Maastricht School of Management
DBA Assignment

The Potato Value Chain in Kenya and Uganda

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<u>Key Words</u>
Agriculture
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Acronyms

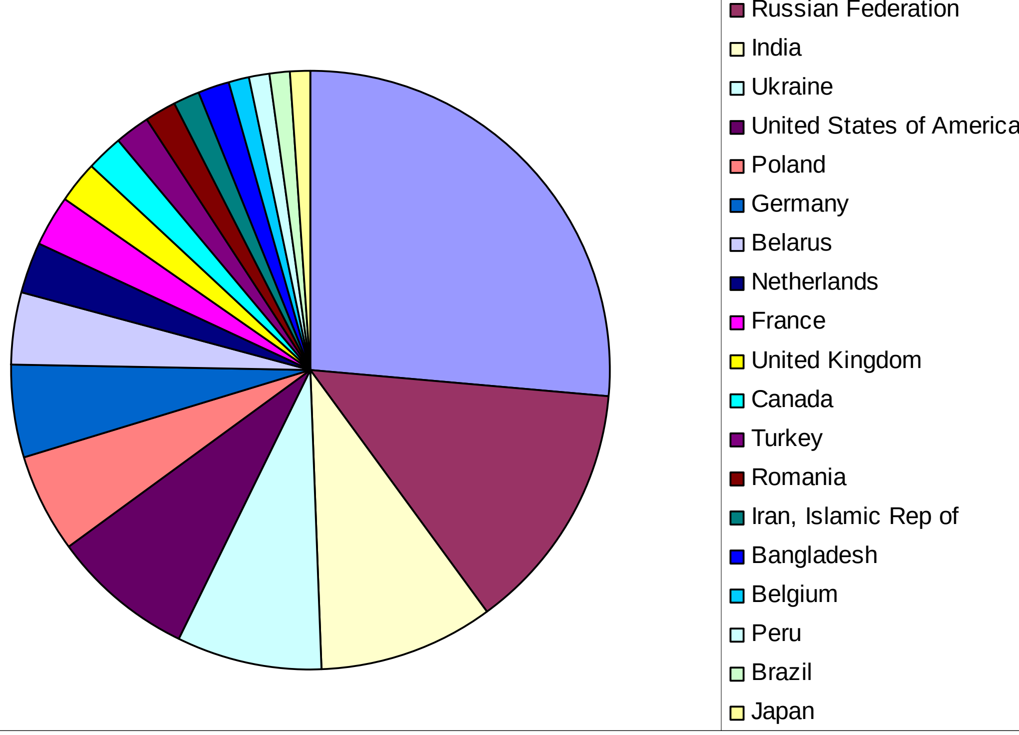
CIP	International Potato Center
FAOSTAT	Food & Agriculture Organisation Statistics
KARI	Kenya Agricultural Research Institute
KMOA	Ministry of Agriculture, Kenya
KASPPA	Kapchorwa Seed Potato Producers Association
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries, Uganda
NAADS	National Agricultural Adversary Services
NARO	National Agricultural Research Organization
UON	University of Nairobi

THE POTATO VALUE CHAIN IN KENYA AND UGANDA

Introduction

Potatoes were introduced in East Africa by the British in the 1880s. Potato production is increasing rapidly in the tropics and sub-tropics and is declining gradually in the temperate zone. Between 1966 and 1980, the area under potatoes in North America and Western Europe decreased annually by more than 2% but the yield increased by almost 1% (Van Der Zaag and Horton, 1983). In Africa and Asia, the area under potatoes increased by about 7% and 4% respectively with yields increasing by 2% in Asia and remaining constant in Africa in the same period.

Figure 1: Leading Potato Producers in the World (MT)



Source: FAOSTAT 2004

The average yields in sub-Saharan Africa have remained stable at between 5-10 tons per hectare while those in Western Europe are over 30 tons per hectare. Figure 2 below shows this kind of trend in the production and yields for Kenya since 1960. Table 1 shows the production & yields in selected countries of Europe and Africa between 1995 and 1997.

Potato Production Trends

Figure 2: Potato Production Trends from 1961-2005

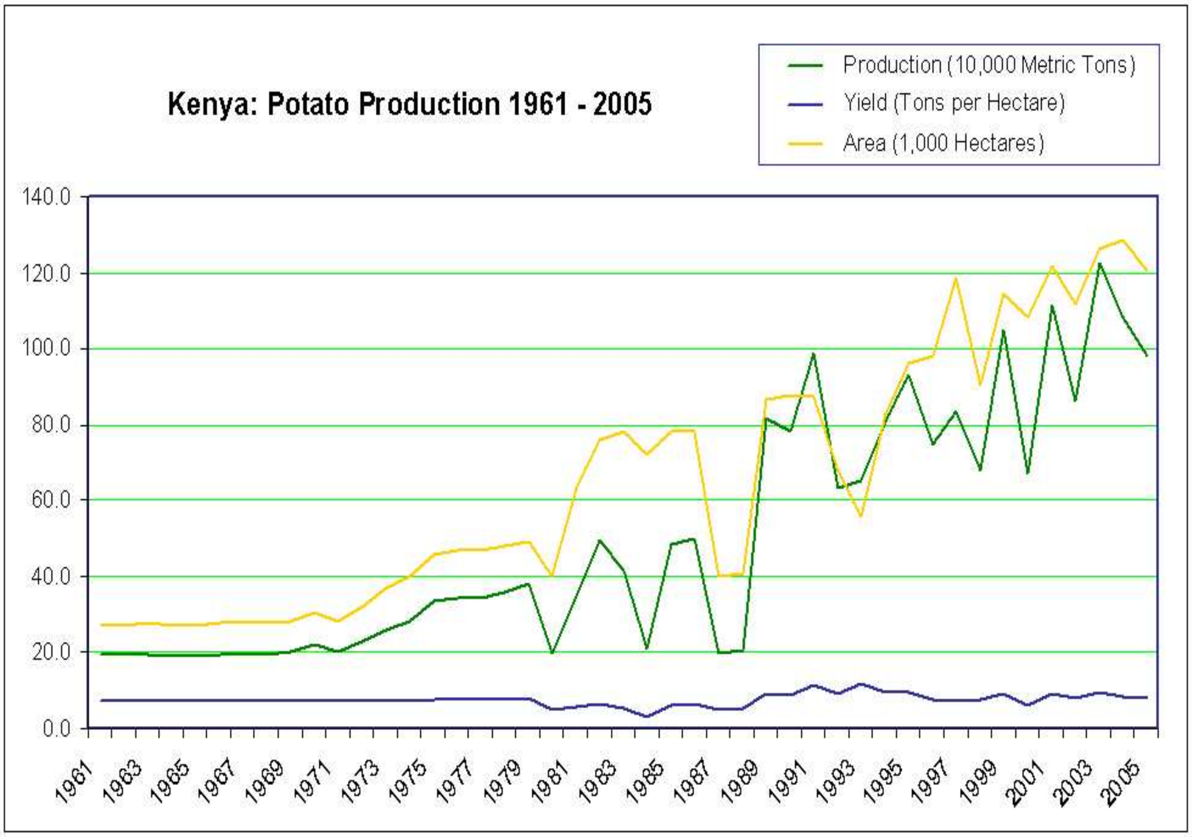


Table 1: Potato Production Area and Yields in Selected Countries of Europe and Africa

	Production 1995-97		
	Production	Area	Yield
	(000 t)	(000ha)	(t/ha)
Europe (n=38)	**154,430**	**9,663**	**16**
Russian Federation	38,534	3,389	11
Poland	24,295	1,390	17
Ukraine	17,380	1,560	11
Germany	12,530	354	35
Netherlands	7,834	183	43
Africa (n=33)	**7,692**	**727**	**11**
Egypt	2,656	130	20
South Africa	1,539	56	28
Algeria	1,099	80	14
Morocco	1,068	62	17
Malawi	379	51	7
Uganda	360	53	7

Source: FAOSTAT

The production of potatoes has been on an upward trend in Kenya and Uganda. Almost all the production is rain fed and the dips in Kenya correspond to periods of drought in the country. Uganda has a more stable rainfall pattern.

Production has been on an upward trend but this has only been achieved by increasing the area under the crop. This is clearly demonstrated by the production and acreage trends in Kenya as per Figure 2 above.

Table 2: Production of Potatoes in Uganda and Kenya

	Uganda	Kenya
Year	Tons (MT)	Tons
2004	573,000	1,000,000
2003	567,000	1,223,531
2002	546,000	861,566
2001	508,000	1,112,849
2000	478,000	670,303
1999	449,000	1,047,572
Source: FAOSTAT Database		

Zones of Production

Potatoes are grown in the highlands of Kenya and Uganda.

For Kenya, the main potato growing areas are between 1,400 and 2,700 metres above sea level with mean annual rainfalls of 1,000 mm or greater (Durr & Lorenzl, 1980). The most suitable areas are:

1. Meru, Embu, and Kirinyaga Districts on the slope of Mt. Kenya;
2. Nyeri, Murang'a, Kiambu, and Nyandarua Districts on both sides of the Aberdare Range;
3. Nakuru and Kericho Districts along the Mau range; and
4. Several highland districts in Nyanza and Western Provinces including Nandy, Uasin Gishu, Kakamega, Kisii, Bungoma, Busia, and Trans-Nzoia.

Potatoes are mainly grown in the highlands of Uganda with Kabale and Kisoro districts of south western Uganda leading in production followed by Mbale and Kapchorwa districts on the slopes of Mt. Elgon (Table 3). In the year 2000 Kabale district alone produced 60% of the potatoes consumed in Uganda.

Table 3: Potato production in ten major producing districts of Uganda in 2000

District	Production (mt)
Kabale	179,571
Kisoro	49,125
Mbale	21,627
Luwero	17,256
Masaka	15,767
Rukungiri	15,084
Lira	13,194
Tororo	12,777
Kamuli	12,156
Kapchorwa	11,058
Mbarara	10,791

Source: MAAIF

Seasons

The growing seasons are largely determined by rainfall patterns. In both Uganda and Kenya, there are two distinct rain seasons occurring between February –June and October –December (Kaguongo et al., 2007). Durr and Lorenzl (1980) also reported that two crops per year are commonly grown.

Consumption

Since nearly all potato production in Kenya and Uganda is locally consumed (imports and exports are negligible), consumption can be estimated by total production. FAOSTAT Kenya's production estimate (2004) of 1000,000 tons, consumed by 34.7m people, averages out to 28.82 kgs annual per capita consumption. The corresponding figure for Uganda in 2004 was 573, 000 tons for a population of 28m giving a per capita consumption of 20.46 kgs. This consumption is moderately high by world standards, but much less than comparable figures for some regions suitable to potato production, such as Europe (86kgs) (FAOSTAT) . Potatoes are mainly consumed in those rural areas where they are produced and in urban centers. The per capita annual consumption as per Durr and Lorenzl (1980) study was 116 kg of potatoes in the major production areas.

Potatoes are often eaten daily, especially in producing areas, typically prepared as stews or mashed with maize and beans, or peas and other pulses to which some green vegetables might be added. Though rural people in producing districts consume far more potatoes than their urban counterparts, potatoes are greatly in demand by urban residents, in various forms such as crisps (potato chips) and French fries served in restaurants. Potato is considered a high quality and prestigious food, so that higher consumption rates of potatoes are associated with higher incomes. In Kenya, potato is not considered a "poor person's food" (KMoA 2007)

GENERAL CONSTRAINTS IN THE POTATO VALUE CHAIN

Production Constraints

Low yields are generally explained in terms of various diseases and the poor quality of seeds used by growers. The most common diseases are late blight and bacteria wilt (Kaguongo et al., 2005; Durr and Lorenzl, 1980). The problem of diseases and poor seeds are intertwined. Recycled virus invested seeds lead to the rapid multiplication of the virus. In both Kenya and Uganda, only about 4% of the farmers reported using seeds from sources that are likely to be clean (Kaguongo et al., 2007). KARI National Potato Research Center in Kenya and Kalengyere research station in Uganda are the single source of clean basic seeds. Their capacities are constrained given that they have the double mandate of research and commercial basic seed production. The seeds they produce are meant to be multiplied into high quality seed potatoes. There is no large private sector involvement in multiplication of seeds and only a small number of specialialised and trained seed potato multipliers exist in Kenya and Uganda (Kaguongo et al., 2007). To deal with the seed problem, the farmers have attempted to organize themselves in places like Kabale in Uganda but there is a lack of efficient organization structure to cater for procurement of quality certified potato seed by farmers.

The most significant inputs in terms of costs are seed followed by fertilizers (Kaguongo et.al, 2005). There is less usage of fertilizers especially due to cost and lack of appreciation of its contribution to enhancing yields. According to the CIP survey of 2005, more growers use fertilizers in Kenya (89%) as compared to Uganda (7%).Farm yard manure is discouraged especially due to its potential to carry over diseases.

Rotation is a recommended practice for building soil fertility and for avoiding the build-up of soil borne diseases but this is inhibited by the small size of land holding. The recommended rotation cycle is to grow potatoes once in every four seasons. This recommended practice has been reported to be more widespread in Uganda (58%) as compared to Kenya (16%) (Kaguongo et al., 2005).

New varieties developed by the research center avail better yields and have lower incidences of diseases. The adoption of improved varieties is better in Uganda (71.8%) as compared to Kenya (53%) (Kaguongo et al., 2005).

Judging by the number and size of government establishment specifically supporting potato production, one can infer that there is limited service delivery by the government especially if one would compare with other food crops like maize.

Marketing Constraints

The most commonly accepted unit of marketing potatoes is the sisal bag, of roughly 100 kgs. However, major urban centers like Nairobi and Kampala demand an "extended bag," (with sisal net extension woven onto each bag), which weigh from 110-150kgs. (KMoA, 2007). The extended bag has been used to deny growers their rightful share of the revenue as the bag is sold at similar prices to the ordinary bag and no references to weight is made.

The marketing system is dominated by a large number of intermediaries. Rural brokers are directed by traders, who often own the lorries which transport potatoes, to assemble crops at an agreed price several days prior to a trip. Brokers in rural areas contact farmers and often leave bags, and sometimes a deposit, toward a promised quantity of potatoes to be delivered. Brokers are responsible to traders for maintaining quality standards and correct quantities, i.e. checking that bags are properly filled.

At central markets, such as in Nairobi, market brokers usually approach lorry operators and offer to sell potatoes at negotiated prices and commissions. Smaller-scale agents distribute smaller quantities down the line of the marketing system, which must continue providing services such as repackaging and hauling, ultimately on the backs of porters.

Attributes considered by the market include the colour of the skin and the size of the tubers. The preferences are driven by taste and usage. For example, the French fries processors prefer white skinned potatoes and those with fewer noodles. Some consumers in certain regions prefer the red skinned potatoes due to their taste. In Kaguongo et al., 2005 study, market preferences were seen to inform production decisions.

Consumption potatoes are stored for up to 3 months which is generally insufficient to maintain a supply of potatoes until the next harvest. Studies indicate that farmers harvest potatoes straight to the market (Durr & Lorenzl,1980, Kaguongo et al., 2005) due to lack of storage facilities.

The farm gate price of potatoes is likely to be less than half the ultimate retail price, but many factors can affect prices at all stages, including not only the relative supply and demand of potatoes, but also the availability of maize (often a factor of the rains), and the effective distance from a rural site to wholesale and retail markets coupled with the state of roads.

POTATO VALUE CHAIN IN KENYA AND UGANDA: COMPARISON OF TWO GROWING DISTRICTS

Nyadarua and Kabare districts lead in potato production in Kenya and Uganda respectively. However, Nyandarua's production is sometimes surpassed by Meru where production is more intensive with about 50% of the production being through irrigation. Kabale is way ahead of other districts in Uganda and produced as much as 60% of the Uganda's production in 2005 (CIP, 2005). Kisore is the second most important potato producing district in Uganda.

Table 4: Comparison of Variable that Impact directly or Indirectly to Potato Production in Nyandarua and Kabale Districts

	Nyandarua	Kabale
Source of Income		
Crop Sale	48%	80%
Animal and Animal Products	36%	2%
Remittances	15%	12%
Other on-farm Incomes	2%	1%
Off-farm Incomes	1%	1%
Household Assets		
Cattle	89%	31%
Sheep & Goat	69%	63%
Ox Plough	30%	1%
Ox Carts	11%	12%
Donkey	14%	0%
Bicycle	67%	49%
Average Acreage	2.1 ha	1.7ha
Acreage Under Potatoes	0.37 ha	0.24ha
Households who have completed Primary Education		
Male		
Female		
Percentage using irrigation for Potato Production	3%	8%
Crop rotation practices Percentage following recommended practice (once every 4 season)	16%	56%
Total Production Year 2000 (tons)	92,538*	179,571
Production in the next best district for Year 2000 (tons)	92,300*	49,125
Varieties Preferred	White Skinned, Nyayo most dominant	Red Skinned, Victoria most dominant

Source: CIP Survey (2005), UON (2002)*

District Potato Value Chain Comparisons

Potato is the second most important economic activity in Nyandarua after dairy. Kabale has potatoes as the most important economic activity. Both areas are in the highlands and have rainfall occurring in two main seasons with an average of 1000-1500mm.

Inputs

The main inputs are labour, machinery (tractors and ox ploughs), seeds, and manual/fertilizer and fungicides.

A few farmers own tractors which they hire out to the other farmers who are able to afford the service. A number of farmers have ox drawn ploughs which are an alternative to tractor drawn ploughs especially for small farms. A majority, especially those mainly involved in subsistence farming use manual labour for ploughing. Mechanical equipment is not used for planting as this is done by manually.

Stockists of inputs are concentrated in the district head quarters in both districts. In Nyandarua 82% of the farmers reported using fertilizers as compared to only 6% in Kabale. Farm manure is also used a great deal in Nyandarua (46%) in view of the large percentage keeping animals as compared to 15% in Kabale.

Due to some farmer groups being involved in multiplication of basic seeds, there is more usage of clean seeds in Kabale as compared to Nyandarua. However, own supply or recycling of seed still make the most important source of seeds for both districts.

Late Blight and Bacteria Wilt are the main diseases that affect potato production. Fungicides, the use of clean planting material, and the use of more resistant varieties help to control these two diseases. Late Blight is easier to control using fungicides while the control of Bacteria wilt is done using a variety of methods including crop rotation. The incidence of bacterial wilt is however low in Kenya and Uganda. Kabale has more farmers using fungicides (81%) as compared to 62% in Nyandarua and its application rate is about 3.3 times per crop as compared to 1.8% for Nyandarua (CIP, 2005)

Crop Rotation

Crop rotation is important for maintaining soil fertility and preventing the build up of soil borne diseases. One planting of potatoes per plot in every four seasons is the recommended rotation practice. This is better achieved in Kabale (56%) as compared to 16% for Nyandarua.

Farmer organization & Credit

In Kabale, the Farmer Field schools have been funded by IFAD and the graduates have also started Farmer-Run Field Schools. The objectives of these groups have been to address the production problems with targets to improve yields and competitiveness. More farmers are in farmer groups in Kabale (36%) as compared to 23% for Nyandarua (CIP, 2005). As per Table 5 below, the groups in Kabale have been able to provide credit to 14% of the farmers as compared to only 1% for Nyandarua. Through economies of scale, such groups are able to reduce some production and marketing costs by sharing tasks, the purchasing of inputs and marketing in bulk. Such groups are also important targets by development agents who find it easy and cost effective to work with groups.

Marketing

The market demand influences the varieties grown. In Nyandarua, 87% of the farmers were growing white skinned potatoes as per the CIP survey of 2005 as compared to only 21% in Kabale with the rest growing red skinned potatoes. Middlemen and customers are willing to pay more for the preferred varieties. Nairobi forms the main market for potatoes grown in the Nyandarua with most of these being destined for the French Fries Market. The red skinned potatoes are in greater demand in the wet markets.

As per Table 5 below, middlemen take 92% of the marketed potatoes for Nyandarua while in Kabale, the district market is the most important market outlet taking 45%. The use of extended bag weighing between 120-140 kgs is more common in Kabale.

Both in Kenya and Uganda, prices of potatoes vary with the season, region and skin colour. Price variation occurs from one season to another and from one division to another based on market characteristics, such as distance to markets and road conditions.Farm gate prices are lowest during harvesting time, especially when it rains in areas with poor roads.

An informal survey indicated that farm gate prices in Nyandarua district averagedUSD 49/t as compared to USD 92/t for Kabale. It is important to note that a district like Meru received a high average farm gate price of about USD94/t which is comparable to that of Kabale. Meru and Kabare districts mainly grow red skinned potatoes which are in greater demand in wet markets.

Table 6: Important market factors for potatoes for Nyandarua and Kabale

	Nyandarua	Kabale
Potato Usage::		
Marketed	65	60
Consumed at home	16	18
Kept for seed	15	20
Feed to livestock/ wasted	4	1
Market outlets for farmers (%)		
Middleman	92	37
Village market	6	45
District/capital market	4	15
Major trader	2	15
Neighbor	1	2
Farmer association	0	1
Packages used for selling (%)		
100-110kg bag	85	57
120-140kg bag	8	29
150-200kg bag	2	0
15-20kg bag	6	8
Farm gate prices (USD/t)		
Average	49	92
Standard Deviation	23	44
Median	37	96
Marketing problems encountered (%)		
Low prices	95	49
Difficult getting buyers	36	50
Long distance to market	24	53
Lack of packaging standards	20	4
Poor roads	15	20

Source: CIP Survey (2005), Kaguongo et al. 2005

Extension services

Only 14% of farmers in Nyandarua, Kenya and 32% in Kabale, Uganda reported having received any agricultural advice during last 12 months preceding the CIP survey of 2005. According to the survey, the public extension service was the main source of advice in Kenya, reaching over 80% of the few farmers who had received advice, followed by private traders and companies (17%). In Kabale district, the National agricultural advisory service (NAADs), the privatized public extension service delivery, was most important followed by AFRICARE (an NGO).

Yields & Profit Margins

The potato yields vary a great deal depending on the variety. Nyayo, the most popular variety in Nyandarua exhibited a yield of 7.7t per hectare while Victoria which is popular in Kabale had a mean yield of 6.8t per hectare (CIP, 2005). Table 6 below shows the costs and returns per hectare of land per season for improved and local varieties for the two districts.

Table 6: Costs and Returns per Hectare of Land per Season for Improved and Local Varieties

	Nyandarua		Kabale	
Input costs:	**Improved**	**Local**	**Improved**	**Local**
Seed	84	68	174	90
Manure	2	6	4	0
Fertilizer	114	56	1	0
Fungicides	35	10	33	6
Total input cost	**235**	**140**	**212**	**96**
Labour cost (Hired only):				
Land preparation, planting and weeding	72	74	40	20
Manure and fertilizer application	4	6	3	0
Fungicide application	4	3	2	4
Harvesting	59	54	15	10
Total cost of hired labour	**139**	**137**	**60**	**34**
Labour cost (hired and opportunity cost of family labour)				
Land preparation, planting and weeding	145	170	83	122
Manure and fertilizer application	23	35	4	0
Fungicide application	9	8	15	13
Harvesting	113	139	38	52
Total cost of hired and family	290	352	140	187
Total Costs (including hired labour only)	**374**	**277**	**272**	**130**
Total Costs (including hired land family labour)	**525**	**492**	**352**	**283**
Mean yield (kgs) per ha.	12299	8492	5662	3293
Price (USD/t)	44	40	98	87
Gross returns	541	340	555	286
Net Returns (hired labour only)	**167**	**63**	**283**	**156**
Net Returns (hired and family labour)	**16**	**(152)**	**203**	**3**
Sample size	23	51	65	10

Source: CIP Survey (2005)

It is clear that price and labour costs are the main determinant of profitability of potatoes. Even with high inputs costs of seed for the Kabale improved varieties, the costs of labour are very high in Nyandarua explaining the higher total costs for all cases. The situation in Nyandarua is worsened by the low prices received. A sensitivity analysis indicate that Nyandarua improved varieties can only accommodate a 3% price reduction for break-even as compared to a possible reduction of 37% for Kabale. Nyandarua is basically operating at a break-even point for the improved varieties and at a loss for local varieties if the opportunity cost of family labour is taken into account.

Figure 1: Potato Value Chain in Nyandarua, Kenya

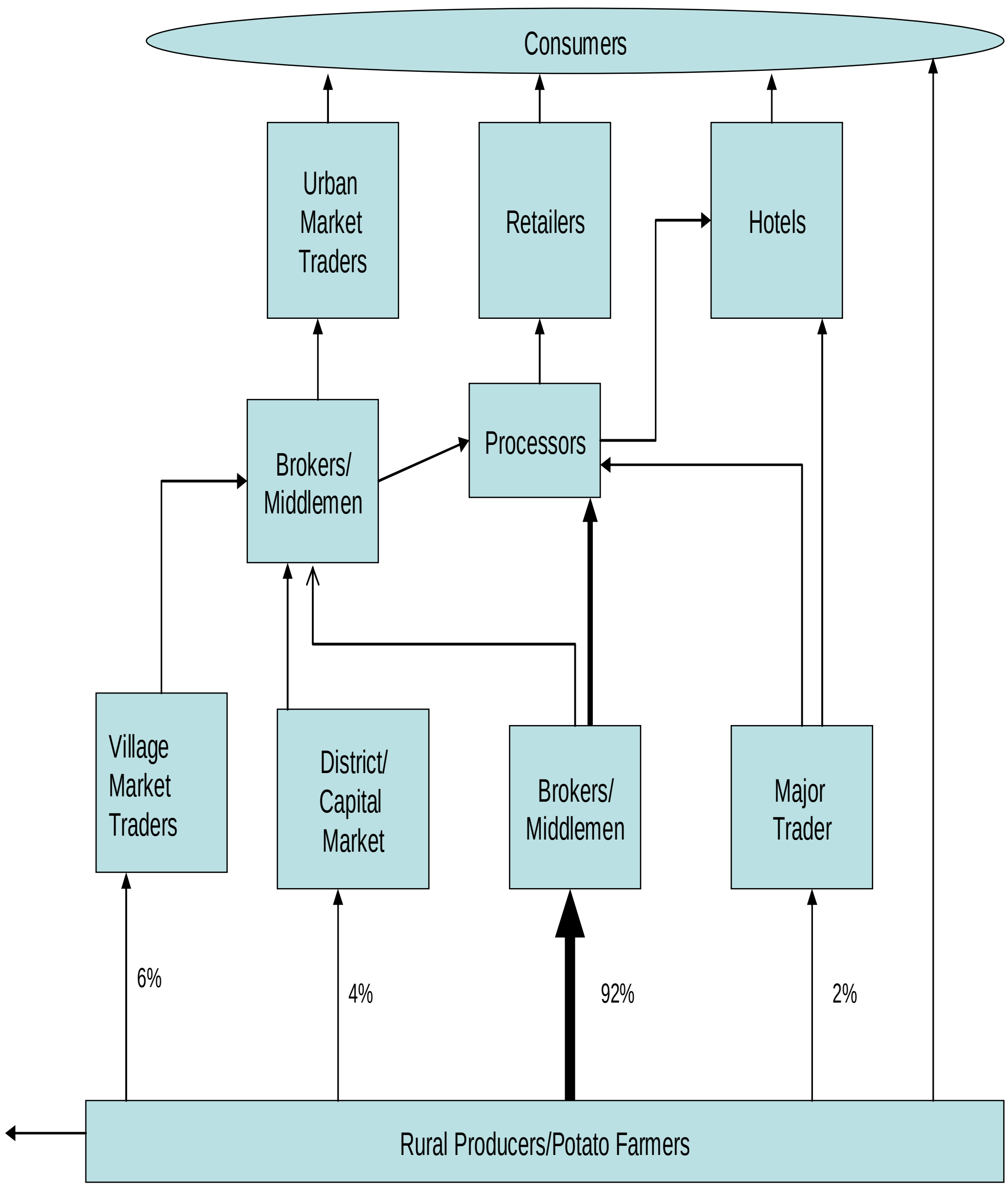
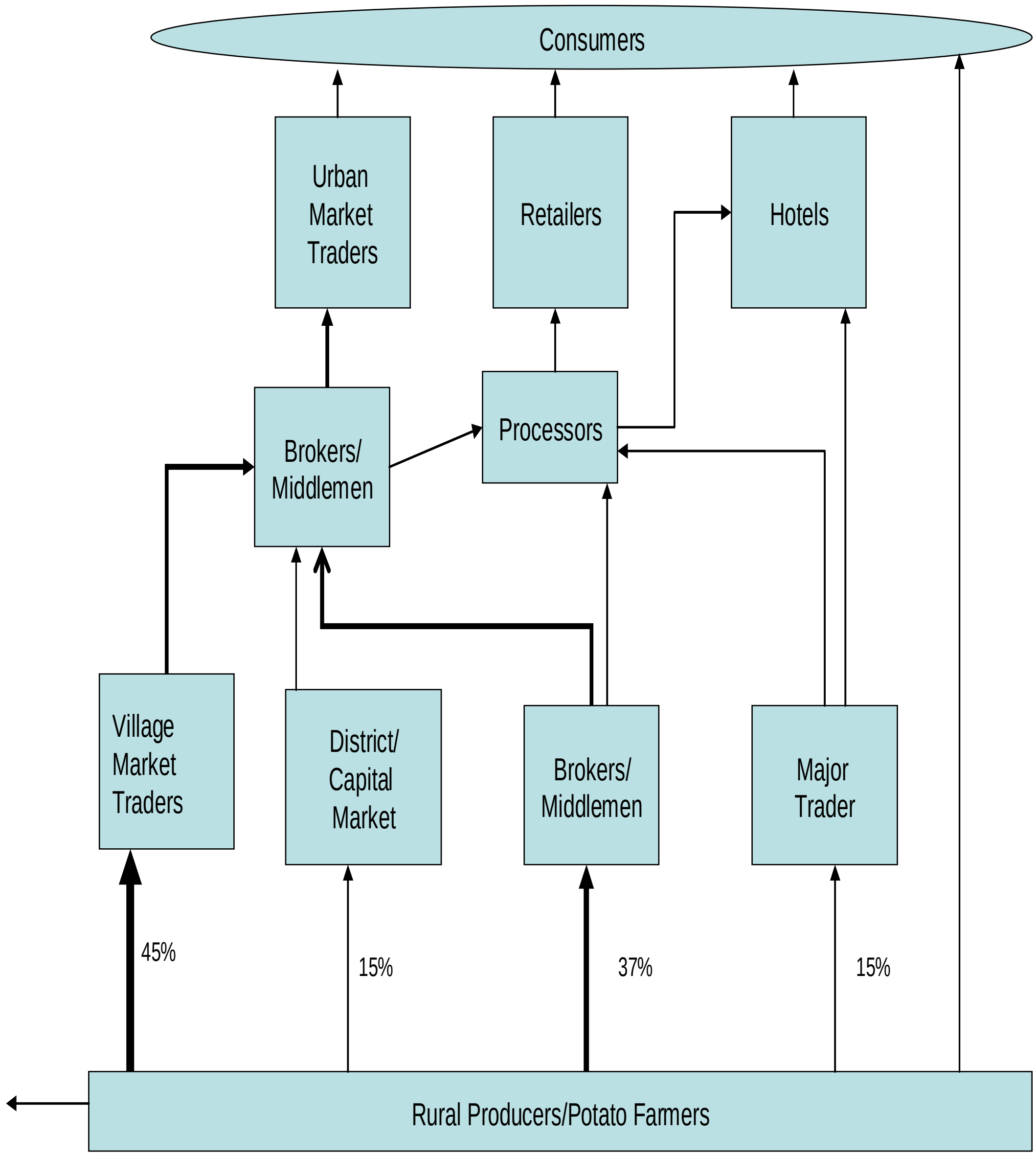


Figure 2: Potato Value Chain in Kabale, Uganda



Conclusions

Potato farming in Kabale is more profitable in Kabale as compared to Nyandarua. Besides the high costs of labour in Nyandarua, low profitability arises from low prices achieved. The low prices are as a matter of fact a product of the long chain dominated by powerful brokers or middlemen (they take 92% of marketed production). Farmers in Nyandarua can benefit a great deal from the collapsing of the chain to eliminate some of the middlemen. The farmers are price takers and the middlemen continue to exercise their power in the consumer market where cost plus margin is used to determine consumer prices (UON, 2002). For Kabale, the village market traders provide 45% of the market with brokers or middlemen only accounting for 37%. The Kabale farmers are more organized and this may have contributed to the better prices they receive for their potatoes.

Farmers in Nyandarua have more extensive land sizes and are only dependent on crop sale income for less than 50% of their income as compared to Kabale where crop sales contribute 80% of the income (Table 4). The low prices that Nyandarua farmers have accepted over time has made them dominate the French Fries market in Nairobi. Their potatoes are also used in the manufacture of Crisps. If labour costs could be sorted out through mechanisation, Nyandarua provides a good opportunity for the expanding processed potatoes industry. The prices obtained by Kabale farmers at the wet markets (as well as Meru in Kenya which focuses on the wet market) cannot be sustained in the processing industry given that processed products like crisps have to compete with imported products.

The Kabale example shows how a local market can provide a profitable business for farmers. There is a case for more promotion of local potato consumption especially with the high prices of cereals arising from the alternative use of these for biofuels. The Kabale case also goes to indicate that potato farmers who have adopted popular tastes are making more money than those selling processing varieties.

The marketing constraints are not a serious as the production problems. Diseases like late blight and bacteria wilt together with poor husbandry methods have limited the yields obtained in Uganda and Kenya (as well as other sub-Saharan countries) to less than 10 tons per hectare as compared to more than 30 tons in developed economies (Table 3). These constraints if sorted out can not only improve farmer's incomes but can also result in a reduction in prices of potatoes. Reduced prices especially as compared to cereal staples like maize would lead to a higher consumption of potatoes especially in this era of high and increasing food prices.

The other big problem is in planting seeds. Unlike a staple like maize where seed companies produces and market seeds at reasonable prices, the potato seeds are sold at exorbitant prices due to the low quantities produced. There are few farmers who use clean seeds as compared to almost 100% of maize producers who use clean seeds. This is an area that provides a great opportunity for improvement.

Potatoes take less time in the farm and are grown for two seasons in a year as compared to one season for maize. They are usually harvested when the cereals are still in the farm and can help improve food security. Higher consumption of potatoes will also reduce the import of cereals in periods of shortages thereby saving foreign exchange. The per capital consumption are still very low at about 30kgs as compared to over 90kgs for developed economies. The use of potato as feedstock is yet to take root and this may provide an avenue to increase the per capita consumption.

Annex I: Bibliography

CIP (International Potato Center). http://www.cipotato.org/potato/facts/indicators.asp

David Sunding and David Zilberman (2000).The Agricultural Innovation Process:Research and Technology Adoption in a Changing Agricultural Sector.*Handbook of Agricultural Economics,* University of California at Berkeley

Durr & Lorenzl (1980). Potato Production and Utilization in Kenya. *Centro Internacional De La Papa*

FAOSTAT statistics database. ⟨http://www.fao.org/corp/statistics/en)

Gregory J. Scott,Mark W. Rosegrant& Claudia Ringler (2000). Roots and Tubers for the 21st Century; Trends, Projections and Policy Options. *International Food Policy Research Institute*

Kaguongo W., P. Kinyae, P. Demo, Peter Gildemacher (2005). A Rapid Appraisal of Potato Production in Kenya.

Kaguongo W., W, Wagoire, P. Demo and P. Gildemacher (2005). A Rapid Appraisal of Potato Production in Uganda

Kaguongo, W., P. Gildemacher, P. Demo, W. Wagoire, P. Kinyae, J. Andrade, G. Forbes, G. Thiele and K. Fuglie (2007). Farmer Practices and Adoption of Improved Potato Varieties in Kenya and Uganda.

Ministry of Agriculture (1998). Annual report for 1998

Ministry of Agriculture (2007). Annual report for 2007

T. G. McGee (2008). Managing the rural–urban transformation in East Asia in the 21st century. *Integrated Research System for Sustainability Science and Springer 2008*

University of Nairobi (2002). Feasibility Study on the Establishment and Operation of Large-Scale Commercial Storage Facilities for Ware (consumption) potatoes in East Africa. Technical report by Prof. S.K. Mbugua and R. Omungo

Van Der Zaag & Horton D. (1983). Potato Production and Utilization in World Perspective With Special Reference to the Tropics and Sub-tropics. *Journal of the European Potato Journal.*

Annex II: Major Stakeholders in the Potato Value Chain

Actors by Function	Uganda	Kenya	Remarks
Major Research Institutions	National Agricultural Research Organization (NARO)	KARI Tigoni Potato Research Center	These national agricultural Research Institutes have many offices in the country
Major NGOS involved in advisory services	International Potato Center (CIP), AFRICARE, Appropriate Technology Uganda	International Potato Center (CIP)	Agricultural NGOs in production areas play some role even if their mandate may be another agricultural commodity.
Seed Sources	Self, Neighbours, Seed Multipliers	Self, Neighbours, Seed Multipliers	55% reported using self supply for seeds (CIP Survey, 2005)
Source of Clean Seeds & New Varieties	Kalengyere Research Station	KARI National Potato Research Center, Tigoni	Though farmers are largely not using clean seeds, there has been a better adoption of new varieties in Uganda (72%) compared to 53% in Kenya.
Seed multipliers	Farmers Associations e.g. Kapchorwa Seed Potato Producers Association, Buginyanya Research Station. Also Kalengyere Research Station	Agriculture development Corporation which has collapsed. Small private companies eg. Midland, Farmers Training Centers eg. Njabini FTC, KARI sub-stations in the countryside, Farmers groups like the Kenya Potato Growers and Marketing Association	No large scale private sector involvement.

Actors by Function	Uganda	Kenya	Remarks
Extension services and Training	Ministry of Agricultural Extension services, Farmers Training Centers, Agriculture Research Centers, Farmer groups, NGOs e.g. AFRICARE, CIP	Ministry of Agricultural Extension services, Farmers Training Centers, Agriculture Research Centers, Private Companies and Traders, NGOs e.g. CIP, Farmers Groups	Only 18% of farmers in Kenya and 31% in Uganda reported having received agricultural advice (CIP Survey, 2005). Some of the National Agricultural Advisory Services (NAADS) have been privatized.
Source of Pesticides and Fertilizers	Importers, Traders in small urban centers, seed companies	Importers, Traders in small urban centers, seed companies	More fertilizers used in Kenya (89%) than Uganda (7%) (CIP Survey, 2005)
Main Markets	Kampala and Mbale towns form the major potato markets for Kapchorwa, Sironko and Mbale districts, while Kampala and Kabale towns form the main markets for Kabale district.	Nairobi (Wakulima Market prices form basis for prices in other regions), Mombasa, Nakuru, Central Kenya Towns	Every town have a wet market where potatoes are sold. The potatoes are now retailing in some of the supermarkets in Kenya
Main Players in the Market	Brokers are responsible for bagging and loading transport vehicles. They identify buyers and negotiate prices. The French Fries Processors in cities buy from the main market centers and rarely buy directly from the producers. There are a few wholesalers who also play the broker's role		For most food crops that do not have an export market, brokers play a key role in marketing from the farm and in the wet markets
Actors by Function	**Uganda /Kenya**		**Remarks**
Actors by Function	**Uganda /Kenya**		**Remarks**

Actors by Function	Uganda /Kenya	Remarks
Brokers and Wholesalers' costs , Margins & Prices	Pay county council cess, open air market space rent, cost of empty bags and sewing sisal ropes.	The brokers can retain 20-60% of the prices offered to the producers (S.K Mbugua & R. Omungo, 2002). Prices determined by cost addition rather than strictly by market forces.
Determination of price	Marketing agents control, determine and set the buying prices for the producer as well as the selling price to the consumer. The prices vary a great deal over short periods of time due to oversupply at harvest. The sale bag is too big and un-standardized especially for urban supply.	Consumer prices for major urban centers are however subject to supply and demand forces due to competition among suppliers from different production areas.
Processors	Besides the French fries restaurants, there are a number of factories that process potatoes into crisps. Crisps are increasing in importance especially to the children who find this snack a delicacy. Children consume a lot of chips (French fries) and demand increases over the school holidays	Crisps have a long shelf life, are light and have the potential to be exported.
Credit	No particular agency provides credit specifically to potato producers. This is due to lack of strong farmer associations like other crops where co-operatives are a major source of credit	Potato producers sometimes benefit for credit meant for the other agricultural produce they are involved in e.g. milk co-operatives
Transport	Transporters	Poor roads a major hindrance