Research Application Summary

Economic evaluation of the potato market chain in Uganda

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Abstract

A survey involving 180 farmers, 60 traders and processors was conducted in Kabale, Mbale and Kampala districts in Uganda for two consecutive potato growing seasons (20011/2012). The Study sought to: 1) to characterise and describe the various potato market chains. 2) determine the efficiency of the existing potato market chain actors at different stages of the chain 3) determine the factors that influence the efficiency of the potato market chain and 4) identify alternative options that could improve the efficiency of the potato market chain actors. Study findings indicate that the potato market chain in Uganda is characterised by a large number of small uncoordinated farmers and buyers who face high marketing costs resulting into lack of mutually beneficial linkages between the various actors in the chain. Only 26.4% of the farmers were in some form of contractual arrangement with buyers. Results also indicate that those who sold under contracts (75%) were organised in groups compared to only 27% who did not sell under any contract but belonged to groups. Results further indicate that those who sold under contracts benefited more and subsequently their potato yield per hectare and annual revenue were significantly higher than for farmers who were under no contractual obligation.

Key words: Contracts, Kabale, Mbale, potato market chain, *Solanum tuberosum*

Résumé

Une enquête menée auprès de 180 agriculteurs, 60 commerçants et industriels a été menée dans les Districts de Kabale, Mbale et Kampala en Ouganda pendant deux saisons consécutives de croissance des pommes de terre (2011/2012). L'étude visait à: 1) caractériser et décrire les différentes chaînes de commercialisation des pommes de terre; 2) déterminer l'efficacité des acteurs existants de la chaîne de commercialisation des pommes de terre à différents stades de la chaîne 3) déterminer les facteurs qui influencent l'efficacité de la chaîne de commercialisation de pommes de terre et 4) identifier les options alternatives qui pourraient améliorer

l'efficacité des acteurs de la chaîne de commercialisation des pommes de terre. Les résultats de l'étude indiquent que la chaîne de commercialisation de pommes de terre en Ouganda se caractérise par un grand nombre de petits agriculteurs et acheteurs non coordonnés qui font face à des coûts élevés de commercialisation résultant de l'absence de liens mutuellement bénéfiques entre les différents acteurs de la chaîne. Seulement 26,4% des agriculteurs étaient dans une certaine forme d'arrangement contractuel avec les acheteurs. Les résultats indiquent également que ceux qui ont vendu sous contrats (75%) ont été organisés en groupes, comparativement à seulement 27% qui n'ont vendu sous aucun contrat, mais qui appartenaient à des groupes. Les résultats indiquent en outre que ceux qui ont vendu en vertu de contrats ont bénéficié plus et par conséquent leur rendement en pommes de terre à l'hectare et le revenu annuel étaient significativement plus élevés que ceux des agriculteurs qui n'étaient sous aucune obligation contractuelle.

Mots clés: Contrats, Kabale, Mbale, chaîne de commercialisation des pommes de terre, *Solanum tuberosum*

Background

In Uganda, potato is grown for both home consumption and income especially in the highland areas of South Western Uganda (Kabale and Kisoro) and Eastern Uganda (Mbale and Sironko) districts. Athough other regions are taking on commercial potato production due to introduction of low land varieties, about 60% of the crop production remains in the East and Southwest of the country (Ferris *et al.*, 2001; Wang'ombe 2008). Farmers produce and sell potato to traders but continue to complain of limited market access in terms of low prices and limited outlets. The problem of market access has been associated with inefficiencies along the farmer – consumer (Africa 2000 Network, 2007). The chain actors generally lack sufficient knowledge, information and enough resources to help them meet quality standards and formal market specifications. This is a big impediment to actors to invest in the market for them to meet product quality and hygiene norms. The general objective of the study was to assess the efficiency of the current potato market chain in Uganda and determine alternative profitable options for linking farmers to markets. The specific objectives were; 1) to characterise and describe the various potato market chains. 2) to determine the efficiency of the existing potato market chain actors 3) to determine the factors that influence the efficiency of the potato market chain and 4) to identify

alternative options that could improve the efficiency of the potato market chain actors.

Literature Summary

Kaplinsky and Morris (2001) reported that the value/market chain describes the full range of activities required to bring a product or service from its conception, through the different phases of production, delivery to final consumers, and final disposal after use. Wang'ombe (2008) noted that association role and contractual relationship in the market/value chain in Uganda and Kenya is still marginal, yet it has consent and potential to improve farmers' bargaining power through collective marketing. For small scale farmers to benefit from participating in emerging high-value markets, they should be able to participate in value/ market-chain innovation (Aliguma *et al*., 2007). Different approaches have been used to determine market chain efficiency (Achike and Anziku, 2010; Feizabadi, 2011) and include gross margin analysis, net firm/farm income and rate of return on investment.

Study Description

The study was conducted in the major potato producing districts of Kabale and MbaleTwo sub-counties (Kamuganguzi and Muko) in Kabale, and one sub-county (Wanale) in Mbale were the most popular potato producers, hence selected for this study. In each of the selected sub-counties, two parishes were randomly selected from which 30 farmers each were randomly selected. giving a total sample size of 180 farmers. In addition, potato traders in urban centres were also selected using the snowball method. For this, farmers gave a guide on the location of the traders who buy potatoes from them. The urban centres included Kabale, Mbale and Kampala. In each of these, 20 traders were randomly selected making a sample of 60 traders. To characterise the market chain actors at different nodes, descriptive statistics including percentages, means, and t- test comparisons were used. Contractual arrangements and marketing costs between actors at each node were reviewed and analysed. Contractual agreements between the buyers and the sellers of potato and its products as well as the terms and conditions under which those agreements exist were considered. To determine efficiency of the potato market chain, value addition approach (Tallec and Bockel, 2005) was used to determine the value added by each of the actors, and consequently the total value added for the entire chain. Value added (VA) by an agent/actor in the value (market) chain is defined as the difference between the value of output (Y) and the value of inputs (X) the agent used.

$$VA = Y - X \quad \text{..... (1)}$$

The analysis considered the value addition functions of the different actors (farmers, processors and salesmen). Efficiency of the market chain was then computed as a ratio of VA to total marketing costs (Achike and Anziku, 2010; Feizabadi, 2011). Finally, regression analysis was carried out to determine the factors that influence the efficiency of the potato market chain, ME. The regression model was specified as:

$$ME_{ni} = \beta_o + \beta_i X_{i's} + e \quad \text{..... (2)}$$

Where X_{is} are the explanatory variables; β_o is the constant; β_i are the cefficient of i^{th} ; and e = is the error term.

Finally, a comparative cost-benefit analysis (Verhaegen and Van Huylenbroeck, 2001) was used to assess alternative options for linking farmers to profitable potato markets.

Research Application

The characteristics of farmers who sold potato under contract and those who sold under no contract did not differ in most of the attributes (Table 1). Generally, they were about 40 years of age, with a formal education of about 7 years. However, there was a significant difference (at 10% level) in household size between those under contract and those without, with contract

Table 1. Social economic characteristics of potato producing farmers under the different contractual arrangements.

Farmer attribute	Contract farmers	Non-contract farmers	t-value	p-value
Age (years)	40.7	42.5	0.744	0.458
Mean household size	6.54	5.71	1.836	0.069
Years of formal education	7.3	6.6	0.999	0.320
Months spent in technical training	7.7	2.5	2.084	0.041
Gender				
Males	91.9	93.9		0.669
Females	8.1	6.1		
Occupation of the farmers				
Farming	91.7	91.7		0.818
Marital status				
Married	94.6	90.7		0.437
Divorced	0	2.1		
Widow/widower	5.4	3.1		
Never married	0	4.1		

Table 2. Variables of the potato marking efficiency at farm level.

Variable	Contract farmers	Non-contract farmers	Overall	t-value	p-value
Average Annual profits from potato sales	1,231,100	213,987	485,536	4.3	0.000
Distance to market	1.8(1.6)	3.0(2.2)	2.7(2.1)	2.9	0.0039
Marketing costs	1441519(121720)	90435(96326.4)	103834(105498)	2.4	0.0180
Quantity of potato sold (bags)	19.0(15.8)	13.0(11.0)	14.5	2.3	0.0222
Price of 100 kg bag of ware potatoes with value addition	56688(26810)	55158(26875)	55641(26684)	0.2	0.8181
Price of 100 kg bag of ware potatoes with no value addition	41526(16939)	41760(15580)	41692(15851)	0.05	0.9573
Percentage of farmers who market					
(i) Individually	66.7	92.3	84.4		0.005
(ii) As a group	13.3	4.6	7.3		
(iii) Both Individually and as a group	20.0	3.1	8.3		
Access to credit (%)	75.7	68.5	65.7		0.125
Access to information	75.7	72.0	72.1		0.667
Access to extension services (%)	73.0	67.0	67.9		0.504

farmers having bigger household sizes. However, in terms of market aspects such as quantities of potato sold, distance to the market, and marketing costs incurred, significant differences between farmers who sold under contract and those who did not were observed (Table 2).

Table 2 shows that the average annual profits from potato sales were significantly (at 1% level) higher for farmers with contractual relationship with buyers. This coupled with bigger quantities produced by contract farmers, and the fact that most of them belong to a potato marketing group (41.7%) enabled them to enjoy economies of scale in terms of increased bargaining power and ready market. However results indicate that contractual farmers incurred significantly (at 5%) higher marketing costs per 100 kg-bag than non-contractual farmers. This is probably because contracted farmers have to incur more costs in terms of sorting, grading, packing, communication, and transport in order to pool potato produce at one strategic point convenient for the buyer. A bigger percentage (75.7%) of contracted farmers has access to credit to facilitate production and marketing activities in order for them to fulfil the terms and conditions of the contract such as agreed potato quantities and quality. The contracted farmers are sure of paying back the credit because of assured potato sales.

The above results are preliminary as data from Mbale farmers and all other chain actors (traders and processors) is undergoing analysis. As such some objectives of the study are partially addressed while others are not yet tackled. From these preliminary results, potato farmers are encouraged to form groups, negotiate contracts and collectively market potato.

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