ASSESSING THE ROLE OF SOCIAL NETWORKS IN AGRICULTURAL COOPERATIVES IN THE NIAYES REGION OF SENEGAL

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January 2016

A thesis submitted to McGill University in partial fulfillment of the requirements of the degree of M.Sc. (Renewable Resources)

English abstract:

Agricultural cooperatives are fast becoming one of the most prominent contributors to rural development internationally. Policymakers, academics, and donors have identified these cooperatives as being an essential mechanism to facilitate information exchange, improve collaboration, disseminate agricultural innovation, and improve market access among smallholder farmers in diverse settings. However, despite significant international support, empirical research on the benefits of agricultural cooperatives has been equivocal, revealing both successes and failures, and raising questions about the ability of cooperatives to equitably and sustainably facilitate change. Further, many existing studies have tended to overlook the dual social and economic identity of agricultural cooperatives, instead focusing on their economic functioning with comparatively little attention being paid to social relationships.

This thesis seeks to better understand how the internal social structure of agricultural cooperatives can influence their function and performance with a view to inform research and policy. More specifically, the research seeks to 1) analyze how social networks within a formal cooperative can influence their ability to facilitate knowledge flow and innovation dissemination; 2) assess how agricultural cooperatives can contribute to developing the sustainable livelihoods of their members; and 3) inform future research and development efforts directed towards ensuring more equitable and resilience-focused agricultural cooperative policy frameworks. Using case studies in the Niayes Region of Senegal, this study reveals the complexity of the social relationships that can underpin agricultural cooperative development in Senegal and how these relationships can impact their overall performance and service provision to members. Results highlight that economic analyses of cooperatives can only partially account for the impacts of existing power arrangements, social structures, and socio-economic diversity present among smallholder farmers in developing areas, often leading to inappropriate power asymmetries and inequitable distribution of benefits. Based on our findings, agricultural development initiatives seeking to establish or collaborate with agricultural cooperatives could benefit from conducting *a priori* assessments of the existing social relations and networks affecting producer interactions in the cooperative. There remains a need for better merging economic analyses (i.e. the impact of cooperative membership on farm income, market access,

commodity prices, etc.) with social analyses (such as who is benefiting from being a cooperative member, how are members interacting and sharing knowledge, and how are collective decisions being made) in cooperatives-related research in order to better address their dual-identity and multiple objectives in developing areas context. Such an approach has the potential to better contextualize their design, operation, and function in order to facilitate innovation and resource access for members.

French Abstract:

Les coopératives agricoles sont rapidement devenues l'un des contributeurs les plus importants de développement rural dans le monde. Des législateurs, des chercheurs, ainsi que des donateurs ont identifié ces coopératives comment des mécanismes essentiels pour faciliter le partage d'information, accroître la collaboration, diffuser l'innovation agricole, et améliorer l'accès au marché pour les producteurs oeuvrant dans des contextes variés. La recherche empirique soutient que les bénéfices des coopératives sont équivoques, révélant des succès et des échecs, en plus de soulever des questions sur la capacité des coopératives à faciliter des changements équitables et durables. Également, la plupart des études menées jusqu'à présent ont négligé d'étudier de manière combinée l'identité sociale et économique des coopératives agricoles, se concentrant davantage sur les aspects économiques en accordant peu d'attention aux relations sociales s'établissant au sein de celles-ci.

Ce mémoire cherche ainsi à mieux comprendre comment l'organisation sociale interne des coopératives agricoles est susceptible d'influencer leur fonctionnement et leur performance, tout en s'attardant à agrémenter la recherche et la politique. Plus spécifiquement, cette recherche i) examine comment les réseaux sociaux au sein d'une coopérative peuvent influencer sa capacité à faciliter le partage des connaissances et la diffusion de l'innovation ; 2) évalue comment les coopératives agricoles peuvent contribuer à développer des moyens durables pour assurer la subsistance des membres; 3) inspire la recherche future et les efforts de développement plus durables et résilients lorsque les politiques issues des coopératives agricoles sont concernées. En utilisant des études de cas de la région des Niayes au Sénégal, cette étude révèle la complexité des relations sociales des coopératives agricoles du pays, et démontre comment les relations sociales peuvent influencer la performance des coopératives et la qualité des services rendus aux membres. Les résultats obtenus démontrent que les analyses économiques des coopératives ne prennent pas suffisamment en compte les configurations de pouvoir, les statuts sociaux, et la diversité socioéconomique en existence entre les petits producteurs dans les régions dites en développement, entrainant ainsi des asymétries de pouvoir inappropriées et une distribution inéquitable des bénéfices.

Selon nos résultats, les initiatives de développement agricole, grâce à une étroite collaboration avec des coopératives agricoles existantes, pourront bénéficier d'une large connaissance endogène des relations et des réseaux sociaux en existence affectant les interactions des coopératives, et éventuellement les efforts de développement. Cependant, pour y parvenir, l'agrégation des analyses économiques (i.e. l'impact de l'adhésion à une coopérative sur le revenu agricole, l'accès au marché, les prix de commodités, etc.) et des analyses sociales (qui bénéficient de la participation à une coopérative, comment les membres partagent les savoirs et les connaissances, comment les décisions sont-elles prises, etc.) dans la recherche liée à l'économie coopérative s'avère nécessaire afin de mieux prendre en compte leur double identité approche présente le potentiel de mieux contextualiser la conception, la gestion, et le fonctionnement du modèle coopératif agricole, dans l'optique d'améliorer l'accès à l'innovation et aux ressources agricoles pour les membres.

Acknowledgements:

This work would not have been possible without the assistance, guidance, and hospitality (*Teranga*) of the Senegalese producers, cooperative leaders, development officials, and government agents that put up with my constant poking, persistence, and endless questions. To them, I dedicate this research and outcomes that will hopefully transcend the confines of the policy-rooms and make some tangible impact for the producers on the ground. Special thanks goes to my research partners, Absa Kadet and Fama Gueye, personal assistant (and brother), Malick Sow, and my good friend, Amadou Sow, for their endless hours of support, laughs, and positive attitude.

I'd like to thank the entire Sustainable Futures Lab for their support and direction throughout the course of my thesis evolution. Thank you to Arlette Saint Ville, Kristen Lowitt, Tuihedur Rahman, and June Po for their many hours of assistance, especially in finding relevant literature and learning social network analysis. A special thanks goes to my supervisor, Dr. Gordon Hickey, for his help and thoughtful guidance through the proposal, research, and writing process.

The Social Sciences and Humanities Research Council (SSHRC), through the Joseph Armand Bombardier Masters Scholarship, McGill University through the William Dawson Scholar Award, and the Canadian Association for the Study of Co-operation (CASC), generously funded this thesis.

Finally, I am so grateful for the support of my entire family, especially my parents for their direct and indirect support. This research would not have been possible with the ongoing support, editing, and encouragement by my beautiful partner, Leila. For that I can't thank her enough.

Thesis Style and Contribution of Co-authors:

This is a manuscript-based thesis. As a result, there is a small degree of unavoidable repetition between the chapters in order to adequately outline the context and describe the research methods for the reader. References cited in the text are listed at the end of each chapter. The organization of the thesis is as follows: Chapter 1 provides a general introduction to the research and the motivation for reintegrating the social dimension into cooperative research. It describes the broad research questions, my motivations for the study, the research design, and the study location. Building on this background, Chapter 2 presents an exploratory study into how existing social networks can influence a cooperative's ability to facilitate agriculture-related knowledge flow and innovation dissemination. Recognizing the ability of agricultural cooperatives to contribute to a wide variety of smallholder outcomes, Chapter 3 then argues for cooperative research and development to more explicitly promote sustainable livelihoods by examining how cooperatives can contribute to smallholder's social, human, physical, financial, and natural capital assets. Both Chapters 2 and 3 will be prepared as manuscripts for submission to peer-reviewed journals. Chapter 4 presents the broad findings and conclusions of the thesis and identifies areas for future research.

I am the senior author for all chapters, responsible for the literature review, research design, planning and execution of data collection and analysis. All field research was conducted between February and May 2015, with the assistance of two research assistants, Absa Kadet and Fama Gueye, from the University of Cheikh Anta Diop. I gratefully acknowledge their contribution to this work.

Dr. Gordon Hickey was the co-author for Chapters 2 and 3 of this thesis, contributing to research design, editing, conceptual framing, and some writing. He also provided the research funding for the field data collection activities and will contribute to the preparation and submission of each chapter to international peer-reviewed journals.

Table of Contents:

List of Tables:

List of Figures:

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CHAPTER 1: GENERAL INTRODUCTION AND MOTIVATIONS FOR THE STUDY

1.1. Introduction

It has become increasingly recognized that smallholder farmers have a central role to play in sustainable rural development, food security, and poverty reduction across the world (McIntrye et al., 2009; World Bank, 2008). These farmers, however, often face significant barriers to supporting these policy objectives (Collier & Deacon, 2014), including low yields, limited commercialization, and decreasingly land availability – challenges that are particularly present in Sub-Saharan Africa (SSA).

The driving force behind the challenges facing smallholder agricultural systems in SSA is their complexity, diversity, and risk proneness (Morton, 2007). It has been well documented that smallholder farmers in the majority of developing area contexts are subject to a variety of sociopolitical, environmental, and economic constraints (Toenniessen, Adesine, & DeVries, 2008). These include: entering global and regional markets (Barrett, 2008); applying for credit and loans (Collier, 2008); adopting advanced agricultural technologies (Pingali & Traxler, 2008); securing land tenure and property rights (World Bank, 2008); adapting to ongoing environmental and climate variability (Hahn, Riederer, & Foster, 2009); and participating in policy or governmental discussions (Jayne, Mather, & Mghenyi, 2010). Recognizing the vulnerability of many smallholders to shocks and their natural-resource dependent livelihoods (Cash et al., 2006), agricultural cooperatives, oriented towards improving market access, production, or general livelihoods, have emerged as a popular response for governments, development agencies, non-governmental organizations, and local communities – especially in the context of commercialization (Key et al., 2000; Fischer & Qaim, 2012a).

1.1.1. Agricultural cooperatives

Agricultural cooperatives have emerged as institutional vehicles to facilitate information exchange, improve collaboration, disseminate agricultural innovation, and improve market access (Bernard & Spielman, 2009; Fischer & Qaim, 2012a). Many donor-countries and development agencies are increasingly using these vehicles to deliver externally funded programmes for poverty alleviation (Johnson & Shaw, 2014). In particular, African cooperatives

are experiencing a revival in both practice and theory; following decades of often inefficient and unsustainable practices coordinated by once-colonial and now-national governments (See Develtere, Wanyama, & Pollet, 2008; Deininger, 1995; Swinnen & Maertens, 2007). These 'contemporary' cooperatives have often been reported to benefit smallholders economically by reducing transaction costs, increasing market access, and improving bargaining power (Bernard & Taffesse, 2012). For example, Markelova and Mwangi (2010), argued that by harnessing collective action[1], cooperatives could help smallholder farmers aggregate their surplus output, pool both tangible and intangible resources, generate economies of scale and scope in marketing, and strengthen their bargaining position to improve their place in the market (Collion & Rondot, 1998; Blokland & Gouet, 2007). Further, agricultural cooperatives can simplify marketing and values by directly bypassing intermediaries and lowering horizontal and vertical coordination costs (Shiferaw, Okello, & Ready, 2009). However, despite the broad international support, academic research on cooperatives has revealed both failures (see Hill, Bernard, & Dewina, 2008; Bernard & Taffesse, 2012) and success (see Bernard, Taffesse, & Gabre-Madhin, 2008; Okello, Narrod, & Roy, 2007), questioning their ability to facilitate positive and sustainable change.

While a number of studies have reported the positive impacts of cooperative membership using economic indicators, including farm income, farm profits, technological adoption, and market participation (see Fischer & Qaim, 2012a, 2012b; Francesconi & Heerink, 2010; Shiferaw et al., 2009), few have focused on the social dimension of cooperatives, including the distribution of benefits, social networks, and power hierarchies (Develtere, 1994). At their very heart, cooperatives are people-based organizations that rely on the active participation and interaction of their members with each other, and with external agents. These interactions, also known as social networks, are essential for their members to access agricultural information and innovations (van Rijn, Bulte, and Adekunle, 2012), to manage risk and vulnerability (Woolcock & Narayan, 2000), and build adaptive capacity to withstand external shocks (Brown & Westaway, 2011). The Statement of Co-operative Identity (ICA, 1995) captures this important social dimension by defining cooperatives as *"[an] autonomous association of persons united*

[1] We define collective action as the voluntary action taken by a group (generally of likeminded individuals) to achieve common interests (Meinzen-Dick, di Gregario, & McCarthy, 2004).

voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically controlled enterprise". Under this definition, cooperatives exist not only as a joint enterprise and a business, but equally as a voluntary association. The duality of this identity is reflected in the economic and social foundations of cooperatives (McKillop, 2005; Valentinov, 2007), which fundamentally implies that each of these foundations cannot be separated or dealt with independently of one another. As Simmons and Birchall (2008) advocated in their study of networks, *"the very nature of cooperatives as economic associations emphasizes the 'connectedness' between cooperatives and their members"* (p. 2134).

Previous research that has focused on the social dimension of agricultural co-operatives has generally identified that it is either: a) the product or outcome of functioning cooperatives (see Majee, 2007; Majee & Hoyt, 2011; Richards & Reed, 2015); or b) a contributing factor to the re-popularization of cooperatives (see Myers, 2004). Recent research has focused more on the external organizational linkages of co-operatives in the context of innovation (Novkovic & Holm, 2012), poverty reduction (Simmons & Birchall, 2008), and economic cooperation (Muthuma, 2011; Valentinov, 2004), but significantly less on the internal social networks and relationships operating within and underpinning cooperatives. Recognizing the importance and novelty of this knowledge gap, we sought to explore how the internal social structure of cooperatives can influence their ability to spread agricultural innovation (Chapter 2), and support sustainable rural livelihoods (Chapter 3). As these are important proposed benefits of cooperative membership, this research seeks to inform cooperative research and development theory while also providing practical insights for agricultural cooperative policy moving forward (Chapter 4).

1.1.2. Conceptual framework

Conceptually, agricultural cooperatives have been identified as being important facilitators of agricultural and rural development, particularly for smallholders. To date, however, there has been limited investigation into the social dimensions of cooperatives, particularly in the context of their operation and management. In what follows, I briefly introduce the related concepts of social capital and social networks and then present the two main agriculture development paradigms through which I intend to examine how agricultural cooperatives function and perform in different contexts.

1.1.2.1. Social capital and networks

While there is debate in the literature, the potential for smallholder collective action generally depends greatly on factors such as group organization, farmer and product characteristics, as well as the institutional arrangements surrounding their creation (Markelova & Mwangi, 2010). The concept of social capital is increasingly being used to explain cooperative behavior within and between groups (Putnam, 1993; Grootaert & Van Bastelaer, 2002; Lowitt et al., 2015). It has been widely adopted by the international development community (Narayan & Pritchett, 1999; Woolcock, 1998), despite slightly different conceptualizations, including: the norms, trust, and networks that facilitate cooperation for mutual benefit (Putnam, 1993; Portes, 1998), the assortment of resources required for communities to act collectively (Pretty & Smith, 2004), and the social bonds and norms important for communities and individuals to form human capital (Coleman, 1988). Proponents have argued that social capital can: facilitate social mobility and help provide access to resources (Coleman, 1988), be a means of social support (Wellman & Frank, 2001), lower transaction costs and facilitate cooperation and collaboration (Pretty, 2003; Ahn & Ostrom, 2008), and improve market performance (Woolcock, 2001). Critics have pointed out that the concept is too broad, lacks indicators for empirical research, and does not adequately pay attention to structural inequalities of class, gender, and generation (Bebbington, 2007; Fine, 2010; Meinzen-Dick et al. 2004; Woolcock 2010).

For the purpose of this thesis, I use Woolcock and Narayan's (2000) definition of social capital as the norms and networks that enable people to act collectively because it permits the incorporation of different types of social capital, including bonding (connecting like-people in similar situations), bridging (connecting like-people in dissimilar situations) and linking (connecting people with formal institutions outside of the community) (Dale & Sparkes, 2007). Sabatini (2009) noted that while bonding social capital is often common among communities, it is through developing bridging and linking social capital that there exists an opportunity to enhance communication and knowledge flows, technological exchange, and equitable representation in agricultural cooperatives. One useful way to operationalize and assess these different types of social capital is through Social Network Analysis (SNA) (Scott, 2012). Here a network can be conceptualized as a collection of elements, typically referred to as actors or egos in sociological studies, connected by lines, referred to as 'edges' or 'ties' (Prell, 2012). Network

analyses hold the potential to reveal characteristics of the social environment (i.e., the cohesiveness of the cooperative) and identify structural patterns that might be constraining or conducive to cooperative operation (Kadushin, 2012). Previous studies have identified the importance of different patterns of social interactions and relationships between stakeholders to manage natural resources (Bodin & Crona, 2009; Bodin, Crona, & Ernston, 2006), but few have considered their implications for the performance and operation of agricultural cooperatives.

1.1.2.2. Agricultural Innovation Systems

Going beyond previous approaches, such as Agricultural Knowledge and Information Systems (AKIS), Agricultural Innovation Systems (AIS) have been identified as an important conceptual approach to focusing on the interactions between agricultural actors (smallholders), and their institutional and policy contexts (Klerkx, Van Mierlo, & Leeuwis, 2012). Hall et al. (2003) defines AIS as the interaction of individuals and organizations with various types of knowledge within a particular social, political, economic, and institutional context that results in "new products, new processes, and new forms of organization" (p. 19). Within AIS thinking, innovation is generally concerned with alternative ways of organizing and the distribution of benefits (Leeuwis & Ban, 2004), as well as new technologies, that facilitate new institutional arrangements and practices for co-learning and innovation (van Rijn et al., 2012; Sumberg, 2005). This approach offers valuable insights to understanding the role of agricultural cooperatives (as institutional arrangements) in supporting and enhancing innovation processes and outcomes in smallholder farming contexts.

1.1.2.3. Sustainable Rural Livelihoods

Increasingly, the Sustainable Rural Livelihoods Framework (SLF) has been used to incorporate a more livelihoods-focused approach into development research and programming (Scoones, 2009). It was first introduced by Chambers and Conway (1992) and expanded by Scoones (1998) as a means to describe a 'sustainable' livelihood, defined in relation to five key indicators. These, depending on the context and scale, could be achieved through access to a range of different livelihood resources (or capital assets) (natural, economic, human, physical, and social), which are then combined in the pursuit of various livelihood strategies (livelihood diversification, migration, and agricultural intensification). Therefore, a smallholder's 'survival' capability is

dependent on the accumulation of household capital assets (Rakodi, 1999; Turner et al. 2003), where assets are modified by endogenous social properties like institutional structure and the ownership and access to resources (Ostrom, 2011; Folke et al. 2005). An important component of the SLF is the analysis of institutional factors that influence sustainable livelihoods. Criticisms of the concept include its limited focus on issues of class and agency (Scoones, 2009), its weak linkages between value chains and a household's livelihood strategy (Dorward et al., 2005), and its description as a "method without a theory" (Ghimire, 2001, p. 387). Moser (1998; 2007) suggested focusing on household assets as a way to address these limitations, where the more assets possessed by a household, the more resilient they are to external shocks (Adato & Meinzen-Dick, 2007).

By drawing on the linked theories of social capital and social networks to identify and analyze the social structures within agricultural cooperatives, and then applying two distinct conceptual frameworks to assess how these structures may influence a cooperative's ability to realize its objectives, this thesis offers new perspectives on how agricultural cooperatives might better contribute to sustainable rural development.

1.2. Research objective and questions

1.2.1. Research objective

The objective of this thesis is to better understand how the internal social structure of agricultural cooperatives can influence their function and performance with a view to informing research and policy. More specifically, my research seeks to 1) analyze how social networks within a formal cooperative can influence their ability to facilitate knowledge flow and innovation dissemination among members; 2) assess how agricultural cooperatives can contribute to developing sustainable smallholder livelihoods; and 3) inform the development of more equitable and resilience-focused agricultural cooperative policy.

1.2.2. Research questions

The principal research question guiding this thesis is: *How does the internal social structure of agricultural cooperatives in Senegal affect their ability to equitably serve their members?*

Working under this broad question, I subsequently identified two sub-questions, which form the basis for each of my results chapters:

- How do existing social networks within formal Senegalese cooperatives influence their ability to facilitate knowledge flow and innovation dissemination among members?
- How do Senegalese cooperatives contribute to the sustainable livelihoods of members in terms of their social, human, physical, financial, and natural capitals?

1.3. General methodology

1.3.1. Overview of methods used

In order to respond to my research questions, I adopted a case-study research design (Yin, 2003) combined with a wider mixed-methods data collection approach that involved quantitative and qualitative research methods (Creswell & Clark, 2011). Adopting a mixed-methods approach facilitated reliability and validity through data triangulation and methodological overlap (Harwell, 2011; Lorenzonia, Cole, & Whitmarsh, 2007).

1.3.2. Research setting: Senegal and the Niayes Region

Senegal offers a particularly interesting context within which to study the role of social relations and networks in the operation of agricultural cooperatives for a variety of reasons. Agriculture and its related activities are essential to Senegal's national economy, employing approximately 75% of the population and comprising of 16.6% of National GDP in 2013 (CNCR, 2014). The Senegalese government, through their most recent national policy document: Emerging Senegal 2015 (*Sénégal Emergent*), and its agricultural program, Acceleration Program for the Rate of Senegalese Agriculture 2015 (*Programme d'Accélération de la Cadence d'Agriculture Sénégalaises*), have expressed their support for rural development and agriculture as a key-engine for economic development and poverty reduction. These documents are especially important for smallholder farmers, who comprise approximately 95 percent of all agricultural exploitations in the Niayes Region and also directly depend on agriculture for their livelihoods (Republique de Senegal, 2014).

Within Senegal, the Niayes is a vital agro-ecological region, located on the West Coast that stretches 180 kilometers from Dakar to Saint-Louis. Due to the favourable microclimate,

accessible groundwater, and fertile soil, agricultural producers are able to harvest two to three times over the year, producing over 80% of Dakar's fresh produce (Dasylva, 2012; Touré & Seck, 2005). Unfortunately, the majority of the region's smallholder farmers face numerous challenges, including low and variable productivity, shrinking agricultural lands, limited access to agricultural inputs, and growing environmental pressures including climate change and rainfall variability (Collier & Dearcon, 2014; Jayne et al., 2010). In order to combat these growing vulnerabilities, smallholders, within the last 20 years, have organized (and been organized) into agricultural cooperatives to improve their access to high quality seeds and agricultural inputs, agricultural support, and increase their bargaining power. In more recent years, these agricultural cooperatives have become the primary vehicle for international development and government agencies to access the smallholder farmers of the region.

While the agricultural cooperatives in the region vary in their membership size from hundreds to thousands, most: produce horticultural products, including potatoes, onions, carrots; and focus predominantly on facilitating market access, agricultural credit, and agricultural inputs. Table 1.1 presents an incomplete list of the agricultural cooperatives in the region, based on available information.

1.3.3. Cooperatives in Senegal

During the French occupation (1895 - 1960), agricultural cooperatives were imposed on Senegalese smallholder farmers to export cotton and peanuts to European markets (CNCR, 2014). During their formative years (1960-1984), the State controlled and supervised the distribution of agricultural inputs as well as the marketing and sale of groundnuts, leaving smallholder farmers only responsible for cultivating (Fall**,** 2008). Senegal's cooperative system experienced a radical change in 1984 through the introduction of the New Agricultural Policy (*Nouvelle Politique Agricole*), supported by the World Bank Structural Adjustment policies. The NPA promoted economic liberalization and privatization of public services, effectively destroying the state-controlled cooperatives and ostracizing smallholder farmers and their livelihoods (Cissokho, 2008). In the spirit of economic liberalization, the State attempted to revive cooperation between smallholder farmers through the introduction of an Economic Interest Group (*Group d'Intérêt Economique - GIE)*, providing the legislative foundation for two

or more interested parties (i.e. smallholder farmers) to organize in order to access agricultural inputs and credit, as well as sell their produce at local and regional markets.

More recently, there has been some revival in the national and regional contexts for designing and developing Senegalese cooperatives. Regionally, the government signed to the Uniform Act 2010 *(Acte Uniforme Relatif au Droit des Sociétés Coopératives)* held by the Organization for the Harmonization of Business Law in Africa. Nationally, the amendment and adoption of the 2010 Policy for Cooperatives (*Politique de développement coopérative)* has provided a much-needed update to the 1984 Cooperative Law. Both actions have made important steps to improve the policy context for Senegalese cooperatives, although the long-term effects have yet to be seen.

1.3.4. Data collection and analysis

Primary data collection involved both quantitative and qualitative tools, including a household survey designed based on the work of Grosh and Glewwe (2000) and Angelson et al. (2011), and semi-structured interviews (Johnson, 2001) with key informants who were involved in cooperatives, development organizations, and government in Senegal. The data collection methods are discussed briefly below and then in more detail in each of the results chapters (Chapters 2 and 3).

Household surveys were designed to elicit statistical information on demographic characteristics, agricultural activities and constraints, reasons for cooperative membership, and indices of social capital, including levels of trust, collaboration, information, and communication. Drawing from the advice of Angelsen et al. (2011), I used the HAI+ format in order to develop a holistic understanding of the specific context for each survey participant. This included the following four groups of questions: 1) household composition and characteristics, 2) assets owned by the household, 3) income of the household, and 4) special section reflecting the focus of the research questions. Importantly, the final section sought information on four sets of relations: similarities, social relations, interactions, and flows, in order to identify how social capital influences cooperative function (Borgatti et al., 2009). The set of relations included similarities (demography, attitudes, and location); social relations (kinship and friendship); flows (occurring

within other social relations); and interactions (support, knowledge sharing). The results of these questions were used for social network analysis (SNA). SNA provides a useful method for investigating the social structures between identified stakeholders (Kadushin, 2012). Sabatini (2009) noted that the most appropriate network measures of social capital depends greatly on the context and nature of the ties that make up the network. The exact measures we used are described in more detail in Chapter 2. More information about the assumptions and limitations of this analytical approach are outlined in Section 2.3.4.

Key informant interviews were used to collect qualitative data and to help contextualize and triangulate quantitative data findings (Freeman, 2006). More specifically, thirty-five interviews were conducted, using a semi-structured schedule (Johnson, 2001), with a wide range of cooperative stakeholders including: leaders of producer cooperatives, producers, civil-society leaders, government officials, and development practitioners. Prior to each interview, the participant received an explanation of the research and consented to audio recording (DiCicco-Bloom & Crabtree, 2006). Interviews were then translated and transcribed in full to enable content analysis (Hsieh & Shannon, 2005) and constant comparison to identify emergent themes (Auerbach & Silverstein 2003). Limitations and assumptions associated with this method of data collection and analysis are further detailed in Sections 2.3.4 and 3.2.3.

1.4. Expectations for the following chapters:

This chapter provided a brief overview of the research context, motivation, objectives, and general methods for this thesis. The next two chapters present the results of my research, providing more detailed literature review, research objectives, research methods, results and discussion.

Chapter 2 explores how social relations and networks can influence the ability of agricultural producer cooperatives to facilitate knowledge flow and innovation dissemination in the Niayes Region of Senegal, drawing on quantitative (survey) and qualitative (interview) data.

Chapter 3 considers the extent to which a well-functioning cooperative can contribute to the development of sustainable rural livelihoods for its members using both qualitative and quantitative data.

Chapter 4 offers a general discussion of the key research findings and conclusion to the thesis, including the identification of future research needs.

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Table 2.1: An incomplete list of the agricultural cooperatives operating in the Niayes Region, with memberships (Fall 2008; Poly Conseils, 2014).

Cooperatives	*Intervention Zone*	*Number of Members*
Fédération des Agro Pasteurs de Diender	Djender	3,000 (1,363 females)
Union des Agro Pasteurs de Keur Moussa	Keur Moussa	319 (37 females)
Union des Groupements de Producteurs de Meckhé	Tivavoune	5,000 (3,250 females)
Union des Groupements des Producteurs Maraichers de Mboro	Mboro	4,000 (2,400 female)
Union des Groupements de Producteurs des Niayes	Darou Khoudoss	2,125 (1,173 females)
Union Nationale des Coopératives Agricoles du Sénégal	National	Not available
Union Nationale des Producteurs Maraîchers	National	Not available
Union Nationale des Femmes Coopératrices du Sénégal	National	15 800

Preface to Chapter 2

Chapter 1 provided some background on the challenges that smallholder farmers in SSA face and identified some of the different roles that agricultural producer cooperatives might play in addressing these challenges. More specifically it identified an important knowledge gap concerning how the internal social organization of agricultural producer cooperatives might impact their ability to equitably serve their members. Chapter 2 approaches this knowledge gap by investigating how social networks can influence the ability of producer cooperatives to facilitate knowledge exchange and disseminate innovation using two cases from the Niayes Region of Senegal. Social Network Analysis is used to first assess how knowledge and innovation spreads through agricultural cooperatives, and second, to explore what might be influencing this spread, with a view to better understanding the role of formal cooperative structures in innovation dissemination.

CHAPTER 2: ASSESSING THE RELATIONSHIPS BETWEEN SOCIAL NETWORKS AND INNOVATION IN AGRICULTURAL PRODUCER COOPERATIVES: INSIGHTS FROM THE NIAYES REGION OF SENEGAL

Abstract:

In the last decade, agricultural cooperatives have emerged as one of the most prominent approaches to rural development. They have been heralded as essential mechanisms to facilitate information exchange, improve trust and collaboration, and disseminate agricultural innovation among smallholders. However, relatively little is known about how innovation spreads or is created within the formal structure of a cooperative. This paper offers an 'inside' look at the role of social networks in the spread of innovation in two agricultural cooperatives operating in Senegal, with a view to better understanding their role in innovation dissemination and, indirectly, smallholder empowerment. Using social network analysis, we aimed to discern how smallholders transmit knowledge and adopt agricultural innovation within the formal cooperative structure. Our findings indicate that innovation was predominantly spread through formal vertical linkages (i.e. between hierarchical representatives), but was significantly controlled by key actors in leadership positions, potentially resulting in large disparities in the innovation potential of different cooperative members. This has implications for understanding the role of cooperatives in agricultural innovation systems, indicating that individual-level social networks will differ greatly between cooperatives and that this will affect their potential to enable information flow and innovation.

Keywords: Smallholders; Organization; Collective action; Social capital; Institutions; Agriculture policy; Community-based development

2.1 Introduction

Increasingly, farmers, policymakers, academics, and donors have been identifying agricultural cooperatives as essential institutional vehicles to facilitate information exchange, improve collaboration, disseminate agricultural innovation, and improve market access for smallholder farmers (Bernard & Spielman, 2009; Fischer & Qaim, 2012). As a result, cooperatives have been receiving increased financial and other support from development and government agencies to support agricultural system innovation and poverty alleviation (Johnson & Shaw, 2014). Within

the last decade, African cooperatives have been experiencing a revival on both theoretical and practical grounds; following decades of often inefficient and unsustainable practices by colonial and post-independence governments (see Deininger, 1995; Swinnen & Maertens, 2007). According to Develtere et al. (2008), approximately one in seven Africans belong to a cooperative, with countries such as Senegal, Rwanda, and Egypt possessing membership rates of over ten percent. However, empirical research on the benefits of cooperatives has been equivocal, revealing both successes (see Bernard, Taffesse, & Gabre-Madhin, 2008; Okello, Narrod, & Roy, 2011) and failures (see Hill, Bernard, & Dewina, 2008; Bernard & Taffesse, 2012), and raising important questions about their ability to facilitate innovation and sustainable positive change.

Agricultural system innovation has been identified as important to bringing new ideas, practices, or processes into diverse smallholder farming systems (Klerkx et al., 2011; Spielman, Davis, Negash, & Ayele, 2011). Agricultural Innovation Systems (AIS) *"consist of a wide range of actors from the public, private, and civil sector to bring new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect the way different agents interact, share, access, and exchange and use knowledge"* (World Bank, 2008, p. 3). In this context, agricultural innovation is not only concerned with new technologies, but also with alternative ways of organizing: including institutions, markets, labour, gender relations, and the distribution of benefits (Leeuwis & Ban, 2004) in order to facilitate joint learning, and create new institutional arrangements and practices (van Rijn, Bulte, & Adekunle, 2012; Sumberg, 2005; Klerkx, Hall, & Leeuwis, 2009).

Although agricultural innovation studies at the regional and national levels are fairly numerous (for example: Borda-Rodriguez & Vicari, 2014), relatively few have addressed the smallholder innovation system at its most basic level – the producers. Examples in Sub-Saharan Africa include Spielman et al. (2011) who examined how social networks facilitate the transfer of knowledge between Ethiopian smallholders, and Raini, Zebitz, and Hoffmann (2006) who used social network analysis as a tool to detect disparities in information flows among key agricultural actors in Kenya in the development of integrated pest management techniques for tomato cultivation, as well as others such as Hermans, Stuiver, Beers, & Kok (2013). With some

exceptions (see Douthwaite et al., 2006), few of these studies have focused on how innovation spreads within formal institutional structures, such as agricultural cooperatives. Importantly, cooperatives have been identified as contributing to the innovation potential of smallholder farmers by: linking and bridging external actors (Clark, 2002; Gouet & Van Paaseen, 2012), articulating technological needs and demands for skills (Kilelu, Klerkx, Leeuwis, & Hall, 2011), and creating and supporting new knowledge (Hall & Clark, 2010). According to Yang, Klerkx, and Leeuwis (2014), agricultural cooperatives can perhaps be best seen as 'innovation intermediaries' (for an in-depth review, please see Klerkx et al., 2011). In this discourse, an important knowledge gap relates to the activities of individual actors within agricultural co-operatives (members) and their relative roles in facilitating innovation (Markard & Truffer, 2008)

Cooperatives are people-based organizations (Puusa, Mönkkönen, & Varis, 2013) that rely almost entirely on the active participation of, and interaction between, their members and with external agents. These interactions, known in the literature as social networks, are recognized as essential for members of cooperatives to manage risk and vulnerability (Woolcock & Narayan, 2000), access agricultural information and innovations (van Rijn, et al., 2012), and build adaptive capacity to withstand external shocks (Brown & Westaway, 2011). A social network's distinct characteristics, including centrality, density, and network structure (Borgatti, Jones, & Everett, 1998), can have a wide range of implications for how a co-operative performs in different contexts. In a recent study, Herbel, Rocchigiani, and Ferrier (2015) identified that a stock of social capital is essential for family farmers to harness collective action, particularly through cooperatives, and to overcome the diverse social, economic, and environmental barriers they face. In another example, Sabatini (2009) noted that while bonding social capital (conceptualized as strong ties within a particular sub-group) is often common among communities, it is by developing bridging and linking social capital that there exists an opportunity to enhance communication and innovation flows, technological exchange, and equitable representation in producer's cooperatives. Further, those who occupy central locations in the network often have access to novel information (Granovetter, 1973), are able to control the flow of knowledge between other members (Degenne & Forsé, 1999), and can maintain coordination and leadership activities (Sandstrom & Carlsson, 2008).

Since innovation generally results from the exchange and use of knowledge, conceptualized as any scientific, technical, organizational, or managerial practice that may originate from the reorganization of indigenous practices or from foreign sources (Clark, 2002), and cooperatives are people-based organizations, the nature of the relationships that exist between cooperative members and with external agents is likely to impact the innovation potential of cooperatives. In order to better understand these relationships, we conducted an exploratory social network analysis (SNA) designed to characterize, measure, and map the existing relationships between actors within two agricultural cooperatives in the Niayes Region of Senegal and subsequently assessed how these relationships influence knowledge flows and innovation dissemination (Spielman et al., 2011). We conceptualize a network as a collection of elements, often referred to as actors or 'egos' in sociological studies, connected by lines, edges, or ties (Prell, 2012). Our analysis sought to reveal characteristics of the social environment (i.e. the cohesiveness of the cooperative) and identify structural patterns that might be constraining or conducive to innovation adoption and dissemination (Kadushin, 2012).

In what follows we provide a brief account of the cooperative movement in Senegal. We then outline our research methods, followed by detailed results and a discussion of their significance for research, policy and practice.

2.2 A brief history of agricultural cooperatives in Senegal

Agriculture is an important sector of Senegal's economy, employing approximately 73 percent of the population and comprising 16.6 percent of national GDP in 2013 (CNCR, 2014). Smallholders, who make up approximately 95 percent of the agriculture sector in Senegal, are primarily organized into producer cooperatives, which have experienced a tumultuous history over the last four decades (Republique of Senegal, 2014). The French colonial tradition of 'societies indigenes de prévoyance' imposed centrally-organized cooperatives on Senegalese smallholders in order to support the growing of cotton and peanuts for export markets (Johnson & Shaw, 2014; CNCR, 2014). The first leaders of independent Senegal, Prime Minister Dia and President Senghor, believed that the cooperative movement would transform Senegalese politics into a self-managing socialism (Fall, 2008). However, this vision was not realized, with

cooperatives instead becoming state-led and externally imposed (Sylla, 2006). In the period following independence (1960-1984), the government controlled, supervised, and distributed agricultural inputs and managed the marketing, storage and sale of farmer's production, leaving smallholders primarily responsible for cultivation (CNCR, 2014). In 1984, a radical change occurred in Senegal's cooperative system through the imposition of structural adjustment policies by the World Bank (Fall, 2008). The subsequent New Agricultural Policy (*Nouvelle Politique Agricole*) in 1984 brought economic liberalisation and the introduction of an Economic Interest Group (GIE), effectively eliminating the state's role in agriculture and ostracizing many smallholders and their livelihoods (Cissokho, 2008). Despite the state's withdrawal, a number of historical legacies have led to what Gellar (2005, p. 98) described as "…unsuitable organizational modes, governance rules, and regulations" placed on rural associations, which have generally impeded smallholders' innovation capacity.

More recently, the cooperative movement in Senegal has experienced a revival in both national and regional policy frameworks. At the national level, the introduction of the Agro-Sylvo Pastoral Law in 2009 provided both legal and financial support for agricultural professionals to organize, strengthening agricultural cooperatives. Furthermore, the recent amendment and adoption of the Policy for Cooperatives in 2010 (*Politique de développement coopérative)* has provided an important update to the previous 1984 Cooperative Law. Regionally, the Senegalese government has also supported negotiations with the Uniform Act related to the Rights of Cooperative Societies of 2010 *(Acte Uniforme Relatif au Droit des Sociétés Coopératives)* held by the Organization for the Harmonization of Business Law in Africa, in order to help bolster cooperatives in the West African region.

2.3 Methods

Working within an exploratory case study research design (Yin 2003; Creswell, 2013), we drew on both qualitative and quantitative methods to assess the role of social networks in agricultural cooperatives, and more specifically, their impact upon innovation and cooperative performance. Adopting a mixed-methods approach to data collection and analysis allowed us to increase the reliability of our findings through data triangulation and methodological overlap (Harwell, 2011).

2.3.1 Study site

On the western coast of Senegal lies a vital agro-ecological and economic region known as the Niayes. The region is home to approximately 52 percent of the Senegalese population and produces up to 80 percent of Dakar's fresh agricultural produce (Dasylva, 2012; Touré & Seck, 2005). The predominant economic activity is horticulture production, with approximately 98 percent of this controlled by smallholder farmers (CNCR, 2014). As with other parts of Senegal, smallholders in the Niayes region face a wide range of social, economic, and environmental constraints to production, including difficulties locating markets, a lack of agricultural credit institutions and high quality inputs, proper storage facilities, and contaminated water from chemical inputs. Cooperatives have subsequently emerged as the primary strategy for smallholders in the Niayes to organize and collectively confront these ongoing constraints.

Our research activities were focused on two producer cooperatives in the region, one identified as 'well-functioning' and the other 'poorly-functioning'. These cooperatives were identified through a joint-ranking activity using key informants drawn from the government, development, and civil society sectors working with smallholders in the Niayes. Using a list of approximately 20 agricultural cooperatives, the key informants collaboratively ranked each cooperative on a scale from 'successful' to 'needs improvement' (following the process described by Mulhall & Taylor, 1998), subsequently resulting in the selection of a 'well-functioning' (CO-OP A) and 'poorly-functioning' (CO-OP B) cooperative.

2.3.2 Data collection and analysis

Primary data were collected using both quantitative and qualitative approaches, including a household survey and semi-structured interviews with key informants involved in cooperatives, development organizations, and government in Senegal.

The household-level survey was designed based on the work of Grosh and Glewwe (2000) and Angelson et al. (2011). The survey was conducted between February and April 2015, with 202 producers in total (136 members in CO-OP A and 66 members in CO-OP B) located in approximately 17 villages spread between three different communes: Diender, Thies, and Mboro.

The survey instrument sought information on: i) basic demographic characteristics; ii) agricultural activities including participation in donor-funded projects, leading agricultural constraints, and reason for cooperative adherence; iii) social capital, including questions measuring levels of trust in village members, leaders, and government officials, propensity to collaborate, information and communication flows, and groups and social ties. An initial version of the questionnaire was pre-tested with cooperative members and back translated in collaboration with enumerators to improve clarity and reduce potential survey biases.

A sampling frame was constructed for both CO-OP A and CO-OP B using a combination of a stratified random and snowball sampling techniques. The primary reason for this approach was that the cooperatives did not possess a comprehensive list of their members, which prevented random sampling. In order to maximize the representativeness of our sample, we selected households from different cooperative sub-villages proportional to the cooperative population and households representing both leadership and general member roles in the cooperative. Before proceeding with the surveys, the research team contacted and met with each cooperative's President in order to introduce the team, the research objectives, and build legitimacy with the chosen communities.

Stratified random sampling involved identifying potential sub-groups (villages in CO-OP A and *groupements* in CO-OP B) and then randomly sampling a representative number of sub-groups (11 villages in CO-OP A and 6 *groupements* in CO-OP B) using a random-number generator. Once the sub-groups were chosen, the study team contacted the local representative of each village (by telephone) to organize a meeting and subsequent sampling list. The contacted representative then provided us with the details of between 10 and 14 cooperative members. Following a secondary check to ensure that the selected participants fulfilled our key criteria, each member was surveyed in the local language (Wolof) by one of two enumerators.

In addition to the survey, thirty-five key informant interviews were conducted using semi-structured questionnaires (Johnson, 2001). Respondents included a wide range of stakeholders including policy-makers, leaders of producer cooperatives, producers, civil-society leaders, and development practitioners. They were selected following a purposive sampling strategy

(Creswell, 2005) that combined snowball sampling and convenience sampling techniques. Interviews ranged from 20 minutes to 1.5 hours depending on the participant's preference and their level of interest. Each participant understood the purpose of the research and consented to be audio recorded (DiCicco-Bloom & Crabtree, 2006). Interviews were then translated and transcribed in full to enable content analysis (Hsieh & Shannon, 2005).

2.3.3 Social Network Analysis (SNA)

Spielman et al. (2011) argued that social network analysis provides tools for the study of innovation that are unique and often absent in other cost-based tools, providing more "holistic insight into the structure of a system and the interdependence between entities" (403). Some researchers (see Douthwaite et al., 2006) have even applied participatory network analysis to help smallholders better understand the stakeholders involved in their own social networks. SNA draws on graph theory and mathematical modeling to investigate the social structures between identified stakeholders (Kadushin, 2012). It has been applied across a wide variety of disciplines, including sociology, political science, and more recently, natural resource management and community-based management (see, for example, Garcia-Amado et al. 2012). Sabatini (2009) noted that the most appropriate network measures of social capital depend greatly on the context and nature of the ties that make up the network. Table 2.1 summarizes the measures we included in our study, including a description of each measure and the potential social capital advantage based on the literature. We sought to address the social networks operating within producer cooperatives by focusing on the component of flows (innovation sharing and provision, Table 2.2). As our network analysis was conducted within a formal structure, we defined the network boundary in three ways: spatially (within the cooperative's intervention zone), temporally (at the time of study), and organizationally (a member of the cooperative). For analysis, we only included survey participants (i.e. cooperative members) in our network generation to enable further attribute analysis (such as sub-group and leadership).

2.3.4 Assumptions and limitations

Five critical assumptions were made in order to assess innovation networks using the SNA approach: 1) positive and negative social capital is embedded in a cooperative member's social relationships; 2) relationships that affect cooperative performance can be studied and local actors

are willing to participate in a safe and non-threatening research environment; 3) relational ties between actors adequately capture the channels that innovation (whether material or information) is transferred through; 4) that cooperative members are likely to know one another thereby allowing the use of a snowball sampling strategy; and 5) network structures provide opportunities for, or constrain, individual action, and adequately capture the patterns of relationships. Furthermore, we recognize the potential selection bias resulting from using local leaders to help us identify members and key informants; however, their addition provided important local legitimacy with the potential participants (Scott, 2012). We therefore included a secondary check, ensuring that the selected participants fulfilled certain key criteria such as membership in our selected cooperatives and deriving their primary livelihood from agricultural production (Johnson, 2001). Non-response bias was minimized in two ways: 1) prior notice to survey participation; and 2) revisiting the participants at a suitable time (as recommended by Dillman, 1991). Less than 10 percent of invited survey participants did not complete the survey.

2.4 Results and discussion

2.4.1 Respondent profile

Survey respondent profiles are presented in Table 2.3. Overall, respondents from both cooperatives reported similar levels of time living in the community (over 85% spent 10 years or more), land size (65% possessed under three hectares of land), cultivating experience (over 88% had 10 years or more of experience), and low levels of education (less than 20% had undertaken secondary school education). According to Dahkil and Clercq (2004), low levels of education can constrain the ability of smallholders to adopt technological innovation and access specialized training – both of which could affect innovation dissemination (Klerkx, Van Mierlo, & Leeuwis, 2012; Lowitt et al., 2015).

2.4.2 Innovation networks

Social networks pertaining to innovation provision (Q5) and innovation sharing (Q6) in each cooperative are presented in Figures 2.2a and 2.2b. Our results show that the 'poorly-functioning' CO-OP B's innovation provision and sharing networks (Figure 2.2a) were dispersed, highly centralized, and comprised of several cohesive sub-groups. Outside of three important focal nodes that play bridging roles between the sub-groups, there is an apparent lack

of connection, indicating a low amount of group cohesion and a high level of modularity. This type of social network structure speaks to what Granovetter (1973) denoted as weak ties, where sub-groups that possess high bonding social capital (i.e. groups with a homogeneity of belief, location, and knowledge), might hinder effective information flow across the co-operative group (Burt 2004; 2009; Warriner & Moul, 1992). The apparent lack of connection between sub-groups in CO-OP B potentially inhibited the cooperative's group structure from playing essential innovation system roles such as innovation intermediation, bridging members to technical and financial resources, and sharing knowledge. This is exhibited in the observation of one interview respondent: *"The information doesn't reach between villages because of the problems posed by poor communication channels when there is no access to electricity or internet to help spread information."* As a result, he continues, *"... This forces the cooperative leaders to share information the old fashioned way, face-to-face, which is not always financially viable for them."*

In contrast, the 'well-functioning' CO-OP A's innovation provision and sharing networks (Figure 2.2b) exhibited a core/periphery network, outlined by Bodin and Crona (2009) as containing a set of densely connected nodes (the core) that are equally well connected to their periphery group (members) as their other core nodes. The implication of this structure is that peripheral nodes often have strong connections to their core and adjacent nodes, but rarely possess a link to other periphery groups, which can lead to the potential for 'structural holes' (Burt, 2000). Structural holes occur when two actors or groups (peripheral nodes) have no direct connection between them, yet there is a third actor or group (core) that possesses ties to both of them, creating a potential advantage for that third-party who can broker the flow of knowledge and control the interaction between subgroups, thereby influencing the spread of innovation. Despite the possible negative implications arising from the presence of structural holes (for an in-depth discussion of this see Burt, 2009), a core-periphery model is not out of place in a cooperative's hierarchical structure, contributing to its ability to encourage innovation. An increase in horizontal linkages between periphery members would likely encourage farmer-to-farmer connections, potentially facilitating social learning and reciprocal knowledge sharing (Pretty & Smith, 2004).

Building on these initial findings, we now consider how innovation spreads in each network and what factors influence this spread drawing on our survey and key informant interview data in order to paint a richer and deeper understanding of both *outsider* and *insider* views of the networks (Edwards, 2010).

2.4.2.1 How does innovation spread?

Our results indicate that for both cooperative A and B, innovation spread in a predominantly vertical manner, where highly connected actors, generally in leadership positions, act as intermediaries between cooperative members and external agents (i.e. government officials, development workers, etc.). This finding is supported by the work of Krishna (2002) who found that appropriate agents are needed to activate communities' endowments of social capital to produce a flow of benefits.

The vertical nature of CO-OP A's core-periphery structure was evident as villages elected representatives to the cooperative, who then designated certain individuals at the cooperative level to act as intermediaries for the entire cooperative. We can see this in the core-periphery model where core agents (leaders) hold key roles in the exchange of information between other members. As a result, CO-OP A offered considerably more opportunity for information and knowledge exchange than the more dispersed, heavily divided social network structure of CO-OP B. In CO-OP B, important bridging and linking actors that could potentially connect sub-groups were not present, limiting their ability to transmit innovations and generate solidarity between members. This reinforces the importance of designing cooperative structures that can build bridging connections between geographically separate sub-groups as well as the importance of developing linking connections to facilitate innovation between cooperative members and external agents (Hussein, 2001)

In both of our cases, a few key individuals can be seen as brokering information transmission and thus innovation dissemination within the cooperatives. Drawing from organizational research literature, this level of centralization can have a potentially negative impact on innovation outcomes, as it tends to concentrate decision-making power in one location (Damanpour, 1991). Often, more dispersed power is necessary to promote system-wide

innovation (Thompson, 1965). Furthermore, the governance structure of cooperatives as democratic and member-driven generally requires that ownership rights (or the rights that assign benefits) not be assigned to one person; rather they should lie in the hands of the members (Bijman & Hendrikse, 2003). This means that more horizontal ties between the peripheries could potentially increase collective action in support of innovation. Bourgeois and Friedkin (2001) determined that collective action between members is substantially more likely between actors that are in contact compared to those that are not in contact. Similarly, Pretty and Smith (2004) argued that agricultural innovation flows and opportunities for social learning could be improved by developing stronger farmer-to-farmer connections in different communities. This suggests an opportunity for cooperatives-related policies and communication initiatives to better connect peripheral members to ensure that knowledge and innovation dissemination flows both horizontally and vertically through careful design and the strategic use of participatory approaches.

2.4.2.2 What influences innovation spread?

Our sample of smallholders reported being highly dependent on a relatively small number of key actors (primarily cooperative leaders) for their agricultural inputs, possible innovations, general information, and market information. This finding further attests to the important role that individuals, and specifically leaders and well-connected individuals, play in the transmission and spread of innovation in agricultural cooperatives (Klerkx & Leeuwis, 2009; Klerkx et al., 2011). One potential strategy could be to develop linkages between cooperatives and 'innovation platforms' – defined as a "multi-actor configuration deliberately set up to facilitate and undertake various activities around identified agricultural innovation challenges and opportunities" (Kilelu, Klerkx, & Leeuwis, 2013, p. 66).

Qualitative data highlighted the central importance of social relations (i.e. whether or not they were included in the immediate friendship circle of members in leadership roles) in accessing innovations, including new agricultural technologies and participating in externally funded development projects. While our survey data indicated high levels of support and trust for village and cooperative leaders (approximately 95% of respondents trusted them), the interview data

painted a different picture, with some members citing these leaders as being the root cause of problems in the cooperative's function.

If we examine the network structure for both CO-OP A and B in terms of components, we can see that the majority of smallholders were linked only to one another through key actors, illustrating the existence of structural holes in the network (see Figure 2.2a and 2.2b). This suggests that information and resources from peripheral actors (e.g. average cooperative members) often need to pass through key actors to reach other smallholders and external actors. Management's role in the operation of cooperatives is known to be an important factor affecting the success of cooperatives (Eilers & Hanf, 1999) and this is an area that would benefit from further social network-related research to better identify their roles and reach in smallholder agricultural innovation systems, particularly in developing area contexts.

In our case studies, those who occupied leadership positions often possessed higher levels of education (e.g. were able to speak French), and had deep roots in their community, and possessed more ties that enabled the linkage of otherwise unconnected actors to each other, as well as the bridging of sub-groups. Through the application of an attribute analysis (i.e. looking at network structure with circles representing leaders), we subsequently found that members with leadership roles were centrally located and possessed high betweenness and density scores in each cooperative. Our qualitative interview data from both cooperatives generally supported this finding:

"The dirigeants (managers) take what pleases them and don't share with the little producers" – COOP A member

"…the dirigeants (managers) have all of the information and they choose what to share and with who…" –COOP B member.

While the centrality of leaders is not surprising, careful attention should be paid to their potential role in fostering innovation within cooperatives (Degenne & Forsé, 1999; Sandstrom & Carlsson, 2008). Importantly, not all leaders will recognize their central role in the innovation system

without appropriate institutional support structures. For example, Szreter and Woolcock (2004) differentiate between forms of responsive and unresponsive linking capital, where the latter tends to reinforce nepotism and power asymmetries. In such cases, Bourgeon and Chambers (1999) suggest that the organizational and governance structures of cooperatives must actively address inequality, ensuring that all members possess similar bargaining power.

Despite our sample of cooperative members reporting participation in annual general assemblies and occasional collective seed buying activities, they did not generally feel that they played an important role in the cooperatives' decision-making processes. This finding is supported by Iliopoulos (2003), who noted that cooperative members often have little or no sense of ownership even though they are, by definition, the owners of the cooperative. Our interview data suggested that cooperative leaders could take advantage of this unequal power to a certain extent by filtering information for personal benefits as captured by this quote:

"There are certain unions where the leader manages everything. Everyone and everything has to pass by him. If [the union] received support in the form of equipment or finances, in place of sharing this information or that money or that equipment with everyone, he personally gives it out." – Development official

Recent research by Rahman et al. (2014) and Rastogi et al. (2014) suggests that fostering broad-based participation and more democratic governance structures have the potential to ensure greater accountability of local leaders. Our results support this view, indicating a role for regular members to better hold their cooperative leaders accountable. Further research as to how best to institutionally support this process in agricultural cooperatives is required.

2.4.3 Challenges facing smallholder farmers' innovation in a cooperative

Organizing smallholders into collective action groups (e.g. cooperatives) is generally understood to improve market access (Devaux et al, 2009), reduce the transaction costs of accessing inputs and outputs (Markelova, Meinzen-Dick, Hellin, & Dohrn, 2009), and increase access to knowledge networks (Herbel et al., 2015; Ganpat et al., 2014). While this is often the case, our results indicate that this is not necessarily the outcome, supporting the view that the success of

collective action in support of innovation depends greatly on factors such as group organization, farmer and product characteristics, as well as the institutional arrangements surrounding their creation (Markelova & Mwangi, 2009). Drawing on both our semi-structured interview and survey data, we identified three factors including a lack of information, lack of financial capital, and a lack of access to markets that constrain agricultural innovation in both of the agricultural cooperatives we studied.

2.4.3.1 Lack of information

Despite the formal structure of a cooperative, our survey data indicated that smallholder innovation networks were divided significantly along village and union sub-group lines. The majority of our respondents identified access to information and technical assistance as key impediments to their adoption of new technologies, crops, or agricultural practices. For example, in response to a question asking whether they had adopted a new technology or innovation during the last five years (Q49), 30% of responding farmers answered that they had not. Among those who responded yes, friends and family (55%) and the cooperative (18%) were reported as being the most important sources of assistance. Since smallholders are likely to draw on their immediate social network to access knowledge (Lyon, 2000) and transfer agricultural innovation (Conley & Udry, 2001), many can become trapped in a cycle of low innovation adoption without external intervention. This speaks to the importance of developing communication strategies at the cooperative level that put more peripheral members (smallholders) in contact with other members and outside technical resources – potentially creating more decentralized knowledge networks (Olaitan, 2006).

It also supports the notion that cooperatives can play important roles in information exchanges if the appropriate horizontal and vertical communication structures are in place. One potential strategy suggested by a key-informant working in a development organization was greater use of community radio as a decentralized strategy to diffuse knowledge, foster innovation and disseminate market information: *"With community radio, we can distribute a lot of information, even information not in French but in national languages in order to ensure everyone has access to the maximum amount of information."* This is an area that requires further research in the

context of upscaling and outscaling in agricultural innovation systems (See Hermans et al., 2013).

2.4.3.2 Lack of financial capital

A lack of access to financial support, whether in the form of credit or philanthropic donations, was one of the primary constraints to innovation adoption reported by our sample of producer cooperative members. For example, approximately 75% of all survey respondents raised the issue of financing as being a barrier to technological adoption in the form of improved water infrastructure, the use of organic seeds and agricultural inputs, and in terms of transporting their produce to markets. Some interview data revealed that collective initiatives arranged through the cooperative enabled certain groups of producers to better access finance for agricultural tools and equipment. However, the producer's ability to access this credit and external support (i.e. from the local development bank, Programme d'Aménagement et de Développement Economique des Niayes) appeared to depend heavily on the social connections they held. Findings from interviews and informal interactions identified a growing amount of inequality between cooperative leaders, their friends (core actors) and other members of the cooperative. CO-OP B illustrated this inequality particularly clearly as members in leadership positions complained that only eight percent of members actively participated in the cooperative and its services, including receiving its benefits. Part of the reason for this was a lack of information (as explained above); however, a more confronting reason could be the perceived disconnect between members (as participating actors in the cooperative) and the leaders/central management of the cooperative. One key-informant outlined the importance of members actively participating in the functioning of the cooperative, and made reference to the potential ramifications of non-participation:

"The members need to personally participate in the functioning of their organisation to ensure that it survives. Unfortunately, in most instances this is not the case as the members have the tendency to think that it's the organisation (management) that will deal with all the problems. For me, the [problem is] members who participate in an organisation without understanding their role, nor the operation of their organisation."

Disparities in the level of involvement of members were generally associated with disparities in their ability to access key financial resources according to our key informants. This suggests a potential role for micro-finance institutions that can enable smallholders' access to financial capital in a more equitable manner (Ellis, 2000; Lowitt et al., 2015).

2.4.3.3 Markets

The inability to access both local and export markets also emerged as constraints to agricultural innovation within both of our case study cooperatives. This highlights the importance of institutional structures that can both support innovation systems while also better linking farmers to markets for their produce. For example, one respondent stressed the need for an awareness-raising campaign advocating the benefits associated with eating locally-produced organic foods in order to help build a market for his organic produce - an innovation common to both of the cooperatives we studied. Several farmers described their challenge to compete with imported products from Europe, particularly onions and potatoes. As onions occupy an essential place in many traditional Senegalese dishes, smallholder's calls for the government to change importation laws have been extensive. In one of our interviews, a government official noted *"... it is difficult for agricultural producers in the region to earn their living if the market is saturated with foreign imports."* The government has begun to answer these calls with increasingly strict regulations to control onion and potato imports in certain seasons, speaking to the important role that formal institutions can play in the development of fragile local production and innovation systems amongst rural smallholders (Hounkonnou et al., 2012; Shiferaw, Okelle, & Reddy, 2009).

2.5 Conclusion

Despite increasing support for agricultural cooperatives as a mechanism for fostering the innovation potential of smallholder communities (Clark, 2002; Gouet & Van Paaseen, 2012), our results suggest that connections at the individual level will likely have a greater impact on innovation dissemination than network-level characteristics. Similar to the findings of Levien (2015), our analysis highlights the benefit of using individual-level analysis within formal collective structures to determine what and/or who is influencing innovation dissemination and its adoption. We identified three factors - including a lack of information, lack of financial

capital, and a lack of markets - that constrain agricultural innovation in both case study agricultural cooperatives, all of which can be seen as a major motivation for joining cooperatives. This is an area that requires further comparative research in order to better understand the relative impact of cooperatives on the social networks of members versus non-members in different contexts.

Nonetheless, our comparative case study illustrates that cooperatives are not necessarily positive vehicles for innovation adoption and knowledge dissemination; rather, their functioning and value for these ends depends heavily on the existing social capital found within the cooperative's framework. Following this theme, one participant likened the cooperative model to an instrument such as a car, saying that it is not the instrument in itself that is good or bad, but rather the utilization and exploitation by people that influences its success or not. This observation warrants further reflection in cooperative-related research in order to better understand how or why cooperatives succeed, fail, or disappear.

Based on our findings, producers participating in cooperatives will need both structured and unstructured opportunities to connect with distinct membership groups, such as different communities, in order to build the bridging social capital necessary to better access wider networks of information (Sabatini, 2009). This speaks to the importance of regulating cooperative identity and ensuring that all members feel empowered, which Alvesson and Willmott (1992) argued is a "significant, neglected and increasingly important modality of organizational control" (p. 5). Encouraging cohesiveness through group activities of training, informal networking events and education that increase the number of potential information and knowledge sharing opportunities (Scott, 2012) and opportunities for farmer-to-farmer connections in different communities (Pretty & Smith, 2004), may facilitate the development of a more discernable 'collective' identity. This may help generate the necessary social cohesion required to improve cooperative activities, such as joint marketing, financing, and political lobbying (Woolcock & Narayan, 2000). Further, the development and integration of innovation platforms may complement identity regulating activities, as well as existing social networks within communities to enable different forms of social capital, including trust and collaboration to be built between multiple stakeholders (Foran et al., 2014).

Our study provides a number of insights into the diverse social relationships operating within a well-functioning and poorly-functioning agricultural cooperative, highlighting the potential for social network analysis to help inform the design and evaluation of cooperatives as vehicles for facilitating collective action and innovation. By shifting the analysis of innovation onto individual actors within a formal structure, we believe that new opportunities can be identified, allowing cooperative-related research and development to re-center on their most important component: people.

Acknowledgements: This work was carried out with the financial support of the Social Sciences and Humanities Research Council (SSHRC) of Canada, the William Dawson Scholar Award of McGill University, and the Canadian Association for the Study of Co-operation. The authors would like to sincerely thank the research assistants, Absa Kadet and Fama Gueye, for their contribution to survey data collection and translation.

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Table 2.1: Individual level network measures of social capital

	Measure	Description	Social capital advantage
Tie Strength	Tie strength (Festinger, et al., 1963)	The intensity of relationship between two actors	Tie strength is associated with bonding social capital, generating trust, facilitating information, and providing social and emotional support (Prell et al., 2009; Bodin et al., 2006).
Centrality	Degree centrality (Freeman, 1979)	The number of immediate contacts an actor has in a network, measuring *local* centrality.	Highly central actors possess various options for receiving and sharing information and resources. It is also associated with influence and the ability of an actors to hold power over the transmission of information (Freeman 1979; Borgatti et al., 1998)
	Eigenvector centrality (Bonacich, 2007)	The local network of actors immediately adjacent to your focal actor.	Captures how well connected the actors are and how well connected are the actors they have ties to are, illustrating their reach and influence (Borgatti et al., 1998). Key for information access (Banerjee and Duflo, 2011).
Brokerage	Betweenness centrality (Freeman, 1979)	Measure how often an actor falls on the shortest path length between two other actors.	Actors with high betweenness centrality are able to not only access diverse resources and information, but control their flow between actors (Borgatti et al. 1998; Prell, 2012).
	Bridging ties (Borgatti et al., 1998)	Ties that bridge different social groups at similar scales (ie. Ties between villages).	Allow actors to access diverse information and resources, increasing their opportunities for action (Burt 2012), innovative capacity, and resilience (Bodin & Crona 2009; Prell et al., 2009).

Table 2.2: Overview of name-generating questions used in the household-level surveys.

Relation	Questions:
Flow (Innovation dissemination)	Who are the persons (relatives, friends or neighbours) who typically share these "new" ideas with you? Who are the persons with who you usually share these "new" ideas, new ways of doing things, new crops (specifically related to your farm or farming) that you have adopted?

Table 2.3: Survey respondent attributes (n= 202)

	COOP A	COOP B
n	136	66
Age		
18 – 24	0 (0 %)	9 (14.5%)
25 – 34	14 (10.3%)	13 (21.0%)
35 – 44	18 (13.2%)	11 (17.7%)
45- 54	26 (19.1%)	15 (24.2%)
Over 54	78 (57.3%)	14 (22.6%)
Education		
No official education	28 (20.9%)	8 (12.9%)
Primary School	13 (9.7%)	17 (27.4%)
Secondary School	12 (8.9%)	7 (11.3%)
Religious	59 (44%)	20 (32.2%)
Superior Education	6 (4.5%)	4 (6.4%)
Other (includes basic literacy/ primary school plus religious schooling)	16 (11.9%)	6 (9.7%)
Experience		
Less than 1 year	0 (0%)	1 (1.6%)
1 – 2.5 years	2 (1.5%)	1 (1.6%)
3 – 6 years	2 (1.5%)	5 (8.1%)
7 – 10 years	2 (1.5%)	0 (0%)
Over 10 years	129 (95.5%)	55 (88.8%)
Years living in the community		
Less than 1 year	0 (0%)	1 (1.6%)
1 – 2.5 years	4 (2.9%)	3 (4.9%)
3 – 6 years	3 (2.2%)	4 (6.5%)
7 – 10 years	2 (1.5%)	1 (1.6%)
Over 10 years	126 (93.3%)	52 (85.2%)
Land size		
Less than 1 ha	45 (35.6%)	2 (3.4%)
1 – 3 ha	62 (46.3%)	35 (60.3%)
4 – 6 ha	20 (14.9%)	16 (27.6%)
7 – 10 ha	3 (2.2%)	3 (5.2%)
Over 10 ha	4 (3.0%)	2 (3.4%)

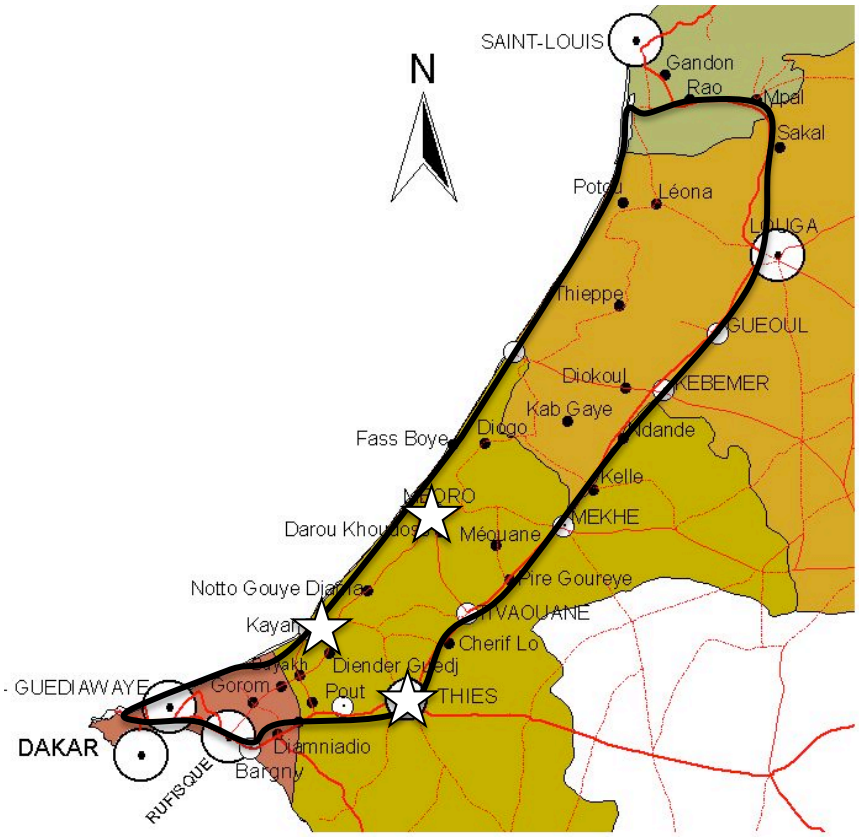

Figure 2.1: Regional Map of the Niayes (outlined in black). Stars indicate where data collection occurred and circles represent cities with more than 50 000 inhabitants. Reprinted and modified from: Scott et al., 2004

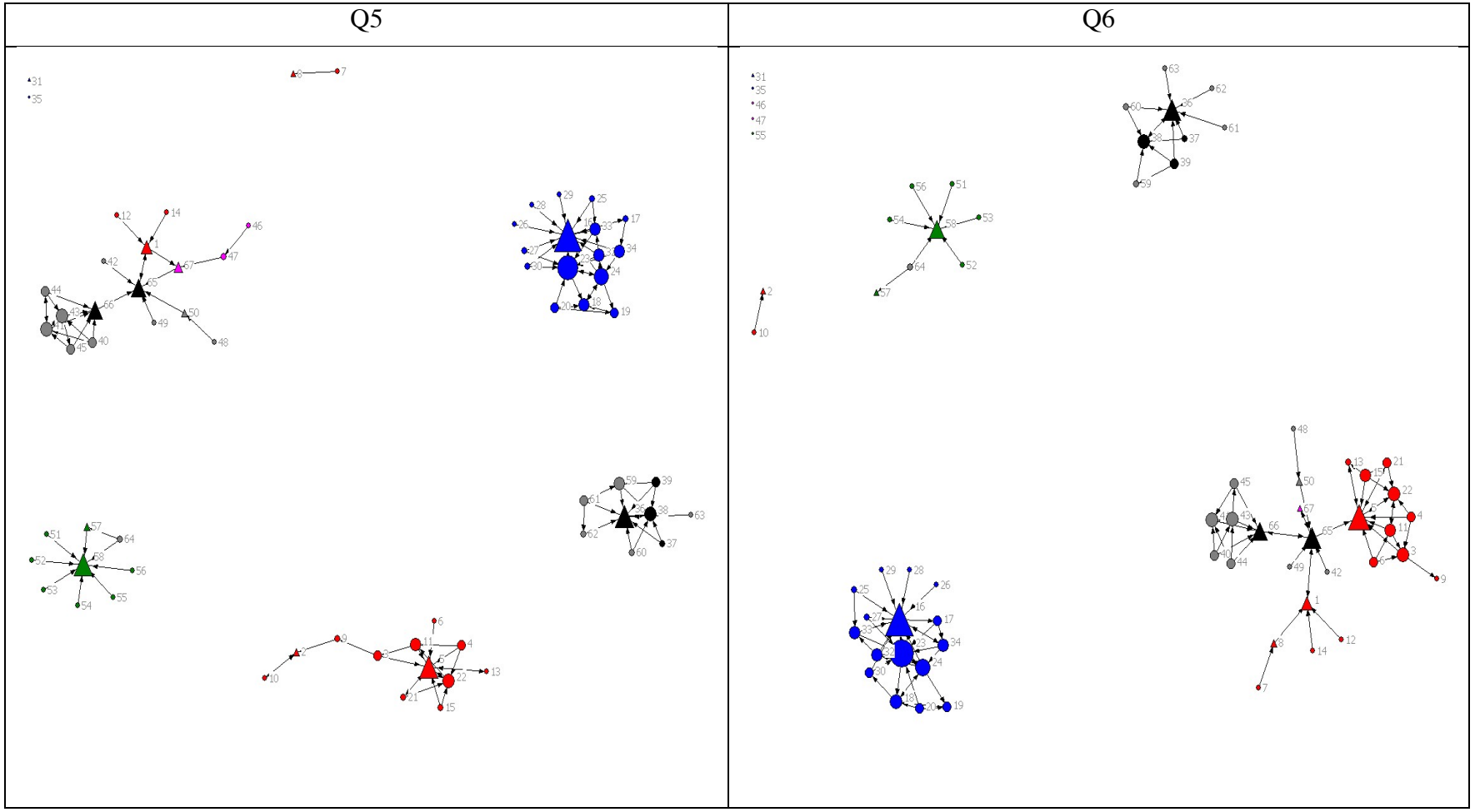

Figure 2.2a: Innovation sharing and provision networks, concerning whom you receive knowledge/ innovation from (Q5) and who you share this information with (Q6), for COOP B (n=66) Colours represent sub-group attribution (village-level). Triangles equal actors in positions of power and Circles are general members

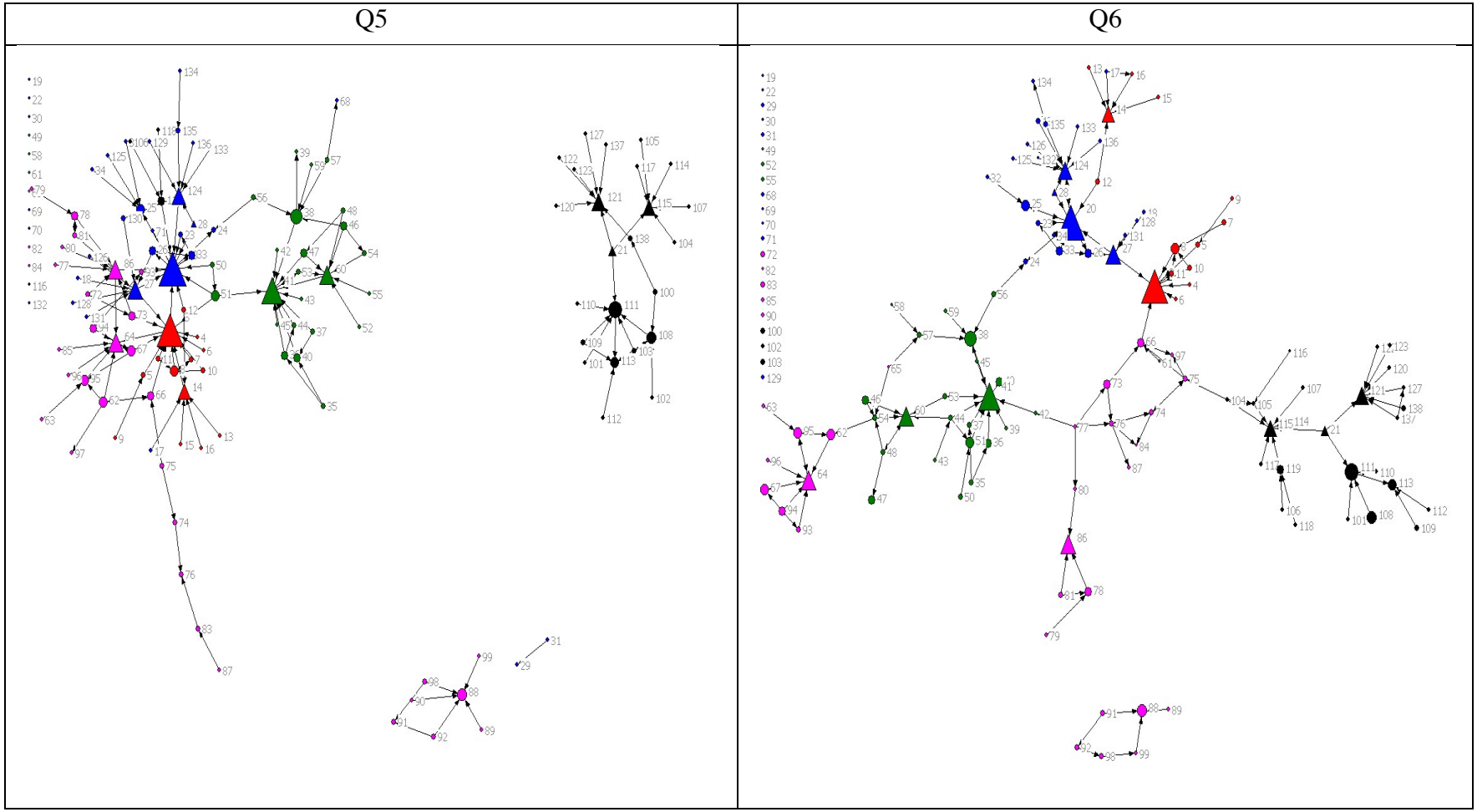

Figure 2.2b: Innovation sharing and provision networks, concerning whom you receive knowledge/ innovation from (Q5) and who you share this information with (Q6), for COOP A (n=136). Colours represent sub-group attribution (Union-level). Triangles represent actors in positions of power and Circles are general members

Preface to Chapter 3:

While a number of studies have reported the positive impacts of cooperative membership using economic indicators, including farm income, farm profits, technological adoption, and market participation, less have focused on the social dimension of cooperatives, including the distribution of benefits, social networks, and power hierarchies. Chapter 2 sought to inform this knowledge gap by examining the role that social networks could play on a cooperative's ability to disseminate knowledge, with results suggesting that it is spread predominantly through vertical linkages but strongly influenced by cooperative leaders. Chapter 3 builds on these findings by asking to what extent cooperatives might be able to contribute to the sustainable development of their member's rural livelihoods in terms of facilitating access to social, human, physical, financial, and natural capital assets.

CHAPTER 3: (RE)CONCEPTUALIZING THE ROLE OF AGRICULTURAL COOPERATIVES IN SUSTAINABLE RURAL LIVELIHOOD STRATEGIES: A CASE STUDY FROM THE NIAYES REGION OF SENEGAL

Abstract:

Agricultural cooperatives have been identified as potentially powerful mechanisms for supporting sustainable rural and agricultural development while also contributing to poverty-reduction. However, their ability to sustainably and equitably address chronic poverty in often remote rural landscapes remains contested, with successes and failures evident in the literature. To date, few studies have focused explicitly on the social dimension of agricultural cooperatives, with even fewer exploring their potential to meaningfully contribute to the sustainable livelihoods of smallholder farmers in Sub-Saharan Africa. This paper seeks to help address this knowledge gap, by exploring how a successfully functioning agricultural cooperative in Senegal contributed to the development of its member's diverse livelihood assets, including human, social, physical, financial, and natural capitals. Our findings indicate that cooperatives can indeed play an important role in assisting members to build bridging and linking social capitals, gain access to training and education activities, access financial credit and agricultural machinery, and help protect their natural resources from degradation. We identified two potential factors, access to agricultural credit and agricultural extension services that had a positive impact on the cooperative's ability to equitably support the development of its members. Importantly, our results also suggest that a member's level of social capital (i.e., their social networks) will likely act as a limiting factor on their ability to access other forms of capital.

Key words: Sustainable rural livelihoods, Poverty reduction, Smallholders; Collective action; Agricultural policy; International development

3.1 Introduction

"Development co-operation without co-operatives is like Hamlet without the prince."

-Iain MacDonald (2005)

Internationally, agricultural cooperatives have been receiving increased interest and attention as potentially powerful mechanisms for supporting rural and agricultural development (Chirwa et al., 2005), and implementing the externally-funded poverty reduction programmes delivered by donor-countries and development agencies (Johnson and Shaw, 2014). This potential role in poverty reduction has been well documented by researchers (Hannan, 2014, Munkner, 2012, Burchi & Vicari, 2014) and international institutions (UN, 2009; DFID, 2010). For instance, Bibby and Shaw (2005) have gone so far as to say, "strengthening the capacity of local co-operatives can have an immediate and direct impact on rural poverty" (p. 23), a sentiment that is being increasingly reflected in donor spending, non-government organization (NGO) programming, and national and international policy responses (World Bank, 2008). However, the extent to which cooperatives can have a decisive impact in chronic poverty remains heavily debated (Verhagen, 1980), with numerous examples of success (see Bernard & Taffesse, 2012; Bernard, Taffesse, & Gabre-Madhin, 2008; Borda-Rodigiquez & Vicari, 2014) and failure (see Salifu, Francesoni, & Kolevalli, 2010; Hill, Bernard, & Dewina, 2008).

In the context of agrarian rural development, cooperatives have often been conceptualized as tools for poverty reduction among rural (and urban) smallholders by, for example, contributing to the innovation potential of smallholder farmers (Reed & Hickey, submitted; Kolade & Harpham, 2014), facilitating social learning and collective action (Pretty & Smith, 2004; Markelova & Mwangi, 2009), creating and supporting new knowledge (Hall & Clark, 2010), and improving collaboration between members (Fischer & Qaim, 2012a). Another important focus has been the cooperative's ability to improve smallholders' economic indicators including their farm income, profits, and market participation (see Francesconi, Heerink & D'Haese, 2010; Shiferaw, Okello, Reddy, 2009). Special emphasis has been placed on their ability to improve commercialization (Key, Saoulet, & de Janvry, 2000; Fischer & Qaim, 2012b) by reducing transaction costs and strengthening the market presence of members (Collion & Rondot, 1998; Shiferaw et al., 2009). In turn, this often allows cooperative members to aggregate their surplus

output, as well as their tangible and intangible resources (Markelova & Mwangi, 2009), to help generate economies of scale and scope in product marketing (Blokland & Gouet, 2007).

The strong focus on smallholder economic development (and the role that cooperatives can play in this development) held by many international agencies (World Bank, 2008; IAASTD, 2008) and some scholars (Barrett, 2008; Collier & Dercon, 2014) has been identified as leading to a *"homogeny of thinking among the organizations and agencies worldwide that attends to the question of agricultural growth"* (Feldman & Biggs, 2012; p. 146). Increasingly, scholars (see Poole, Chitundu, & Msoni, 2013; Akram-Lodhi & Kay, 2009; Akram-Lodhi & Kay, 2010) have been challenging traditional economic approaches by arguing that they do not adequately take into account the diversity of national contexts and the inherent heterogeneity of rural livelihoods (for a more in-depth discussion, please refer to Akram-Lodhi & Kay, 2009; Feldman & Biggs, 2012). In order to more comprehensively address the complexity and multifunctionality of agrarian rural development, there is a need to better conceptualize and assess the role of agricultural cooperatives in developing sustainable rural livelihoods for members. Here, the Sustainable Rural Livelihoods Framework introduced by Chambers & Conway (1992) and Scoones (1998) has emerged as the leading way to incorporate a more holistic assessment into development research and programming, strongly reflected in the majority of development thinking circles (Scoones, 2009). Considering the role of cooperatives in developing sustainable livelihoods has the potential to enable researchers and policy-makers to better observe the breadth of benefits that cooperatives might contribute to their members, rather than solely focusing on their economic outcomes (see Fischer & Qaim, 2012a, 2012b; Francesconi et al., 2010; Shiferaw et al., 2009).

While livelihood approaches have been well incorporated in the rural development discourse regarding smallholders (see Lyon, 2003; Bacon, 2005; Haque, Deb, & Medeiros, 2009), few have explicitly focused on the links between livelihoods and cooperatives (see Bacon et al., 2008), and even fewer have analyzed the role of cooperatives in developing sustainable rural livelihoods. The exceptions to this are: 1) Wanyama, Develtere and Pollet (2008), who considered the livelihood framework as an important means for understanding the contributions of cooperatives to mediation activities (something they explained as the mediation of

smallholders' needs by an organization, rather than by policy implantation tools); and 2) King, Alder, and Grieves (2013), who examined the experience of two different Mexican communities and their formation of cooperatives to create sustainable livelihoods. In both of these cases, and others (Scoones, 1990), the livelihoods approach has been promoted as a "people-centered" approach that helps shifts the emphasis back to understanding the realities of the poor themselves (ibid, 1990). In this paper, we use the Sustainable Rural Livelihoods Framework to assess the ways in which a 'well-functioning' agricultural cooperative in the Niayes Region of Senegal has been able to help develop the livelihoods of its members with a view to informing strategies for both cooperatives and policy-makers seeking to improve their development impacts and interactions with smallholders.

In what follows we present our methods, including a brief description of the cooperative movement in Senegal and our agricultural cooperative case study. This is followed by detailed results and a discussion of their significance for development policy and practice.

3.1.1 Cooperatives in Senegal: A reorientation of "the business of rural development"

Senegal's cooperative system experienced a radical change in 1984 when the World Bank imposed their Structural Adjustment Policies (Fall, 2008). This resulted in the passing of the New Agricultural Policy (*Nouvelle Politique Agricole*) that promoted economic liberalization and privatization of public services, eliminating the state's role in cooperatives (For an in-depth history, refer to Fall, 2008; Reed & Hickey, submitted). In the spirit of economic liberalization, the state attempted to revive cooperation between smallholder farmers through the introduction of an Economic Interest Group (*Group d'Intérêt Economique - GIE)*, providing the legislative foundation for two or more interested parties (i.e. smallholder farmers) to organize in order to access agricultural inputs and credit, as well as sell their produce at local and regional markets. Producers, especially in the Niayes Region, were quick to adopt this system of cooperation, unaware that they were replacing a theoretically multi-purposed organization (cooperatives) with one that strictly emphasized the economic dimension of commercialization (Personal communication, Interview**).**

This reflected the growing international discourse on smallholder 'economic' development, which postulated that economic growth would inherently bring smallholders out of poverty. Unfortunately, it ignored the complexity of the rural landscape, which is adaptive, diverse, and multifunctional (Van der Ploeg et al., 2000). Diverse groups of actors, economic activities, social norms, behaviours, and motivations, combine and interact in thousands of configurations and actions (Knickel & Renting, 2000). One key informant captured the importance of social organization on Senegalese rural life: *"…[i]n an environment where the social statues count enormously, the roles are determined by this social status. The group organizes on the basis of this social organization"*.

In recent years, the Senegalese government has been integrating this complexity and the reality of rural development into their policy environment. During this reflection, they have begun to take into consideration the role that cooperatives, as dual-identity enterprises, can potentially play in the resurgence of agricultural development. (McKillop, 2005; Valentinov, 2007). Such an organizational form has been proven to be more resilient than conventional businesses to shocks (Spear, 2000; Borda- Rodriguez, Johnson, Shaw, & Vicari, 2015), enabling members to respond better to their particular challenges and circumstances. As a result, the Senegalese government has taken a number of steps to support the development of cooperatives, including the adoption of the Agro-Sylvo-Pastoral Law (2009) and the Policy for Cooperatives (2010), which have provided the legislative grounding to strengthen agricultural cooperatives and their members. In addition, the signing of the Uniform Act relating to the rights of cooperative societies (2010) has helped harmonize business laws concerning cooperatives across West Africa, contributing to their reinforcement across the region. Despite these efforts at creating an 'enabling institutional environment' for cooperatives to flourish (Munkner, 2012), community-level factors continue to impact Senegalese cooperatives and limit their potential to bring about positive change.

3.2 Methods

In order to better understand the role that agricultural cooperatives can play in developing sustainable rural livelihoods, we drew on qualitative and quantitative data collected within a mixed-methods case-study research design (Creswell, 2013). This approach allowed us to

maximize the reliability of our findings through methodological overlap and data triangulation (Harwell, 2011).

3.2.1 Sustainable Rural Livelihoods Framework

Scoones (2009) described a "sustainable livelihood" in relation to five key indicators which, depending on the context and scale of the situation, could be achieved through a person's access to livelihood capital assets. These capital assets are comprised of natural (e.g. land size and access, soil fertility, water, etc.), financial (e.g. access to credit and insurance), social (e.g, social networks, relations, associations), human (individual capabilities in terms of education and training), and physical capital (e.g. agricultural machines, infrastructure, etc.). The access to these assets is generally enabled or hindered by the policies, institutions, and processes, including social relations, institutional environment, and markets, that surround cooperatives and their members (Scoones, 1998). The resources and proxies we used in this study are presented in Table 3.1. These various livelihood resources are then combined in the pursuit of livelihood strategies, linking a smallholder's survival capability to their accumulation of household assets (Rakodi, 1999; Turner et al., 2003), yet recognizing the impact of endogenous properties such as access to resources and institutional structures (Ostrom, 2011; Folke et al., 2005). One important component is the addition of the vulnerability context, speaking to the trend, cycles (in terms of seasonality), and shocks that are outside of the household's control (Allison & Horemans, 2006). This framework has been applied to a wide variety of contexts and disciplines, including rural sociology, natural resource management, agricultural sciences, and political science.

3.2.2 Case study research

The case-study method offered the most appropriate research design to answer our spatially- and temporally-specific research question, concerning the ways in which a 'well-functioning' agricultural cooperative contributed to its members' sustainable rural livelihoods (Gerring, 2004). This follows the reasoning of Yin (2003), where case study research represents a comprehensive research strategy that covers the research design, data collection techniques, and specific approaches to data analysis an interpretation. Regarding the important issue of generalizability in case study research, Flvbjerg (2006) argued that: "one can often generalize on the basis of a single case, and the case study may be central to scientific development via

generalization as supplement or alternative to other methods" (p. 228). Central to this point is the understanding that case study research is not designed to generalize to populations, but rather to inform future theory and policy insights, ultimately supplementing future research (Darke, Sharke, & Broadbent, 1998). We adopted an exploratory research design due to the dearth of literature on our phenomena of interest, recognizing the importance of generating broad insights and understandings (Stebbins, 2001).

Our research activities focused on one 'well-functioning' agricultural cooperative in the region that was identified using a joint ranking activity with three key informants working in different sectors of the Niayes Region (for more information, refer to Reed & Hickey, submitted). Gerring (2004) described this as the "intensive study of a single unit for the purpose of understanding a large class of units" (p. 342). Further by using a participatory selection process in which key-informants ranked cooperatives in terms of "successful" and "needs improvement", we added an important dimension of local credibility to the study (Gould & White, 2012). The ranking outcomes were supported by a third-party diagnostic report ranking cooperatives on their governance, organizational management, staff, and external resources (see Poly Conseils, 2014).

3.2.2.1 Case study: Horticulture Cooperative of the Niayes (HCN)[2]

Created in 1994, the HCN brings together approximately 3,000 members[3] to promote sustainable agriculture and to contribute to Senegal's food security. The members are principally engaged in the production of organic fruits and vegetables. The members operate broadly in the commune of Djender, spread between the rural collectivities of Sangalkam, Notto, and Djender. This results in a hierarchical management system involving village representatives, area representatives, and federation representatives. One cooperative leader explained their structure:

> *"The HCN is organized on three levels: the Village General Assembly, the Zone General Assembly, and the Cooperative General Assembly. Each zone is represented by 3-5 villages, and all five zones make up the Cooperative. There are five village representatives who go to the Zone General Assembly. After the*

[2] A pseudonym designed to protect the identity of the cooperative and its members.
[3] Similar to other agricultural cooperatives in the area, the majority of members do not actively participate in the operational and implementation activities of the cooperatives.

Zone General Assembly, they name five representatives to go the Cooperative General Assembly. The five representatives of each zone make up the twenty-five representatives of the Cooperative General Assembly, who then go on to form the Administration Council and Executive Board."

A visual representation of this organization s presented in Figure 3.1. HCN's mission includes: i) informing and building awareness about the dangers of using agrochemicals, ii) promoting the use of agro-ecological production techniques, iii) defending smallholders' rights, iv) protecting natural resources from desertification and salinization, and v) improving the rights of women and the living conditions of the community.

The HCN is located in the Niayes Region of Senegal, one of the most important economic and agricultural regions in the country, particularly in terms of horticulture production (Dasylva, 2012; Touré & Seck, 2005). Smallholders here tend to less than two hectares of land (CNCR, 2014) and face a number of challenges including low and variable productivity, shrinking agricultural lands, limited access to agricultural inputs, and growing environmental pressures from climate change and rainfall variability (Collier & Dearcon, 2014; Jayne, Mather, & Mghenyi, 2010).

3.2.2.2 Data collection and analysis

All field data were collected between February and April 2015, including household-level surveys and in-depth semi-structured interviews. We conducted 136 household-level surveys with producers located across 11 villages. A combination of stratified random and snowball sampling techniques were used, where first, we randomly selected a representative number of villages (11 in this case) using a random number generator; and second, the local representatives provided us with 10-14 names of members. Following this, we conducted a secondary check to ensure that the participants fulfilled our predetermined criteria (being a member of a cooperative who earned their primary income from agriculture). The survey-instrument drew lessons from the work of Grosh and Gleewe (2000) and Angelsen et al. (2011) to seek data on:

- *Demographic characteristics*: information on the age, sex, education of participants, as well as the number of people living in the home, cooperative membership and reasons for adherence.
- *Agricultural activities and constraints*: farm size, ownership, and main vegetable production, percentage of plot cultivation, leading constraints for their production, and percentage of household income from farming and non-farming.
- *Social capital*: groups and collaboration, networks, trust, collective action and cooperation, information and communication, capital assets as well as social cohesion and inclusion.

As specific measures of capital assets can be context specific, we followed the advice of Krishna and Shrader (2006) to include local details to tailor the survey questions. The survey instrument was pre-tested and back translated using local research assistants to reduce survey bias and improve clarity. More detailed information concerning our methods and sampling strategy can be found in Reed and Hickey (submitted). The survey was supplemented with thirty-five semi-structured interviews with key informants involved in agricultural cooperative policy development and implementation, including local leaders, producers, development workers, government officials, and civil-society leaders. These interviews, combined with informal interactions, were intended to better capture the "hearts and minds" of smallholders and cooperative leaders, responding to one of the foremost critiques of the livelihoods approach (Poole et al., 2013). Qualitative data were collected around the common themes of smallholder farmers, cooperatives policy, as well as informal and formal institutions. Interviews were then translated and transcribed in full to enable content analysis (Hsieh & Shannon, 2005; Creswell & Clark, 2011).

3.3 Assumptions and limitations

There were a number of assumptions and limitations associated with our research. A number of measures were incorporated in our study, including length of engagement in the field, consideration of all groups and member checking following an interview, in order to increase the validity of our findings (Whittemore, Chase, & Mandle, 2001). Biases in key informant interviews are often classified as respondent or interviewer bias. Respondent bias is best

minimized by carefully selecting respondents using criteria based on the research question (Johnson, 2001). Interviewer bias was minimized, following the advice of DiCicco-Bloom and Crabtree (2006), by building rapport with the respondent, emphasizing the objective and scope of the research in jargon-free clear language, avoiding leading questions, and signaling a desire to achieve common objectives. We addressed non-response bias in two ways: prior notice to survey participation, and revisiting the participants at a suitable time.

Although the SLF has provided useful conceptual and operational guidance to our study, a number of ongoing limitations have influenced the way in which it can be interpreted and therefore operationalized. First, the framework is insufficient for analyzing and addressing questions of power, class, and agency (Scoones, 2009). Second, it has limited utility in understanding how local institutional practices and relationships shape a person's livelihoods (Dorward et al., 2005; Allison & Horemans, 2006). Third, the predominantly technocratic development focus is at odds with the principles and values that underpin community development work (Brocklesby & Fisher, 2003). For a full discussion of the critiques, refer to King et al. (2013).

3.4 Results and Discussion

Our survey respondents possessed similar demographic characteristics, including their years living in the community (over 85% spent 10 years or more), number of members in the household (over 90% had more than 10 members), and their age (77% of members were over 45). In general, these respondents predominantly cited two reasons for being part of the cooperative: i) increased access to agricultural credit; and ii) increased access to improved cultivation tools (e.g. seeds, water-irrigation pumps, and chemical inputs). However, others joined for more socially motivated reasons, aligning with some of the principles of the cooperative model, citing reasons such as: *"... to develop our locality and our activities", "...to work together to develop a vision for organic agriculture",* and *"...to develop [strong] agricultural personnel"*. Another respondent noted the importance of working together: *"to join forces with other producers will increase our strength and power"*.

Recognizing the people-based nature of cooperatives, our analysis centered on how members of the cooperative accessed human, social, physical, financial, and natural capital resources, based on the assumption that a cooperative's contribution to developing its member's sustainable livelihoods is predicated on its member's ability to access various capitals. In what follows we discuss each capital asset in turn, highlighting examples and potential implications. Some of the strategies that cooperatives can use to better assist members' access capital assets are then discussed.

3.4.1 Human capital

Scoones (1998) defines human capital as the skills, knowledge, and physical capability necessary for the successful pursuit of different livelihood strategies. In our survey and interviews, we used self-reported educational levels and cultivation experience, as well as experience in training programs as proxies to assess the level of human capital amongst our sample.

Education levels and years of cultivation are outlined Table 3.2. In general, our respondents had a low level of formal education, with the majority (more than 80%) possessing less than secondary school-level education. While some have argued that low educational levels can constrain access to specialized training and engagement with cooperative economics, Chambers (1994) and others argue that their in-depth cultivation experience, when adequately harnessed, can provide direct and indirect benefits to the cooperative and its members. Our respondents possessed a high level of cultivation experience, over 95% have more than ten years, with members interested in both gaining and sharing skills and expertise, as captured by the following quote: *"I joined to benefit from the services of the cooperative, but more importantly share the knowledge and experiences I gained from traveling and the military with other cooperative members."*

Access to educational opportunities and training sessions are widely regarded as two of the most important human capital investments an organization can make in an individual (Becker, 1993). However, this is grounded on the belief that all individuals (members) actively engage and participate in the opportunities offered. Drawing on our survey and interview results, we can identify some illustrative examples to help understand how members accessed these

opportunities. The first relates to how members could access important knowledge and innovation and the related benefits: *"We benefited from technical information, such as production techniques concerning the quality of chemical inputs, information on commercialization. We benefitted from training that permits us to produce better"*. The second related to the reciprocal nature of peer-to-peer learning where members both receive and share knowledge with others: *"I manage a group of women who want to practice organic agriculture. So if they need some information concerning practices, I either respond to their questions or direct them to the people necessary"*. This speaks to the belief that one producer held when he noted that in the right forum, *"horticulture producers can share their problems and try to collectively find the solutions"*. Further, it aligns well with the growing literature arguing that peer-to-peer learning and sharing are vital to strengthening the positions of smallholders and optimizing their engagement in farmer organizations, such as cooperatives (Blokland & Gouet, 2007; Devaux et al., 2009; Klerkx & Leeuwis, 2009).

From a cooperative leadership perspective, one leader in particular noted that the training and support of its members was the cooperatives' top priority, especially for *"…different cultivation techniques including organic agriculture, soil preparation and conservation, and erosion control."* He continued that *"…when a member doesn't have the necessary education to fully understand the environmental and agricultural challenges… it is our responsibility to search for the information, train the representatives, and present it in a way that is effective and accessible for all."* Another respondent suggested the potential to *"…try to create training centers (farmer training schools) to use other members to train smallholders in French and introductory business."* Both of these statements align well with Hartley's (2014) conceptualization of cooperatives as 'learning spaces', in which members learn from social process of interaction and engagement with other members. In addition, it speaks to the importance of the cooperative's role in brokering relationships between members and external actors.

Overall, the development of human capital through cooperative membership was a recurring theme in our data, with one respondent observing: *"We change the world with our knowledge"*.

3.4.2 Social capital

Previous research has indicated that social capital can: facilitate access to resources and valuable services (Coleman, 1998; Woolcock & Narayan, 2000); lower transaction costs to enable cooperation and collaboration (Pretty, 2003; Ahn & Ostrom, 2008); and increase access to agricultural information and innovations (Van Rijn, Bulte, and Adekunle, 2012; Reed & Hickey, submitted). Within our dataset, we used responses related to friendship, moral support networks, and social services as proxies of social capital and organization in the co-operative.

The moral support network and friendship network of the survey respondents are outlined in Figure 3.2. Both networks paint very different pictures, notably the moral support network illustrated a core-periphery model, which means that our sample of members reported relying on a small number of key actors (identified as members in leadership positions) to access other capital assets, including financial and physical capital. Drawing on the work of Fuller and Unwin (2004) on horizontal learning, we can see that the majority of members had more than one tie of support (whether agricultural, personal, financial). Qualitative evidence from surveys and interviews confirmed the importance of social relations (i.e. whether or not you are included in the immediate friendship circle of members in leadership roles) to one's access to information, donor projects, and social services. For example: one member described a situation where *"...in forming an environmental commission, we expected to have members from each zone. However, when it came time, it seemed that the group did not include all of the producers and only certain members were included"*.

In reference to the importance of the cooperative in helping its members access social services, one respondent noted: *"[The cooperative] has solidarity funds (for things like health) at the village and cooperative level. So if a member is sick and they need help, they can ask the village representative to ask the federation for the financial resources to help in their care."* This type of initiative highlights how a member's access to social capital through an agricultural cooperative can influence their ability to access support networks.

In general, our respondents reported receiving and sharing information from village and cooperative neighbours, (i.e. their immediate social network), rather than the cooperative leadership. One member described her strategy behind sharing information with others: "*because*

we are all in the same village and the houses are close, if I have some information to share either I enter in each house and tell the information directly or send the children." As part of the cooperative's mandate, members often participate in training sessions concerning the environmental and social impacts of chemical pesticides. One member explained his experience in sharing information with others in this context: *"Every time that I go to a training workshop, whether on the dangers of chemical pesticides or on the cultivation of organic agriculture, I return to the village, call a meeting, and share the new information with them."* Both examples highlight the importance of information and its transmission, enabling smallholders to access new ways of organizing (Clark, 2002), technologies (Leeuwis & Ban, 2004), and facilitating collective learning (van Rijn et al., 2012). This aligns with the nature of cooperatives as people-based organizations that depend on the interactions between their members (Puusa, Mönkkönen, & Varis, 2013).

3.4.3 Financial capital

Our sample identified a general lack of access to financial support, whether in the form of credit or microfinance, as one of the primary constraints to their agricultural productivity. This is exemplified in the small, dispersed financial support network presented in Figure 3.3. Here, we can see that members did not have structured access to financial support, except for those who were connected to leaders. One cooperative leader echoed this observation when he claimed *"…lines of credit are difficult for smallholders to access for the simple reason that they do not have enough collateral (guarantee) so they turn to micro-finance institutions for aid…"*

It is well recognized that the linkages between farm and non-farm sectors are essential for increasing growth and rural development (Davis et al., 2002; Maertens, 2009). In our case study, 62 percent of member respondents derived more than 90 percent of their income from on-farm sources, whereas only 11 percent of members derive more than 60 percent of their income from off-farm sources. Understandably, respondents described a lack of funds (or in the literature liquidity) as a barrier from investing in agricultural inputs (Maertens, 2009). One key informant explained how the Senegalese system is under transformation: *"Previously, agriculture was a dominant source of income for rural inhabitants, however we are increasingly seeing that non-agricultural activities are beginning to dominant the rural landscape, changing the village*

mentality". Cooperative members were beginning to reflect this transformation, as in one case, members reported coming together to create a small (non-agriculture) business, creating their *"own income-generating projects in the region".*

Our results indicate that member producers with more diverse sources of income (derived from non-farming activities) had higher levels of education than average members and often occupied leadership positions within the cooperative. This can be observed in the financial support network presented in Figure 3.3, where the majority of ties that are present (despite their scarcity) are between a cooperative member and a cooperative leader. This suggests the importance of cooperative leaders to a member's financial support network (social capital). Interviews revealed that members had arranged different initiatives through the cooperative to better access finance for purchasing agricultural tools and equipment; however, such initiatives were heavily dependent on external support provided through development projects. For example, some members reported gaining access to organic seeds and credit, agricultural equipment, and agricultural extension through their participation in a European Union-funded cabbage project through the cooperative. However, due to the generally small size of such development initiatives, the majority of members did not report participating (76 % of our respondents) and reported not directly benefitting from the project.

The promotion of cooperatives as tools for economic development can downplay their role in community-building and deepen a belief amongst cooperative members (especially in our case study) that members need external development actors to fund their initiatives. According to Birchall (2003), one of the goals of a cooperative should be to create a self-propelling movement that enables members to improve without needing external resources. One respondent reflected this belief, saying *"We always fight, always fight for autonomy, we want a certain level of financial autonomy that allows us to support our producers without the help of partnering organizations."* This points to the potential of cooperatives to facilitate economic freedom (Sen, 2000) and develop the capacities of members to create their own income-generating opportunities (Birchall, 2004).

3.4.4 Physical capital

High-quality seeds are recognized as essential to the successful development of agriculture, as *"…the seed sets the ultimate limit on the levels of crop productivity"* (Zerbe, 2001: 657). In our case study, while some respondents lamented their lack of access to high quality seeds, others spoke about their ability to access seeds through the cooperative. Here, we define access as "the *ability* for people to benefit from things (emphasis added)" (Ribot and Peluso, 2003: p. 153). One woman described her experience: *"there has been a big change because the female members of the cooperatives have received organic seeds, and manure, which has resulted in a huge increase in agricultural productivity."* She continued: *"Through training programmes on organic agriculture, I have learned new agricultural practices to boost production."*

Facilitating access to physical capital can make an enormous difference to a member's agricultural productivity (Chinsinga, 2010). Heltberg and Tarp (2002) have identified that access to post-harvest transportation can have a significant impact on market participation for smallholders. This was reflected in our case study data, with one respondent identifying a major benefit of being a cooperative member as follows: *"They provide the trucks to collect produce in order to stock and sell our products, but they are not common in the region."* This raises a second important benefit identified by our respondents, accessing storage facilities, which is essential to reduce post-harvest losses and maintain the nutritional value of produce (see FAO, 2011b). Facilitating member access to these types of physical resources is an important development role for agricultural cooperatives in many settings.

When considering issues of access, certain social relationships have been identified as having the ability, and thus power, to affect the practices and ideas of others (Ribot & Peluso, 2003). Figure 3.3 shows how the physical support network of regular members is highly dependent on having a connection with a cooperative leader (social capital) who can then act as a broker of access to certain physical resources. In the spirit of cooperative development, this relationship of 'power over' between cooperative leaders and members needs to be transformed into what Rowland (1997) referred to as 'power within', in order to lessen power inequalities and maximize collective human capital (Rahman et al., 2014). Thompson (1965) suggested that a dispersed source of power is necessary to facilitate system-wide innovation, aligning with the more recent Agricultural Innovation Systems (AIS) thinking paradigm (Klerkx, Van Mierlo, & Leeuwis,

2012). Central to this thinking will be minimizing the reliance of members on leaders by offering more opportunities for broad-base participation between horizontal (producer-to-representative) and vertical (producer-to-producer) linkages, as well as more democratic governance structures (Rastogi et al., 2014; Rahman et al., 2012). This will enable the cooperative to shift the "bundle of power" into a position where smallholders can better access the required physical capital to increase agricultural cooperative (Ribot & Peluso, 2003).

3.4.5 Natural capital

According to Kristjanson et al. (2005), the more access that an individual has to higher quality natural capital the more they can access diverse livelihoods. Our respondents reported farm sizes ranging between one and three hectares, with varying proportions under active cultivation (the majority cultivated less than half, see Table 3.3. The main constraints to cultivation included lack of access to water, financial credit and markets. Interestingly, most of our respondents did not identify land access as a major constraint because the majority either owned (63%) or worked (18%) on a family plot.

Despite this, some respondents spoke about the challenges for women to access land and how this was changing in the community: *"In the past, there were women who couldn't access land but today they have benefited from training programs from NGOs to help them recognize their rights and the proper avenues to follow in order to have access to their land. It's because of this that if, for example, a lady loses her father, the woman knows what to do in order to ensure that she has her part of the land. She reasserts her right without problem."* In this situation, the cooperative played a direct role in increasing members', especially women members', knowledge concerning land access by facilitating training programmes between an external agent (NGO) and members. This service is in line with recent recommendations of the Food and Agriculture Organisation (2012) for cooperatives to "facilitate and increase rural women's access to, control over and management of productive resources and agricultural services." (p. 4).

This potential could also apply to the rural youth who are known to be struggling to access land and often face high levels of unemployment (White, 2012), identified by one of our respondents as follows: *"...youth as the most disadvantaged populations in agricultural development."*

International organizations (FAO, 2010) have already identified the potential future that agricultural cooperatives could play in facilitating youth's access to land and water resources (natural capital) through the creation of youth-sensitive policies or youth-sections in existing cooperatives, as well as mentoring, guidance, and advisory services to overcome the common challenges (FAO, 2012). This is an area that would benefit from further research in the context of Senegal.

3.4.6 Factors influencing how agricultural cooperatives could contribute to livelihoods

From the above analysis, we can see that our sample of members were able to access human, social, physical, financial, and natural assets through the cooperative in a variety of ways (see Figure 3.4). Members reported benefitting from technical-training, financial credit, improved transportation, and enhanced agricultural inputs – all of which can be viewed as essential elements for improving their agricultural productivity, as well as being important in shaping the social interactions and services that underpin the sustainability of their livelihoods.

Our survey respondents identified access to financial and physical capital as being the most important barriers to increasing their agricultural productivity, aligning with the findings of Swinnen and Gow (1999). Drawing on our findings, agricultural cooperatives have the potential to play a significant role in facilitating smallholder access to resources, particularly through micro-credit initiatives by, for example, acting as a guarantor, and thus enabling member access to the physical and natural capital they require to improve production. This potential role was supported by a local agricultural credit worker who observed: *"Our selection [of recipients] has become significantly stricter because of the problems of reimbursement. As a result, we now target groups of producers, whether in a cooperative or a GIE, to identify the smallholder's financial needs and bring them to us for funding"*. This quote also points to the importance of 'accountable representativeness' wherein the needs of cooperative members are appropriately brought to the table, discussed, and then addressed as a group (Ribot, 2002). One respondent described this process as follows: *"We hold meetings to discuss the most pressing challenges that members are confronted with and if enough members request the same services, the cooperative is obligated to respond or representatives could be ignored."*

Another informant spoke about the challenge of using agricultural technology without the requisite training and support: *"When you enter into the Niayes Region, there's a lot of debris from old machines, irrigation water pumps, and water towers because the producer's don't have the level of education or experience to manage and exploit the new technologies."* According to Wongtschowski et al. (2013), despite producer's being innovative and entrepreneurial, *"...they need advice from others; they need services"* (p. vii). This points to another important potential role for cooperatives, which could experiment with different peer-to-peer agricultural extension models in order to better support their member's knowledge needs, as well as their build their capacity to achieve financial autonomy (Birchall, 2003). At its very heart, agricultural extension was designed to "…mitigate the consequences of market failure, poor governance, and related socio-economic vulnerabilities, by increasing access to resources such as knowledge and inputs" (Davis, Babu, & Blum, 2014, p. 128). These objectives align closely with the reasoning behind the formation of many agricultural cooperatives, suggesting the potential for cooperatives to play a greater role in supporting their members through extension services designed to draw and build on their member's capital assets.

Our SNA results, and the above discussion, highlight that in the identified cooperative, knowledge and innovation was spread primarily through either the vertical hierarchy of the cooperative (Reed & Hickey, submitted) or through a member's immediate social networks, illustrating what Rogers (1962) refers to as the *diffusion of innovation* - an early paradigm in the agricultural extension literature. More recently, there has been an effort to transform this paradigm from a one-way flow of knowledge into a more reciprocal two-way relationship, whereby processes are designed to facilitate social learning and collaboration between producers and external agents, while simultaneously building capacity (Kilelu, Klerkx, Leeuwis, & Hall, 2011; Sulaiman & Davis, 2012). From this perspective, Yang et al. (2014) conceptualize cooperatives as important "innovation intermediaries", with the aim to improve their members position in the agricultural value chain and innovation system, while also facilitating collective marketing and credit supply (Poulton et al., 2010). Recognizing the diverse range of services that a well-functioning cooperative can and does offer to its members, we suggest their role might be more appropriately viewed as being a "livelihoods intermediary" for their members.

3.4.7 Implications for policy

It is widely acknowledged that cooperatives generally require some degree of government support in the form of policy regulation, small grants, and enabling policy frameworks (Borda-Rodgiquez & Vicari, 2014) to successfully and sustainability support their members, despite the ongoing struggle that this presents (Birchall, 2003; Birchall, 2004). In recent years, the Senegalese government has begun to provide national and regional support to the Senegalese cooperative movement. The most recent Cooperative Policy (2010) aligns well with the internationally recognized (UN, 2009) standard of cooperative policy. However, much is still to be done to ensure cooperatives are able to equitably and sustainably support the development objectives of members, donors and government agencies. Drawing on our key-informant interviews, a number of constraints were identified as limiting the case study cooperative from reaching its full potential.

First, contrary to Munkner's (2012) recommendation to invest in infrastructure that facilitates cooperative (and directly its members) activities, the Senegalese government has continued to give an increasing amount of support to the development, support, and attainment of private agri-businesses at the expense of many smallholders and their livelihoods. Many respondents spoke strongly against this ongoing support, and instead advocated for better consideration of smallholders, and their cooperatives, within national level governmental decision-making. In particular, one local leader argued: *"We must help the small producers become big producers, not agricultural workers for agribusiness."* Another representative spoke about the misalignment between Dakar-based policy-makers and the reality in the field: *"The state program and the practices on the field are out of sync. The actors are not kept in the loop of the opportunities that are offered to them."* As the cooperative movement continues to grow in Senegal, the capacity to engage in two-way communication and knowledge sharing will be essential to ensure meaningful policy learning and implementation.

Second, there continues to be a negative perception concerning cooperatives held by many of the smallholders we interviewed and surveyed, broadly triggered by the historically forced implementation of colonial, top-down cooperatives (see Getnet & Anullo, 2012). However, according to a respondent from a development agency in Senegal, when the options for farmers'

self-organization were presented to producers, they often chose the 'true' cooperative model (according to the ICA principles):

> *"When we compare [the forms of organization in the rural world], the advantages and disadvantages of the different structures, the producers themselves choose the cooperative model. To illustrate, we have done the same exercise in each one of our forty projects, and every time, the producers chose the cooperative model."*

This observation underlines the importance of ensuring accurate information access concerning cooperatives and their principles by all actors through more decentralized, participatory and collaborative methods of organization that are better able to ensure the inclusion of members in decision-making processes.

3.5 Conclusion

Understanding how agricultural co-operatives contribute to the sustainable development of their member's livelihoods is an essential component to ensuring their resilience and success in rural landscapes. Focusing on the case of a well-functioning cooperative in the Niayes Region of Senegal, we examined some of the livelihood assets being accessed by cooperative members, with an aim to informing potential strategies to help improve cooperative-related policy.

Our findings highlight that members have been able to access technical training and peer-to-peer knowledge sharing through the cooperative to improve their agricultural practices. In contrast, the majority of respondents spoke of the challenges associated with accessing financial support in the form of credit or micro-finance, and its subsequent impacts on accessing physical capital in terms of seeds, transport, and storage facilities. There have, however, been several instances of members accessing both physical and financial capital in the context of donor- or governmental-funded projects through the cooperative, which (while positive for short periods of time) does not appear to allow members to, as one key-informant put it, "*develop the necessary knowledge and skills associated with advanced cultivation*". Many members believe in autonomous development and strive to work towards a future where they are "economically free" (Sen, 2000). Recognizing the people-based nature of the cooperative, we found that a member's social

capital (particularly their immediate social relations) acted as a lubricant for the attainment of the other forms of capital, speaking to the interconnectivity of all the capital assets. Importantly, the role of social capital would likely vary between men and women, an important area for future research.

Our findings support the need for cooperatives to focus on building member-to-member extension and support models in order to help build upon the collective expertise of its membership and facilitate the building of social networks through which financial, human, natural and physical assets can be better accessed and more sustainably developed. In this light, we encourage future research and cooperative interventions to adopt a broad livelihood approach, recognizing the complexity of rural settings and the requirement to become "livelihood intermediaries" to improve the sustainable livelihoods of cooperative members. In the Senegalese context, we are already seeing greater policy emphasis on using the cooperative development to help develop smallholder livelihoods and create income-generating opportunities (Birchall, 2004). Future research would benefit from more explicitly focusing on the importance of social capital to building and supporting the sustainable development of cooperatives and their members livelihoods. There is also a linked need to further explore how the original cooperative values of "autonomy, voluntarism, and democracy" can be best fostered and ensured in different developing area contexts to inform more decentralized policy and practice.

Acknowledgements: This work was carried out with the financial support of the Social Sciences and Humanities Research Council (SSHRC) of Canada, the William Dawson Scholar Award of McGill University, and the Canadian Association for the Study of Co-operation. The authors would like to sincerely thank the research assistants, Absa Kadet and Fama Gueye, for their contribution to survey data collection and translation.

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Table 3.3: Overview of the capital assets used in this study

	Definition	What we measured?	How?
Social Capital	The norms and networks that enable people to act collectively (Woolcock & Narayan, 2000)	Moral support, cooperation, and friendship network	• How many *close* friends do you have these days? These are people that you feel at ease with, can talk to about private matters, or call on for help • In the past 12 months, how many community members with a personal problem (e.g personal, agricultural or financial) have turned to you for assistance? • To what extent do any differences in wealth, social status, etc… characterize your village/neighborhood?
Human Capital	The skills, knowledge, ability to labour and good health and physical capability important for the successful pursuit of different livelihood strategies (Scoones, 1998)	Education, access to training, cultivating experience;	• What is the highest level of schooling obtained in this household? • How long have you been cultivating for?
Financial Capital	The capital base of assets that is essential to the pursuit of any livelihood strategy (includes cash, production equipment and technologies)	Access to financial support; farm and non-farm income	• What percentage of your household income from farming and non-farming activities? • If you suddenly needed a small amount of money, how many people beyond your immediate household could you turn to who would be willing to provide this money?
Physical Capital	Refers to the physical artifacts that an individual possesses (equipment, storage facilities, etc…)	Access to agricultural equipment and infrastructure, seeds	• If you needed a piece of agricultural equipment or help harvesting your crops, how many people beyond your immediate household who would be willing to help you?
Natural Capital	The natural resource stocks and environmental services	Land ownership	• Farm size (in hectares) • Farm status

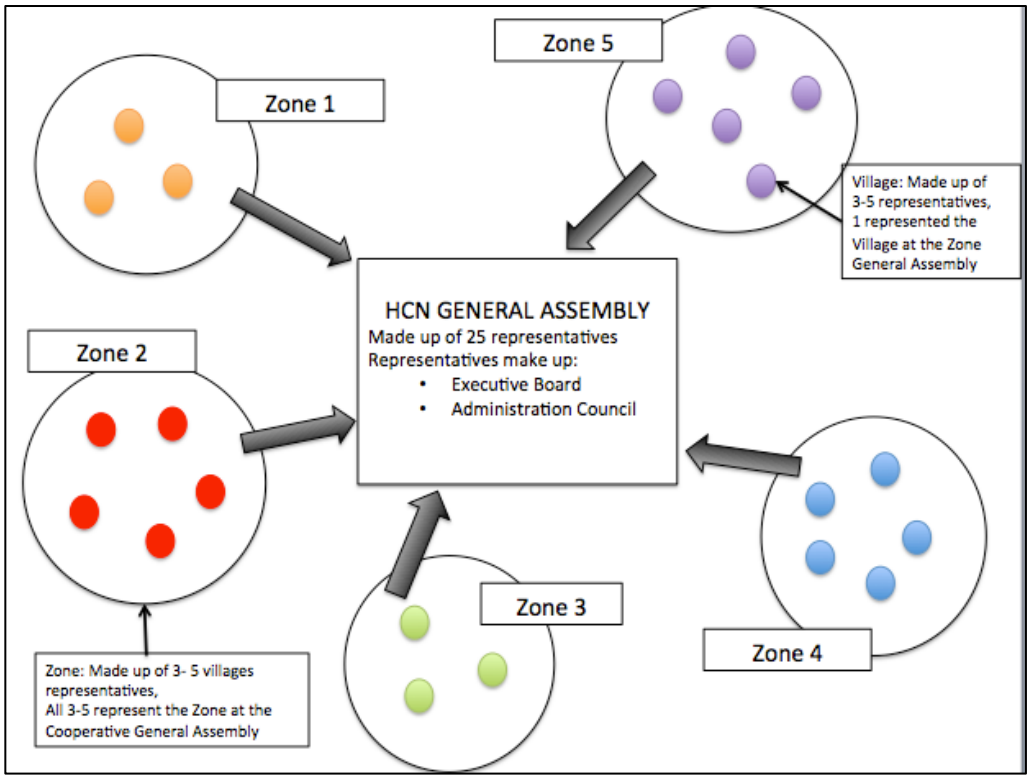

Figure 3.1: HCN's organizational structure: Separated into three administrative assemblies: i) the Village General Assembly, 3-5 representatives are named to the Zone General Assembly; ii) five representatives (out of the 25 present) of the Zone are elected to attend the Cooperative General Assemby, and iii) the members of the Cooperative General Assembly elect the Executive Board and Administration Council.

Table 3.2: Human capital attributes (n= 136)

Education	
No official education	28 (20.9%)
Primary School	13 (9.7%)
Secondary School	12 (8.9%)
Religious	59 (44%)
Superior Education	6 (4.5%)
Other (includes basic literacy/ primary school plus religious schooling)	16 (11.9%)
Experience	
Less than 1 year	0 (0%)
1 – 2.5 years	2 (1.5%)
3 – 6 years	2 (1.5%)
7 – 10 years	2 (1.5%)
Over 10 years	129 (95.5%)

Table 3.3: Natural capital attributes (n= 136)

Land size	
Less than 1 ha	45 (35.6%)
1 – 3 ha	62 (46.3%)
4 – 6 ha	20 (14.9%)
7 – 10 ha	3 (2.2%)
Over 10 ha	4 (3.0%)

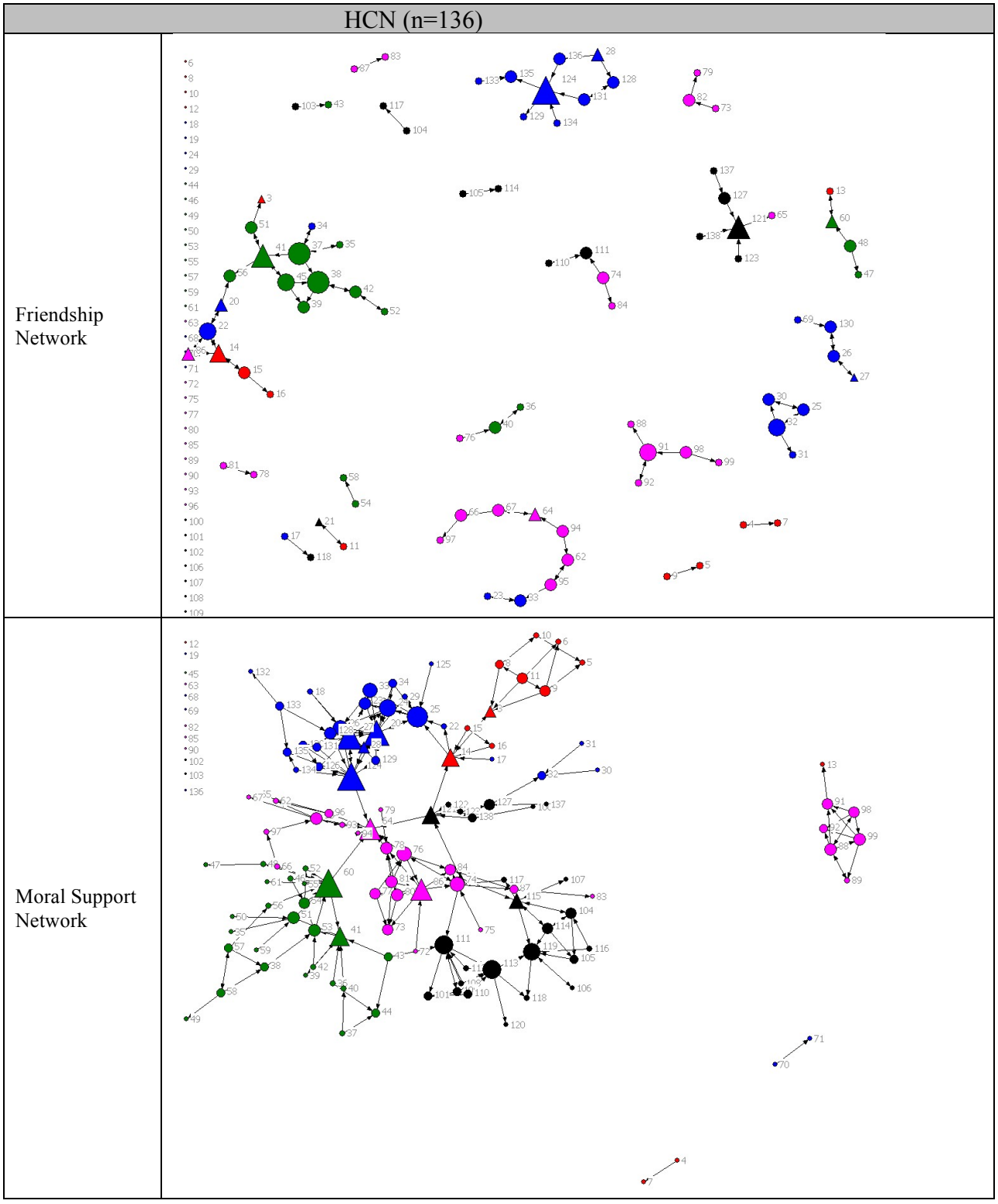

Figure 3.2: Moral Support and Financial Network of HCN (n=136). Colours represent sub-group attribution. Triangles equal actors in positions of power and Circles are general members.

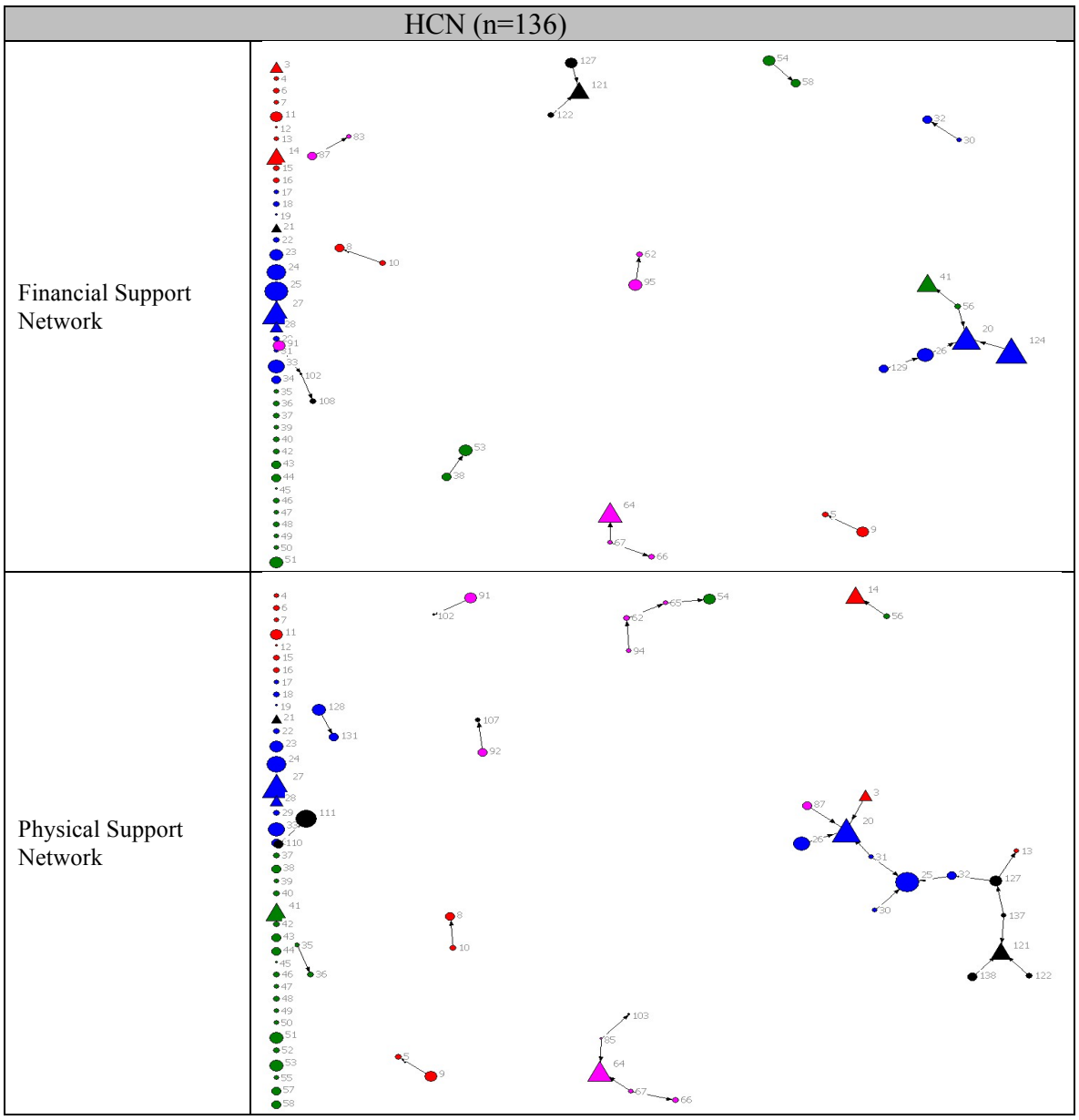

Figure 3.3: Networks of Financial Support (Q3), and Physical Support (Q4) in the HCN cooperative. Colours represent sub-group attribution (Union-level). Triangles equal actors in positions of power and Circles are general members.

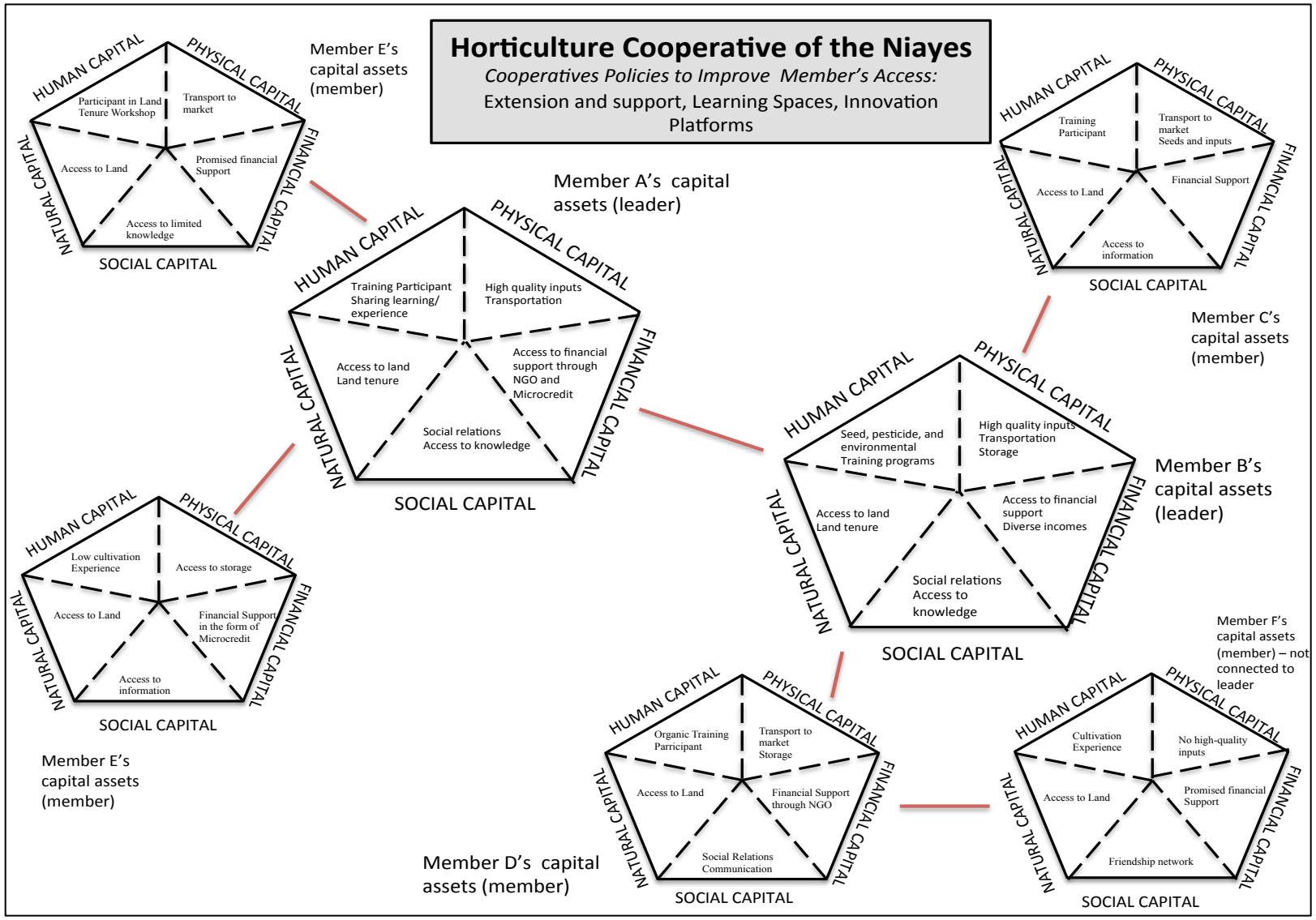

Figure 3.4: Understanding a smallholder's access to capital assets through cooperative membership. The box represents the wider framework in which members can access and get support from the cooperative. The red lines represent the ties that are (or aren't) present. In this example, we see that members C through F have varying levels of capital assets depending on their existing ties with each other or with cooperative leaders. At the top of the Figure, we see potential policies or roles that the cooperative could play in improving its member's access to the five capital assets. It is important to consider the interconnectivity of these assets, represented by the different slices of the pentagon.

CHAPTER 4: GENERAL CONCLUSION AND FUTURE DIRECTIONS

4.1 General conclusions

As the national and international renaissance of African cooperatives continues, understanding how or why cooperatives succeed, fail, or disappear is needed (Johnson & Shaw, 2014; Develtere, Wanyama, & Pollet, 2008). To date, the predominant narrative (Simmons & Birchall, 2008; Bernard & Spielman, 2009; Bernard, Taffesse, & Gabre-Madhin, 2008) in cooperative literature has tended to overlook or play down the social dimensions of cooperatives, despite them being dual-identity enterprises and people-based organizations (Puusa, Mönkkönen, & Varis, 2013). Through the adoption of network-based analyses, this thesis attempted to better *integrate* the social dimension in the assessment of agricultural cooperatives in order to contribute a better understanding of the factors impacting their operation and performance. The results inform future research, development and policy discussions on how to approach the design of more equitable and resilience-focused cooperatives in smallholder farming systems.

Drawing on mixed methods including household survey and semi-structured interviews, I examined how the internal social structure (in terms of networks) of an agricultural cooperative can affect their operation, using a case study analysis conducted in the Niayes region of Senegal (Fall, 2008). More specifically, this thesis considers two perspectives of social structure in cooperatives: how social networks influence a cooperative's ability to facilitate innovation and knowledge dissemination (Chapter 2); and how cooperatives can contribute to developing the sustainable livelihoods of its members in terms of human, physical, financial, social, and natural capital (Chapter 3). Taken together, the thesis findings suggest that existing social networks (and organization) in agricultural cooperatives are fundamental determinants of their operation and performance. In what follows I summarize the general findings concerning how the organization of agricultural cooperatives can affect innovation dissemination and sustainable livelihoods, and consider the primary contributions to knowledge. I then identify some potentially fruitful research directions for the agricultural cooperatives community.

4.1.1 Innovation dissemination

Our comparative case study indicated that knowledge and innovation was spread, in the formal structures, through predominantly vertical linkages where highly connected actors, generally leaders, acted as intermediaries between high-level partners (governments and markets) and the cooperative members. These key actors were reported as receiving significant power from their role, potentially resulting in a wide variation of knowledge and adoption of innovative practices across cooperative members, due to their ability to control the flow of knowledge. Our results suggested that individual-level social networks not only differed greatly between members, but also affected their potential to access and share knowledge concerning innovation. This finding challenges the notion that cooperatives are inherently positive vehicles for innovation dissemination (Yang, Klerkx, & Leeuwis, 2014), and instead suggests the need to better recognize that their function depends heavily on the existing social capital of cooperative members.

We identified three factors that were constraining agricultural innovation dissemination in both case study cooperatives - a lack of information, lack of financial capital, and a lack of market access. These findings support the need for members to have both structured and unstructured opportunities to connect with internal (other members) and external agents, building the social capital necessary to access wider networks of information (Sabatini, 2009). This type of thinking may provide an opportunity for cooperatives to intersect with agricultural innovation platforms seeking to facilitate forums for interactions that can build trust, collaboration, and networks between multiple stakeholders in the food system (Foran et al., 2014). Through these avenues, new opportunities may be identified to re-center cooperative-related research on member dynamics and interactions.

4.1.2 Sustainable livelihoods

Our findings illustrated how agricultural cooperatives can play potential facilitation roles for their members to develop their sustainable livelihoods, including their social, human, physical, financial, and natural capital assets. The results demonstrated that member access to capital assets through the cooperative varied greatly. Human capital, through technical training and peer-to-peer knowledge sharing, as well as social capital, through the exchange of information and provision of social services, was being well-accessed by our sample of cooperative

members. However, access to financial and physical capital was more variable, despite some members accessing these resources trough donor- or government-funded projects involving the cooperative. Here, it was a member's social capital (particularly their immediate social relations) that enabled better access to the other forms of capital. These findings speak to the importance of conducting individual-level analysis in member-based organizations (Levien, 2015).

Drawing on our key-informant interviews, a greater focus on novel forms of peer-to-peer extension through the cooperative will be most likely to contribute to the development of its member's livelihoods. This offers an attractive future direction for cooperatives in developing area contexts as they experiment with different forms of organization in order to better draw on the collective expertise of their members, potentially through the creating of "learning spaces" (Hartley, 2014) and "innovation platforms" (Kilelu, Klerkx, & Leeuwis, 2013), while at the same time offering entrepreneurial opportunities for members. We propose a new orientation for agricultural cooperatives as a "livelihoods intermediary" in order to recognize the important role they play (or could play) for their members' sustainable livelihoods.

4.2 Future research directions

This thesis sought to contribute to reorienting cooperative research towards the often-overlooked social dimensions of their design and operation. Due to the relative dearth of literature in the topic, my exploratory research design enabled a number of issues related to the social organization of cooperatives to emerge. Drawing on these issues, some fruitful future research and development directions could potentially involve:

- Systematically assessing and comparing the impact of different agricultural cooperatives on innovation and rural livelihoods in different contexts, including between members and non-members to better understand the different benefits associated with cooperatives and the opportunities for them to further support sustainable agricultural development;

- Further exploring how social inequalities and gender differences between members affect cooperative design, direction, management, and performance in different contexts;

- Better integrating economic and social factors in the analysis and evaluation of agricultural cooperatives to assess the distribution of economic and social benefits and costs of membership;

- Exploring the role that agricultural cooperatives could and do play in empowering disadvantaged groups in rural landscapes, such as ethnic minorities, youth and women;

- Examining the basis for the often-negative local perception surrounding cooperatives and their colonial legacies in order to identify constructive ways forward that can better take account of these issues.

Much work is to still to be done, but I believe this is a very exciting time to be asking such questions in agricultural cooperative research and development.

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Appendix 1: Consent form, Semi-structured interviews, and Household survey

The role of social networks in agricultural cooperatives in the Niayes Region of Senegal

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Contact Information: Tel: 77 380 64 97.

This notification is to invite you to participate in a study investigating the role of social networks and relationships in farmer cooperatives. The main goal of this research is to understand how social networks can contribute to more successful, equitable, and resilient farmer cooperatives and their smallholders. By improving our understanding of these networks, we will be better able to assist your farmer cooperative in its delivery of services to you, the members. This project is the main component of my Master's thesis.

What you will be asked to do: You will be asked to participate in a survey to discuss various aspects of social capital, including groups and networks, collaboration, trust, and, social cohesion, as well as agricultural cooperatives, and knowledge and information flows.

Surveys will take place at wherever is most convenient for you, for example: local community centers, at your office, or at your farm. The survey will last between one and two hours. Only my supervisor and I will have access to the survey responses, which will be securely stored/backed-up on password protected computers/hard disks at McGill.

Confidentiality: Your name will be kept confidential by using a respondent identification code and a reference number (Cooperative/ HH specific code). To ensure this, the identification code and reference number will be separated, where only the latter will be entered into the database. Only my supervisor and I will have access the file, linking the respondent information and the reference number

Your participation is entirely voluntary and you may choose not to participate, to withdraw at any time or refuse to answer any question for any reason. Even if your survey has already been completed, you may withdraw it from the study up until the publication of results. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researcher. In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible.

The results of this research will be disseminated in the following ways: i) at least two publications in scientific journals including papers from the social network analysis and institutional analysis, ii) conference presentations to a range of interest groups, and iii) presentations and posters depicting research findings in the field, aimed at farmers and policy makers in Senegal as well as policy makers and aid professionals.

Consent:
I have read the above information and I agree to participate in this study.
Signature: _____ Researcher's signature: _____
Name: _____ Date: _____

If you have questions about your rights as a research participant, or if you would like to verify the ethical approval of this study, please feel free to contact: McGill Research Ethics Board at 514-398-6831, or by e-mail Lynda.mcneil@mcgill.ca.

Semi-structured interview questions:

1. How do you interact with agricultural cooperatives in the Niayes Region?
    a. Prompts: Have you been apart of a cooperative? Why/ when did you get involved? Has your role changed over time? (Progression from member to leadership role)
2. What is the purpose of an agricultural cooperative?
    a. Prompts: What is the role of the state/ external actors? Who should support their operational costs? What is the responsibility of the smallholder?
3. What are the greatest strengths of a cooperative? Why?
    a. Prompts: Access to technology? Market access? Access to information? / Friendship?
4. What do you see as your organization's role in building/ supporting these strengths?
    a. Prompts: Helping smallholder's access technology/ the market/ information? Providing grants? Extension officers? (Would likely be different depending on interviewee). Should you even have a role or is it the cooperative's responsibility?
5. Do you remember how farmer cooperatives operated prior to the Groupement d'Interet Economique? To what extent has this been a successful introduction to assist smallholders?
    a. Prompts: Do you know what the GIE is? Has it helped smallholders access the market to sell their products and fulfill its purpose? Are there other tools the government could use?
6. What are the greatest weaknesses of a cooperative? Why?
    a. Prompts: Political constraints? Inability to access the Market? Storing food? Technology? Low yields?
7. What do you see as your organization's role in helping improve these weaknesses?
    a. Prompts: Helping smallholder's access technology/ the market/ information? Providing grants? Extension officers? (Would likely be different depending on interviewee) Should you even have a role or is it the cooperatives responsibility?
8. Does information often reach all members in a cooperative?
    a. Are there certain groups that are left out (women/ ethnic groups)? Are there any bottlenecks that exist? Who's responsibility is it to ensure a successful knowledge dissemination?
9. How can we improve information/ knowledge transfer to the rural smallholder?
    a. Prompts: Is it your responsibility? Should it part of the cooperative's role?
10. Can cooperatives assist with enhancing your livelihoods and level of household food security and if so, how might the benefits be enhanced?
    a. Prompts: Are cooperative's successful tools for rural smallholders?
11. How can we better design cooperatives to make them more accountable, enduring and effective for their members?
    a. Prompts: Are cooperatives even the way of the future? Are their different options to help smallholders? What form and structure would they take? Are there any other groups that need to be more involved (i.e women?)

Union:	Recenseuse :	Date:	Début: Fin :

ENQUETE SUR LES RÉSEAUX SOCIAUX DANS LES UNIONS AGRICOLES

Introduction :
Salamalekum ! Je m'appelle _____ et actuellement je fais parti(e) d'une étude à l'université de McGill à Montréal, Canada. J'ai reçu votre numéro par votre président, _____, et le coordinateur de l'AUMN, Mamadou Ndiaye.

Cette étude tentera d'examiner le rôle des réseaux sociaux (c'est-a-dire les individus ou les organisations que vous interagissez régulièrement) dans le fonctionnement et le succès de votre union maraichère Avec la connaissance des réseaux sociaux, nous pourrons mieux aider votre union dans l'approvisionnement des services, la diffusion d'innovation agricole, d'exchange d'information et de mieux répondre à vos besoins. Vous serez demandés de participer en répondant aux questions, environ une heure du temps, afin d'identifier et de discuter des caractéristiques du capital sociale. Le questionnaire aura lieu dans votre bureau, votre ferme, ou à votre maison de quartier.

Votre nom sera confidentiel et l'information que vous donnez sera seulement utilisée pour l'objet de la recherche. Votre participation est volontaire; vous pouvez choisir de ne pas participer, de quitter le questionnaire en tout temps, ou de refuser de répondre aux questions pour n'importe quelle raison. Lorsque le questionnaire a complété, vous pourrez vous retirer de l'étude jusqu'au moment de la publication des résultats. Est-ce que vous êtes d'accord pour participer dans cette recherche**.**

Signature du participant: _____ Nom: _____

Caractéristiques

1. Département: 2. Commune: 3. Village:

4. Sexe: F □ M □ 5. Groupement

6. Dans quelle tranche d'âge situez-vous ?
18-24 25-34 35-44 45-54 54 et plus

7. Combien de personnes habitent chez vous ?
Moins que 1 1- 3 4 – 6 7-10 Plus que 10

8. Combien de personnes prenez-vous en charge (des enfants ou des personnes âgées)?
Moins que 1 1- 3 4 – 6 7-10 Plus que 10

9. Quel est votre lien avec le chef de ménage?
Chef de ménage Epoux/ Epouse Mère/ Père Grand-mère/ Grand-père Tante/ Oncle Frère/ Sœur Autre: _____

10. Quel est votre niveau d'éducation?
Pas éducation officiel Ecole Primaire Ecole Secondaire Religieux Enseignement Supérieur Autre: _____

Activités des producteurs:

11. Depuis combien d'années êtes-vous un producteur ?
Moins que 1 an 1- 2.5 ans 3 – 6 ans 7-10 ans Plus que 10 ans

12. Depuis combien d'années cultivez-vous dans ce village ?
Moins que 1 an 1- 2.5 ans 3 – 6 ans 7-10 ans Plus que 10 ans

13. Comment avez-vous connu l'existence de cette union ? _____
_____
_____

14. Pourquoi êtes-vous devenus membre ? _____

_____
_____

15. Depuis quand faites-vous partie de cette union? _____

16. Avez-vous une carte de membre ? _____

17. Est ce que l'union demande une cotisation mensuelle ou annuelle ? Si oui, combien ?
_____

18. Quand était la dernière fois que l'union a récupéré sa cotisation ?
_____

19. Quelle est votre culture principale ? _____

20. Etes vous ? : Locataire Propriétaire Titulaire de Bail Terre de famille Autre: _____

21. Superficie totale (en hectares) ? Moins de 1 ha 1- 3 ha 4 – 6 ha 7-10 ha Plus que 10 ha

22. Proportion de l'exploitation sous production (en hectares) :
Moins que 10% 11-25% 26-50% 51-75% Plus que 75%

Pourquoi ? _____

23. Quelles contraintes confinent votre production?

Manque de travailleurs	Manque d'information de marché	Baisse de prix	Des ravageurs	Qualité du sol
Problème d'eau	Le marché est trop serré	Stockage	Financière	Autres :

24. Quel pourcentage de votre revenu provient de a) revenu agricole_____ b) revenue non-agricole_____

25. Quel est votre marché principal? _____

26. Faisiez-vous partie des projets agricoles fournis par des bailleurs de fonds ou des ONGs ?
    a. Si oui, combien ? _____
    b. Si non, pourquoi ? _____
    _____
    _____

27. Actuellement, faites-vous partie d'un projet ?
    a. Si oui, lequel _____
    b. Si non, pourquoi ? _____
    _____
    _____

28. Quels sont les deux derniers projets dont vous avez participés?

Nom	Date	Pourquoi avez-vous participé ?	Pourquoi avez-vous terminé ?

CAPITAL SOCIAL:

Des groupes et des réseaux:

29. Je voudrais commencer en vous questionnant au sujet des groupes, des organisations, des réseaux, et des associations dans lesquels vous, ou un autre membre de votre ménage, faites partie. Cela peut être des groupes officiels et bien organisés, ou simplement des groupes de personnes qui se rencontrent pour faire une activité ou discuter.

Veuillez, si vous plait, me dire si vous ou un membre de votre ménage font partie des groupes suivants :

Groupe de producteurs/ unions	Comité rurale	Groupe religieux	Mouvement politique	Association culturelle
Groupe d'épargne ou de crédit	Comité éducatif ou de l'école	Équipe sportive	Gestion de l'environnement ou des ressources naturelles	Autres : _____

30. Parmi les groupes dont vous faites partie, quels sont les deux plus importantes selon vous? Pourquoi ?

Groupe 1: Groupe 2:

31. Combien de fois au cours des 12 derniers mois, avez-vous participé à une activité de ces groupes ? Par exemple, participer dans les réunions ou de travaux communautaires?

Groupe 1: Groupe 2:

32. En pensant aux membres des groupes, est ce qu'ils viennent de ces même catégories ? : 1=Oui/ 0=Non

	Group 1	Group 2
Quartier/ Village		
Famille		
Religion		
Genre		
Groupe d'ethnique ou linguistique		

33. Est-ce que ce groupe travaille ou interagit avec d'autres groupes dans la localité de l'union ?

0= Non, 1= Oui, des fois (<5 fois/ année), 2= Oui, fréquemment (>5 fois/ année), 3=Ne sait pas

Groupe 1: Groupe 2:

34. Est-ce que ce groupe travaille ou interagit avec des groupes **externes** de la localité de l'union ?

0= Non, 1= Oui, des fois (<5 fois/ année), 2= Oui, fréquemment (>5 fois/ année), 3= Ne sait pas

Groupe 1: Groupe 2:

35. Qui est le fondateur du groupe ?

Groupe 1: Groupe 2:

Réseaux:

36. Combien d'amis proches avez-vous, actuellement ? Par exemple, des amis avec qui vous vous sentez à l'aise avec, pouvez poser des questions, ou demander pour l'assistance._____

37. Pouvez-vous nommer cinq de vos amis?

1. 2. 3. 4. 5.

38. Au cours des 12 mois derniers, combien de membres de l'union sont venus vous voir avec des questions (soit personnelles, agricoles, ou financières) ? _____

39. Pouvez-vous nommer cinq d'eux?

1. 2. 3. 4. 5.

40. Si vous auriez, soudainement, besoin une petite somme de l'argent, combien de personnes, en dehors de votre ménage immédiat, pensez-vous qui serait disponible à fournir cet argent ? _____

41. Pouvez-vous nommer cinq d'eux?

1. 2. 3. 4. 5.

42. Si vous aviez besoin d'un équipement agricole ou de l'aide pendant la récolte, combien de personnes en dehors de votre ménage immédiat, pensez-vous qui serait disponible à offrir l'assistance ? _____

43. Pouvez-vous nommer cinq d'eux?
1. 2. 3. 4. 5.

44. Si vous avez rencontré une famille en difficulté, êtes vous prêts a l'aider? Si oui, comment ? _____

45. Si vous avez rencontré une famille proche ou un ami, êtes vous prêts a l'aider? Si oui, comment ? _____

Confiance

46. En général, est ce que vous êtes d'accord ou pas avec les phrases suivantes :
1= fortement d'accord, 2= d'accord, 3= ni en accord ni en désaccord, 4= désaccord. 5= fortement désaccord

La majorité de personnes dans le village sont fiables	
Dans ce village, il faut être vigilant ou quelqu'un d'autre pourra vous exploiter	
La majorité de personnes dans le village sont disponible pour aider, si vous en avez besoin	
Dans ce village, les personnes n'ont pas confiance à l'un ou l'autre au sujet d'emprunt et de prêter l'argent	

La majorité de personnes dans l'union sont fiables	
Dans cette union, il faut être vigilant ou quelqu'un d'autre pourra vous exploiter	
La majorité de personnes dans l'union sont disponible pour aider, si vous en avez besoin	
Dans cette union, les personnes n'ont pas confiance à l'un ou l'autre au sujet d'emprunt et de prêter l'argent	

47. Avez-vous confiance aux acteurs suivants ?
1= En grande partie, 2= En partie, 3= En moyenne, 4= Dans une faible mesure. 5= Dans une très faible mesure

D'autres membres d'union	
Des chefs locaux	
Des agents de vulgarisation/ technicien	
Des agents officiels de gouvernement	
Des BanaBanas	
Des policiers	
D'autres membres du village	

Action collectif / Coopération

48. Combien de fois au cours des 12 derniers mois avez-vous participe à une activité communautaire pour le bénéfice de l'union? _____

Répondre aux trois question ssuivantes en utilisant l'échelle dessous :
1= Très probable, 2= Probable, 3= Ni probable ni improbable, 4= Improbable, 5= Très improbable,

49. Quelle est la probabilité que les membres qui ne participent pas aux activités communautaires soient critiqués ou sanctionnés? _____

50. S'il y avait un problème avec l'approvisionnement de l'eau, quelle est la probabilité que les membres coopérant puisse le régler ? _____

51. Quelle est la probabilité que les membres se réunissent pour faire le plaidoyer aux agents officiels gouvernementaux ou des chefs d'états pour améliorer la situation de l'union ?_____

Information et Communication

52. Au cours des cinq dernières années, avez-vous adopté des innovations agricoles ? Par exemple, une nouvelle culture, une nouvelle façon de cultiver, nouvelle méthode de plantation, nouvelle technique de gérer contre des ravageurs, gestion de l'eau, ou gestion du sol.

Si oui, lesquelles ?_____

_____

Si non, pourquoi ?_____
_____

53. Par quel moyen recevez-vous, typiquement, l'information au sujet d'une nouvelle idée, une nouvelle façon de cultiver, ou une nouvelle technique liée à votre exploitation?

Famille / Amis	Officiers de gouvernement/ des techniciens	Voisin/ La ferme voisin	Marché local	Coopératives/ Unions
Chef du village	Officier d'une ONG	Radio, Télévision, ou Internet	Livres ou journaux	Autres: - _____

54. Selon vous, quels sont les trois moyens les plus importants pour recevoir de nouvelles informations? Pourquoi ?
1. 2. 3.

Sont-elles les même pour recevoir l'information au sujet du gouvernement ? Si non, pourriez- vous citer une autre source de l'information ? _____

55. Qui sont les membres de l'union qui, typiquement, partagent les nouvelles idées avec vous ? Nommez-en cinq
1. 2. 3. 4. 5.

56. Qui sont les membres de l'union avec qui vous partagez les « nouvelles idées »que vous avez adoptées? Nommez-en cinq
1. 2. 3. 4. 5.

Cohésion Sociale et Inclusion

57. Souvent, il existe des différences entre les personnes qui font parties de la même union. Par exemple, des différences dans la richesse, le revenu, la religion, l'allégeance politique, le statut social, l'origine ethnique, l'âge ou en éducation. Dans quelle mesure pensez-vous que ces différences caractérisent votre union? Utilise l'échelle suivant :
1= En grande partie, 2= En partie, 3= Ni en partie ni en moyen, 4= Dans une faible mesure. 5= Dans une très faible mesure

_____

58. Est-ce qu'un ou plusieurs de ces différences causent des problèmes ?Si oui, lesquels sont les plus problématiques?

Education	Religion	Richesse
Propriété de la terre	Allégeance politique	L'origine ethnique
Statut	Age	Autre:_____

MERCI POUR VOTRE PARTICIPATION

Si vous aurez des questions ou des commentaires, merci de contacter Graeme à 77 380 64 97