EXTENDING THE SHELF LIFE OF FRESH CASSAVA ROOTS FOR INCREASED INCOMES AND POSTHARVEST LOSSES REDUCTION IN UGANDA: A PROPOSED BUSINESS CASE

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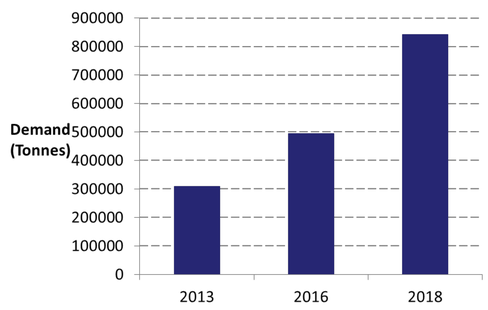
Introduction & Justification

- The major constraint facing the large-scale production and marketing of fresh cassava (*Manihot esculenta*) roots is the rapid postharvest physiological deterioration (PPD). Biochemical changes occur in stored roots and in the functional properties of their starches, thereby adversely affecting the flavor, texture and general eating quality of cassava roots.
- Roots perishability implies short marketing period, leading to high discounting and sometimes postharvest losses (PHL) of up to 90% of initial value. To reduce losses in quality and quantity, sellers charge very high retail prices. This reduces utilization and further market growth.
- Storage in cool and humid environments, such as in humid saw dust, show promise in reducing postharvest losses of fresh roots. Other technologies such as waxing also extend the shelf life and they are in use elsewhere. Although waxing is expensive, fresh cassava prices are high, at about Uganda shillings 1000 per kg.

Women retailers dominate the fresh roots value chain. In Uganda, fresh roots total consumption is estimated at 1.32 million tonnes, out of which 309,528 is marketed. More people are relying on markets for incomes and food. Estimates indicate demand to increase by an average of 60% per year, reaching a total of 841,917 tonnes in 2018.



This business case will test and validate similar technologies in Uganda, using PMCA and feasibility analysis. It will also analyze current value chains to determine critical improvements. Development outcomes will include increased incomes to growers and marketers, especially women traders; better functioning gender sensitive value chains and better marketing opportunities.

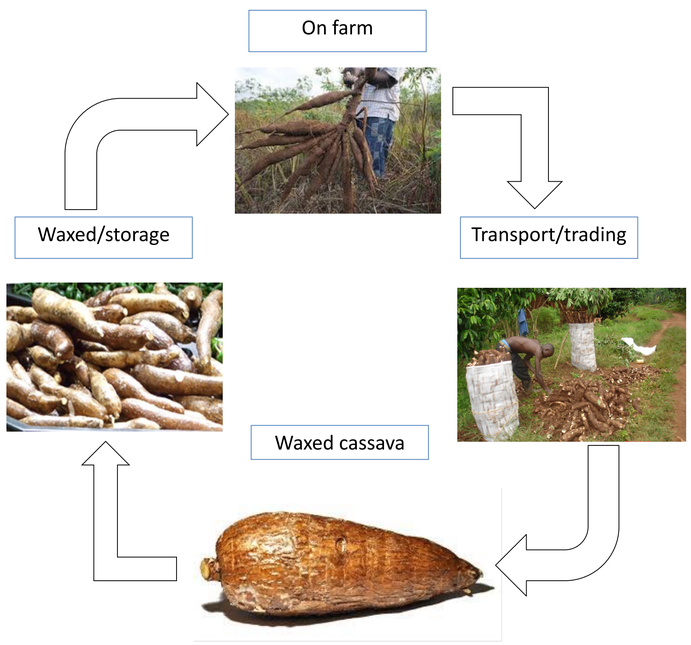
Objectives

- To build the capacity of traders especially women with knowledge and skills of minimising fresh cassava postharvest losses.
- To increase the competitiveness and profitability of strategic agro-enterprises along the fresh cassava value chain for increased household incomes.
- To increase the ability of farmers, traders and consumers to enhance fresh cassava product diversification, value addition, storability and safety of fresh cassava.

FRESH CASSAVA ROOTS WITH DESIRABLE ATTRIBUTES

FRESH CASSAVA RETAIL MARKET DOMINATED BY WOMEN

POST-HARVEST LOSSES CAN OCCUR ANYWHERE ALONG THE VALUE CHAIN



Materials and Methods

The approach used was a uniquely collaborative and participatory research effort that will aim at finding, testing and validating technologies that increase the shelf life of cassava and increase market opportunities

•A thorough analysis and characterization of markets in terms of demand segments, consumer preferences by gender, quality characteristics and specifications, and general trends

•A desktop study and knowledge sharing on most efficient technologies that have successfully been utilized elsewhere

•Using Participatory Market Chain Analysis (PMCA), in the identification of critical constraints and opportunities for increasing the market opportunities

•Introducing and testing viable technologies for extending shelf-life of fresh cassava roots, and validating the benefits of cassava new shelf-life extension technologies on reduction of losses, quality, price and consumer demand

•Areas included fresh market end markets in Kampala, Jinja, Mukono. Supermarkets, large farmers and consumers were interviewed.

•Market analysis was done using quantitative data to analyze for size and current and future trends in volume and prices.

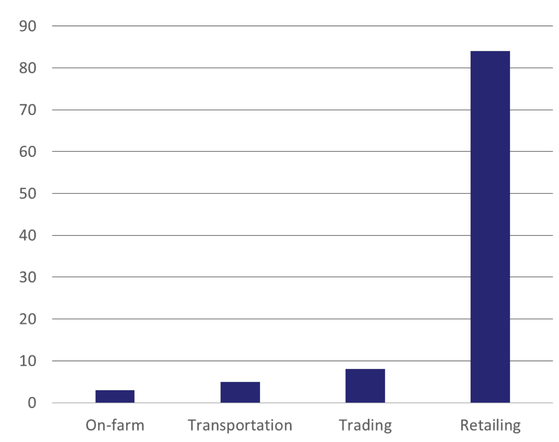
Results and Discussion

Consumers and traders were not aware of the range of storage methods for fresh cassava roots available in Uganda and where interested in knowing more about fresh cassava storage to increase shelf life. The local preservation methods some retailers are using is by soaking roots in water which could keep roots for 5-7days if the water is changed every day while others cover the cassava roots to keep them in humid conditions.

Postharvest losses of fresh cassava are highest at retailers and consumption level due to poor methods of storage and lack of preservation methods. Women play a prominent role in retail trading of fresh roots in the markets.

Supermarkets like Nakumat and Capital Shoppers tried to penetrate the fresh cassava value chain with little success due to the short shelf life of the fresh roots. The roots in the shelf last 2-3 days only due to lack of preservation methods.

Based on the results of the scoping study, these technologies will maintain the desirable attributes of fresh cassava roots (appearance, taste, starch content and whiteness) demanded by major supermarket and export markets.



A lot of research has been made elsewhere to understand the factors that aggravate PPD and the technologies to reduce losses from PPD. A number of them exist and a few are already in use, including the proposed technology for this business case ie waxing. Waxing has been found to be effective in extending the shelf-life of cassava and has enabled countries like Costa Rica to export fresh cassava roots. The technology is known to be used on other commodities such as fruits, vegetables and candy to make them shiny and pretty in addition to retarding moisture loss and spoilage. It has a similar impact on fresh cassava appearance. Cassava roots are dipped in melted paraffin wax at 51.5^0 C to 52.5^{0}C (125^{0}F to 127^{0}F) for one second which adds a smooth thick surface coating to the root. This coating helps to reduce root moisture loss and it drastically extends shelf life to up to 2 months. Further, discoloration of the vascular tissue is reduced. Immediately after waxing the roots will be placed in clean, strong, well ventilated carton boxes.

Paraffin wax is a chemical preservative. It has a potential to open up future research into using plant origin materials to reduce the cost incurred by using paraffin wax.

Waxing will undoubtedly add cost that might translate into higher prices of cassava roots. The process will slightly extend the time required to prepare fresh roots for marketing. The added costs are due to the extra labor and/or equipment needed to apply the wax, along with the cost of the wax material. However, there is a high probability that this cost will be met by the market. Consumers are already paying high prices in urban markets serving low income earners. Consumers in upscale markets like supermarkets pay even higher prices. The only main challenge has been lack of reliable supplies.

Fresh cassava is a delicacy and highly demanded by both women and men. Economic growth is creating a high income and highly educated class that shops in supermarkets. Therefore it is most likely to appreciate this innovation. Given the high levels of education, this class would easily understand the food preparation instructions and the fact that the wax has no effect on safety.

Conclusions

All along the fresh cassava value chain, actors desire to consume the product very quickly due to postharvest deterioration of the roots. Cassava is usually harvested either late evening, packaged and transported overnight to try and reach markets when it is still fresh. Given these hard conditions, many female traders find it very difficult. A technology that extends the shelf-life by such a long period (2 months) will release marketing pressures off traders and especially women traders. Labor requirements are also limited in such late hours. Therefore, by allowing for an extended period of harvesting, the technology will help stabilize prices. Uganda shoppers prefer a fresh product all of the time. This technology provides it.

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