

2012

Organization of innovation platforms for Agricultural Research and Development in the Great Lakes Region of Africa

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**Organization of innovation platforms for Agricultural Research and Development in
the Great Lakes Region of Africa**

By

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A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

Major: Sociology

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Ames, Iowa

2012

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DEDICATION

To my husband Joseph Mulema, my children Gabriel and Anastasia, and to all my family

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LIST OF ACRONYMS

AKIS	-	Agricultural Knowledge and Information Systems
CALS	-	College of Agriculture and Life Sciences
CGIAR	-	Consultative Group on International Agricultural Research
CIAT	-	International Center for Tropical Agriculture
CIP	-	Crop Intensification Program
CRST	-	Cross-site Research Support Team
DRC	-	Democratic Republic of Congo
FARA	-	Forum for Agricultural Research in Africa
FGD	-	Focus Group Discussions
GDP	-	Gross Domestic Product
IAR4D	-	Integrated Agricultural Research for Development
IP	-	Innovation Platform
IRB	-	Institutional Review Board
ISAR	-	Institut des Sciences Agronomiques du Rwanda (Rwanda Agricultural Research Institute)
KAZARDI	-	Kachwekano Zonal Agricultural Research and Development Institute
LC	-	Local Council
NAADS	-	National Agricultural Advisory Services
NGO	-	Non-Governmental Organization
PLS	-	Pilot Learning Site
RADA	-	Rwanda Agricultural Development Authority
SUCAPRI	-	Strengthening of University Capacity for Promoting, Facilitating and Teaching Rural Innovation Processes

SPSS	-	Statistical Package for Social Scientists
SSA-CP	-	Sub Saharan Africa Challenge Program
T&V	-	Training and Visit
ToT	-	Transfer of Technology

ACKNOWLEDGEMENTS

The writing of this dissertation has been the most significant academic challenge that I have ever had to face. Without the support, patience and guidance of the following people, I would never have been able to finish my dissertation. It is to them that I owe my deepest gratitude.

- My advisor Prof. Robert E. Mazur. His wisdom, knowledge and commitment to the highest standards inspired and motivated me. You made me re-write sections several times to meet your standards.
- All my Program of Study Committee members who provided excellent guidance: Dr. Cornelia Flora, Dr. Francis Owusu, Dr. Lois Wright Morton, and Dr. Terry Besser.
- The College of Agriculture and Life Sciences (CALs) and the International Center for Tropical Agriculture (CIAT) who financially supported my research. Thanks to Dr. Lorna M. Butler and Dr. Robert O. Butler for the Butler International Travel grant, which I was awarded to travel to Uganda and Rwanda to conduct my research.
- CIAT scientists and sub-Saharan Africa Challenge Program scientists, including but not limited to Dr. Wanjiku Chiuri, Dr. Moses Tenwya, Dr. Eliud Birachi, Dr. Robin Buruchara, Dr. Pascal Sanginga, Dr. Susan Kaaria, Dr. Jemimah Njuki, Dr. Imelda Kashaija, and Dr. Joy Tukahirwa for their guidance. Their comments and suggestions helped me focus my research.
- CIAT finance and administration for managing my research funds and ensuring that they were available in time, and making arrangements for my local and international travels, most especially Sarah Nassozi, Jolly Basemera, Yosum Mugarura, Sam Bakulama and Baguma Athanasio.

- Staff from the sub-Saharan Africa Challenge Program site coordinating institutions in Uganda, Rwanda and Democratic Republic of Congo, i.e., Kachwekano Zonal Agricultural Research and Development Institute (KAZARDI), Rwanda Agricultural Research Institute (ISAR) and Plate-Forme Diobass. I thank Pamela Pali, Bernard Fungo, Pascal Habumugisha, Francoise Murorunkwere, Mathew Kuule, Benjamin Wimba and Leblanc Bahiga for your support and cooperation.
- Joseph Mulema, my husband, thanks for your love, support and constant patience. You always asked me “when are you coming back?” Gabriel Mulema, my son, for being patient with me for all these years I’ve been away from home. Once in a while you also asked me “Mum, when are you coming back? What are you doing? Are you reading your books? I miss you.” From now on, I will dedicate most of my time to you.
- My parents, Wilson and Jane Muwereza, my sisters - Susan, Harriet, Juliet, Janet, Violet, Solome, Sarah, and brothers - Herbert, Wilson and Samuel. They were always supporting, and encouraging me with their best wishes.
- Orley and Charlsie Kilburn, who hosted me and my daughter Anastasia for one year. Knowing you was a blessing to us. You loved and took good care of us.
- My mother-in-law, Harriet Kigongo and sisters-in-law Oliver Nakafumbe and Gorreti Nabaggala who lovely and unselfishly looked after my son Gabriel while I was away pursuing my Ph.D. Thanks for your encouragement and being understanding and supportive all the time.
- Robert and Semakaleng Mazur for providing me and my daughter Anastasia with an excellent environment for studying. It was great staying with you toward the end of

my program.

- David and Sylva Williams for your love and care.
- My friends Joseph Malual, Haymanot Wondafrash, Jean McGuire, Victoria LeBeaux, Angela Carter, Claudia Prado-Meza, Adrienne Riegle, Isaac Christiansen, Roshan Malik, Rabia Malik, Natalia Frishman, Angela Glosser, Lijin Ju, Richard Stockner, Diego Thompson, Silvina, Meghan Gillette and Kimberly Rogers. Thank you for such wonderful care and love, especially when I was sick. Special thanks to Jean who ensured that I had sufficient healthy food for the first 4 months when I had my baby. All my friends that I've not mentioned, I appreciate your love and care.
- Friends from African fellowship, I will always remember your love, support and encouraging words most especially Christiana Abatan, Ezinwanne Uchendu and Rebecca Buxton.
- Fellow countrymen - Milly Kanobe, Charles Kanobe, Gerald Sebuwufu, Martin Mutambuka, Dennis Katuuramu, Jackson Nteebe, Muhammed Walugembe, Mercy Kabahuma, Emanuel Byamukama, Agatha Ampaire, and Bernard Obaa. Thanks for your support. Together we'll always stand.
- Rachel Burlingame for the technical assistance in page numbering
- Members of North Grand Christian Church for your constant prayers, love and support especially Elaine Lee. Friends from the 'Empty Nesters' group were a blessing to us.
- My relatives especially uncle Martin Muwereza and Diiro Gracious for their encouraging words. Harold Irumba, thanks for constantly checking on my progress.
- Colleagues at CIAT for their cooperation, encouragement and keeping in touch most

especially Edidah Ampaire, Amos Owamani, Stephen Buah and Samuel Bakulama.

- Neo and Thabisa Mazur, and Samson for their love, patience and entertaining Anastasia
- My research participants, who willingly took time off their busy schedules to respond to my questions. Thanks to IP chairpersons for mobilizing farmers.
- Research assistants who helped in data collection and the driver who safely drove the research team to and from the meeting venues.
- Anastasia, for her patience, maintaining her naturally happy personality, cooperative attitude, and ‘helping’ me with ‘typing’ when she sat on my lap. Special thanks to Semakaleng Mazur, Dorothy Masinde, Ebby Luvaga, Rodah Runanu, Charlsie and Orley Kilburn, David and Sylva Williams, and Angela Carter for babysitting.

ABSTRACT

The Innovation platforms (IPs) approach was developed to address shortcomings of linear approaches to agricultural research and extension. However, 'innovation platform' is a relatively new concept in agricultural research for development. There is limited knowledge and understanding of how best to organize IPs to facilitate numerous and multi-directional interaction among diverse stakeholders. The study examined how IPs are organized, the factors which motivated actors to participate in IPs, and the power dynamics within IPs.

Data were collected from five IPs in Uganda and Rwanda Sept.-Dec. 2010. We conducted 184 semi-structured interviews with farmers, 34 in-depth interviews (with traders, extension workers, policy makers, NGO staff, researchers, IP chairpersons and non-IP members) and six focus group discussions with farmer representatives. I analyzed quantitative data using the Statistical Package for Social Scientists. Qualitative data were analyzed using line-by-line coding.

The size of IP, age and nature of landscape influenced the extent of vertical and horizontal decentralization. IPs that were highly decentralized both vertically and horizontally demonstrated high knowledge and information sharing among actors. However, decentralization alone was not sufficient. Other factors need to be in place to facilitate interaction such as good leadership and proper infrastructure.

Actors were motivated to participate in IPs by several factors (including development, material, economic, social and purposive). Farmers were primarily motivated by the desire to acquire knowledge and skills (developmental incentives). However, development incentives

alone were not sufficient to encourage active farmer participation. Economic and material incentives encouraged farmers to continue participating. Participation of local policy makers and the private business sector was limited. Participation was curtailed by: expectation of tangible short-term benefits, poor understanding of IP concept, lack of resources, prior commitments and feeling devalued.

IPs empowered farmers to prioritize issues of concern to them. However, concerns of small-scale local traders and women were not completely taken into account. Actors who accessed more information, knowledge, and financial resources demonstrated more power and influenced the decision-making, and implementation process.

The key policy implications are to advocate for holistic, and integrative approaches that promote inclusion of the scientific and non-scientific communities in research. Government support is required for integrating IP activities in existing government programs and enforcement of bylaws.

CHAPTER 1. GENERAL INTRODUCTION

Background

Agriculture is the engine for poverty reduction and economic development in developing nations. The sector employs over 50% of the population and contributes over 30% of Gross Domestic Product (GDP) (McCullough, Pingali, and Stamoulis 2008). Despite the importance of agriculture, innovation and technological change in the sector continues to be slow and patchy. Developing countries invest only a small portion of their GDP in agricultural research. Agricultural development plans exhibit little concern for staple food production despite its importance in developing nations (World Bank 2007b). Agriculture is taking place in a rapidly changing, globalized setting. The sector's development is being driven more by market concerns (both local and external) (World Bank 2007a). Production and marketing are highly competitive and innovation based. However, food systems in developing nations are traditional and market chains are largely unorganized.

The traditional approach of agricultural research and extension follows a linear approach where researchers and experts produce new knowledge and technology and transfer it to the end users who need it to innovate and change (Lundy, Gottret, and Ashby 2007). The linear approach assumes that agricultural research, through technology transfer, leads to technology adoption and increased productivity. Emphasis is placed on building capacity of research (through investment in scientific infrastructure, human capital, setting research priorities and providing operational funds to implement those priorities) and less attention is paid to other factors that enable new technologies to be used. Public research and extension institutions are considered to be the only source of knowledge and innovation required to

promote agricultural development. In addition, research is not linked to technology users and other actors in the sector (World Bank 2007a).

As a result, the traditional agricultural research and extension approach has generally failed to translate research outputs into development impacts (FARA 2007) that address widespread poverty, hunger and malnutrition in sub-Saharan Africa (Mokwunye 2010). Further, the traditional approach has failed to promote a continuous learning and innovation process capable of helping people and their communities to cope with growing complexity and rapidly changing contexts because of the following (Lundy et al. 2007):

- limited appreciation of local and indigenous knowledge
- knowledge generated is not piloted in the actual environment where it will be used
- lack of interaction among different sources of knowledge
- the approach is linear, with limited interaction between knowledge experts and users to develop user capacity in relation to the innovation

Scholars argue that the organization of agricultural research and extension is the major reason why agricultural research and development projects have failed to improve livelihoods of resource poor farmers (Hall 2007). The existing system of generating research and knowledge is not structured or organized to deal with the rapidly changing context (dynamic policy, market, technology and environment) for agriculture in many countries. The ability to cope with increased complexity and uncertainty in agri-food systems requires new ways of conducting research that enhance the capacity of smallholder farmers to respond to rapidly changing contexts through continuous innovation. Agri-food systems are

increasingly vertically integrated, thus requiring new approaches to engage smallholder farmers in markets (World Bank 2007a).

The failure of the traditional approach to meet users' needs has led to increased understanding of the need to achieve greater and more focused collaboration in agricultural research by involving new actors in research including non-governmental organizations (NGOs), civil society actors, producer associations, and private business sector firms to respond to the new challenges for agriculture innovation. There is growing recognition of the need for inter-organizational corporation to solve agricultural related problems as scientists realize that the complex nature of agricultural problems cannot be solved by a single organization. Hall (2009:31) asserts that:

- Innovation requires knowledge from multiple sources, including users of that knowledge;
- It involves those different sources of knowledge interacting with each other in order to share and combine ideas;
- These interactions and processes are usually very specific to a particular context;
- Each context has its own routines and traditions that reflect historical origins shaped by culture, politics, policies and power.

From Classical National Agricultural Research Systems to Agricultural Innovation Systems

Different models of agriculture extension have evolved over the past 40 years to disseminate information to farmers in order to increase farm production, access to market and management of the natural resource base. Uganda and Rwanda, like many other countries,

experienced different agricultural extension approaches - both top-down (Transfer of Technology and Training and Visit) and bottom-up (Farming System Research, participatory extension, Farmer to Farmer extension, partnership extension, Agricultural Knowledge and Information System, privatization of agricultural extension, and contracting extension service delivery). The first approach of extension was the transfer of technology model (ToT). This approach was prevalent during colonial times and re-emerged during the 1970s and 1980s when the training and visit (T&V) approach was introduced in many Asian and sub-Saharan African countries. The technology transfer model was a linear approach, transferring technologies from research to farmers, and persuaded farmers to take up specific varieties of crops and practices to increase food production. The aim was to speed up dissemination of Green Revolution technologies. Other forms of production such as livestock and horticulture were ignored (Swanson and Rajalahti 2010).

The main actors in this model were the researchers, extensionists and farmers. This approach was primarily suitable for homogenous, low risk natural and social environmental conditions but was not suitable for small-scale farmers in highly variable conditions with no control over growing conditions. As a result, the farming systems approach emerged and the emphasis was on participation of farmers in technology development. The aim was to understand farmers' complex environment and the interdependencies among elements of farming systems in order to design technologies adapted to their conditions (Biggs 1989; Farrington and Martin 1987). In the mid-1980s, more participatory approaches were introduced with more emphasis on farmers. The concept of Farmer First was introduced which involved approaches such as Farmer-back-to-Farmer, Farmer First and Last, Farmer Participatory Research, and Participatory Technology Development. Farmers were involved

in the process of generating, testing and evaluating technologies to promote sustainable agricultural production. The goal was to develop technologies suitable for small-scale, resource poor farmers and ensure adoption to increase farm productivity and income (Selener 1997).

In 1990s, the Agricultural Knowledge and Information Systems (AKIS) approach emerged to strengthen vertical and horizontal information flow in agricultural systems. The performance of the system is determined by the extent to which actors' access information and technology (Röling 1992). In order to make knowledge and information available among actors, a continuous circulation of intermediary outputs is crucial. This is enhanced by knowledge networks, which are relatively stable patterns of communication and interaction among social actors sharing a common goal. Such knowledge networks emerge as a result of relationship building efforts among actors. To govern knowledge sharing and information exchange in networks, there should be mutual understanding and trust among actors (Engel and Salomon 1997).

However, the AKIS paradigm was criticized because of its linear vision on delivering technology to large farms while ignoring farmers with limited land and resources, and not listening to farmers in terms of their problems and priorities for government and university researchers. Therefore, the conceptual debate has now shifted from the AKIS paradigm to agricultural innovation systems (Sulaiman and Hall 2006). Although the AKIS paradigm is simplistic, it is still a useful concept in highlighting the importance of developing a system of education, technology and extension institutions that are the drivers of transforming traditional agriculture (Bonnen 1998).

Many developing countries are now working towards improving rural livelihoods of

smallholder farmers. However, achieving this goal will require transforming the traditional top- down, technology-driven extension model to a more decentralized, farmer-led, and market-driven extension system. Innovation has become a focus of many development projects and innovation systems are the centerpiece of many development projects. Although the concept has been used to improve economic development in the North, its application to agriculture in developing countries has been recent (Hall et al. 2001). An innovation system comprises the organizations, enterprises, and individuals that together demand and supply knowledge and technology, and the rules and mechanisms by which these different agents interact. The innovation systems approach is a more holistic approach to planning knowledge production and use (World Bank 2007a:5).

The innovation systems framework sees innovation in a more systematic, interactive and evolutionary way, whereby networks or organizations, together with the institutions and policies that influence their innovative behaviors and performance, bring new products and processes into economic and social use (Hall 2005:614). More emphasis is placed on fostering active interaction among diverse stakeholders and enhancing human capacity to continuously innovate to be able to adapt to changing social economic and environmental conditions. This is further enhanced by favorable policies that stimulate and support innovation, and utilization of new innovation. An environment that supports innovation is not the outcome of a single policy but of a set of policies that work together to shape innovative behavior and, consequently, performance (Mytelka 2000). The Ugandan government's commitment to overcome the challenges in agriculture is reflected in its policy documents (i.e., the Plan for Modernization of Agriculture and Poverty Eradication Action Plan), and in Rwanda it is outlined in the National Agricultural Extension Strategy. Table 1-1 shows the

features of different approaches that have evolved over years.

Table 1-1 Features of Agricultural Innovation Capacity Development Frameworks

Defining Features	Classic National Agricultural Research Systems (NARS)	Classic Agricultural Knowledge and Information Systems (AKIS) as defined by FAO-World-Bank 2001)	Agricultural Innovation Systems
Purpose	Planning capacity for agricultural research, technology development and transfer	Strengthening communication and knowledge delivery services to people in the rural sector	Strengthen the capacity to innovate and create novelty throughout the agricultural production and marketing system
Actors	<ol style="list-style-type: none"> 1. National Agricultural Research Organizations 2. Agricultural universities or faculties 3. Extension services 4. Farmers 	<ol style="list-style-type: none"> 1. National Agricultural Research Organizations 2. Agricultural universities or faculties 3. Extension services 4. Farmers 	Potentially all actors in the public and private sectors involved in the creation, diffusion, adaptation and use of all types of knowledge relevant to agricultural production and marketing
Outcome	Technological invention and technology transfer	Technology adoption and innovation in agricultural production and marketing in rural areas	Combination of technical and institutional innovations throughout the production, marketing, policy research and enterprise domains
Organizing principle	Using science to create knowledge*** Invention driven**	Accessing agricultural knowledge*** Invention driven*	New uses of knowledge for social and economic change*** Innovation driven**
Mechanism of innovation	Transfer of technology	Interactive learning	Interactive learning
Degree of market integration	Nil	Low	High
Role of policy	Resource allocation, priority setting	Enabling framework	Integrated component and enabling framework
Nature of capacity strengthening	Infrastructure and human resource development	Strengthening communication between actors in rural areas	Same as NARS and AKIS, plus: strengthening linkages and interaction; institutional developments to support interaction; learning and innovation; creating of an enabling policy environment

Source: World Bank 2007 and Hall 2009

Degree of emphasis: * = low; ** = medium; *** = high

If agricultural research projects are to be successful in bringing about social and economic change, more partners along a value chain need to be included (Duncan 2011; Hall

et al. 1998). Approaches that seek to elicit information and knowledge from farmers and promote feedback loops are seen as alternatives to the linear approach (Hall 2007). Successful approaches for generating community change need to build on existing community capitals and focus on strengths rather than needs. The existing community assets are used to work towards the desired goals. The Appreciative Inquiry (AI) approach focuses on what works and instead of problems or needs (Flora and Flora 2008). Better ways of integrating indigenous knowledge with scientific knowledge through interactive processes of innovation are required (Bell 2006). In this respect, various institutions have worked on the concept of innovation platforms (IPs) to provide a space where different stakeholders interact to understand each other better, learn and develop shared priorities, define roles and agree on joint actions (Hall et al. 2003).

Innovation platforms have their roots in the innovation systems approach. IPs are seen as a significant improvement over the linear, less inclusive and less interactive traditional agricultural research and extension approach. Involvement of multiple stakeholders in agricultural research is thought to generate research outputs that will increase food security, increase access to markets, reduce poverty and malnutrition, and promote sustainable natural resource management (Mokwunye 2010). An IP is an arrangement in which a set of relatively interdependent stakeholders are identified and - usually through representatives - invited to meet and interact in a forum for conflict resolution, negotiation, social learning and collective decision making towards concerted action (Röling 2002). In this study, IP is defined as a forum in which multiple actors/stakeholders with meaningful interests in a common issue collaborate in identification of problems, share and develop new

ideas to better solve those problems, and implement creative solutions to improve livelihoods.

An Overview of the sub-Saharan Africa Challenge (SSA-CP) Program

The researchers in SSA-CP designed and implemented the integrated agricultural research for development (IAR4D) approach to respond to the need for a more interactive approach that involved diverse stakeholders along a commodity chain. The approach is aimed at improving agricultural research by involving different actors in research to ensure relevance, responsiveness of research to stakeholders' needs and create an environment that enhances social learning. The aim of this pilot study is to determine whether an interactive approach to agricultural research with multiple stakeholders involved from program inception onwards, in the actual farming environment for smallholder farmers, can have more benefits than the traditional agricultural research and development approach. Innovation platforms are used as a mechanism to organize stakeholders (including farmers, pastoralists, rural communities, researchers, extension agents, development specialists, traders and processors, wholesalers and retailers, policy makers, regulators and consumers) who then identify research issues, problems, needs and opportunities in their respective localities and generate strategies to address them (FARA 2007).

The IAR4D approach employs a decentralized system of governance in which community members are fully involved in decision-making. Decentralized programs transfer decision-making power to local institutions and ensure adequate participation of community members. However, decentralization leads to effective participation when local communities are empowered with rights and when local organizations account to local communities (Irvin

and Stansbury 2004; Martin and Lemon 2001). Without empowerment and commitment from political leaders and other local community leaders, decision-making power may not be distributed amongst the actors, which in turn influences participation (Kull 2002).

The program was initiated in 2004 and operates in eight countries in three pilot learning sites in Africa (Lake Kivu region in East Africa, Zimbabwe-Mozambique-Malawi in Southern Africa and Kano-Katsina-Maradi in West Africa). The key principles which govern IAR4D include: 1) the innovation platform must be in place before initiating the process of establishing solutions to an identified problem; 2) non-linear collective and collaborative interaction among actors; 3) research addresses key constraints and opportunities approved by the IP in the context of entire value chains and sustainable livelihoods systems; 4) research process must be multi-disciplinary and participatory; and 5) build institutional and human capacity for IAR4D actors to participate effectively (FARA 2009b).

Innovation Platforms and their Importance

Innovation platforms (IPs) are knowledge generation and governance forms that emerge from complex dynamic processes. They emerge either through spontaneous processes or can be facilitated or directed (Consoli and Patrucco 2008). IPs facilitate integration of perspectives, knowledge and actions of different stakeholders around a common issue and foster learning through interaction (Hawkins et al. 2009). IP create interdependences among stakeholders, promote social learning, and build confidence and joint action (Röling 2002). Interdependent multiple stakeholders bring in diverse knowledge and experience which complement each other, fostering joint problem solving (Bouwen and Taillieu 2004). Multi-stakeholder platforms strengthen the relationship between different

stakeholders and create a favorable environment where local innovations and knowledge interact with scientific knowledge to achieve great synergies (Hall et al. 2003). Such platforms have been facilitated at farmer level to promote linkages among farmers, local government and service providers to enable the poor categories of farmers to benefit from different innovations (Röling 2002). IPs are believed to provide space where relevant stakeholders (such as farmers, pastoralists, rural communities, researchers, extension agents, development specialists, traders and processors, wholesalers and retailers, policy makers, regulators and consumers) are organized in a manner that facilitates effective, efficient, targeted research for development.

Under the SSA-CP, 12 IPs were established in each Pilot Learning Site (PLS) and organized at sub-county level based on common challenges, to provide opportunities for action, reflection and learning. They are facilitated by a team of interdisciplinary scientists (Task Forces) to bring together stakeholders along the resource to consumption continuum, with a diverse range of knowledge and skills, on principles of mutual learning, resource sharing and knowledge management. IPs are organized to address issues concerning productivity enhancing technologies, natural resource management, marketing strategies, livelihood enhancing strategies, enabling policies and institutional arrangements (FARA 2007).

Each IP focuses on a specific value chain. Of the 12 IPs, seven were established during the last quarter of 2008 and five in the first quarter of 2009. The process of forming the IPs was either research-led or market-led. The older IPs used the research-led approach in which stakeholders were sensitized about the agricultural problems and how they could

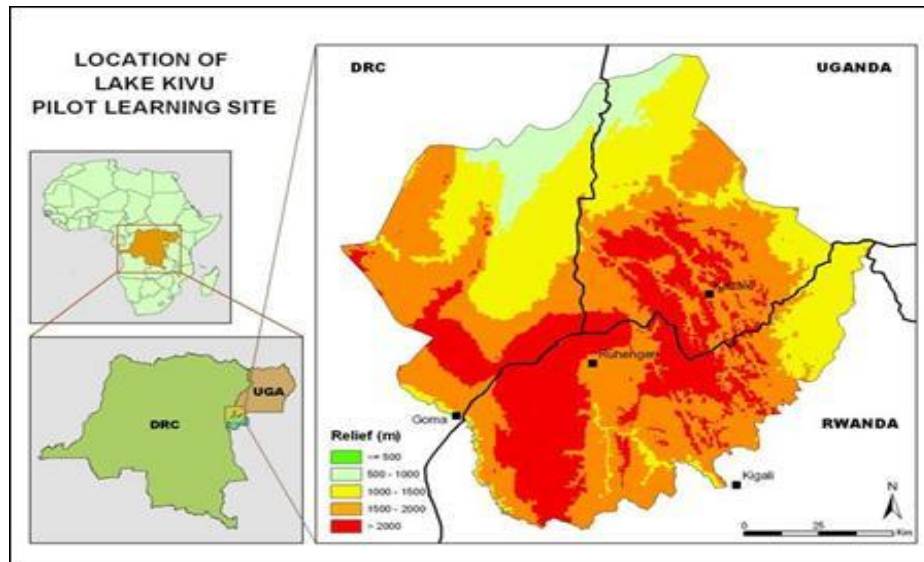
contribute to resolving the problems. In the newer IPs, the market-led approach was used in which stakeholders were introduced to the available market opportunity and organized to access that market. IPs have a governance structure at sub-county level and parish level with an Executive Committee (with chair, vice chair, secretary, treasurer and committee members representing groups from different parishes) supported by sub-committees which focus on marketing, research, finance, natural resource management, and monitoring and evaluation (Tenywa et al. 2011). The process of IP formation has influence on processes examined in this dissertation.

Description of the Study Area

This study was conducted in Lake Kivu Region (the Great Lakes Region) where northeastern Rwanda, eastern Democratic Republic of Congo (DRC) and southwestern Uganda intersect (figure 1-1). The region is characterized by very steep slopes, a bimodal rainfall pattern, high population density and fragmented smallholder plots that are intensively cultivated (FARA 2005; FARA 2009a). The climate ranges between semi-humid (800mm per year) to humid (2000mm per year) and mild temperatures at higher elevations. The average land holding is 0.5 acres (FARA 2005). In Uganda, the study was conducted in Bubare and Bufundi sub-counties in Kabale district and Chahi sub-county in Kisoro district. In Rwanda, the study was conducted in Gataraga and Remera sub-counties in Musanze district. These sub-counties were selected by the challenge program based on the level of agricultural research for development between 2003 and 2008. These are sub-counties which have had either no or limited agricultural project interventions by NGOs or government, experience low crop and livestock production, and have poor access to markets. (Farrow,

Tenywa, and Nkonya Submitted). The challenge is to increase food production and nutrition, household incomes while conserving the natural resource base.

Figure 1-1: Map Showing Location of Uganda and Rwanda



Kabale district is located in southwestern Uganda and lies at an approximate altitude of 1,200-3000m. The district has a population of approximately 460,000 people, with 93% residing in rural areas. It is the third most densely populated rural district in Uganda after Mbale and Kisoro with overall population density of 345 persons km². Kabale has a montane climate with a bimodal rainfall pattern. The mean annual rainfall is 1,092 mm, the mean annual temperature is 18° C and the relative humidity ranges between 90-100% in the mornings and 42-75% in afternoons throughout the year (Kabale District Council 2010). It has a total area of 1827 km² of which 93% is under cultivation. An average household has 6-7 plots of land measuring 0.1-0.7 acres each, which are normally scattered on different hills. The land on hilly slopes is highly fragmented. Agriculture is the main occupation of the district with 86% of its population being subsistence farmers. The main crops grown are

potato, beans, peas and sorghum. Potato is the main cash crop but the yields have declined due to declining soil fertility from continuous cropping with no inputs, soil erosion on hilly slopes and sedimentation in lowlands (Kabale District Council 2010).

Kisoro district is located in the extreme southwestern part of Uganda and borders with Kanungu district to the North, Kabale district to the East, Rwanda to the South and the Democratic Republic of Congo to the West. The district is mountainous and hilly, lying at an altitude of 1981m. It is one of the least developed and smallest districts in Uganda with a total area of approximately 729 km² of which 662 km² is open land and the rest is open water and swamps (Kisoro District Local Government 2008). It has a population of approximately 240,000 people. The population density is 324 persons per km². The population pressure resulting from rapidly increasing population and delicate nature of landscape pose severe threats to land degradation. The district has a bimodal rainfall pattern with two rainy seasons (March to May and September to December). The annual rainfall ranges between 900-2200 mm and the deep volcano soils make the district favorable for agriculture (Tenywa and Fungo 2011). The minimum and maximum temperature is 10°C and 26°C, respectively. The relative humidity is 80%. The main economic activity is agriculture and majority of the people practice subsistence farming. The main crops grown include corn, potato, sorghum, beans and vegetables (Kisoro District Local Government 2008).

Musanze district is in the northern province of Rwanda and is the most mountainous district in Rwanda. The average altitude is 1860 m. It has the largest part of the national volcano park which occupies 60% of the district's total land area (530km²). The annual rainfall is 1400-1800mm and the average temperature is 20°C. The population in Musanze

district was estimated to be 317, 000 habitants. The population density is 593 habitants per km². The volcanoes enhance soil fertility, thereby making the district favorable for agriculture. The major crops produced are potatoes, corn, wheat, beans, bananas, fruits, vegetables and flowers. The livestock reared include cows, goats, sheep, poultry, rabbits and pigs. The high population density and the relief hinder proper cultivation and the majority of famers are subsistence (District du Musanze 2007).

Objectives, Research Questions and Hypotheses

The purpose of this research was to examine the organizational structure and exchange of information and knowledge within IPs, the factors that motivate stakeholders to participate and contextual factors which influence motivations. This study also investigated the decision-making process and factors which influence decision-making (such as knowledge, access to information, control of resources, and policy) in IPs.

Research questions

The central questions to be addressed are:

- 1a. How are IPs organized?
- 1b. Does organizational structure influence information sharing for innovation?
- 2a. What motivates different actors to participate in innovation platforms?
- 2b. Does active participation enable actors to achieve their desired goals?
- 2c. What are the factors which sustain or curtail participation?
- 3a. Does active involvement of farmers enhance prioritization of issues that address their needs?
- 3b. How do knowledge, access to information and resources influence decision- making?

- 3c. Which contextual factors influence decision-making and implementation of decisions?

Hypotheses

The hypotheses tested include:

- 1a. The level of interaction among actors within an IP is positively associated with the degree of vertical and horizontal decentralization in the IP.
- 1b. The level of trust among stakeholders is positively related to the amount of knowledge and information shared.
- 2a. Expectation of material and economic benefits positively affects the degree of actors' participation in innovation platforms.
- 2b. Active participation positively affects benefits derived from IPs.
- 2c. Lack of short-term benefits has a negative effect on continued participation of actors.
- 3a. Active involvement of farmers in decision-making enhances prioritization of issues that are of concern to farmers.
- 3b. Actors with more access to knowledge, information, and financial resources have more influence in decision-making.
- 3c. Contextual factors such as existing hierarchical structures, supportive national and local policies will influence decision-making and implementation of decisions.

Methods and Data

Data were collected from five IPs, i.e., Bubare sorghum IP, Bufundi potato IP, and Chahi potato IP in Uganda, and Isangano Gataraga potato IP and Remera maize IP in

Rwanda. This study was conducted between September-December 2010 after approval of the research protocol by the institutional review board (IRB) of Iowa State University. Data were collected using semi-structured interviews, in-depth interviews and focus group discussions. A team of researchers (including myself and research assistants) conducted semi-structured interviews with 184 farmers at parish/village level to verify information provided by their representatives at sub-county level. We randomly sampled farmers from up-to-date membership lists obtained from IP chairpersons. I conducted 34 in-depth interviews with members from the private business sector, researchers, non-governmental organization (NGO) staff, IP chairpersons, local policy makers and implementers, and extension workers. I also conducted six focus group discussions (FGDs) with farmers' representatives. The in-depth interviews and FGDS were digitally recorded and transcribed to permit detailed coding (open, axial and selective coding). I analyzed the transcribed interviews qualitatively using line by line coding to identify the major themes and categories that emerged. The Statistical Package for Social Scientists (SPSS) was used to analyze quantitative data.

Organization of this Dissertation

The dissertation is organized as follows. Chapter 2 describes the IP organizational structure and information sharing. The level of vertical and horizontal decentralization across IPs is examined. The chapter uses social capital theory to explain the factors which facilitate information sharing among IP hierarchies. Chapter 3 investigates the factors which motivate actors to participate in IPs and the role of contextual factors in influencing participation in IPs. Social exchange and social capital theories are used to examine the relationship between motivations and participation in IPs. Chapter 4 focuses on power and influence in decision-making, articulating the type of actors who have increased or gained power and participants

who do not have enough power to enact their roles and accomplish their goals. Contextual factors within which decisions are made and their influence on decision-making are also analyzed. Chapter 5 presents a summary of the empirical findings, conclusion, and implications for facilitators of innovation platforms, policy and theory as well as areas for further research.

References

- Bell, Martin. 2006. "Background Paper for the L20 Workshop on Furthering Science and Technology, March 2006." Maastricht: UNU-MERIT.
- Biggs, Stephen D. 1989. "Resource-Poor Farmer Participation in Research: A Synthesis of Experiences from Nine National Agricultural Research Systems." ISNAR, The Hague.
- Bonnen, James T. 1998. "Agricultural Development: Transforming Human Capital, Technology, and Institutions." Pp. 271-286 in *International Agricultural Development*, edited by C. K. Eicher and J. M. Staatz. Baltimore: Johns Hopkins University Press.
- Bouwen, René and Tharsie Taillieu. 2004. "Multi-party Collaboration as Social Learning for Interdependence: Developing Relational Knowing for Sustainable Natural Resource Management." *Journal of Community and Applied Social Psychology* 14:37-153.
- Consoli, Davide and Pier Paolo Patrucco. 2008. "Innovation Platforms and the Governance of Knowledge: Evidence from Italy and the UK." *Economics of Innovation and New Technology* 17:701-718.
- District du Musanze. 2007. "Plan de Development du District de Musanze 2008-2012."

- Duncan, Alan. 2011. "What is a Local Innovation Platform." *Brief 7. Retrieved from <http://www.nilebdc.org> on Jan 05 2012.*
- Engel, P. G. H. and M. L. Salomon. 1997. *Facilitating Innovation for Development: A RAAKS Resource Box*. Amsterdam: KIT Publishers.
- FARA. 2005. "Findings of the Lake Kivu Pilot Learning Site Validation Team. A Mission Undertaken to Identify Key Entry Points for Agricultural Research and Rural Enterprise Development in East and Central Africa." Forum for Agricultural Research in Africa (FARA).
- . 2007. "Sub-Saharan Africa Challenge Programme: Medium Term Plan 2008-2010." Accra, Ghana: Forum for Agricultural Research in Africa (FARA).
- . 2009a. "Sub-Saharan Africa Challenge Program (SSA-CP): Strategies and Lessons Sharing Forum." Synthesis report.
- . 2009b. "Sub-Saharan Africa Challenge Programme: Research Plan and Programme for Impact Assessment." Pp. 36. Accra, Ghana: FARA (Forum for Agricultural Research in Africa).
- Farrington, John and Adrienne M. Martin. 1987. "Farmer Participatory Research: A Review of Concepts and Practices. Discussion Paper No. 19." Agriculture Administrative Network, Over Seas Development Institute, UK.
- Farrow, Andy, Moses Tenywa, and Ephraim Nkonya. Submitted. "Selecting Sites to Prove the Concept of IAR4D in the Lake Kivu Pilot Learning Site." *African Journal of Resource Economics*.

- Flora, Cornelia B. and Jan L. Flora. 2008. "Generating Community Change." Pp. 345-376 in *Rural Communities: Legacy and Change*, edited by F. B. Cornelia and J. L. Flora. Boulder, CO: Westview Press.
- Hall, Andrew J., M.V.K. Sivamohan, Norman Clark, Sarah Taylor, and Geoffrey Bockett. 1998. "Institutional Developments in Indian Agricultural R&D Systems: The Emerging Patterns of Public and Private Sector Activity." *Science, Technology and Development* 16:51-76.
- Hall, Andrew J., Geoffrey Bockett, Sarah Taylor, M. V. K. Sivamohan, and Norman Clark. 2001. "Why Research Partnerships Really Matter: Innovation Theory, Institutional Arrangements and Implications for Developing New Technology for the Poor." *World Development* 29:783-797.
- Hall, Andy. 2005. "Capacity Development for Agricultural Biotechnology in Developing Countries: An Innovation Systems View of What it is and How to Develop it " *Journal of International Development* 17:611-630.
- . 2007. "The Origins and Implications of Using Innovation Systems Perspectives in the Design and Implementation of Agricultural Research Projects: Some Personal Observations." in *UNU-MERIT Working Paper 2007-013*. Maastricht, The Netherlands: United Nations University.
- . 2009. "Challenges to Strengthening Agricultural Innovation Systems: Where do we go from here." Pp. 30-38 in *Farmer First Revisited: Innovation for Agricultural Research and Development*, edited by I. Scoones and J. Thompson. Warwickshire: Practical Action Publishing.

- Hall, Andy, B. Yoganand, R. Sulaiman, and N. Clark. 2003. "Innovations in Innovation: Partnerships, Learning and Diversity in the Generation, Diffusion and Use of New Knowledge." in *Innovation in Innovations: Reflections on Partnership and Learning*, edited by A. J. Hall, B. Yoganand, R. Sulaiman, R. S. Rajeswari, P. Shambu, G. Naik, and N. G. Clark. Patancheru, India: CPHP, ICRISAT and NCAP.
- Hawkins, Richard, Willem Heemskerk, Robert Booth, Jon Daane, Arno Maatman, and Adewale A. Adekunle. 2009. "Integrated Agricultural Research for Development (IAR4D): A Concept Paper Prepared for Forum for Agricultural Research in Africa (FARA) and the Sub-Saharan Africa Challenge Program (SSA CP)." Accra, Ghana: FARA.
- Irvin, Renee A and John Stansbury. 2004. "Citizen Participation in Decision Making: Is It Worth the Effort?" *Public Administration Review* 64:55-65.
- Kabale District Council. 2010. "Kabale District Local Government Three Year Development Plan 2010/2011 - 2012/2013." vol. 1. Kabale: Kabale Local Government.
- Kisoro District Local Government. 2008. "The State of Environment Report for Kisoro District 2007/2008." Kisoro: Kisoro District Local Government.
- Kull, Christian A. 2002. "Empowering Pyromaniacs in Madagascar: Ideology and Legitimacy in Community-Based Natural Resource Management." *Development and Change* 33:57-78.
- Lundy, Mark, Maria V. Gottret, and Jacqueline Ashby. 2007. "Learning Alliances: An approach for Building Multi-Stakeholder Innovation Systems " Pp. 37-57 in *Learning Alliances: Scaling up Innovations in Water, Sanitation and Hygiene*, edited by S.

- Smits, P. Moriarty, and C. Sijbesma. Delft, The Netherlands: IRC International Water and Sanitation Centre. (Technical paper series; no. 47).
- Martin, Adrian and Mark Lemon. 2001. "Challenges for Participatory Institutions." *Society and Natural Resources* 14:585-597.
- McCullough, Ellen B., Prabhu L. Pingali, and Kostas G. Stamoulis. 2008. *The Transformation of Agri-food Systems: Globalization, Supply Chains and Smallholder Farmers*. Rome, Italy: Routledge.
- Mokwunye, Uzo. 2010. "Regional Review of Africa's Agricultural Research and Development." CGARD 2010.
- Mytelka, Lynn K. 2000. "Local Systems of Innovation in a Globalised World Economy." *Industry and Innovation* 7:15-32.
- Röling, Neils. 1992. "The Emergence of Knowledge Systems Thinking: A Changing Perception of Relationships Among Innovation, Knowledge Process and Configuration." *Knowledge, Technology and Policy* 5:42-64.
- . 2002. "Beyond the Aggregation of Individual Preferences: Moving from Multiple to Distributed Cognition in Resource Dilemmas." Pp. 25-47 in *Wheelbarrows Full of Frogs: Social Learning in Rural Resource Management*, edited by C. Leeuwis and R. Pyburn. Assen, The Netherlands: Koninklijke Van Gorcum.
- Selener, Julio D. 1997. *Participatory Action Research and Social Change*. Ithaca, New York: Cornell Participatory Action Research Network, Cornell University.
- Sulaiman, Rasheed V. and Andy J. Hall. 2006. "Extension Policy Analysis in Asian Nations." Pp. 23-54 in *Changing Roles of Agricultural Extension in Asian Nations*, edited by A. W. van den Ban and R. K. Samanta. Deli: B. R. Publishing Corporation.

- Swanson, Burton E. and Riikka Rajalahti. 2010. "Strengthening Agricultural Extension and Advisory Systems: Procedures for Assessing, Transforming, and Evaluating Extension Systems." The International Bank for Reconstruction and Development/The World Bank, Washington, DC.
- Tenywa, M. M., K. P. C Rao, J. B. Tukahirwa, R. Buruchara, A. A. Adekunle, J. Mugabe, C. Wanjiku, S. Mutabazi, B. Fungo, I. N. Kashiya, Pamela M. Pali, S. Mapatano, C. Ngaboyisonga, A. Farrow, J. Njuki, and A. Abenakyo. 2011. "Agricultural Innovation Platform As a Tool for Development Oriented Research: Lessons and Challenges in the Formation and Operationalization." *Learning Publics Journal of Agriculture and Environmental Studies* 2:117-146.
- Tenywa, Moses and Bernard Fungo. 2011. "Facilitating Farmer-Market Linkages Increased Adoption of Maize Technology in Chahi, Southwestern Uganda." *Agricultural Journal* 6:201-206.
- World Bank. 2007a. *Enhancing Agricultural Innovation: How to Go Beyond the Strengthening of Research Systems*. Washington, DC: The International Bank for Reconstruction and Development / The World Bank.
- . 2007b. *World Development Report 2008: Agriculture for development*. Washington DC: The International Bank for Reconstruction and Development / The World Bank.

CHAPTER 2. ORGANIZATIONAL STRUCTURE AND INFORMATION SHARING WITHIN INNOVATION PLATFORMS

Manuscript prepared for submission to the *Journal of Development Studies*

Abstract

There is growing interest in design and implementation of innovation platforms (IPs) for agricultural research to improve farmers' livelihoods. The study examined the relationship between organizational structure and interaction among diverse stakeholders within five IPs in the Great Lakes Region of Africa. Data were collected in Uganda and Rwanda Sept.-Dec. 2010 through semi-structured interviews, in-depth interviews and focus group discussions. The structure of IPs evolved over time to form decentralized clusters for innovation at different implementation levels. Size, age of IP, and nature of landscape determined the extent of vertical and horizontal decentralization. IPs that were highly decentralized both vertically and horizontally demonstrated high knowledge and information sharing among actors. This was enhanced by social capital, which motivates actors to exchange knowledge and information. Less vertically and horizontally decentralized IPs had less effective two-way information flow. Farmer representatives who directly accessed critical information and knowledge controlled the distribution of knowledge and information.

Introduction

There is increased interest in the past decade in design and implementation of innovation platforms (IPs) for agricultural research in order to generate research output that directly responds to the needs of smallholder farmers. An IP is an arrangement in which a set

of relatively interdependent stakeholders are identified and - usually through representatives - invited to meet and interact in a forum for conflict resolution, negotiation, social learning and collective decision making towards concerted action (Röling 2002). In this study, an IP is defined as a forum in which multiple actors with meaningful interests in a common issue collaborate in identification of agricultural problems, share and develop new ideas to better solve those problems, and implement creative solutions to improve livelihoods. The words actors and stakeholders are used interchangeably.

Scholars argue that the organization of agricultural research and extension is the major reason why agricultural research and development projects have failed to improve livelihoods of resource poor farmers (Hall 2007). The traditional agricultural research and extension approach follows a linear approach in which researchers and experts produce new knowledge and technology, and then transfer it to the end users who need it to innovate and change. The approach lacks interaction among different knowledge sources, and there is limited appreciation of local and indigenous knowledge (Lundy et al. 2005).

Improving the effectiveness of agricultural research requires complementary organizational, and policy changes so that research outputs are put into productive use. Approaches that elicit information and knowledge from farmers and promote feedback loops are seen as alternatives to the linear approach (Hall 2007). In addition, better ways of integrating indigenous knowledge with scientific knowledge through interactive processes of innovation are required (Bell 2006). If agricultural research projects are to be successful in bringing about social and economic change, more partners along a value chain need to be included (Hall et al. 1998; Duncan 2011). Engagement of multiple knowledge sources

requires dedicated coordination of activities and knowledge to generate and sustain complementarities across diverse competences (Ekboir et al. 2009; Hawkins et al. 2009).

The sub-Saharan African Challenge Program (SSA-CP) has responded to the need for pro-poor oriented research involving diverse partners by designing and implementing an Integrated Agricultural Research for Development (IAR4D) approach. In this approach, IPs are used as forums for involvement of multiple actors (rural communities, researchers, extension agents, development specialists, traders and processors, wholesalers and retailers, and policy makers) to identify and conduct pro-poor oriented research (FARA 2007). IPs are seen as a significant improvement over the linear, less inclusive and less interactive traditional agricultural research and extension approach.

IPs are believed to facilitate integration of perspectives, knowledge and actions of different stakeholders around a common issue and foster learning through interaction (Hawkins et al. 2009). Organizing effective patterns of interaction between diverse knowledge sources is the central principle for innovation systems because it's through interaction that important pieces of information and ideas are brought together to facilitate innovation (Hall 2007). Therefore, IPs present an interesting setting for exploring the relationship between structure and information sharing among actors.

However, 'innovation platform' is a relatively new concept in agricultural research for development. There is limited knowledge and understanding of how best to organize IPs to facilitate numerous and multi-directional interaction among diverse stakeholders to collectively generate, share and utilize knowledge to address the needs of smallholder

farmers. Lack of this information limits the ability of researchers, development practitioners and policy makers to design and implement strategies that build trust, foster interaction and coordination among diverse actors. The purpose of this research was to examine the structure and the exchange of information and knowledge among multiple actors by studying five IPs in the Great Lakes Region of Africa. The two central questions to be addressed are:

1. How are IPs organized?
2. Does organizational structure influence information sharing for innovation?

This paper uses social capital theory to explain the relationship between structure and information sharing within IPs. Key elements of structure include centralization, decentralization, formalization and complexity. The paper focuses on centralization and decentralization.

I hypothesize that IPs which are highly decentralized (both vertically and horizontally) have higher levels of interaction among stakeholders. The innovation sub-clusters¹ and high frequency of interaction between farmers and their representatives facilitate information sharing. This is enhanced by a high level of trust among stakeholders at different implementation levels. This analysis contributes to innovation systems theory by proposing effective ways of organizing innovation systems that enhance information and knowledge exchange. The study also contributes to organization theories by critically

¹ An innovation cluster consists of groups of actors with different expertise who gather together to share information and knowledge to address common issues in an entire value chain. An innovation sub-cluster is a group of actors with similar characteristics. It's a subset of an innovation cluster.

examining the structure of IPs that stimulate and promote knowledge and information exchange. This information can be utilized by policy makers and conveners of IPs to design and implement strategies that facilitate interaction and learning among multiple actors, and to modify the current linear approaches of agricultural research. The paper may have practical implications for conveners and members of IPs to design structures, which facilitate information sharing among stakeholders along a value chain. The paper also has policy implications for policy makers in reforming agricultural research that promotes inclusion of the scientific and non-scientific communities in research.

This paper is organized as follows. The second section presents an overview of the sub-Saharan Africa Challenge program and IPs. Section three discusses organizational structure, knowledge and information exchange. Section four characterizes the methods and data. Lastly, section five articulates the conclusions and implications.

The sub-Saharan Africa Challenge Program and Innovation Platforms

The SSA-CP designed and is piloting a systems-based IAR4D approach as an alternative to the linear, less interactive traditional agricultural research and extension approach. The goal is to address low agricultural production caused by a set of factors: use of unimproved seeds and improper agronomic practices; low soil fertility resulting from a degraded natural resource base; failure to link agricultural production to markets; and inadequate and inappropriate policies (Mokwunye and Ellis-Jones 2010). The program was initiated in 2004 and operates in eight countries in three pilot learning sites in Africa (Lake Kivu region in east Africa, Zimbabwe-Mozambique-Malawi in southern Africa and Kano-Katsina-Maradi in west Africa). This study was conducted in Lake Kivu Region (the Great

Lakes Region) where northeastern Rwanda, eastern Democratic Republic of Congo (DRC) and southwestern Uganda intersect.

In this region, 12 IPs – each with a specific value chain - were established (four in each country). Seven of the IPs were established during the last quarter of 2008 and five in the first quarter of 2009. The process of visioning and stakeholder analysis was either research-led or market-led. The older IPs used the research-led approach in which stakeholders were sensitized about the agricultural problems and how they could contribute to resolving the problems. In the newer IPs, the market-led approach was used in which stakeholders were introduced to the available market opportunity and organized to access that market (Tenywa et al. 2011). Actors in an IP work in partnership to bring about desired changes, are technically competent, and have incentives to jointly innovate to address problems along the entire value chain (FARA 2009a).

IPs were organized at sub-county level² based on common challenges to provide opportunities for collective action, reflection and learning. The IPs are facilitated by a team of interdisciplinary scientists (Task Force) to bring together stakeholders along the production to consumption continuum, possessing a diverse range of knowledge and skills regarding principles of mutual learning, resource sharing and knowledge management. IP address issues concerning productivity enhancing technologies, marketing strategies, natural resource management and enabling policies (FARA 2007).

² Sub-county is the third political administrative unit in Uganda and Rwanda. The sub-county is subdivided into parishes or cells. Parishes contain villages, the lowest political administrative units.

IPs have an Executive Committee (with chair, vice chair, secretary, treasurer and committee members representing groups from different parishes) supported by sub-committees which focus on marketing, research, finance, natural resource management, and monitoring and evaluation. The Executive committee, together with other actors, meets at sub-county level and makes operational decisions, e.g., developing the agenda, convening IP meetings, and following-up on decisions made (Tenywa et al. 2011). The governance structure at sub-county level is paralleled at lower implementation levels to ensure proper coordination of activities among levels. A cross-site research support team (CRST) builds the capacity of IP members by providing technical support in key areas, i.e., increasing production, access to markets, natural resource management and policy (FARA 2009b). In the next section, I discuss organizational structure and information sharing.

Organizational Structure

Organizing systems of innovation places emphasis on creating patterns of organization that foster information flow for decision-making. Some of the patterns are formed when the system is defined, and some emerge in the process of learning (Hall 2007). Organizational structure is not fixed for all the time. Structure emerges from interaction, but over time it tends to influence interactions (Giddens 1984). Structure is conceptualized as the arrangement of individuals in groups, and groups in networks, with special emphasis on patterns of interaction and information exchange among these components (O'Reilly and Roberts 1977). The 'arrangement' should be capable of coping with a rapidly changing environment in which sudden events can change established patterns of identity, organizational culture, routine and capabilities (Ciborra 1996; Hawkins et al. 2009). When

individuals are grouped and arranged in a certain way, they behave differently from a group structured in a different way (Becker and Baloff 1969).

Previous studies have revealed organizational structure as one of the most important factors influencing innovation capabilities. Group structure influences group processes such as communication, coordination, leadership, political processes and power (Ekboir et al. 2009). Structure affects information and knowledge exchange, which consequently affects performance. To enhance performance of the innovation system, proper coordination is needed in the process of negotiating and implementing action plans (Daane et al. 2009).

Existing literature presents two models of organizational structure, i.e., the mechanical and organic structure. Organizations with a mechanical structure are more centralized, formalized and specialized. The organic structure is more decentralized, less formalized, with low levels of specialization (Damanpour and Gopalakrishnan 1998; Ekboir et al. 2009; Olson and Eoyang 2001). The organic structure is built on confidence that all actors in their positions have the ability to make informed decisions unlike the mechanical structure which does not reflect trust in the capability of people at lower levels (Olson and Eoyang 2001). This paper focuses on centralization and decentralization.

Centralization and Decentralization

Centralization is “the level and variety of participation in strategic decisions by groups relative to the number of groups in the organizations” (p. 65). Centralization and decentralization are not absolute but two ends of a continuum. A more centralized structure has greater coordination but less flexibility (Hall and Tolbert 2005). A centralized structure is

essential for understanding the knowledge structures since it captures the pattern and direction of knowledge flow within the organization (Rulke and Galaskiewicz 2000). However, in centralized structures, critical knowledge and information is shared among a small number of individuals (Gigone and Haste 1993). Centralized structures concentrate decision-making authority in a small number of individuals at the higher levels of the hierarchy (Tsai 2002). Centralization limits participation in decision making thus reducing communication, commitment and involvement with tasks among members (Damanpour 1991; Rogers 2003; Sivadas and Dwyer 2000).

Decentralization refers to the extent to which decision-making power is concentrated in a few positions or dispersed throughout the organization. Decentralized structures have few layers of organization hierarchy to foster quick response and a high level of vertical and horizontal communication to ensure coordinated action (Koufteros and Vonderembse 1998). Decentralized structures increase the amount of information available (Rogers 2003), and enhance communication, interpersonal exchanges and social interactions for information and knowledge exchange. Decentralized groups with minimal hierarchies have maximum knowledge and information flow (Albrecht and Ropp 1984). Decentralized structures have a number of communication channels which enhance access to information (Forsyth 2010; Rogers 2003). However, organizations may face problems integrating ideas coming from different members (Hall and Tolbert 2005). The nature of decentralization depends upon who is able to exercise power, and the accountability relations to which they are subject. If powers are decentralized to actors who are not accountable to their constituents, or who are only accountable to themselves or superior authorities within the structure, then the interests of the constituencies are less represented. It is only when constituents come to exercise

accountability as a countervailing power that decentralization is likely to be effective (Agrawal and Ribbot 1999). Constituencies would be able to stop or reverse a decision/action which does not meet their interests.

Mintzberg (1979) further distinguishes organizational structure into horizontal and vertical centralization and decentralization. Vertical and horizontal centralization is where power is concentrated in the hands of a single individual at the top of the hierarchy. Vertical decentralization is where decision-making power is distributed to managers down the hierarchy of authority. Horizontal decentralization is the extent to which decision making is distributed among non-managers at the same level (Mintzberg 1979). This paper adapts Mintzberg's classification of vertical and horizontal decentralization. In this study, vertical decentralization refers to distribution of decision-making roles to lower level innovation clusters (parish/village level innovation clusters). Horizontal decentralization refers to distribution of decision-making roles to innovation sub-clusters at the parish/village levels.

Information flow depends on the structure and quality of social networks. Horizontal networks are effective in persuading peers, support construction and the re-framing of meaning about a practice or technology. Vertical networks are more effective in diffusing codified information and authoritative decisions (Deroian 2002). Horizontal communication processes help to generate internal consensus through guided discussions, easing the transition from an individual to a shared organizational vision. These processes generate collective or organizational knowledge (Ekboir et al. 2009). Organizations often face information distortions which negatively affect performance. Information distortion may result from unavailability of information, incorrect communication, unavailability of agents

expected to solve a problem, or lack of appropriate communication channels. The effect of information distortion on centralized or decentralized structures depends on the task environment and contextual factors (Carley and Lin 1997).

Organizational characteristics such as size and age influence organizational structure. Size significantly determines the level of centralization and decentralization. Larger organizational size puts more pressure on top management, thereby leading to increased delegation of roles or decentralization (Hall and Tolbert 2005). In addition, structure reflects the age of the organization. As organizations grow, they change structural features that may improve performance. However, age alone may not explain change in structure. Other factors such as environment, economic and technical conditions influence organizational structure (Mintzberg 1979).

Interaction and information sharing

In innovation systems, emphasis is placed on fostering active interaction among diverse stakeholders and enhancing human capacity to continuously innovate to be able to adapt to changing social, economic and environmental conditions (Hall, Mytelka, and Oyeyinka 2005). The ability to effectively transfer knowledge among individuals within an organization is critical to the processes and outcomes of an organization (Szulanski 1996). Previous studies have recognized the importance of social interaction in information and knowledge sharing among individuals. Interaction among individuals within groups and organizations may build trust (Granovetter 1985; Maskell 2000). Frequent interaction increases the level of trust and enables actors to know each other, share information, and create a common understanding (Maskell 2000; Tsai and Ghoshal 1998).

Knowledge and information sharing is enhanced by trust and mutual understanding among members (Bouty 2000; Levin and Cross 2004). The existence of trust among parties fosters willingness to engage in cooperative interaction (Nahapiet and Ghoshal. 1998). Where the level of trust among actors is high, actors are more motivated to exchange knowledge and cooperate (Putnam 1993). The networks, norms and trust inherent in social relations among individuals within a group can foster cooperation and information exchange both within and between groups (Flora and Fora 2008). To build the necessary level of trust among stakeholders, representation, inclusiveness and transparency are very critical. Involvement of stakeholders in meaningful dialogues in which they feel ownership and the possibility of deriving benefits fosters acceptability of activities (Burger and Claudia 2003).

Effective interaction among stakeholders depends on two-way exchange of information and knowledge (both tacit and codified). Two-way information flow is often constrained by poor networks, coordination among stakeholders (World Bank 2007) and language (Critchley, Verburg, and Veldhuize 2006). Information sharing is also constrained by lack of personal motivation to share knowledge (Stenmark 2001). The increasing value given to knowledge and the persons possessing the right kind of knowledge create perceptions of power around knowledge. If individuals realize that their power results from the knowledge they possess, it limits knowledge sharing (Davenport and Prusak 1997; Gupta and Govindarajan 2000). Differences in power and status among actors within an organization are likely to inhibit the rate of feedback communications between levels and as the social distance between organizational levels increases, free flow of information decreases (Barnard 1946). On the other hand, reciprocity facilitates knowledge sharing if

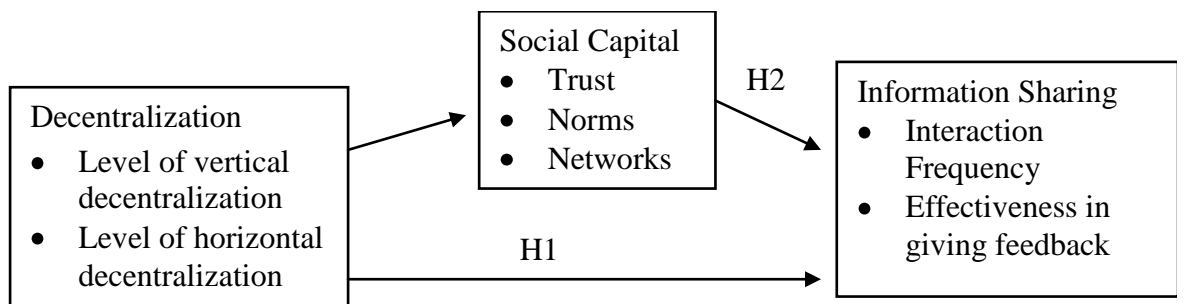
individuals perceive that the status given to them depends on the knowledge shared (Hendriks 1999; Weiss 1999) and if they perceive it as worthwhile to share knowledge with others (Schultz 2001).

Hypotheses tested

H1: The level of information sharing among actors within an IP is positively associated with the degree of vertical and horizontal decentralization in the IP

H2: The level of trust among stakeholders is positively related to the amount of knowledge and information shared

Figure 2-1: Relationship between structure and information sharing

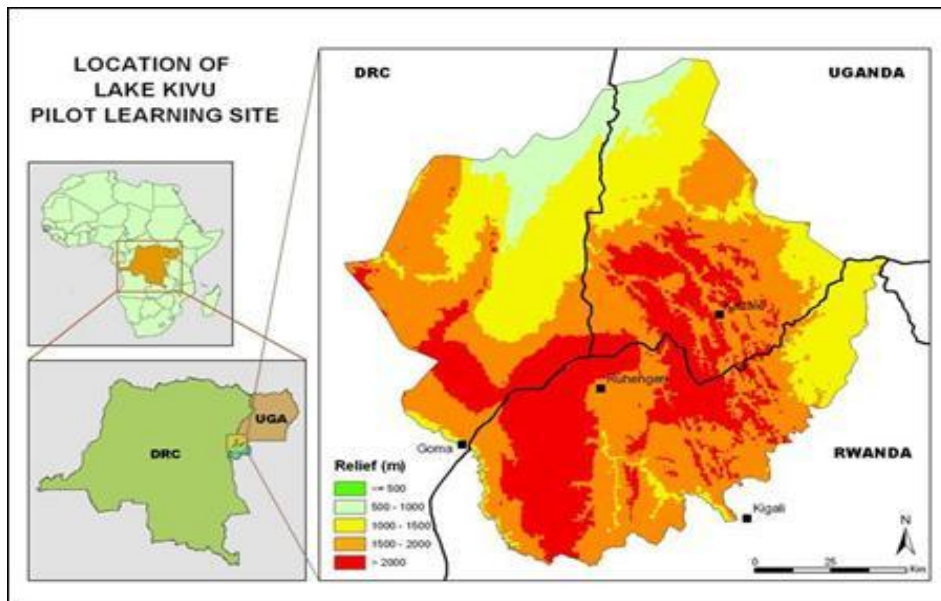


Methods and Data

The study was conducted in Uganda and Rwanda, two of the three sub pilot learning sites (PLS) in Lake Kivu Region between September-December 2010. The region is characterized by very steep slopes, a bimodal rainfall pattern, high population density and fragmented smallholder plots that are intensively cultivated (FARA 2005; FARA 2009a). The nature of the terrain affects interaction between IP members and consequently

information and knowledge sharing. In Uganda, the study was conducted in Bubare and Bufundi sub-counties in Kabale district and Chahi sub-county in Kisoro district. In Rwanda, the study was conducted in Gataraga and Remera sub-counties in Musanze district. Figure 2-2 shows the location of Rwanda and Uganda.

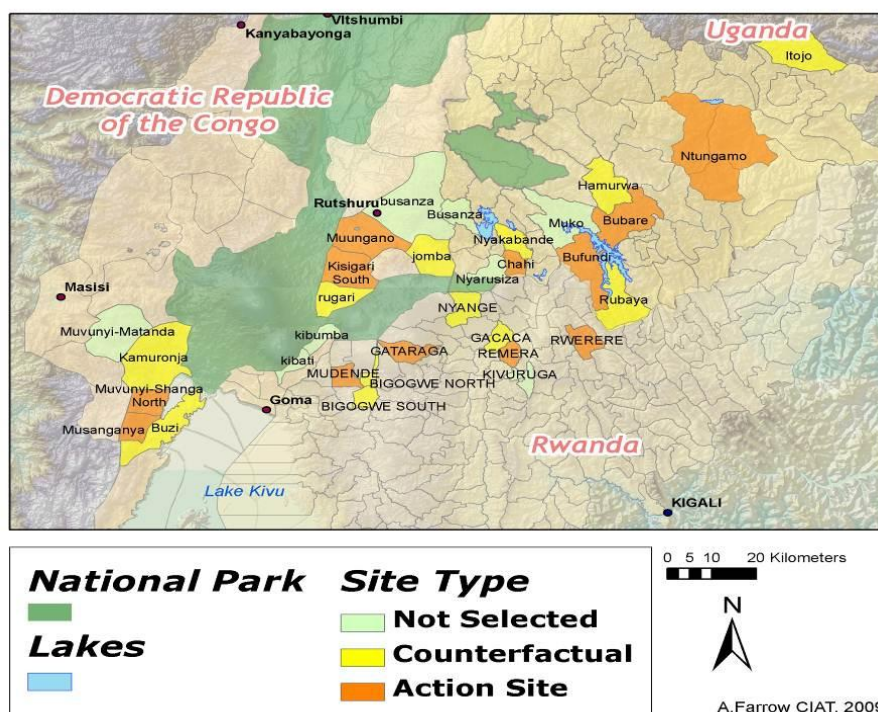
Figure 2-2: Map of Africa showing location of Rwanda and Uganda



Five of the 12 IPs in the region were studied to reflect the variation in organizational structure and interaction. The IPs studied were Bubare sorghum IP, Bufundi potato IP, and Chahi potato IP in Uganda, Isangano Gataraga potato IP, and Remera maize IP in Rwanda. Selection was based on date of formation, enterprise of focus, and approach of formation (Table 2-1). Figure 2-3 shows the location of IP studied.

Table 2-1: Characteristics of the Selected IPs

Country	Name of IP	Date Formed	Membership		No. of parishes	Approach	Sample
			Male	Female			
Uganda	Bubare sorghum	Sept. 2009	83	96	6	Market-led	42
	Bufundi potato	Nov. 2008	65	77	5	Research-led	42
	Chahi potato	Nov. 2008	62	77	3	Research-led	43
Rwanda	Isangano Gataraga potato	Nov. 2008	160	98	4	Research-led	41
	Remera maize	Sept. 2009	29	27	4	Market-led	16

Figure 2-3: Map Showing Location of IPs in Lake Kivu Region

Source: (Farrow, Tenywa, and Nkonya (Submitted))

Data were collected using survey, in-depth interviewing and focus group methodologies to triangulate the information to improve its validity and reliability (Verschuren and Doorewaard 1999). The research protocol was approved for human subjects

quality assurance by Iowa State University's Institutional Review Board. I recruited research assistants from Uganda and Rwanda and trained them in data collection. Before participating in data collection, research assistants completed the online training on the protection of human research participants. My research assistants and I interviewed 184 farmers at the lower implementation level (parish/village level) to verify information given by their representatives at sub-county level. We used semi-structured questionnaires, which we pre-tested with 15 IP members to ensure the effectiveness of the instrument. Up to date lists of IP members were obtained from the IP chairpersons and we randomly sampled from those lists. Semi-structured interviews generated information about: (1) IP representation, (2) effectiveness of representatives in giving feedback, (3) frequency of interaction between respondents and their representatives, (4) type of information received and whether information was delivered in a timely manner and (5) participation in decision-making. We used checklists with in-depth interviews and focus group discussions (FGDs) to explore issues about the structure of the IP, how it changed over time, and interactions among actors at the different implementation levels.

I conducted 34 in-depth interviews with private business operators, researchers, NGO staff, IP chairpersons, local policy makers/implementers and extension workers. We conducted six FGDs with farmers' representatives. Interviews were conducted in English and local languages. In-depth interviews and focus group discussions were digitally recorded and transcribed to permit detailed coding (open, axial and selective coding). I developed the initial codes through line-by-line coding. I used the Statistical Package for Social Scientists (SPSS) to analyze quantitative data from household surveys. I operationalized structure in a

way that captured variation in the vertical and horizontal dimensions. Vertical decentralization was measured by the extent to which members in lower level innovation clusters were involved in decision making. Horizontal decentralization was measured by the involvement of innovation sub-clusters in decision-making. Information sharing was operationalized in terms of the frequency of interaction with representatives, and feedback exchanges. The following section discusses the findings from the study.

Results and Discussion

a) Characteristics of farmer respondents

A slight majority of respondents were female (54%), with Chahi potato IP being the most female dominated. In contrast, most (63%) respondents in Isangano Gataraga potato IP were male. The chi-square test shows a significant difference in sex of respondents across IPs ($p=0.027$), which could partially explain variation in interaction. The median age of respondents was 45 years ($Q1=35$ and $Q3=52$) and the modal age category was 18-39 (35%). Gataraga had more members in the lower age category, while Remera had more members above age 50. The chi-square test indicates a significant difference in age across the IPs ($p=0.006$). This might partially explain variation in information sharing among IP members. Most of the respondents had attained a primary level of education (68%). Compared to other IPs, Isangano Gataraga potato IP had more members who had attained secondary education (39%). The level of education could influence knowledge and information exchange among actors within IPs.

b) Organizational Structure and Information Sharing

(i) Organizational structure

All the IPs were initially organized using a decentralized cluster approach. The structure of older IPs had evolved since inception in 2008. At inception, the older IPs (i.e., Bufundi, Chahi and Isangano Gataraga potato IPs) had innovation clusters at two implementation levels, i.e., the strategic and operational levels. The strategic level involves executives of participating organizations who develop strategies to promote innovation along a given commodity chain at national level and also influence policy. Actors at the strategic level also facilitate activities at the operational levels. At inception, all actors met at the core operational level (i.e., the sub-county innovation cluster) to identify research issues, explore opportunities, identify solutions, develop action plans, and implement solutions.

At the time of the study, two of the older IPs (Bufundi and Gataraga) had undergone a process of re-structuring by creating innovation sub-clusters at parish/village levels to facilitate effective knowledge and information sharing among members, and coordination of activities (Figure 2-4). This was attributed to the size of IPs (in terms of membership and size of parishes), nature of landscape, distance to meeting venue and poor infrastructure (mostly mentioned by Bufundi IP members), which made information and knowledge sharing inefficient. Bufundi sub-county had the poorest transportation and telecommunication infrastructure of all the sub-counties. Some of the farmers interviewed reported that:

At first, we had a demonstration and when we used the demonstration for the parish, people failed to turn up because they complained that the demonstrations were very far. So when we came back, we had to form groups that are nearby (FGD participant, Bufundi, Nov. 12, 2010)

Because Gataraga is large, we divided it into groups. Farmers are trained and do field demonstrations in those groups. In each group, we divided into other smaller groups called PIP [Pepiniere d'innovation de Plate-forme] made of 5-7 persons. We did this because it is easier to work when you are in small

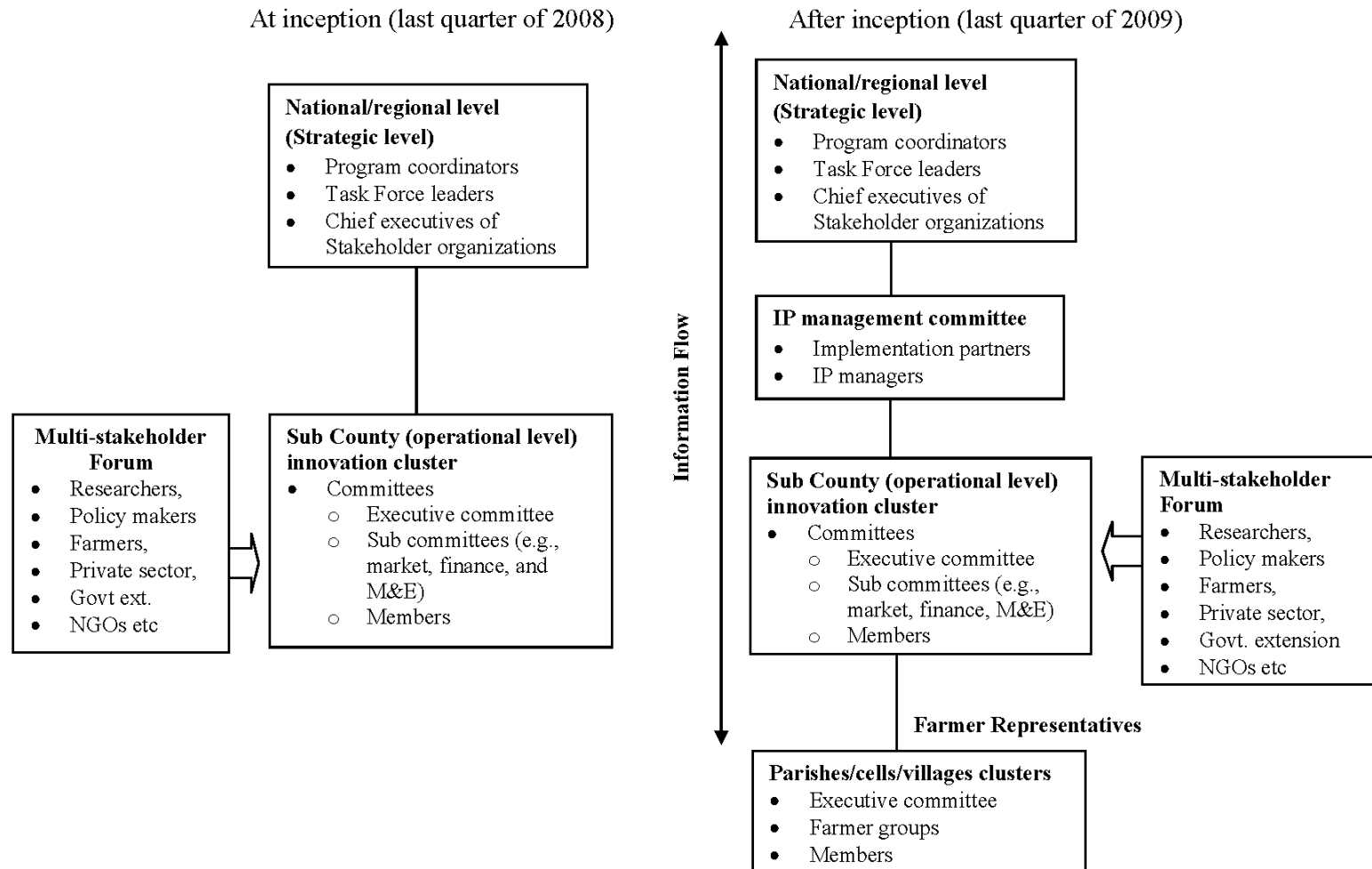
numbers than to work when you are in a big group (FGD participant, Gataraga, Dec. 17, 2010)

It was not effective. It was tiresome for farmers. In the meetings at the sub-county, we had refreshments so we were about 120 and in such gathering it was big for the Challenge Program, including inconveniencing farmers. So, we said let's come down to the parish. Maybe it will be more participatory. And it is participatory. At least in my parish, the turn up is good (farmer, Chahi, Nov. 19, 2010)

In addition, the training conducted by SCAPRI project (Strengthening of University Capacity for Promoting, Facilitating and Teaching Rural Innovation Processes) to sensitize farmers about the concept of IPs led to the re-organization of IPs. The training was directly provided only to Ugandan IPs, but the knowledge was scaled-out through meetings to IPs in Rwanda and Democratic Republic of Congo.

There was a difference in the level of decentralization (horizontal and vertical) between the older and newer IPs. Isangano Gataraga and Bufundi potato IPs were further decentralized through formation of innovation clusters at parish/village level (vertical decentralization) and innovation sub-clusters within parishes/villages (horizontal decentralization). Farmers in Isangano Gataraga potato IP were organized into groups at parish/village level composed of 20-30 members (vertical decentralization) and each group was further sub-divided into smaller innovation clusters called *Pepiniere d'innovation de Plate-forme (PIP)* (horizontal decentralization). Each PIP was composed of 5-7 farmers.

Figure 2-4: Overall Structure of IPs at Inception and After Inception



Similarly, Bufundi IP had innovation sub-clusters at parish/village level (horizontal decentralization). They were organized into groups based on the technologies to be promoted. The innovation sub-clusters formed concerned soil and water conservation (also called *fanya chini* and *fanya juu* group), bean production, potato production, livestock production and agro-processing. These sub-clusters were formed to increase access to information by farmers who lived far from the originally centralized demonstration plots, strengthen group cohesion and increase performance. Bubare Sorhum IP, Chahi potato IP and Remera maize IP did not have smaller innovation sub-clusters at parish/village level. However, they had individual farmers who hosted technologies in demonstration plots. This could be attributed to the size and age of IPs, with larger and two of the older IPs (Bufundi and Gataraga potato IPs) having more innovation clusters and sub-clusters:

The re-structuring of sub-county IP was due to the number of members which was big to contain at sub-county level, like in the meetings. Per now, we have reached the parish level and the numbers are still minimal. That is why we've not gone to village level (FGD participant, Chahi, Nov. 17, 2010)

Since two of the three older IPs had re-structured to form innovation sub-clusters, it implies that age alone may not necessary influence structure of IPs. Size and nature of landscape are major determinants of organization structure. However, there might be no optimum size of an IP since new stakeholders with relevant skills and opportunities are continuously identified while other members may withdraw. As group size increases, the range of abilities, knowledge and skills that are available to the group increase. However, organizational problems increase due to the greater number of potential interpersonal relationships. Larger group size inhibits participation of group members, decreases the rate of

communication and interpersonal attraction (Shaw 1976), and management of information becomes a challenge (Goetsch and McFarland 1980). Therefore, larger groups are more likely to form sub-groups (Shaw 1976). Table 2-2 presents a summary of structural characteristics based on where decisions are made.

Table 2-2: Summary of Structural Characteristics of IPs

Name of IP	Vertical Decentralization of Innovation Clusters			Horizontal Decentralization		Degree of Decentralization	
	Sub-County	Parish	Village	Parish / Village groups	Parish / Village sub-groups	Vertical	Horizontal
Bubare Sorghum	✓	✓				Low	Low
Bufundi Potato	✓	✓	✓	✓		High	Moderate
Chahi Potato	✓	✓				Low	Low
Gataraga potato	✓	✓	✓	✓	✓	High	High
Remera Maize	✓	✓				Low	Low

Decision-making

Decisions were made collectively within clusters at the different implementation levels and decisions that could not be made at lower levels were forwarded to the sub-county innovation cluster, e.g., decisions concerning bylaws³ for natural resource management.

³ Bylaws are rules made by lower local government councils at village (LC1) and sub-county level (LC3) and provide the local policy guidelines to be followed in sectoral developments, such as agricultural and natural resource management. Bylaws for natural resource management are now seen as viable alternatives for enforcing government policies and rectifying their inefficiencies (Sanginga et al. 2004). Policies refer to laws, rules and regulations from public or state or collective decision-making (Means et al. 2002).

We usually identify issues in meetings. Mainly, we focus on issues raised in reports from parishes. From the parish reports, we identify areas or problems to discuss... Issues are prioritized in our meetings at sub-county level. We collect a number of ideas (farmer, Bubare, Nov. 7, 2010)

The sub county executive makes decisions. The decisions are made annually. During monthly meetings in Parishes, members express their needs. What they cannot solve, is taken to the sub-county. Things like money or penalty can be solved at parish level (local policy implementer, Chahi, Nov. 18, 2010)

Identification of problems starts at the PIP. They present their problems to the group. The group makes decisions. These problems are then presented in the meeting involving all groups in the IP (FGD member, Gatarga, Dec. 12, 2010)

The sub-county innovation cluster was the hub where information collected from all other clusters was processed, decisions are made and feedback is given to the members in other clusters. Decisions concerning stakeholders to bring on board were made within the sub-county innovation cluster and decisions such as problems to address, and use of membership fee were made at both the sub-county and parish/village innovation clusters.

One of the participants emphasized involvement of stakeholders in decision-making as a principle of IAR4D, which reflects the potential of IPs to promote participatory decision-making. Involvement in decision-making encourages actors to willingly share information and knowledge.

IAR4D [Integrated Agricultural Research for Development] talks about involving all relevant stakeholders in decision-making...it's the people who come to those meetings to discuss the problems and solutions and decide who to bring on board. The list of stakeholders is finalized by the people who come to these meetings. It's not the site coordinator or anybody else who says let so and so come on board (researcher, Kabale, Nov. 29, 2010)

The results indicate that different types of decisions were made at different implementation levels. Individuals at higher levels made decisions that had more influence.

For instance, in Rwanda the local government made decisions concerning land use and major crops to grow in particular areas. This could be attributed to variation in the political environment. In Uganda, IP decisions on by-laws were made with the involvement of other actors, although dominated by local government officials since it was their role to implement by-laws.

In the meetings, everybody has the right to speak. We make decisions democratically. All members participate in decision making but the big decision is made by RADA [Rwanda Agricultural Development Authority] (extension worker, Musanze, Dec. 17, 2010)

This implies that although IPs were decentralized, there was a degree of centralization since decisions with major impact were made by individuals at the top of the hierarchy.

Representation

Farmer representatives served as the link between innovation clusters at sub-county and parish/village implementation levels. On the other hand, IP managers linked the sub-county innovation cluster and the national/region innovation cluster. Representatives were responsible for transferring information and knowledge both vertically and horizontally. Overall, most (76%) of the respondents across the IPs reported that their representatives were voted by farmers (57% in Bubare sorghum IP, 65% in Bufundi potato IP, 88% in Chahi potato IP, 92% in Gataraga IP and 92% in Remera IP). However, the chi-square test indicated a significant difference in knowledge on selection of representatives ($p=0.013$). About 31% of the respondents from Bubare IP did not know how their representatives were selected. This influences the interaction between farmers and their representatives, thereby affecting vertical and horizontal knowledge and information sharing.

These findings support the literature on multi-stakeholder processes. Ensuring representation is recognized as a challenge in facilitating multiple actor learning systems (Edmunds and Wollenberg 2001). In system-wide processes of creating change, most of the actors who participate are representatives who are supposed to represent their constituencies, such as villages. However, representatives are not elected by the constituencies that they represent. They are appointed through traditional forms of governance or authority, and often are not accountable to their constituencies (Groot et al. 2002).

The number of farmer representatives ranged between one and four based on the size of group (membership), size of parish (no. of villages) and number of issues to be raised. More than one-half (58%) of the respondents reported having only male representatives, 19% had only female representatives, and 17% had both male and female representatives; some respondents did not know their representatives. Poor representation of women in leadership was attributed to the high level of illiteracy among women and absence of women in meetings during election.

Men occupy most of the positions in the IP because majority of the women are illiterate. Men also have the capacity to lead because they are educated (FGD participant, Chahi, Nov. 17, 2010)

We have eight parishes and each has two representatives. Some are represented by male and females. Where you find males only, during the meeting at the sub-county, only men attended that meeting (farmer, Bubare, Nov. 7, 2010)

Women from this region are not civilized because they live close to the volcano forest. They do not like to go to the sub-county. They are afraid of leadership (farmer, Gataraga, Dec. 17, 2010)

Although women may be well represented as group members, they have a weak representation in leadership positions and the number is lower as one moves from lower to

upper tiers. The few women leaders at higher levels also have limited ability to effectively represent the interests of grassroots women. Therefore, concerns of women are not voiced strongly. Consequently, women farmers may not significantly experience the benefits of organized action. Involvement of women in decision-making enables them to raise their concerns and ensure that they are addressed (Penunia (2011).

Involvement of women in collective action poses challenges to women themselves and facilitators. Women's productive and reproductive roles constrain their active participation. Women experience pressure from the external environment and may lack household support due to culture that hinders them from going to public places. Facilitators may also lack effective tools and facilities that encourage participation of women. Participation of women can be encouraged by bonding social capital at both household and community level (Aleman and Flora 2003).

(ii) Knowledge and information sharing among actors

There was a hierarchical flow of information between implementation levels where information flowed from lower level innovation clusters to upper level clusters and vice versa. Information and knowledge were mainly shared through meetings held at the different implementation levels.

We share information through meetings. Reports are brought by representatives. Parish representatives take information from sub-county to parishes and from parishes to sub-county (farmer, Bubare, Nov. 7, 2010)

The information is brought by the parish representatives to the sub-county meetings. This system of information flow has its own shortfalls...some of their representatives do not communicate (trader, Kabale, Nov. 16, 2010)

As a rule, IP members at the different implementation levels had to meet once each month. Results from the survey revealed that some (22%) farmers interacted face-to-face with their representatives weekly, most (69%) interacted monthly, and only a few (9%) interacted yearly to share information. The chi-square test did not show any statistically significant effect of age ($p=0.692$), sex ($p=0.312$), marital status ($p=0.769$) or membership in organizations ($p=0.453$) on face-to-face interaction among farmers and their representatives. However, there was a significant difference in level of education and the frequency of face-to-face interaction among farmers and their representatives ($p=0.036$). Results from in-depth interviews with key informants revealed that in Remera maize IP the educated members did not want to interact with farmer representatives because they thought farmers did not bring in any new knowledge:

The educated women and men influence mobilization as they tell IP members that we are not bringing in any new knowledge. They only want to hear from partners and not farmers. They think partners have more knowledge than farmers (extension worker, Remera, Dec. 21, 2010)

In addition, the current structure constrained interaction of farmers in the parish/village innovation clusters with diverse actors who were thought to have better knowledge. Lack of interaction with other actors was strongly emphasized as a pitfall of the current structure of IPs, especially among members of Bubare, Remera and Bufundi IPs.

The challenge is that farmers want to see partners and talk face to face. They minimize the knowledge and information that representatives bring to them. They claim that they are not bringing in any new knowledge (extension worker, Remera, Dec. 21, 2010)

The current structure is not good [shaking head strongly]. This is because we do not know the views of those who meet at the sub-county. Even if they bring feedback, we are not satisfied. We want to converse with other actors that come at the sub county, see each other...we want to be with them but for

them, they do not want. It would be good if we meet each other at the sub-county at least after 2 months (input dealer, Bufundi, Nov. 28, 2010)

Information Disclosure and Feedback

Disclosure is the act of making new information known to others. It occurs during interaction among actors in different innovation clusters through meetings, trainings, informal face-to-face interactions, telephone and reports. The study revealed a difference in information shared between representatives and their constituencies. Critical information was not shared freely with farmers in the lower clusters such as issues concerning money and information about tours. These issues were mainly raised by members of Bubare, Bufundi, Chahi, and Remera IPs.

The treasurer gives us feedback on money we contribute as membership. But the money we get from SSA CP...we have no accountability. The chairman controls the money. The treasurer also does not know how money is used. This is going to spoil the IP (trader, Bubare, Nov. 13, 2010)

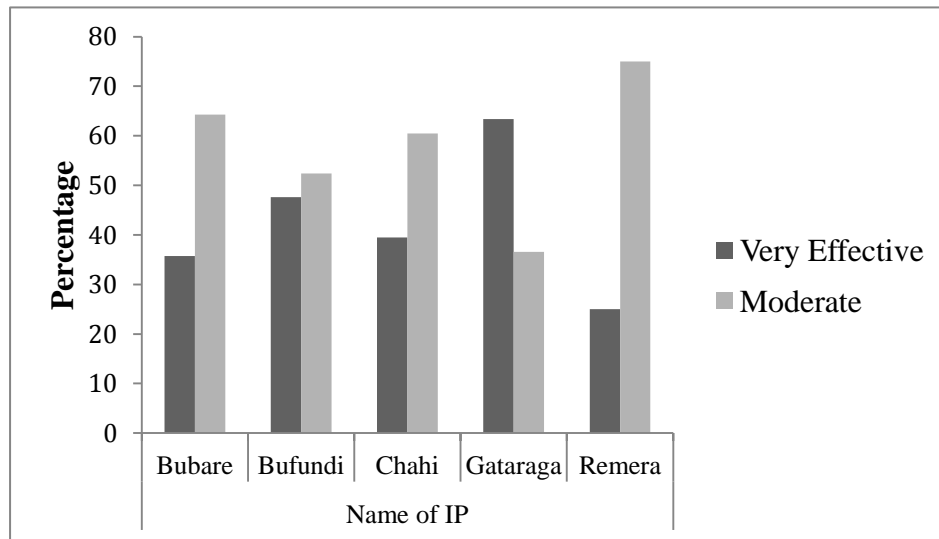
All information that is discussed at the sub-county is taken back to the parish level. For the case of money, they do not...we want to go for a tour but if those people at the lower level hear about that, they will also want to come to the sub-county. So we do not tell them (FGD participant, Chahi, Nov. 17, 2010)

This implies that individuals who access critical information possess more power and control the distribution of information. This may have influence on proper coordination of individuals and activities in IPs.

Results from the survey showed a significant difference in effectiveness of representatives in giving feedback ($p=0.036$). The majority of members in Bubare, Chahi and Remera IPs indicated that their representatives were not very efficient in giving feedback (Figure 2-5). In addition, 35% of farmers indicated that information definitely came in time,

58% reported that information somewhat came in time and 14% noted that information did not come in time.

Figure 2-5: Effectiveness of Farmer Representatives in Giving Feedback



Results from the in-depth interviews also implied the same:

Those who attend sub-county meetings or trainings are not present in parish meetings to give feedback. Even the chairperson has been complaining that we who attend seminars do not go back to the parishes to teach our colleagues....those who go for training have kept the knowledge to themselves (farmer, Chahi, Nov. 19, 2010)

I'm not a committee member at the sub-county. We meet at the parish. I present my problems to the chairman who takes them to the sub-county. He does not give feedback (input dealer, Bufundi, Nov. 28, 2010)

The poor two-way information flow can be explained by poor networks, coordination among actors, the nature of information to be disseminated (World Bank 2007) and lack of trust (Maskell 2000). The value attributed to knowledge also influences whether and how individuals share it. Knowledge is increasingly perceived as commercially valuable (Brown and Martyn 1999; Jarvenpaa and Staples 2001; Weiss 1999). When individuals perceive the

knowledge acquired or possessed as commercially valuable, they emotionally own it and decided what knowledge to share, who to share it with, and when to share it (Andrews and Delahaye 2000). In situations where knowledge has high commercial value, individuals encounter contradictory incentives on whether to share it or withhold it (Ipe 2003). This information asymmetry constrains formation of systems of innovation (Klerkx and Leeuwis 2009).

Lack of representatives, the size of parish and the nature of landscape also affected two-way information flow. These were major problems in IPs that had no sub-clusters at parish/village level. The steep slopes constrained members with information to deliver it to members who lived on the upper side of the hills. This implies that lack of group organization negatively influences representation, which in turn affects communication within IPs.

We have a very poor terrain in the parishes. In addition, some parishes are big and others are smaller. We have the upper and lower parts of the parish. It happens that leaders are selected from one area mainly the lower area. This happens during meetings. Most homes are located below the hills and the road network is in the lower areas and not the upper areas. Therefore, people in the upper areas are not represented. It is those close to meeting areas that attend. We thought that those chosen in lower areas would go to upper areas to disseminate information but they don't (farmer, Bubare, Nov. 7, 2010)

The work of the extension worker is good but because the area is hilly and it's always rainy, he cannot reach all villages. It's the government's problem not providing him with transport (FGD participant, Bufundi, Nov. 12, 2010)

In contrast, most of the members of Isangano Gataraga potato IP indicated that their representatives were very efficient in giving feedback. This could be attributed to the extensive level of horizontal and vertical decentralization in this IP. Extensive sub-clustering of the IP and the frequency of interaction fostered trust building among members. The

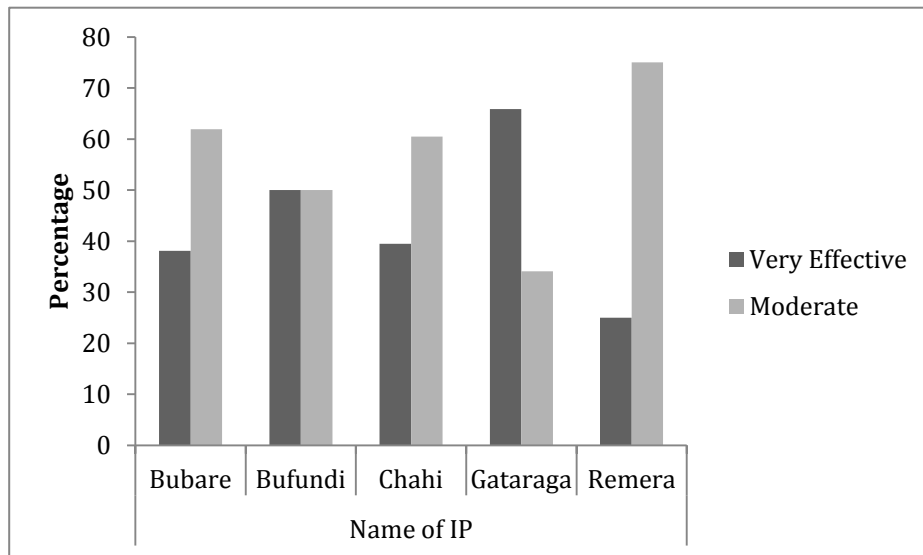
literature shows that frequent interaction among actors builds trust (Granovetter 1985; Maskell 2000; Tsai and Ghoshal 1998). High level of trust among group members enhances exchange of knowledge and cooperation (Putnam 1993).

Assessment of information flow up the hierarchy indicated a degree of misrepresentation of information by farmer representative. This resulted in formation of committees to ensure proper coordination and management of information as stated by one of the respondents:

Parish representatives initiated the ideas of committees because during reporting in meetings at sub-county, reports were conflicting, e.g., somebody would report an issue on a neighboring parish. One would say people in one parish are digging trenches and another report would say 'no.' So we needed committees so that we get proper information (farmer, Bubare, Nov. 7, 2010)

Results from the survey revealed a significant difference in effectiveness of representatives in articulating needs of farmers ($p=0.023$). Most of the farmers in Bubare sorghum IP, Chahi potato IP and Remera maize IP indicated that their representatives were relatively good at articulating their needs. However, a majority of farmers in Bufundi and Isangano Gataraga potato IPs indicated that their representatives were very efficient in articulating their needs (figure 2-6).

Figure 2-6: Perceived Effectiveness of Representatives in Articulating Farmers' Needs



Information Distortion

Farmer representatives in the sub-county innovation cluster interacted directly with diverse knowledge sources while farmers in parish/village innovation clusters interacted more with their peers. The study revealed that as information was moved through hierarchies, it was more likely to be distorted. This was attributed to the number of hierarchies and nature of information shared. Schulz asserts that explicit knowledge (codified knowledge) can be easily disseminated and communicated unlike tacit knowledge (Schultz 2001).

Communication itself is very tricky. Before it reaches the destination, it is distorted. Since we do not rely on distributing information through radio, it is distorted. From the parish, information that reaches the sub-county is 20% less. Even for the farmer who gets information to the village, there is a % of distortion. The whole program cannot bring change in one year until the technical stuff goes deep down there and meet the local people...Management By Walking Around (MBWA). Be with them, show them” (local policy maker, Bufundi, Nov. 15, 2010)

There is lack of proper communication when discussing issues pertaining to the IP. Help us to organize another committee so that we can access IP information and services” (farmer, Bubare, Nov. 27, 2010)

Information distortion may be attributed, in part, to poor feedback mechanisms leading to missing information and misinforming farmers. Misinforming farmers contributed to unrealistic expectations, discussed in another paper.

Conclusion

There is growing interest in IPs for agricultural research and development during the past decade. IPs are seen as a significant improvement over the linear, less inclusive and less interactive traditional agricultural research and extension approach. However, 'innovation platform' is a relatively new concept in agricultural research for development. There is limited knowledge and understanding of how best to organize IPs to facilitate numerous and multi-directional interaction among diverse stakeholders to collectively generate, share and utilize knowledge to address the needs of smallholder farmers. This study analyzed the relationship between organizational structure and information sharing within five IPs in the Great Lakes Region of Africa. Data were collected from IP members (including farmers, NGO representatives, traders, processors, input dealers, researchers local policy makers/implementers and extension workers) using semi-structured interviews, in-depth interviews, and focus group discussions.

The size, age and nature of landscape influenced the structure of IPs. Larger IPs had more levels in the hierarchy and were more horizontally decentralized into innovation sub-clusters. Although Bubare sorghum IP was relatively large, it was not highly decentralized. This could be because the IP was still at a very early stage of development. In addition, only two of the three older IPs were more vertically and horizontally decentralized. One of the older IPs (Chahi potato IP) was not highly decentralized because it was small in size. This

implies that several factors influence the structure of IPs. However, as the size of IPs continues to increase, more re-structuring is likely to occur.

IPs that were more vertically and horizontally decentralized had more effective two-way information flows among and within innovation clusters. The formation of innovation sub-clusters strengthens social capital among IP members who are themselves motivated to share information and knowledge. Less vertically and horizontally decentralized IPs had less effective two-way information flow as measured by the effectiveness of farmer representatives in providing feedback up and down the hierarchy. These findings supported the first and second hypotheses. Innovation clusters enhance knowledge and information flow through networking. Innovation clusters also create and strengthen social capital which increases technology transfer (Juma 2011). Effective two-way information flow in these IPs with high vertical and moderate horizontal decentralization was influenced by the nature of landscape. Although decentralization aids vertical and horizontal information and knowledge exchange, decentralization alone is not sufficient. Other factors need to be in place to facilitate interaction at all implementation levels such as good leadership and proper infrastructure.

Farmer representatives in the sub-county innovation clusters occupy a higher status position since they interact directly with diverse knowledge experts and directly access information that is critical to the performance of IPs. They control the distribution of information in their constituencies. Therefore, measures need to be in place to motivate actors to freely exchange information and knowledge. There is need to build trust among members of IPs to encourage free exchange of information through management of

communication and organizing interactive events. It is also imperative that members of these IPs establish rules that govern their interactions and conform to those rules. This will minimize selfish behavior (e.g., concealing valuable information) and foster action in the interest of the collective.

This paper contributes to organizational theory by identifying structures that promote knowledge and information sharing. This study extends innovation systems theory by analyzing structural factors which influence effective knowledge and information flow. Although vertical and horizontal decentralization may facilitate knowledge and information sharing, the quality of information may be distorted as it moves among hierarchies. The paper has implications for the methodology used to analyze innovation systems and policy for reforming agricultural research that promotes inclusion of the scientific and non-scientific communities in research. The information has practical implications for conveners and members of IPs to design structures and create favorable conditions that enhance information sharing.

Since the IPs were still at an early stage at the time of the study, the influence of structure on performance was not examined. This research did not explore the types of innovations that resulted from interaction with multiple actors along the value chain. Further research needs to be conducted to determine the performance of IPs, comparing IPs that were formed using the research and market oriented approaches. In-depth research needs to be conducted to determine why some IPs flourish while others don't, and investigate the conditions under which highly decentralized IPs function. Studying the relationship between information sharing and performance of IPs will be a great complement to this study.

References

- Agrawal Arun and Jesse C. Ribot. 1999. "Accountability in Decentralization: A Framework with south Asian and west African Cases." *The Journal of Developing Areas* 33: 473-502.
- Albrecht, Terrance L. and Vickie A. Ropp. 1984. "Communicating about Innovation in Networks of Three U.S. Organizations." *Journal of Communication* 34:78-91.
- Aleman, Silvia and Cornelia B. Flora. 2003. "Rural Organizations in Guerrero, Mexico: Sustainability, Gender and Social Capital." in *Community Development Society Meeting*. Cornell University, Ithaca, NY.
- Andrews, Kate M. and Brian L. Delahaye. 2000. "Influences on Knowledge Processes in Organizational Learning: The Psychological Filter." *Journal of Management Studies* 37:2322-2380.
- Barnard, Chester I. 1946. "Functions and Pathology of Status Systems in Formal Organizations." Pp. 46-83 in *Industry and Society*, edited by W. F. Whyte. New York, NY: McGraw-Hill Book Company.
- Becker, Selwyn W. and Nicholas Baloff. 1969. "Organization Structure and Complex Problem Solving." *Administrative Science Quarterly* 14:260-271.
- Bell, Martin. 2006. "Background paper for the L20 workshop on Furthering Science and Technology," March 2006 UNU-MERIT Maastricht, retrieved April 20, 2012 http://www.l20.org/publications/21_sY_Sci_background_Bell.pdf
- Bouty, Isabelle. 2000. "Interpersonal and Interaction Influences on Informal Resource Exchanges between R&D Researchers Across Organizational Boundaries." *The Academy of Management Journal* 43:50-65.

- Brown, Reva B. and Martyn J. Woodland. 1999. "Managing Knowledge Wisely: A Case Study in Organisational Behaviour." *Journal of Applied Management Studies* 8:175-198.
- Burger, Dietrich and Mayer Claudia. 2003. *Making Sustainable Development a Reality: The Role of Social and Ecological Standards*. Eschborn: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH.
- Carley, Kathleen M. and Zhiang Lin. 1997. "A Theoretical Study of Organizational Performance under Information Distortion." *Management Science*, 43:976-997.
- Ciborra, Claudio U. 1996. "The Platform Organization: Recombining Strategies, Structures, and Surprises." *Organization Science* 7:103-118.
- Critchley, Will, Miranda Verburg, and Laurens van Veldhuize. 2006. "Facilitating Multi-Stakeholder Partnerships: Lessons from PROLINNOVA." in *The Series of Promoting Local Innovation*. Silang, Cavite, Philippines: IIRR/Leusden: PROLINNOVA International Secretariat, ETC EcoCulture.
- Daane, Jon, J. Francis, O. Oliveros, and M. Bolo. 2009. "Performance Indicators for Agricultural Innovation Systems in ACP Region. Synthesis Report." Wageningen: CTA.
- Damanpour, Fariborz and Shanthi Gopalakrishnan. 1998. "Theories of Organizational Structure and Innovation Adoption: The Role of Environmental Change." *Journal of Engineering and Technology Management* 15:1-24.
- Damanpour, Fariborz. 1991. "Organizational Innovation: A Meta-analysis of Effects of Determinants and Moderators." *Academy of Management Journal* 34:555-590.

- Davenport, Thomas H. and Laurence Prusak. 1997. *Information Ecology: Mastering the Information and Knowledge Environment*. Oxford, UK: Oxford University Press.
- Deroïan, Frédéric. 2002. "Formation of Social Networks and Diffusion of Innovations." *Research Policy* 31:835-846.
- Duncan, Alan. 2011. "What is a Local Innovation Platform." *Brief 7*. Retrieved from <http://www.nilebdc.org> on Jan 05 2012.
- Edmunds, David and Eva Wollenberg. 2001. "A Strategic Approach to Multistakeholder Negotiations." *Development and Change* 32:231-254.
- Ekboir, Javier M., Gabriela Dutrenit, Griselda V. Martinez, Arturo Torres Vargas, and Alexandre O. Vera-Cruz. 2009. *Successful Organizational Learning in the Management of Agricultural Research and Innovation: The Mexican Produce Foundations* Washington D.C: International Food Policy Research Institute.
- FARA. 2009a. "Sub-Saharan Africa Challenge Programme: Research Plan and Programme for Impact Assessment." Pp. 36. Accra, Ghana: FARA (Forum for Agricultural Research in Africa).
- FARA. 2009b. "Sub-Saharan Africa Challenge Program (SSA-CP): Strategies and Lessons Sharing Forum." Synthesis report.
- FARA. 2007. "Sub-Saharan Africa Challenge Programme: Medium Term Plan 2008-2010." Accra, Ghana: Forum for Agricultural Research in Africa.
- FARA. 2005. "Findings of the Lake Kivu Pilot Learning Site Validation Team. A Mission Undertaken to Identify Key Entry Points for Agricultural Research and Rural

- Enterprise Development in East and Central Africa." Forum for Agricultural Research in Africa (FARA).
- Farrow, Andy, Moses Tenywa, and Ephraim Nkonya. (Submitted). "Selecting Sites to Prove the Concept of IAR4D in the Lake Kivu Pilot Learning Site." *African Journal of Resource Economics*.
- Flora, Cornelia B. and Jan L. Fora. 2008. *Rural Communities: Legacy and Change*. Boulder, CO: Westview Press.
- Forsyth, Donelson R. 2010. *Group Dynamics*. Belmont, CA: Wadsworth/Cengage.
- Giddens, Anthony. 1984. *The constitution of society*: Berkeley, CA: University of California Press.
- Goetsch, Gerald G. and David D. McFarland. 1980. "Models of the Distribution of Acts in Small Discussion Groups." *Social Psychology Quarterly* 43:173-183.
- Gigone, Daniel and Reid, Hastie. 1993. "The Common Knowledge Effect: Information Sharing and Group Judgment." *Journal of Personality and Social Psychology* 65:959-974.
- Granovetter, Mark S. 1985. "Economic Action and Social Structure: The Problem of Embeddedness." *American Journal of Sociology* 91:481-510.
- Groot, Annemarie, Natasha van Dijk, Janice Jiggins, and Marleen Maarleveld. 2002. "Three Challenges in the Facilitation of System-wide Change." Pp. 199-213 in *Wheelbarrows Full of Frogs: Social Learning in Rural Resource Management*, edited by L. C. a. R. Pyburn. Assen: Koninklijke van Gorcum, The Netherlands.
- Gupta, Anil K. and Vijay Govindarajan. 2000. "Knowledge Management's Social Dimension: Lessons from Nucor Steel." *Sloan Management Review* 42:71-80.

- Hall, Andy. 2007. "The Origins and Implications of Using Innovation Systems Perspectives in the Design and Implementation of Agricultural Research Projects: Some Personal Observations." in *UNU-MERIT Working Paper 2007-013*. Maastricht, The Netherlands: United Nations University.
- Hall, Andy, Lynn Mytelka, and Banji Oyeyinka. 2005. "Innovation Systems: Implications for Agricultural Policy and Practice." ILAC Brief 2: ILAC.
- Hall Andrew J., M.V.K. Sivamohan, Norman Clark, Sarah Taylor and Geoffrey Bockett. 1998. "Institutional Developments in Indian Agricultural R&D Systems: The Emerging Patterns of Public and Private Sector Activity." *Science, Technology and Development*, 16: 51-76.
- Hall, Richard H. and Hall, P. H. S. Tolbert. 2005. *Organizations*. NJ: Prentice Hall
- Hawkins, Richard, Willem Heemskerk, Robert Booth, Jon Daane, Arno Maatman, and Adewale A. Adekunle. 2009. "Integrated Agricultural Research for Development (IAR4D): A Concept Paper Prepared for Forum for Agricultural Research in Africa (FARA) and the Sub-Saharan Africa Challenge Program (SSA CP)." Accra, Ghana: FARA.
- Hendriks, Paul. 1999. "Why Share knowledge? The Influence of ICT on the Motivation for Knowledge Sharing." *Knowledge and Process Management* 6:91-100.
- Ipe, Minu. 2003. "Knowledge Sharing in Organizations: A Conceptual Framework." *Human Resource Development Review* 2:337-359.
- Jarvenpaa, Sirkka L. and Sandy D. Staples. 2001. "Exploring Perceptions of Organizational Ownership of Information and Expertise." *Journal of Management Information Systems* 18:151-183.

- Juma, Calestous. 2011. *The New Harvest: Agricultural Innovation in Africa*. New York, NY: Oxford University Press.
- Klerkx, Laurens and Cees Leeuwis. 2009. "Establishment and Embedding of Innovation Brokers at Different Innovation System Levels: Insights From the Dutch Agricultural Sector." *Technological Forecasting & Social Change* 76:849–860.
- Koufteros, Xenophon A. and Mark A. Vonderembse. 1998. "The Impact of Organizational Structure on the Level of JIT Attainment: Theory Development." *International Journal of Production Research* 36:2863-2878.
- Levin, Daniel Z. and Rob Cross. 2004. "The Strength of Weak Ties You Can Trust: The Mediating Role of Trust in Effective Knowledge Transfer." *Management Science* 50:1477-1490.
- Lundy, Mark, Maria V. Gottret, and Jacqueline Ashby, J. 2005. "Learning Alliances: An Approach for Building Multi-stakeholder Innovation Systems." ILAC Brief. No. 8. Rome, Italy, ILAC Institutional Learning & Change. Retrieved March 17, 2010 (http://www.cgiar-ilac.org/files/publications/briefs/ILAC_Brief08_alliances.pdf).
- Maskell, Peter. 2000. "Social Capital, Innovation and Competitiveness." Pp. 111-123 in *Social Capital: Critical Perspectives*, edited by S. Baron, J. Field, and T. Schuller. New York, NY: Oxford University Press.
- Means, K., C. Josayma, E. Neilsen, and V. Viriyasakultorn (2002) 'Community-Based Forest Resource Conflict Management. A Training Package. Volumes', vol. 1-2. Rome, Italy: Food and Agriculture Organization of the United Nations, FAO.
- Mintzberg, Henry. 1979. *The Structuring of Organizations*. New Jersey: Prentice-Hall, Inc.

- Mokwunye, Uzo and Jim Ellis-Jones. 2010. "Sub-Saharan African Challenge Program (SSA-CP): Internal Review Report." FARA.
- Nahapiet, Janine and Sumantra Ghoshal. 1998. "Social Capital, Intellectual Capital and the Organizational Advantage." *Academy of Management Review* 23:242-266.
- O'Reilly, Charles A. and Karlene H. Roberts. 1977. "Task Group Structure, Communication, and Effectiveness in Three Organizations." *Journal of Applied Psychology* 62:674-681.
- Olson, Edwin E. and Glenda H. Eoyang. 2001. *Facilitating Organization Change: Lessons from Complexity Science*. San Francisco: Jossey-Bass/Pfeiffer.
- Penunia, Esther A. 2011. "The Role of Farmers' Organizations in Empowering and Promoting the Leadership of Rural Women." in *Enabling Rural Women's Economic Empowerment: Institutions, Opportunities and Participation*. Accra, Ghana: UN Women, FAO, IFAD and WFP.
- Putnam, Robert D. 1993. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton: Princeton University Press.
- Rogers, Everett M. 2003. *Diffusion of Innovations*. New York, NY: Free Press.
- Röling, Neils. 2002. "Beyond the Aggregation of Individual Preferences: Moving from Multiple to Distributed Cognition in Resource Dilemmas." Pp. 25-47 in *Wheelbarrows Full of Frogs: Social Learning in Rural Resource Management*, edited by C. Leeuwis and R. Pyburn. Assen, The Netherlands: Koninklijke Van Gorcum.
- Rulke, Diane L. and Joseph Galaskiewicz. 2000. "Distribution of Knowledge, Group Network Structure, and Group Performance." *Management Science*, 46:612-625.

- Sanginga, Pascal C., Rick Kamugisha, Andrienne Martin, Adison Kakuru, and Ann Stroud (2004) 'Facilitating Participatory Processes for Policy Change in Natural Resource Management: Lessons from the Highlands of Southwestern Uganda', *Journal of Agricultural Sciences* 9(1): 958-970.
- Schultz, Martin. 2001. "The Uncertain Relevance of Newness: Organizational Learning and Knowledge Flows." *Academy of Management Journal* 44:661-181.
- Shaw, Marvin E. 1976. *Group Dynamics: The Psychology of Small Group Behavior*. New York: McGraw-Hill.
- Sivadas, Eugene and Robert F. Dwyer. 2000. "An Examination of Organizational Factors Influencing New Product Success in Internal and Alliance-Based Processes." *Journal of Marketing* 64:31-49.
- Stenmark, Dick. 2001. "Leveraging Tacit Organizational Knowledge." *Journal of Management Information Systems* 17:9-24.
- Szulanski, Gabriel. 1996. "Exploring Internal Stickiness: Impediments to the Transfer of Best Practice within the Firm." *Strategic Management Journal* 17:27-43.
- Tenywa, M. M., Rao, K. P. C., Tukahirwa, J. B., Buruchara, R., Adekunle, A. A., Mugabe, J., et al. 2011. "Agricultural Innovation Platform As a Tool for Development Oriented Research: Lessons and Challenges in the Formation and Operationalization." *Learning Publics Journal of Agriculture and Environmental Studies* 2: 117-146.
- Tsai, Wenpin. 2002. "Social Structure of "Coopetition" within a Multiunit Organization: Coordination, Competition, and Intraorganizational Knowledge Sharing." *Organization Science* 13:179-190.

- Tsai, Wenpin and Sumantra Ghoshal. 1998. "Social Capital and Value Creation: The Role of Intrafirm Networks." *Academy of Management Journal* 41:464-476.
- Verschuren, Piet and Hans Doorewaard. 1999. *Designing a Research Project*. Utrecht: LEEMA.
- Weiss, Leigh. 1999. "Collection and Connection: The Anatomy of Knowledge Sharing in Professional Service." *Organization Development Journal* 17:61-72.
- World Bank. 2007. *Enhancing Agricultural Innovation: How to Go Beyond the Strengthening of Research Systems*. Washington, DC: The International Bank for Reconstruction and Development / The World Bank.

CHAPTER 3. A DROP OF WATER IN AN OCEAN: MOTIVATION AND PARTICIPATION IN INNOVATION PLATFORMS

Manuscript prepared for the journal: World Development

Abstract

This paper examines the relationship between motivation and participation in five innovation platforms (IPs) in the Great Lakes Region of Africa. IP participants are motivated by different incentives. Although farmers prioritized new knowledge and skills, these were not sufficient to foster active participation. Anticipated economic (markets, income and credit) and material (inputs) livelihood benefits encouraged active farmer participation. Many actors did not mention social incentives (networks and status). Participation of local policy makers and the private business sector was limited. Participation was curtailed by: expectation of tangible short-term benefits, understanding of IP concept, lack of resources, prior commitments and feeling devalued.

Introduction

The growing interest in multi-stakeholder innovation platforms (IPs) for agricultural research and development during the past decade reflects their potential to address problems of smallholder farmers and improve their livelihoods. An IP is an arrangement in which a set of relatively interdependent stakeholders are identified and - usually through representatives - invited to meet and interact in a forum for conflict resolution, negotiation, social learning and collective decision making towards concerted action (Röling 2002). In this paper, an IP is defined as a forum in which multiple actors/stakeholders with meaningful interests in a

common issue collaborate in identification of problems, share and develop new ideas to better solve those problems, and implement creative solutions to improve livelihoods.

The traditional national agricultural research and extension approach cannot deal with the rapidly changing context (dynamic policy, market, technology and environment) of agriculture in many countries. The traditional system follows a linear approach where researchers and experts produce new knowledge and technology and transfer it to the end users who need it to innovate and change (Lundy, Gottret, and Ashby 2005). The linear approach assumes that agricultural research, through technology transfer, leads to technology adoption and increased productivity. However, realization of this goal depends on the capacity of agricultural research, training and extension organizations in the public sector (World Bank 2007a).

The approach lacks interaction among different knowledge sources, and there is limited appreciation of local and indigenous knowledge (Lundy et al. 2005). The research of most national agricultural systems is not linked to technology users and other actors in the sector. Researchers, the end users of research outputs and other providers of services that support agricultural production, value addition and marketing, largely work in isolation from one another. Therefore, research outputs do not meet the needs of end users. The World Bank recognizes that agricultural related problems are complex in nature and need to be addressed using a holistic systems approach (World Bank 2007a).

Designing and implementing a sustainable development intervention requires involvement of diverse stakeholders (grassroots groups, non-government organizations (NGOs), private business sector and government agencies) in a more collaborative participatory process (Brown and Ashman 1996). System-based approaches are thought to

provide spaces for value chain actors to interact, communicate, and act to improve the performance of the agricultural sector (World Bank 2007a). More recently, the systems-based Integrated Agricultural Research for Development approach (IAR4D) was designed and is implemented by the sub-Saharan Africa Challenge Program (SSA-CP). The goal is to address low agricultural production caused by use of unimproved seeds and improper agronomic practices; low soil fertility resulting from a degraded natural resource base; failure to link agricultural production to markets; and inadequate and inappropriate policies (Mokwunye and Ellis-Jones 2010).

In this approach, IPs are used to involve relevant actors throughout a specific value chain (including producer organizations, researchers, extension agents, development specialists, private business sector, and policy makers) to identify and conduct pro-poor oriented research (FARA 2007). Research institutions and government agencies consider IPs as a significant improvement over the linear and less inclusive traditional agricultural research and extension approach. IPs are dependent on participation and the quality of engagement affects their effective functioning. However, there is limited understanding of what motivates groups or organizations to participate in IPs and the factors that sustain or curtail active participation in IPs. This knowledge gap constrains mobilization of relevant actors to solve critical problems and preserve their participation. Understanding the interests of participants in IPs is very relevant because it enables facilitators/conveners of IPs to identify appropriate actors and to craft measures that cater for diverse interests within IPs to ensure sustainability.

This article seeks to address this gap by examining participation in five IPs in the Great Lakes Region of Africa. The central questions addressed are:

1. What motivates different actors to participate in innovation platforms?
2. Does active participation enable actors to achieve their desired goals?
3. What factors sustain or curtail participation?

I hypothesize that expected development (knowledge and skills) material (inputs), economic (market, income and credit) social (networks and status) and purposive benefits (pursuit of organizational goals) positively affect the degree of actors' participation in IPs; active participation positively affects benefits derived from IPs, and that lack of short-term benefits negatively affects continued participation. I use social capital theory and social exchange theory to explain participation in IPs. This paper contributes to the relatively understudied field of innovation systems by documenting the factors that motivate actors to participate and the conditions that sustain and constrain participation in innovation systems. The paper also has practical implications for community organizers and policy makers in designing community participatory programs and making participation successful.

The paper proceeds as follows: section 2 defines the concept of participation in multi-stakeholder processes, outlines how social exchange theory contributes to our understanding of participation, and develops a set of hypotheses. Section 3 describes the data, and the final section presents the conclusion and implications.

The Organizational Structure and Purpose of IPs

An IP constitutes actors with the knowledge and skills required to address key constraints in the entire value chain, integrating issues of productivity, environment, policy and market. Actors in an IP have incentives to jointly innovate and work in partnership to bring about the desired change (FARA 2009b). IPs facilitate integration of perspectives,

knowledge and actions of different stakeholders around a common issue and foster learning through interaction (Hawkins et al. 2009).

Twelve IPs were established in Lake Kivu Region, a region where northeastern Rwanda, eastern Democratic Republic of Congo (DRC) and southwestern Uganda intersect. IPs are facilitated by a team of interdisciplinary scientists (Task Forces) who bring together stakeholders with diverse competence to address problems in an entire value chain (FARA 2007). Seven of the IPs were established during the last quarter of 2008 and five in the first quarter of 2009. The process of visioning and stakeholder analysis was either research-led or market-led. The older IPs used the research-led approach in which stakeholders were sensitized about the agricultural problems and how they could contribute to resolving the problems. In the newer IPs, the market-led approach was used in which stakeholders were introduced to the available market opportunity and organized to access that market (Tenywa et al. 2011).

Each IP is organized to address problems specific to a given value chain (such as potato and sorghum value chains). IPs have innovation clusters at two implementation levels, i.e., the strategic level (regional and national level) and operational level (sub-county⁴). An innovation cluster consists of groups of actors with similar characteristics, who gather together to address common issues. The sub-county innovation cluster is sub-divided into innovation sub-clusters at parish and village level.

IPs have an executive committee (with chairman, vice chairman, secretary, treasurer and committee members representing groups from different parishes) supported by sub-

⁴ Sub-county is the third political administrative unit in Uganda and Rwanda. The sub-county is subdivided into parishes or cells. Parishes contain villages, the lowest political administrative units.

committees (which focus on marketing, research, finance, natural resource management, and monitoring and evaluation). The committee, together with other actors, meets at sub-county level and makes operational decisions (developing the agenda, convening IP meetings, following-up on decisions made, facilitating interaction between different IP members, mobilizing important actors who are not present at IP meetings and liaise with national and regional partners). Strategic decisions (such as agenda of the country or region and location of activities) are made at national and regional levels (Tenywa et al. 2011).

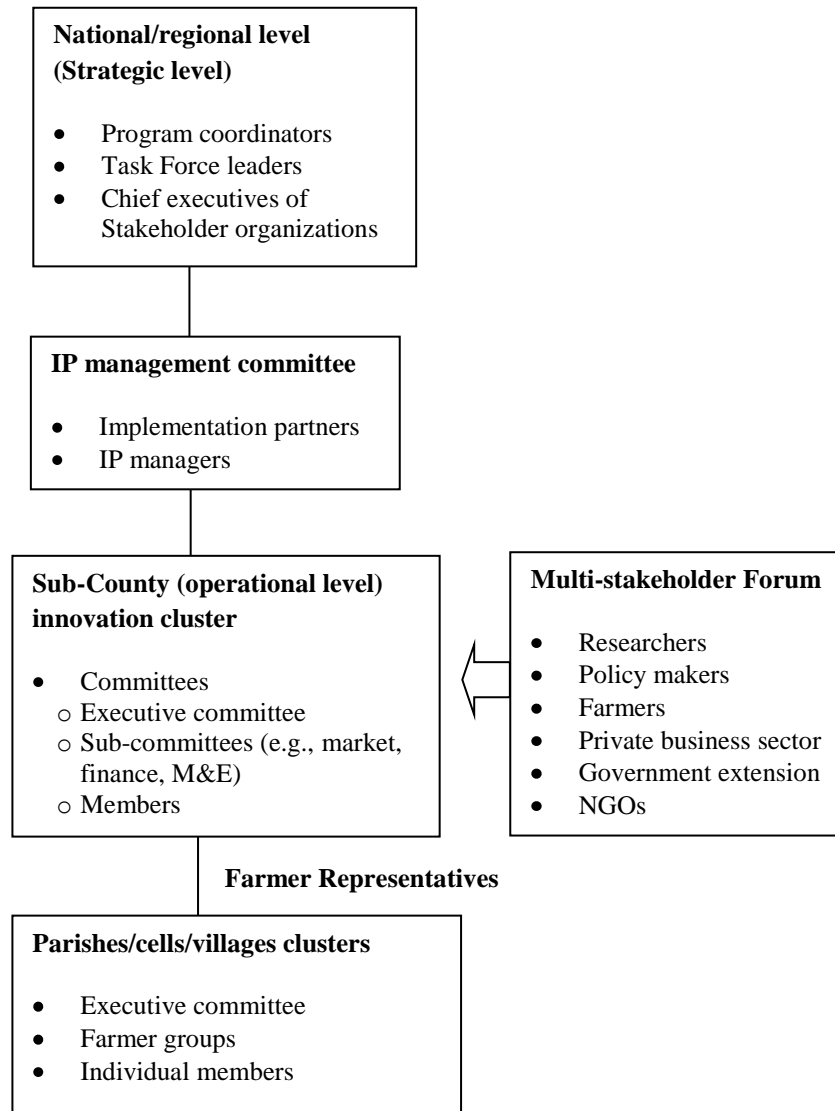
The governance structure at sub-county level is paralleled at lower implementation levels to ensure proper coordination of activities between hierarchies. Members of IPs at the different implementation levels meet once a month, with members of the lower level (parish/village level) meeting first so that their representatives forward their issues to the sub-county executive committee. The sub-county innovation cluster is the hub where information collected from other implementation levels is processed, decisions are made and feedback is given to members in other clusters. A cross-site research support team (CRST) builds the capacity of IP members at the operational level by providing technical support in key areas, i.e., increasing production, access to markets, natural resource management and policy (FARA 2009a). Figure 3-1 shows the IP organizational structure at the time of the study.

Participation in Development Projects

Participation of community members in development projects is assumed to integrate local people's knowledge into program planning and implementation. Participation enables community members to interact with influential people in society, thereby empowering them to voice their concerns (Fox 1996). Although participation is an important ingredient for development, it is not easy to attain, especially from marginalized groups (Agarwal 2000).

Opening up spaces for participation does not imply that people will be enthusiastic to participate. Many opportunities for participation receive little enthusiasm or cooperation from community members (Mullen and Allison 1999; Wandersman and Giamartino 1980).

Figure 3-1: Organization Structure of IPs



In participatory programs, some groups of individuals may not be involved (Agarwal 2001). People can be frustrated into thinking that nothing ever changes, even if they put time and effort into participation (Warner 2006). Doubt in ability to effect change is mainly found

among the disadvantaged (Wandersman et al. 1987). Conveners of multi-stakeholder platforms often under - or over- estimate the abilities and motivations of stakeholders to participate (Cooke and Kothari 2001; Warner 2005). In addition, participatory approaches do not recognize how different, changing and multiple identities of individuals affect their choice about whether to participate and how to participate (Cleaver 2001). Groups may exclude themselves from the process when they feel that the benefits do not exceed the costs (Warner 2006).

Stakeholders have different interests and that some may not be as supportive as others in pro-poor interventions (Warner 2006). People will engage in and maintain a relationship as long as they can satisfy their self-interests and at the same time ensure that the benefits outweigh the costs. People will maintain those exchanges that have proven to be rewarding in the past and break off those which prove to be costly and establish new relations which have a good chance of being more rewarding (Blau 1964). On the other hand, Uphoff (2000) claims that people do not engage in collective action only on the basis of self-interest or altruism. They combine the two since self-interest and altruism can co-exist in people's minds and motivations. People may derive satisfaction in altruism even if it costs them something. Norms that promote pursuit of self-interests can undermine establishment of social capital (the features of social organization such as networks, norms and trust that facilitate coordination and cooperation for mutual benefit (Putnam 1993)).

a) Factors that motivate participation

Community members are more likely to participate in collective action if they are sure that participation will generate the anticipated benefits (Matta and Alavalapati 2006). Widmer (1985) found in a study of board members in non-profit and voluntary organizations

that participation was positively correlated to incentives and the value of expected outcomes to individuals. Widmer classified incentives to participation into four broad categories - material (goods and services), social (networks, status, and honor), developmental (opportunity to use or acquire knowledge and skills) and purposive benefits (achievement of organizational goals which may not directly benefit participant). In his study, social and personal development incentives were more common and effective compared to purposive incentives⁵. Other authors include economic incentives, the mechanisms that provide financial rewards.

Participation in development projects is often linked to availability of material incentives; short-term material benefit is important to sustain participation (Oakley 1991). Other incentives such as recognition, opportunity for social interaction and favorable environment foster participation (Prestby et al. 1990). Stakeholders may also be motivated to participate in collective action to achieve goals, such as enhancing prestige, acquiring knowledge and skills, access and use resources upon which their livelihoods depend (Warner 2007).

Individuals' feelings of belonging and sense of identity influence the extent to which they participate (Burke 1968). Stakeholders are more likely to participate if they perceive that a problem exists and feel the need to solve the problem. Perception of a real problem is key

⁵⁵ Material incentives are tangible rewards which have a monetary value or can easily be translated into one that has. Social incentives are intangible benefits that have no monetary value and cannot easily be translated in one that has. They are derived from the act or socializing. Purposive incentives are intangible rewards derived from the goals of the organization. They offer individuals the satisfaction of participating in the activities of a group whose goals correspond to their beliefs or principles, e.g., adoption of certain practices (Clark and Wilson 1961:134-135).

in mobilizing social capital amongst affected people to solve the problem (Mullen and Allison 1999). The degree of participation in development programs is a major determinant of success or failure. Previous studies have revealed that lack of participation leads to inefficiencies in implementation such as problems with enforcing rules, communication flow, resource assessments and conflict resolution (Agarwal 2000).

b) Factors that influence participation

Social exchange theory assumes that all human relationships are formed by the use of a subjective cost-benefit analysis and the comparison of alternatives. If the costs of a relationship are perceived to outweigh the benefits, an individual will choose to leave the relationship. If the benefits outweigh the costs, the individual will choose to maintain the relationship and if the costs and benefits are equal, then the relationship is said to be equitable (Homans 1964). The cost of participation (in terms of time, labor and resources) is one factor that influences participation (Lawrence and Deagen 2001; Negra 1998). Participation of low-income families may be constrained by work and family priorities (Irvin and Stansbury 2004). Rural people who receive tangible material benefits from development projects are motivated to participate, and participation declines when there is lack of material incentives (Oakley 1991).

The continuous exchange of goods and services regulates social interaction, thus fostering development of network relations and group structure (Blau 1964). Networks are held together by mutual expectations of benefit and sustained by expectations or norms of reciprocity (Uphoff 2000). Social relations create value through reciprocity, which is related to trust (Fukuyama 1995). While reciprocal exchanges can be undertaken on self-interested

basis, their sustainability, stability and productivity is enhanced by trust and confidence (Frank 1992). Social exchange requires trust among individuals which builds through a process of continuous exchange.

Robinson (1998) found a positive correlation between participation and membership in unions. People in municipalities with strong union traditions participated more in decision making involving resource allocation unlike people in areas with low organization capacity. Women's productive and reproductive roles and cultural norms and values that hinder women from going to public places constrains their active participation. Facilitators may also lack effective tools and facilities to enhance participation of women (Aleman and Flora 2003), such as provision of day care services.

Large geographical areas also pose challenges for face-to-face meetings (Irvin and Stansbury 2004). The timing of meetings (weekdays versus evening or weekends), their length and venue may not favor participation of all categories of stakeholders (Griffin 1999). Furthermore, the complexity of technical knowledge required to participate can present challenges to citizen participation (Irvin and Stansbury 2004). Individuals without the required knowledge and skills may devalue their contribution to the participatory process (Jonsson 2005). Joint action is built on common vision, goals and values. However, stakeholders may have different goals and attitudes towards the central vision (Critchley et al. 2006). Lack of shared understanding of the aims of the program affects participation (Matta and Alavalapati 2006).

Political barriers are the most difficult challenges faced in engaging and coordinating activities involving multiple stakeholders. The political environment in a particular country may or may not be supportive of participatory processes. Countries that do not encourage

openness and involvement of community members in decision-making do not provide a conducive environment for participation (Oakley 1991). Effective participation calls for a favorable environment with carefully selected representatives of stakeholders, a transparent process of decision making to build trust among participants, competent and unbiased facilitators, regular meetings and adequate financial resources (Beierle 1999; Howell, Olsen, and Olsen 1987).

Social exchange theory asserts that people develop attitudes towards other people and things in the context of anticipated benefits and costs to be derived from the relationship. Activities that generate net benefits tend to be perceived positively, while activities which generate net losses tend to be perceived negatively (Napier and Napier 1991). Contemporary exchange theory stresses that farmers seek the 'best value' through participating in the programs (Napier, Carter, and Bryant 1986). Consistent with exchange theory, Napier and Napier (1991) argue that rural farmers tend to be engaged in programs that have positive net benefits.

The research questions asked are:

1. What motivates different actors to participate in innovation platforms?
2. Does active participation enable actors to achieve their desired goals?
3. What are the factors which sustain or curtail participation?

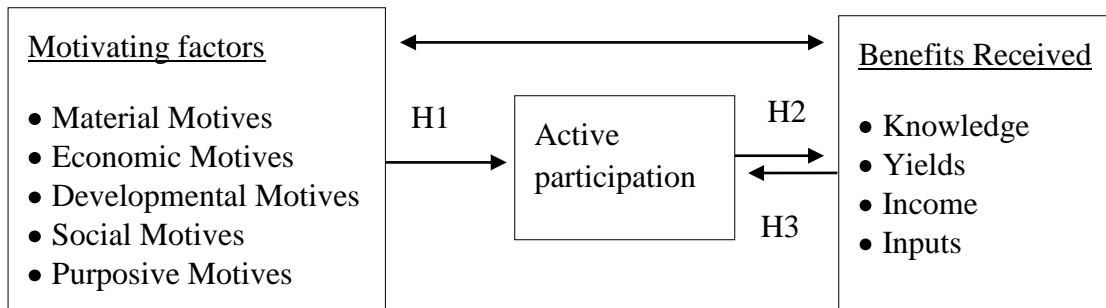
The paper seeks to test the following hypotheses:

H1: Expectation of material, economic, developmental, social and purposive benefits positively affects the degree of actors' participation in innovation platforms.

H2: Active participation positively affects benefits derived from IPs.

H3: Lack of short-term benefits has a negative effect on continued participation of actors.

Figure 3-2: Relationship between Motivating Factor and Participation



Methods and Data

The study was conducted in Uganda and Rwanda, two of the three pilot learning sites (PLS) of the SSA-CP in the Lake Kivu Region. The institutional Review Board approved the study in 2010. In Uganda, the study was conducted in Bubare and Bufundi sub-counties in Kabale district and Chahi sub-county in Kisoro district. In Rwanda, the study was conducted in Gataraga and Remera sub-counties in Musanze district. This area is emerging from conflict. The region consists of tall volcanic mountains, hills and valleys which may constrain active involvement in development interventions. The climate ranges between semi-humid (800 mm per year) to humid (2000 mm per year) and the temperatures are mild at higher elevations. The average land holding is 0.5 acres (FARA 2005).

The study population included members of IPs (including farmers, members from the private business sector, researchers, non-governmental organization (NGO) staff, IP chairpersons, local policy makers and extension workers). The following five out of the 12 IPs in the region were studied: Bubare sorghum IP, Bufundi potato IP, and Chahi potato IP in Uganda, and Isangano Gataraga potato IP and Remera maize IP in Rwanda. Selection was

based on date of formation (selecting old and new IPs), enterprise of focus (staple crop – root tuber or cereal), approach of formation (market driven or research driven). Table 3-1 shows the characteristics of the IPs selected.

Table 3-1: Characteristics of the Selected IPs

Country	Name of IP	Date of formation	Membership		Approach of formation	Sample
			Male	Female		
Uganda	Bubare sorghum IP	Sept. 2009	83	96	Market-led	42
	Bufundi potato IP	Nov. 2008	65	77	Research-led	42
	Chahi potato IP	Nov. 2008	62	77	Research-led	43
Rwanda	Isangano Gataraga potato IP	Nov. 2008	160	98	Research-led	41
	Remera maize IP	Sept. 2009	29	27	Market-led	16

Data were collected using semi-structured interviews, in-depth interviews and focus group discussions to triangulate the information to improve validity and reliability (Verschuren and Doorewaard 1999). The research team consisted of myself and research assistants (recruited from Kabale and Rwanda and trained by me). We conducted interviews with farmers at the lower implementation level (parish/village level) to verify information provided by their representatives at sub-county level. We used semi-structured questionnaires, which were pre-tested with 15 members of IPs to help refine the final questions. We randomly sampled IP members from up-to-date membership lists obtained from IP chairpersons. The research team interviewed a total of 184 farmers from the five IPs.

In addition, I used checklists with in-depth interviews and focus group discussions (FGDs) to explore issues about participation and the factors which sustain or curtail participation. I conducted a total of 34 in-depth interviews with members from the private business sector, researchers, non-governmental organization (NGO) staff, IP chairpersons, local policy makers and extension workers. Since these actors were few in number they were not sampled. Two of the in-depth interviews were conducted with non-members to understand why they ceased participation. I conducted six FGDs with farmers' representatives. Interviews and FGDs were conducted in English and the local languages. Information generated by the three techniques included: what inspired members to join IPs, what members expected from participating in IPs, activities in which they are involved, how they would assess their level of participation in IP activities, and perceptions about participation of other actors. The in-depth interviews and focus group discussions were digitally recorded and transcribed to permit detailed coding (open, axial and selective coding). This study was conducted between September-December 2010.

I analyzed the transcribed interviews qualitatively using line by line coding to identify the major themes and categories that emerged. Memos of the major categories that emerged were written. Patterns in the data were used to understand the potential of stakeholders to be involved in meaningful participation. The Statistical Package for Social Scientists (SPSS version 18) was used to analyze quantitative data. I first coded the open-ended questions in the semi-structured questionnaire and analyzed the data using descriptive statistics, correlation and linear regression. Multiple linear regression was used to analyze the demographic factors (including sex, age, highest level of education, and membership to organizations) that affect participation (number of activities involved in).

In order to organize my data, I adapted Widmer's (1985) classification of incentives to participate. Board members reflect the diversity of communities they serve and like board members, community members may have both individual and collect motives. I group the incentives to participate into 5 categories, i.e., developmental benefits (use and acquire knowledge and skills in crop and livestock production, soil management and value addition); material benefits (access agricultural inputs), economic benefits (access remunerative markets, credit and income), social (expand social network, improve social status, group membership) and purposive (role fulfillment to achieve organizational goals). Although the terms 'material' and 'economic' incentives tend to be used interchangeably, this paper uses 'material' incentives to refer to tangible items that can be used to generate financial and non-financial rewards, while 'economic' incentives refer to financial rewards. Participation was measured by the number of different types of IP activities in which actors are involved. The degree of participation was also measured using an ordinal scale (very active, active, somewhat active and not active).

Results and Discussion

a) Characteristics of farmer participants

Of the farmers interviewed, 54% were female. The-chi square test shows a significant difference in sex of respondents across IPs ($p=0.027$). Gataraga and Chahi IPs had relatively more male and female members, respectively, than the other IPs. The median age of respondents was 45 and the modal age category was 18-39 (34.8%). The chi-square test indicates a significant difference in age across the IPs ($p=0.006$). Gataraga had more members in the lower age category, while Remera had more members above age 50. This may explain the level of participation in IP activities. Overall, 87% of the respondents were

married. Most of the respondents had attained primary level of education (68%). Compared to other IPs, Isangano Gataraga potato IP had more members who had attained secondary education (39%). The level of education could also explain variation in the level of participation among farmers.

b) Motivation to participate

(i) Farmers

Results from the survey showed that the 184 farmers were motivated to participate by anticipated developmental benefits (95%), material benefits (68%), or economic benefits (67%), and some by social benefits (19%). The Pearson chi-square test revealed that farmers who had membership in other organizations were motivated by economic incentives such as access to profitable markets, increased access to credit facilities, and increased household income ($p=0.003$). A cross tabulation of motivating factors shows that 67% of farmers were motivated by development and material incentives, 66% by both development and economic incentives, while 79% were motivated by both material and economic benefits.

The categories were also correlated to determine their relationship. Table 3-2 shows that the correlation between social and material benefits was negative and significant. There is no significant relationship between development and other motivating factors. Farmers with high social expectations had low material expectations but there is a positive relationship between economic and material expectations.

Table 3-2: Correlation between Factors that Motivate Farmers to Participate (n=184)

Incentive	Developmental	Material	Economic	Social
Developmental	1.000			
Material	-.020 (.786)	1.000		
Economic	-.040 (.589)	.360 (.000*)	1.000	
Social	.053 (.436)	-.183 (.013*)	-.124 (.094)	1.000

*p<.05

In-depth interviews and FGDs also revealed developmental, material, and economic factors as the main incentives to participate in IPs as indicated in the quotes below.

“What motivated me is that in a group you share a lot of information with different people and that information can help you. I alone as an individual cannot do much, so being in a group is very, very good” (farmer, Gataraga, Dec. 14, 2010)

“There are so many partners who interact with us to solve problems. After identifying problems, they help us solve them. We share information, increase production which is an opportunity to access better markets” (farmer and input dealer, Bufundi, Nov 28, 2010)

“People register themselves in the group of IP because they think that when there’s a chance of seeds, they will get as registered members but when you call for meetings, they cannot attend” (FGD participant, Bubare, Nov. 10, 2010)

These findings show that farmers were motivated to participate because of the social networks through which they exchange information and knowledge. Although some farmers were motivated by self-interest such as accessing inputs and elevating social status, farmers were also motivated to participate because of the benefits that enhance the wellbeing of many other members.

Social factors such as networking, membership to groups and status enhancement were mentioned by a few farmers. One of the farmers mentioned that:

“I found myself being involved as a leader or initiator of the idea. I thought that if I could lead such a program and it fails, my name would be tarnished so you have to work hard so that it does not fail. Its good when you start something and it goes through. It improves your name in the society” (Farmer, Bubare, Nov. 7 2010)

This could be attributed to the fact that since majority of households in the communities studied were poor, the priority was increasing production to improve their livelihoods.

(ii) Extension workers

The four extension workers interviewed were motivated to participate because they felt it was their responsibility to improve farmers’ livelihoods; had expert knowledge and skills in agriculture; envisioned that IPs would help them do their work effectively (such as mobilizing farmers and disseminating information and technologies); and to motivate community members to participate. The participatory nature of the approach also motivated extension workers to participate. The extension workers stated that:

“I’m motivated because this program helps me in my role. If someone can do demonstration of some crops and the neighbors see that the yield is high, it helps me in many ways, e.g., dissemination of information in agriculture” (extension worker, Remera, Dec. 21, 2010)

“As an extension worker, when members see me with them, they get motivated...when they see me they are happy that their person is involved” (extension worker, Bufundi, Nov. 13, 2010)

“I joined by virtue of being the NAADS coordinator but I also picked interest after knowing how it operates...some programs come and impose things on farmers but when I realized that it was participatory, I was encouraged to participate” (extension worker, Bubare, Nov 16, 2010)

The results imply that extension workers were primarily motivated by purposive benefits to achieve their organization’s goal of improving farmers’ livelihoods. Extension workers were not directly paid by the Challenge Program but paid by their host/partner

organizations. Although extension workers may be motivated by self-interest, they also worked towards the collective good.

(iii) Non-Governmental Organizations (NGO) staff

Similar to extension agents, representatives from NGOs were primarily motivated by the desire to fulfill their roles because they believed that they possessed expert knowledge and skills required to improve agricultural production. In addition, they were also motivated by development and social incentives because of the desire to acquire knowledge and skills on how IPs work and identify future partners.

“As people who are involved in integrated agriculture, livestock and crops, we were identified as service providers who can assist in livestock component and sustainable organic agriculture...as experts in that field we ensure that their farming is done well” (NGO staff, Kigali, Dec. 22, 2010)

“Our main interest is to learn how these IPs work so that we can also develop same projects elsewhere. A platform is an opportunity to identify other actors we didn't know” (NGO staff, Kabale, Nov. 13, 2010)

Well as farmers may be motivated by anticipated benefits that directly improve their livelihoods, representatives from organizations were motivated by benefits that directly improve performance of the organizations. Developmental and social benefits were also important to representatives from organizations such as contributing knowledge and expertise to benefit farmers and also engaging in relationships with other partners for further collaboration. This could be attributed to the perception of a common problem, thereby building social capital to address the problem.

(iv) Policy makers/implementers (local government staff)

Similar to extension workers and NGO representatives, local policy makers and implementers were motivated by purposive benefits. They were motivated by virtue of their

position in the community (as community developers charged with the responsibility to implement programs that improve farmers' livelihoods) and felt that their participation would enable community members to build trust in the new project and actively participate. Policy makers stated that:

“By virtue of me being a sub-county chief, as a policy implementer, I become a member because I have to implement all other programs in the sub-county. With modern methods of managing programs... you have to move with them. You have to be a full participant...”I also feel that we need to uplift the standard of our people...to have food security at home. It gives me pleasure that my people have taken a better step to move out of poverty” (local policy implementer, Bufundi, Nov. 15, 2010)

“As a sub-county chief, I needed to be there because when they see me there, they are encouraged to come...when you fully participate, they think its authentic” (local policy implementer, Kisoro, Nov. 18, 2010)

v) Private business individuals

Traders, processors and input dealers across IPs were primarily inspired by material and economic benefits (maximizing profit, new market opportunities, easy access of produce from farmers, credit and improved equipment/machinery). Other motivating factors were social (e.g., strengthening business networks and group membership) and developmental (acquire knowledge and skills) as reflected in the following quotes:

“We already have a chain of supermarkets within our gazette area, so we thought it would be easy to penetrate that market...Tuskys supermarket is the one that actually kick-started us to join IPs...we got an order from them...” (Trader, Kampala, Nov. 19, 2010)

“I wanted to gain knowledge on how to grind sorghum. The way sorghum is milled does not make it fine. If it was milled and made fine, we would get a lot of profit...we expected to be given grinding mills that grind better than what we have and pay in installments...we expected to get mills that use both electricity and fuel and also get market for packed flour” (processor, Bubare, Nov 13, 2010)

“I was waiting for the group to form and crying for the group but my tears used to go inside as the Banyarwanda saying goes: Amarira yumugabo atembo aja munda (the tears of a man fall while going inside)” (trader, Gataraga, Dec 14 2010)

Maximizing profit is key in stimulating private business sector participation in IPs. Private sector involvement in the value chain is imperative, as it motivates other actors, especially farmers, to engage in activities that improve their livelihoods. Without creating opportunities for financial benefit, it is difficult to spur the private business sector to get involved.

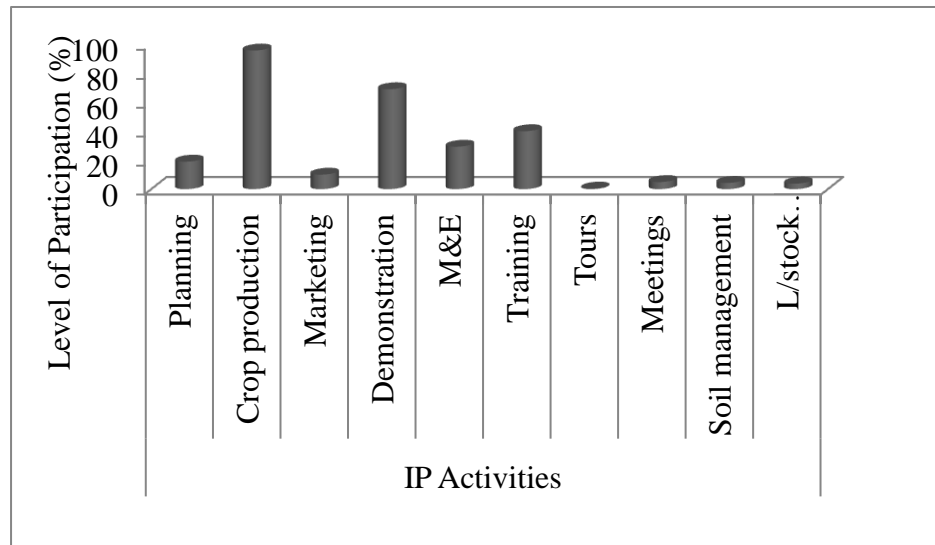
c) Participation in innovation platform activities

The main IP activities mentioned by farmers included crop production (97%), demonstration with new technologies (96%), designing action plans (55%), trainings/workshops (45%), monitoring and evaluation (45%), and marketing (29%). Other activities included soil fertility management, meetings, tours, and livestock and pasture management. Assessment of the level of farmer involvement in these activities indicates that in crop production, 55% were very active, 33% were active, and 12% were somewhat active. In demonstrations, 35% were very active, 37% were active (figure 3-3). In planning, only 35% were very active, 19% were active and 46% were somewhat active. In training, 41.7% of the farmers were very active, 25% were active and 33.3% were somewhat active. 42% participated in 0-2 activities, nearly one-half (49%) of farmers participated in 3-4 activities, and only 9% participated in more than 5 activities.

The chi-square test showed that farmers who were motivated by economic benefits participated in more activities ($p=0.019$). In this study, although most of the farmers claimed to be motivated by developmental objectives, acquiring new knowledge and skills alone were

not sufficient to motivate them to actively participate. Economic and material outputs motivated them to participate in numerous activities. The more educated participated in more activities ($p=0.038$).

Figure 3-3: The Level of IP Member Participation in Activities



Results from the hierarchical linear regression (including sex, age, education and membership to organizations) showed that education contributed significantly ($t=2.599$) to participation in innovation platforms (table 3-3). Addition of group membership to the model did not produce any significant adjustment in R^2 .

Table 3-3: The Association of Socioeconomic Factors and IP Participation, Standardized Coefficients (t-value)

Variable	Model 1	Model 2	Model 3	Model 4
Sex	0.086 (1.117)	0.077 (0.994)	0.017 (0.213)	0.012 (0.150)
Age		0.082 (1.053)	0.116 (1.503)	0.124 (1.60)
Education			0.208 (2.599*)	0.201 (2.508*)
Membership in organizations				-.093 (-1.221)
Adjusted R^2	0.001	0.002	0.036	0.038
F-statistic	1.25	1.18	3.00*	2.68*

* $p<0.05$

The relationship between education and participation is significant in Model 3 and remains robust after membership in organization is entered in Model 4. Among all the variables in Model 4, education explains 20% of the variation in IP participation. Only 4% of the variation in participation is explained. Even though the amount of variation explained is only 4%, both Models 3 and 4 are significant. Much of the variation may be explained by factors not included in the model. There are other factors associated with IP participation that are not captured by this analysis. They are captured in the qualitative analysis and include factors such as prior experience with rural development projects which raise unrealistic expectation, lack of resources, poor understanding of concept and prior commitment. These factors are discussed in section (e).

Although results from the survey did not exhibit variation in the level of participation by gender, in-depth interviews and FGDs revealed that women were more involved compared to men.

“Women are benefiting because they are involved more than men and when you go to villages, women are more active” (FGD participant, Bubare, Nov. 10, 2010)

“We participate in all discussions and in decision making freely. The number of women in the group is greater than the number of men. That is why they express their ideas in group freely” (female farmer, Gataraga, Dec 17, 2010).

Variation in participation by the two methodologies could be explained by participants' expectations from participation in the study. Respondents could have expected to receive benefits by indicating that they were actively involvement in IP activities. The study conducted by (Sanginga, Tumwine, and Lilja 2006) also revealed that participation of women in farmer participatory research was more than participation of men. Participation of men is higher at the beginning of the process but as the group evolves the proportion of men

decreases significantly while the proportion of women continues to rise until it dominates the group.

Similar to the results from the survey, very limited farmer participation was strongly emphasized by all actors who participated in in-depth interviews. This was in part attributed to poor sensitization of community members about the new concept of IPs and lack of resources.

“There is less participation of farmers. Even those who participate, it’s a drop of water in an ocean” (local policy implementer, Kabale, Nov. 15, 2010)

“Some participants are not fully active. They do not want to participate and leave the burden to others. Many people are still behind and do not want to attend meetings” (farmer, Bubare, Nov. 6, 2010)

Besides low levels of farmer participation, other actors who are important links in the value chains were not actively involved. Limited participation of individuals from private business sector, local government officials (policy makers and implementers) and transporters was mentioned several times during in-depth interviews, FGDs, and in comments made by farmers during the survey. This was mostly mentioned in four out of five IPs. The trader in Gataraga IP was a very active participant not only because of desire to network with members but also due to material and economic outputs realized from participation such as remunerative markets, access to credit, and new tools and equipment.

Participants stated that:

“Private sector does not come to our meetings. Only one comes and it’s because he deals in potato. That is why he is interested. Transporters are not active. They are not full participants. We only have to convince them. I don’t think they are much interested” (FGD participant, Chahi, Nov. 17, 2010)

“The people see that we are not with the government and the government does not help us. It could be better if the officials in the government came and took

up responsibilities at the sub county but they can't" (FGD participant, Bufundi, Nov. 12, 2010)

Limited participation of traders and transporters could be attributed to them not yet realizing how to make a contribution and how they were going to benefit, since a majority of the IPs had not started marketing collectively. Spielman and Grebmer (2004) report that some of the challenges involved in engaging the private business sector relate to differing incentives, cultures and interests. The private business sector can be engaged in projects that produce short-term results and products that are appealing to consumers. However, in the case of IPs, the overall interest is in conducting research that addresses the needs of small-scale farmers who have poor market access. In addition, results from these interventions are long-term and generate public goods.

Local policy makers/implementers were expected to participate in policy innovations. Policies refer to laws, rules and regulations from public or state or collective decision-making (Means et al. 2002). Policies formulated at lower government administrative levels are referred to as bylaws. Bylaws are rules made by lower local government councils at village (LC1) and sub-county level (LC3) and provide the local policy guidelines that are followed in sectoral developments, such as agricultural and natural resource management (Sanginga et al. 2004). During the colonial era, authority to manage natural resources was transferred from customary and traditional institutions to the state to avoid destruction of natural resources by communities.

However, the needs and rights of local people were given less consideration. After decentralization, government institutions now recognize the importance of involving local communities in natural resource management (Place, Ssentenza, and Otsuka 2001). Bylaws

for natural resource management are now seen as viable alternatives for enforcing government policies and rectifying their inefficiencies (Sanginga et al. 2004). Within IPs, bylaws on soil and water conservation are formulated with the involvement of all actors at sub-county level. To institutionalize or scale-out bylaws to community level and ensure that they are respected, they need to be approved and enforced by local policy implementers.

Enforcement of bylaws was very weak, especially in Ugandan IPs. Limited participation of local policy makers/implementers in bylaw formulation, approval and implementation was further exacerbated by conflicts between political parties e.g., in Bufundi IP. Implementation of bylaws was a political issue, which in-turn frustrated the active participation of other actors. Literature reveals that when political objectives overshadow development objectives, efforts to establish ownership and encourage participation are frustrated (MSH 2003). Political power differences require continuous negotiation among parties involved in order to achieve desired goals (Brown et al. 2003; Edmunds and Wollenberg 2001).

d) Benefits derived from participation

Since the IPs were still at an early stage at the time of the study, a majority of the actors had not yet realized tangible benefits. Interviews with farmers showed that 30% had definitely realized benefits, 57% had benefited somewhat, and only 13% had not benefited at all. Farmers who participated in more activities perceived IPs to be rewarding ($p=0.01$). Some of the benefits included acquisition of knowledge on modern methods of crop production (61%), accessed agricultural inputs (35%), increased yield (33%), increased income (28%), and knowledge and skills in soil and water conservation (21%).

Most members from the private business sector had not realized any tangible benefits, especially small-scale local traders and processors.

“I expected three things but have not come to pass e.g. access loans at a lower interest rate or without interest, to interact with other traders from Kampala and exchange visits. I have not achieved any” (trader, Bubare, Nov 14, 2010)

Relatively large-scale operators had realized economic and material benefits, such as new products (sorghum porridge) developed by the processor/trader purchasing sorghum from Bubare IP and machinery by the trader from Gataraga IP:

“I have acquired machines (maize sheller, pasture cutter, sorting machine even if its made of wood), running water, now I can pay school fees for the university students. I can now interact with many people. I can also go and look for market and negotiate with buyers because I no longer fear people” (trader, Gataraga, Dec. 14, 2010)

“We have a product on market but the issue is that marketing becomes costly this being a new product, promoting it to the required level is limited (trader, Kabale, Nov. 16, 2010).

This implies that the scale of operation may also determine the rate at which tangible outputs can be realized among traders. Lack of resources to enhance the capacity of small-scale local traders (who are the majority of traders operating in the areas, and are more accessible to farmers) will weaken the value chain and frustrate farmers’ efforts to work towards market-oriented production. Enhancing local traders’ access to economic/financial resources will enhance their capacity to purchase farmers’ produce, which will in turn motivate farmers to increase production and conserve natural resources.

e) Factors sustaining or curtailing participation

- (i) *Expectation of immediate material and economic benefits*

Expectation is a belief that one's participation will result in realization of desired goals. Not meeting expectations of IP members was the most frequently reoccurring theme under factors curtailing participation. This was mentioned over 20 times in both in-depth interviews and FGDs. Actors had unrealistic expectations and their motives of interaction were inconsistent with the intentions of the project. Majority of farmers expected to receive immediate material and economic benefits (such as inputs and money). However, the sub-Saharan Africa Challenge Program does not give material or economic incentives to lure people into participation. It aims at nurturing a development mentality whereby all actors contribute towards solving a common problem. Since participation in development projects is now associated with giving out material and economic incentives, actors devalue projects which deviate from this practice, hence withdrawal or reduce their involvement as reflected below.

“Some farmers expected money and free seeds so after failing to get these things they disappeared and that was not the target of FARA because FARA was interested in giving them knowledge only and then they work for themselves” (farmer and trader, Gataraga, Dec. 15, 2010)

“The IP has started not to do well. Nowadays, there is no progress. Some members joined the IP to get money or profits but after a few times, they see that there is no direct money to them so they decreased their effort” (extension worker, Gataraga, Dec. 17, 2010)

“They thought they would get allowances, income...that is why the processor left. He thought the project would put him into business immediately. He thought his mill would be busy packing, selling sorghum but realized that the thing was long distance” (farmer, Bubare, Nov. 7, 2010)

“The processor dropped out because he thought the Challenge Program is going to give money for that processing...he thought the business would go to him, but also the money for the business would be given to him by the program...his interests were not catered for and he dropped out (researcher, Kabale, Nov. 29, 2010)

High expectation of immediate material and economic benefits may be attributed to community members' prior experience with rural development projects which give farmers material or economic incentives to stimulate and sustain participation. In addition, the expectation of receiving money at meetings could also have risen by the strategy used at initiation of the project when participants were given money to cover transport costs to the meeting venue. The expectation are conditioned by experience and reinforced by culture. Prior experience influences expectations about how behavior will be rewarded either materially or non-materially (Uphoff 2000). Warner (2006) notes that unrealistic expectations bring disappointment, which in turn makes it harder to involve people in future participatory initiatives. Some stakeholders may not participate because they do not see how they benefit or fail to see the gains if there are no quick returns. Sanginga et al. (2007) note that high individual expectations led to partnership termination at formation and implementation stages.

Sustaining participation will require changes in attitudes from expecting external incentives to more self-efficacious development in which each and every actor believes in their ability to contribute towards value chain development to improve the wellbeing of smallholder livelihoods. Change in expectations, nurturing of positive attitude and working together toward long-term goals had sustained participation of members as mentioned below.

“I thought that I would quickly get benefits...I would have the enterprise modified and get profits. I thought sorghum was going to be improved quickly, get money quickly and fees. But when we developed the work plan, I knew it was not as quickly as I thought (laughs). I knew that it was going to be gradual. But I know, not very long, sorghum will be a very good enterprise. More profitable to farmers” (farmer, Bubare, Nov. 7, 2010)

“I also expected seeds and money but when the seeds delayed, I remained in the group and now am seeing some fruits such as information on agriculture,

and am now the trader of the IP. Instead of giving somebody a fish every day, it's better to teach him how to fish so that he can also fish by himself" (trader, Gataraga, Dec. 14, 2010)

"I thought it was like any other organization that come and then leave. With time, I knew that the IP had come to stay. It is farmer centered" (local policy maker, Bubare, Nov. 11, 2010)

Furthermore, conveners of IPs need to be clear about the objectives of the process and prioritize what can realistically be achieved without significantly raising expectations and, thereby, sustain participation. Maintaining participation within IPs requires that project managers generate short-term and tangible outputs (such as honoring members by giving them products that raise their status in society), craft strategies that cater for the interests of all actors, and continue sensitizing participants about the long-term benefits of collaboration. Prioritization of issues, which could not be realistically achieved in the short-term led to loss of trust in the project and consequently low participation as stated by one of the policy implementers:

"They mentioned construction of store in the sub-county, which was going to be a sign of development. I wanted to register success in the sub-county within the period of office. However, it did not become a solid reality....we did not get what we wanted....now am demoralized of not achieving what I had anticipated" (local policy implementer, Kisoro, Nov. 18, 2010)

(ii) *Lack of proper understanding of IP concept*

IP is a new concept and many actors do not have a clear understanding of how the approach works. Members expressed lack of sufficient information about the concept of IPs. The approach has new ways of doing things which creates fear and uncertainty among actors as reflected in the statements below:

"The problem is farmers. They do not buy into new ideas quickly. But also other actors like transporters and input dealers may not easily see how they will benefit from the IP because they are exploiters. That is the fear. The

trader thinks the prices will be affected if they enter into meetings...the culture of working in isolation. IP being a new concept causes those fears (NGO representative Kabale, Nov. 13, 2010)

“Traders at the lower level are not with us. Since they are used to exploiting farmers, they think that collective marketing will threaten their pricing system” (farmer and trader, Bubare, Nov. 13, 2010)

In addition, a lack of clarity regarding some actors’ roles and non-formal partnerships among organizations limited their commitment to and integration of IP activities.

(iii) Lack of resources

Lack of resources was also mentioned several times in both in-depth interviews and FGDs. Extension workers and IP chairpersons lacked resources, in terms of transportation to mobilize farmers who live on the upper side of the hills. Therefore, these members did not receive information about meetings, which affected their active involvement. In addition, chairpersons lacked financial resources to make radio announcements to reach as many people as possible. Lack of facilitation in terms of transport and meals during meetings held at lower implementation levels (parish/village level) also discouraged farmers at those levels from participating. In addition, lack of resources to apply knowledge acquired (such as improved seed, fertilizer, tools, equipment and credit) curtailed active participation of farmers and individual from the private business sector:

“Members have started neglecting IP meetings because whenever they come to attend, they do not facilitate them e.g. lunch and their transport back” (farmer, Bubare, Nov. 6, 2010)

“We in NAADS, as extension workers, we never received any facilitation [resources] but people think we have a lot of money. Local government delayed to release funds for extension workers to do what they are supposed to be doing” (extension worker, Bufundi, Nov. 13 2010)

“IP has its own technical staff but what is lacking is the other arm of government to work with the person of IP. The problem of government is that if am not facilitated [resources] then I see no reason to be there” (local policy implementer, Kisoro, Nov. 18, 2010)

We have no packing materials and we do not know where to purchase them e.g., thermometers. We ordinary farmers cannot have the skill to purchase them” (trader who quit Bubare IP, Bubare, Nov. 27, 1010).

(iv) Over-commitment

Participation requires dedication of time, money and energy, which are costs to participating actors. All local government officials interviewed indicated prior commitment to many other activities as one of the constraining factors to their full participation in innovation platform activities. Engagement in IPs constituted additional roles. This was worsened by not integrating IP activities into already existing government programs. This was primarily observed in Uganda IPs and it’s reflected in the statements below.

“I participate once in a while because of the nature of my work. Normally, the IP has its activities and I also have NAADS activities but when I have time, I participate” (extension worker, Bubare, Nov. 16, 2010)

“I attend few meetings in person. Meetings are scheduled on Tuesday so I do not attend. Their fieldwork is done on weekend, so it becomes difficult for me to attend. Fieldwork on other days, I find it easier to delegate than me being there. If they contacted me early enough, we would agree on the date. If they would fully participate in NAADS, I would handle them concurrently. That is what we call joint work plan or integrated activity” (local policy implementer, Bufundi, Nov. 15, 2010)

“At first I was very active when it had been introduced. I was a secretary for atleast 2 months. Thereafter, I realized that I would not have a lot of time and also did not know much about agriculture. The sitting would be on Saturday when I needed to rest...” I’m now the agricultural officer yet I did history. When I call IP members, what will I tell them? Now they are doing things and I’m not participating. Sitting with them is not significant. That’s where there’s frustration” (local policy implementer, Chahi, Nov. 18, 2010)

On the other hand, discussions with farmers revealed lack of interest in the program by local government officials mainly policy makers and implementers because they lacked resources and immediate incentives to motivate them. Warner (2007:58) asserts that obtaining and sustaining commitment from political leaders is not easy, since politicians are more attracted to initiatives which provide tangible and short-term outputs, and the outcomes from integrated and collaborative approaches are often intangible and long term.

Contrary to the IPs in Uganda, the IP activities in Rwanda were integrated into government programs to pool resources and avoid conflicts and violation of government policies. IPs in Rwanda operated within the framework of government policies. This implies that a favorable policy environment is required to foster active participation of actors. Integration of IP activities into existing government programs and activities would foster participation of relevant actors to minimize transaction costs in terms of time, energy and resources. In the previous section, we noted that policy makers were motivated to participate because they believed that their participation motivated other community members to participate. This indicates that poor participation of local policy makers may limit participation of other community members.

v) *Feeling de-valued*

Feeling devalued limits active participation of members and may lead to withdrawal from IPs. The processor who dropped out of Bubare IP felt that facilitators of the program devalued his capacity to process quality sorghum product and gave the processing skills to the established large-scale processor. The policy maker who dropped out of Bufundi IP felt that the IP chairperson did not respect him. In addition, the extension worker in Bubare IP

felt that being treated like farmers was devaluing since she was more qualified than farmers.

The respondents reported that:

“They trained us only for one week. So I knew that we were going to process by themselves.... we knew that Mr. Z was doing processing...but we also wanted more skills in processing. We went to Mr. Z’s processing plant and that is where I changed my mind. When we reached there I was amazed. I didn’t see much that our ordinary farmer can’t do. In my view, we were beating him. I had been processing sorghum for 12 years and he was new in the industry. I asked Mr. X, why are you giving skills to Mr. Z yet farmers are eager to process themselves? Although we are processing locally, we can modernize. As processors, what we want are skills. So I said let me go” (processor - quit IP, Bubare, Nov. 27, 2010)

“The chairman of the IP does not invite me to meetings. One time, I brought 100 bags of potato seed and he chased me. So ever since, I and the chairman do not work together” (secretary of production - quit the IP, Bufundi, Nov. 15, 2010)

“This innovation platform is not treating me the way I’m supposed to be treated. The way we are treated is the way farmers are treated. Being at the same level with farmers is challenging... the way the chairman is involved, he is on top...he is the one telling me what we are going to do. Sometimes I have no morale for IP because of that” (extension worker, Bubare, Nov. 16, 2010)

“We had training on how to process sorghum for 3 days. We did the processing and packaging by ourselves. Mr. Z came in after a month. We were told that he can make porridge that can be sold in Kampala. We toured Mr. Z’s industry. He showed us machines that make cheese, yoghurt and porridge. The way he made sorghum is the way we were taught in the IP. So what made the vice chairman to leave the IP was that he was also processing porridge. So he said... you people, you think we are ladders to climb on. We make porridge. This man is from town [Mr. Z]. He does not come from our village. If you had told us that the machine costs this amount, we would have mobilized money to buy it. So he left and handed over everything. He said that those who are learned want the lower person to remain at a lower level and the upper person to go up. He was encouraged to also process sorghum and give it another label but he got so angry and left” (trader, Bubare, Nov. 14, 2010)

It is important to encourage participation from all actors by creating a higher level of trust and respect for all actors. Recognition of existing community assets such as human capital and building of these strengths further motivates participation of community members.

Conclusions and Implications for Future Research

The increasing interest in IPs reflects their potential for addressing agricultural related problems to improve smallholder livelihoods. However, no studies have previously been conducted to understand the relationship between motivation and participation in IPs. This study was designed to determine the factors that motivate actors to participate in IPs, determine whether full participation helps actors to achieve their desired goals, and identify the factors which sustain or curtail participation. The study uses social capital and social exchange theory to examine participation in five IPs in the Great Lakes Region of Africa.

The study demonstrates that actors within an IP have multiple factors that motivate them to participate (including development, material, economic, social and purposive). Farmers were primarily motivated by factors that directly improve their livelihoods while extension workers, NGO representatives and policy makers were motivated by purposive incentives, and traders were mainly motivated by economic incentives. Although the majority of farmers indicated developmental benefits as the main motivating factor, the desire to acquire knowledge and skills alone was not sufficient to encourage active participation. Economic and material incentives encouraged farmers to continue participating. Farmers who were more educated participated in more activities. However, the regression model did not explain much of the variation in participation. Much of the variation was explained by qualitative data. Farmers who participated in more activities perceived innovation platforms to be rewarding. While the survey results did not reveal differences in level of participation between men and women, qualitative interviews revealed that women were more active than men.

Although private business actors were mostly motivated by anticipated economic benefits, they did not participate actively in four of the five IPs. The size of operation influenced the extent to which individuals in the private business sector generated tangible benefits, with large-scale traders benefiting more and within a shorter time frame. In addition, local policy makers were not active participants due to lack of tangible short-term benefits to motivate them to participate. The study generated mixed results for hypothesis 1. Although expectation of material, economic, development, social and purposive benefits may encourage actors to participate in IPs, active and sustainable participation is achieved with actual realization of short-term benefits, primarily material and economic benefits. The second and third hypotheses were supported.

Factors that curtailed continued participation were priori experience of receiving immediate tangible benefits from development projects which raised unrealistic expectations, lack of sufficient knowledge about the concept IPs, lack of resources, over-commitment and feeling de-valued. Although IPs have been successful in including diverse value chain actors, success in establishing strong value chains and improving smallholder livelihoods will depend on active participation of all relevant chain actors and developing common interests. This will require changes in attitudes about receiving external incentives, nurturing positive attitude and commitment from all stakeholders to contribute to the process. Social exchange theory reflects the iterative nature of social relationships. The feedback loops either reinforce continued participation or are a disincentive to participation. Continued participation in exchanges is further enhanced by social capital. Although people may engage in collective action for self-interest, they are also interested in and willing to contribute to activities that

benefit others. Therefore, social exchange theory alone cannot explain participation of individuals in collective action. It must be complemented by social capital theory.

This research has practical implications for community organizers and policy makers to determine the advantages of multi-stakeholder participation, design and implement inclusive development interventions, and make participation successful. IP members would benefit greatly from being trained and sensitized about the expectations supposed to govern their behavior. Future research needs to investigate the characteristics of individuals who continue or cease participating in IPs, the conditions that facilitate participation, and the strategies to cope with obstacles to successful IPs. Future research can also examine how intrinsic and extrinsic incentives influence performance of IPs.

References

- Agarwal, B. (2000). *Group Functioning and Community Forestry in South Asia: A Gender Analysis and Conceptual Framework*: World Institute for Development Economics Research.
- Agarwal, B. (2001). Participatory Exclusion, Community forestry, and Gender: An Analysis for South Asia and a conceptual Framework. *World Development*, 29(10), 1623-1648.
- Aleman, S., & Flora, C. B. (2003). *Rural Organizations in Guerrero, Mexico: Sustainability, Gender and Social Capital*. Paper presented at the Conference, Community Development Society Meeting, July 2003, Cornell University, Ithaca.
- Beierle, T. C. (1999). Using Social Goals to Evaluate Public Participation in Environmental Decisions. *Policy Studies Review*, 16(3-4), 75-103.
- Blau, P. M. (1964). *Exchange and Power in Social Life*. New York: Wiley.

- Brown, D. L., & Ashman, D. (1996). Participation, Social Capital, and Intersectoral Problem Solving: African and Asia Cases. *World Development*, 24(9), 1467-1479.
- Brown, D. L., Bammer, G., Batliwala, S., & Kunreuther, F. (2003). Framing Practice-research Engagement for Democratizing Knowledge. *Action Research* 1(1), 65-85.
- Burke, E. M. (1968). Citizen Participation strategies. *Journal of the American Institute of Planners*, 34(5), 287-294.
- Clark, P. B., & Wilson, J. Q. (1961). Incentive Systems: A Theory of Organizations. *Administrative Science Quarterly*, 6(2), 129-166.
- Cleaver, F. (2001). Institutions, Agency and the Limitations of Participatory Approaches to Development. In B. Cooke & U. Kothari (Eds.), *Participation: The New Tyranny* (pp. 36-50). London: Zed Books.
- Cooke, B., & Kothari, U. (2001). *Participation: The New Tyranny*. London: Zed Books.
- Critchley, W., Verburg, M., & Veldhuize, L. v. (Eds.). (2006). *Facilitating Multi-Stakeholder Partnerships: Lessons from PROLINNOVA*. Silang, Cavite, Philippines: IIRR/Leusden: PROLINNOVA International Secretariat, ETC EcoCulture.
- Edmunds, D., & Wollenberg, E. (2001). A Strategic Approach to Multistakeholder Negotiations. *Development and Change*, 32(2), 231-254.
- FARA. (2005). *Findings of the Lake Kivu Pilot Learning Site Validation Team. A Mission Undertaken to Identify Key Entry Points for Agricultural Research and Rural Enterprise Development in East and Central Africa*: Forum for Agricultural Research in Africa (FARA).
- FARA. (2007). *Sub-Saharan Africa Challenge Programme: Medium Term Plan 2008-2010*. Accra, Ghana: Forum for Agricultural Research in Africa (FARA).

- FARA. (2009a). *Sub-Saharan Africa Challenge Program (SSA-CP): Strategies and Lessons Sharing Forum*. Synthesis report.
- FARA. (2009b). Sub-Saharan Africa Challenge Programme: Research Plan and Programme for Impact Assessment (pp. 36). Accra, Ghana: FARA (Forum for Agricultural Research in Africa).
- Fox, J. (1996). How Does Civil Society Thicken? The Political Construction Social Capital in Rural Mexico. *World Development*, 24(6), 1089-1103.
- Frank, R. (1992). *Passion within Reason: The Strategic Role of Emotions*. New York: W.M. Norton.
- Fukuyama, Francis. 1995. Trust: The Social Virtues and the Creation of Prosperity. New York: Free Press.
- Griffin, C. B. (1999). Watershed Councils: An Emerging Form of Public Participation in Natural Resource Management. *Journal of American Water Resources Association* 35(3), 505-518.
- Hawkins, R., Heemskerk, W., Booth, R., Daane, J., Maatman, A., & Adekunle, A. A. (2009). Integrated Agricultural Research for Development (IAR4D): A Concept Paper Prepared for Forum for Agricultural Research in Africa (FARA) and the Sub-Saharan Africa Challenge Program (SSA CP). Accra, Ghana: FARA.
- Homans, G. (1964). Bringing Men Back In. *American Sociological Review*, 29(5), 809-818.
- Howell, R. E., Olsen, M. E., & Olsen, D. (1987). *Designing a Citizen Involvement Program: A Guide for Involving Citizens in the Resolution of Environmental Issues*.
- Irvin, R. A., & Stansbury, J. (2004). Citizen Participation in Decision Making: Is It Worth the Effort? *Public Administration Review*, 64(1), 55-65.

- Jonsson, A. (2005). Public Participation in Water Resource Management: Stakeholder Voices on Degree, Scale, Potential, and Methods in Future Water Management. *AMBIO: A Journal of the Human Environment*, 34(7), 495-500.
- Lawrence, R. L., & Deagen, D. A. (2001). Choosing Public Participation methods for Natural Resources: A Contextual Specific Guide. *Society and Natural Resources*, 14(9), 857-872.
- Lundy, M., Gottret, M. V., & Ashby, J. (2005). Learning Alliances: An Approach for Building Multi-stakeholder Innovation Systems ILAC Brief. No. 8. Rome, Italy: ILAC Institutional Learning & Change.
- Matta, J. R., & Alavalapati, J. R. R. (2006). Perceptions of Collective Action and its Success in Community Based Natural Resource Management: An Empirical Analysis. *Forest Policy and Economics*, 9: 274-284).
- Means, K., Josayma, C., Neilsen, E., & Viriyasakultorn, V. (2002). Community-Based Forest Resource Conflict Management. A Training Package. Volumes (Vol. 1-2). Rome, Italy: Food and Agriculture Organization of the United Nations, FAO.
- Mokwunye, U., & Ellis-Jones, J. (2010). Sub-Saharan African Challenge Program (SSA-CP): Internal Review Report: FARA.
- MSH (Management Science for Health). (2003). Coordinating Complex Health Programs. *The Manager* 12, 1-24.
- Mullen, M. W., & Allison, B. E. (1999). Stakeholder Involvement and Social Capital: Keys to Watershed Management Success in Alabama. *Journal of the American Water Resources Association*, 35(3), 655-662.

- Napier, T. L., Carter, M. V., & Bryant, E. G. (1986). Local Perceptions of Reservoir Impacts: A Test of Vested Interests. *American Journal of Community Psychology, 14*(1), 17-37.
- Napier, T. L., & Napier, A. S. (1991). Perceptions of Conservation Compliance Among Farmers in a Highly Erodible Area of Ohio. *Journal of Soil and Water Conservation, 48*(3), 220-224.
- Negra, C. (1998). *Identifying Factors Leading to Effective Local Conservation Commission: An Investigation in New Hampshire and Vermont*. Burlington, VT: The Northern Regional Center for Rural Development.
- Oakley, P. (1991). *Projects with People: The Practice of Participation in Rural Development*. Geneva: International Labour Organisation.
- Place, F., Ssentenza, J., & Otsuka, K. (2001). Customary and Private Land Management in Uganda. In *Land Tenure and Natural Resource Management* (pp. 195-233). Washington DC: IFPRI.
- Putnam, R. D. (1993). *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton: Princeton University Press.
- Prestby, J. E., Wandersman, A., Paul Florin, Rich, R., & Chavis, D. (1990). Benefits, Costs, Incentive Management and Participation in Voluntary Organizations: A Means to Understanding and Promoting Empowerment. *American Journal of Community Psychology, 18*(1), 117-149.
- Robinson, M. (Ed.). (1998). *Democracy, Participation, and Public Policy*. Oxford: Oxford University Press.

- Röling, N. (2002). Beyond the Aggregation of Individual Preferences: Moving from Multiple to Distributed Cognition in Resource Dilemmas. In C. Leeuwis & R. Pyburn (Eds.), *Wheelbarrows Full of Frogs: Social Learning in Rural Resource Management* (pp. 25-47). Assen, The Netherlands: Koninklijke Van Gorcum.
- Sanginga, P. C., Chitsike, C. A., Njuki, J., & Kaaria, S. (2007). Enhanced Learning from Multi-stakeholder Partnerships: Lessons from the Enabling Rural Innovation of Africa Programme. *Natural Resource Forum*, 31, 273-285.
- Sanginga, P. C., Kamugisha, R., Martin, A., Kakuru, A., & Stroud, A. (2004). Facilitating Participatory Processes for Policy Change in Natural Resource Management: Lessons from the Highlands of Southwestern Uganda. *Journal of Agricultural Sciences*, 9(1), 958-970.
- Sanginga, P. C., Tumwine, J., & Lilja, N. K. (2006). Patterns of Participation in Farmers' Research Groups: Lessons from the Highlands of Southwestern Uganda. *Agriculture and Human Values*, 23, 501-512.
- Spielman, D. J., & von Grebmer, K. (2004). Public-Private Partnerships in Agricultural Research: An Analysis of Challenges Facing Industry and the Consultative Group of International Agricultural Research Washington, D.C: International Food Policy Research Institute.
- Tenywa, M. M., Rao, K. P. C., Tukahirwa, J. B., Buruchara, R., Adekunle, A. A., Mugabe, J., et al. (2011). Agricultural Innovation Platform As a Tool for Development Oriented Research: Lessons and Challenges in the Formation and Operationalization. *Learning Publics Journal of Agriculture and Environmental Studies*, 2(1), 117-146.

- Uphoff, N. (2000). Understanding Social Capital: Learning from the Analysis and Experience of Participation. In P. Dasgupta & I. Serageldin (Eds.), *Social Capital: A Multifaceted Perspective*. Washington D.C: The International Bank for Reconstruction and Development / The World Bank.
- Verschuren, P., & Doorewaard, H. (1999). *Designing a Research Project*. Utrecht: LEEMA.
- Wandersman, A., Florin, P., Friedmann, R., & Meier, R. (1987). Who Participates, Who Does Not, and Why? An Analysis of Voluntary Neighborhood Organizations in the United States and Israel. *Sociological Forum*, 2(3), 534-555.
- Wandersman, A., & Giamartino, G. A. (1980). Community and Individual Difference Characteristics as Influences on Initial Participation. *American Journal of Community Psychology*, 8(2), 217-228.
- Warner, J. F. (2005). Multi-Stakeholder Platforms: Integrating Society in Water Resource Management. *Ambiente & Sociedade*, 3(2), 1-21.
- Warner, J. F. (2006). More Sustainable Participation? Multi-Stakeholder Platforms for Integrated Catchment Management. *International Journal of Water Resources Development*, 22(1), 15-35.
- Warner, J. F. (2007). *Multi-Stakeholder Platforms for Integrated Water Management*. Burlington, VA: Ashgate Publishing Company.
- Widmer, C. (1985). Why Board Members Participate. In R. D. Herman & J. V. Til (Eds.), *Nonprofit Boards of Directors: Analyses and Applications* (pp. 8-23). New Brunswick, NJ: Transaction Publishers.

World Bank. (2007a). *Enhancing Agricultural Innovation: How to Go Beyond the Strengthening of Research Systems*. Washington, DC: The International Bank for Reconstruction and Development / The World Bank.

CHAPTER 4. POWER AND INFLUENCE IN DECISION-MAKING WITHIN INNOVATION PLATFORMS

Manuscript prepared for the journal: *Development and Change*

Abstract

Innovation platforms (IPs) have emerged as important governance structures in the agricultural sector to promote collaboration among diverse stakeholders along a commodity value chain to address the needs of smallholder farmers. This study was conducted to provide an understanding of the power dynamics in IPs, their effect on decision-making and the context in which decisions are made. IPs nurtured a consensual and democratic process of decision-making. Active involvement of farmers in decision-making enhanced prioritization of issues of concern to them. However, concerns of small-scale local traders and women were not completely taken into account. Those with more access to information, knowledge, and financial resources demonstrated more power and influenced the decision-making, and implementation process. Existing hierarchical power structures generated power struggles between the empowered farmers and the powerful local government officials. Rigid government policies and their implementation may promote collective decision-making but also constrain implementation of potential technologies.

Introduction

Innovation platforms (IPs) have emerged as important structures in the agricultural sector to involve a diversity of stakeholders along the commodity value chain in agricultural research to address the needs of smallholder farmers. Platforms are commonly defined as decision-making bodies comprising different stakeholders who perceive the same problem, realize their interdependence for solving it, and come together to agree on action strategies to solve the problem (Steins and Edwards 1998:1). An IP is an informal partnership of researchers, extension workers, farmers, development practitioners, individuals from the private business sector and policy makers who are motivated to collaborate by the belief that increasing agricultural productivity can help improve the welfare of all community members (Eicher 2006). In this study, an IP is defined as a forum in which multiple actors with

meaningful interests in a common issue collaborate in identification of agricultural problems, share and develop new ideas to better solve those problems, and implement creative solutions to improve livelihoods.

Research institutions and government agencies have organized and developed IPs to provide a space where different stakeholders (civil society, producer associations, public and private business sector) interact to learn about each other's values and interests, develop shared priorities, define roles and agree on joint actions (Hall et al. 2003) to address concerns regarding smallholder farmers' production and marketing of crops. IPs have been designed in response to the failure of the traditional agricultural research and extension approach to translate research outputs into development and social impacts (FARA 2007) that address widespread poverty, hunger and malnutrition in sub-Saharan Africa (Mokwunye 2010).

The traditional approach of knowledge generation and learning follows a linear approach where researchers and experts produce new knowledge and technology and transfer it to the end users who need it to innovate and change (Lundy et al. 2005). The research of most national agricultural systems is not linked to technology users and other actors in the sector. Researchers, the end users of research outputs and other providers of services that support agricultural production, value addition and marketing, largely work in isolation from one another. As a result research outputs do not address the needs of end users (FARA 2007; World Bank 2007a). Therefore, IPs are seen as a significant improvement over the linear, less inclusive and less interactive traditional agricultural research and extension approach.

The sub-Saharan African Challenge Program (SSA-CP), initiated in 2004, designed and implemented the Integrated Agricultural Research for Development (IAR4D) approach to respond to the need for innovative and high impact research. The approach aims at involving a diversity of actors along a commodity chain to ensure relevance, responsiveness of research to stakeholders' needs, and creating an environment that enhances social learning. In this approach, IPs are used as a forum for involvement of diverse actors (including farmers, researchers, extension agents, development specialists, input and output traders, agro processors, financial institutions, policy makers, and cooperatives), for joint problem identification, prioritization and implementation of viable solutions (FARA 2007) that will

increase food security, access to markets, reduce poverty and malnutrition, and promote sustainable natural resource management (Mokwunye 2010).

IAR4D implements a decentralized system of governance in which actors at the community level, including farmers, are involved in decision-making. Participation of community members is assumed to promote democratization and empowerment in decision-making (Edmunds and Wollenberg 2001). Participatory decision-making is also thought to reduce the gap of power inequalities through processes of knowledge production which strengthen the voice of marginalized groups (Gaventa and Cornwall 2001). However, IP is a relatively new concept in agricultural research for development and there is limited understanding of how decision-making processes empower farmers to articulate issues that are of concern to them and the context within which decisions are made.

Many multi-stakeholder processes ignore power differences and inequality among participants, which leads to over estimation of the level of consensus. Stakeholders with limited power to influence decisions may be manipulated by more powerful stakeholders (Edmunds and Wollenberg 2001). Participatory approaches fail to adequately address issues of power and control of information and other resources (Biggs 1995). The belief that participation is a good practice has resulted into less consideration of power and politics in processes (Clever 2001). In addition, most of the multi-stakeholder processes are set up in environments characterized by high socioeconomic inequalities (such as income levels, education attainment, and access to information). Therefore, traditional patterns of power tend to persist and manipulate the identification of problems and the definition of agendas (Warner 2007:134). Failure to recognize power differences may reproduce power differences - thereby reinforcing asymmetric relations that an intervention would seek to change (Brown et al. 2003).

This study was designed to investigate the power dynamics within IPs and the factors which influence decision-making (such as knowledge, access to information, control of resources, structure and policy) in five IPs in Lake Kivu Region between Sept.-Dec. 2010. Both qualitative and quantitative methods of data collection were employed. The research questions addressed are:

1. How are decisions made in IPs?

2. Does active involvement of farmers enhance prioritization of issues that address their needs?
3. How do knowledge, access to information and resources influence decision- making?
4. What contextual factors influence decision-making and implementation of decisions?

I hypothesize that full participation of farmers in decision-making enhances prioritization of issues that address their concerns and that farmers who access more information and knowledge exercise more power. I use the theory of power and concept of participation, to explain the factors that influence decision-making in IPs. This will facilitate better understanding of social and economic inequalities in IPs and development of measures to address them. This study extends innovation systems theory and social capital theory by explicitly incorporating the concept of power. Innovation systems theory assumes that all stakeholders have realistic potential to exert relatively equal influence. This paper has practical implications for organizers of multi-stakeholder platforms in addressing power relations to ensure that less powerful actors have the ability to raise their concerns. The paper also has implications for policy makers in designing policies that facilitate participation of community members in making decisions, which directly impact their livelihoods. The findings may be of value to scholars who are interested in understanding the emergency and implementation of IPs.

The paper is organized as follows. The next section presents the key features of IPs, the third section discusses decision-making, participation and power in multi-stakeholder platforms, section four reveals the methodology, data, and discussion and finally, section five presents the conclusion.

Key Features of Innovation Platforms

IPs constitute actors with diverse competence working in partnership to address problems in the entire value chain (FARA 2009b). IPs are expected to generate better and acceptable decisions compared to decisions made without involvement of community members (Hemmati 2002). Multiple actors within the IP bring a diversity of knowledge and information on which to base decisions compared to a centralized process (Botchway 2001;

FARA 2007). Stakeholders are more likely to accept a project or solution to a problem if they have been part of the decision-making process (Faysse 2006).

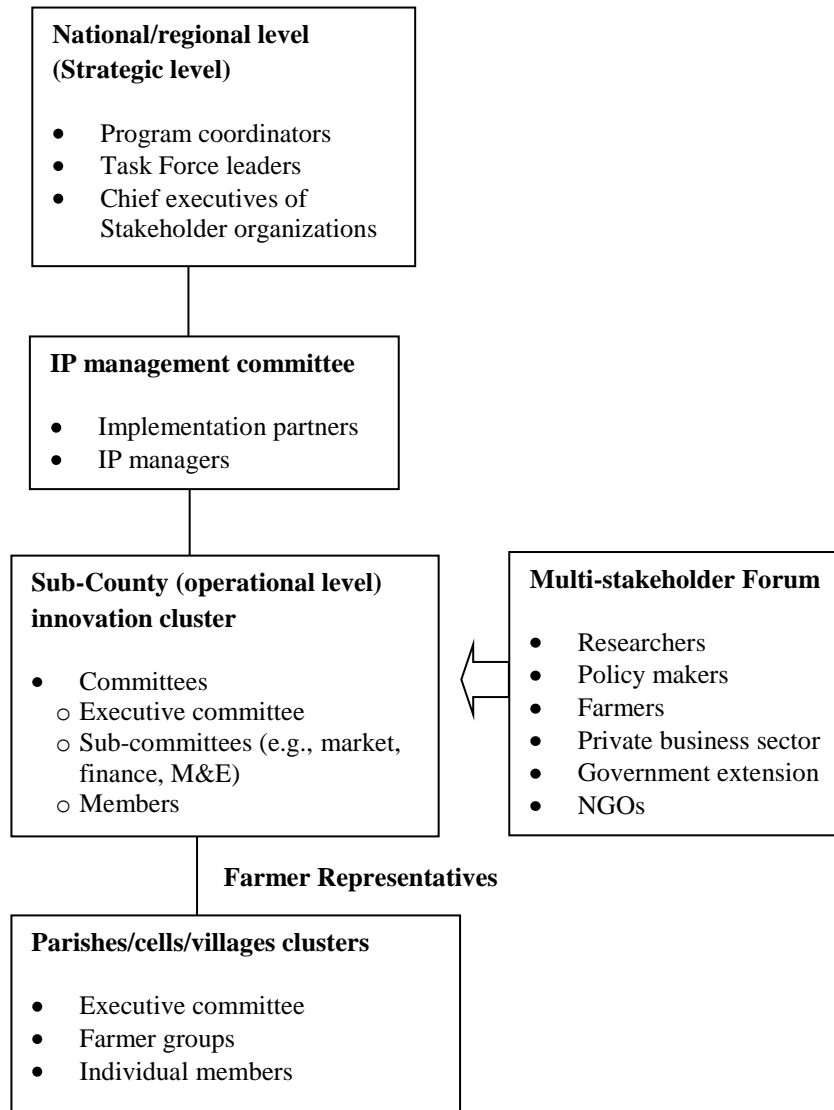
Twelve IPs were established in Lake Kivu Region. This is the region where northeastern Rwanda, eastern Democratic Republic of Congo (DRC) and southwestern Uganda intersect. Seven of the IPs were established during the last quarter of 2008 and five in the first quarter of 2009 (Tenywa et al. 2011). IPs are facilitated by a team of interdisciplinary scientists (Task Forces) who bring together stakeholders along the resource to consumption continuum (FARA 2007). Each IP is organized to address problems specific to a given value chain (such as potato and sorghum value chains). IPs have innovation clusters at two implementation levels, i.e., the strategic level (regional and national level) and operational level (sub-county⁶). An innovation cluster consists of groups of actors with similar characteristics, who gather together to address common issues. The sub-county innovation cluster is sub-divided into sub-clusters of innovation at parish and at village level (Figure 4. 1). A cross-site research support team (CRST) builds the capacity of IP members at the operational level by providing technical support in selected key areas, i.e., increasing production, access to markets, natural resource management and policy (FARA 2009b).

Governance of multi-stakeholder platforms is ideally based on pluralistic principles including democracy, participation, equity and justice, unity in diversity, transparency, inclusiveness, legitimacy, and accountability (Schiffer et al. 2010). IPs have an executive committee (with chairman, vice chairman, secretary, treasurer and committee members representing groups from different parishes) supported by sub-committees (which focus on marketing, research, finance, natural resource management, and monitoring and evaluation). The committee, together with other actors, meets at sub-county level and makes operational decisions (developing the agenda, convening IP meetings, following-up on decisions made, facilitating interaction between different IP members, mobilizing important actors who are not present at IP meetings and liaise with national and regional partners). Strategic decisions (such as agenda of the country or region and location of activities) are made at national and regional levels (Tenywa et al. 2011).

⁶ Sub-county is the third political administrative unit in Uganda and Rwanda. The sub-county is subdivided into parishes or cells. Parishes contain villages, the lowest political administrative units.

The governance structure at sub-county level is paralleled at lower implementation levels to ensure proper coordination of activities between hierarchies. Members of IPs at the different implementation levels meet once a month, with members of the lower level (parish/village level) implementation cluster meeting first so that their representatives forward their issues to the sub-county executive committee. The sub-county innovation cluster is the hub where information collected from other implementation levels is processed, decisions are made and feedback is given to members in other clusters.

Figure 4-1: Organizational Structure of an IP



Participation, Power and Influence in Decision-Making

Community development approaches are rooted in the inclusion of community members in planning and decision-making. It is argued that community members' livelihoods are more likely to be improved if a broad range of stakeholders is included in the process of decision-making (Hyman 2002). Improving livelihoods of community members does not limit itself to individuals within the community. Both internal and external relationships are required (DeFilippis 2001). Transparent and inclusive decision-making processes increase the level of trust among stakeholders. Increase in the level of trust can potentially increase the ability of stakeholders to implement decisions (Wagner and Fernandez-Gimenez 2008; Wondolleck and Yaffee 2000). Participation and representation of all diverse groups in decision-making is believed to generate consensus and social learning (Narayan 1999).

Consensus-based decision-making processes are committed to reaching a mutual agreement and seek win-win solutions (Peterson, Peterson, and Peterson 2005). Susskind et al. (1999) claims that consensus-based decisions reach more creative solutions, which are more readily implemented compared to those made by non-consensus processes. However, other authors have argued that consensus augments power inequalities in relationships. Consensus may favor the status quo and lead to risky decisions. Weaker groups may accept decisions contrary to their interest (Cooke and Kothari 2001; Peterson et al. 2005). Success and sustainability of a value chain depends on the existence of suitable governance systems. Leaders need to identify governance systems to ensure that partners behave in a manner that benefits the entire chain and do not exhibit opportunistic behavior (Gooch, 2005).

Several authors have argued that participation has not been successful in overcoming power relations and has sustained and reinforced inequalities in economic, political and social structures. Power remains dispersed between individuals and structures (Cooke and Kothari 2001; Hildyard et al. 2001) and affects the choices made within social systems (Pfeffer 1981). The level of power and influence depends on the relations that people have within social structures (Blau 1964; Marsden and Friedkin 1994). The relations between individuals are embedded within social networks. Positions of individuals within networks can constrain or enhance their ability to exercise influence. Actors with more opportunities

exercise more influence in decision-making. Although multi-stakeholder platforms are assumed to have no lines of command, there are actors, such as those in government organizations, who may assume that they are the leading decision makers even when a democratic decision-making process is in place (Schiffer, Hartwich, and Monge 2010).

There are multiple sources of power including physical strength, authoritative position, wealth, prestige, command of information, and personal traits (Flora and Fora 2008; Trounstein and Christensen 1982). Power can be further categorized into five types based on their sources: coercive power (due to fear of the consequences of not complying), reward-based power (ability to distribute or reward benefits), legitimate power (based on one's position in the organization), expert power (based on experience, skills or knowledge) and referential power (based on the relationship with someone who possesses desirable resources or personal characteristics) (Hall and Tolbert 2005; Pfeffer 1981).

Actors obtain power from the resources they possess or control such as persons, information, and money. Access to resources is influenced by the individual's position in the organization. However, access to resources alone is not sufficient to provide individuals with power. The value attached to the resource by others, ease of acquisition and ease of substitution determines the power of the individual. Individuals who can provide critical and difficult to obtain resources (e.g., money, expertise, and prestige) gain power (Hall and Tolbert 2005).

The amount of power that one person has over another is based on how much each depends on the other. Since group members are interdependent, no single group member can control all power in the group. However, as the inequity between group members grows, it becomes more and more likely that a few members will be able to dominate the group. Since group members are interdependent, members of a group always have the ability to exercise power, even when one member is dominant (Pfeffer 1981). Power is tolerable only on condition that it masks a substantial part of itself. Its success is proportional to its ability to hide its own mechanism (Foucault 1979:86).

Different levels of knowledge among stakeholders generate power differences. Power cannot be separated from knowledge, and since knowledge requires records and a system of communication, it is in itself power (Foucault 1977). Knowledge is used to determine what is

possible, for and by whom. Actors who have access to knowledge and participate in its production, use and dissemination affect the conceptualization of what is useful knowledge and what is possible (Gaventa and Cornwall 2001). In resource poor areas, receipt of funding from external sources influences the decision-making process and actions implemented. “The ability to give funding is closely linked to the ability to set the agenda, even if the funder is located at a distant place. By determining what the funds have to be used for, funders can structure the content and degree of activity on the ground” (Schiffer et al. 2010:5).

Foucault (1982) and Forester (1989) see power as political communication entailing information presentation and misrepresentation, interpretation and misinterpretation, manipulation and withholding information. Actors who are connected to diverse networks are more informed than those who are not. Therefore, more informed actors are more likely to influence decisions of less informed actors because those less informed consider the better informed as references (Erickson 1988; Sparrowe and Liden 1997; Sparrowe and Liden 2005). The main obstacle to successful interactive processes is lack of proper communication. Participants may not speak openly about their objectives, and may not consider other participants’ interests, which creates a barrier to consensus building (Sultana and Thompson 2004). Improved access to information and participation in decision-making enhances the quality and the implementation of decisions (Warner 2007).

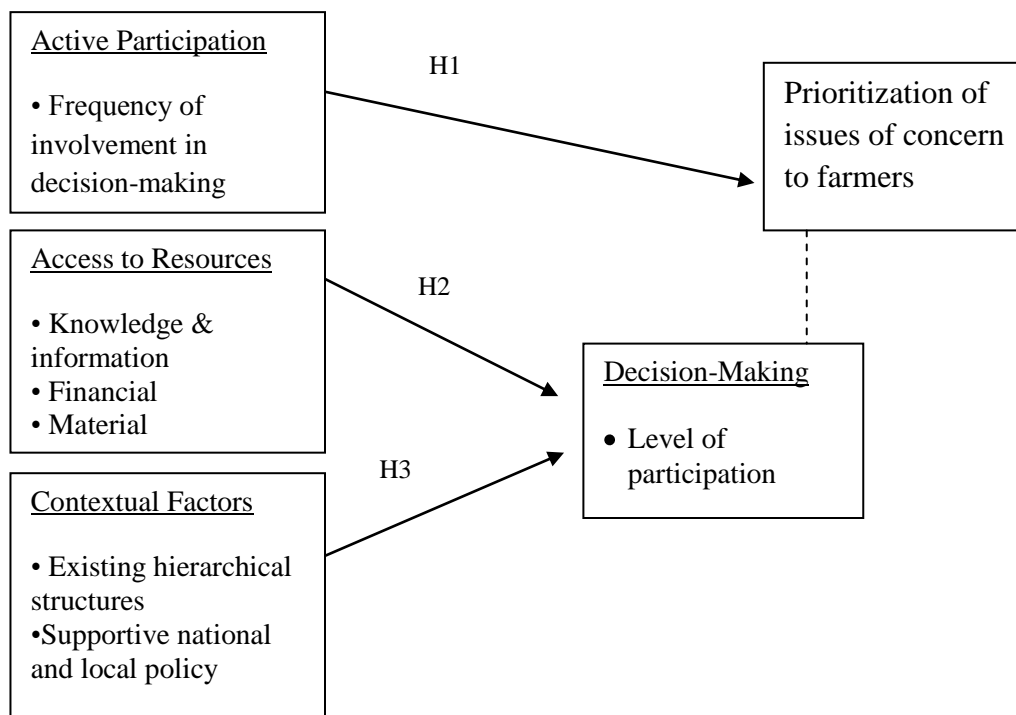
Although development projects involve women in decision-making, Hildyard et al. (2001) noted that women’s voices (especially from lower strata) were still marginalized in decision-making concerning forest management. Even where discussions addressed issues affecting women, the voices of women were frequently ignored. This was attributed to existing power structures within the communities. Cornwall (2003) asserts that women’s ability to influence decisions depends not only on having women on committees and representing women’s interests but also depends on the good will of group leaders, usually men, to listen to women’s voices.

For multi-stakeholder platforms to be successful, individuals at local level need to be empowered to make decisions. Democratization of the process is important to benefit the disadvantaged groups. Multi-stakeholder platforms may empower participants who have the ability to negotiate, raise their concerns and access new information. However, the process

may be disempowering as well. Problems of inequality prevail and marginalized groups may remain unheard. Therefore, inclusion alone is not enough because issues that are of concern to the poor might not be mentioned, tabled or considered. Powerless groups need to be given voice and their claims should be put into consideration (Edmunds and Wollenberg 2001).

It is important that the process of innovation includes actors across different social, cultural and administrative levels to obtain legitimacy. However, facilitators often face challenges in striking a balance in the amount of attention dedicated to each level of the system. Higher level policy makers (e.g., at national level) are not involved and are reluctant to be fully engaged. Facilitation of learning is often limited to grassroots and local levels such as village or district level. Therefore, decisions made at the local level have limited scope, impact and sustainability due to lack of policy support. Addressing issues such as the land tenure system, prices or subsidies require policy support (Groot et al. 2002). It is critical that high level policy makers are involved because they formulate policies which influence change at the local level and the sustainability of these changes (Steins and Edwards 1999).

Figure 4-2: Participation in Decision-making



Hypotheses

The paper tests the following hypotheses

H1: Active involvement of farmers in decision-making enhances prioritization of issues that are of concern to farmers.

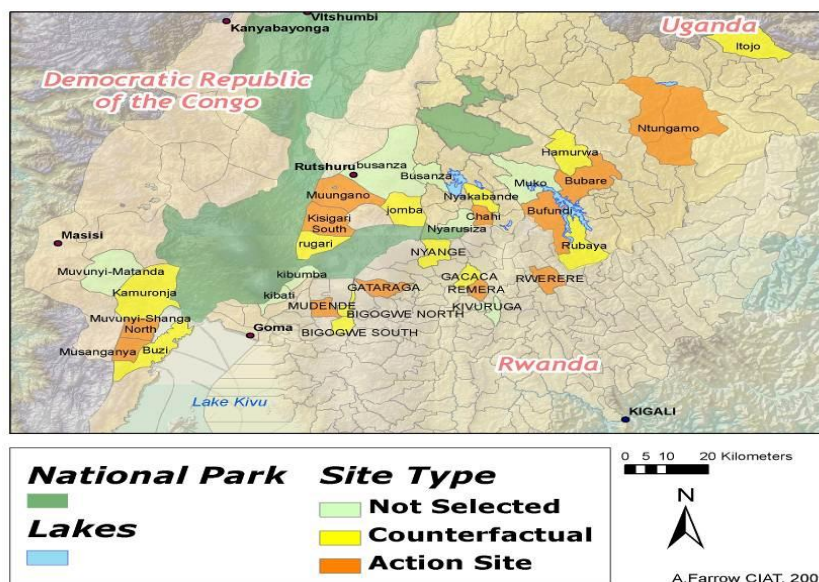
H2: Actors with more access to knowledge, information, and financial resources have more influence in decision-making

H3: Contextual factors such as existing hierarchical structures, supportive national and local policies will influence decision-making and implementation of decisions

Methods and Data

The study was conducted in Uganda and Rwanda, two of the three pilot learning sites (PLS) of the SSA-CP in the Lake Kivu Region (figure 4-3). The region is characterized by very steep slopes, a bimodal rainfall pattern, high population density and fragmented smallholder plots that are intensively cultivated (FARA 2005; FARA 2009a). The agroecology is very fragile and highly degraded. In Uganda, the study was conducted in Bubare and Bufundi sub-counties in Kabale district and Chahi sub-county in Kisoro district. In Rwanda, the study was conducted in Gataraga and Remera sub-counties in Musanze district. Figure 4-3 shows the location of the study area.

Figure 4-3: Map Showing Location of IPs Studied



Source: (Farrow, Tenywa, and Nkonya (Submitted))

The study population included members of IPs. Five of the 12 IPs in the region were studied to understand decision-making processes and power dynamics. The IPs studied were Bubare sorghum IP, Bufundi potato IP, and Chahi potato IP in Uganda, and Isangano Gataraga potato IP and Remera maize IP in Rwanda. Selection was based on date of formation, enterprise of focus, and approach of formation (market driven or research driven). Table 4.1 shows the characteristics of the IPs selected.

Table 4-1: Characteristics of the Selected IPs

Country	Name of IP	Date Formed	Membership		Approach	Sample
			Male	Female		
Uganda	Bubare sorghum	Sept. 2009	83	96	Market-led	42
	Bufundi potato	Nov. 2008	65	77	Research-led	42
	Chahi potato	Nov. 2008	62	77	Research-led	43
Rwanda	Isangano Gataraga potato	Nov. 2008	160	98	Research-led	41
	Remera maize	Sept. 2009	29	27	Market-led	16

Data were collected using semi-structured interviews, in-depth interviewing and focus group methodologies to triangulate the information to improve validity and reliability (Verschuren and Doorewaard 1999). The Institutional Review Board approved the research in 2010. The research team consisted of myself and research assistants (recruited from the study area and trained by me). We conducted interviews with farmers at the lower implementation level (parish/village level) to verify information provided by their representatives at sub-county level. We used semi-structured questionnaires, which were pre-tested with 15 members of IPs to help refine the final questions. We randomly sampled IP members from up-to-date membership lists obtained from IP chairpersons. The research team interviewed 184 farmers from the five IPs. Semi-structured questionnaires generated information about involvement in problem identification, frequency of participation in needs prioritization, perceptions about priority needs vis-à-vis needs addressed by IPs.

In addition, I used checklists with in-depth interviews and focus group discussions (FGDs) to generate information on the process of prioritizing needs, whose needs are prioritized, actors influencing the process and how (exploring the influence of knowledge, access to information and other resources on decision-making) and the context within which decision-making was made. We conducted 32 in-depth interviews with different IP actors who met at sub-county level (Figure 1) and six FGDs with farmers' representatives. Since farmer representatives were few, they were not sampled in order to obtain the number required for a FGD. Interviews and FGDs were conducted in English or the local language. The in-depth interviews and focus group discussions were digitally recorded and transcribed to permit detailed coding (open, axial and selective coding). This study was conducted between September-December 2010. I analyzed the transcribed interviews qualitatively using line-by-line coding to identify the major themes and categories that emerged. The Statistical Package for Social Scientists was used to analyze quantitative data. This paper uses more of the data collected using qualitative methods.

Results and Discussion

Decision Making in Innovation Platforms

Reaching Consensus

Results from FGDs with farmer representatives and in-depth interviews with different actors demonstrated a shift in the ladder of participation (Arnstein 1969) from consultative meeting to partnership where all actors, especially farmers (the originally excluded group from decision making) were actively involved in making decision on issues that affect them (including problems to address, actors to bring on board and implementation of bylaws for soil and water conservation⁷) and actions to be taken. In all IPs, members revealed that decisions were mainly made by consensus or democratically.

⁷ Bylaws are rules made by lower local government councils at village (LC1) and sub-county level (LC3) and provide the local policy guidelines to be followed in sectoral developments, such as agricultural and natural resource management. Bylaws for natural resource management are now seen as viable alternatives for enforcing government policies and rectifying their inefficiencies (Sanginga et al. 2004). Policies refer to laws, rules and regulations from public or state or collective decision-making (Means et al. 2002).

We usually identify issues in meetings. Mainly, we focus on issues raised in reports from parishes. From the parish reports, we identify areas or problems to discuss... Issues are prioritized in our meetings at sub-county level. We collect a number of ideas. Then, we have a general discussion of all issues raised in the parishes. They discuss one report and then move to the next. At the end of the meeting, we have a resolution. We sometimes generate consensus or vote (farmer, Bubare, Nov. 7 2010)

You cannot decide for many. You have to reach a consensus. You have to convince members how you reached your decision, unlike in other groups where the chairperson becomes the decision maker. You have to convince them why one side should win, you do not force them (farmer, Bubare, Nov. 7, 2010)

In the meeting, everybody has a right to speak. Decision-making is done democratically. I normally present my problems to the whole group and farmers determine the premium price...the farmers can say...you have to give us this amount and they also consider me so that I can also get something to eat because for me, I'm not after making a lot of profit. I also want my farmers to get something to develop (trader, Gataraga, Dec. 14, 2010)

Lack of Dominance

Other respondents emphasized lack of dominance in the process of problem or issue identification. IPs were perceived to be leveled grounds where all actors had equal chance to air out their views as stated by some respondents:

No one dominates when we meet at the sub-county. We bring problems from our people down. Everybody presents their issues and we see what is important. The chairman asks what is more important and we vote (local policy maker, Chahi Nov. 17, 2010)

We handle issues collectively, then come up with the solution. The way IP handles issues is different. It is not like NAADS [National Agricultural Advisory Services]. No one dominates or has power (farmer, Bubare, Nov. 7, 2010)

No one dominates meetings. No one shows power. We sit and talk properly. We feel good when we talk to professors and we are at the same level. They do not sit alone. They mix with us (local policy maker, Chahi, Nov. 17, 2010)

People present in the meeting influence prioritization but we agree, e.g., if we have 10 challenges, we discuss and agree. Nobody dominates (extension worker, Bubare, Nov. 16, 2010)

Other actors stated that the process of decision-making was bottom up, empowering members at the grassroots to be involved in decision-making.

The system here is bottom up. We respect farmers most. Those farmers are empowered. They are not limited. It's farmers driving it. It's farmers who call for meetings. NAADS [National Agricultural Advisory Services] is top-down because we implement decisions from top (local policy implementer, Bubare, Nov. 11, 2010)

For us we keep quiet and let those farmers, traders to air out their issues. In NAADS, we have the executive which decides what to do, then the farmer forum agrees or disagrees. We have the general council, which gives the final blessing. In IP, all stakeholders meet and make decisions. In NAADS, some meet and think for others (extension Bubare, Nov. 16, 2010)

Similar to the qualitative data, results from the survey conducted with farmers at parish/village level showed that 65 per cent of the farmers were involved in identification of issues to address. Of these, 29 per cent were always involved, 20 per cent were often involved, 35 per cent were involved sometime, and only 16 per cent indicated seldom. The issues that were of priority to farmers at parish/village level were: lack of agricultural inputs (such as improved seeds, fertilizer, pesticides, tools and implements, and labour) (86 per cent), poor soil fertility (77 per cent), lack of profitable markets (61 per cent) and poor post-harvest handling practices (38 per cent). The key problems that the IPs were addressing included: Low crop productivity (90 per cent), poor soil fertility (70 per cent), low value addition 34 per cent, and poor market access (45 per cent). Relating farmers' priority problems with the problems that IPs were addressing, we notice that IPs addressed farmers priority needs.

However, one of the critical issues, i.e., lack of inputs, was not addressed. This could be explained by the composition of IPs since three out of the five IPs did not have input dealers. Where IPs had input dealers, the inputs were costly. This influenced farmers' decisions to adopt input use. These findings demonstrate the potential of IPs to empower farmers to make decisions, which is important for sustainability. By empowering farmers to make decisions, IPs are more likely to address their issues.

Power Dynamics in the Decision-Making Process

The Invisible and Unheard

Although the process of decision-making was mainly by consensus and democratic, not all stakeholders had equal bargaining power to have their issues raised and taken into account. For instance, local small-scale traders (input and output traders) in Bubare and Bufundi IP and millers in Bubare IP felt that their issues were not prioritized because they were few in number, lacked purchasing power and that their issues were not visible. Some of the traders reported that:

In the IP meeting, normally they have their own agenda and the problems of millers are not there. Issues of farmers are considered most (miller, Bubare, Nov. 13, 2010)

Yes, we are involved in defining challenges. Issues prioritized are things to do with demonstrations and making porridge because they are visible. Ours, which are not seen, are not emphasized a lot. Even then we have no money to buy the sorghum. We cannot write to those people [microfinance] to give us a loan so we leave it there (trader, Bubare, Nov. 14, 2010)

They vote when there are many problems to address. Traders would be listened to, but there is not much produce at the moment (extension worker, Bufundi, Nov. 13, 2010)

Had we to unite ourselves, our problems would be solved. It's because we do not have enough money. Had we had enough money, we would make a society to buy Irish potato (trader, Bufundi, Nov. 28, 2010)

Compared to relatively large-scale traders, small-scale local traders felt disempowered to raise their voices due to lack of money, an empowering resource. Lack of money to purchase farmers' produce was mentioned several times by small-scale traders and considered disempowering. Emphasis on farmers' issues could also be explained by the fact that many households targeted by the program are poor and food insecure. Hence, increase in production for food security is central in these areas. In addition, lack of organization of small-scale traders into associations limited their bargaining power. Since farmers were the majority in number, they controlled the agenda. Therefore, the size of a particular group of actors may affect the ability to raise issues even in consensus based decision-making processes. In democratic decision-making process characterized by majority rule, actors who

are relatively few in number may still lose out. Therefore, smaller and weaker groups such as small-scale local traders need to be empowered by linking them to microfinance institutions where they can access financial resources, organizing them into associations and enhancing their negotiating skills through training.

Projects that employ participatory approaches assume that bringing all stakeholders around the table will result in a consensus being reached that is fair to all. However, these assumptions hold only in situations where all actors have equal bargaining power (which they usually do not) or if equalities between stakeholders are viewed as technical (Wright and Nelson 1995:6). Weaker groups such as local traders may be forced to accept a decision that may not benefit them. Since prioritization of issues is based on reports from lower innovation clusters, it is imperative that small traders also organize themselves at lower levels so that their issues are integrated into the parish reports and presented to the sub-county executive committee for consideration.

Access to adequate and timely financial services for all actors in the chain is a key element for successful value chain development. Besides large producers and traders, small producers and traders need access to appropriate financial services to make optimal use of value addition and income generation. However, linking microfinance institutions to other actors in the value chain needs building trust and strong relationships between chain actors and financial service providers (KIT and IIRR, 2010). Large-scale traders were empowered to raise their issues and have them addressed since they owned empowering resources such as money and machinery. They influenced the variety of crops to grow, quality of produce, practices or technologies to use, amount to be purchased, and the actors to bring on board for expert knowledge to meet the demands of the traders.

For instance in Gataraga potato IP, the trader purchased only two varieties of potato preferred by customers, i.e., *Kinigi* and *Sangema* yet the seed was expensive for farmers to procure. In addition, the trader purchased potato dehauled using a specific practice. The trader had access to credit from a microfinance institution which she loaned to farmers as they dehauled the potato. However, the price of the product was negotiated with farmers to create a win-win situation. On one incidence during data collection, farmers in Chahi IP exercised agency by not selling their produce to a Kampala traders' association because the

association did not meet the minimum initial deposit required by farmers. Some of the respondents reported that:

The trader of IP wants potato harvest at maturity stage, potatoes of good quality preferred by their customers. Our market prefers two varieties of potato...Kinigi and Sangem and seeds of these varieties are not easily available and even if they are available, they are expensive (FGD participant, Gataraga, Dec. 17, 2010)

Farmers put up a list of their problems. From those, they were helped by actors of the Challenge Program. Together with farmers, they decided to sort out what was most important to address. As those issues are addressed, other issues emerge, e.g., if you are doing processing, I dictate...I need this kind of variety...that drives the shaft in another direction. That is where experts come in (trader, Kabale Nov. 16, 2010)

My role is to sell agricultural inputs. I'm close to farmers so they do not spend time and money going to town to buy inputs, I do not give any credit because I'm looking for money to go and buy other things (trader, Bufundi, Nov. 28, 2010)

Although women were involved in decision-making, women representatives at sub-county level, felt that men did not consider their issues.

Presently, we use gender balance. When a man presents an issue, also a woman gives hers. In meetings, women talk but men do not consider their issues (FGD participant, Bubare, Nov. 10, 2010)

Women also speak out when addressing their issues but sometimes, when other women are absent and there's only one, their views are not taken because she has no support from other women (FGD participant, Bufundi, Nov. 12, 2010)

Both men and women participated in identifying problems at parish level. But by nature, men dominate (local policy maker, Bufundi, Nov. 15 2010)

The results reflect male dominance in IPs, a common challenge in interactive processes. Creating spaces for those less powerful such as women does not imply that their voices will be heard. Having women on committees alone is not sufficient to enable women to influence decisions. Even where women representatives are able to raise their voices, this does not necessarily translate into influence (Agarwal 1997; Moore 1994). Women are more

likely to lose out in participatory decision-making since their issues are marginalized and overlooked. Measures such as having women only groups may overcome the silencing of women's voices (Cornwall 2003; Guijt and Shah 1998; Mayoux 1995; Mosse 1994). In addition, reconfiguring the rules of interaction in public spaces helps to transform gender blindness and address power and powerlessness (Cornwall, 2003).

Access to Information and Knowledge

The structure of the IPs influenced access to information and knowledge. Information in IPs flowed hierarchically among the implementation levels and horizontally within implementation levels. Unequal access to information and knowledge created power asymmetries within IPs, with farmer representatives in the decision-making group at sub-county level having more power. In the sub-county forum, farmer representatives interacted with diverse actors thereby extending their network of information and knowledge. The status of chairpersons was enhanced since they were the contact persons of all other actors outside the communities.

In addition, most trainings were conducted at sub-county level and were attended by farmer representatives. However, farmer representatives did not freely share information and knowledge acquired from trainings conducted at sub-county level with farmers in their constituencies. Farmer representatives controlled information and made decisions regarding with whom to share the information how and when. This was a major problem in Bubare, Bufundi, Chahi and Remera IPs. Accessing critical information that is valuable to other farmers in decision-making gives representatives power to influence actions of other farmers. Some of the respondents noted that:

Those who attend sub-county meetings and trainings are not present in parish meetings to give feedback. Even the chairperson has been complaining that we who attend seminars do not go back to the parish to teach our colleague....those who go for training have kept the knowledge to themselves (farmer, Chahi, Nov. 19, 2010)

There is a chain of command. The chairman is at the top at the sub-county and there are sub-committees and then parishes....the chairman has to get a way to deliver information at parish level....it is a leveled ground but there should be somebody guiding the group. From time immemorial, when someone is an

elder of the family he can speak on behalf of the others (extension worker, Bufundi, Nov. 13, 2010)

In addition, influence from educated community members was felt in Remera IP.

The educated men and those with more income want to use resources the way they want. They think no one should influence the way they do their things. The educated women are extension workers and they influence mobilization. They tell IP members that IP representatives [farmers] are not bringing in any new knowledge. They want to hear from partners [facilitators] and not farmers. They think partners have more knowledge (extension worker, Remera, Dec. 21, 2010)

Social capital plays an important role in facilitating information exchange. Social capital facilitates willingness and cooperation to share information. Individuals decide whether to participate in information exchange with others, or whether to acquire or provide information (Putnam, 1993). Therefore, increasing the level of trust by fostering two-way communication, transparency and teamwork will minimize information asymmetries. Project implementers need to put in place a monitoring and evaluation system to ensure that farmer representatives provide feedback to their constituencies.

Access to Financial Resources

Access and control of resources imperative to the proper functioning of IPs caused power differences among IP members. External institutions (such as the CGIAR science council which approves research) influenced the project design, structure, financing and implementation of project activities. This led to modification of the original implementation strategy at the time of initiation leading to redundancy in execution of roles by some partners who found themselves involved in similar activities. Pressure from donors to show results influenced decisions made by facilitators of IPs (researchers) in allocation of resources to generate quick and tangible outputs.

Sometimes, we dream of things and we want them to happen tomorrow. There is a time when X came and there was that heat of 'we must put money in farmers' pockets by December'. If IAR4D is to prove that it's working, whatever activities you do, the farmers should have money in the pocket by December. Then you look at it as a researcher, even in our local government, even if you're to plant sorghum that time how much will you have planted for the farmer to be a billionaire or millionaire like that? So, pressure comes in

and you find that I'm being 'forced' to allocate money or to pay for what was not pre-planned (researcher, Kabale, Nov. 29, 2010).

Shortening the process of implementing activities in order to generate quick returns compromised use of the appreciative inquiry approach to achieve future goals. The approach focuses on understanding and utilizing available community assets and not initially focusing problems or needs. In addition, since facilitators controlled the budgets to implement IP activities, they influenced the type of activities to be conducted. The site coordinating office and taskforce leaders approved implementation of activities from the decisions made by the sub-county forum, e.g., demonstrations and field trips, and ensured that activities were implemented on time. IP chairpersons received funds to facilitate IP meetings and made decisions on how to use the money. This elevated the chairpersons' status within IPs but also created conflicts. Conflicts were settled by researchers using their power as stated by one of the farmers:

The people who came at the district [researchers] said that we should not ask about money. They told us they would give us 200,000 UGX to facilitate our meetings at the sub-county. We have no accountability of this money. The chairman controls this money (farmer, Bubare, Nov. 14, 2010)

Contextual Factors Influencing Decision-Making

Existing Hierarchical Power Structures

Existing hierarchical power structures play a role in creating power asymmetries and generating power struggles within IPs. Although a majority of the originally powerful actors (local policy makers, scientists, local government officials and extension workers) felt that interacting with farmers at the same level was tolerable, other actors felt that they had been stripped of their power since the existing structure gave them more power compared to farmers and they were more educated than farmers. This created power struggles between the now empowered farmers and the originally powerful actors. Some local government officials felt that they needed their power back and were not comfortable having farmers as drivers of the process. Such power struggles were observed mainly Bubare and Bufundi and Remera IPs. This could be attributed to lack of proper understanding of the IP concept, poor

leadership, conflicts between political parties e.g., in Bufundi and differences in level of education.

The way we are treated is the way farmers are treated. Being at the same level is challenging. The coordinator should be top...the way the chairman is involved, he is on top. He is the one telling/leading the coordinator. He tells you...we are going to do this, we are going to do this... it does not make me comfortable. Now the farmers are coordinating me. So I say this innovation is not treating me the way I am supposed to be treated. The farmer has first-hand information and for you, you are just like any other person. We still need our power back. If they give power to all farmers it is not good. Sometimes, I have no morale for IP because of that (extension worker, Bubare, Nov. 16, 2010)

In addition, although decisions were made democratically, government officials in the top hierarchies made some of the major decisions (e.g., land consolidation in Rwanda) as stated by some of the respondents:

I'm involved in identifying problems. Everybody brings an idea. Where there are arguments, we vote. We negotiate properly and vote where necessary. There is one person people do not argue with. People do respect him. When he talks everybody keeps quiet...the X officer. When he talks everybody keeps quiet. People think he has much knowledge. He talks with a lot of energy. Even the chairman fears him. We go by what he says (farmer, Bubare, Nov. 14, 2010)

IP report is sent to CIP who then send report to RADA. RADA organizes meetings in the district where you find CIP, ISAR, IP members and discuss. All of them participate in decision-making but the big decision is made by RADA [Rwanda Agricultural Development Authority]". All decisions in agriculture come from up not farmers. We technicians comply with all decisions (extension worker, Gataraga, Dec. 17, 2010)

Influence from Policy Makers

Contrary to Uganda IPs, in Rwanda, IPs experienced great influence from national and local policies. Policy influence was strongly emphasized by participants in Rwanda. The policies influenced decision-making and implementation of activities. For instance, land consolidation policies influenced the type of crops grown in particular areas and allocation of land to a given crop. Incentives for land consolidation, e.g., agricultural inputs encouraged production of crops supported by government. Such policies strengthened social capital as farmers consolidated their land and made collective decisions. However, rigidity of policies

limited the creativity of IP members to experiment with new technologies. For input dealers, policy intervention enhanced stabilization of prices and supply of authentic inputs.

We are facing a big problem with policy makers in land consolidation. When they decide that this village must grow maize and in that village, there are IP members who want to grow potato because ISAR is supplying seeds, you cannot grow what policy makers do not want. So you decide to grow maize and abandon potato (farmer, Gataraga, Dec. 17, 2010)

There are so many policies in Agriculture. There is no policy constraining the IP. The IP must follow government policy so that there are no constraints. To do demonstrations, they must ask for permission because there is some land to be reserved for crops, e.g., beans or wheat. We give priority to farmers who respect government programs, e.g., land consolidation (extension worker, Gataraga, Dec. 17, 2010)

There are some policies and rules from government that affect us for example we can reserve some plots for growing potato and the government comes in and says you grow maize in this area hence affecting us (trader, Gataraga, Dec. 14, 2010)

In Uganda IPs, influence from policy makers was mainly experienced in integration of IP activities in existing government programs and enforcement of by-laws for soil and water conservation. For instance, in Bubare sorghum IP, policy makers facilitated integration of IP activities in the government extension systems (NAADs). In Bufundi and Chahi IPs, lack of support from local policy makers/implementers constrained integration of IP activities in the government extension system. Implementation of bylaws to conserve soil and water was the role of policy makers. They used their power to either support or sabotage approval and enforcement of bylaws. Well as Rwanda IPs were challenged by rigid government policies, IPs in Uganda were constrained by weaker policy enforcement.

In Rwanda, a law is a law. In Uganda, we are relaxed. In Rwanda, laws come both from government and IP or independent society. When the father is very strict, the mother becomes strict. In Uganda, when the top system is weak even the lower one is weak. In Uganda, it is laissez faire – to whom it may concern (local policy implementer, Chahi, Nov. 18, 2010)

The internal dynamics of the value chain and external environment in which the value chain operates can positively or negatively affect the chains ability and motivation to acquire

knowledge and translate it into operational decisions. The external environment may affect the nature, structure and performance of the value chain (VCMC and GMC, 2012).

Conclusion

IPs have been designed as a significant improvement over the linear, less inclusive and interactive traditional agricultural research and extension approach. IPs are used as a mechanism to involve new partners (including farmer's organizations, non-governmental organizations, private business sector and policy makers) in agricultural research. These partners mobilize the key resources (such as scientific expertise, local knowledge, marketing channels, and financing) that ultimately benefit smallholder farmers. For IPs to generate outputs that directly address the concerns of smallholder farmers, farmers need to be empowered to make and implement decisions that impact their livelihoods.

However, the concept of IPs is relatively new in agricultural research for development. No studies have been conducted within the context of IPs to understand the power dynamics within IPs, the influence of power on decision-making and the context in which decisions are made. Mapping power differences enhances proper understanding of the content and context of the negotiation process, stakeholders' incentives to participate and benefits obtained by stakeholders. If facilitators ignore individuals with power, they may not fully understand how power relations shape the planning process and its outcomes (Ekboir et al. 2009). The research questions addressed were: (1) How are decisions made in IPs? (2) Does active involvement of farmers enhance prioritization of issues that address their needs? (3) How do knowledge, access to information and resources influence decision-making and (4) What contextual factors influence decision-making and implementation of decisions? This study was conducted in five IPs in Lake Kivu Region between Sept.-Dec. 2010.

The results demonstrate that IPs nurtured a consensual and democratic process of decision-making with active involvement of farmers. Identification of issues followed a hierarchy where issues were first defined at lower level (parish and village level) and forwarded to the core decision-making group at sub-county level. Decisions such as problems to address, actors to bring on board and allocation of group resources were made

with the involvement of farmer representatives at sub-county level. The results support the first hypothesis. IPs empowered farmers to raise their concerns and challenge originally powerful actors. However, issues of small local traders and women were not fully taken into account.

Although IPs re-defined the relationships between actors to promote a leveled ground, power asymmetries are unavoidable. Stakeholders, who had more knowledge, accessed more information and resources exercised more power. Farmer representatives who interacted with diverse actors at sub-county level accessed more information and knowledge, and determined how, when and whom and to share it with. This finding supports the second hypothesis. Existing hierarchical power structures led to power struggles between originally powerful actors like extension workers and policy makers, and originally powerless farmers. The policy environment also influenced the type of decisions made and implementation. These findings supported the third hypothesis.

Several scholars argue that if weaker groups are empowered, it is possible to set up multi-stakeholder platforms where power relations are not overlooked, but promote dialogue and social learning (Edmunds and Wollenberg 2001; Leeuwis 2000). This study revealed persistence of some traditional partners of power. This will require social learning so that all actors appreciate each other's contributions and their role within IPs. Schiffer et al. (2010) argue that different organizational cultures need to be reconciled to foster consensus building. The study reveals that social capital and power relations can co-exist. While promoting social capital to facilitate collaboration between actors, it's also important to understand how people exercise power because it's embedded within existing relations.

Therefore IPs are not perfect leveled grounds without power inequalities but can be considered useful approaches that could enhance interactions among value chain actors and performance of value chains. Innovation systems theory assumes that all stakeholders have realistic potential to exert relatively equal influence. However, this study shows that possession of critical information and knowledge generates power asymmetries in innovation systems. Therefore, power relations need to be considered during the processing of facilitating IPs.

The results have practical implications for facilitators of IPs. Facilitators of IPs need to consider contextual factors like existing hierarchical power structures and policies and design strategies to address them. The paper may have implications for policy makers in addressing structural factors, which cause inequalities. The research has implications for IP members in considering the potential costs and benefits in engaging in consensus-based decision making-processes. Future research can examine processes of inclusion and exclusion, and the characteristics of actors included in decision-making. This study did not capture the prior interactions between actors and how this could affect interaction in decision-making. Further research on how the prior strength of interaction among actors influences their interaction in the process of decision-making will complement this study.

References

- Agarwal, Bina (1997) 'Re-sounding the Alert - Gender, Resources and Community Action', *World Development* 25(9): 1373-1380.
- Arnstein, Sherry R. (1969) 'A Ladder of Citizen Participation', *JAIP* 35(4): 216-224.
- Biggs, Stephen S. (1995) 'Participatory Technology Development: A Critique of the New Orthodoxy', *Durban: Olive Information Service (AVOCADO series 06/95)*.
- Blau, Peter M. (1964) *Exchange and Power in Social Life*. New York: Wiley.
- Botchway, Karl (2001) 'Paradox of Empowerment: Reflections on a Case Study of Contest and Power in Dutch Rural Policy', *Journal of Rural Studies* 21(1): 297-312.
- Brown, David L., Gabriele Bammer, Srilatha Batliwala, and Frances Kunreuther (2003) 'Framing Practice-research Engagement for Democratizing Knowledge', *Action Research* 1(1): 65-85.
- Cleaver, Francis (2001) 'Institutions, Agency and the Limitations of Participatory Approaches to Development', in B. Cooke and U. Kothari (eds) *Participation: The New Tyranny*, pp. 36-50. London: Zed Books.
- Cooke, Bill and Uma Kothari (2001) *Participation: The New Tyranny*. London: Zed Books.
- Cornwall, Andrea (2003) 'Whose Voices, Whose Choices? Reflections on Gender and Participatory Development', *World development* 31(8): 1325-1342.
- DeFilippis, James (2001) 'The Myth of Social Capital in Community Development', *Housing Policy Debate* 12(4): 781-806.

- Edmunds, David and Eva Wollenberg (2001) 'A Strategic Approach to Multistakeholder Negotiations', *Development and Change* 32(2): 231-254.
- Eicher, Carl K. (2006) 'The Evolution of Agricultural Education and Training: Global Insights or Relevance for Africa', East Lansing, Michigan: Department of Agricultural Economics, Michigan State University.
- Ekboir, Javier M., Gabriela Dutrenit, Griselda V. Martinez, Arturo Torres Vargas, and Alexandre O. Vera-Cruz (2009) *Successful Organizational Learning in the Management of Agricultural Research and Innovation: The Mexican Produce Foundations* Washington D.C: International Food Policy Research Institute.
- Erickson, Bonnie H. (1988) 'The Relational Basis of Attitudes', in B. Wellman and S. D. Berkowitz (eds) *Social Structures: A network Approach*, pp. 99-121. New York: Cambridge University Press.
- FARA (2005) 'Findings of the Lake Kivu Pilot Learning Site Validation Team. A Mission Undertaken to Identify Key Entry Points for Agricultural Research and Rural Enterprise Development in East and Central Africa', Forum for Agricultural Research in Africa (FARA).
- FARA (2007) 'Sub-Saharan Africa Challenge Programme: Medium Term Plan 2008-2010', Accra, Ghana: Forum for Agricultural Research in Africa (FARA).
- FARA (2009a) 'Sub-Saharan Africa Challenge Program (SSA-CP): Strategies and Lessons Sharing Forum', Synthesis report.
- FARA (2009b) 'Sub-Saharan Africa Challenge Programme: Research Plan and Programme for Impact Assessment', Pp. 36. Accra, Ghana: FARA (Forum for Agricultural Research in Africa).
- Farrow, Andy, Moses Tenywa, and Ephraim Nkonya (Submitted) 'Selecting Sites to Prove the Concept of IAR4D in the Lake Kivu Pilot Learning Site', *African Journal of Resource Economics*.
- Faysse, Nicolas (2006) 'Troubles on the Generating Community Change', in C. B. Flora and J. L. Flora (eds) *Rural Communities: Legacy and Change*, pp. 345-376. Boulder, CO: Westview Press.

- Flora, Cornelia B. and Jan L. Flora (2008). *Rural Communities: Legacy and Change*. Boulder, CO: Westview Press.
- Forester, John F. (1989) *Planning in the Face of Power*. Berkeley and Los Angeles, CA: University of California Press.
- Foucault, Michel (1982) 'The Subject and Power', *Critical Inquiry* 8:777-795.
- Foucault, Michel (1979) *The History of Sexuality, Volume 1: An Introduction*. Translated by R. Hurley. London: Guilford.
- Foucault, Michel (1977) *Discipline and Punish: The Birth of the Prison*, Edited by A. Sheridan. London: Penguin Books.
- Gaventa, John and Andrea Cornwall (2001) 'Power and Knowledge', in P. Reason and H. *Handbook of Action Research: Participative Inquiry and Practice*, pp. 70-80. Bradbury. London: Sage Publisher.
- Gooch, Martin (2005) 'Drivers, Benefits and Critical Success Factors of Developing Closely-Aligned Agri-Food Value Chains', Ontario: George Morris Centre.
- Groot, Annemarie, Natasha van Dijk, Janice Jiggins, and Marleen Maarleveld (2002) 'Three Challenges in the Facilitation of System-wide Change', in C. Leeuwis and R. Pyburn (eds) *Wheelbarrows Full of Frogs: Social Learning in Rural Resource Management*, pp. 199-213. Assen: Koninklijke van Gorcum, The Netherlands.
- Guijt, Irene and Kaul M. Shah (1998) 'Waking Up to Power, Conflict and Process', in I. Guijt and K. M. Shah (eds) *The Myth of Community: Gender Issues in Participatory Development*. London: Intermediate Technology Publications.
- Hall, Andy, B. Yoganand, R. Sulaiman, and N. Clark (2003) 'Innovations in Innovation: Partnerships, Learning and Diversity in the Generation, Diffusion and Use of New Knowledge', in A. J. Hall, B. Yoganand, R. Sulaiman, R. S. Rajeswari, P. Shambu, G. Naik, and N. G. Clark (eds) *Innovation in Innovations: Reflections on Partnership and Learning*. Patancheru, India: CPHP, ICRISAT and NCAP.
- Hall, Richard H. and Pamela S. Tolbert (2005) *Organizations: Structures, Processes, and Outcomes*. New Jersey, NJ: Pearson Prentice Hall.
- Hemmati, Minu (2002) *Multi-stakeholder Processes for Governance and Sustainability. Beyond Deadlock and Conflict* London: Earthscan.

- Hildyard, Nicholas, Pandurang Hegde, Paul Wolvekamp, and Somasekhare Reddy (2001) 'Pluralism, Participation and Power: Joint Forest Management in India', in C. Bill and U. Kothari (eds) *Participation: The New Tyranny?* pp. 56-71. New York NY: Zed Books.
- Hyman, James B (2002) 'Exploring Social Capital and Civic Engagement to Create a Framework for Community Building', *Applied Development Science* 6(4): 196-202.
- KIT and IIRR (2010) *Value Chain Finance: Beyond Microfinance for Rural Entrepreneurs*. Royal Tropical Institute, Amsterdam; and International Institute of Rural Reconstruction, Nairobi.
- Leeuwis, Cees (2000) 'Reconceptualizing Participation for Sustainable Rural Development: Towards a Negotiation Approach', *Development and Change* 31:931-959.
- Lundy, Mark, Maria V. Gottret, and Jacqueline Ashby (2005) 'Learning Alliances: An Approach for Building Multi-stakeholder Innovation Systems', ILAC Brief. No. 8. Rome, Italy: ILAC Institutional Learning & Change.
- Marsden, Peter V. and Noah E. Friedkin (1994) 'Network Studies of Social Influence', in S. Wassermann and J. Galaskiewicz (eds) *Advances in Social Network Analysis: Research in Social and Behavioral Sciences*, pp. 3-25. Thousand Oaks, California:
- Mayoux, Linda (1995) 'Beyond Naivet: Women, Gender Inequality and Participatory Development', *Development and Change* 26 (2): 235-258.
- Means, Katherine, Cynthia Josayma, Erik Nielsen, and Vitoon Viriyasakultorn (2002) 'Community-Based Forest Resource Conflict Management. A Training Package. Volumes', vol. 1-2. Rome, Italy: Food and Agriculture Organization of the United Nations, FAO.
- Mokwunye, Uzo (2010) 'Regional Review of Africa's Agricultural Research and Development', CGARD 2010.
- Moore, Henrietta (1994) *A Passion for Difference*. Cambridge Polity Press.
- Mosse, David (1994) 'Authority, Gender and Knowledge: Theoretical Reflections on the Practice of Participatory Rural Appraisal', *Development and Change* 25:497-526.
- Narayan, Deepa (1999) 'Bonds and Bridges: Social Capital and Poverty', The World Bank, Washington, DC.

- Peterson, Nils M., Markus J. Peterson, and Tarla R. A. I. Peterson (2005) 'Conservation and the Myth of Consensus', *Conservation Biology* 19:762-767.
- Pfeffer, Jeffrey (1981) *Power in organizations*. Boston: Pitman.
- Putnam, Robert D. (1993) *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton: Princeton University Press.
- Sanginga, Pascal C., Rick Kamugisha, Andrienne Martin, Adison Kakuru, and Ann Stroud (2004) 'Facilitating Participatory Processes for Policy Change in Natural Resource Management: Lessons from the Highlands of Southwestern Uganda' *Journal of Agricultural Sciences* 9(1): 958-970.
- Schiffer, Eva, Frank Hartwich, and Mario Monge (2010) 'Who has Influence in Multistakeholder Governance Systems?' IFPRI.
- Sparrowe, Raymond T. and Robert C. Liden (1997) 'Process and Structure in Leader-member Exchange', *Academy of Management Review* 22:522-552.
- Sparrowe, Raymond T. and Robert C. Liden (2005) 'Two Routes to Influence: Integrating Leader-member Exchange and Network Perspectives', *Administrative Science Quarterly* 50:505-535.
- Steins, Nathalie A. and Victoria M. Edwards (1998) 'Platforms for Collective Action in Multiple-Use CPRs.' in *Crossing Boundaries, the Seventh Annual Conference of the International Association for the Study of Common Property*. Vancouver, British Columbia, Canada.
- Steins, Nathalie A. and Victoria M. Edwards (1999) 'Platforms for Collective Action in Multiple Use Common-pool Resources', *Agriculture and Human Values* 16:241-255.
- Sultana, Parvin and Paul Thompson (2004) 'Methods of Consensus Building for Community-based Fisheries Management in Bangladesh and the Mekong Delta', *Agricultural Systems* 82:327-353.
- Susskind, Lawrence, Sarah McKernan, and Jennifer Thomas-Larmer (1999) 'Introduction. The Consensus Building Handbook: A Comprehensive Guide to Reaching Agreement' in L. Susskind, S. McKernan, and J. Thomas-Larmer (eds) *The Consensus Building Handbook: A Comprehensive Guide to Reaching Agreement*, pp. xiii-xxii. London: Sage Publications.

- Tenywa, M. M., K. P. C Rao, J. B. Tukahirwa, R. Buruchara, A. A. Adekunle, J. Mugabe, C. Wanjiku, S. Mutabazi, B. Fungo, I. N. Kashaija, Pamela M. Pali, S. Mapatano, C. Ngaboyisonga, A. Farrow, J. Njuki, and A. Abenakyo. 2011. "Agricultural Innovation Platform As a Tool for Development Oriented Research: Lessons and Challenges in the Formation and Operationalization." *Learning Publics Journal of Agriculture and Environmental Studies* 2(1): 117-146.
- Trounstone, Philip J. and Terry Christensen (1982) *The Movers and Shakers: The Study of Community Power*. New York, NY: St Martin's Press.
- VCMC (2012) Characterizing the Determinants of Successful Value Chains. A Paper prepared for the Canadian Agri-Food Policy Institute, Ottawa: Canadian Agric-Food Policy Institute.
- Verschuren, Piet and Hans Doorewaard (1999) *Designing a Research Project*. Utrecht: LEEMA.
- Wagner, Cheryl L. and Maria E. Fernandez-Gimenez (2008) 'Does Community-Based Collaboration Increase Social Capital?' *Society and Natural Resources* 21(4): 324-344.
- Warner, Jeroen F. (2007) *Multi-Stakeholder Platforms for Integrated Water Management*. Burlington, VA: Ashgate Publishing Company.
- Wondolleck, Julia Marie and Steven Lewis Yaffee (2000) *Making Collaboration Work: Lessons from Innovation in Natural Resource Management*. Washington: D.C: Island Press.
- World Bank (2007a) *Enhancing Agricultural Innovation: How to Go Beyond the Strengthening of Research Systems*. Washington, DC: The International Bank for Reconstruction and Development / The World Bank.
- Wright, Susan and Nici Nelson (1995) 'Participatory Research and Participant Observation: Two Incompatible Approaches', in N. Nelson and S. Wright (eds) *Power and Participatory Development: Theory and Practice*, pp. 43-59. Michigan: Intermediate Technology Publications.

CHAPTER 5. CONCLUSION, IMPLICATIONS AND FUTURE RESEARCH

Agriculture is central in achieving the Millennium Development Goal that calls for halving the number of people living under extreme poverty and hunger between 2000-2015. Over 75% of poor people in developing nations live in rural areas and most of them depend directly or indirectly on agriculture for their livelihoods. The contribution of agriculture to overcoming poverty and enhancing food security requires increases in productivity. However, most developing countries invest less in agricultural research (World Bank 2007b). The traditional system of generating research and knowledge is not organized to deal with the rapidly changing context for agriculture in many countries. Agriculture is taking place in a globalized setting and is driven by markets, both local and external. The private sector now plays a prominent role in agricultural sector (World Bank 2007a)

Approaches that enhance agricultural innovation capabilities have evolved over the past 40 years (including National Agricultural Research Systems, National Agricultural Knowledge and Information Systems and Innovation Systems). The sub-Saharan Africa Challenge program designed and implemented the Integrated Agricultural Research for Development approach in which multiple stakeholders along a commodity value chain are identified and involved in collective problem identification and implementation of solutions. Innovation platforms are used to bring together diverse stakeholders along the production to consumption continuum to share information and develop innovations. IPs have their roots in innovation systems and may overcome the limitations of the linear, less inclusive and less interactive traditional agricultural research and extension approach.

This study examined the relationship between IP organizational structure and exchange of information and knowledge, the factors that motivate stakeholders to participate and the contextual factors which influence motivation to participate. This study also explored the decision-making process and the factors which influence decision-making (such as knowledge, access to information, control of resources, and policy) in five IPs in the Lake Kivu Region. Data were collected from IP members (including farmers, NGO representatives, traders, processors, input dealers, researchers local policy makers/implementers and extension workers) using semi-structured interviews, in-depth interviews, and focus group discussions.

The study demonstrates that the level of vertical and horizontal decentralization varied across IPs. The extent of decentralization depended on the size of IP, age of IP and nature of landscape. IPs that were more vertically and horizontally decentralized had more effective two-way information flows among and within hierarchies. The innovation sub-clusters strengthen social capital among IP members who are themselves motivated to share information and knowledge. Less vertically and horizontally decentralized IPs had less effective two-way information flow as measured by the effectiveness of farmer representatives in giving feedback up and down the hierarchy. Effective two-way information flow in these IPs with high vertical and moderate horizontal decentralization was influenced by the nature of landscape.

Although decentralization aids vertical and horizontal information and knowledge sharing, decentralization alone is not sufficient. Other factors need to be in place to facilitate knowledge and information sharing at all implementation levels such as good leadership and proper infrastructure. In addition, decentralization may strengthen the power of local

knowledge brokers. Farmer representatives who interacted with diverse knowledge sources accessed more knowledge and information and did not share it freely with farmers in their constituencies. This was reported in Bubare, Chahi and Remera IPs. Misrepresentation of information that was communicated up the hierarchy was also reported in some IPs.

Social capital and exchange theories were used to examine the relationship between motivation and participation. The results revealed that actors within an IP have multiple factors that motivate them to participate. Well as farmers were mainly motivated by factors that directly improve their livelihoods, extension workers, NGO representatives and policy makers were mostly motivated by purposive incentives that contribute to realization of organizational goals, and traders were mainly motivated by economic incentives. Although the majority of farmers indicated developmental benefits (acquire knowledge and skills) as the main motivating factor, the desire to acquire knowledge and skills alone was not sufficient to encourage active participation. Anticipated economic (markets, income and credit) and material incentives (agricultural inputs) sustained farmers' participation. Social incentives such as expanding social networks and status were mentioned by a few actors. We also noted that farmers who were more educated participated in more activities. Farmers who participated in more activities perceived IPs as more rewarding.

Although IPs had promoted inclusion of multiple value chain actors, other important value chain actors were not active participants including local policy makers and members from the private business sector. Active involvement of actors in IP activities was curtailed by expectation of short-term tangible outputs due to prior experience with development projects which give tangible material or economic incentives to motivate actors especially farmers to participate. Other factors included lack of proper understanding of the concept of

IP, lack of resources, prior commitments and feeling devalued. For IPs to establish strong value chains, there is need to encourage active participation of all value chain actors, nurture positive attitudes and commitment from all stakeholders. Building trust and respect for all actors will encourage active participation of actors.

Furthermore, the results demonstrate the potential of IPs to empower farmers to raise their concerns and challenge originally powerful actors. However, issues of small local traders and women were not completely taken into account. Although IPs re-defined the relationships between actors to promote a leveled ground, power asymmetries are unavoidable. Stakeholders who had more knowledge and accessed more information and resources exercised more power. Existing hierarchical power structures led to power struggles between originally powerful actors such as extension workers and originally powerless farmers.

Practical Implications

The findings have practical implications for conveners and members of IPs to design structures and create favorable conditions that enhance information sharing. Structures which enhance social capital among diverse stakeholders may facilitate two-way information sharing. Although decentralized structures exhibit more knowledge and information sharing, other factors such as size, age, and landscape may influence effective knowledge and information sharing. These factors need to be considering in organizing IPs. This research has practical implications for community organizers to determine the advantages of multi-stakeholder participation, design and implement inclusive development interventions, and develop a clear understanding of contextual factors which may influence actors' decision to

participate in IPs. Facilitators of IPs need to consider contextual factors such as existing hierarchical power structures and policies, and design strategies to address them.

Organizers of multi-stakeholder platforms need to address power relations to ensure that less powerful actors have the ability to raise their concerns. The research has implications for IP members in considering the potential costs and benefits in engaging in consensus-based decision-making processes. Comparing IPs to the traditional linear approach of agricultural research and extension, IPs appear to be more successful in including diverse value chain actors in sharing knowledge and information and decision-making to improve the performance of a specific value chain. However, ensuring active and sustainable participation of actors, and reducing the effects of power inequalities still need to be addressed. Organizers of IPs need to focus on strengths within the communities to help community members utilize available resources in addressing their problems.

Policy Implications

The study has implications for policy makers to reform agricultural research and advocate for holistic, and integrative approaches that promote inclusion of the scientific and non-scientific communities in research. Support from policy makers is needed in designing policies that facilitate participation of community members in making decisions, which directly impact their livelihoods. Policy support is required in formulating, approving and implementing bylaws for soil and water conservation. Enforcing soil and water conservation policies will contribute towards reduction of runoff on steep slopes thereby increasing soil fertility. Policy makers and implementers need to address structural factors (such as decision-making, access to information, knowledge and resources) that cause inequalities, which in turn influence performance in innovation systems. Government support is required for

integrating IP activities in existing government programs to pool resources and minimize transaction costs.

Theoretical Implications

Innovation systems theory assumes that all stakeholders have realistic potential to exert relatively equal influence. However, this study shows that power asymmetries exist in innovation systems which need to be addressed to facilitate their proper functioning. Results showed that farmers who interacted with diverse knowledge sources at the sub-county level accessed more knowledge and information compared to other farmers. In addition, actors who had more financial resources such as traders, controlled the variety, quantity and quality of produce, and required that farmers adopt specific agricultural practices in order to meet the quality of produce required by consumers. Some of the originally powerful actors, such as government extension workers, felt that their powers had been diminished. While promoting social capital to facilitate collaboration between actors, it is also important to understand how people exercise power that is embedded within existing relations. Social exchange theory alone cannot explain participation in social relationships. It has to be complimented with social capital theory. Social capital fosters continued participation in exchange relationships.

Areas for Future Research

Further research needs to explore the types of innovations that resulted from interaction with multiple actors along the value chain. Research should be conducted to determine the performance of IPs (in terms of innovations generated), comparing performance of IPs that were formed using the two different approaches, i.e., research-oriented and market-oriented approaches. In-depth research needs to be conducted to determine why some IPs flourish while others don't, and investigate the conditions under

which highly decentralized IPs function. Studying the relationship between information sharing and performance of IPs will be a great complement to this study. Future research needs to investigate the characteristics of individuals who continue or cease participating in IPs, the conditions that facilitate participation, and the strategies to cope with obstacles to successful IPs. Future research can also examine how intrinsic and extrinsic incentives influence performance of IPs, examine processes of inclusion and exclusion, and the characteristics of actors included in decision-making. This study did not capture the prior interactions between actors and how this could affect interaction in decision-making. Further research on how the prior strength of interaction among actors influences their interaction in the process of decision-making will be great complement to this study.

References

- World Bank. 2007a. *Enhancing Agricultural Innovation: How to Go Beyond the Strengthening of Research Systems*. Washington, DC: The International Bank for Reconstruction and Development / The World Bank.
- . 2007b. *World Development Report 2008: Agriculture for development*. Washington DC: The International Bank for Reconstruction and Development / The World Bank.

APPENDIX A: HUMAN SUBJECTS QUALITY ASSURANCE REVIEW

APPENDIX A: HUMAN SUBJECTS QUALITY ASSURANCE REVIEW



Uganda National Council For Science and Technology

(Established by Act of Parliament of the Republic of Uganda)

Your ref:

Date :

Our ref:A.457..

01/12/2010

Ms. Annet Mulema
 C/o International Center for Tropical Agriculture
 Kawanda Agricultural Research Institute
 P.O Box 6247
 Kampala

Dear Ms. Mulema,

RE: RESEARCH PROJECT, "ORGANIZING COLLECTIVE ACTION FOR AGRICULTURAL RESEARCH AND DEVELOPMENT: A CASE OF AGRICULTURAL INNOVATION PLATFORMS IN THE GREAT LAKES REGION OF AFRICA"

This is to inform you that the Uganda National Council for Science and Technology (UNCST) approved the above research proposal on **October 11, 2010**. The approval will expire on **March 11, 2011**. If it is necessary to continue with the research beyond the expiry date, a request for continuation should be made in writing to the Executive Secretary, UNCST.

Any problems of a serious nature related to the execution of your research project should be brought to the attention of the UNCST, and any changes to the research protocol should not be implemented without UNCST's approval except when necessary to eliminate apparent immediate hazards to the research participant(s).

This letter also serves as proof of UNCST approval and as a reminder for you to submit to UNCST timely progress reports and a final report on completion of the research project.

Yours sincerely,

Jane Nabbuto
 for: Executive Secretary
 UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

REQUEST FOR WAIVER OF DOCUMENTATION OF CONSENT

Title of Study: Organizing Collective Action for Agricultural Research and Development: A Case of Agricultural Innovation Platforms in the Great Lakes Region of Africa

Investigators: Annet Abenakyo Mulema and Dr. Robert Mazur

1. The research presents no more than minimal risk of harm to subjects
 - The study will not involve any physical or physiological examinations or tests. Subjects will be asked questions regarding their experiences in participating in collaborative research involving multiple stakeholders (including farmers, researchers, private sector, NGO and policy makers) are involved.
 - There will be no physical or psychological harm or discomfort. Discomfort that may result from the length of the interview will be minimized by making the interview simple, short and easy to comprehend.
 - Information identifying participants will be kept confidential and their names will remain anonymous.
2. The waiver or alteration will not adversely affect the rights and welfare of the subjects:
 - The information letter will be read to the participants and this will inform them about their rights. Participants will be informed that participation is voluntary and that they may decide not to involve themselves or withdraw from the study at any time. Participants will be free to not answer questions that make them feel uncomfortable or questions that they simply do not want to answer.
3. The research may not be practically carried out without the waiver or alteration:
 - The majority of the rural population in Uganda is illiterate. Therefore it likely that majority of the participants cannot read, write and understand English.
 - There are over 40 languages spoken in Uganda and one language may have several other dialects. In addition, communication norms vary considerably. Therefore, simply presenting a document translated word to word may not be appropriate. Therefore, all documents and data gathering instruments are normally prepared in English.
 - Since regulations require that participants be informed about the study in the language understandable to them, the letter of information will be verbally translated into the local language and dialect understandable to the participants. This will be done by a local person who is familiar with the local dialects and communication norms.
4. Whenever appropriate, the subjects will be provided with additional pertinent information after participation
 - Participants will be encouraged to ask questions any time during the interview, comment on this study or seek more information about the study. Information that enables participants get a better understanding of the study and its implications (socially, economically or politically) will be availed.
 - Research findings will also be shared with the participants involved in innovation platforms and associations to help them modify the system of agricultural research and better address the needs of smallholder farmers.

Letter of Information

Title of study: Organizing Collective Action for Agricultural Research and Development: A case of Agricultural Innovation Platforms in the Great Lakes Region of Africa

Investigators: Annet Abenakyo Mulema, Dr. Robert Mazur

Information Letter for non-IP members

I am Annet Mulema, a Ph.D. student at Iowa State University. I'm conducting a research study to understand how innovation platforms (IPs) are organized to facilitate interaction among diverse stakeholders for collective knowledge generation, sharing and utilization to solve a common problem. You are being invited to participate in this research study because of your active involvement in the association that is represented at IP level.

Please take your time in deciding whether you would like to participate. In addition to you, another 100 non-IP members and 60 IP members will participate in this research study. There are no foreseeable risks at this time from participating in this study. If you choose to participate in this study, there will be no direct benefit to you but your participation will indirectly assist in improving collaborative agricultural research that involves multiple stakeholders, including smallholder farmers. The information in this study is important in helping facilitators of IPs to re-design their implementation strategy and employ strategies that facilitate interaction among diverse knowledge sources within IPs and outside IPs to increase production, marketing of agricultural produce and conservation of the natural resource base.

Participation in this interview is completely voluntary. You may decide to not involve yourself or you may withdraw from the study any time. The interview will take about one and a half hours and will be based on a series of questions related to your interests, knowledge about the IP, information flow between IP and non-IP members, inclusiveness in decision making, integration of local knowledge, and articulation of your concerns. You are free to not answer questions that make you feel uncomfortable or questions you simply do not want to answer. You are free to ask questions any time during the interview. You are also encouraged to comment on this study or seek more information about the study.

Information identifying participants will be kept confidential. To ensure confidentiality, your name will not appear on the questionnaire. Identification numbers will be used when working with data. The data will be kept in password protected computer files. Only authorized persons will have access to the data. The data will be destroyed within two years after the study. In reporting, data will be reported in aggregates and if results from this study are published, your identity will remain anonymous.

For further information about the study, please contact the following: Annet Mulema, the principal investigator (256-772-932-092), Dr. Robert Mazur – major advisor (1-515-294-9286) and Dr. Wanjiku Chiuri – project coordinator (250-783-630110). Thank you very much for your cooperation.

APPENDIX B: CHECKLIST FOR KEY INFORMANTS

I. Background Information

- a) Name of Respondent.....
- b) Country.....
- c) Name of IP.....
- d) Type of actor.....
- e) Respondent organization.....
- f) Role of organization.....
- g) Respondents position in organization.....
- h) Gender of respondent.....
- i) Date of interview.....
- j) Name of interviewer.....

Question 1: How are IPs organized? How does IP organization influence actors' interactive exchanges for innovation?

1. What does the term IP mean to you? What inspired you to participate in IPs?
2. What are the types of actors involved in the IPs? **Probe:** How many actors are they? What is the composition by gender? How many represent each organization/group? What are their positions?)
3. Are there any changes in the type of actors? Are there any changes in the number of actors? Are there actors who have withdrawn or others who have joined? How many have withdrawn? How many have joined? Why these changes?
4. What are your roles in the IP? **Probe:** Are they written anywhere? Any additional roles besides what is stated? Have your roles changed since inception? What are your key strengths in this IP? What are your key weaknesses? What would be required to perform your role (s) better?
5. What are the roles of other actors (farmers, private sector, policy makers, researchers and training institutions)? **Probe:** What are the strengths of other actors? What has been most satisfying about the roles played by different actors? What are their weaknesses? What has been least satisfying about their roles? What can they be strengthened in?
6. To what extent have the roles of all other actors been clearly defined? Do all actors know what they are supposed to do? Use a scale of 1 to 10 with 1 being the least and 10 being most clearly defined. **Probe:** Have the role of different actors changes since inception? If yes how? If no, do you think the roles of other actors need to be redefined? Please explain. How often are the roles redefined?

7. Are there rules governing the IP? **Probe:** What are the rules? What is the source of the rules? Are there any written rules? Do members abide by the rules?
8. What kind of information is required by the farmers? **Probe:** What is the mode of communicating this information? Who passes on the information? In what form is the information communicated? How frequent is the information communicated?
 - Find out type of information e.g. IP management, production technologies, post-harvest handling, processing, soil conservation, availability of seed, and access to credit.
9. Do you also receive information from farmers? **Probe:** What kind of information? What is the mode of receiving information from farmers? Who delivers the information?
10. What are the most pertinent concerns/issue of these IPs? How are the issues identified? How are they handled? **Probe:** Are different issues handled by different groups? What issues are handled by different groups? What are their positions, qualifications, abilities, sex? How are the groups formed?
 - Example of issues: Lack of knowledge on specific technologies, management of IPs, lack of credit, lack of market, poor crop varieties, poor infrastructure
11. Is the type and number of actors participating enough to help solve the problems/issues as they arise? As the IP evolves are the actors (type and number) enough to address problems/issues that arise? Please explain. **Probe:** What is the optimal number? What problems are identified? How do they determine who is to solve what? To what extent have the IPs addressed those problems? How would you assess the likelihood of IPs to address smallholder farmers' problems?
12. How are you integrating indigenous knowledge to increase production, conserve soil fertility and add value to agricultural produce? How is it being used?
13. What did the IPs set out to achieve? What successes have the IP realized so far? **Probe:** How do IPs measure success? Who measures it? What are the indicators of success?
14. What have you learned in bringing multiple actors together in the different locations? **Probe:** What are you doing differently compared to what was planned at the beginning of the IP? What has caused the changes? What had you expected to learn? Has it changed the way you do things? What where you expected to do?
15. What challenges have you experienced in forming and managing these IPs? **Probe:** What is the magnitude of the challenges? How have you resolved them?

Do you have any questions or comments about this study?

Thank you very much for your time.

APPENDIX C: CHECKLIST FOR IP CHAIRPERSON AND SECRETARY

Name of IP.....
 Country.....District.....Sub-county.....
 Parish.....Village.....
 Date of interview.....Name of interviewer.....

Background information

1. Respondent’s ID.....
2. Gender of respondent.....
3. Respondents position in IP.....
4. Type of actor: i) Farmer ii) Input dealer iii) Trader/marketer iv) Transporter
5. When did you join the IP?.....

Objective 1: How are IPs organized? How does the IP organization influence actors’ interactive exchanges for innovation?

6. What do IPs mean to you? **Probe:** Objectives of your IP? How enterprise was selected, activities carried out?
7. Who are the key actors in this IP? **Probe:** How many are they? Gender? What are their positions? What was the original number? Who were the actors?. How many have joined? Type of actors who have joined? How many have withdrawn? Type of actors who have withdrawn? Reason for change? how many represent each category?
8. What are the committees in this IP? **Probe:** How committees were they formed? Are there any sub committees? Size? Gender? What are the qualifications of the members? How have they evolved? How are they ruled/managed? Who initiated the idea of committees? How often do they meet?
9. What are the roles of each committee? Who defines the roles of the committees? Rank the extent to which the roles of different committees are clearly defined from using a scale of 1 to 10 with 1 being the least and 10 being the highest? Have the roles changed? If yes, how? Why have they changed? Do the roles of committees need to be redesigned? If yes, how?
10. How do actors and committees carrying out different roles share information? What kind of information is required by each committee? What kind of information do they share? How often? What don’t they share? Describe in what way the method used to share information has helped all members gain access to and comprehend the information shared. Describe how it has hindered access to and comprehension of information shared. Rank the extent of sharing information using a scale of 1 to 10 with 1 being the least and 10 the highest. Explain.
11. What are the rules governing interaction among actors/committees? Are they written or unwritten? Do members abide by the rules?

12. What are your roles in this IP? Who defines your roles? Rank the extent to which your roles are clearly defined using the scale of 1 to 10, with one being the least and 10 being the highest. Please explain. Have your roles changed since you first engaged in the IP? If yes, how have they changed? Why? **Probe:** what are your strengths? What are your weaknesses? What would be required to perform your roles better?
13. What type of information is required by farmers? What kind of information and knowledge is shared with farmers? Information not shared? How is information and knowledge shared with farmers? In what form is the information communicated? Who delivers the information? How often do you share each kind of information? Please rank the extent of sharing information from 1 to 10 with 1 being the lowest and 10 being the highest.
 - Find out type of information e.g. IP management, production technologies, postharvest handling, processing, soil conservation, availability of seed, and access to credit, money, field trips.
14. What are the kinds of decisions made in the IP? What are the important decisions? Who defines the level of importance of decisions? Who makes the most important decisions in the IP? **Probe:** What are their positions, qualification, sex, role in IP?
15. Who implements the most important decisions? What is required to implement the decisions (e.g. approval, resources, etc)?
16. Within the last 12 months, what are the names and roles of people in the IP with whom you:
 - a. Discuss issues pertaining to the I. **Probe:** What are the issues discussed? Frequency?
 - b. From whom you seek advice. **Probe:** Type of advise sought
 - c. You come up to when you have a problem. **Probe:** For what kind of problem
 - d. You can count on; is this a person you can trust? **Probe:** Extent of trust
 - e. You have talked with over the past 12 months when you wanted to make a decision. **Probe:** Type of decision
 - f. You are very good friends with
17. Are there rules within or outside the IP that are influencing the functions of the actors? If yes, what are they?

Objective 2: What are the factors that motivate key actors to participate in IPs? Does full participation help each actor achieve their respective goals?

18. What are the goals/objectives of this IP?
19. What are the factors that inspired you to join the IP? **Probe:** What are your expectations? How have your expectations change from the time in engaged in the IP?
20. What are members' expectations from participating in this IP?
21. How have members' expectations changed over time as a result of experiences during earlier stages of IP development?
22. What activities are being carried out to achieve the objectives of the IP?
23. What IP activities are you actively involved in? How are you involved? How are other IP members involved in different activities?
24. Has participation in the IP enabled you to achieve your goals?

Question 3: Does the composition of IPs at the stage of formation influence articulation of priorities that address the concerns of smallholder farmers? As the IP evolves, do any associated changes in composition affect the focus on concerns of smallholder farmers?

25. What are the priority needs/concerns of farmers? Have these changed over time?
Probe: What were the initial priorities at IP formation? What are the priorities currently? What are the causes of change ----change in actors?
26. What research problems/issues is the IP addressing now? *Probe:* How are IP research problems/issues identified? Who is involved? What are their qualifications, positions, sex, roles in IP? Do all members have equal chance to voice their concerns?
27. Are there rules governing prioritization of needs? If yes, what are the rules governing prioritization of needs? What is the source of the rules? Do members abide by the rules?
28. Who are the key implementers of IP priorities? What are their qualifications, positions, sex, roles in IP? How do they influence the implementation? *Probe:* Are there issues addressed by different groups? What are the issues? How are the groups formed?
29. To what extent have the different concerns of smallholder farmers been addressed? List concerns and use the scale of 1 to 10, with 1 being the least and 10 being the highest. Is the composition of IPs enough to address the concerns of smallholder farmers as they evolve? Do actors bring in the kind of learning that members expect?
30. To what extent have the concerns of other actors been addressed? *Probe* about: Traders/marketers, input dealers, transporters, and local leaders. Who has been served most?
31. What has been your experience so far from participating in the IP? *Probe:* What is the extent of trust among members?
32. What successes has the IP realized so far? How do you measure success? Who measures success? What are the indicators of success?
33. What are the challenges that the IP is facing? What is the magnitude of each challenge? How have you addressed the challenges? What has not been addressed?
34. What opportunities do you foresee from participating in this IP?
35. Do you have any questions or comments about this study?

Thank you very much for your time.

APPENDIX D: CHECKLIST FOR FOCUS GROUP DISCUSSIONS WITH FARMERS

Name of IP.....Country.....
 District.....Category of actors interviewed.....
 Composition of the group: No. of males.....No. of females.....
 Date of interview.....
 Name of interviewers.....
 Duration of interview: Start time.....End time.....

1. What does this concept of IPs mean to you? Could you please map out what these IPs mean to you? Draw linkages among actors (dominant, weak, average)
2. What do you think about the process of forming this IP? **Probe:** What inspired you to join the IP? What are your expectations from participating in this IP?
3. What are the roles of (category of actors) in this IP? Are they written anywhere? What are your key strengths in the IP? What are your key weaknesses? What would be required to perform your roles better? Have your roles changed since IP inception? If yes, how? If no, do think your roles need to be redefined?
4. What are the roles of other actors in this IP (farmers, researchers, private sector, extension, training institutions, etc)? How did the IP come up with the different roles carried out by different actors? How were the roles distributed? What are the strengths of different actors? What are the weaknesses of different actors? How have the roles of other actors changed since inception of the IP? Why?
5. How do different actors and committees carrying out different roles interact? What kind of information do they share? How do they share information with the people they represent? How are they ruled/managed e.g. self managed, or directed?
6. What are your concerns/needs? Describe how the IP prioritizes the research problems/issues to address? Are you involved in defining research challenges? How are you involved? Does the process allow (mention the type of actor e.g farmers) to voice their concerns? If yes, how? Are men and women able to voice their concerns? Has the process changed over time? If yes, how? How often are issues defined?
7. What decisions are made in the IP? How are decisions made in the IP e.g. participatory or concentrated? How were decisions made before formation of the IP? **Probe:** What are the most important decisions? Who defines the level of importance of decisions? Who makes the most important decisions? Who implements the most important decisions? What does it require to implement them e.g. approval?
8. Is the number and type of actors adequate to enable IPs to generate and utilize knowledge
 - a. that enables farmers to increase production? Do the actors bring in a kind of learning that members expect? (consider gender aspects). Explain
 - b. that enables farmers/traders/marketers to obtain quality produce and access profitable markets? Do they bring in a kind of learning that members expect?

- c. that enables farmers to conserve the natural resource base? Do they bring in a kind of learning that members expect? Explain.
 - d. Policy makers to come up with policies that improve agricultural and livestock production, and natural resource management? Explain.
 - e. *Probe* about the extent to which the concerns mentioned the group have been addressed.
9. What are the changes that have occurred within the IP since inception? What is being done differently? Which changes represent improvements? What changes do not represent improvement? What has caused the changes? If membership has changed, does it present an opportunity to better address the concerns of smallholder farmers, trader/marketers, policy markets, and private sector? If yes, how?
10. What kind of information do you request for? How do you decide on which information to seek? What information do you receive? Who delivers the information? How is it delivered? In what form is it delivered? Are you all able to access the same information? Count those that are able to access or not access information. How do you utilize the information?
11. What is the level of trust among members of the IP? Rank the level of trust between 1 and 10, with 1 being the lowest and 10 being the highest.
12. What successes has the IP achieved so? Who defines success? How is it measured? What has not been successful, or successful enough? Why? What challenges is the IP facing in collectively solving problems? Do you think the IPs will make a difference?

Thank you very much for your time!

Interviewer's observations

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.....

- iv) To access better market
- v) To access credit
- vi) Widen social network
- vii) Other
(Specify).....
.....
.....

14. What are your expectations from participating in the IP
- i) Gain knowledge and skills in increasing crop and livestock production
 - ii) Gain knowledge and skills in improving soil fertility
 - iii) Access credit
 - iv) Access agricultural inputs (specify).....
 - v) Access better markets
 - vi) Interact with other people
 - vii) Other (specify).....

15. Have your expectations changed from the experience of participating in the IP?
- i) Yes 0) No

16. If yes, how have your expectations changed from the experience of participating in the IP?
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17. What are the key activities that the IP is carrying out to achieve the desired goals?
- i) Designing the action plan
 - ii) Crop Production
 - iii) Marketing of produce
 - iv) Experimentation with new technologies
 - v) Monitoring and evaluation
 - vi) Other (Specify).....

18. May you please tell me some of the IP activities in which you are involved
- i) Designing the action plan
 - ii) Crop Production
 - iii) Marketing of produce
 - iv) Experimentation with new technologies
 - v) Monitoring and evaluation
 - vi) Other (Specify).....

19. How would you assess the extent to which you are involved in the activities mentioned above? Use the codes below

Activity	Level of involvement
1.	
2.	
3.	
4.	
5.	
6.	

Activity: i) Designing the action plan ii) Crop production iii) Marketing of produce
 iv) Experimentation v) Monitoring and evaluation vi) Other (Specify).....

Level of involvement: i) Very active ii) Active iii) Somewhat active iv) Not at all active

III. Objective 3: To understand the influence of IP organizational structure and composition on articulation of IP priorities that address the concerns of smallholder farmers.

In this section, I would like you to tell me how the issues addressed in the IP are identified and your involvement in the activity.

20. What needs/issues are of priority to you?

- i) Lack of better yielding varieties
- ii) Poor soil fertility
- iii) Lack of access to profitable markets
- iv) Poor post-harvest handling practices
- v) Other (specify).....

21. What problems/issue is the IP addressing now?

- i) Low crop productivity
- ii) Poor soil fertility
- iii) Low value addition
- iv) Poor market access
- v) Other (specify).....

22. Are you involved in identifying the problems/issues that the IP is addressing?

- i) Yes 0) No

22(b) If yes, how often are you involved in identification of problems/issues to address?

- i) Always
- ii) Often
- iii) Sometimes
- iv) Seldom (rare)

- 23. If not, who identifies the problems/issues to address?
 - i) IP chairperson (Parish)
 - ii) Facilitators
 - iii) Sub county committee
 - iv) Parish committee
 - v) I don't know
 - vi) Other (specify).....

- 24. (a) Do you know the person (s) representing your needs/issues to the sub-county/*secteur* committee?
 - i) Yes.....
 - 0) No.....

- 25. What are their positions in the IP? Specify the sex of the representative (s)
 - i) Chairperson
 - ii) Secretary
 - iii) Treasure
 - iv) Member
 - v) Other (specify).....

- 26. How are/were they selected to represent the IP at sub-county/*Secteur* level?
.....
.....

- 27. How often do you interact face to face with your representative (s)?.....

- 28. What information/skills/materials do you seek from the sub-county/*Secteur* committee?
 - i) Planting new crop varieties
 - ii) Post-harvest handling practices
 - iii) Value addition
 - iv) Use of agricultural inputs
 - v) Agricultural inputs
 - vi) Tools and equipment
 - vii) Market for produce
 - viii) Other (specify).....

- 29. Is the information/skills/materials received what you ask for?
 - i) Yes, definitely
 - ii) Yes, somewhat
 - iii) No, not at all
 - iv) No, definitely not

If yes, does the information/materials come in time?

- i) Yes, definitely
- ii) Yes, somewhat
- iii) No, not at all
- iv) No, definitely not

30. Who delivers the information/materials and how is it delivered? Use codes below

Type of information/material	Who delivers the information/materials	How is the information/material delivered	How often do you receive the information	How is the information utilized

Type of information/materials: i) Planting new crop varieties ii) Post harvest handling practices iii) Value addition iv) Use of agricultural inputs v) Improved seed fertilizers vi) Tools and equipment viii) Market for produce ix) Other (specify).....

Who delivers information: i) IP Chairperson ii) IP secretary iii) Publicity secretary iv) trainer of trainers v) member vi) IP Facilitator vii) Others (Specify).....

How information is delivered: i) Meetings ii) Contact individuals iii) leaflets/brochures iv) Other (specify).....

How often information is received: i) Every day ii) Once a week iii) Once a month iv) other (Specify).....

How information is utilized: i) Determination of needs ii) Comparing alternative options iii) Implementation of solution iv) Share with other IP members v) Have not utilized it vi) Other (specify).....

31. How efficient are your representatives in articulating your needs?

- i) Very efficient
- ii) Moderate
- iii) Poor
- iv) Very poor

32. How efficient are your representatives in bringing feedback?

- i) Very efficient
- ii) Moderate
- iii) Poor
- iv) Very poor

33. What are your other sources of information? What information do you obtain from the different sources? (Use the codes below)

Sources of information	Type of information received	How the information is utilized

Source of information: i) Government extension (e.g. NAADS) ii) NGO Extension iii) Fellow farmer but non IP member iv) Newspaper v) Radio vi) Other (specify).....

Type of information: i) Planting new crop varieties ii) Post harvest handling practices iii) Value addition iv) Use of agricultural inputs v) Markets for produce vi) Other (specify).....

How information is utilized: i) Determination of needs ii) Comparing alternative options iii) Implementation of solution iv) Share with other IP members v) Have not utilized it vi) Other (specify).....

34. Please rank the level of importance of all your sources of information, 1 being the most important

Source of information	Rank
IP	
Government extension (e.g. NAADS)	
NGO extension	
Other non-IP farmers	
News papers	
Radio	
Other (Specify)	

35. Has participation in the IP activities enabled you to achieve your goals?

- ii) Yes, definitely
- ii) Yes, somewhat
- iii) No, not much
- iv) No, definitely not

36. If yes, what are some of the rewards realized from participating in this IP?

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37. What challenges are you facing in this IP?

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38. Do you have any questions or comments?

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Thank you very much for you time!

Interviewer's observations

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APPENDIX F: EXAMPLE OF BYLAWS

A) BYLAWS FOR ISANGANO IP/ GATARAGA

ARTICLE I

Purpose of ISANGANO IP Name, Location, Objective, Duration

Section I.03 Purpose. The Purpose of ISANGANO IP/ GATARAGA is to fight against poverty through joining together to engage in the production of agricultural products especially irish potato and strengthen the market power by adding value to irish potato.

Section I.02 Name. The name is ISANGANO IP/ GATARAGA

Section I.03. Location. The principal office of ISANGANO IP/ GATARAGA shall be located at GATARAGA Sector office. IP ISANGANO/GATARAGA will be operating its activities within GATARAGA Sector in the Cells of ;

Mudakama

Murago

Rubindi and

Rungu, but it may be expanded to other Sectors depending on how farmers receive the approach. The office of ISANGANO IP/ GATARAGA may be designated by the agreement of 2/3 of all IP memebbers.

Section I.04 Duration. ISANGANO IP/GATARAGA has no time when to end.

ARTICLE II

2.1.1 Stakeholders/ Members

Section 2.0I Members of ISANGANO IP are farmers who sign these bylaws and will promote development through using the IAR4D approach.

Section 2.02 Members who will join ISANGANO IP later will be accepted as long as they work together with others to promote development in Gataraga Sector.

Section 2.03 Stakeholders outside Gataraga will join the ISANGANO IP/GATARAGA . These staholders will help members to resolve some of the Agricultural problems that face farmers in Gataraga.

ARTICLE III ISANGANO IP ORGANIZATION STRUCTURE

Section 3.01 General meeting The general meeting is the highest level of power of the ISANGANO IP/ GATARAGA and it's this level the decisions are made.

Section 3.02 General meeting is composed by all members of ISANGANO IP/GATARAGA

Section 3.03 Monthly Meetings, The monthly meetings of the members of the ISANGANO IP shall be held in Gataraga Sector in the morning hours on every Friday for the last week of each month.

Section 3.04 Special meetings, The committee may call special meetings of the members at any time upon written request by at least 10% of the stakeholders. The request shall state the time, place and the purpose of the meeting.

Section 3.05 Notice of the meetings, Written and printed notice all meetings except the one specified above, shall be prepared and delivered to each member's last known address not less than 7 days before the meeting. Also phone calls will be used to deliver the message to some members who seem to live far.

Section 3.06 Recalling the meeting, when the meeting is not attended by ½ of the members there is need to recall a meeting and this meeting should take place after 8 days.

Section 3.07 Voting, Voting takes place by show of hands, unless a majority of the members present at the meeting decide to do otherwise.

ARTICLE IV COMMITTEES

Section 4.01 the committee of ISANGANO IP/GATARAGA is composed of nine people:

President

V/President

Secretary

Treasurer

3 Advisers

Section 4.02 Committees are elected by ISANGANO IP/GATARAGA for one mandate of 2 years and they are allowed to be elected for the second term only.

Section 4.03 Powers and Duties

The powers and duties of ISANGANO IP/GATARAGA shall be as follows:

a) The president shall preside over the general meetings of the members; President shall play a role of resource development and representing the ISANGANO IP/ GATARAGA within and outside the community, President shall chair the committee.

b) Vice President. In case of absence of the President, or of her/his inability from any cause to act, the Vice President shall perform the duties of the office. Like President, the V/President shall play a role in resource development and representing the ISANGANO IP/ GATARAGA within and outside the community

c) The secretary shall be responsible for keeping records of all meetings, also Secretary shall be in charge of communications – e.g., notices of meetings, official communications.

d) Treasurer will be in charge of financial management, including keeping all appropriate fiscal records and ensure that all funds are recorded, spent and monitored consistent with funder requirements, legal requirements, and sound financial management.

e) Advisers shall advise the committee to work according to what they are assigned. They will be in charge of discipline in ISANGANO IP/GATARAGA.

ARTICLE V ASSET AND PROPERTIES OF THE IP

Section 5.01

The funds of ISANGANO IP come from: Membership fee, gifts and the funds from donors in terms of agricultural materials.

Section 5.02

The funds or properties of ISANGANO IP is used to to prepare, Meetings, agricultural trainings, farmer exchange visits and prepare small agricultural projects.

ARTICLE VI AMENDMENT OF BYLAWS

The bylaws of ISANGANO IP/GATARAGA may be adopted, amended or repealed by the majority vote of the members of the ISANGANO IP/ GATARAGAten in the office, provided that at least ten days' written notice has been given each member of the IP of the intention to adopt,amend, or repeal the bylaws.

**These bylaws approved by the members of ISANGANO IP/GATARAGA
on 27/05/2009**

B) BYLAWS FOR SOIL AND WATER CONSERVATION

Some of the bylaws mentioned by farmers in Bubare IP:

- Construction of water trenches: if someone does not construct a trench, they should not cultivate
- If a person steals someone's crop and is caught, she or he will pay a certain amount of money
- no person should rear bees near somebody's land of cultivation
- When planting trees, you should leave a boundary
- Everybody planting trees should construct trenches
- Cattle grazers should not let their cows to destroy water trenches

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PROFESSIONAL PUBLICATIONS

Kaaria, S., Njuki, J., **Abenakyo, A.**, Delve, R., & Sanginga, P. (2008). Assessment of the Enabling Rural Innovation (ERI) Approach: Case studies from Malawi and Uganda. *Natural Resources Forum*, 32: 53–63.

Kaganzi, E., Ferris, S., Barham, J., **Abenakyo, A.**, Sanginga, P., & Njuki, J. (2008). Sustaining linkages to high value markets through collective action in Uganda. *Food Policy*, 34: 23-30.

Sanginga, P., **Abenakyo, A.**, Kamugisha, R. Martin A, M & Muzira, R. (2010). Tracking outcomes of social capital and institutional innovations in natural resources management: Methodological issues and empirical evidence from participatory bylaw reform in Uganda. *Society and Natural Resources*, 23: 1–16.

Tenywa, M.M., Rao, KPC., Tukahirwa, J.B., Buruchara, R., Adekunle, A.A., Mugabe, J., Wanjiku, C., Mutabazi, S., Fungo, B., Kashaija, N.I., M., Pali, P., Mapatano, S., Ngaboyisonga, C., Farrow, A., Njuki, J. and **Abenakyo, A.** (2010). Agricultural innovation platform as a tool for development oriented research: Lessons and challenges in the formation and operationalization. *Learning Publics Journal of Agriculture and Environmental Studies*, 2: 117-146.