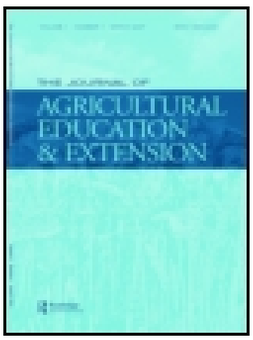

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Strengthening collective action to improve marketing performance: evidence from farmer groups in Central Africa

Justus Ochieng [a], Beatrice Knerr [b], George Owuor [c] and Emily Ouma [d]

[a]World Vegetable Center, Eastern and Southern Africa, Arusha, Tanzania; [b]Department of Development Economics, Migration and Agricultural Policy, University of Kassel, Witzenhausen, Germany; [c]Department of Agricultural Economics and Business Management, Egerton University, Njoro, Kenya; [d]International Livestock Research Institute (ILRI), Bioversity International, Kampala, Uganda

ABSTRACT

Purpose: Several development organisations have implemented programs to enhance smallholder farmers' crop productivity and market access through collective action with mixed results. Therefore, this study examines the drivers of success of collective action initiatives as a pathway to improving farmers marketing performance using data from Rwanda and the Democratic Republic of Congo.

Design/methodology/approach: This study uses primary data collected from 30 farmer groups through focus group discussions. These groups are assessed for differences in their marketing performance using descriptive and cluster analysis techniques.

Findings: Most of the group members are poor (67%) and few are considered as rich (2%) or middle class (28%), while the rest are destitute. The destitute community members are often excluded from the groups due to their own passivity and inability to contribute financial resources for joint activities. Mature farmer groups with strong internal structures and greater participation in product bulking as well as formally organised groups with stable external links significantly have higher marketing performance.

Practical implications: We recommend that for farmers to maximise the benefits of collective action, supportive policies are necessary to encourage the formation of groups and transform existing ones into business entities to access high-value markets and perhaps even export markets. Farmer groups need to intensify their market research to access ready and stable markets such as supermarkets and institutions with larger volumetric requirements.

Theoretical implications: The study shows that collective action is important for smallholder farmers in developing countries to sustainably access markets and increase their marketing performance.

Originality/Value: Few studies have examined how social capital and collective action are utilised to improve smallholder farmers marketing performance, particularly in Central Africa.

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CONTACT Justus Ochieng Justus.ochieng@worldveg.org World Vegetable Center, Eastern and Southern Africa, P.O. Box 10, Duluti, Arusha, Tanzania

1. Introduction

Despite increased global food supply since the 1990s, food security remains a major challenge in many low-income countries (LICs) especially in sub-Saharan Africa. Food insecurity at the national level is aggravated by insufficient food production to feed growing populations, and high food price volatility in the global market that stifles food importation to meet the shortfalls. Majority of the populations of these countries reside in rural areas, practise subsistence agricultural production and are the most food insecure. The problem is also widespread in post-conflict countries such as Rwanda and The Democratic Republic of Congo (DRC) where 90% and 78% of the rural households are subsistence farmers, respectively (Ouma, Birachi, and Pypers 2012). Many international aid organisations and policy-makers have lauded collective action as a strategy to organise production and marketing activities particularly in the small farm sector to boost food production and avert food insecurity among rural households in LICs. It is institutionalised in the form of farmer organisations[1] such as farmer cooperatives and farmer groups that are recognised as major stakeholders in the agricultural policy formulation and implementation (Heemskerk and Wennink 2006). In spite of the efforts to enhance operations of such organisations, smallholder production and commercialisation remains low and the effectiveness of such interventions, which are somewhat arbitrary, is not clear in terms of marketing performance. Due to market failures such interventions seek to address remain largely unresolved (Francesconi and Wouterse 2015).

Given the market imperfections in many LICs, farmer organisations have been instrumental in addressing the challenges of smallholder access to input and output markets (Markelova et al. 2009). Smallholders' main strategy in this context is to pool their resources to jointly carry out profitable agri-value chain activities that would otherwise not be possible if done individually due to high risks, transaction costs and limited economies of scale (Markelova et al. 2009). However, smallholders rarely self-organise in a formal way and many never grow into formal business entities due to limited leadership skills and weak organisational capacity, and severe resource constraints to sustain adequate performance. Organisation and activities of many of the farmer groups are often externally driven by development project roll-outs so that the group activities fade away at the end of the projects (Ochieng, Veettil, and Qaim 2017). As argued by Ostrom (2000), self-organised farmer organisations tend to work more sustainably than externally initiated ones as they tend to establish and adhere to clearer rules, and build on stronger mutual trust and closer cooperation among members.

Farmer organisations are therefore foundations of rural economic growth and development by expanding market access. Market access facilitates greater production and market opportunity for surplus produce thereby acting as a source of household food and nutrition security, employment and household income (Dorward et al. 2004). Although small-scale production has some competitive advantages over large-scale production emanating from lower production costs and greater flexibility of family labour, smallholders are less competitive in the markets for high-value cash crops and processed food items since they face higher per unit transaction costs and enjoy less economies of scale (Poulton, Dorward, and Kydd 2005). Collective action can counterbalance these disadvantages and facilitate linking farmers to customers in regions where markets are pervasively imperfect and weak. Furthermore, farmer groups help smallholders to integrate into the expanding

global food supply chains that require greater volumes and to fetch higher prices for their products (Markelova et al. 2009). The groups are also cost-effective and key in the dissemination and diffusion of agricultural innovations.

More than 80% of the population in the rural areas in both countries practise smallholder agriculture and farm less than one acre of land. Bananas and legumes are the major staple crops which are cultivated by 80–96% of the rural population in different regions in Rwanda (Ansoms and McKay 2010) and more than 80% in the DRC (Ouma, Birachi, and Pypers 2012). Farmers producing bananas and legumes have organised themselves into groups to benefit from collective action initiatives supported by development agencies and governments. It is important to understand the operations and challenges of the farmer organisations in order to improve their efficiency and effectiveness in meeting targets. Many studies have analysed the impacts of farmer organisations on different aspects of smallholder farmers' welfare, adoption of technologies and market access (e.g. Kaganzi et al. 2009; Markelova et al. 2009; Fischer and Qaim 2012). Surprisingly, studies on the performance of the organisations and its dynamics are scarce. Farmer organisation structures are complex and evaluation of their performance is highly context-specific, aspects that have not been sufficiently understood as a basis to inform policy. The social capital developed by these groups can also mobilise productive resources among poor communities (Ouma, Birachi, and Pypers 2012). We consider social capital as 'the property of individuals', but only by virtue of their membership in a group as defined by Szreter and Woolcock (2004). It consists of a network with shared norms, values and understandings that facilitate cooperation and cohesion within or among the groups (Coulter et al. 1999; Fabusoro and Sodiya 2011). Gouët and Van Paassen (2012) found that peer-to-peer relationships among smallholder marketing cooperatives are crucial to overcome the internal and external social dilemmas they are bound to face while improving smallholders' market access. Still, only a few studies have examined how this social capital and cooperative spirit are utilised to improve marketing performance particularly in Central Africa.

Against this background, we employ different analytical approaches to examine the drivers of marketing performance of farmer organisations. The results could inform policy to improve operations and market performance of the organisations and by extension, increase smallholder access to markets. The rest of the paper is organised as follows. Section 2 presents the concept of collective action as an instrument for promoting agricultural development. The research method is explained in Section 3, while Section 4 provides background information about CIALCA and profiles of the farmer groups. Section 5 analyses the drivers of farmer groups marketing performance, while Section 6 summarises and concludes.

2. The concept of collective action as an instrument for promoting agricultural development

Collective action emerged as an alternative approach to addressing failures of many rural development programs in the 1960s and 1970s. The development paradigms of this period assumed that communities would deliberately engage in collective activities, but paid little attention to understanding the conditions under which this approach would be successful and how these actions might be sustained in the long run (Meinzen-Dick, DiGregorio, and

McCarthy 2004). At the time, several definitions of collective action existed, with that of Marshall (1998) eventually emerging as the most acceptable: 'action taken by a group (either directly or on its behalf by an organisation) in pursuit of members' shared interests'. Development organisations, non-governmental organisations (NGOs) and government extension services emphasise that smallholders should cooperate in groups to fully benefit from development projects or programs. The formation of farmer groups has been particularly promoted for marketing and processing activities to harness economies of scale and reduced transaction costs in collective marketing, acquisition of equipment, access to training and information (extension) services. Today, farmer organisations are still promoted as a means to resolving different rural development challenges. This paper suggests ways to utilise the organisations better to address rural development challenges, particularly poverty and food insecurity.

A review of previous research points to the need for more studies to fully understand the heterogeneity of the organisations and leadership gaps that should be addressed (Salifu, Francesconi, and Kolavalli 2010). Collective action literature identifies various factors and conditions that influence the success of such collective initiatives including group size, clarity of boundary definitions, shared norms, past experiences, appropriate leadership, interdependence among the group members, heterogeneity of endowments, homogeneity of identities and general concerns and levels of poverty (Arrow, McGrath, and Berdahl 2000; Barham and Chitemi 2009; Kaganzi et al. 2009; Shiferaw et al. 2009; Fabusoro and Sodiya 2011). Social capital influences the success of collective action and helps in solving development problems (Pretty and Ward 2001). However, poor management practices and ethics by group leaders (especially when duties are performed without accountability and transparency) and misuse of authority and finances lead to mistrust and the eventual failure of farmer groups (Shiferaw et al. 2009). Kaganzi et al. (2009) showed that with strong internal leadership, farmer groups in Uganda considerably improved their market situation and provided high-quality services to group members. Existing social capital and collective action literature are important in explaining how certain group characteristics determine group marketing performance and are particularly useful in the context of this study since the impact of production and marketing technologies promoted by CIALCA through collective action initiatives varies significantly among farmer groups. To make further progress, it is essential to know the reasons for heterogeneous impacts.

We contribute new insights to this debate by focusing on smallholders in Central Africa. Based on Arrow, McGrath, and Berdahl's (2000) results, we hypothesise that (1) distance to the market significantly contributes to group marketing performance; (2) that mature groups and those with more functional activities and have contracts and those with more wealthy members are more likely to improve their marketing performance; (3) the intensity of members participation in group activities increases with the number of members – in turn, group marketing performance improves with maturity due to longer market experience (Barham and Chitemi 2009); (4) that groups with larger land areas attain higher banana and legume yields and sales exhibiting better marketing performance; (5) farmer groups with closer ties to external organisations (other value chain actors) are able to improve their marketing performance than those with weaker ties and; (6) groups that adopt market orientation strategies are able to significantly increase their marketing performance.

3. Methodology

3.1. The study site

The study was conducted in the CIALCA project action sites in Rwanda and the DRC. Action sites are geographical zones covering one or a few groups of communities of between 500 and 5000 households. CIALCA operates directly in action sites in collaboration with National Agricultural Research Institutes to develop, evaluate and promote agricultural technologies through participatory on-farm experiments. There are also Satellite sites where CIALCA's partners operate and the technologies are upscaled by them. The action sites covered in this study were Kabare and Walungu Territories in South Kivu, DRC, and Kirehe, Gatsibo (Umutara), Kayonza, Ngoma and Bugesera in the Eastern province of Rwanda. These sites neighbour each other and are similar in terms of farming practices, ethnic composition and culture (Ochieng et al. 2016). At the time of the survey, CIALCA was working with 60 farmer groups in Rwanda, Burundi and DRC to improve farmers' marketing performance. However, groups in Burundi were excluded from the study because limited market interventions had been initiated at the time. Only 30 groups were selected from the list provided by CIALCA, 9 from the Eastern province in Rwanda and 21 from South Kivu of DRC (for the locations, see Figure 1). The groups had participated in the product transformation and market access improvement component of the project, and their members had received training on market orientation strategies. Primary data were collected in March–April 2012 from the farmer groups through focus group discussions (FGDs)

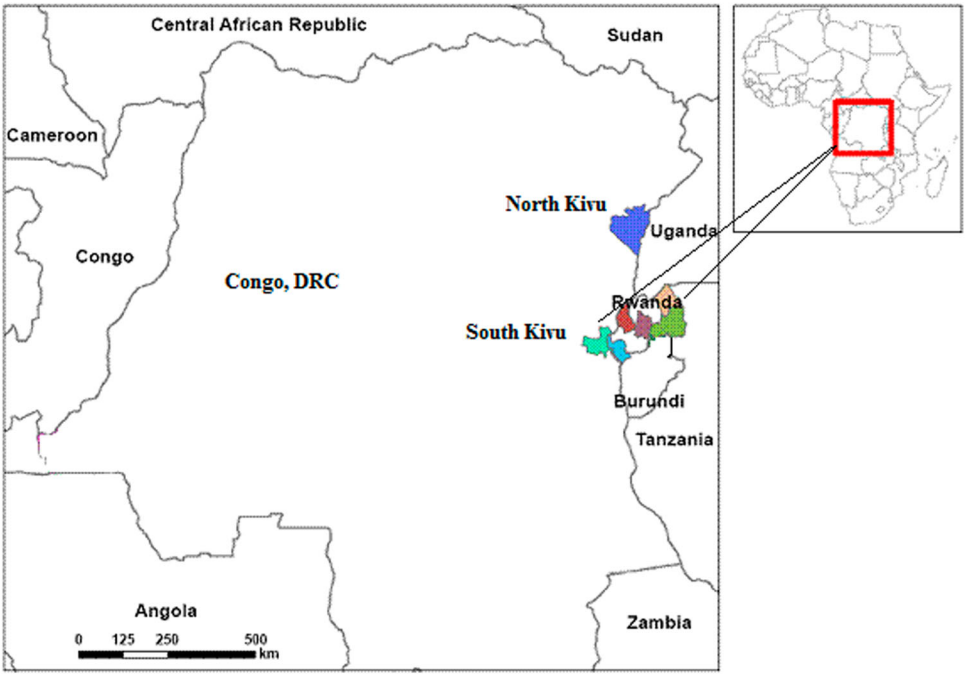

Figure 1. Study sites in Rwanda and Eastern DRC. Source: Adapted from Ouma, Birachi, and Pypers (2012).

that took approximately two hours. Each FGD comprised about six to eight farmer organisation members who ordinarily oversee operations: the president, vice president, treasurer, secretary, group advisor and members' representative. We prepared a checklist of questions to guide the discussions that covered different subject domains including profile of farmer groups (membership, leadership and wealth categories of members), characteristics of the villages, types of crops grown and quantity produced and sold to the market, use of CIALCA market orientation strategies, and challenges face by the group and farmers themselves. We also conducted seven key informant interviews with representatives of NGOs and government extension services and collected reliable and relevant information on how collective action can be utilised to improve farmers' livelihoods through probing and iteration.

3.2. Analytical approach and data

The study used cluster analysis to identify homogenous groups with similar characteristics using performance variables: sales volumes, the share of members participating in collective marketing and contract farming. We then compared the identified groups by an independent *t*-test to clarify whether the groups are conceptually distinguishable. This method has been advocated by Punj and Stewart (1983) for marketing research and has since been applied by other researchers, e.g. Petrovici and Gorton (2005) and Jansen et al. (2006) for quantitative analysis of livelihood strategies. Some studies have pointed out that a cluster analysis should be performed after conducting a factor analysis to avoid problems of multicollinearity that usually distort the cluster analysis (Hair et al. 2006). However, this factor-cluster approach has been criticised especially in marketing research on the ground that interpretations based on derived factors are questionable and do not give unequivocal results (Dolnicar and Grun 2008). Because of this argument and the small sample size of 30 farmer groups, we adopted cluster analysis[2] as an exploratory technique for providing rough guidance for policy decision-making. This made it possible to perform the analysis with directly measured field data using Statistical Package for the Social Sciences (SPSS) software version 12.

We used a two-step clustering procedure because our variables are both metric and nominal, and such a procedure can handle mixed variable problems (Chiu et al. 2001). Barham and Chitemi (2009) examined the extent to which various group characteristics influence certain marketing outcomes by subjectively measuring marketing performance using Likert scales. The main strength of our study is measuring marketing performance objectively. Homogenous groups were derived based on marketing performance indicators: volume of sales, proportion of members participating in collective marketing and extent of contract farming. Gender and wealth indicators were used to capture group heterogeneity and were identified as possible determinants of marketing performance since they have been found to affect the farmer groups' performance. We measure gender and wealth heterogeneity by calculating Herfindahl–Hirschman Index (HHI) which provides a better understanding of the degree of diversity in farmer groups. Gender heterogeneity (*HHI_gender*) is calculated by squaring the percentage of females and males in the group and then summing the resulting numbers. Specifically, $HHI\_gender = (female\_ratio^2 + male\_ratio^2)$. Wealth heterogeneity (*HHI_wealth*) is also calculated by squaring the percentage of group members in each of the four wealth categories: rich,

middle class, poor and destitute, and then summing the results. Specifically, $HHI\_wealth = (Rich\_ratio^2 + Middleclass\_ratio + Poor\_ratio^2 + Destitute\_ratio^2)$. The minimum value of HHI is 0, which means that the group is very heterogeneous, and a maximum of 1 meaning that the group is very homogeneous.

We classified wealth profiles of group members based on farmers' own perceptions about group characteristics, which became known during intense FGDs. However, heterogeneity of wealth is not necessarily associated with group performance but can lead to a multiplicity of outcomes that can hardly be predicted in the absence of knowledge about members' behaviour, interests or preferences (Varughese and Ostrom 2001).[3] Differences in interests or preferences among members do pose challenges for groups especially with regard to overcoming incentives to free ride and shirk. The methodology we used to discover wealth profiles was based on the participatory poverty assessment which classifies poverty profiles of the Rwandan population based on perceptions offered by the interviewees (ROR 2001). According to this methodology, the information should be collected in a participatory manner through interviews or discussions with all the categories of the population in a given region.

Farmer groups sold bananas and legumes (beans, groundnuts and soya bean) bulked from individual farmers as well as those produced from group owned land. Given that not all the group members participate in collective marketing; the share of those contributing to the bulking of produce is a good indicator of the marketing outcomes of groups. Contract farming is a means to manage marketing risks and uncertainty and, therefore, measuring the extent to which members participate in contract farming is a useful market performance indicator. Market access variables were measured in terms of distance to the nearest market which is the distance from the group's meeting place to the nearest market location. External linkages captured the number of service providers or value chain actors working with the group at the time of our survey. Service providers offer assistance by training groups in new agricultural technologies, business and marketing skills, and by linking them to market value chain actors – with the assumption that farmer groups will eventually undertake collective action initiatives. Farmer group composition variables included group size measured by the total number of members and leadership by sex which looked at the ratio between male and female elected leaders. Leadership by sex is the ratio of male to female elected leaders, such that interval scores with 0 = all female leaders, 0.5 = balanced leadership, <0.5 = a majority of female leaders and >0.5 = a majority of male leaders. In addition, group age was measured in years, land size in hectares and activity level was estimated by the number of activities in which the farmer group was involved at the time of survey.

4. Background information about CIALCA program and profile of the farmer groups

4.1. The CIALCA program

The empirical research was conducted in the framework of the CIALCA project in the Great Lakes Region in Central Africa. CIALCA is a joint activity by three International Agricultural Research Centres: Biodiversity International, the International Institute on Tropical Agriculture (IITA) and International Center for Tropical Agriculture (CIAT).

The program collaborated with National Agricultural Research Systems (NARS) and with other development partners in Rwanda, Burundi and South Kivu in the DRC. The projects mission is to improve agriculture-based livelihoods through enhancing income, health and the natural resource base of smallholder farmers in Central Africa. These countries face the challenge of recovering from political strife and civil wars which left households in poverty and facing food security challenges. For instance, in Rwanda, 28% of the rural population is food insecure, while 24% and 25% are highly and moderately vulnerable to food insecurity, respectively (WFP 2009). In the DRC, about 75% are food insecure (AfDB 2013).

The CIALCA program began in 2006 and ended in 2012. It developed and disseminated more than 30 innovative technologies including improved legume/banana plantain varieties, improved crop management practices, improved market orientation strategies (via collective marketing, implementation of business plans and product transformation) and participatory market research aimed at increasing smallholders' marketing potential. The study focuses on the improvement of smallholders' market position in the action and satellite sites where CIALCA operated together with NARS to develop, evaluate, promote and disseminate new technologies through on-farm experiments and participatory research approaches. Through capacity-building efforts, the project disseminated market orientation strategies: collective marketing, group business plans, product transformation and participatory market research to improve farmers' market position. In this framework, farmer groups undertook activities such as group training to improve their production and marketing skills; enhance their access to extension services; support timely collective marketing procedures and immediate cash payments; facilitate a collectively negotiated product price; and allow for access to financial services that could improve their market access and yields.

4.2. Profiles of farmer groups

CIALCA adopted two approaches for improving the livelihoods of smallholders: a 'production-oriented' path and a 'market-oriented' path. The production-oriented path strives to reduce production costs through delivery if affordable farm inputs such as improved legume seeds and germ plasm and fertilisers. The market-oriented path focuses on enhancing competitiveness through product differentiation and the development of smallholder niche markets; emphasis is placed on consumer preference so that production is shaped by the market. Furthermore, it aims at facilitating farmer groups' self-reliance and enhancing organisational and management skills to equip them with the capacity to forge effective business interactions with the private sector (Bingen, Serrano, and Howard 2003). CIALCA has promoted interventions in form of 'market orientation strategies' through farmer groups. These include business plans, collective marketing, product transformation and participatory market research promoted to improve farmers' bargaining power and strengthen their business and entrepreneurial skills, with the overriding objective to empower farmers to *produce for markets* rather than *to produce and afterwards look for the markets*. Those who successfully adopt market-oriented strategies are able to integrate into market chains, connect to actors and acquire business and marketing skills (Wheatley 2001), which significantly contribute to their market performance and household income.

Table 1. Profile of sampled farmer groups in Rwanda and the DRC.

Variables	DRC	Rwanda	Overall
Pre-existing groups (%)	90.5 (6.6)	77.8 (14.7)	86.7 (6.3)
Group level (%)			
Village	90.5 (6.6)	33.3 (16.7)	73.3 (8.2)
District	9.5 (6.6)	66.7 (16.7)	26.7 (8.2)
General assembly meetings (%)			
Weekly	23.8 (9.5)	0.0	16.7 (6.9)
Monthly	52 (11.2)	0.0	36.7 (8.9)
Every two months	14 (37.8)	0.0	10 (5.6)
Every three months	9.5 (6.6)	0.0	6.7 (4.6)
Every six months	0.0	100	30 (8.5)
Election of leaders (%)			
Every two years	9.5 (6.6)	11 (11.1)	10 (5.6)
Every three years	80.9 (8.8)	88.9 (11.1)	83.3 (6.9)
Every five years	9.5 (6.6)	0.0	6.7 (4.6)
Group age (years the group has existed)	10.6 (0.7)	12.0 (2.3)	11.0 (0.8)
Average group size (number)	34 (5.9)	135 (46.3)	64 (16.4)
Male members	13 (2.5)	74 (26.1)	31 (9.3)
Female members	21 (7.3)	61 (20.6)	33 (7.3)
Number of registered groups (number)	5	7	12
Number of groups (*n*)	21	9	30

Note: Standard errors in parenthesis.
Source: Authors' results.

The size, composition and organisational characteristics of farmer groups, broken down by country of location are presented in Table 1. The project worked mainly with pre-existing farmer groups; only 13% were established during the project's inception year 2005/2006. The pre-existing groups had been formed by farmers who had joined on their own initiative in order to benefit from economies of scale and to access services offered by various institutions that aim at improving crop productivity and enhancing livelihoods. About 73% of the farmer groups operate at the village level, and many participants are neighbours and relatives living in close proximity to each other; the remainder are run at the district level and must seek membership from highly dispersed farm households. At the time of the survey, the groups had existed for 11 years on average while the project had been ongoing for 5 years. The groups had an average membership of 64 persons, with the majority of groups in Rwanda being larger on average than those in the DRC. On average, about 74 males were involved in group activities in Rwanda and 13 in the DRC. This could be attributed to the Rwandan government's policy launched in 2005 to promote registration of farmer groups and cooperatives as a way of increasing rural development. In the investment projects associated with the policy, more men than women took part because they had control over land rights, the ability to access credit and to shoulder group monthly fees.

In the DRC, half of the farmer groups had their general assembly meeting (i.e. a gathering of all group members to discuss the issues affecting them and the achievement of their set goals) monthly, while the remainder had these meetings weekly, every two months or every three months. In Rwanda, all groups held meetings biannually as stipulated by the regulations of the Rwanda Cooperative Agency (RCA). In the DRC, legal provisions did not govern the operations of farmer groups or cooperatives, allowing them to operate autonomously under their own bylaws. In DRC, only the NGOs empower, strengthen and encourage farmer groups to operate as business entities in their production and sales. However, the policy environment in the DRC does not favour the formation of

institutions of collective action that seek to address the challenges of imperfect markets. In Rwanda, in contrast, RCA registers all farmer groups and cooperatives. Farmer groups must have a minimum amount of capital and members in order to be registered. Services provided by farmer groups are critical for improving production and market performance of the farmer groups (see Table 2). Hence, such membership thresholds encourage increased participation that would help to improve the availability of services to a greater number of farmers.

In many cases, farmer groups help to resolve or at least reduce problems associated with market imperfections such as high transaction costs, asymmetric information and externalities associated with non-excludability. The group functions essentially are classified as economic, social, policy advocacy, exchange of information and capacity building (Biénabe and Sautier 2005). Economic functions comprise production, processing and marketing of goods and services and management of inputs like water, land, labour and agricultural equipment. Most farmer groups (over 80%) integrated provision of financial services (mainly credit and savings) into their collective activities which made members more resilient to financial risks. Social activities such as cultural events are used to foster education, training, healthcare, supply of drinking water and mutual support to benefit members and the local community. Policy advocacy entails representation of the group and defends their interests and, when needed, advocacy at local and national levels. Thorp, Stewart, and Heyer (2005) broadly classify the aforementioned group functions as one of the following: 'market failure or efficiency functions', 'claim functions' or 'pro bono functions' which are all covered in Table 2. Claim functions focus on advancing the claims of members; for example, lobbying for favourable policies on behalf of smallholders and 40% of the groups participated in policy advocacy. Pro bono functions are those which extend benefits to the greater society; for example, in the DRC, group members mentioned that they maintained roads and schools because of the failure by the government to adequately provide these services. The FGD participants overwhelmingly mentioned that they are forced to perform community activities to respond to the challenges such as lack of markets or buyers, lack of production and business skills, lack of cash to purchase inputs, exploitation by brokers and poor road network system.

Furthermore, farmer groups in this region delegate some members to collect information about production technologies and market-related factors which are then disseminated among members by way of extension visits and demonstration sessions organised by development partners including CIALCA. This knowledge can be obtained by individuals at the group level or by sending group representatives for further training elsewhere.

Table 2. Services provided by the farmer groups in Rwanda and the DRC.

Services offered to members	DRC (%)	Rwanda (%)	Overall (%)
Marketing services (collective marketing)	100	78	93
Financial services (savings and credit)	91	78	87
Technology services (training and extension)	95	67	87
Policy lobbying/advocacy	29	67	40
Joint input purchase	95	56	83
Processing (banana beer, soya milk)	62	56	60
Collective production activities (labour)	100	89	97
Contract farming	14	56	27
Number of groups (*n*)	21	9	30

Source: Authors' results.

Despite the many advantages of farmer groups discussed above, Kaganzi et al. (2009) found that collective action in Uganda had failed to increase farmers' net profits due to overwhelming transaction costs and time demands and that some individually managed sales sometimes emerged as the most profitable option.

4.2.1. Group leadership

High-quality leadership is essential for an effective coordination of the group activities and for positive production and marketing outcomes. In 80% of the cases, group leaders were elected every three years, while 10% and 6.7% of groups held elections every two and five years, respectively (Table 1). Well-educated leaders are assumed to have good management skills that make them learn fast from training provided by CIALCA and other NGOs. However, it was evident that well-educated candidates seem to shy away from group activities and rather prefer to look for formal employment. All group presidents in the study had been educated up to only a primary or secondary level (Table 3).

The few with post-secondary education were either retired civil servants or teachers who engaged in farming as a secondary source of income. Chirwa et al. (2005) claim that when members lack basic literacy, business skills and experience, leaders tend to become unaccountable to the members and more likely to misuse resources. This shows that it is essential for group leaders to gain the trust of members in order to facilitate rapid decision-making on production and marketing issues as well as to possess entrepreneurial skills. For this to happen, farmers too need to receive training in order to hold the leaders accountable. Gouët and Van Paassen (2012) also reported that leadership is important for the success of smallholder cooperatives and participation of members is a key characteristic needed for proper functioning of these cooperatives. Leadership positions in the study were dominated by males; only treasurer positions were more frequently held by women (87%) as female leaders were seen as more trustworthy with group finances than their male counterparts. The leaders' average age was slightly above 40 years; group advisors heading the advisory committee were usually 50 years or more (Table 3). During the FGD, group leaders mentioned lack of commitment and trust among some group members, lack of regular participation in group meetings, inability of some members to pay monthly fees and credit unworthiness as major challenges they faced.

4.2.2. Wealth categories within farmer groups

Four wealth categories – rich, middle class, poor and destitute – were identified within the farmer groups (Table 4). The rich (1.7% of all members) are well endowed with technical

Table 3. General farmers group leadership structure.

Group positions	President	Vice President	Secretary	Treasurer	Advisor
Education (%)					
Post-secondary	0.00	6.90	3.30	6.70	0.00
Secondary	66.7	44.8	66.7	30.0	22.7
Primary	33.3	37.9	30.0	33.3	63.6
No Education	0.00	10.3	0.00	30.0	13.6
Mean age (years)	46.6	44.7	43.7	41.9	50.0
Gender (%)					
Male	83.3	58.6	80.0	13.3	54.5
Female	16.7	41.4	20.0	86.7	45.5

Source: Authors' results.

Table 4. Wealth category profiles.

Wealth categories	Characteristics
Rich 1.7% ($n = 47$)	• Land holding larger than 3 hectares • Capable of paying school fees up to university • Keep more than 30 cattle units • Permanent brick or stone house • Work as entrepreneurs running a business • Food secure throughout the year • Capable of paying medical bills/insurance • Own a car
Middle class 28.6% ($n = 772$)	• Land ownership between 1 and 3 hectares • Keeping mainly local livestock and small ruminants • Having a semi-permanent house (rough cast or wooden walled) • Food secure throughout the year • Able to pay school fees up to university • Own a motorcycle • Able to pay medical bills or insurance fees
Poor 66.5% ($n = 1798$)	• Land holding less than 0.5 hectares • Own only small ruminants and chicken • Able to educate children up to primary and, in rare cases, secondary level normally with external support • Hire out their labour to other farms • Unable to pay health insurance/medical bills for the whole household • Not food secure throughout the year • Wooden house/mud-walled small house
Destitute 3.2% ($n = 87$)	• Grass-roofed house or miniscule house in poor condition • Usually landless or holding only land given by the community (squatters in some cases) • Hire out their labour to other farms • Do not own livestock, but may keep animals donated by others • No capacity to educate children beyond primary level

Source: Authors' results.

skills and education, and they have access to alternative sources of income, particularly from non-agricultural sectors. Since the rich may have less incentive to join farmer groups, they are generally reluctant to join, and the groups remain dominated by middle class, poor and destitute members. The rich have accumulated assets such as land, permanent houses, cars, motorcycles and businesses; they have the ability to educate their children to higher levels and to pay medical bills throughout the year. They are considered food secure because at all times they have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs, and preferences for an active and healthy life (FAO 2012).

Majority of the group members were poor (66.5%) and often lacked access to markets, networks, rights and assets, and depended on external interventions, all of which are components of successful collective action. Collective action initiatives can help farmers to escape from extreme poverty; however, the poor are less likely to have successful groups. Moreover, 'the poorest of the poor', the destitute or lower-caste groups as referred in South Asia, are typically excluded from successful groups and not elected into the executive committee of the groups (Thorp, Stewart, and Heyer 2005). Few destitute members (3.2%) belonged to groups since it is difficult for them to bear monthly contributions. The more efficient and successful farmer groups often excluded the poorest of the poor by setting admittance requirements that they could not fulfil. This reflects the sentiments of one of the male participants that the 'destitute often work for people throughout the year, own grass thatched house in poor condition and food insecure all year round'.

Landlessness was often used as an exclusion criterion and generally barred the destitute from participating in successful groups. The participants in addition pointed out that the landless who are members often access land through collective action by participating in crop production activities in the group-owned land. This means that collective action helps the destitute to gain access land due to the social networking and interaction with other members. This is supported by findings from Ethiopia that the poorest of the poor tend to be excluded from cooperative membership and that they do have a chance to benefit from positive spillovers from the cooperatives in their regions (Bernard and Spielman 2009).

4.2.3. Market orientation strategies

CIALCA interventions were promoted as a package and disseminated through farmer groups to increase both productivity and marketing of banana and legumes produced by smallholders. Market orientation strategies aim at encouraging commercial agriculture, increasing household incomes and strengthening food security by enabling farmers to meet market demands and to access appropriate markets for their products. In collaboration with NARS, these aims were realised by strengthening farmer groups and creating marketing linkages with other actors such as financial institutions, traders, processors and wholesalers. Table 5 shows the awareness, training and adoption rates of the four market orientation strategies – namely collective marketing, business plan development, participatory market research and product transformation – which were disseminated over the CIALCA project lifecycle.

Collective marketing was adopted by almost all farmer groups (95% in DRC and 89% in Rwanda) in order to reduce transaction costs and strengthen their bargaining power in pursuit of higher market prices. Over 50% of the farmer groups adopted business plans, product transformation and participatory market research strategies (Table 5), all of which require relatively high amounts of cash, time and business skills. Product transformation requires packaging and specialised machine that groups could not afford, for example, processing soya into soya milk and meat using traditional methods.[4] The commonly transformed products were soya milk, banana juice and, less commonly, banana beer and soya meat. Banana beer was only brewed in South Kivu (DRC), while in Rwanda, the government prohibited the production of banana beer, and few farmers had illegal plantations.

Business plans, participatory market research and product transformation were the least adopted strategies indicating that smallholders rarely engage in market investigation

Table 5. Awareness, training and adoption of market orientation strategies (% of groups).

	DRC			Rwanda			Overall		
Market orientation strategies	Awareness	Training	Adoption	Awareness	Training	Adoption	Awareness	Training	Adoption
Collective marketing	100	100	95	100	100	89	100	100	93
Business plans	95	91	67	100	100	57	100	100	63
Product transformation	100	95	52	100	89	67	100	93	57
Participatory market research	100	81	53	100	100	67	100	87	57
No. of groups (*n*)		21			9			30	

Source: Authors' results.

prior to production. This happened despite the essentiality of identifying one's customers prior to starting production of products intended for high-value markets such as supermarkets. The low adoption of 'market research' strategies might be due to the fact that farmers face a variety of obstacles during the sale of their products while also bargaining and negotiating for transport of their products and difficulties in locating markets for bananas and legumes. As a result, many rely on traders and middlemen who purchase products at low farm-gate prices. These actors often exploit farmers in terms of the sale price by making use of asymmetric market information and monopsonistic market structures. Factors influencing farmer group's marketing performance are presented in the next section.

5. Drivers of farmer groups marketing performance

Cluster analysis was used to identify farmer groups with similar marketing performance indicators in terms of volume of sales, the share of members participating in produce bulking for collective marketing and the extent of contract farming. By two-step clustering, two clusters were obtained which had a small Bayesian Information Criterion (BIC) value and a small change in BIC between adjacent numbers of clusters. The Schwarz's BIC was 1208.72 for cluster one and 1172.99 for cluster two; the difference in BIC was −35.73. Prior to interpreting the cluster solution, its stability and validity were assessed by comparing the two cluster centroids. The generated clusters were categorised as 'high marketing performing' (H-groups) and 'low marketing performing' groups (L-groups) (Table 6). Independent *t*-tests and chi-square tests were then used to gain insight into major differences between the two derived clusters in terms of group characteristics and asset endowments – factors which we had hypothesised as indicators of group marketing performance.[5]

The H-groups were fewer (40%) than the L-groups (60%). Farmers of L-groups travelled significantly shorter distances to the nearest local market than those of H-groups; in fact, their being on average nearer to a local market contradicts the hypothesis that being nearer to a market would lead to better marketing performance. The reason might be that local markets accessed by L-groups are small, not well-developed and are generally located in remote villages where small volumes of bananas and legumes are bulked for sale. Hence, proximity to a market did not really lead to better marketing performance. This is clearly demonstrated by the absence of input vendors in these local markets which necessitate that farmers walked longer distances to purchase inputs. Also, during the in-depth discussions, it emerged that the H-groups had relatively better and motivated leaders who were trusted by the members and those members participated more in the group activities as well as meetings.

In regards to the second hypothesis, farmer groups with contracts had a relatively better marketing status. Contract farming is a means to manage risks and uncertainty in production and marketing and allows for sharing of transaction costs. A potential advantage of contracting is that inputs, technological assistance, production and management competencies, and access to credit can be provided by agribusiness firms. Still, only 40% of the groups had valid contracts (Table 2), and these were mainly verbal agreements. Those with contracts were more successful because they bulked larger quantities of output and attracted traders who could purchase at the farm gate. However, these farmer groups

Table 6. Drivers of farmer groups marketing performance.

	Low marketing performing groups (L)	High marketing performing groups (H)	*t*-value /chi-square[5]
Market performance variables			
Contract farming (1 = yes)	0.010	0.660	16.364***
Share of members bulking (%)	0.447	0.710	−2.140**
Sales volume (USD) for 2011/2012	3075.6	9409.25	−1.979**
Farmer group characteristics			
Group size (numbers)	39.33	101.3	−1.924**
Leadership by sex (index)	0.592	0.604	−0.181^{ns}
Activity level (numbers)	1.389	1.500	−0.433^{ns}
Group age (years)	9.611	13.08	−2.131**
Group land size (ha)	1.078	3.051	−1.140^{ns}
Service providers (numbers)	3.389	4.167	−0.828^{ns}
Distance to nearest market (km)	5.194	10.250	−1.913*
Distance to input seller (km)	13.38	10.250	0.240^{ns}
Farmer Group Heterogeneity			
Gender (Herfindahl index)	0.568	0.587	0.575^{ns}
Wealth (Herfindahl index)	0.577	0.608	0.590^{ns}
Country (1 = Rwanda)	0.166	0.500	3.810*
Market orientation strategies			
Product transformation (1 = yes)	0.500	0.667	0.814^{ns}
Collective marketing (1 = yes)	0.889	1.000	1.429^{ns}
Business plan (1 = yes)	0.611	0.667	0.096^{ns}
Participatory market research (1 = yes)	0.444	0.750	2.738*
No. of groups (*n*)	18	12	

***Significant at 1%; **significant at 5%; *significant at 10%; ns: not significant.
Source: Authors' results.

are yet to penetrate high-value modern markets which are emerging in major towns and cities in the Great Lakes region.

Members' participation in product bulking significantly influenced farmer group marketing performance. Generally, participation in collective marketing is determined by the level of benefits group provides as incentives to its members (Table 6). Thus, focusing on members' needs and expectations may increase participation in the long run. Therefore, offering economic benefits to members in order to encourage participation in collective activities is an essential element of leadership as a stipulation. Larger groups showed significant better marketing performance than smaller groups since they benefit from economies of scale and are capable of bulking larger quantities especially if they have contracts with buyers. On the other hand, smaller groups or cooperatives often have the advantage of better internal cohesion because it is easier for members to get to know one another and for members to be monitored (Coulter et al. 1999) which reduces free-riding problems. Free-riding is when individuals 'shirk' the rules and procedures of the group and try to gain the benefits from collective action without incurring some of the costs or forgoing private opportunities, requirements necessary for generation of group benefits (Chirwa et al. 2005). Similarly, the ability of the farmer groups to effectively manage jointly owned assets such as group land requires a high level of personal commitment as well as good business competence. Hence, there is usually a trade-off between economies of scale and group cohesion, although cohesion might be more important as it is critical for any sustained success (Stringfellow et al. 1997). In addition, according to Adams, Roch, and Ayman (2005), farmer groups with the members who are familiar with each other might take less time to reach a consensus but experience shows that they sometimes make erroneous decisions.

Supplying adequate quantities of a given product is necessary for the profitability of the farmer groups. However, the low supply volumes of bananas and legumes are a common problem threatening the economic sustainability of farmer groups in Central Africa. It creates marketing problems in particular when the groups are not able to meet contractual obligations. In general, groups with larger sales volumes showed better performance than those with lower volumes. This corresponds with Shiferaw et al.'s (2009) results that the major constraints to collective marketing in Kenya are low supply, lack of credit and price variability. In some regions in the DRC, the dispersed location of members and poor road networks on a difficult terrain made products collection and transportation challenging and sometimes unprofitable for members. Marketing performance of the groups varies across the countries. In Rwanda, 17% of farmer groups were L-groups compared to 83% in the DRC. This could be due to the higher proportion of commercial-oriented farmers in Rwanda who purchase inputs such as fertilisers and realise higher yields (Ochieng et al. 2016). In addition, the RCA monitored the management of groups which could lead to better performance of the groups, while in the DRC the government is not involved in the functioning of the farmer groups.

The hypothesis that group maturity has a positive impact on marketing performance is supported. Results showed that older farmer groups are more successful than more recently formed ones. This is explained by the fact that mature groups were in a better position to mobilise resources and take advantage of emerging market opportunities. Mature groups have had time to establish more solid market linkages because of repeated transactions and functioning group activities. This result is in line with that of Barham and Chitemi (2009). In Tanzania, newly formed farmer groups were not able to effectively improve their market situation due to their lack of market experience (Barham and Chitemi 2009). There is no evidence in our study to support the hypothesis that gender and wealth heterogeneity is related to group marketing performance. Still, the L-groups turned out to be more diverse, confirming the findings of Varughese and Ostrom (2001) that heterogeneity in member characteristics may be unrelated to group performance and that the viability of the groups may be threatened by competing interests of different members. Similar results were reported by Barham and Chitemi (2009) referring to farmer groups in Tanzania. We did not find any significant difference between the groups with regard to the adoption of market orientation strategies.

Business plans, collective marketing and product transformation were not different between groups, although a difference was found concerning the adoption of participatory market research which supports the hypothesis that market research can actually improve group marketing performance. Results from the key informant interviews with the NGOs indicate that encouraging poor smallholder farmers to link up with the high-value markets and retail outlets would be more beneficial for them than concentrating on local or informal markets. Although this is a challenge to smallholders who rarely self-organise and face a lot of challenges such as lack of access to essential public goods (roads, electricity, water) and limited production resources, etc. Therefore, in order for the groups to improve their market performance, it is necessary for them to thoroughly search for and identify buyers prior to production. The possibility to enter into contractual arrangements with buyers (such as supermarkets, NGOs, schools, colleges and universities, and so forth) offers the potential to provide ready and dependable markets.

Table 7. Marketing performance of farmer groups in Rwanda and the DRC.

	Rwanda (1)				DRC (2)				
Performance variables	Low performing groups (L)	High performing groups (H)	Test[a](H≠L)	Total	Low performing groups (L)	High performing groups (H)	Test[a](H≠L)	Total	Test (1≠2)[b]
Share of groups with contract farming (%)	0	83	2.4**	55.6	13.3	50	1.8*	14.3	5.5**
Share of members bulking (%)	48.8	56.6	1.4^{ns}	53.9	40.5	59.6	1.1^{ns}	45.9	26.4^{ns}
Sales volume (USD) for 2011/12	8075	17964	2.4**	14668	1484	2121	0.3^{ns}	1727	2.8**
No. of groups (n)	3	6		9	6	15		21	

***Significant at 1% and **significant at 5%, respectively, for χ^2 or *t*-test of difference in means; ns: not significant.
[a]Test between low and high performing groups within the country.
[b]The test between the two countries.
Source: Authors' results.

Further analysis shows that farmer groups in Rwanda significantly performed better than those in the DRC (Table 7). Farmer groups in Rwanda on average obtained 12,941 USD per annum higher in sales than the DRC counterparts. More Rwandan groups had contracts with buyers (56%) had contracts than DRC (14%). Besides, H-groups in Rwanda had more contracts and realised more sales volumes than those in the DRC (Table 7). Results are similar for L-groups. The poor performance of the DRC farmer organisations is because the government does not support them to cope with obstacles like poor market infrastructure and weak road networks that made the marketing of their products more difficult. During the FGD meetings in DRC, farmers reported that the government had not supported the cooperatives for several years and that they only get support from both local and international NGOs with no regulatory authority. One participant said that 'our government has neglected us and they don't care about what is happening to the farmers any more but we are happy that some organizations still value us'. The policy environment in the DRC does not support the growth and the consequence could be seen in the low market performance of the existing farmer organisations in South Kivu. Comparatively, smallholder farmers in the DRC may not improve their marketing situation and get expected economic benefits from participating in the farmer group activities.

6. Summary and conclusion

Farmer groups are important for improving food security of farm households in regions with limited market infrastructure and persistent market imperfections. Groups provide institutional mechanisms to facilitate the pursuit of market-oriented strategies, yield-enhancing technologies and linking of members to markets for more efficient commercialisation. Farmer groups undertake collective activities such as collective marketing of produce, product transformation, participatory market research and business planning to improve the market position of their members. Beyond marketing, farmer groups

provide a broad spectrum of services to their members like financial and technical advice, policy advocacy, product transformation, input purchase and assistance with production activities.

Farmer groups were trained and most of them adopted collective marketing; while business plans and product transformation exhibited low adoption rates. Most of the group members were poor and few were considered as rich or middle class, while the rest were destitute. The possible reason for this composition is that the poor often come together to pool their limited resources while the rich are reluctant to join groups since they are able to perform successfully on their own and do not see a net benefit from group affiliation. The destitute are often excluded from the groups for various reasons including their own passivity or their inability to contribute any resources to joint activities. Group leadership was dominated by male farmers except for the treasurer positions which were usually held by women. This study supports the hypothesis that group size, adoption of market research, group maturity, sales volume proportion of members bulking produce and engaging in contract farming significantly influence farmer group marketing performance. However, it does not support the hypothesis that gender and wealth heterogeneity and distance to the nearest market are related to group marketing performance. Farmer groups' marketing performance varies across the countries due to differences in policy support, environmental and economic conditions in Rwanda and the DRC.

The improvement of marketing performance of farmer groups has the potential to contribute to poverty alleviation and reduce food insecurity incidences among vulnerable groups in the remote rural regions. This will require that farmer groups intensify their market research to find better ways for entering into contractual arrangements with larger buyers such as supermarkets, schools and private companies that represent ready and stable markets. Furthermore, groups should transform into formal business entities to brand their products in order to access high-value markets and perhaps even regional export markets. Finally, planners and decision-makers must complement the initiatives of farmer groups by encouraging their formation and provide adequate infrastructure, particularly roads. This will render collective action opportunities more beneficial to smallholders who are responsible for the majority of food production in sub-Saharan Africa. There is a need for farmer groups to integrate the destitute – 'the poorest of the poor' – into group activities to provide them with economic and social benefits. The major issue is how to achieve this in the midst of several constraints they face including the inability to pay group subscription fees, lack of land and negative community perception about them. This is an essential task for further in-depth empirical research.

Notes

1. Farmer organisations in this study are mainly concerned with increasing production and market access to their members. They exclude those that focus on the management of common property resource (irrigation, fisheries or forests) and grassroots self-help or faith-based organisations.
2. Factor-cluster analysis requires a sufficiently large sample size to meet the cases-per-variable ratio. The recommended minimum is a ratio of 20-to-1 cases-per-variable for factor-cluster analysis (Hair et al. 2006). This study has 10 to 1 cases per variable and is far below the recommended ratio. In addition, due to a relatively small sample size ($N = 30$), we could not perform multivariate analytical techniques.

3. We did not collect data on homogeneity in identities, specifically not on the preferences, interests or behaviour of members, and this could constitute a limit of this work.
4. In some situations, the processed banana beer was packaged in recycled bottles that were not branded. Packaging the products with group logos never existed in groups.
5. Due to the small sample size ($N = 30$), all independent variables with a p value below .10 were also considered statistically significant (Barham and Chitemi 2009). The categorical variables were tested using chi-square test.

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Notes on contributors

Justus Ochieng is an agricultural economist at the World Vegetable Center, Arusha, Tanzania. He obtained his PhD in agricultural economics at the University of Kassel, Germany and Msc and Bsc degrees in Agriculture and Applied Economics from Egerton University, Kenya. His research interests include agricultural value chain analysis, poverty and food security, technology development and adoption, climate change and impact assessment.

Beatrice Knerr is a professor of Development Economics at the University of Kassel, Germany. She obtained her PhD in Agricultural Economics at the University of Kiel, Germany. Thereafter, she served for several years as an Associate Professor at the University of Stuttgart/Hohenheim. Her research interests are in rural development, labour mobility and labour migration and agricultural development policy.

George Owuor is a professor of agribusiness management at Egerton University, Kenya. He obtained his PhD in Agribusiness Management through a program between Kiel University, Germany and Egerton University and MSc in Agricultural Economics and BSc in Agribusiness Management from Egerton University, Kenya. His research interests are in crop and livestock value chains, land-use management, agricultural finance and participatory impact assessment.

Emily Ouma is an agricultural economist, currently working for the International Livestock Research Institute in Uganda. She obtained her PhD in Agricultural Economics at the University of Kiel, Germany, and her BSc and MSc degrees in Agricultural Economics from Egerton University, Kenya. Her research interests are in agriculture and livestock value chain analysis, market development, consumer economics and environmental and cultural heritage economics.

ORCID

Justus Ochieng http://orcid.org/0000-0002-6326-1377
Beatrice Knerr http://orcid.org/0000-0001-8517-3725
George Owuor http://orcid.org/0000-0002-3123-1376
Emily Ouma http://orcid.org/0000-0003-3988-626X

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