POST-HARVEST INNOVATIONS FOR BETTER ACCESS TO SPECIALIZED WARE POTATO MARKETS: A PROPOSED BUSINESS CASE, UGANDA

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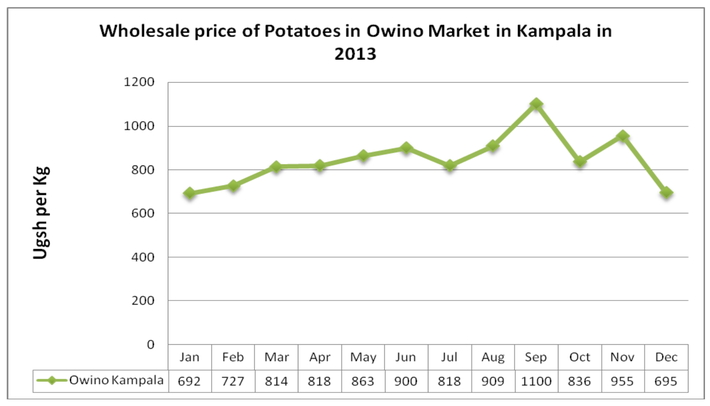
Introduction

- Potato production in Uganda was estimated at 775,000 tonnes in 2013 up from 573,000 tonnes in 2004 with an on-farm yield of approximately 7t/ha (FAOSTAT, 2014).
- Prominent potato producing areas include Kabale, Kanungu and Kisoro districts in Southwest Uganda and Kapchorwa, Mbale, Bukwo, Kween and Sironko districts in Eastern Uganda.
- Potato is produced twice a year during the rainy seasons resulting into excess supply during harvest periods (January, June, July, August and December) and shortage in supply on the market (March, April, May, September, October and November) when crop is in field.
- 95% of ware potato is traded as fresh tubers in local markets, consequently the inconsistent supply causes seasonal price fluctuations which negatively impact producers, as well as traders and consumers.
- Access to improved pre- and postharvest management techniques especially storage is limited in Eastern Uganda. In order to minimize postharvest losses farmers harvest prematurely (30% yield reduction) or sell immediately after the main harvesting season at very low prices.
- At the time of gluts in the market farmgate prices drop to as low as 0.08 $/kg which hardly covers production costs, while in times of scarcity farmgate prices rise to about $0.44 per kg (Fig. 1).

FIG. 1 - WHOLESALE PRICES OF POTATO IN OWINO MARKET IN 2013 (FARMGAIN, 2014)



- This project, therefore, intends to introduce and evaluate storage innovations at individual, association and at wholesale-trade levels to ensure safe storage of potato for longer periods to ensure steady supply of potato to the market.
- Consistent consumers of potato (e.g. operators of fast food outlets, crisp makers, super market chains and hoteliers) shall benefit from steady supplies while traders shall be able to stock up in seasons of plenty and release back into the market in seasons of scarcity hence stabilizing market prices.

Demand for the innovation

- The scoping study showed that producers sell only when a reliable trader/transporter is available. Transporters/wholesalers/retailers sell within 3-5 days otherwise they incur 15-30% losses due to spoilage during handling and storage.
- Despite producers having some traditional storage practices such as pitting, mudded dark granaries, room in the house and use of local maize cribs it was shown that such practices are inefficient to maintain tuber quality as they tend to green and degenerate in taste. Furthermore, existing storage practices and methods can only cater for limited quantities and hence are not sufficient to handle current levels of production (Fig. 3).
- Limited sources of alternative income coupled with urgent need for cash to meet other obligations, such as school fees, clothing and medical expenses, force farmers to sell immediately after harvest. Introducing the proposed technologies would enable actors in the potato value chain, especially producers, to extend stored potato shelf-life without compromising quality and thus supply potato over another 3-6 months over the period of scarcity after bumper harvest.

Approach

- A three-tier approach is proposed to addressing postharvest losses of ware potato involving:

1. Small-scale individual-producer level household ambient stores which are constructed using local materials like thatch grass, poles and dried reeds (Fig. 4). This kind of storage may have capacity of about 4t and may cost about $400 which is likely to be affordable by women. Farmers will also be trained in postharvest handling techniques (i.e. dehaulming, proper harvesting, sorting, grading and packaging) which affect shelf life.
2. Association level comprising of improved ambient stores with capacity of about 30–60t at an estimated cost of $2,500–$5,000. This kind of storage is proposed for farmer groups or associations (20–30 members) with mechanisms and management capacity in place to jointly collect, store and market produce (Fig. 5).
3. Wholesale/processor-trade level: coolbot which is a room measuring 8 ft x 10 ft x 8 ft on a raised platform with insulated walls and a solar powered air conditioning system with controller to enhance cooling and ceiling rotating vent to ensure ample air circulation (Fig. 6. A coolbot can store about 20–40t of potatoes and cots $5000–$10,000 depending on its size.

- Evaluations and demonstrations of the 3 proposed technologies will be held in the following sites: Kapchorwa (1,800 m), Kween (1,900-2,300 m), Wanale (1,800-2,000 m), Mbale (1,200 m) and Kampala (1,200m).

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Research questions

1. What are the pre-storage practices required to maintain ware potato quality during storage?
2. How long can we store potatoes under different technologies and what is the effect of different varieties?
3. How can male and female value chain actors even out potato supply through manipulating varietal differences in maturity and dormancy periods?
4. What are the gender sensitive strategies to enable value chain actors to engage effectively, competitively and sustainably in the newly identified market opportunities?

Feasibility

- The proposed storage interventions have been piloted and adopted in Bangladesh and Kenya (CIP 2014).
- Technical feasibility: findings in Kenya revealed that the crisping quality of potato remains unaffected when stored at ambient temperatures of 120C to 170C (Kibar, 2012).
- Economic feasibility: male farmers who invest in household-level storage shall be able to increase their profit margins from 27% to about 59% while women who make the same investment can improve their margins from 19% to 55% (Fig. 2).
- A processor who requires 600kg of potato daily invests in a coolbot, would be able to annually save about $3000 as a result of prices fluctuating above the annual average wholesale price of Ugx 844 per Kg in Owino market.
- Social feasibility, household-level technology will be especially beneficial to women and youth in various activities along the potato value chain especially marketing

FIG. 2 - PROFIT COMPARISONS FOR MEN AND WOMEN IN KAPCHORWA

Details of Potato farm budget	Men without storage	Women without storage	Men if storing for 2-3 months	Women if storing for 2-3 months
Production cost (Ugx/acre)	1,780,000	1,976,000	1,780,000	1,976,000
Production cost per Kg	254	282	254	282
Average storage costs* (Ugx)			250,000	250,000
Yield (Kg/acre)	7,000	7,000	7,000	7,000
Farmgate price (Ugx)	350	350	700	700
Gross revenue (Ugx)	2,450,000	2,450,000	4,900,000	4,900,000
Gross profit (Ugx)	670,000	474,000	2,870,000	2,674,000
Profit per Kg	96	68	410	382
Margin (%)	27%	19%	59%	55%

FIG.3 - STORAGE METHODS IN URBAN & LOCAL MARKET

PROPOSED STORAGE TECHNOLOGIES

FIG. 4 - IMPROVED LOCAL STORE DESIGN

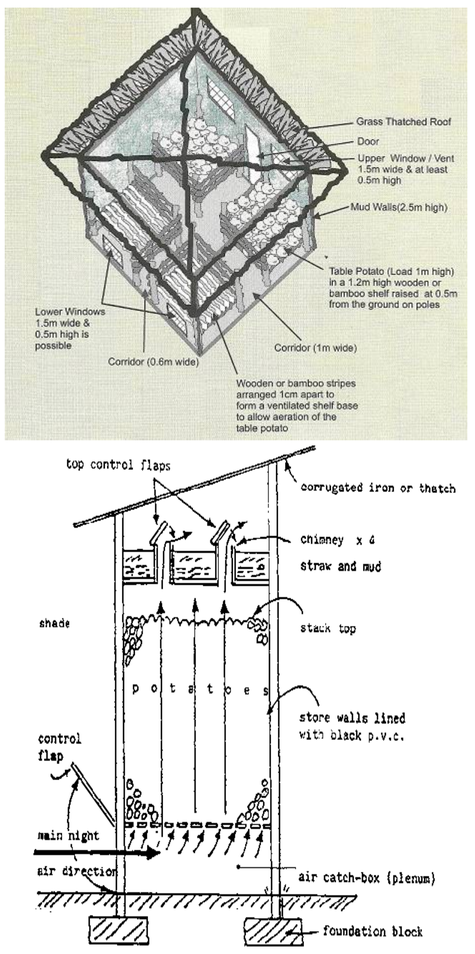

FIG. 5 - AN AMBIENT POTATO STORE IN KENYA

FIG. 6 - A COOLBOT IN BANGLADESH

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Acknowledgement

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