of togetherness ($\chi^2 = 18.865$, $df = 6$, $\alpha = 0.05$, $p\text{-value} = 0.004$). The results show that the migrant communities were more together than the non-migrant communities.

Table 33: The extent of togetherness in the communities

Extent of togetherness	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Close	36	69.2	64	87.7	73	70.2	80	86.0	204	78.6
Can't tell	2	3.8	5	6.8	10	9.6	3	3.2	20	6.2
Not close	14	27.0	4	5.5	21	20.2	10	10.8	35	15.2
Total	52	100.0	73	100.0	104	100.0	93	100.0	322*	100.0

$\chi^2 = 18.865$, $df = 6$, $\alpha = 0.05$, $p\text{-value} = 0.004$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

A follow-up question was posed for respondents to explain why, in their opinion, their community members were either close together or not close together. Among the explanations given for the feeling of belonging were that the community members were united and were willing to help one another. Another reason was the perception that community members were one big family. On the other hand, some of the reasons assigned for the low level of feeling of belonging or togetherness were individualism in the communities and differences in political affiliation responsible for polarising the communities. While some community members were jealous and quarrelsome, others were not willing to offer help in times of need, and still

others blamed their chief for bringing divisions among community members.

Networks and coping strategies

One of the essential issues that is related to rural livelihoods and rural agricultural development is coping strategies. Because agricultural yields are sometimes erratic in developing countries, due to the dependence of the sector on the weather, coping strategies enable farmers to stay in production. The examination of the coping strategies of respondents became necessary as it has been observed that networks play an important part in ensuring that people are able to cope in adverse circumstances.

As part of the discussion on the coping strategies of respondents, the study explored whether the respondents had experienced low crop yield; what caused the low crop yield; and how respondents managed to survive. Regarding whether respondents ever experienced low crop yield, respondents indicated their views on this item. The results in Table 34 show that most (87.5%) of the respondents from the study communities had experienced low

Table 34: Ever experienced low crop yield

Low crop yield	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	44	86.3	63	88.7	87	87.0	80	87.9	274	87.5
No	7	13.7	8	11.3	13	13.0	11	12.1	39	12.5
Total	51	100.0	71	100.0	100	100.0	91	100.0	313*	100.0

$$\chi^2 = 0.206, df = 3, \alpha = 0.05 \text{ p-value} = .977.$$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

crop yield. A Pearson's Chi-square test of independence was used to examine the significance of the differences in the study communities with respect to their experience of low crop yield. The differences were not statistically significant ($\chi^2 = 0.206$, $df = 3$, $\alpha = 0.05$ p -value = .977).

Several reasons were assigned by respondents for the low crop yield that they had experienced. As indicated in Table 35, the reasons for low crop yield clearly show that agricultural activities in the study communities heavily depended on the weather. Respondents indicated low rainfall (26.0%), failure to apply agro-chemicals (22.2%), poor land fertility (14.6%) change in rainfall patterns (10.9%), poor farm maintenance (8.8%), and high temperatures (7.1%) as some of the explanations given to the low yield that they had experienced. Other respondents mentioned late planting (5.0%), inadequate finance needed to maintain farms (4.6%), and strong winds (0.8%). Respondents, however, managed to survive in spite of the low yield.

The coping strategies of respondents, as presented in Table 36, show that various strategies were adopted to enable respondents survive following the low crop yield that they had experienced. Among the strategies were: the reduction in the amount of food consumed (36.2%), reliance on produce from mixed cropping (17.0%), and the application of agro-chemicals (16.2%). Other measures taken to improve their farms were: reliance on incomes from non-agricultural sources (8.5%), securing food from other farmers (6.8%), taking of loans (4.2%), relying on friends (4.2%) and relying on stored farm produce (2.6%) in order to secure household consumption.

Table 35: Reasons for low crop yields

Reason	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Low rain	6	15.0	18	34.6	27	35.5	11	15.5	62	26.0
No application of agro chemicals	10	25.0	9	17.3	10	13.2	24	33.8	53	22.2
Infertile land	7	17.5	9	17.3	14	18.4	5	7.1	35	14.6
Change in rainfall pattern	7	17.5	2	3.9	9	11.9	8	11.3	26	10.9
Improper farm maintenance	2	5.0	-		2	2.6	17	23.9	21	8.8
High temperatures	6	15.0	5	9.6	5	6.6	1	1.4	17	7.1
Wrong planting time	-		3	5.8	7	9.2	2	2.8	12	5.0
Lack of finance to manage the farm	1	2.5	6	11.5	1	1.3	3	4.2	11	4.6
Strong winds	1	2.5	-		1	1.3	-		2	0.8
Total	40	100.0	52	100.0	76	100.0	71	100.0	239*	100.0

* Less than number of respondents because of non-response

Source: Fieldwork, 2013

Table 36: Coping strategies of respondents

Coping strategies	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Relied on produce from mixed farming	9	25.7	7	13.5	16	21.1	8	10.7	40	17.0
Reduced consumption	9	25.7	18	34.6	28	36.9	30	40.0	85	36.2
Application of fertilizers	9	25.8	7	13.5	8	10.5	17	22.7	38	16.2
Relied on income from other business	4	11.4	1	1.9	8	10.5	7	9.3	20	8.5
Bought from other farmers	2	5.7	1	1.9	7	9.2	6	8.0	16	6.8
Planted another crop	-		8	15.4	2	2.6	-		10	4.3
Relied on stored farm produce	-		4	7.7	1	1.3	1	1.3	6	2.6
Went for loan	2	5.7	4	7.7	1	1.3	3	4.0	10	4.2
Relied on friends	-		2	3.8	5	6.6	3	4.0	10	4.2
Total	35	100.0	52	100.0	76	100.0	75	100.0	235*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Across the communities, none of the respondents from Adugyaa relied on friends, stored farm produce or planted another crop in order to secure household consumption. However, the responses from the communities did not differ much. Generally, the most common strategies for survival in all the communities were the reduction in the consumption level of the affected farmers, application of fertilizers and the reliance on produce from mixed cropping.

As part of the items on coping strategies, respondents were asked to indicate if they had ever suffered post-harvest losses and, if so, they should indicate how they managed to survive. From the findings, most (67.1%) of the respondents had never suffered post-harvest losses (Table 37). However, across the communities, Ahomaho had the largest proportion (50.7%) of those who had suffered post-harvest losses, followed by Kwaata (44.4%) and Adugyaa (23.5%). The pattern of responses across the study communities was

Table 37: Ever suffered post-harvest losses

Post harvest losses	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	12	23.5	34	50.7	40	44.4	15	16.7	101	32.9
No	39	76.5	33	49.3	59	59.6	75	83.3	206	67.1
Total	51	100.0	71	100.0	100	100.0	91	100.0	307*	100.0

$$\chi^2 = 24.964, df = 3, \alpha = 0.05, p\text{-value} = .000$$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

tested, using the Chi-square test of independence. The association was found to be significant at both the 0.01 and 0.05 alpha levels ($\chi^2 = 24.964$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .000$). Respondents from Ahomaho suffer more post harvest losses than the rest of the communities.

The respondents who had suffered from post-harvest losses explained how they managed to secure household consumption (Table 38). The survival strategies as espoused by those who had suffered post harvest losses show that about 45 percent of them reduced consumption, while 25.3 percent depended

Table 38: How respondents secured household consumption after suffering from post-harvest losses

Strategy	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Reduced consumption	6	54.5	15	46.9	15	36.6	9	60.0	45	45.4
Depended on other crops	3	27.3	5	15.6	16	39.0	1	6.7	25	25.3
Depended on others	1	9.1	9	28.1	8	19.5	1	6.7	19	19.2
Bought on credit	1	9.1	3	9.4	2	4.9	4	26.7	10	10.1
Total	11	100.0	32	100.0	41	100.0	15	100.0	99*	100.0

* Less the number of respondents because of non-response

Source: Fieldwork, 2013

on other crops. Others depended on friends and relatives (19.2%), while some (10.1%) bought goods on credit in order to secure household consumption.

Within the communities, the majority of the respondents from Kyirenkum (60.0%) and Adugyaa (54.5%) reduced their volume of consumption.

Social networks and rural agriculture

This section presents the examination of social networks and agricultural development in the study communities. Issues under agricultural development that are discussed include: access to information, adoption of technology and knowledge transfer; marketing of agricultural produce; accessibility to credit for rural agriculture; the relationship among network size, density, yield and income.

Access to information, adoption of technology and knowledge transfer

In discussing respondents' access to information, adoption of technology and knowledge transfer, the issue of how advice networks helped farmers in their farm activities was first examined. Views of respondents were sought on whether they discussed farm-related activities or issues with their friends or neighbours. It became evident that, while 81.6 percent of the respondents discussed farm related activities or issues with their friends, the rest (18.4%) did not. The study communities, however, differed on their responses to this item. The details are presented in Table 39.

The details of the responses on whether farm related issues were discussed among farmers, as shown in Table 39, show that 94.1 percent of the responses from Adugyaa, compared with 76.0 percent of the responses from Kwaata, discussed farm related activities and issues with friends and neighbours. Similar responses were received from Ahomaho (84.9%) and

Kyirenkum (78.3%).

In order to determine the significance of the pattern of responses in the study communities, a Chi-square test of independence was conducted at the 5% alpha level. The test results show that the communities were different on how respondents discussed farm related issues and activities with their friends and neighbours ($\chi^2 = 8.733$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .033$). A further analysis, using the Phi coefficient test and the Cramer's V, confirmed the significance of the preponderance of responses on the discussion of farm related issues and activities with friends and neighbours (Phi = .165, $p\text{-value} = .033$; Cramer's V = .165; $\alpha = 0.05$, $p\text{-value} = .033$). Respondents from Adugyaa and Ahomaho discussed farm related activities more than those from Kyirenkum and Kwaata.

The study also ascertained the issues and the activities that were often discussed. Findings from the study show that no issue or activity dominated in the discussion. Nonetheless, about a third (32.2%) of the issues usually discussed related to farm management practices. This was followed by discussion on the times and seasons to grow or to plant crops (17.2%). Other issues discussed included: the appropriate use of agro-chemicals (15.3%), moral support and encouragement (10.3%), and fertilizer application (26%). Respondents usually discussed these issues at drinking bars, after church services, during communal labour, and at community meetings. Others included play grounds, on farm visits, agricultural extension meetings and in the homes of respondents during visitation by friends.

The next issue examined is access to knowledge and adoption of technology. Access to knowledge on technology is essential for rural farming.

However, access to technology and information on the application of technologies is sometimes difficult. In most rural areas, farmers rely on

Table 39: Discussion of farm-related activities/issues with friends and neighbours

Discuss farm related activities	Adugyaa		Ahomaho		Kwaata		Kyirenkun		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	48	94.1	62	84.9	79	76.0	72	78.3	261	81.6
No	3	5.9	11	15.1	25	24.0	20	21.7	59	18.4
Total	51	100.0	73	100.0	104	100.0	92	100.0	320*	100.0

$\chi^2 = 8.733$, p-value = .033; Phi = .165, $\alpha = 0.05$, p-value = .033; Crammer's V = .165; p-value = .033

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

information within their informal social networks (Isaac et al., 2007) to improve their agricultural activities. One of the issues examined under the adoption and diffusion of technology was whether respondents observed other farmers. In relation to this issue, the majority (81.1%) of the respondents did observe other farmers. A cross tabulation showing the distribution of the observation of other farmers by community is presented in Table 40.

As evidenced from Table 40, farmers at Adugyaa (96.2%) and Kyirenkun (87.1%), both in the same administrative district, observed other farmers on their farms. Kwaata had the least, with 71.4 percent of the respondents affirming that they observed other farmers. In order to ascertain the significance of the pattern of responses from the study communities, a Chi-

square test of independence was conducted. With a Chi-square value of 17.204 and a corresponding p-value of 0.001, the differences in the responses from the study communities were found to be significant at both the 0.01 and the 0.05 alpha levels ($\chi^2 = 17.204$, $df = 3$, $p\text{-value} = .001$). Respondents from Adugyaa and Kyirenkum observed other farmers on their farms more than those from Ahomaho and Kwaata.

Table 40: Distribution of whether respondents observed other farmers in their farms by community

Observation	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	50	96.2	56	76.7	75	71.4	81	87.1	262	81.1
No	2	3.8	17	23.3	30	28.6	12	12.9	61	18.9
Total	52	100.0	73	100.0	105	100.0	93	100.0	323*	100.0

$\chi^2 = 17.204$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .001$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Another issue that was explored under access to information and diffusion of technology was whether respondents altered their farm practices after observing other farmers. Out of the 262 respondents who had observed other farmers or farms, 98.8 percent altered their farm practices. More than 92 percent of respondents from each community who had observed other farmers or farms altered their farm practices, reflecting no significant differences ($\chi^2 = 3.387$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .336$). The findings are similar to those of

Isaac et al. (2007) who concluded that both external and internal farmer-derived sources of knowledge of agro-forestry practices were transferred through informal advice networks, providing available information throughout the farming community, as well as a foundation for community-based adoptive management.

Access to information is seen as one of the factors that aid agricultural development, especially in developing countries where the level of education among farmers is very low (Spielman, Davis, Negash & Ayele, 2008). From this premise, respondents were asked to list the specific information on farm practices that they had received from their network.

Table 41 shows that respondents benefited from varied types of information on how to improve their farms, with the most important being good farm practices (22.3%), followed by information on best season for planting crops (17.8). Others received information on how to apply organic fertilizer (11.5%), line planting (9.0%) and appropriate agro-chemical usage (9.0%). According to Conley and Udry (2003), practices, such as pruning methods, planting density and the management of organic matter and shade trees, are some of the good farming practices acquired by farmers from their networks. As part of the examination of the specific information received

from respondents' networks, the researcher explored the sources of the information received and how useful the information was. Evidence from the data collected from the field showed that most of the information came from friends (62.9%), followed by radio and television (14.6), agricultural extension officers (9.5%), relatives (6.8%), neighbours (4.8%) and market partners

Table 41: Information received on how to improve farm

Type of information	Frequency	Percent
Good farm practice	74	22.3
Best season for planting crops	59	17.8
Application of organic fertilizer	38	11.5
Line planting	30	9.0
Appropriate agro chemical	30	9.0
Spraying of crops	27	8.2
How to harvest	15	4.5
Best times to prune	22	6.6
How to nurse crops and plants	19	5.7
Pegging	10	3.0
Mixed farming	6	1.8
Livestock farming	2	0.6
Total	332*	100.0

* More than the number of respondents because of multiple responses

Source: Fieldwork, 2013

(1,4%). A cross tabulation, showing the specific information received and the source, is presented in Table 42. It can be seen from the table that the information on mixed farming (2.0%) came from friends, neighbours and radio and television. Also, the information on times to plant (18.0%), spraying of crops (7.8%) and good farm practices (24.2%) were received from friends, neighbours, extension officers, radio/television, relatives and market partners. Findings from the study showed that almost all (99.2%) of the 248 respondents

Table 42: Types and sources of specific information on farm management practices

Type of information	Friends		Neighbours		Extension Officers		Radio/TV		Relatives		Market partners		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Mixed farming	4	2.1	1	7.1	-	-	1	2.3	-	-	-	-	6	2.0
Line spacing	22	11.9	3	21.3	2	7.1	-	-	3	15.0	-	-	30	10.2
Pegging	2	1.1	-	-	3	10.7	3	6.9	-	-	-	-	8	2.7
Nursing of crops/plants	7	3.8	2	14.4	1	3.6	3	6.9	-	-	-	-	13	4.4
Application of fertilizers	22	11.9	-	-	3	10.7	8	18.6	1	5.0	-	-	34	11.6
Spraying of crops	13	7.0	2	14.4	4	14.3	3	7.0	1	5.0	-	-	23	7.8
Appropriate agro chemical	17	9.2	1	7.1	-	-	7	16.3	1	5.0	-	-	26	8.8
How to harvest	10	5.4	-	-	-	-	3	7.0	1	5.0	-	-	14	4.8
Times to plant	30	16.2	3	21.3	7	25.0	7	16.3	5	25.0	1	25.0	53	18.0
Good farm practices	51	27.6	2	14.4	5	17.9	4	9.3	6	30.0	3	75.0	71	24.2
How to prune	7	3.8	-	-	3	10.7	2	4.7	2	10.0	-	-	14	4.8
Livestock farming	-	-	-	-	-	-	2	4.7	-	-	-	-	2	0.7
Total	185	100.0	14	100.0	28	100.0	43	100.0	20	100.0	4	100.0	294*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

found the information to be useful. The study also explored whether there were differences in how the respondents from the various communities assessed the information. The results indicated that there were no significant differences among the communities ($\chi^2 = 2.451$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .484$).

Further analysis was done on innovation and the use of new agricultural technology. Respondents' views were sought on whether they had used new agricultural technology, the type of technology used and how they got information on the new technology. With respect to whether respondents had used new agricultural technology, 63.8 percent indicated they had used new agricultural technology, while the rest (36.2%) had never used new agricultural technology.

Table 43 shows the differences in the communities with respect to the use of new agricultural technology. Adugyaa had the highest proportion (86.5%) of respondents who had used new agricultural technology. This was followed by Ahomaho (63.4%), Kwaata (58.3%) and Kyirenkum (57.4%). These differences in the communities with respect to the adoption or use of new agricultural technology were significant at both 0.01 and 0.05 levels of significance ($\chi^2 = 14.653$, $df = 3$, $p\text{-value} = .002$). As Udry and Conley have noted, farmers experiment with varying levels of intensity and that, a given farmer will begin to use, for example, more fertilizer after a neighbour, with whom he/she is linked in an information network, uses high amounts of fertilizer and achieves surprisingly high profits.

After the indication of the use of new agricultural technology, the study

Table 43: Use of new agricultural technology by community

Used new technology	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	45	86.5	45	63.4	60	58.3	54	57.4	204	63.8
No	7	13.5	26	36.6	43	41.7	40	42.6	116	36.2
Total	52	100.0	71	100.0	103	100.0	94	100.0	320*	100.0

$$\chi^2 = 14.653, df = 3, \alpha = 0.05, p\text{-value} = .002$$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

explored the specific technology used by the farmers. The main technologies herbicides (23.1%); and pegging/line spacing (10.3%) (Table 44). The migrant communities appear to use more herbicides than the non-migrant communities. The non-migrant communities, however, were noted for pegging/line planting (12.4%) and the nursing of seeds (4.1%). The differences in the communities with respect to the use of specific agricultural technology were, however, not statistically significant ($\chi^2 = 6.062, df = 3, \alpha = 0.05, p\text{-value} = .192$).

In addition to the specific technologies used, the source of the specific information on the new technologies used was examined. Dominant among the sources of new technologies were neighbours (39.1%), agricultural extension officers (32.2%), radio/television/books (17.8%) and market partners (10.9%). It is evident from Table 45 that the study communities differed with respect to the sources from which respondents got their information on new agricultural technologies. In Ahomaho, for example, 64.4 percent of the information on new technologies was received from agricultural extension officers, compared

with 18.9 percent from Kyirenkum and 25 percent each from Adugyaa and Kwaata. The respondents intimated that extension workers taught them how to plant in lines as well as the best times to plant. Other respondents said they

Table 44: Use of specific agricultural technologies by type of community

Technology used	Migrant		Non-migrant		Total	
	No.	%	No.	%	No.	%
Herbicides	26	26.5	19	19.6	45	23.1
Fertilizer	35	35.7	36	37.1	71	36.4
Equipment/machines	29	29.6	26	26.8	55	28.2
Pegging/line spacing	8	8.2	12	12.4	20	10.3
Nursing of seeds	-		4	4.1	4	2.0
Total	98	100.0	97	100.0	195*	100.0

$\chi^2 = 6.062$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .192$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

were taught how to apply fertilizers. Education on how to prune, application of agro-chemicals and best farm practices were other benefits derived from the visits of the agricultural extension workers. In addition, half of the sources of information on new agricultural technologies in Adugyaa came from neighbours, compared with 24.4 percent for Ahomaho. The differences in the communities with respect to the source of information on new agricultural technologies were found to be statistically significant ($\chi^2 = 38.836$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .000$). Generally agricultural extension officers were an

important source of information on agricultural technologies in Ahomaho, while the rest of the communities depended more on neighbours.

Table 45: The sources of new technologies by community

Source	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Neighbours	22	50.0	11	24.4	23	38.3	23	43.4	79	39.1
Extension officers	11	25.0	29	64.4	15	25.0	10	18.9	65	32.2
Radio/television/books	9	20.5	4	9.0	15	25.0	8	15.1	36	17.8
Market partners	2	4.5	1	2.2	7	11.7	12	22.6	22	10.9
Total	44	100.0	45	100.0	60	100.0	53	100.0	202*	100.0

$\chi^2 = 38.836$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .000$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Further analysis was done to explore the differences in the type of community (migrant/non-migrant) in relation to the source of new agricultural technology. There were significant differences ($\chi^2 = 8.688$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .034$) in the type of community and the source of new agricultural technology. While the migrant communities relied more on community members and radio and television for information on new agricultural technology, the non-migrant communities mostly got their information from agricultural extension officers and market partners.

Also examined, as part of the discussion on adoption and diffusion of technology, was the experimentation by farmers and the diffusion of newly

acquired knowledge. As indicated in Table 46, the results suggest that 65.3 percent of the respondents from the communities conducted on-farm experiment. Details from the table show that most of the respondents from Ahomaho (83.3%), Kwaata (65.0%), Adugyaa (62.7%) and Kyirenkum (53.2%) conducted on-farm experiment. In order to determine the significance of the preponderance of responses in the study communities, the Chi-square test of independence was performed. The test result showed significant differences in the study communities in relation to on-farm experimentation by respondents ($\chi^2 = 16.568$, $df = 3$, $\alpha = 0.05$ p-value = .001), with communities from the Assin South District (Ahomaho and Kwaata) conducting more on-farm experiment than those from the Twifo-Heman-Lower Denkyira District (Adugyaa and Kyirenkum).

Table 46: Conduct of on-farm experiment by respondents

Experiment	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	32	62.7	60	83.3	67	65.0	50	53.2	209	65.3
No	19	37.3	12	16.7	36	35.0	44	46.8	111	34.7
Total	51	100.0	72	100.0	103	100.0	94	100.0	320*	100.0

$\chi^2 = 16.568$, $df = 3$, $\alpha = 0.05$, p-value = .001

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

With respect to the specific type of experiment that they conducted, the evidence in Table 47 shows that respondents experimented with different

Table 47: The type of on-farm experiment by community

Experiment	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Type of crop that soil can support	7	26.0	19	33.3	26	40.6	22	44.9	74	37.6
Type of breed that gives highest yield	8	29.6	15	26.3	17	26.6	9	18.4	49	24.9
Cultivation with different chemical fertilizers	6	22.2	20	35.1	17	26.6	5	10.2	48	24.3
Application of insecticides and agro-chemicals	3	11.1	-	-	-	-	8	16.3	11	5.6
Changes that occur to plants during seasons	1	3.7	1	1.8	4	6.2	3	6.1	9	4.6
Application of organic manure	2	7.4	2	3.5	-	-	2	4.1	6	3.0
Total	27	100.0	47	100.0	64	100.0	49	100.0	197*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

crops and plants to enable them to identify the type of crop or plant that the soil could support (37.6%). This was followed by the type of breed that gave the highest yield (24.9%) and cultivating with different chemical fertilizers (24.3%). The application of insecticides and agro-chemicals (5.6%), seasonal changes in plants (4.6%) and the application of organic manure (3.0) were among the least experiments conducted by the farmers. Across the communities, 44.9 percent of the responses from Kyirenkum as compared with 26.0 percent of the responses from Adugyaa experimented with the type of crops that the soil could support. The proportions in Kwaata and Ahomaho that experimented with different crops to find which one did well on the soil were 40.6 percent and 33.3 percent respectively. The largest proportion of the responses that experimented with different breeds came from Adugyaa (29.6%), followed by Kwaata (26.6%) and Ahomaho (26.3%).

Another type of on-farm experiment was the use of chemical fertilizers. About a quarter (24.3%) of the respondents experimented with the use of chemical fertilizers. Within the communities, Ahomaho had the largest proportion of respondents (35.1%) experimenting with chemical fertilizers, followed by Kwaata (26.6%), while Kyirenkum had the least (10.2%). It is also evident from Table 47 that the experimentation with organic manure was done in all the communities, except in Kwaata. Also, it was only in Adugyaa (11.1%) and Kyirenkum (16.3) that insecticides and agro-chemicals were applied.

In furtherance of the discussion on on-farm experimentation, the study examined the transfer of knowledge acquired from the on-farm experiment. It became evident that the majority (90.9%) of the respondents shared their

newly acquired knowledge with other farmers. The majority of the respondents from Adugyaa (96.3%), Ahomaho (91.2%), Kwaata (90.6%) and Kyirenkum (87.8%) who conducted on-farm experiment shared their knowledge with other farmers (Table 48). The findings are similar to those of Goswami and Basu (2011). In a study on the influence of information networks on farmers' decision, Goswami and Basu concluded that information networks are necessary for the understanding of the diffusion process of agricultural innovations at the micro level.

Table 48: Sharing of newly acquired knowledge with other farmers

Knowledge shared	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	26	96.3	52	91.2	58	90.6	43	87.8	179	90.9
No	1	3.7	5	8.8	6	9.4	6	12.2	18	9.1
Total	27	100.0	57	100.0	64	100.0	49	100.0	197*	100.0

$$\chi^2 = 1.544, df = 3, \alpha = 0.05, p\text{-value} = .672$$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Another issue that was examined in relation to knowledge transfer and technology adoption was how respondents accessed good farm practices when their friends visited them on their farms. The type of assistance or help they got from these friends during the times that they visited them on their farms are presented in Table 49. Almost all the benefits were labour-related. Labour was supplied in different stages of their farming activities. These included: weeding (28.8%), harvesting of farm produce (19.8%), cracking of cocoa pods

(18.7%), and planting (11.7%). Other assistance in the farm centred on spraying of crops (5.0%) and pruning (2.7%).

Table 49: Benefits received by respondents when their friends visited them on their farm

Benefits	Frequency	Percent
Weeding	74	28.8
Harvesting of farm produce	51	19.8
Cracking of cocoa pods	48	18.7
Planting	30	11.7
Advice	27	10.5
Spraying of crops	13	5.0
Pruning	7	2.7
Supply of seeds	4	1.6
Helped to make shades	2	0.8
Carting of farm produce	1	0.4
Total	298*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Social networks and the marketing of agricultural produce

Market networks play a very important role in the growth and development of rural agriculture. Research has shown that just belonging to a group or an association is not a pre-requisite for the development of rural

agriculture (Verhofstadt & Maertens, 2013). This is because the driving force of most agricultural produce in developing countries is demand. It was as a result of this that respondents were asked a number of questions that bordered on the marketing of their farm produce. The questions bordered on where respondents marketed their farm produce, whether respondents belonged to market cooperatives, sources of information about market prices, and whether respondents had sold on credit.

First, respondents indicated where they sold most of their farm produce. It became evident that most (75%) of the farm produce of the respondents were sold in the communities in which they resided. The reasons given were that buyers from most parts of the country came to the communities to purchase the produce from them. With respect to cocoa, for example, all the cocoa beans produced by farmers were sold in their communities because of the presence of cocoa buying companies in the communities. Apart from the cash crops that were mainly sold in the communities, some of the food crops were sold in different communities in the same district (22%), while others were sold in different districts (1%) (Figure 8).

A follow-up question was posed to elicit information on the size of respondents' market networks. The minimum number of customers respondents sold to was one, while the maximum was 60. While 50 percent of the respondents had at least two customers, 25 percent had more than three customers whom they sold to. The median number of customers respondents sold to was two (skewness = 7.7).

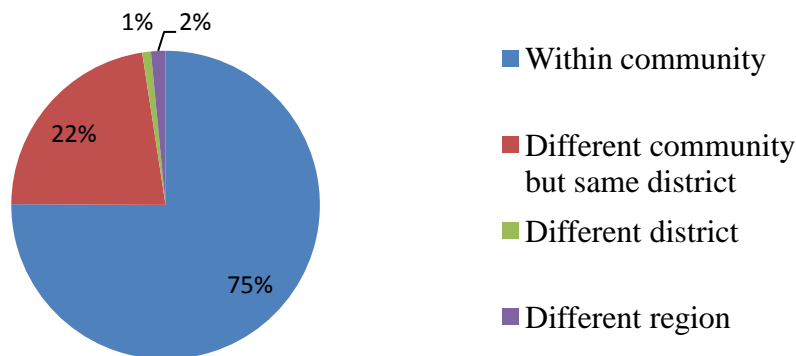


Figure 8: Marketing of farm produce

N=329 because of multiple responses

Source: Fieldwork, 2013

Related to the number of customers respondents sold to was the question of the number of sellers respondents bought their farm inputs from. A little over 33 percent of the respondents had particular sellers from whom they bought farm inputs. The rest (66.9%) bought farm inputs from any available sellers. Out of those who bought from specific sellers, 62.9 percent bought from one specific seller, 23.8 percent bought from two sellers, while the rest (13.3%) either bought from three or more sellers.

The study also examined how market networks helped respondents in their agricultural activities. Items in this category covered market cooperatives and the type of produce they marketed, as well as the source of information on market prices. Other issues discussed as part of respondents' market networks included credit sales and the purchase of agricultural inputs on credit.

One of the questions that were posed was for respondents to indicate whether they belonged to a market cooperative. It became evident that most (89.3%) of the respondents did not belong to a market cooperative. The details

of the responses in Table 50 show that most of the respondents from all the communities did not belong to market cooperatives. With regard to the type of produce the cooperatives marketed, it was found out that the cooperatives marketed mainly cocoa and oil palm.

Table 50: Membership in a market cooperative

Member	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	8	15.4	12	16.9	5	5.0	9	9.7	34	10.7
No	44	84.6	59	83.1	96	95.0	84	90.3	283	89.3
Total	52	100.0	71	100.0	101	100.0	93	100.0	317*	100.0

$\chi^2 = 7.632$, p-value = .054

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Besides market cooperatives, the study explored respondents' sources of information about market prices. As indicated in Table 51, most of the sources of information about prices of farm produce came from market partners (55.5%), radio (21.7%) and friends (15.3%). Additional sources of information were government announcement (4.3%), agricultural extension officers (1.1%) and relatives (0.7). Among the communities, most of the responses from Kwaata (73.9%), Adugyaa (56.5%), and Kyirenkum (54.5%) indicated market partners as the main source of information about market prices. Ahomaho had no dominant source of information about market prices as respondents got the information mainly from market partners (28.8%), radio

(27.1%), friends (25.4%) and the government (11.9%).

Table 51: Sources of information about market prices of farm produce

Source	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Market partners	26	56.5	17	28.8	65	73.9	48	54.5	156	55.5
Radio	14	30.4	16	27.1	8	9.1	23	26.1	61	21.7
Friends	5	10.9	15	25.4	13	14.8	10	11.4	43	15.5
Government	-		7	11.9	-		5	5.7	12	4.3
Self	1	2.2	1	1.7	-		2	2.2	4	1.4
Extension officers	-		1	1.7	2	2.3	-		3	1.1
Relatives	-		2	3.4	-		-		2	0.7
Total	46	100.0	59	100.0	88	100.0	81	100.0	281	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Further analysis on market networks among the respondents related to credit sales. A question was posed to elicit information on whether respondents sold on credit. The majority (79.8%) of the respondents had sold on credit (Table 52). It is obvious from the table that most of the respondents from each community had sold their agricultural produce on credit. Among the communities, Kyirenkum had the largest proportion (84.6%) of its respondents who had sold on credit. This was followed by Adugyaa (82.0%), Kwaata (77.2%) and Ahomaho (75.7%). The differences in the responses from the communities were tested, using the Pearson's Chi-square test of independence.

The results showed no significant differences in the communities with respect to credit sales of agricultural produce ($\chi^2 = 2.599$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .458$).

Table 52: Credit sales by respondents

Credit sales	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	41	82.0	53	75.7	78	77.2	77	84.6	249	79.8
No	9	18.0	17	24.3	23	22.8	14	15.4	63	20.2
Total	50	100.0	70	100.0	101	100.0	91	100.0	312*	100.0

$\chi^2 = 2.599$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .458$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Respondents further ascertained the persons to whom they sold their produce on credit. It was revealed that the majority (93.3%) of the credit sales went to market partners. Only a few went to relatives (3.1%), friends (2.8%) and neighbours (0.8%) (Table 53).

Related to the credit sales of agricultural produce is the purchase of farm inputs on credit. It is based on this that the researcher explored whether respondents ever bought farm inputs on credit. From Table 54, the majority (63.1%) of the respondents had bought farm inputs on credit. However, the proportion of those who had bought farm inputs on credit was higher in Kyirenkum (72.3%) than in Adugyaa (67.3%), Ahomaho (58.9%) and Kwaata

Table 53: Persons to whom produce was sold on credit

Persons	Adugyaa		Ahomaho		Kwaata		Kyirenkun		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Market partners	40	97.6	50	90.9	70	87.5	77	98.7	237	93.3
Relatives	1	2.4	1	1.8	5	6.2	1	1.3	8	3.1
Friends	-		3	5.5	4	5.0	-		7	2.8
Neighbours	-		1	1.8	1	1.2	-		2	0.8
Total	41	100.0	55	100.0	80	100.0	78	100.0	254*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

(55.4%). The differences in the responses from the study communities were tested, using the Chi-square test of independence. However, the result indicated no significant differences in the purchase of farm inputs on credit in the study communities ($\chi^2 = 6.938$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .074$).

Table 54: Purchase of farm inputs on credit

Credit purchase	Adugyaa		Ahomaho		Kwaata		Kyirenkun		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	35	67.3	43	58.9	56	55.4	68	72.3	202	63.1
No	17	32.7	30	41.1	45	44.6	26	27.7	118	36.9
Total	52	100.0	73	100.0	101	100.0	94	100.0	320*	100.0

$\chi^2 = 6.938$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .074$.

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

However, those respondents who had bought farm inputs on credit were asked to indicate the persons from whom they bought the inputs. The findings in Table 55 reveal that majority (79.3%) bought from market partners. Most of the respondents explained that there was an agreement between them and the market partners. The market partners supplied farm inputs to farmers on credit and the farmers, in turn, sold their produce to them, sometimes on credit. There was usually a trade-off between the market partners and the farmers. In Kyirenkum, 91.2 percent of the respondents bought from market partners, while the proportion that bought from market partners from Adugyaa, Kwaata and Ahomaho were 83.3 percent, 70.7 percent and 69.6 percent respectively. Besides market partners, some (20.7%) of the respondents bought from friends. The differences in the communities with respect to whom respondents bought farm inputs from on credit were found to be significant at both the 0.01 and 0.05 alpha levels ($\chi^2 = 11.486$, $df = 3$, $p\text{-value} = .009$).

Table 55: Sources of purchased farm inputs

Source	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Market partners	30	83.3	32	69.6	41	70.7	62	91.2	165	79.3
Friends	6	16.7	14	30.4	17	29.3	6	8.8	43	20.7
Total	36	100.0	46	100.0	58	100.0	68	100.0	208*	100.0

$\chi^2 = 11.486$, $df = 3$, $\alpha = 0.05$, $p\text{-value} = .009$

* Less than number of respondents because of non-response

Source: Fieldwork, 2013

Social networks and credit for agricultural activities

Access to credit is seen as one of the factors that promote rural agriculture. Finance can come from formal or informal sources. However, in the rural areas, informal sources of finance are the main sources of credit and are, therefore, critical to the day-to-day activities of farmers (Swain, 2002).

The respondents were asked to indicate whom they were likely to borrow from in case they were in need of financial assistance. While some of the respondents were risk averters and so were afraid to borrow, others had multiple sources of borrowing. The results in Table 56 show that the main sources of credit available to respondents in case they were in need of financial

Table 56: Available sources of credit to respondents

Source	Frequency	Percent
Friends	76	34.9
Relatives	65	29.8
Market partners	37	17.0
Financial institutions	19	8.7
Children	9	4.1
In-laws	7	3.2
Community elders	3	1.4
<i>Susu</i> (informal financial institution)	2	0.9
Total	218*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

assistance were: friends (34.9%), relatives (29.8%) and market partners (17.0%). Other sources were: financial institutions (8.7%), children (4.1%), in-laws (3.2%), community elders (1.4%), and *susu* (0.9%). The financial institutions that the respondents could access credit from include: commercial banks, rural banks, financial non-governmental institutions and non-bank financial institutions.

Closely related to the above discussion is the question that sought to know whom respondents would lend to, if they had large sums of money. As can be observed from Table 57, a little over a third (35.4%) of the respondents would lend to their friends. This was followed by lending to relatives (22.0%), and to people who could pay back (21.6%) as well as lending to children (11.1%). Only a few of the respondents would lend to their spouse (5.7%), financial institutions (2.9%) and market partners (1.3%).

A number of items were designed to enable the researcher ascertain how the respondents accessed credit for their agricultural activities. Respondents first indicated whether they required credit for their farm activities. It was revealed from the study that the majority (82.2%) of the respondents said they required credit for their farm activities (Table 58). Within the communities, the highest proportion of respondents that required credit for their farm activities came from Adugyaa (94.2%), while the lowest came from Ahomaho (71.2%). The differences in the requirement for credit across the communities were significant at both the 0.01 and 0.05 levels ($\chi^2 = 12.28$, $df = 3$, $p\text{-value} = .006$).

Table 57: Persons/institutions whom respondents would lend to

Persons/institution	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Friends	19	36.5	25	37.9	32	31.4	35	37.2	111	35.4
Relatives	11	21.2	19	28.8	21	20.6	18	19.1	69	22.0
People who can pay back	12	23.1	12	18.2	25	24.5	19	20.2	68	21.6
Children	6	11.5	3	4.5	13	12.7	13	13.8	35	11.1
Spouse	2	3.8	4	6.1	5	4.9	7	7.4	18	5.7
Financial institutions	1	1.9	2	3.0	5	4.9	1	1.1	9	2.9
Market partners	1	1.9	1	1.5	1	1.0	1	1.1	4	1.3
Total	52	100.0	66	100.0	102	100.0	94	100.0	314*	100.0

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

Table 58: The need for credit by community

Need for credit	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Attempted	49	94.2	52	71.2	83	80.6	80	86.0	264	82.2
No attempt	3	5.8	21	28.8	20	19.4	13	14.0	57	17.8
Total	53	100.0	73	100.0	103	100.0	93	100.0	321*	100.0

$$\chi^2 = 12.28, df = 3, \alpha = 0.05, p\text{-value} = .006$$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

However, the majority (69.7%) of the respondents who required credit for their farm activities never made the attempt to secure one (Table 59). It was only in Ahomaho that a little over half of the respondents (51.9%) who indicated that they required credit actually made the attempt to secure one. Lower proportions of the attempts made to secure credit were recorded in Kyirenkum (16.2), Kwaata (24.1) and Adugyaa (40.8%). The differences in the attempt to secure credit were significant at both the 0.01 and 0.05 significance levels ($\chi^2 = 23.067, df = 3, \alpha = 0.05, p\text{-value} = .000$). The respondents who did not make the attempt to secure credit cited fear of default (43.5%), high interest rate (19.6), cumbersome procedure for loan acquisition (19.0%), collateral (9.8%), and lack of guarantors (8.1%).

Based on the attempt made by respondents to secure credit for their farm activities, the study further explored the success rate of those who made

Table 59: Attempts made to secure credit

Attempt made	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	20	40.8	27	51.9	20	24.1	13	16.2	80	30.3
No	29	59.2	25	48.1	63	75.9	67	83.8	184	69.7
Total	49	100.0	52	100.0	83	100.0	80	100.0	264*	100.0

$$\chi^2 = 23.067, df = 3, \alpha = 0.05, p\text{-value} = .000$$

* Less than the number of respondents because of non-response

Source: Fieldwork, 2013

the attempt to get credit. Findings from the study indicated that most (57.5%) of the respondents who made the attempt to secure credit were not successful (Table 60). Within the study communities, it was only in Adugyaa that the majority (55.0%) of the respondents who made the attempt to obtain credit were successful. It can be seen in Figure 9 that most of the respondents got their credit from rural banks (42.0%) and commercial banks (16.0%). While some secured their credit from market partners (16.0%), others obtained their credit from credit unions (8.0%), friends (5.0%), children (5.0%), *susu* collectors (5.0%), and non-governmental organisations (3.0%). However, the differences in the responses across the study communities were not statistically significant ($\chi^2 = 2.686, df = 3, \alpha = 0.05, p\text{-value} = .443$).

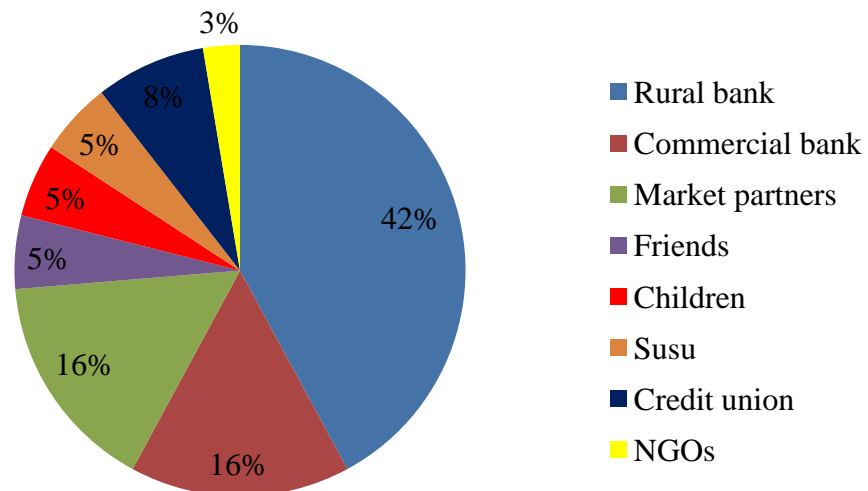


Figure 9: Sources where respondents secured credit

Source: Fieldwork, 2013

The study further examined how the credit obtained was used. Most (55.6%) of those who were able to obtain credit invested the money in petty trading ostensibly to cushion the income they got from their agricultural activities. About 42 percent of them also used the credit to purchase agro-chemicals and farm inputs. Only 2.8 percent of those who secured credit used the money to hire labourers. Generally, almost all (96.8%) of those who secured credit said the credit was very useful as it helped improve their livelihoods. Those who used the money in their agricultural activities said that the agro-chemicals that they used the credit for helped to increase their yield. Others were not successful because they could not meet the conditions of the credit. These conditions included: collaterals, guarantors, inconsistencies in the information supplied on the loan forms.

Table 60: Success in securing credit

Successful	Adugyaa		Ahomaho		Kwaata		Kyirenkum		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	11	55.0	12	44.4	6	30.0	5	38.5	34	42.4
No	9	45.0	15	55.6	14	70.0	8	61.5	46	57.5
Total	20	100.0	27	100.0	20	100.0	13	100.0	80*	100.0

$$\chi^2 = 2.686, df = 3, \alpha = 0.05, p\text{-value} = .443$$

* Only 80 respondents made the attempt to secure credit

Source: Fieldwork, 2013

Network size, network density, yield and income from agriculture

This section examines the relationship among network size, network density, yield and income from agriculture. In order to address this, respondents were asked to indicate the types of crops grown. Among the crops grown by the respondents were: cocoa (28%), cassava (17%), oil palm (14%), maize (13%), tomatoes (5%), pepper (4%), cocoyam (3%), and okra (2%) (Figure 10).

With respect to cocoa, the minimum farm size was one acre, the maximum was 100. The median farm size was four acres (skewness = 6.9). The yield of cocoa varied from a minimum of one bag to a maximum of 600 bags. The median bags of cocoa produced were seven (skewness = 7.56). The income from cocoa depended on the yield. While the minimum income was ₵120.00, the maximum was ₵40,000.00.

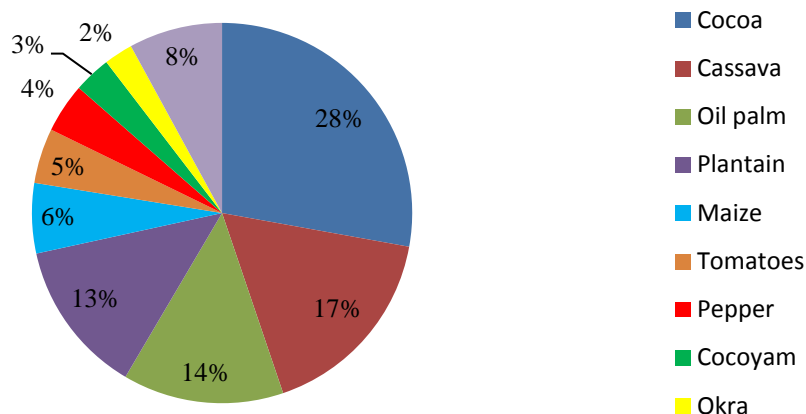


Figure 10: Crops grown by respondents

N=855 because of multiple responses

Source: Field data, 2013

Cassava was a popular crop in the study communities. The minimum farm size for cassava was 0.5 acres, while the maximum was eight acres. The median farm size for cassava was one acre (skewness = 7.6). The median bags of cassava produced in a year were 10 bags (skewness = 1.9), with a yearly median income of ₵425.00.

The minimum farm size for oil palm was one acre, the maximum was 20 acres. The distribution of size of farm for oil palm was positively skewed (skewness = 1.837) and the median farm size was four acres. The median annual yield was 600 bunches (skewness= 2.469), with a median income of ₵750.00.

With regard to plantain, the minimum farm size was 0.25 acres, while the maximum was seven acres. The distribution of plantain farm size was positively skewed (skewness = 0.93). The median farm size was one acre. The minimum yield was 10 bunches, the maximum was 240 bunches. The average (median) bunches harvested per year was 15. Income from plantain farms

varied from ₵20.00 to ₵4500 per annum.

The size of maize farm varied from 0.25 acres to 10 acres. The distribution of farm size was skewed (skewness = 0.61). The yield of maize varied from one to 100 bags. Income from sale of maize also varied from ₵100.00 to ₵2000.00 per annum. The yearly median income (skewness = 2.3) from maize farming was ₵140.00.

Aside from cocoa, cassava, oil palm, plantain and maize, the farmers in the study community also cultivated tomatoes, pepper, cocoyam, okra and other crops. These crops were, however, either cultivated alongside the major crops or were in smaller quantities.

The study examined the relationship among network size and yield of cocoa, oil palm, cassava, maize and plantain. First, the study found a significant positive linear relationship between network size and yield of cocoa ($\rho = 0.404$, $p\text{-value} = 0.000$) (Table 61). Generally, large network sizes were associated with higher yields of cocoa. However, the relationships between network size and yield for oil palm ($\rho = 0.046$, $p\text{-values} = 0.848$), cassava ($\rho = 0.126$, $p\text{-values} = 0.713$) and maize ($\rho = 0.303$, $p\text{-values} = 0.509$) were positive but not significant. The study also found a negative, but insignificant relationship between network size and yield of plantain ($\rho = -0.038$, $p\text{-value} = 0.908$).

With regard to the relationship between network size and income, the study found a significant positive linear relationship between network size and income from cocoa ($\rho = 0.425$, $p\text{-value}, 0.000$) (Table 62). Besides cocoa, the study found positive but insignificant relationships between network size

Table 61: Relationship between network size and yield

Crop	N	Spearman's rho	P-value
Cocoa	142	0.404	0.000**
Oil palm	117	0.046	0.848
Cassava	145	0.126	0.713
Maize	51	0.303	0.509
Plantain	112	-0.038	0.908

** Correlation is significant at the 0.01 level of significance

Source: Fieldwork, 2013

and income from oil palm ($\rho = 0.307$, p -values = 0.165) and maize ($\rho = 0.145$, p -values = 0.784). However, the relationships between network size and income from cassava ($\rho = -0.017$, p -values = 0.955) and plantain ($\rho = -0.115$, p -values = 0.736) were negative and not significant. Generally, large network sizes were associated with higher incomes from cocoa but not for other crops.

Table 62: Relationship between network size and income

Crop	N	Spearman's rho	P-value
Cocoa	142	0.425	0.000**
Oil palm	117	0.307	0.165
Cassava	145	-0.017	0.955
Maize	51	0.145	0.784
Plantain	112	-0.115	0.736

** Correlation is significant at the 0.01 level of significance

Source: Fieldwork, 2013

The study further examined the relationship between network density and yield. A significant positive linear relationship was found between network density and yield of cocoa ($\rho = 0.249$, $p\text{-value} = 0.003$) (Table 63). Apart from cocoa, the relationships between network density and the yield of oil palm ($\rho = 0.147$, $p\text{-value} = 0.537$) and maize ($\rho = 0.075$, $p\text{-value} = 0.873$) were positive but not significant. However, the relationships between network density and yield of cassava ($\rho = -0.112$, $p\text{-value} = 0.743$) and plantain ($\rho = -0.004$, $p\text{-value} > 0.991$) were negative and not significant. Generally, higher network densities were associated with higher yields of cocoa but not for other crops (Table 63).

Table 63: Relationship between network density and yield

Crop	N	Spearman's rho	P-value
Cocoa	153	0.249	0.003**
Oil palm	117	0.147	0.537
Cassava	142	-0.112	0.743
Maize	51	0.075	0.873
Plantain	88	-0.004	0.991

** Correlation is significant at the 0.01 level of significance

Source: Fieldwork, 2013

The study also examined the relationship between network density and income from cocoa, oil palm, cassava, maize and plantain (Table 64). The relationship between network density and income from cocoa was positive and significant ($\rho = 0.347$, $p\text{-value} = 0.000$). Also, the relationship between network density and income from oil palm was positive and significant ($\rho =$

0.566, p-value = 0.006). The study further found a positive but insignificant relationship between network density and income from maize ($\rho = 0.273$, p-value = 0.600). However, the relationship between network density and income from cassava ($\rho = -0.329$, p-values > 0.250) and plantain ($\rho = -0.160$, p-values = 0.639) was negative but insignificant. Generally, higher network densities were associated with higher incomes from cocoa and oil palm farmers but not for cassava, maize and plantain.

Table 64: Relationship between network density and income

Crop	N	Spearman's rho	P-value
Cocoa	142	0.347	0.000**
Oil palm	113	0.566	0.006**
Cassava	145	-0.329	0.250
Maize	51	0.273	0.600
Plantain	112	-0.160	0.639

** Correlation is significant at the 0.01 level of significance

Source: Fieldwork, 2013

Summary of social networks, community characteristics, local conditions and rural agricultural development

Key resources in the study communities were land/forest resources, rivers and streams. Bamboo and rocks were additional resources in Adugyaa. Both community members and strangers had open access to the rivers, streams, bamboo and rocks. Access to land depended on the ownership systems in the study communities. Land in the migrant communities was distributed by chiefs,

while family heads distributed lands in the non-migrant communities.

On the issue of togetherness or feeling of belonging in the communities, most (63.4%) of the responses indicated that the people in the study communities were very close. However, most of the respondents from Adugyaa perceived that their community was not close, citing issues like differences in political affiliation, jealousy and individualism as factors polarising their community.

The majority of the respondents in the study communities had experienced low crop yields. Respondents indicated low rainfall, change in rainfall patterns, high temperatures and strong winds as some of the explanations given to the low yields that they experienced. Respondents relied on produce from mixed cropping, reduction in the amount of food consumed and the reliance on incomes from non-agricultural sources as part of the coping strategies. Others took measures to improve their farms by applying agro-chemicals, secured food from other farmers or relied on shelved crops. Generally, the most common strategies for survival in all the communities were the reduction in the amount of food consumed and the reliance on produce from mixed cropping.

About 82 percent of the respondents discussed farm-related activities or issues with their friends. Farm-related activities and issues often discussed with friends included farm management practices, the times and seasons to grow or to plant crops, appropriate use of agro-chemicals and fertilizer application. Respondents usually discussed these issues at drinking bars, after church services, during communal labour, and at community meetings. Others included play grounds, on-farm visits, agricultural extension meetings and in the homes of

respondents during visitation by friends.

Observation of other farms and farmers was a common practice in all the communities. More than 92 percent of respondents who had observed other farmers or farms altered their farm practices. Respondents also benefited from varied information on how to improve their farms, with the most preponderant being good farm practices, followed by information on best season for planting crops. While the migrant communities received more information on pegging and the best seasons for planting crops, farmers in the non-migrant communities accessed more information on good farm practices. Most of the information came from neighbours, agricultural extension officers, radio/television/books and market partners.

Most (75.1%) of the farm produce of the respondents was sold in the communities in which they resided. The minimum number of customers that respondents sold to was one while the maximum was 60. While 50 percent of the respondents had at least two customers, 25 percent had more than three customers. The median number of customers respondents sold to was two (skewness = 7.7). The majority (89.2%) of the respondents did not belong to a market cooperative. While some (55.5%) of the respondents relied on market partners for information on market prices, others relied on radio (21.7%) and friends (15.5%). The selling of farm produce on credit to market partners, friends, neighbours and relatives was a common practice in all the communities.

Accessing credit from informal sources was a normal practice in the study communities. Respondents could borrow from friends, relatives, market partners, in-laws, and financial institutions. Others also borrowed from *susu* collectors, credit unions and non-governmental organisations. Even though the

majority of the respondents required credit for their farm activities, only a few made an attempt to secure one. While most of the respondents from Kwaata, Ahomaho and Kyirenkum were not successful, a little over half of those who made the attempt to secure credits in Adugyaa were successful.

Generally, large network sizes were associated with higher yields and incomes for cocoa farmers, but not for oil palm, cassava, plantain, and maize farmers. Also, higher network densities were associated with higher yields and incomes for cocoa farmers. Also, the relationship between network density and incomes for oil palm farmers was significant.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The chapter focuses on the summary of the study, the conclusions drawn from the findings, and recommendations. The final sections of the chapter examines at the contribution to knowledge and areas for further research.

Summary

The study set out to examine the utilisation of social networks among rural farmers in four rural communities in the Central Region of Ghana. The specific objectives of the study were to: examine the roles social network characteristics play in the agricultural development of the selected communities; examine the mobilisation and utilisation of social networks among rural farmers in the selected communities; and determine the relationships among social networks, community characteristics, local conditions and rural agricultural development.

In order to achieve the set objectives, a sample of 327 farmers was selected from a population of 2084 from Ahomaho, Kwaata, Adugyaa and Kyirenkum. The egocentric approach was used to constitute the sample. First, two farmers, made up of a male and a female, were accidentally selected in each of the communities from which their networks were generated. The snowball technique was then used to select the respondents until the theoretical

sample of 327 was obtained. A mixed research design was chosen for the study, with quantitative being the dominant approach. Data were collected through the use of interview schedule for the farmers; an interview guide for the chiefs and key informants; and a community profiling guide. The analysis of data was done using the Statistical Product and Service Solutions (Version 21) software. Data were presented by the use of percentages, frequencies. The Chi-square, Spearman's rank order correlation, Kruskal Wallis and the median tests were used to examine the relationships of the variables in the study as well as the differences in the study communities.

Key findings of the study

The main findings of the study were as follows:

The role of social network characteristics in rural agricultural development

1. Network characteristics differed in terms of structure, content and function.
2. With respect to network size, the minimum was three, while the maximum was 304. The median network size was 9.
3. Respondents from Adugyaa had the largest network size (mean rank = 163.28), followed by Kyirenkum (mean rank = 137.27), Kwaata (mean rank = 131.19), and Ahomaho (mean rank = 112.79).
4. The minimum network density was 1.5, the maximum was 151. The median network density was 4.0. Among the study communities, Adugyaa had the highest network density (mean rank = 156.3), followed by Kyirenkum (mean rank = 156.3), Kwaata (mean rank = 140.53) and Homaho (mean rank = 104.70).

5. Two forms of relationships were identified. These were horizontal and vertical relationships. Respondents made more use of horizontal networks than vertical networks.
6. Among the powerful agents in the vertical relationships were the buyers of farm produce, religious leaders and chiefs.
7. The resources that flowed among networks included rendering of services (31.1%), information (26.2%), advice (15.0%), money (8.7%), and food. Offering of labour assistance (5.4%) was common in all the communities. Other resources distributed among networks in the study communities were farm inputs (1.4%), and home visitation (1.4%). The intent of the exchange relationships was mostly reciprocal.
8. The functions of the networks identified included: social support, companionship, appraisal and monitoring.
9. The social support functions were both tangible and intangible. With respect to the tangible support, the networks served as a conduit for providing finance, food and farm inputs to the actors. The intangible aspects of the social support identified included: moral support/advice, labour, services, and visitations.
10. Most of the respondents agreed that people volunteered (88.9%) in community activities and made fair contributions (79.2%) to community activities. Those who did not participate in community activities were sanctioned. Paramount among the sanctions was the payment of fines.
11. Appraisal of networks was usually done by chiefs, family heads, elders, religious leaders, committee members and friends.

12. Networks monitored the behaviour of members by using disciplinary measures. Specific sanctions included the payment of fines (51%), suspension (10.8%), dismissal (9.9%) and counselling (8.2%).

Mobilisation and utilisation of social networks among rural farmers

13. The most common events that brought people together in all the communities were: community meetings (29.2%), funerals (29.2%) and communal labour (14.1%). Other events were: church conventions (7.7%) and Christmas festivities (3.6%).

14. The number of people that usually congregated during community meetings, funerals, communal labour and church conventions was between 20 and 600. The median number of people per event was 100.

15. The most important institutions in the mobilisation and utilisation of networks in the study communities were tribes and families.

16. Prominent among those who played leadership roles in mobilising groups and networks were chiefs followed by Unit Committee chairpersons. Other persons and positions were pastors, Assembly persons, Unit Committee members and community elders.

17. Farming activity in the study community was a household activity and family members, both core and extended, served as a source of free labour. Family members were often mobilised for farm activities, usually during planting and harvesting. Other institutions that mobilised networks for agricultural activities were formal and informal agricultural groups and associations. While the informal associations mainly mobilised labour for the clearing of farmlands,

planting and harvesting, the formal associations usually provided logistics (farm inputs) and market support as well as education on good farm practices.

18. Market networks in the study communities were usually based on sex. Females were mostly responsible for selling food crops, while the males were involved in the selling of cash crops and livestock.
19. There was no dominant means by which respondents maintained networks ties. However, the provision of material and non-material support as well as regular conversation with networks was vital in the sustenance of network ties.
20. The dominant agricultural associations were Cocoa Abrabopa and Akuafu Adamfo, both cocoa marketing companies. These agricultural groups were responsible for supplying farm inputs, marketing of farm produce, and the education of farmers on good farm practices.

Relationships among social networks, community characteristics and local conditions and rural agricultural development

21. Key resources in the study communities were land/forest resources, rivers and streams. Bamboo and rocks were additional resources in Adugyaa.
22. Both community members and strangers had open access to the rivers, streams, bamboo and rocks. Access to land depended on the ownership systems in the study communities. Land in the migrant communities was distributed by chiefs, while family heads distributed lands in the non-migrant communities.
23. On the issue of togetherness or feeling of belonging in the communities, it became evident that the people in the study communities were close (78.6%). However, some (27.0%) of the respondents from Adugyaa perceived that their

community was not close, citing issues like differences in political affiliation, jealousy and individualism as factors polarising their community.

24. Most (87.5%) of the respondents in the study communities had experienced low crop yields. Respondents cited low rainfall (25.9%), failure to apply agro-chemicals (22.2%), infertile land (14.6%), changes in rainfall patterns (10.9%), high temperatures (7.1%) and strong winds (0.8%) as factors responsible for the low yields that they experienced.
25. The most common strategies for survival in all the communities were the reduction in the consumption level (36.2%) of the affected farmers and the reliance on produce from mixed cropping (17.0%).
26. About 82 percent of the respondents discussed farm-related activities or issues with their friends. Farm-related activities and issues often discussed with friends included: information on good farm practices (24.2%), followed by information on best season for planting crops (18.0%), fertilizer application (11.6%), and line planting (10.2%). Respondents usually discussed these issues at drinking bars, after church services, during communal labour, and at community meetings. Others included: play grounds, on-farm visits, agricultural extension meetings and in the homes of respondents during visitation by friends.
27. Observation of other farms and farmers was a common practice in all the communities. More than 92 percent of the respondents who observed other farmers or farms altered their farm practices.
28. Respondents benefited from varied information on how to improve their farms. These included: farm management practices (22.3%), the times and seasons to

grow or to plant crops (17.8%), application of organic fertilizer (11.5%) and appropriate use of agro-chemicals (9.0%).

29. While the migrant communities received more information on pegging and the best seasons for planting crops, farmers in the non-migrant communities accessed more information on good farm practices. Most of the information on new technologies came from neighbours (39.1%), agricultural extension officers (32.2%), radio/television/books (17.8%) and market partners (10.9%).
30. Most (75.1%) of the farm produce of the respondents were sold in the communities in which they resided. The minimum number of customers that respondents sold to was one, while the maximum was 60. While 50 percent of the respondents had at least two customers, 25 percent had more than three customers. The median number of customers respondents sold to was two (skewness = 7.7).
31. The majority (89.3%) of the respondents did not belong to market cooperatives. Most (55.5%) of them relied on market partners for information on market prices, while radio (21.7%) and friends (15.5%) were other major sources of information related to the prices of produce.
32. The selling of farm produce on credit to market partners (93.3%), relatives (3.1%) friends (2.8%), and neighbours (0.8%) was a common practice in all the communities.
33. The main sources of credit available to the respondents in case they were in need of financial assistance were: friends (34.9%), relatives (29.8%), market partners (17.0%), financial institutions (8.7%) and in-laws (3.2%).
34. Even though the majority (82.2%) of the respondents required credit for their farm activities, only a few (30.3%) made an attempt to secure one. While most

of the respondents from Kwaata (70.0%), Ahomaho (55.6%) and Kyirenkum (61.5%) were not successful, a little over half of those who made the attempt to secure credits in Adugyaa were successful. Those who were successful got the credit from rural banks (42.0%), while others secured their credit from market partners (16.0%), commercial banks (16.0%), credit unions (8.0%), friends (5.0%), children (5.0%), *susu* collectors (5.0%), and non-governmental organisations (3.0%).

35. The study found a significant positive linear relationship between network size and yield of cocoa ($Rho = 0.706$, $p\text{-value} = 0.000$), but not for oil palm, cassava, maize, and plantain.
36. There was a significant positive linear relationship between network size and income from cocoa ($Rho = 425$, $p\text{-value} = 0.000$), but not for oil palm, cassava, maize, and plantain.
37. There was a significant positive linear relationship between network density and yield from cocoa ($Rho = 249$, $p\text{-value} = 0.003$), but not for oil palm, cassava, maize, and plantain.
38. There was a significant positive linear relationship between network density and income from cocoa ($Rho = 0.347$, $p\text{-value} = 0.000$) and oil palm ($Rho = 0.566$, $p\text{-value} = 0.006$), but not for cassava, maize, and plantain.

Conclusions

Based on the findings of the study, the following conclusions were drawn:

Large network sizes and densities were associated with higher yields and incomes for cocoa farmers, but not for other farmers. What was important was the type of resources that flowed across networks. Out of the resources that flowed

across networks, information and services, in the form of exchange of labour, were the most common resource exchanged among networks. Besides the resources that flowed across networks, the social support function of networks, exchange of tangible and intangible agricultural resources, also favoured rural agriculture.

Two forms of relationships were identified, horizontal and vertical. Horizontal relationships were more pronounced because respondents were mostly of equal socio-economic status and power. Exchange of resources was usually made among agents of equivalent power and status. However, there were a few of the respondents who were caught up in vertical relationships. The horizontal relationships were found to be more effective in promoting agriculture than the vertical relationships.

The most prominent among those who played leadership roles in mobilising groups and networks were chiefs, Unit Committee chairpersons, pastors, Assembly persons, Unit Committee members and community elders. Institutions that mobilised networks for agricultural activities were formal and informal agricultural groups and associations. The informal associations mainly mobilised labour for the clearing of farmlands, planting and harvesting, while the formal associations usually provided farm inputs and educated farmers on good farm practices.

Key resources in the study communities were land/forest resources, rivers and streams. Access to land in the study communities depended on the ownership systems. Land in the migrant communities was mainly distributed by chiefs, while family heads distributed land in the non-migrant communities. Farmers in most of the study communities were close and had a strong feeling of belonging. However, farmers from Adugyaa perceived that their community was

not close, citing issues like differences in political affiliation, jealousy and individualism as factors polarising their community.

Farmers in the migrant communities benefitted more from information on pegging and the best times to plant crops, while farmers from the non-migrant communities accessed more information on good farm practices. Most of the information came from neighbours, agricultural extension officers, radio/television/books and market partners.

Observational learning was key in the adoption of technologies among the rural farmers. Apart from the conventional means by which agricultural knowledge and technology were shared, farmers learnt about new technology by observing their neighbours and other people in their network. The most important players in the innovation processes were neighbours, including friends and relatives, agricultural extension officers, the media and market partners. Experimentation with different crops, type of breed and fertilizers was also part of their learning process. Respondents shared the knowledge gained from experimentation with farmers in their network.

Most of the farmers from the study communities did not belong to market cooperatives and they mostly relied on market partners for information on market prices, even though radio and friends were the other major sources of information related to prices of produce. The selling of farm produce on credit to market partners, friends, neighbours and relatives was a common practice in all the communities.

Large network sizes and densities were associated with high yields and incomes from cocoa. Also, high network densities were associated with high

income from oil palm. However, network size and density were not associated with yields and incomes from maize, plantain and cassava.

Recommendations

The following recommendations have been made based on the findings and the conclusions:

Farmers

1. Since resources that flow across networks are important in rural agricultural activities, it is recommended to farmers to pay attention to the types of resources that are exchanged. Exchange of information, related to good farm practices and labour, should be encouraged.
2. Informal agricultural associations contribute greatly to rural agricultural development. Farmers could form such associations to support their agricultural activities.
3. Since information flows informally among farmers, farmers could maintain regular contacts with their neighbours, agricultural extension officers, and market partners. Aside from the informal sources, farmers also access information from radio and television. It is, therefore, recommended to those who do not have access to radio and television to make the effort to get one since a lot of information on good farm practices comes from these sources.
4. Farmers in rural areas access and adopt information on farm technology informally by observing other farms and farmers. It is recommended that farmers observe other farms and farmers in order to access more information on new technologies and good farm practices.

Policy makers interested in rural agriculture

5. It is recommended to policy makers who aim to use social networks to improve rural agriculture to focus on the resources that flow across networks, especially those that have implications for rural agriculture, such as farm inputs, information on farm management practices and labour. Attention should also be paid to the social support functions of the networks.
6. Owing to the fact that most rural areas access and adopt information on farm technology by observing other farms and farmers, any policy aimed at the introduction of new agricultural technology should consider model farms to enable farmers to observe how the technology works and the likely benefits to be derived from such technologies. In addition, farmers gain a lot of knowledge through on-farm experimentation. Some of this knowledge can be accessed and re-packaged for other farmers. Any policy that aims at technology adoption among farmers should take into consideration the information networks among farmers, since these networks are key in understanding how farmers create and share knowledge on agricultural practices.
7. Key personalities, such as chiefs, Unit Committee chairpersons, Assembly persons, Unit Committee members, and community elders, that mobilise networks in rural agricultural communities in Ghana should be part of any policy that aims at harnessing networks for agricultural development.

Contribution to knowledge

Most studies on social networks reiterate the importance of network size, network density, types of relationships, resources that flow across networks and the functions of networks for rural agricultural development. The study, however, found that, out of these social network characteristics, the resources that flow across networks, namely: services, information, advice, money, food items and labour, matter more in rural agriculture than the other network characteristics. These findings strengthen existing knowledge using the ego-centred approach to social network studies

The study also adds to literature by developing a conceptual framework of the contribution of social network to rural agricultural development.

Areas for further research

Based on the findings of the study, further research could be conducted to examine:

- How extra-local conditions affect the utilisation of networks among rural farmers; and
- The limits of social networks to rural agricultural development.

BIBLIOGRAPHY

- Abrahamson, E. (1991). Managerial fads and fashions: The diffusion and rejection of innovations. *Academy of Management Review*, 16 (3), 586-612.
- Adams, A. M., Madhavan, S., & Simon, D. (2006). Measuring social networks cross-culturally. *Social Networks*, 28, 363 – 376.
- Adler, P.S., & Kwon, S.W. (2002). Social capital: Prospects for a new concept. *Academy of Management Review*, 27 (1), 17-40.
- Ahn, T.K. (2000). *Finitely repeated 2 * 2 social dilemma gains: Equilibrium analysis and experimental test*. Working Paper W00-26. Bloomington: Indiana University.
- Akyeampong, K., Roleston, C., Ampiah, G. J., & Lewin, M. K. (2010). *Access transitions and equity in education: Researching, practice, problems and policy*. Create Pathways to Access Research Monograph. No. 72.
- Ali, A.K., & Mansor, E.A. (2006). Social capital and rural community development in Malaysia. In S. Yokoyama & T. Sakurai. *Potential of social for community development* (pp. 144-171). Tokyo: Asian Productivity Organisation.
- Anriquez, G. & Stamoulis, K. (2007). *Rural development and poverty reduction: Is agriculture still the key?* ESA Working Paper. 07 – 02.
- Astone, N. A., Marie, P., Nathanson, C.A., Schoen, R., & Kim, Y.J. (1999). Family demography, social theory and investment in social capital. *Population and Development Review* 25 (1), 1-31.
- Audinet, J., & Haralambus, S. (2005). *Achieving the millenium development goals: Rural investment and enabling policy*. Panel Discussion Paper,

- IFAD Governing Council- 28th Seesion 16-17 February, 2005.
- Badiru, I. O. (2010). *Review of small farmers' access to agricultural credit in Nigeria*. IFPRI Policy Note, No. 25.
- Baerenklau, K.A. (2005). Towards an understanding of technology adoption, risk learning and neighbourhood effects. *Land Economics* 8 (1), 1-19.
- Baker, W. (1990). Market networks and corporate behaviour. *American Journal of Sociology*, 96, 589-625.
- Bankston, D. & Zhou, Z. (2002). *Levels at which social capital is located*. Retrieved on August 25, 2011 from www.socialcapitalresearch.com.
- Barham, B.M., Clark, E.K., & Schurman, R. (1992). Non-traditional agricultural exports in Latin America: Towards an appraisal. *Latin American Research Review*, 27 (2), 43-82.
- Barnes, J. (1954). Class and committees in a Norwegian Island Parish. *Human Relations*, 7, 39-58.
- Barrerra, M. Jr. (1986). Distribution between social support concepts, measures and models. *American Journal of Community Psychology*, 14, 413-445.
- Barrett, C. B. (2005). Smallholder identities and social networks: The challenge of improving productivity and welfare. In C. B. Barrett (Ed.), *The social economics of poverty: Identities, groups, communities and networks* (pp. 78 – 106). London: Routledge
- Bartolini, S., & Bonatti, L. (2007). *Endogenous growth, decline in social capital and expansion of market activities*. MPRA Working Paper 3341.

- Bearman, P.S., Moddy, J., & Stovel, K. (2004). Chains of affection: The structure of adolescent romantic and sexual networks. *American Journal of Sociology, 110*, 44-91.
- Begley, T. & Tan, W.L. (2001). The socio-cultural environment for entrepreneurship: A comparison between East Asian and Anglo countries. *Journal of International Business Studies, 32* (3), 537-553.
- Berggren, N., Elinder, M., & Jordahl, H. (2007). Trust and growth: A shaky relationship. Retrieved on May 5, 2011, from doi 10.1007.
- Bernard, H.R., Johnsen, C.E., Killworth, P.D., McCarty, C., Shelley, G.A., & Robinson, S. (1990). Comparing four different methods for measuring personal social networks. *Social Networks, 12*, 179-215.
- Betz, F. (2008). *Returns to sociability*. Paper Presented at 15th International Economic Association World Congress, Istanbul, June.
- Bisin, B., & Guaitoli, D. (2006). *Social capital, modernization and growth*. Asset conference, Mimeo, June 2, 2006.
- Blau, P. M. (1964). *Exchange and power in social life*. New York: Wiley.
- Blau, P. M. (1974). Parameters of social structure. *American Sociological Review, 9* (5), 615-635.
- Blau, P. M. (1994). *Structural context of opportunities*. Chicago: University of Chicago Press.
- Borgatti, S. P., & Halgin, D. S. (2011). On network theory. *Organisation Science, 7*, 1526-5455.
- Bourdieu, P. & Wacquant, L. (1992). *An invitation to reflexive sociology*. Chicago IL:University of Chicago Press.

- Bowles, S., & Gintis, H. (2002). Social capital and community governance. *The Economic Journal*, 112, 419 – 436.
- Brass, D. J. (1995). A social network perspective on human resource management. *Research in Personnel and Human Resource Management*, 13, 39-79.
- Brass, D. J. (2002). *Social networks in organizations: Antecedents and consequences*. Unpublished manuscript, University of Kentucky, Lexington.
- Brewer, A. (2003). *Levels at which social capital is located*. Retrieved on January 8, 2011, from www.istheory.yorku.ca.
- Britwum, A.O., Ghartey, N.T.K., & Agbesinyale, P. (2006). *Organizing labour in the informal sector: The conditions of rural agriculture in Ghana*. Accra: Ghana Universities Press.
- Brown, C.K. (1986). Urban bias and rural development in Ghana. In C.K. Brown (Ed.) *Rural development in Ghana* (pp. 201-219). Accra: Ghana Universities Press.
- Brown, J. S., & Duguid, P. (1991). Organisational learning and communities of practice: Towards a unified view of working, learning and innovation. *Organisation Science*, 2 (1), 40-57.
- Brunner, M., & Strulik, H. (2002). Solution of perfect foresight saddle point problems: A simple method and applications. *Journal of Economics Dynamics and Control*, 25 (5), 737-753.
- Buam, D. (2007). *Cultural capital in Ghana: How the cooperative maximizes its potential to create locally driven economic development in rural communities*. Durham: Duke University.

- Burt, R.S. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.
- Burt, R.S. (1997). The contingent value of social capital. *Administrative Science Quarterly*, 42, 339-365.
- Burt, R.S. (2001). Structural holes versus network closure as social capital. In N.Lin, K.Cook & R.S. Burt (Eds.), *Social capital theory and research* (pp 130-131). New York: Aldine de Gruyter.
- Busch, L. & Juska, A. (1997). Actor networks and the globalisation of agriculture. *Review of International Political Economy*, 4 (4), 668-708.
- Buttel, F., Larson, O., & Gillespie Jr., G. (1990). *The sociology of agriculture*. Greenwood Press: London.
- Callon, M. (1991). Techno – economic networks and irreversibility. In J. Law (Ed.), *A sociology of monsters: Essays on power, technology and domination* (pp. 132-161). London: Routledge.
- Carly, K. M. (1991). A theory of group stability. *American Sociological Review*, 56, 331-354.
- Carpenter, J. P. (2002). Measuring social capital: Adding field experimental methods to the analytical toolbox. In J.Isham, T.Kelly, & S. Ramaswamy (Eds.), *Social capital and economic development: Well being in developing countries* (pp. 64-82). Cheltenham: Edward Elgar.
- Carrasco, J. A., Hogan, B., Wellman, B., & Miller, E. J. (2006). *Agency in social activity and ICT interactions: The role of social networks in time and space*. Invited paper at the second international specialist meeting on ICT. Bergen Netherlands, November 10-11, 2006.

- Carrington, P. J., Scott, J. & Wasserman, S. (Eds.) (2005) *Models and methods in social network analysis*. Cambridge: Cambridge University press.
- Casebeer, A. L. & Verhoef, M.J. (1997). Combining qualitative and quantitative research methods: Considering the possibilities for enhancing the study of chronic diseases. *Chronic Diseases in Canada*, 18, 130-135.
- Castle, E. N. (2003). The social capital paradigm: Bridging across disciplines-an overview. *The American Journal of Agricultural Economics*, 85 (5), 1208-1210.
- Clark, A. (2007) *Understanding communities: A review of networks, ties and contacts*. NCRM Working Paper. *ESRC National Centre for Research Methods*, ncrm.ac.uk.
- Clark, L. (2006). *Network mapping as a diagnostic tool*. Bolivia: Centro Internacional de Agricultura Tropical.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98, 310-357.
- Coleman, J.S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, 95-120.
- Coleman, J.S. (1990). *Foundations of social theory*. Cambridge: Harvard University Press.
- Conley, T., & Udry, C. (2001). Social learning through networks: The adoption of new agricultural technologies in Ghana. *American Journal of Agricultural Economics*, 83, 668-673.
- Conway, S. & Steward, F. (1998). Mapping innovation networks. *International Journal of Innovation Management*, 2 (2), 223-254.

- Cook, K. S., Gillmore, M. R., & Yamagishe, T. (1983). The distribution of power in exchange networks. Theory and experimental results. *American Journal of Sociology*, 89, 275-305.
- Cook, J. A. & Fonow, M. M. (1990). Knowledge and women's interest: Issues of epistemology and methodology in feminist sociological research. In J. M. Nielson (Ed.) *Feminist research methods* (pp. 69-93). Westview: Boulder Co.
- Cook, S. K. (1997). Exchange and power in networks of international relations. *Sociological Quarterly*, 18, 62-82.
- Costa, A.C. (2003). Work team trust and effectiveness. *Personnel Review*, 32 (5), 605-622.
- Couch, C. A. (1987). Objectivity: A crutch and club for bureaucrats and subjectivity: A haven for lost souls. *Sociological Quarterly*, 28, 105-118.
- Creswell, J. W. (1998) *Qualitative inquiry and research design*. Thousand Oaks, California: Sage.
- Crona, B., & Bodin, Ö. (2006). What you know is who you know? Communication patterns among resource users as a prerequisite for co-management. *Ecology and Society* 11 (2), 7-32.
- Cross, R., Borgatti, S.P., & Parker, A. (2001). Beyond answers: Dimensions of the advice networks. *Social Networks* 23, 215-235.
- Crossley, N. (2009). The social world of the network: Combining quantitative and qualitative elements in social network analysis. *Sociologica* 4 (1), 78-111.

- Crow, G. (2004). Social networks and social exclusion: An overview of the debate. In C. Phillipson, G. Allan, & D. Morgan (Eds.). *Social networks and social exclusion* (pp.7-19). Ashgate: Aldershot.
- Cuong, D.M., & Thevenot, P. (2001). *Practical guide on agricultural cooperatives in Vietnam: Research group and technological exchanges*. Vietnam: International Labour Organization Office.
- Dadson, J. A. (1988). *The need for cooperative reorientation: The Ghanaian*. Seminar Proceedings No. 21. Scandinavian Institute of African Studies, 1988. Nordiska Afrikanstitutet
- Dahlman, C. J. (1980). *The open field system and beyond*. London: Cambridge University Press.
- Darr, D. & Pretzsch, J. (2007). *The spread of innovations within formal and informal farmers group: Evidence from rural communities of semi-arid eastern Africa*. Institute of International Forestry and Forest Products, Germany, Working Paper.
- Davenport, T., DeLong, D., & Beers, M. (1998). Successful knowledge management project. *Sloan Management Review*, 39 (2), 43-57.
- Davidson-Hunt, I. J. (2006). Adaptive learning networks: Developing resource management through social learning forums. *Human Ecology* 34, 593-614.
- De Lange, D., Agneessens, F., & Waeye H. (2004). Asking social network questions: A qualitative assessment of different measures. *Metodoloski Zvezki*, 1 (2), 351-378.

- Demiryurek, K. (2010). Information systems and communication networks for agriculture and rural people. *Journal of Agricultural Economics*, 56 (5), 209-214.
- Department of Census and Statistics. (2003). *Household income and expenditure survey 2002: Preliminary report*. Colombo: DCS.
- Dirks, K.T. (1999). The effects of interpersonal trust on work group performance. *Journal of Applied Psychology*, 84, 445-455.
- Dissanakye, L. (2001). Improving the current manpower: Crucial issues in sustainable rural development; Human resource development in the context of participatory rural development. Retrieved from www.apo-tokyo.org.
- Dordick, G. (1997). *Something left to lose: Personal relations and survival among New York's homeless*. Philadelphia: Temple University Press.
- Douthwaite, B. (2002). *Enabling innovations: A practical guide to understanding and forecasting technological change*. London: Zed Books.
- Dubini, P., & Aldrich, H. (1991). Personal and extended networks are central to the entrepreneurial process. *Journal of Business Venturing*, 6 (5), 305-313.
- Durlauf, S.N. & Fafchamps, M. (2004). *Social capital*. Centre for the Study of African Economics, Working Paper Series, 214.
- Ebers, M. (1997). Explaining inter-organisational network formation. In M. Ebers (Ed.) *The formation of inter-organisational networks* (pp. 3-40). Oxford: Oxford University Press.

- Edelman, F.L., Bresnen, M., Newell, S., Scarbrough, H., & Swan, J. (2002).
The darker side of social capital. Retrieved from www.epsrc.org
- Edwards, G. (2010) Mixed-methods approaches to social network analysis.
Economic and Social Research Council, NCRM/015.
- Edwards, B. & Foley, M. W. (2001) Social capital and civil society beyond
Putnam. Retrieved on January 4, 2012 from [http://artscience.cua.edu
/pol/faculty/putnam2.htm](http://artscience.cua.edu/pol/faculty/putnam2.htm).
- Edwards, G. & Crossley, N. (2009). Measures and meanings: Exploring the
ego-net of Helen Kirkpatrick Watts, Militant Suffragette. *Methodo-
logical Innovations, 4*, 37-61.
- Eicher, C. K., & Baker, D. C. (1982). *Research on agricultural development in
sub-Saharan Africa: A critical survey*. International Development
Paper, No. 1, Michigan State University, USA.
- Ekeh, P. P. (1974). *Social exchange theory*. Cambridge: Harvard University
Press.
- Emerson, R. M. (1972). Exchange theory: Part I. A psychological basis for
social exchange. In J. Berger, M. Zelditch, and B. Anderson (Eds.),
Sociological theory in progress (pp. 38-57). Boston: Houghton.
- Emerson, R. M. (1981). Social exchange theory. In M. Rosenbery and R. H.
Turner (Eds.) *Social psychology: Sociological perspective* (pp. 30-65).
New York: Basic Books.
- Emirbayer, M., & Godwin, J. (1994). Network analysis, culture and agency.
American Journal of Sociology, 99, 1411- 1453.
- Emmanuel, W. A., Amare, M., & Waibel, H. (2012). *Agricultural innovation
systems and adoption decision: Findings from a study of Ghanaian*

plantain sector. Retrieved on May 7, 2013 from <http://www.ael.ethz.ch>.

Emmel, N. (2008). *Participatory Mapping: An innovative sociological method*, Retrieved from ESRC National Centre for Research Methods website, ncrm.ac.uk.

Emmel, N., & Clark, A. (2009). *The methods used in connected lines: Investigating networks, neighbourhoods and communities, real life methods*. The Manchester/Leeds node of the ESRC, National Centre for Research methods.

Erickson, B.H. (1995). *Networks, success and class structure: A total view*. Sunbelt Social Networks Conference. Charleston, S.C., February

Ermias, W. (2007). *The role of information technology in enhancing participatory governance*. Addis Ababa: The World Bank.

Etzioni, A. (2001). *Humble decision making*. Boston: Harvard University Press.

Evans, P. (1995). *The state of problems and solutions: Predation, embedded autonomy, and structural change*. NJ: Princeton University Press.

Evans, P. (1996). Government action, social capital and development: Reviewing evidence on synergy. *World Development*, 24 (6), 1119 – 1132.

Faber, A. D., & Wasserman, S. (2002). Social support and social networks: Synthesis and review. In J. A. Levy (Ed.), *Social networks and health* (pp. 29-79). New York: Elsevier Science.

- Fafchamps, M., & Minten, B. (1999). *Evidence from agricultural trade: Social capital initiatives*. Working Paper No.17. Washington DC: The World Bank.
- Fedderke, J., & Klitgaard, R. (1998). Economic growth and social indicators: An exploratory analysis. *Economic Development and Cultural Change*, 46 (3), 455-489.
- Fernandez, R. M., & Weinberg, N. (1997). Sifting and sorting: Personal contacts and hiring in a retail bank. *American Sociological Review*, 62, 883-902.
- Fine, B. (1999). The developmental state is dead: Long live social capital. *Development and Change*, 30, 1-19.
- Fischer, C. (1982). *To dwell among friends*. Berkeley: University of California.
- Fletcher, M. (1998). A good-school, bad-grade mystery. Educators striving to close racial gap in affluent Ohio suburb. *The Washington Post*, October 23, 1998.
- Frankfort-Nachmias, C. & Nachmias, D. (1996). *Research methods in the social sciences*. London: St Martin's Press.
- Fred, P. (2011). South Africa's white farmers are moving further north. *The Guardian*, May 1, 2011. Retrieved on June 16, 2014 from <http://www.guardian.com>.
- Freeman, L. C. (1979). Centrality in social networks: Conceptual clarification. *Social Networks*, 1, 215-239.
- Friedland, W., Busch, L., Buttel, F.H., & Rudy, A. (1991). *Towards a new political economy of agriculture*. West view: Boulder.

- Fukuyama, F. (1997). Social capital and the modern capitalist economy: Creating a high trust workplace. *Stern Business Magazine*, 4 (1).
- Fukuyama, F. (2002). Social capital and development: The coming agenda. *SAIS Review*, 22 (1), 23-38.
- Furuya, J., & Sakurai, T. (2005). Capacity utilization of rice milling industry and interlinkage in the rice market in Ghana. *Japanese Journal of Rural Economics*, 7, 88-99.
- Gabby, S.M., & Leenders, R.T.A.J. (1999). The structure of advantage and disadvantage. In R.T.A.J. Leenders & M.S.Gabba (Eds.), *Corporate social capital and liability* (pp. 1-14). Boston: Kluwer Academic Publishers.
- Gallego, J.M., & Mendola, M. (2011). Labour migration and social networks participation: Evidence from Southern Mozambique. *INSIDE Paper*.
- Gambetta, D. (2000). Can we trust trust? In D. Gambetta (ed), *Trust: Making and breaking cooperative relations* (pp. 46-65). Oxford: Oxford University Press.
- Ghana (2006). *The current state of the macro economy 2000-2009*. Accra: CEPA.
- Ghana Statistical Service (2002). *The 2000 population and housing census*. Accra: Republic of Ghana.
- Ghana Statistical Service (2012). *The 2010 population and housing census: Summary reports of final results*. Accra: Sakoa Press Limited.
- Ghana Statistical Service (2015). *The 2010 population and housing census*. Retrieved on April 21, 2015 from <http://statsghana.gov.gh/pop>

- Gittel, R., & Vidal, A. (1998). *Community organising: Building social capital as a development strategy*. Thousand Oaks: Sage Books.
- Gonzalez, C., Johnson, N., & Lundy, M. (2002). *Social capital and organizational structure in Colombian agro enterprise*. Bogota: CIAT Mimeo.
- Goodman, D. (1999). Agro-food studies in the “age of ecology”: Nature, corporeality, bio-politics. *Sociologia Ruralis*, 39, 17–38.
- Goswami, R., & Basu, D. (2011). Influence of information networks on farmers’ decision-making in West Bengal. *Indian Resource Journal*, 11 (2), 27–53.
- Gouldner, A. W. (1960). The norm of reciprocity: A preliminary statement. *American Sociological Review*, 2 (25), 161-178.
- Granovetter M (1973). The strength of weak ties. *American Journal of Sociology*, 8, 1360-1380.
- Granovetter M (1985). Economic action and social structure. The problem of embeddedness. *American Journal of Sociology*, 91 (3), 481-510.
- Granovetter M (2005). The impact of social structure on economic outcomes, *Journal of Economic Perspective*, 19 (1), 3-50.
- Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Towards a conceptual framework for mixed-method evaluation design. *Education Evaluation and Policy Analyst*, 11 (3), 255-274.
- Grootaert, C. (1998). *Social capital: The missing link?* Working Paper No. 3 of the World Bank Social Capital Initiative.

- Grootaert, C., & Bastelaer, T.V. (2002). *Understanding and measuring social capital: A multidisciplinary tool for practitioners*. Washington DC: The World Bank.
- Grootaert, C., Narayan, D., Jones, V.N., & Woolcock, M. (2003). *Integrated questionnaire for the measurement of social capital*. Washington DC: The World Bank.
- Hainess, V. A., Beggs, J. J., & Hurlbert, J. S. (2002). Exploring the structural context of the support process: Social networks, social support, and psychological distress. In J. A. Levey & B. A. Pescosolido (Eds.), *Social networks and health* (pp. 269-292). New York: Elsevier Science.
- Halpern, D. F. (2005). How time-flexible work policies can reduce stress, improve health and save money. *Stress and Health*, 21 (3), 157-168
- Hanifan, L.J. (1916). The rural school community. *Annals of American Academy of Political and Social Science*, 67, 130-138.
- Hanneman, R. A. (2001). *Introduction to social network methods*. Retrieved from University of California website, <http://faculty.ucr.edu>.
- Hanneman, R. A., & Riddle, M. (2005). *Introduction to social networks methods*. California: University of California.
- Hardin, R. (1982). *Collective action*. Baltimore: Johns Hopkins University Press.
- Harris, J. (2001). *Depoliticizing development, the World Bank and social capital*. New Delhi: Left World Books.
- Hartwich, F., Fromm, I., & Romero, G. (2010). Innovation trajectories in Honduras' coffee value chain: Public and private influence on the use

- of new knowledge and technology among coffee growers. *International Journal of Food System Dynamics*, 3, 237-251.
- Hayami, Y. & Peterson, W. (1972). Social return to public information services: Statistical reporting of U.S. farm commodities. *American Economic Review*, 42 (1), 119-130.
- He, W. & Zou, K. (2006). Information needs of farmers in Chinese. *Technical Economics*, 12, 38 – 41.
- Heath, S., Fuller, A., & Johnston, B. (2009). Chasing Shadows: Defining network boundaries in qualitative social network analysis. *Qualitative Research*, 9 (5), 645-661.
- Hedja, M. (1999). *Investigation of smallholders' behaviour as factors influencing farm performance in Ethiopia: The case of smallholders in Eastern Harrarghe*. Msc. Thesis, Department of Horticulture, Hanover University.
- Heider, F. (1958). *Psychology of interpersonal relations*. New York: Wiley.
- Hill, R. (1998). What sample size is “enough” in internet survey research. *Interpersonal Computing and Technology: An Electronic Journal for the 21st Century*, 6 (3), 1-10.
- Holland, P. W., & Leinhardt, S. (1975). Local structure in social networks. In R. H. David (Ed.), *Sociological methodology* (pp. 1-45). San Francisco: Jossey-Bass.
- Holland, P. W., & Leinhardt, S. (1981). An exponential family of probability distributions for directed graphs. *Journal of the American Statistical Association*, 76, 33-65.

- Homans, G. C. (1961). *Social behaviour: Its elementary forms*. New York: Harcourt, Bruce and World.
- Homans, G. C. (1969). The sociological relevance of behaviourism. In *Certainties and doubt: Collected papers* (pp. 1962–1985). New Brunswick: Transaction Books.
- Homans, G.C. (1974). *Social behaviour: Its elementary forms*. New York: Harcourt Brace Jovanovich.
- House, E. R. (1993). *Professional evaluation*. Thousand Oaks, California: Sage.
- House, E. R. (1994). Integrating the quantitative and qualitative. In C. S. Reichardt & S. F. Rallis (Eds.), *The qualitative-quantitative debate: New perspectives* (pp. 13-22). San Francisco: Jossey-Bass.
- House, J.S., Landis, R.R., & Umberson, D. (1988). Social relations and health. *Science*, 234, 540-545.
- Huntoon, A. (2001). *Building social capital*. Retrieved on May 8, 2010 from www.analytictech.com/networks/.
- Hurtwich, F. & Scheidegger (2010). Fostering innovation networks: The missing piece in rural development. *Rural Development News*, 1, 2010.
- Ibra, H. (1995). Race, opportunity and diversity of social circles in managerial networks. *Academy of Management Journal*, 38, 673-703.
- International Labour Office Cooperative Branch (2002). *The promotion of cooperatives*. Geneva: ILO.
- Isaac, M. E., Erickson, B. H., Quarshie-Sam, S. J., & Timmer, V. R. (2007). Transfer of knowledge on agroforestry management practices: The

structure of farmer advice networks. *Ecology and Society*, 12 (2), 32-66.

Jacobs, J. (1961). *The death and life of great American cities*. New York: Random House.

Jana, R., Bandyopadhyay, S., & Choudhuri, A. K. (2013). Reciprocity among farmers in farming system research: Application of social network analysis. *Journal of Human Ecology*, 41 (1), 45-51.

Johnson, S. (2003). The redefinition of family farming: Agricultural restructuring and farm adjustment in Waihemo, New Zealand. *Journal of Rural Studies*, 20 (4), 419-432.

Kajisa, K. (2002). *Measurement method of social capital: Social capital and international cooperation*. Tokyo: Japan International Cooperation Agency.

Katungi, E., Edmeades, S., & Smale, M. (2006). *Gender, social capital, and information exchange in rural Uganda: Collective action and property rights*. Working Paper No. 5, International Food Policy Research Institute.

Katz, N., Lazer, L., Arrow, H., & Contractor, N. (2004). Network theory and small groups. *Small Group Research*, 35 (3), 307-332.

Kawachi, I., Kennedy, B.P., & Glass, R. (1999). Social capital and self-rated health: A contextual analysis. *American Journal of Public Health*, 89 (8), 1187-1193.

Kenworthy, L. (1997). Civic engagement, social capital and economic cooperation. *American Behavioural Scientist*, 40, 645-656.

- Ker, A. (1995). *Farming systems of the African Savana: A continent in crisis*. Ottawa: International Development Research Centre.
- Kilby, C. (2002). Levels of social capital. Retrieved on January 17, 2012 from www.analytictech.com/networks/.
- Kinderen, (2012). *Social capital in the Upper East Region of Ghana*. Retrieved on April 16, 2013 from <http://smallreservoir.org>.
- Knox, H., Savage, M., & Harvey, P. (2006). Social networks and the study of relations: Networks as method, metaphor and form. *Economy and Society*, 35 (1), 113-140.
- Krackhardt, D., & Hanson, J.R. (1993). Informal networks: The Company behind the chart. *Harvard Business Review*, 71, 104-111.
- Krishna, A., & Uphoff, N. (1999). *Mapping and measuring social capital: A conceptual and empirical study of collective action for conserving and developing watersheds in Rajasthan, India*. Social Capital Initiative Working Paper No.13. Washington DC: The World Bank.
- Larsen, K (2008). *Economic consequences of collaborative arrangements in the agricultural firm, Acta Univestatis Agriculturae Sueciae*. Doctoral Thesis No. 2008:8. Faculty of Natural Resources and Agricultural Science, Swedish University of Agricultural Sciences.
- Latour, B. (1986). The powers of association. In J. Law (Ed.), *Power, action, belief: A new sociology of knowledge?* London: Routledge and Kegan Paul.
- Lauman, E., Marsden, P., & Prensky, D. (1983). The boundary specification problem in network analysis. In R. Burt & M. Minor (Eds.), *Applied*

- network analysis: A methodological introduction* (18-34). Beverly Hills: Sage.
- Lazega, E. (2001). *The collegial phenomenon: The social mechanism of cooperation among peers in a corporate law partnership*. Oxford: Oxford University Press.
- LeCompte, M. D. & Goetz, J. P. (1982). Problems of reliability and validity in ethnographic research. *Review of Educational Research*, 52, 31-60.
- Lecompte, M.D., & Sehensul, J. J. (1999). Analysing and interpreting ethnographic data. In J. J. Sehensul & M. D. LeCompte (Eds.), *The ethnographer's toolkit* (vol. 1). Walnut Creek CA: Altamira Press.
- Lee, J. (2006). *Social capital in Asia: Background and report structure*. Retrieved on May 9, 2010 from www.apo-tokyo.org.
- Lesser, E. L. (2000). Leveraging social capital in organizations. In E. L. Lesser (Ed.), *Knowledge and social capital: Foundations and applications* (pp. 3-16). Boston: Butterworth Heinemann.
- Liang, T., Liu, C., & Wu, C. (2008). *Can social exchange theory explain individual knowledge sharing behaviour?* International Conference on Information Systems (ICIS, 2008 Proceedings).
- Lin, N (2000). Building a network theory of social capital, *Connections*, 22 (1), 28-51.
- Lin, N. (2001). Building a network theory of social capital. In N. Lin, K.S. Cook, & R.S. Burt (Eds.), *Social capital: Theory and research* (pp.3-29). Hawthorne: Aldine de Gruyter.

- Liverpool, L. S. O., & Winter-Nelson, A. (2010). *Poverty status and the impact of social networks on smallholder technology adoption in rural Ethiopia*. IFPRI Discussion Paper 00970.
- Locke, E.A. (1999). Some reservations about social capital. *Academy of Management Review*, 24 (1), 1-9.
- Lofourcade, O. (2002). *Prestamo de US\$32 millones para Colombia*. Bogota: CIAT Mimeo.
- Loury, G. (1977). A dynamic theory of racial income difference. In P.A. Wallace & A. LeMund (Eds), *Women, minorities, and employment* (pp. 43-78). Lexington: Lexington Books.
- Lyon, F. (2000). Trust, networks and norms: The creation of social capital in agricultural economics in Ghana. *World Development*, 28 (4), 663-682.
- Maequardt, D., Mollers, J., & Buctienrieder, G. (2012). Social networks and rural development: LEADER in Romania. *Sociologia Ruralis*, 52 (4), 399-431.
- Manandhar, N. (2000). Action research on social dialogue. Retrieved from www.nepalnews.com.
- Manski, C. F. (2000). Economic analysis of social interactions, *Journal of Economic Perspective*, 14 (3), 843-867.
- Marsden, P. V. (2005). Recent development in network management. In Carrington, P. J., Scott, J., & Wasserman, S. (Eds.) *Models and methods in social network analysis* (pp. 8-30). Cambridge: Cambridge University Press:
- Marsden, T., Murdoch, J., Lowe, P., Munton, R., & Flynn, A. (1993). *Constructing the countryside*. London: UCL Press.

- Marxwell, G. & Oliver, P. (1993). *The critical mass in collective action: A micro-social theory*. Cambridge MA: Cambridge University Press.
- McGinnis, M. (2000). *Polycentric games and institutions: Readings from the workshop in political theory and policy analysis*. Ann Arbor: University of Michigan Press.
- McLean, P. (2007). *The art of networks*. Durham: Duke University Press.
- McPherson, M., Smith-Lovin, L., & Cook, J.M (2001). Birds of a feather: Homophily in social networks. *Annual Review Sociology*, 27, 415-44.
- Mertens, D. M. (2003). Mixed methods and the politics of human research: The transformative-emancipatory perspective. In A. Tashakklori, & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioural research* (pp. 135-164). Thousand Oaks: Sage Publications.
- Misztal, B. (2001). Trust and cooperation: The democratic public sphere. *Journal of Sociology*, 37, 371-386.
- Mitchel, J.C (1969). *The concept and use of social networks*. Manchester: University of Manchester Press.
- Mitchell, J. C. (1978). On Freeman's segregation index: An alternative, *Connections*, 2, 9-12.
- Moazami, M. (2006). *The impacts of social capital on land consolidation projects: A case of Arak county in Iran*. Retrieved on May 8, 2012 from www.apo-tokyo.org.
- MoFA (Ministry of Food and Agriculture) (2007). *Food and agricultural sector development policy (FASDEP II)*. Ghana: MoFA.
- MoFA (Ministry of Food and Agriculture) (2011). *Agriculture in Ghana*. Retrieved on May 8, 2010 from <http://mofa.gov.gh> .

- Molm, L. D. (1991). Affect and social exchange: Satisfaction in power-dependence relations. *American Sociological Review*, 56, 475-493.
- Molm, L. D. (2000). Theories of exchange and exchange networks. In G. Ritzer & B. Smart (Eds.), *Handbook of social theory*, (pp. 260-272). Thousand Oaks, CA: Sage.
- Molm, L. D., & Cook, S. K. (1995). Social exchange and exchange networks. In K. S. Cook, G. A. Fine, & J. S. House (Eds.), *Sociological perspectives on social psychology* (pp. 209-235). Boston: Allyn and Bacon.
- Monge, P. R. & Contractor, N. (2003). *Theories of communication networks*. New York: Oxford University Press.
- Moreland, R. L. (1999). Transactive memory: Learning who knows what in work groups and organizations. In L. Thompson, D. Messick, & J. Levine (Eds.), *Sharing knowledge in organisations* (pp. 3-31). Mahwah, NJ: Lawrence Erlbaum.
- Morse, J. M. (1994). Designing funded qualitative research. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (pp 220-235). Thousand Oaks, CA: Sage.
- Moss, M. L. (1998). Technology and cities. *Cityscape*, 3 (3), 107-127
- Mubiru, J.B. & Ojacor, F.A. (2001). Agricultural extension and education: Agriculture in Uganda. *General Information*, 1, 295-306.
- Murdoch, J. (2000). Networks: A new paradigm of rural development? *Journal of Rural Studies*, 19 (2000), 407 – 419.

- Murdoch, J., Marsden, T., & Banks, J. (2000). Quality, nature and embeddedness: Some theoretical considerations in the context of the food sector. *Economic Geography*, 72 (2), 107-125.
- Murdoch, J., & Miele, M. (1999). Back to nature: Changing worlds of production in the food sector. *Sociologia Ruralis*, 39, 465-483.
- Mutusckhe, I. (2008). *Evaluating the impact of social networks in rural innovation systems: An overview*. IFPRI Discussion Paper. 00816.
- Mutusckhe, I., Mishra, R.R., & Qaim, M. (2007). Adoption and impact of hybrid wheat in India. *World Development*, 35 (8), 1422.
- Nahapiet, J., & Ghoshal, S. (2000). Social capital, intellectual capital and the organisational advantage. In E.Lesser. (Ed.), *Knowledge and social capital: Foundations and application* (pp. 119-149). Massachusetts: Butterworth and Heinemann.
- Najafi, A. (2003). *Land consolidation as a movement towards agricultural productivity promotion: The experience of the Islamic Republic of Iran*. Tokyo: Asian Productivity Organization.
- Narayan, D. (1999). *Bonds and bridges: Social capital and poverty*. Policy Research Working Paper No. 2617, Washington D.C: The World Bank.
- Narayan, D., & Cassidy, M.F. (2001). A dimensional approach to measuring social capital: Development and validation of a social capital inventory. *Current Sociology*, 49 (2), 59 -102.
- Narayan, D., & Pritchett, L. (1999). Cents and sociability: Household income and social capital in rural Tanzania. *Economic Development and Cultural Change*, 47(4), 871-897.

- Nelson, L. S. (2001). Environmental networks: Relying on process or outcome for motivation. In M.P. Mandel (Ed.), *Getting results through collaboration: Networks and network structures for public policy and management* (pp. 82-102), Westport, CT: Quorum Books.
- Nelson, R. R. & Nelson, K (2002). Technology, institutions and innovation systems. *Research Policy*, 31, 256-272.
- Neuman, W. L. (2003). *Social research methods: Qualitative and quantitative approaches*. New York: Allyn and Bacon.
- Newell, S., Edelman, L. F., Bresnen, M., Scarborough, H., & Swan, J. (2000). *Reinvention in reengineering projects: Evidence from a Midlands hospital project*. Paper presented at the British Academy of Management Conference.
- Newman, M. E. J. (2001). The structure of scientific collaboration networks. *Proceedings of the National Academy of Sciences of the U.S.A*, 98 (2), 404-409.
- North, D.C. (1990). *Institutions, institutional change and economic performance*. Cambridge: Cambridge University Press.
- North, D. (1994). Economic performance through time. *The American Economic Review*, 84 (93), 359-368.
- Okonya, J.S, & Kroschel, J. (2014). *Gender differences in access and use of selected productive resources among sweet potato farmers in Uganda*. Retrieved on June 5, 2014 from Agriculture & Food Security website: <http://www.agricultureandfoodsecurity.com/content/3/1/1>

- Okwu, O. J., & Umoru, B. I. (2009). Women farmers' agricultural information needs and accessibility. *Journal of Agricultural Research*, 4 (12), 1404-1409.
- Organisation for Economic Cooperation and Development (2001). *The well-being of nations: The role of human and social capital*. Paris: OECD.
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. New York: Cambridge University Press.
- Ostrom, E. (2000). Social capital: A fad or a fundamental concept. In P. Dasgupta, & I. Serageldin (Eds.), *Social capital: A multifaceted perspective* (pp. 172-214). Washington DC: The World Bank.
- Ostrom, E., Gardner, R., & Walker, J. (1994). *Rules, games and common-pool resources*. Ann Arbor: University of Michigan Press.
- Padgett, J. F., & Ansel, C. K. (1993). Robust action and the rise of the Medici, 1400-1434. *American Journal of Sociology*, 98, 1259-1319.
- Pahl, R., & Spencer, L. (2004). Personal communities: Not simply families of 'fate' or 'choice'. *Current Sociology*, 52, 119-221.
- Pantoja, E. (2000). *Exploring the concept of social capital and its relevance for community-based development: The case of coal mining areas in Orissa, India*. Social Capital Initiative Working Paper No.18. Washington DC: The World Bank.
- Pearlin, L. I., & Aneshensel, C. S. (1986). Cooping and social supports: Their functions and applications. In L. H. Aiken & D. Mechanic (Eds.), *Application of social science to clinical medicine and health policy* (pp. 427-437). New Brunswick: Rutgers University Press.

- Peay, E. R. (1980). Connections in a general model for valued networks. *Social Networks*, 2, 385-410.
- Pescosolido, B.A. (2011). Sociology of social networks. In D. B. Clifton & P. L. Dennis (Eds.), *The handbook of 21st Century sociology* (pp. 208-217). Thousand Oaks, CA: Sage Publications.
- Peshkin, A. (1993). The goodness of qualitative research. *Educational Researcher*, 22 (2), 23-29.
- Poole, I.de S., & Kochen, M. (1978). Contacts and influence. *Social Networks*, 19, 303-323.
- Portes, A. (1998). Social capital: Its origin and applications in modern sociology, *Annual Review of Sociology*, 23, 1-24.
- Portes, A. & Landolt, P. (2000) Social capital: Promise and Pitfalls of its role in development. *Journal of Latin American Studies*, 32 (2), 529-547.
- Portes, A. & Sensenbrenner, J. (1993). Embeddedness and immigration: Notes on the social determinants of economic action. *American Journal of Sociology*, 98, 1320-1350.
- Putnam, R.D. (1993). *Making democracy work: Civic traditions in modern Italy*. Princeton: Princeton University Press.
- Putnam, R.D. (2000). *Bowling alone: The collapse and revival of American communities*. New York: Simon and Schuster.
- Rahmah, K. (2004). *Poverty alleviation: A national agenda, a pragmatic approach*. Paper presented at the Poverty Alleviation Course. The Malaysian Experience, September 24, 2004 in Kuala Lumpur.
- Rahn, W. M. (2004). *Feeling, thinking, being, doing: Public mood, American national identity, and civic participation*. Presented at the annual

meeting of the Midwest Political Science Association, April 17, 2004, Chicago.

Raini, R. K., Zebnitz, C. P. W., & Hoffmann, V. (2005). *Integrated pest management and information flow: Case study of tomato stakeholders' practices in Kenya*. Paper presented at the Tropentag 2005, Stuttgart-Hohenheim, Germany (October, 11-13).

Rankin, M.K., & Russell, I.W. (2002). *Building sustainable farmer cooperatives in the Mekong Delta, Vietnam: Is social capital the key?* Retrieved on February 5, 2012 from www.queenslanduniversity.org

Ravallion, M., Chen, S., & Sangraula (2007). *New evidence on the urbanisation of global poverty*. Washington DC: World Bank.

Rees, D., Momanyi, M., Wekundah, J., Ndungu, F., Odondi, J., Oyure, A.O., & Jolndesma, R. (2000). *Agricultural knowledge and information systems in Kenya: Implications for technology development and dissemination*. ODI. Agricultural Research and Extension Networks. Network Paper No. 107.

Reyes, A., Lensinki, R. Kuyvenhoven, A., & Moli, H. (2012). *Impact of access to credit on farm productivity of fruit and vegetable growers in Chile*. Selected Poster prepared for presentation at the International Association of Agricultural Economists (IAAE) Triennial Conference, Foz do Iguaçu, Brazil, 18-24 August, 2012.

Ritzer, G. (2000). *Modern sociological theory*. New York: The McGraw-Hill Companies.

- Robinson, L. J., & Flora, J. L. (2003). The social capital paradigm: Bridging across disciplines. *American Journal of Agricultural Economics*, 85 (5), 1187-1193.
- Rodrik, D. (1997). *Where did all the growth go? External shocks, social conflict and growth collapses*. Working Paper No.6350. Cambridge: Mass.
- Rose, N. S. (1999). *Governing the soul: The shaping of the private self*. London: Free Associations Books.
- Rosenthal, N., Fingrutd, M., Ethier, M., & Karant, R. (1985). Social movements and network analysis: A case study of 19th Century Women's reform in New York State. *American Journal of Sociology*, 90, 1022-1054.
- Rotolo, T. (2000). Town heterogeneity and affiliation: A multilevel analysis of voluntary association membership. *Sociological Perspectives*, 43, 271-289.
- Rubio, M. (1997). Perverse social capital: Evidence from Columbia. *Journal of Economic Issues*, 31 (3), 805 – 816.
- Sabatini F (2006). *An inquiry into the empirics of social capital and economic development*. PhD Thesis, Department of Public Economics, University of Rome. Retrieved on January 18, 2012 from <http://www.ageconsearch.umn.edu/bitstream>.
- Sakuri, S. (2002). Strategies of utilizing regional resources for rural revitalisation in the trend of short-term and year-round tourism, *Technical Bulletin of the Faculty of Agriculture*, 56, 127-141.

- Sakurai, T., Furuya, J., & Futakuchi, K. (2006). Efficiency and product quality improvement effects of industrial clusters: The case of the rice milling industry in Ghana. In Y. Sawada & T. Sonobe (Eds), *Market and economic development* (pp 151-179). Tokyo: Toyo Keizai Shinpo-sha.
- Samuel, K. (2000). *Civil society coalitions, alliances and networks: The movement for free and fair elections- Srilanka: A case study*. Retrieved on February 5, 2012 from IFCB website, <http://www.ifcb-ngo.org/publications/does/can-sl.doc>.
- Samuelson, P. (1954). The pure theory of public expenditure. *Review of Economics and Statistics*, 36, 387-389.
- Sander, A. (2002). Levels at which social capital is located. Retrieved on February 5, 2012 from www.gnudung.com
- Sarantakos, S. (2005). *Social research*. New York: Palgrave Macmillan.
- Scott, J. (2000). *Social network analysis: A handbook*. London: Sage.
- Scott, W. R. (2001). *Institutions and organisations*. Thousand Oaks: Sage
- Sealey, J. R., Sim, A. R. & Loosely, E. W. (1956). *Crestwood heights: A study of the culture of Suburban life*. New York: Basic Books.
- Serrat, O. (2009). *Social network analysis: Knowledge solutions*. Manila: Asian Development Bank.
- Sims, E. (2006). *Social capital in firms, alliances and clusters: Why it is important for productivity and competitiveness and how to build it*. Retrieved on February 5, 2012 from ww.apo-tokyo.org.
- Skocpol, T. (1996). Unravelling from above. *The American Perspective*, 25, 20-25.

- Sligo, F. X., & Massey, C. (2007). Risk, trust and knowledge networks in farmers' learning. *Journal of Rural Studies*, 23 (2007), 170-182.
- Smith, L., & Sorensen, P. (2000). Pathological outcomes of observational learning. *Econometrica*, 68 (2), 371-398.
- Snijder, T. A. B. (2001). The statistical evaluation of social network dynamics. *Sociological Methodology*, 35, 361-395.
- Sobel, J. (2002). Can we trust social capital? *Journal of Economic Literature*, 40, 139-154.
- Sorenson, C. (2000). *Social capital and rural development: A discussion of issues*. Washington D.C.: The World Bank.
- Soubeyran, A., & Weber, P. (2002). *Building social capital*. Retrieved on may 1, 2003 from [www.social capital research.com](http://www.socialcapitalresearch.com).
- Sparrowe, R.T., Liden, R.C., Wayne, S. J., & Kraimer, M. L. (2001). Social networks and the performance of individuals and groups. *Academic Management Journal*, 44 (2), 316-325.
- Spielman, D. J., Davis, K.E., Negash, M., & Ayele, G. (2008). *Rural innovation systems and networks: Findings from a study of Ethiopian smallholders*. IFPRI Discussion Paper. 00759.
- Steckler, A. McLeroy, K. R. Goodman, R. M., Bird, S. T., & McCormick, L. (1992). Toward integrating qualitative and quantitative methods: An introduction. *Health Education Quarterly*, 19, 1-8.
- Stiglitz, J. (1985). Information and economic analysis: A perspective. *Economic Journal*, 95 (380a), 21-41.

- Stiglitz, J. (1998). *Towards a new paradigm for development: Strategies, policies, and processes*. Given at the 1998 Prebisch Lecture at UNCTAD, Geneva (October 19, 1998).
- Stolle, D. (2001). Clubs and congregations: The benefits of joining an association. In K.Cook. (Ed.), *Trust society* (pp 26-42). New York: Russell Sage Foundation.
- Sunasee, N., & Sewery, D. (2002). *A theoretical framework for knowledge management*. Proceedings of the 2002 annual research conference of South African Institute of Computer Scientists and Information Technologist on Enablement through Technology, Port Elizabeth.
- Swain, R. B. (2002). Credit rationing in rural India. *Journal of Development Economics*, 27 (2), 1-20.
- Tadesse, D. (2008). *Access and utilization of agricultural information by resettler farming households: The case of Metema Woreda, North Gondar, Ethiopia*. A masters' thesis submitted to the Development of Rural Development and Agricultural Extension, School of Graduation Studies, Haramaya University.
- Tan, W. (2006). Social capital in Asia: A case study of Singapore. Retrieved on 20 June, 2007 from www.apo-tokyo.org.
- Tashakkori, A. & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches*. Thousand Oaks, California: Sage.
- Tendler, J. (1997). *Good governance in the tropics*. Baltimore: Johns Hopkins University Press.

- Thaden, L. I., & Rotolo, T. (2009). The measurement of social networks: A comparison of alter-centred and relational designs. *Connections*, 29 (1), 15-25.
- Thibaut, J. W., & Kelly, H. H. (1959). *The social psychology of groups*. New York: Wiley.
- Thoits, P. (1995). Stress, coping and social support process: Where are we? What next? *Journal of Health and Social Behaviour*, 36 (1), 53-79.
- Tilly, C. (1981). *As sociology meets history: Studies in social discontinuity*. New York: Academic Press.
- Trotter, R. (1999). Friends, relatives and relevant others: Conducting ethnographic network studies. In J. Schensul, M. LeCompte, R. Trotter, E. Cromley & M. Singer (Eds.), *Mapping social networks, spatial data, and hidden populations* (Ethnographers Toolkit Volume 4). Walnut Creek, CA: Altamira Press.
- Turner, J. C. & Oakes, P. J. (1989). Self-categorisation theory and social influence. In P.B. Paulus (Ed.), *Psychology of group influence* (pp. 233-275). Hillsdale, NJ: Lawrence Erlbaum.
- Turner, R. J., & Marino, F. (1994). Social support and social structure: A descriptive epidemiology. *Journal of Health and Social Behaviour*, 35, 193-212.
- Udry C.R., & Conley, T.G. (2004). *Social networks in Ghana*. Discussion Paper Number 888. Economic Growth Center, Yale University.
- Umali, D. & Schwartz, L. A. (1994). *Public and private agricultural extensions: Beyond traditional frontiers*. World Bank Discussion Paper. Washington, D. C: World Bank.

- Uphoff, N. (2000). Understanding social capital: Learning from the analysis and experience of participation. In P. Dasgupta & I. Serageldin (Eds.), *Social capital: A multifaceted perspective* (pp. 15-28). Washington DC: The World Bank.
- Uphoff, N., & Wijayarathna, C.M. (2000). Demonstrated benefits from social capital: The productivity of farmer organisations in Gal Oya, Sri Lanka. *World Development*, 28 (11), 1875-1890.
- Uslaner, E. (2002). *The moral foundations of trust*. Cambridge: Cambridge University Press.
- van der Poel, M.G.M. (1993). *Personal networks*. Lisse: Swets and Zeitlinger.
- Varshney, A. (2001). *Ethnic conflict and civic life: Hindus and Muslims in India*. New Haven: Yale University Press.
- Verhofstadt, E. & Maertens, M. (2013). *Cooperative membership and agricultural performance*. Bioeconomics Working Paper Series. No. 6.
- Wade, M. (2005). *Social network theory*. Retrieved on January 17, 2012 from <http://www.istheory.yorku.ca/socialnetworktheory.htm>
- Wasserman, S., & Faust, K. (1999). *Social network analysis: Methods and applications*: Cambridge: Cambridge University Press.
- Wellman, B. (1983). Network analysis: Some basic principles. *Social Theory*, 1, 155-200.
- Wellman, B., & Wortey, S. (1990). Different strokes from different folks: Community ties and social support. *American Journal of Sociology*, 96 (93), 558 – 588.
- Whatmore, S., & Thorne, L. (1997). Nourishing networks: Alternative geographies of food. In D. Goodman, & M. Watts (Eds.), *Globalising*

- food: agrarian questions and global restructuring* (pp. 287-304).
Routledge: London.
- White, H., Boorman, S. & Breiger, R. (1976). Social structure from multiple networks I: Blockmodels of roles and positions. *American Journal of Sociology*, 81, 730-780.
- Wiig, H. (2003). *The productivity of social capital*. New Haven: Yale University.
- Williams, K., & Durrance, J. C. (2008). Social networks and social capital: Rethinking theory in community informatics. *The Journal of Community Informatics*, 4 (3), 1-16.
- Wilson, P. A. (2001). Building social capital: A learning agenda for the 21st Century. *Urban Studies*, 34 (6), 745-760.
- Winkels, A., & Adger, N.W. (2002). *Sustainable livelihoods and migration in Vietnam: The importance of social capital as access to resources*. Paper presented at the International Symposium on Sustaining food security and managing natural resources in Southern Asia – Challenges for the 21st Century, January 8-11, 2002, Chiang Mai: University of Hohenheim.
- Wolcott, H. F. (1994). *Transforming qualitative data: Description analysis and interpretation*. Thousand Oaks, CA: Sage.
- Woolock, M. (1998). Social capital and economic development: Towards a theoretical synthesis and policy framework. *Theory and Society*, 27(2), 151-208.

- Woollock, M., & Narayan, D. (2000). Social capital: Implications for development theory, research and policy. *World Bank Research Observer, 15* (2), 225-249.
- World Bank (1998). *Concessions for infrastructure: A guide to their design and award*. World Bank Technical Paper No. 399.
- Wright, E. O. (1997). *Class counts: Comparative studies in class analysis*. Cambridge: Cambridge University Press.
- Yiadom-Boakye, E., Owusu-Sekyere, E., Nkegbe, P. K., & Ohene-Yankyera, K. (2013). Gender, resource use and technical efficiency among rice farmers in the Ashanti Region, Ghana. *Journal of Agricultural Economics and Development, 2* (3), 102-110.
- Yoon, H.D. (2006). Social capital in Asia: An exploratory study. Retrieved on May 20, 2011, from www.apo-tokyo.org.
- Zafirovski, M. (2005). Social exchange theory under scrutiny: A positive critique of its economic-behaviourist formulation. *Electronic Journal of Sociology, 11*(98), 36-55.
- Zhao, Y. (1998). Analysis of farmer's behaviour on market information needs. *Agriculture Information Exploration, 5*, 28-29.
- Zuwarimwe, J. & Kirsten, J. (2011). Social networks and rural non-farm enterprise development and implication for poverty reduction among rural households in Zimbabwe. *Educational Research, 2* (3), 1031-1042.

APPENDIX A

**INTERVIEW SCHEDULE ON SOCIAL NETWORKS AND RURAL
AGRICULTURAL DEVELOPMENT**

Identification Box

Name of interviewer.....
Community.....

SECTION A: Background characteristics of respondents

1. Sex i. Male ii. Female
2. Age.....
3. Marital status i. married ii. Single iii. Divorced iv.
Widowed v. Separated
4. Religion i. Christian ii. Muslim iii. Traditionalist
5. Educational level.....
6. Number of spouse.....
7. Number of children.....
8. How many of your children are working.....
9. How many of your children are married.....

SECTION B: SOCIAL NETWORK CHARACTERISTICS

10. Provide the following information about your friends in this community.

Name	House no./location	What benefits do you often get from these friends

11. Out of these friends, who is your closest friend?

12. Who do you get advice from when making important decisions.....

13. Do you have contacts with friends, family or business partners outside this community? i. Yes ii. No

14. If yes, how many contacts do you have outside this community.....

15. What assistance have you received from these contacts.....

16. If you need a large sum of money, who could you borrow it from?
.....

17. If you have to lend a large sum of money, who would you lend to?
.....

18. Have any of your friends visited you on your farm in the past 12 months?
 i. Yes ii. No

19. If yes, what help did you get from these friends when they visited your farm?

.....

20. Has any agricultural extension worker visited you in the past 12 months?

- i. Yes ii. No

21. If yes, how did you benefit from the visit.....

.....

22. Do you belong to a group or an association? i. Yes ii. No

23. If yes, complete the table.

Name of group/association	Number of members	Functions	Benefits derived from the association

24. On the average, how often in a month, do you participate in the activities of the group to which you belong?

25. Where do you sell your farm produce?

26. Do you have a particular buyer(s) for your farm produce? i. Yes ii. No

27. If yes, who is this person?

28. Where is this person(s)?

29. How many traders or buyers do you have contact with regarding the sales of your farm produce?

30. Do you have a particular seller(s) from which you buy farm inputs from?

- i. Yes
- ii. No

31. If yes, how many sellers can you possibly buy inputs from?

.....

SECTION C: MOBILISATION AND UTILISATION OF SOCIAL NETWORKS

32. How do you maintain network ties?

.....

33. List the essential qualities that you expect members of your family, groups and association to have.....

34. What will make you lose trust and confidence in the members of your family, groups or association and the community?

.....

.....

35. What happens if members of the group or association you belong deviate from the norms or rules of the association?

.....

.....

36. If they are sanctioned, describe the type of sanction.

.....

.....

37. What happens if the association fails to sanction non-conformists?

.....

38. List the formal or informal agricultural groups, associations, and networks that exist in the community and their functions.

Group/association/network	Formal	Informal	Functions

39. How often are the formal groups activated?

40. What triggers bring groups together (e.g. Weddings, funerals, births etc).

List all

41. At what different public or private settings or event do groups or networks come together? How many people do they bring together? How often do these meetings occur?

Public /private setting or event	Number of people that congregate	How often do these meetings occur

42. Who plays a leadership or mobilizing role in the groups or network.....

43. What factors contribute to leadership within such groups (e.g. Age, elections, education, gender, socio-economic factors)?
.....
.....

44. Describe the diversity of roles within the groups or networks.....
.....

45. What is usually exchanged in the network (e.g. goods, services, favours, information, goods, moral support etc)?
.....
.....

46. What are the most important aims of the exchange relationships?
.....
.....

SECTION C: COMMUNITY CHARACTERISTICS, LOCAL CONDITIONS AND EXTRA LOCAL FACTORS

47. How does telephone communication help in your agricultural activities?
.....
.....

48. How do people resolve issues of daily life in this community?

.....

49. Availability and access to key resources (natural resources, cultural and recreational facilities, markets, communication infrastructure etc)

Key resources	How are the resources distributed among households and groups

50. How close is the togetherness or feeling of belonging in your community?

- i. Not close at all ii. Not close iii. Can't tell iv. Very close

51. Explain.....

52. How likely is it that you would ask your neighbours for money if you were broke?

- i. Very unlikely ii. Unlikely iii. Likely iv. Very likely

53. How likely is it that you will ask your neighbours to help you in your farm if you were sick?

- i. Very unlikely ii. Unlikely iii. Likely iv. Very likely

54. In your community, it is generally expected that people will volunteer or help in community activities?

- i. Strongly disagree ii. Disagree iii. Not sure iv. Agree v. Strongly agree

55. People who do not volunteer or participate in community activities are likely to be criticized or fined.

- i. Strongly disagree ii. Disagree iii. Not sure iv. Agree v. Strongly agree

56. Most people in your community make a fair contribution to community activities.

- i. Strongly disagree ii. Disagree iii. Not sure iv. Agree v. Strongly agree

57. On average, how many times per month do you volunteer in community activities?

SECTION D: SOCIAL NETWORKS AND RURAL AGRICULTURE

58. Do you discuss farm-related activities or issues with friends or neighbours?

- i. Yes ii. No

59. If yes, what types of advice on farm practices do you usually receive from friends and neighbours?

60. Do you observe other farmers in their farms? i. Yes ii. No

61. Have you ever altered your farm practices after observing another farm or farmer? i. Yes ii. No

62. List your sources of information on farming practices and management and the specific information you receive from each source

Source of information	Specific information received	How useful was the information

63. Do you conduct on-farm experiments? i. Yes ii. No
64. If yes, what type of information do you seek from your experiments?
.....
.....
65. Do you share your newly acquired or original knowledge with other farmers? i. Yes ii. No
66. Do you belong to a market cooperative? i. Yes ii. No
67. If yes, what agricultural produce does the cooperative market?
.....
.....
68. From whom do you get information about market prices?
.....
.....
69. Have you ever sold goods on credit? i. Yes ii. No
70. If yes, whom did you sell on credit (e.g. relatives, friends, market partners etc)?
71. Have you ever bought goods on credit? i. Yes ii. No
72. If yes, whom did you buy on credit (e.g. relatives, friends, market partners etc)?
73. Have you ever experienced low crop yield? i. Yes ii. No
74. If yes, what was responsible for the low crop yield?
.....
.....
75. How did you manage to survive?
76. Have you ever suffered from post harvest losses? i. Yes ii. No

77. If yes, how were you able to secure household consumption?

.....

78. Have you received labour assistance for your farm?

- i. Yes ii. No

79. Do you require credit for your farm or business activities?

- i. Yes ii. No

80. If yes, have you ever made the attempt to secure one?

- i. Yes ii. No

81. Were you successful? i. Yes ii. No

82. Where did you get the credit from?

83. What did you use the credit for?

84. How did the credit help you?

85. Have you ever used new agricultural technology? i. Yes ii. No

86. If yes, specify the type of technology?

87. How did you get information on the new technology?

.....

88. Complete the following table providing your farm size, and average yearly income per crop.

Crop	Size (acre)	Yield (bags)	Average yearly income

Any other comments?

.....

.....

.....

.....

APPENDIX B

COMMUNITY PROFILING GUIDE

1. History of the community
2. Religious composition
3. Ethnic composition
4. Groups and associations
5. Seasons for farming
6. Village infrastructure
 - i. Schools
 - ii. Road networks
 - iii. Communication networks
 - iv. Social centres
 - v. Play grounds
 - vi. Shops/stores
 - vii. Physical structures
 - viii. Water infrastructure
 - ix. Markets within and outside the community
7. Resources in the community
8. Distance (in km) from the community to the nearest market?.....
9. How far (in km) is the nearest village or town?.....
10. Distance (in km) from the community to the district capital.....
11. What is the distance from your community to the nearest market.....
12. Number of communication networks (telephone provided) in the community?.....
13. Problems faced by the community

APPENDIX C

INTERVIEW GUIDE FOR KEY INFORMANTS

1. How are agricultural activities organised in your community?
2. How do network members contribute to agricultural activities?
3. How are agricultural network ties maintained and destroyed?
4. How do groups and associations support agricultural activities?
5. What stages of agricultural production are networks mobilised and how do they help?
6. What are the limits to networks in promoting agricultural development?

APPENDIX D

TABLE FOR DETERMINING SAMPLE SIZE FROM A GIVEN POPULATION

N-----n	N-----n	N-----n	N-----n	N-----n
10-----10	100-----80	280-----162	800-----260	2800-----338
15-----14	110-----86	290-----165	850-----265	3000-----341
20-----19	120-----92	300-----169	900-----269	3500-----346
25-----24	130-----97	320-----175	950-----274	4000-----351
30-----28	140-----103	340-----181	1000-----278	4500-----354
35-----32	150-----108	360-----186	1100-----285	5000-----357
40-----36	160-----113	380-----191	1200-----291	6000-----361
45-----40	170-----118	400-----196	1300-----297	7000-----364
50-----44	180-----123	420-----201	1400-----302	8000-----367
55-----48	190-----127	440-----205	1500-----306	9000-----368
60-----52	200-----132	460-----210	1600-----310	10000-----370
65-----56	210-----136	480-----214	1700-----313	15000-----375
70-----59	220-----140	500-----217	1800-----317	20000-----377
75-----63	230-----144	550-----226	1900-----320	30000-----379
80-----66	240-----148	600-----234	2000-----322	40000-----380
85-----70	250-----152	650-----242	2200-----327	50000-----381
90-----73	260-----155	700-----248	2400-----331	75000-----382
95-----76	270-----159	750-----254	2600-----335	100000-----384

Where N= Population size, and n= sample size required.

Source: Krejcie and Morgan (1970:608) in Hill (1998).