Multi-stakeholder partnerships in value chain development

A case of the organic pineapple in Ntungamo district, Western Uganda

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Abstract

Purpose – The purpose of this paper is to demonstrate that agricultural commodity value chain development using multi-stakeholder partnerships (MSPs) can fast-track improvement in the livelihoods of rural farming households. With the view that such partnerships can raise farmers' incomes, the study uses the case of the organic pineapple (OP) value chain in Ntungamo, Western Uganda, to understand the governance features that hold the value chain partners together, to analyse the costs and margins to the participating farmers, to identify opportunities for demand-driven upgrading of the farmers' skills and knowledge, and the role that partnerships play in such upgrading.

Design/methodology/approach – The study uses the qualitative tools of value chain analysis: value chain maps of stakeholders, processes and support services of the OP value chain, and a quantitative tool to analyse costs and margins to the participating farmers. Interviews were conducted with key informants from the OP innovation platform, and survey data collected for the planting season, February–July, 2014, across three farmer categories of certified organic, conventional, and farmers not participating in the innovation platform.

Findings – Careful selection of partnerships to develop the value chain is found to be critical. Partners to involve should be those that enable the upgrading of farmers' knowledge, skills and technologies to position

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them for better markets. Partners should also include those that enable the improvement of margins to the farmers and efficiency of the value chain. The strategic MSPs should be bound by formal contracts, to ensure stable relationships in the value chain and hence sustainable market access for the farmers.
Research limitations/implications – Although carried out on a specific value chain in a specific local context, this is not likely to limit the applicability of the findings to commodity value chains in a range of local contexts.
Originality/value – The study fulfils the need to highlight the role that stakeholder partnerships can play in value chain development and how they can be sustained by governance and institutional arrangements.

Keywords Uganda, Governance, Value chain, Gross margins, Multi-stakeholder partnerships, Organic pineapple
Paper type Research paper

1. Introduction

The development of small-scale agriculture and linking farmers to functional markets in an effort to address poverty has for long been high on the agenda of most Sub-Saharan African (SSA) countries. The twenty-first century, in particular, has presented enormous opportunities for human progress and business success worldwide, but has been seriously challenged by persistent poverty, inequality, instability, and insecurity especially in the developing countries. As such almost two-thirds of the world's population still has limited access to basic services, efficient markets, and good governance (World Economic Forum (WEF), 2005) most of whom are found in the developing countries.

Governments and development agencies are increasingly using value chain development as a key element in their development strategies to improve the income of poor groups of society through value addition. However, while improvements are achieved for some parts of the value chain, others remain underdeveloped and altogether little is achieved (UNIDO, 2011). It has additionally been recognised that partners must be found who complement the value chain development effort. Multi-stakeholder partnerships (MSPs) in particular are believed to have enormous potential as development interventions in general (Brown, 2007), and value chain development in particular. Therefore, although poverty is still a challenge in Uganda at the time when the millennium development goals expire, approaches of agricultural commodity value chain development using MSPs promise to fast-track improvement in the livelihoods of rural farming households. This case study demonstrates that MSPs in value chain development have the potential to improve smallholder farmer incomes.

One of the most important trends in international development lately has been a growing awareness of the crucial role that a productive, competitive, well-diversified and responsible private sector plays, not only in underpinning economic growth and wealth creation but also in supporting the key pillars of development, particularly poverty reduction. It has therefore become necessary to find ways to harness the innovation, technology networks, and problem-solving skills of the private sector in partnership with others to support international development goals (WEF, 2005). Partnerships, an idea that was intriguing but hardly obvious in the mid-80s, are now widely accepted by international development agencies, transnational corporations and governments (Brown, 2007). They are increasingly being recognised as important mechanisms to help address market failures, weak public administration, poor infrastructural capacity where neither the market nor the government is able on its own to deliver public goods or meet crucial social and environmental challenges. In such situations, it has been found necessary to mobilise both public and private resources, and this is often done through partnerships (Malena, 2004; WEF, 2005). Due to their enormous potential as development interventions, MSPs in particular have been pointed out as the only manner in which to achieve the UN's global goals (Brown, 2007; Martens, 2007).

The concept of MSP as an instrument for achieving development goals is sound, particularly when stakeholders with unique complementary strengths or core competencies

add value to the development efforts and pool their resources and assets in solving problems (GKP, 2003). Value chain development approaches therefore stand to benefit from MSPs. A "value chain" describes the full range of activities required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers and final disposal after use (Kaplinsky and Morris, 2001; in Mitchell *et al.*, 2009). Value chain development is a positive or desirable change in a value chain to extend or improve productive operations and generate social benefits such as poverty reduction, among others (UNIDO, 2011).

1.1 Background of Ntungamo organic pineapple innovation platform (NOPIP)

NOPIP was established in 2009 by the Sub-Saharan Africa Challenge Programme (SSA CP) that was funded by the Forum for Agricultural Research in Africa (FARA). The central focus of the challenge programme was to test the proof of the Integrated Agricultural Research for Development (IAR4D) concept. This concept utilises the principles of innovation systems approach to foster significant changes in agriculture through wholesome engagement of stakeholders in useful partnership, market integration and participatory innovation along with technological, institutional and infrastructural realms (Adekunle *et al.*, 2013). The concept was implemented under the different socio-economic and cultural conditions of the Lake Kivu Pilot Learning Site (LKPLS), one of the three sites employed by the SSA CP in Africa. LKPLS composed of three neighbouring countries: Rwanda, Democratic Republic of Congo (DRC), and Southwestern Uganda. In each country, four innovation platforms (IPs) were established. NOPIP is one of the four IPs that were established in southwestern Uganda.

The IAR4D concept is implemented on an IP. An IP in the context of IAR4D is defined as a physical or virtual forum established to facilitate interaction and learning among stakeholders of a commodity value chain and others that are outside the chain but influence the chain's activities (Adekunle *et al.*, 2014). Their interaction leads to participatory diagnosis of problems, joint exploration of opportunities and investigation of solutions, leading to the generation of agricultural innovation along the targeted commodity chain. Initially, the SSA CP partners from Makerere University (MUK), Kabale Zonal Agricultural Research and Development Institute (KAZARDI), Kabale District Local Government, and Africa Highlands Initiative (AHI) met officials of the Ntungamo District Local Government (NDLG) in consultative meetings to discuss the possibility of establishing an IP in Ntungamo District. In these meetings, it became clear that although pineapples had high potential in the district with good market both within and outside the district, not much support had been given to the pineapple growers. The National Agricultural Advisory Services together with the District Agricultural Office (DAO) had chosen to support bananas, dairy and coffee as priority enterprises for the district. Yet a good number of households in the district grow pineapples and finding profitable markets would greatly contribute to raising their incomes. A meeting was then held by the district leaders, partners and farmer leaders from seven sub-counties that were selected to be the highest pineapple producing sub-counties in the district[1]. The sub-counties were Itojo, Rugarama, Kayonza, Ngoma, Nyabihoko, Ruhama and Nyakyera. Together with the farmer leaders, the development of the organic pineapple (OP) value chain was chosen to be the central focus for the IP activities. The NOPIP has since been composed of development partners and farmers from the seven sub-counties.

When the development of the OP value chain was identified as priority for the NOPIP, it was necessary to identify a partner that would guide the farmers in organic farming. It was then that the National Organic Agriculture Movement in Uganda (NOGAMU) was identified as a suitable partner for the IP. The farmer leaders mobilised their

respective farmers to form groups and associations in order to work with NOGAMU. The farmers in their groups and through their leaders identified the following problems to be addressed with the partners: the lack of planting material, collective marketing, post-harvest handling, lack of value addition, technologies for soil and water conservation, and the need to have gloves when working with pineapples. Another partner, Mbarara Zonal Agricultural Research and Development Institute (MBAZARDI), located closer to the IP than KAZARDI, was brought on board for a concerted effort to address the farmers' issues.

NOPIP is governed by an executive committee which comprises the DAO as chairperson, district secretary for production representing the district political leadership, and the farmer leaders representing the seven sub-counties. The IP executive committee meetings are regularly held where sub-county representatives update the committee on the performance of the sub-counties.

Since its establishment, NOPIP has received numerous trainings on soil and water conservation from MUK, solar drying of fruit by an expert from Africare, a non-governmental organisation (NGO), and members were facilitated by KAZARDI in 2010 to visit pineapple farmers in Kayunga District, another well-known pineapple-producing district in Uganda. Partners have supported the IP to acquire five solar dryers, situated in Itojo sub-county. NOGAMU trained three farmer representatives on the Internal Control System (ICS) in 2011. The training would enable them to understand the organic farming practices and field standards expected of the farmers by NOGAMU. Several farmers have been inspected and certified organic by NOGAMU. As a result, NOGAMU has also opened up linkages with potential supermarkets in Kampala and exporters of dried OP: the Fruits of the Nile (FON) and Jakana Foods Ltd (JFL) In addition NOGAMU continues to promote the OP products in the regional market through exhibitions.

This case study analyses the OP value chain at the NOPIP in a multi-stakeholder context and also from the point of view of the participating farmers. It specifically aims to map the stakeholders, processes and key support services of the value chain, to understand the governance and institutional issues that help to hold the stakeholders and the entire value chain together, and to analyse the costs and margins to the participating farmers. The study also identifies opportunities for demand-driven upgrading of farmers' knowledge and skills that will enable their sustained access to the identified markets, and the role that the partnerships can play in such upgrading.

2. Methodology

The OP value chain analysis is conducted using four tools that enable the following: value chain mapping, analysis of governance and institutional features, identification of opportunities for demand-driven upgrading of farmers' knowledge, and analysis of costs and margins. The first three of these are qualitative with information collected from key informants, while the last one is quantitative.

2.1 Value chain mapping

This enables a basic overview of the value chain, a better understanding of the connections between the value chain actors, processes and support services (Hellin and Meijer, 2006; M4P, 2008). It also enables the identification of constraints and possible solutions at different levels of the value chain.

2.2 Analysis of governance and institutional features of the value chain

The main objective of this analysis is to understand how the OP value chain is coordinated: the key stakeholders, coordinating mechanisms, to identify the rules,

regulations and standards that influence the value chain, and how compliance is monitored. It is from this analysis that the essential institutional features that hold the value chain together are identified.

2.3 Identification of opportunities for demand-driven upgrading of farmers' knowledge and skills

This analysis identifies upgrading opportunities for the farmers to provide the quality of output required by the market, the need for upgrading their skills, knowledge and technologies, and the possibility of making the identified opportunities available through the embedded services, external services and/or learning.

2.4 Analysis of costs and margins

This is a quantitative tool. Data for this analysis was obtained from a survey data set that was collected for the planting season, February-July, 2014. A sample of 97 farmers was drawn purposively from two sub-counties: Itojo an IP sub-county and Rubare a non-IP sub-county for comparison. From Itojo, a total of 78 farmers were randomly selected, of which 28 were found to be certified organic farmers, and 50 were still conventional farmers. A total of 19 farmers were randomly sampled from Rubare. The analysis of costs and margins enables the identification of farmer's production costs, the revenue from the sale of pineapples and other crops, and the calculation of the margins to the farmers. The farmers' production costs mainly arise from the costs incurred when applying manure, mulch to the gardens, and to a small extent the use of pesticide. Some of the mulch and manure is bought, and some comes from the farm, while labour to apply them is paid. These costs are added to constitute the total production costs for each farmer as given below:

$$Cman_i + Cmul_i + Cp_i = TPC_i \tag{1}$$

where $Cman_i$ is the cost of purchasing manure in Uganda shillings (U.shs) for an individual farmer *i,* in the study period; $Cmul_i$ is the cost of purchasing mulch in U.shs for same farmer, in the same period; Cp_i is the cost of purchasing pesticide in U.shs in the same period; and TPC_i is the total production cost for the farmer in that period.

The average production cost (*APC*) for each sample category is obtained as follows:

$$APC = \frac{\sum_{i=1}^{i=n} TPC_i}{n} \tag{2}$$

where $n = 19$ in Rubare, $n = 28$ for Itojo certified organic farmers, and $n = 50$ for Itojo conventional farmers.

Labour is computed by adding up the labour that was used by the farmer; family and hired labour in the entire season, for other activities (other than mulching and manure) such as ploughing, planting and weeding and harvesting. The total labour input for all crop production for each farmer (TLC_i) and total labour input for pineapple production (TLP_i) are computed in man days. These are compared across the sample categories. The average labour input on pineapple production (*ALP*) is then obtained as given below:

$$ALP = \frac{\sum_{i=1}^{i=n} TLP_i}{n} \tag{3}$$

where n is as above. The results are compared across the sample categories. Pineapple revenue (*PR*) and other crop revenue (*CR*) were obtained from the farmers' estimates of the two revenues in that planting season, and the averages are subsequently computed.

Gross margins for each farmer are obtained by subtracting the total production costs (TPC_i) of each farmer from his total crop revenue (TCR_i). Average gross margins (AGM_1) for each sample category are then computed (equation provided below). Average gross margins per pineapple acre (AGM_2) are obtained by dividing the gross margins by the pineapple acreage for each farmer and then the average computed for each sample category (equation provided below):

$$AGM_1 = \frac{\sum_{i=1}^{i=n} (TCR_i - TPC_i)}{n} \tag{4}$$

where AGM_1 is the average gross margin for a given sample category:

$$AGM_2 = \frac{\sum_{i=1}^{i=n} (TCR_i - TPC_i)/P_{Ai}}{n} \tag{5}$$

where AGM_2 is the average gross margins per pineapple acre for each sample category; P_{Ai} is pineapple acreage for each farmer; TCR_i, TPC_i and n are as above.

3. Results and discussion

3.1 Value chain mapping of stakeholders, processes and support services

The key processes in the OP value chain include the supply of planting material (suckers), production, collection of pineapples at the solar dryer sites, solar drying, wholesale and retail marketing, and consumption. The suckers are shared by the farmers within the IP. The farmer groups within the IP are responsible for collecting their group pineapples and delivering them at a solar dryer for drying. The fresh pineapples that are not solar dried are either consumed at home or individually sold by the farmers in the local markets. The dried pineapple slices are packed and are expected to be sold to supermarkets in Kampala and are exported. The potential exporters so far identified are FON and JFL. In addition, there are support services that are provided along the value chain. These include research, training, extension and product promotion. Figure 1 shows a map of the key actors / stakeholders, processes and support services in the OP value chain in NOPIP.

There exists a wide range of stakeholders – from the producers to the traders, business and exporters. The latter ensure market access, the major incentive for farmer participation. The presence of technical support services is especially important to enhance the role of the

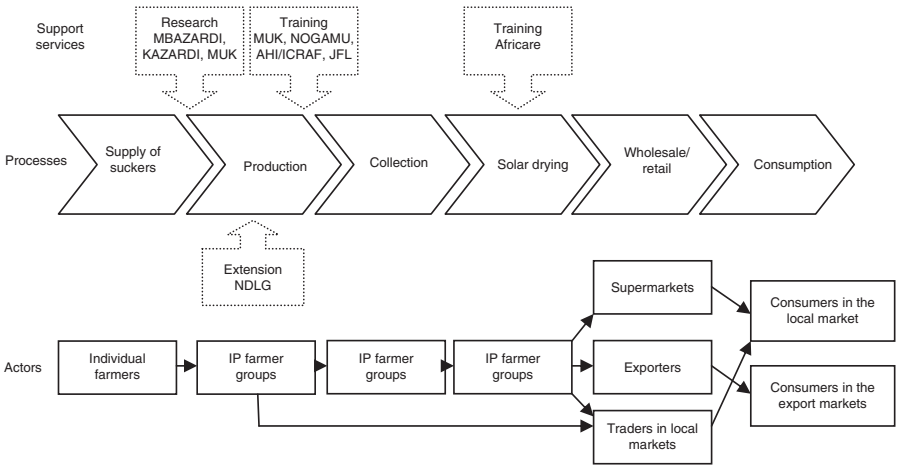

Figure 1.
Mapping of the stakeholders, processes and support services in the OP value chain

farmers in ensuring sufficient supplies of good quality pineapple throughout the chain. The careful selection of the service providers has enabled the IP to access a range of technical services such as extension, soil and water conservation trainings, community banking, improved planting material, among others. The presence of NDLG ensures political support and also enables the mobilisation of farmers to join IP activities.

3.2 Governance and institutional features of the value chain

Governance refers to both the official rules that address output, and the commercial imperatives of competition that influence how production is structured (M4P, 2008). The instruments of governance range from contracts between value chain participants to government institutions and regulatory frameworks, to local institutions and unwritten norms that determine who can participate in the market. Governance in this study is categorised into three dimensions: coordinating structures; rules, regulations, and standards; and control mechanisms including the transfer of information and services. The forms of support that can help farmers achieve the required standards are also identified.

3.2.1 Coordination structures. Coordination structures describe the way the different actors are organised to participate in the value chain, and how they link with each other along the chain. At the NOPIP, the coordination structures of the value chain consist of both horizontal and vertical forms of coordination. Horizontal coordination of the farmers in groups and on the IP strategically positions them for technical support and facilitates market access. The individual pineapple farmers form groups in their respective sub-counties, and the sub-counties then register their groups with the IP. The IP is governed by an IP executive committee comprising a chairperson, secretary and seven sub-county farmer representatives, one from each sub-county. The IP also has a manager to oversee and direct the partner activities. The chairperson is the DAO, while the manager is from World Agroforestry Centre, one of the partners. Transactions of the OP farmers with other value chain actors are then effected through the IP. Further, the IP has plans to register a cooperative society at the national level to obtain legal status, increase its visibility in the market and recognition by other actors.

NOGAMU, a registered not-for-profit organisation is an instrumental link between the IP and the organic markets both within and outside the country. NOGAMU is a membership organisation of farmer groups, associations and buyers of organic products. When the IP was established in 2009, some 18 farmers in the Itojo sub-county were already registered members with a paid-up annual subscription and organic certification from NOGAMU. These farmers were the initial members of the IP. Since then NOGAMU has granted organic certification to 127 pineapple farmers in a total of six sub-counties, also known as clusters. The current total number of farmers in the IP is about 2,500 and NOGAMU is still in the process of certifying them as funds become available. With these developments, NOGAMU is able to link NOPIP to regional and international buyers, and support the IP to produce the required quality standards in these markets. NOGAMU ensures that organic standards are achieved and maintained by providing organic certification. This certification enables organic farmers in Uganda to access regional markets. As such NOGAMU has been actively involved in promoting the certified farmers' products within the region through exhibitions and trade fairs.

NOGAMU has linked the certified IP farmers to supermarkets in Kampala, the FON and JFL, both exporters based in Kampala. Supermarkets and other private outlets are considered to be strategic. So far partners to NOGAMU and linkages with certified organic farmers are made whenever possible. JFL and FON are private businesses, and members of NOGAMU who would normally make contracts with the suppliers of their inputs. JFL has already signed a contract with NOPIP for the supply of dried pineapples

for export. JFL expects the IP to finalise its formal registration, and subsequently the IP to make subcontracts with the participating sub-counties. This vertical coordination of the IP with the major market actor, JFL through a contract ensures stability of the accessed market.

The important coordination structures for this value chain include the groups in which the individual farmers are initially registered and the IP at the district level that registers member groups. These structures enable the coordination of the farmers and facilitate access to support services of extension and training. This horizontal coordination also enables the identified market actors to interact with the farmers as a recognised entity. The importance of producer organisation as a form of horizontal coordination is highlighted by Mitchell *et al.* (2009), as a sustainable intervention that supports poor producers to access export markets. It allows bulking of their produce, access to technical support and enables them to overcome barriers to entry in global markets. The coordination is sustained by committees at the group and IP levels, as well as by regular meetings. Organic certification not only enables NOGAMU's intervention in the value chain but ensures access to a niche market of organic products in the region. The contracts, a form of vertical coordination, made between the private actors such as the exporters and the IP commit both parties to certain obligations that further sustain interaction of the value chain actors. The coordination structures are summarised in Table I.

Actors	Pineapple farmers	NOGAMU	Supermarkets	Jakana Food Ltd (exporters)
Coordinating structures	Farmers organised in groups in each of the 7 sub-counties 7 sub-counties comprise the IP IP has an executive committee (1 chairperson, secretary, 7 sub-county representatives)	A registered national NGO Membership of farmer groups and associations Organic certification	Private businesses Contracts with suppliers/ farmers	A limited liability company JFL certification Contracts with suppliers/farmers
Rules and regulations	All pineapple growers in the 7 sub-counties can join the groups and associations which subsequently can be members of the IP Members must adhere to organic standards of farming, production, processing and handling of products Members adhere to exporters/ supermarket requirements of packaging and labelling	Internal Control Systems (ICS) Internal Quality Management system Standards of organic farming Standards in processing	Agreed delivery schedules Agreed product quantities Product quality Particular packaging	Delivery schedules Adherence to Organic and fair for life (FFL) requirements Agreed quantities of products Adherence to Jakana ICS Collection and drying of fruit according to JFL standards Proper labelling of all deliveries Farm gate price and 10% premium
Forms of support	Support is provided by partners as shown in Table II	Promotion of products in exhibitions and fairs Training opportunities Support in ICS and IQM, Provision of market linkages and information Organic certification	–	Commercial processing and marketing of natural food products Technical assistance to farmer suppliers Organic and FFL training

Table I.
Summary of coordinating structures, rules and regulations, and forms of support

3.2.2 Rules and regulations. These are rules and regulations that the actors must generally abide by in order to participate in the value chain. The rules for becoming a member of the IP are less stringent. As long as a farmer is a pineapple grower, is willing to learn and apply organic farming practices, and be certified organically, they can join the IP. However, most of the rules that govern the functioning of the value chain are set by the exporting company, JFL. These include adherence to JFL standards, organic and fair for life requirements, agreed upon quantities of products and delivery schedules, among others (Table I). These requirements are more robust and require extra certification from what is offered by the NOGAMU. The requirements by JFL are for an international market and so conform to the international organic trade regulations. JFL has so far certified 80 of the 127 farmers certified by the NOGAMU. The rules summarised in Table I are also specified in the contract between the IP and JFL.

3.2.3 Control mechanisms. NOGAMU mediates between the IP and JFL; particularly by giving support to the IP to meet the required standards. NOGAMU has instituted an ICS to monitor the maintenance of its standards. The NOGAMU ICS consists of farmers that have been trained to monitor the requirements among fellow farmers' gardens.

JFL also has an ICS and conducts regular audits to confirm the appropriateness and maintenance of its standards by the farmers. The rules and regulations specified in the contract with JFL are enforced through JFL ICS and regular audits, and every effort is being made by both the farmers and JFL to achieve and maintain the required standards. JFL also expects the IP to produce a minimum output of 200 kg of dried pineapple. There is therefore flexibility in the quantities that can be supplied provided they do not go below the required minimum. JFL is pursuing flexibility on the part of the producers, which shows commitment to have a long-term relationship with the IP, a good indicator for the sustainability of the value chain. The major incentive for the farmers to abide by the specified rules and regulations are two premiums to be offered by JFL to the farmers upon delivery. The first is a 10 per cent premium above the farm gate price, and the second is a premium by the fair trade regulations. JFL and NOGAMU are also committed to opening a development account of the IP for the premium money. This can be used for further developments of the value chain, such as investment in the required equipment and other inputs.

3.2.4 Forms of support and information flows. The bulk of the support is given by the IP partners. These are development practitioners who provide a range of services including research, agricultural extension and assorted trainings. These services enable the farmers to achieve the standards required by the identified markets. The list of partners and support services they provide are shown in Table II.

The exporters and supermarkets relay information on various aspects such as production, drying and delivery of products, to the IP farmers. The information concerns standards of organic production and drying, timing of delivery schedules, recommended packaging, labelling and price. Further market information is passed on to the IP by NOGAMU. Figure 2 shows a mapping of information flows along the value chain.

NOGAMU and the exporter are committed to assist the IP farmers act on the information provided. They assist with various trainings to maintain the required hygiene standards, packaging and labelling.

3.3 Opportunities for upgrading farmers' knowledge and skills

Upgrading enables understanding how the incomes of the farmers can be augmented (Mitchell *et al.*, 2009). Upgrading involves acquiring the technological, institutional and market capabilities that enable the farmers improve their competitiveness and move into value activities. The OP value chain provides opportunities for this upgrading. Ordinarily the farmers in the Ntungamo district grow pineapples without using fertilizers and pesticides.

Partner	Form of Support
Africare	Technical backstopping in solar drying
Agriculture Innovation System Brokerage (AGINSIBA)	Training in village savings and community banking
AHI / ICRAF	Training in Natural Resource Management and Agroforestry; IP Management
Bishop Stuart University (BSU)	Facilitation of NRM by-law formulation and implementation activities
KAZARDI	Overall coordination and research of partner activities in NOPIP
KDLG	Technical advice in the establishment and development of the IP
MBAZARDI	Research for the development of required varieties and technologies of production
MUK (Food science)	Testing and advising on product composition and quality
MUK (Soil science)	Training on soil and water conservation; soil testing
NDLG	Agricultural extension services; community mobilisation; political support
NOGAMU	Capacity building in organic farming and market linkages

Table II.
Support provided by partners

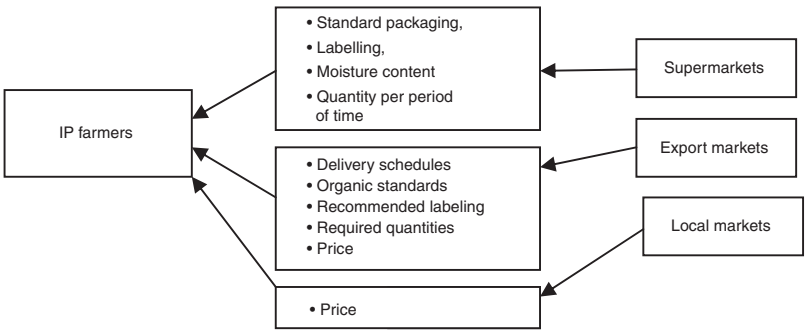

Figure 2.
Mapping of information flows

The smooth cayenne pineapple is well favoured by the warm climate. These factors make it easy for the farmers to shift from the conventional farming methods to organic farming since they would not need to purchase and apply chemicals in order to achieve the required product standards. From the conventional farming methods, the farmers have to adopt organic farming practices. These include the protection of the farm from chemical application as well as those of neighbouring farms, good management of biodiversity including the use of local varieties, and soil conservation by the use of cover crops, mulching, and ridging among others. There is both product and process upgrading, which contribute to improving product quality and chain efficiency. These practices enable farmers to grow "healthy" foods, and attract niche organic markets, both locally and in the region. The adoption of the practices qualifies a farmer for organic certification by the NOGAMU.

Further, organic farming enables better utilisation of resources within the entire farming system. Farmers are able to learn the synergies that exist between the various enterprises, both crop and animal enterprises. Organic farming largely benefits from the presence of livestock on the same farm for the production of manure and organic pesticides, while crops can be used to feed animals. Farmers' knowledge is therefore enhanced for better management of their resources.

The value chain enables the farmers to achieve the standards required of the organic fresh and dried pineapple. This is done through the support services of the partners.

It also enables functional upgrading of farmers' knowledge from simply production to processing. Dried pineapple in particular is produced by solar drying. So far, five solar dryers have been purchased and placed at strategic locations in the Itojo sub-county. JFL and NOGAMU intend to acquire more advanced dryers than what the farmers already have in order to further boost the quality of production. The commitment of these two organisations to invest in the solar dryers is commendable. Webber (2008) affirms that chances of success are higher if the leaders of a value chain are willing to invest time and financial resources in upgrading farmers' knowledge and skills. Women IP members stand to benefit more from the solar drying than their male counterparts. This is because the process is quite engaging: slicing the pineapples, arranging the slices in the solar dryer and paying attention to hygiene. Women farmers have been found to enjoy these processes more than the men. They therefore have the opportunity to acquire an additional skill of solar drying, packaging and handling the dried pineapple.

3.4 Analysing costs and margins of the pineapple farmers

The costs and margins of the farmers are calculated using the survey data. The costs considered consist of investments made by the farmers to grow crops in that season. These include the cost of manure, mulch and pesticide for the farmers still using conventional practices. These costs are estimated in U.shs. The labour input is estimated in person days for both the total labour input of the crop enterprises and that of the pineapple enterprise. Other values obtained include total land area under crops, land area under pineapples in acres, total crop revenue and revenue from selling fresh pineapples (Table III).

3.4.1 Analysing the costs. The major costs of production are constituted by the cost of applying manure and mulch to the farms. Farmers in Ntungamo district in general keep animals including cattle, goats and chicken. Animal manure is therefore easily accessible, but labour may have to be hired to gather and apply it in the farms, as well as gather and apply mulch. Farmers on average do not use chemicals and hence the minimal average costs on pesticides for the farmers in Rubare and Itojo conventional farmers. Otherwise, the total cost of production per acre is highest with the certified organic farmers at U.shs187,061/= per acre of pineapple. This is to be expected since organic certification would require a more intensive use of these materials and on the entire farm than in conventional agriculture. Besides, the proportion of total land under pineapples is also the highest with the certified organic farmers, which explains the concentration of effort on these materials. However, the average acreage under pineapples is small at 1.8 acres for the certified farm compared with 4.4 acres of the conventional farms in Itojo. This is because the process of certification and monitoring to maintain the standard is quite tedious and costly. The organic certification standard is required to be maintained on the whole farm and not just the pineapples. Therefore, NOGAMU has so far only been able to certify a few farmers, with smaller acreages to start with.

The total crop labour input is also highest with the certified organic farmers as well as the total labour input on pineapples. These organic farmers are putting in a lot of labour effort in pineapple growing since they have been certified and are targeting an identified market for the pineapples. The proportion of their pineapple labour input to total crop labour input is however the least when compared with the other farmers because their labour input is not only concentrated on pineapples, but spread across the entire farm in an effort to achieve and maintain the overall organic standards.

Variable	Location: Rubare ($n=19$)	Itojo (cert.org, $n=28$)	Itojo (conventional, $n=50$)
Land (acres)			
Av. total household land	6.5	3.5	13.98
Av. acreage under pineapple (A_p)	1.73	1.8	4.42
Proportion under pineapple (%)	26.62	51.43	31.62
Costs (U.shs)			
Cost of manure (C_{man})	141,875	190,071.40	244,560
Cost of mulch (C_{mul})	216,315	464,642.90	618,400
Pesticide (C_p)	2,000	0	5,750
Total costs (*TPC*)	360,190	654,714.30	868,710
Av. total cost per acre (*APC*)	55,413.85	187,061.23	62,139.48
Labour (person days)			
Av. Crop labour input (*ACL*)	80.63	975.2	91.7
Av. Pineapple labour input (*ALP*)	47.52	63.78	46.14
Proportion of crop labour (%)	58.94	6.54	50.32
Revenue (U.shs)			
Av. crop revenue (*ACR*),	511,394	858,691.10	1,188,047
Av. pineapple revenue (*APR*)	15,000	248,162.50	529,997
Av. pineapple revenue per acre	8,670.52	137,868.06	119,908.82
Proportion of total crop revenue	2.93	28.90	44.61
Other household income	388,421	471,428	260,360
Total household income	1,092,395	1,382,941	1,612,327
Pineapple proportion of total income (%)	1.37	17.94	32.87
Margins (U.shs)			
Av. Gross margins (AGM_1)	151,204	203,976.80	319,337
Av. Gross margins per pineapple acre (AGM_2)	87,401.16	113,320.44	72,248.19

Table III.
Costs and margins of the pineapple farmers

Notes: Av, average; U.shs, Uganda shillings
Source: Author calculations from survey data (2014)

3.4.2 Analysing revenues and margins. The certified organic farmers received on average higher revenue of U.shs137,868.06 per acre of pineapples than their other two counterparts who received U.shs 8,670/= and U.shs 119,908/= in Rubare and Itojo (conventional), respectively. Representing 28.9 per cent of their total crop revenue, this revenue reflects the extra effort the OP farmers put into the soil conservation measures of mulching and applying manure. The same farmers also achieved higher household income from other activities. Although other income may arise from non-farm activities, it is possible that the certified farmers are also benefiting from producing apple bananas, another commodity that has been targeted by the organic exporters in addition to OP.

Gross margins are obtained by subtracting the total production costs from the total crop revenue. Gross margins per pineapple acre are obtained by dividing the total gross margins by the pineapple acreage. Although average gross margins are highest for the conventional farmers (U.shs. 319,337, perhaps because of their relatively larger acreages, the average gross margins per pineapple acre are highest for the certified organic farmers (U.shs 113,320). Therefore, on average, it pays a certified organic farmer to produce pineapples more than a conventional farmer. Besides, in spite of the extra labour effort required, a certified organic farmer, once established, has the opportunity to produce other organic products on the same farm, and for the same markets. These calculations have been made on the basis of the

farmers selling fresh products. Yet the arrangement with the exporter, JFL is for the supply of both the fresh and dried product whenever they are able to dry the products. Supermarkets in particular have shown more interest in the dried products.

The certified organic farmers therefore stand to have an edge over the rest of the farmers once these arrangements are established and stabilized. There is opportunity to increase the efficiency of the value chain especially by the increased revenue that will accrue to the farmers with dried pineapple. The cost of production is not likely to reduce due to the intensive labour requirement of organic farming although some practices such as mulching, and the use of cover crops have the ability to reduce the cost of weeding. However, the premiums offered on the organic products, pineapple and others produced by the same farms with nearly the same costs, are likely to improve the incomes of the participating farmers.

4. Conclusion and policy recommendations

The value chain analysis of the OP in Ntungamo shows how MSPs in value chain development help support farmers to improve production, processing and marketing activities. Further, certified organic producers are found to have higher average gross margins per pineapple acre, hence higher income than conventional producers in the same area where the MSP is active. The careful selection of stakeholders to participate in the value chain provides a range of critical support services that enhance the role of the farmers in the value chain. Through MSPs, the OP value chain presents opportunities for farmers to upgrade the farming practices, product quality through drying the pineapple, and skills to package the products. The value chain then presents the opportunity to increase the margins of the participating farmers above other farmers using conventional farming. This opportunity is three-fold – through the sale of fresh OP to an export market and dried pineapple to local supermarkets, regional and export markets, and the sale of other organic products produced with the same resources on the certified organic farms, to the same markets. This study recommends government effort to support and promote MSPs in value chain development of agricultural commodities in Uganda. In particular, a conducive regulatory environment where private value chain actors can complement public actors to support farmers along the value chain will be worthwhile in improving farm incomes.

Glossary

AGINSBA	Agriculture Innovation System Brokerage
AHI/ICRAF	Africa Highland Initiative/World Agroforestry Centre
BSU	Bishop Stuart University
DAO	District Agricultural Officer
DRC	Democratic Republic of Congo
FARA	Forum for Agricultural Research in Africa
FON	Fruits of the Nile
IAR4D	Integrated Agricultural Research for Development
ICS	Internal Control System
IP(s)	Innovation Platform(s)
JFL	Jakana Foods Ltd

KAZARDI	Kabale Zonal Agricultural Research and Development Institute
KDLG	Kabale District Local Government
LKPLS	Lake Kivu Pilot Learning Site
MBAZARDI	Mbarara Zonal Agricultural Research and Development Institute
MSP	Multi-Stakeholder Partnership
MUK	Makerere University Kampala
NAADS	National Agricultural Advisory Services
NDLG	Ntungamo District Local Government
NOGAMU	National Organic Agriculture Movement in Uganda
NOPIP	Ntungamo Organic Pineapple Innovation Platform
OP	Organic Pineapple
SSA CP	Sub-Sahara African Challenge Programme
UN	United Nations

Note

1. Ntungamo District has 21 sub-counties in total: 18 sub-counties and 3 town councils.

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