

# IMPROVED CASSAVA CHIPS PROCESSING FOR EFFECTIVE POSTHARVEST LOSSES REDUCTION AND INCREASED FOOD AND INCOME SECURITY IN UGANDA: A PROPOSED BUSINESS CASE

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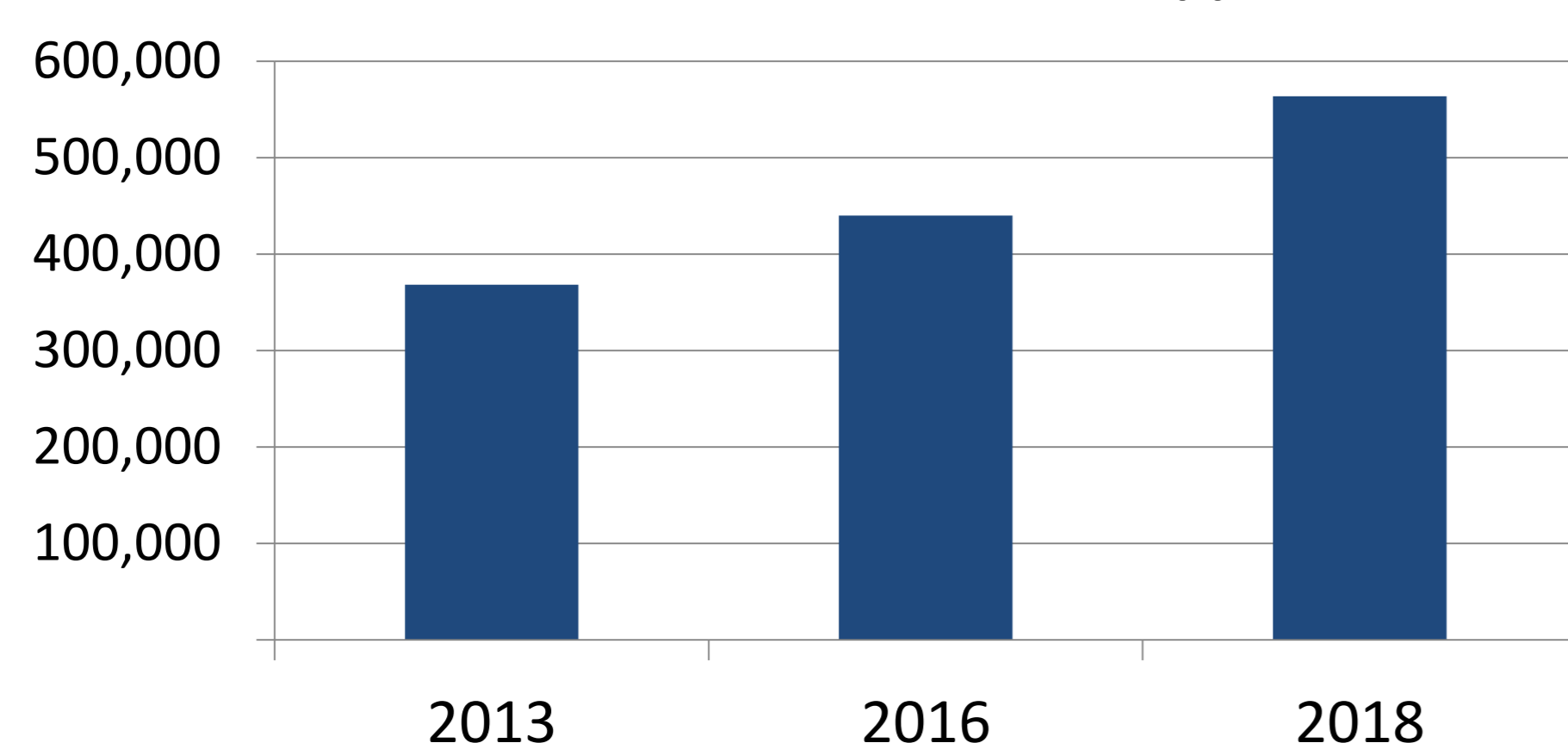
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## Introduction & Justification

- Cassava (*Manihot esculenta*) is the second most important staple crop in Uganda. Processing and marketing cassava chips is a major activity providing income mainly for rural women.
- Cassava chips market is big and growing. Total chips consumption was 620,383t (2013) of which 368,275t was marketed. By 2018, market demand will reach 563,717t.
- Major growth market segments include food, bakery products i.e., chapatis, mandazi, pancakes, industrial brewing all of which demand quality chips at competitive prices.

CASSAVA CHIPS DEMAND TREND (t), 2013 - 2018



- Due to poor quality, the industry is losing an estimated USD 60 million annually. Attempts to introduce improved motorized chipping with farmer groups have largely not been successful in supplying these markets due to inefficient chipping, poor drying and business management and weak value chains that have very limited private sector participation.
- Improving chipping, drying facilities and creating more robust private sector driven and managed supply chains will reduce these losses, increase processing capacity and market access and lead to increased incomes and food security.
- Women play a bigger role in chips processing. The improved chipping and drying technologies will not only increase incomes to women processors but will also release their labor for other activities. All inclusive and better functioning value chains will in turn lead to increased productivity, more output, incomes and investments and hence better standard of living for rural poor. Increased processing and marketing will lead to more off-farm employment opportunities.

## Objectives

- Characteristics of the different market segments for cassava chips in terms of consumer preferences (gender disaggregated), prices, demand seasonality, size, quality specifications and growth trends and opportunities determined.
- Most efficient processing technologies for chipping and drying cassava identified, tested, validated and promoted for wider uptake.
- Capacity of both users and beneficiaries in inclusive business planning, and processing enhanced via learning alliance and in-house trainings.
- Best marketing strategy that works for the poor producers and processors designed, tested and implemented (win-win, equitable incomes).
- Gender sensitive improved value chains for cassava chips identified, developed and being implemented.
- Effective communication strategy that promotes and facilitates up and out-scaling designed and being implemented.

## Materials and Methods

- Uniquely collaborative research effort involving 5 research institutions, including IITA, Afrii, NARO, IIRR, Makerere University, private sector equipment fabricators and millers.
- Initially a desk study was conducted to understand market trends, and their needs, challenges to processing, current business models.
- Use of focus group discussions involving traders and processors.
- Informal interviews with key informants, traders, and end markets.
- Observations of processing, marketing practices.
- Analysis of primary data
- Conducted in major urban consumption centers of Kampala and Jinja. Focused on major supply areas within Busoga, Teso and Lango regions.

## Results and Discussion

- Two main markets are driving improvements in the quality of chips. One is the market for bakery products other than biscuits and bread. It includes products made from soft wheat i.e., chapatis, mandazis, pan-cakes. It is paying a premium price of Uganda shillings 800. Current potential stands at about 90,000 tonnes per annum.
- The second main market is the brewery market. Its current demand stands at 5,000 tonnes but it is expected to grow tenfold in the next 3 years, according to industry experts.
- None of these markets is supplied directly by current cassava processing sites. A number of reasons explain this, including lack of capital and requirements to enter these markets. These markets are being supplied by traders, mainly medium and large scale. However, discussions have been held in the past.
- There is growing evidence of increased demand for drying and chipping technologies. Traders in major urban centers rewash the chips to try and make an improved product. This product is sold at a premium which is higher by between 100 and 200 shillings, depending on the season.
- All processing centers have been contacted for supplies of high quality chips but they have failed to meet the demand. Sun drying is the mode of drying and with current rainfall season, it is very difficult for the processing to achieve commercial volumes of good quality. Most of them do not chip optimum sizes which also has implications in terms of drying.
- There is evidence of new actors and models. Two main ones stand out. One involves a business partnership between farmer group processors and intermediate traders who have tried to pay upfront for cassava chips.
- The other involves individual traders who are directly providing a market to individual growers. These traders are building their own supply chains. Both of these models offer opportunities and bring in the much needed finances.
- Apart from enough finances, drying is the most critical challenge. Artificial drying is expensive and yet it would require chips that have already been dried to at most 16 – 17%. The most feasible drying technology would be a walk-in solar drier. To hasten the process, chips would need to have a diameter of 5 mm.



TRADITIONAL DRYING  
POOR AND LABOR  
INTENSIVE



PRESENT DRYING  
METHODS ON RAISED  
PLATFORMS



PROPOSED DRYING  
TECHNOLOGY  
(Improved sun  
dryer)

## Conclusions

- Products from cassava chips have a wide area of utilisation including processing into flour used in plywood, brewery and bakery industries.
- Currently, a number of processors cannot satisfy the demand for good quality chips from the brewery, millers, and snack food processors. This is due to weak business models and difficulty in drying especially during the wet season. During sunny conditions, there is risk of contamination from sand while during the rainy season it is very difficult to dry chips leading to low volumes, increased prices and less market access.
- There is a huge opportunity to improve competitiveness of improved cassava chips by improving drying techniques and increasing quantities to reduce unit costs of production.
- However, new drying technologies, efficient chipping and new all inclusive business models have to be identified and promoted if postharvest losses in cassava chips are to be reduced and utilization expanded. Increased processing will create more income opportunities especially for women thereby improving gender balanced development.

HIGH QUALITY CASSAVA CHIPS



A WOMAN CHIPPING CASSAVA



## References

- Graffham et al., 2000. Industrial Markets for Starch-Based Products: An Assessment of the Industrial Potential for Cassava in Uganda.
- Kaaya and Eboku, 2010. Mould and Aflatoxin Contamination of Dried Cassava Chips in Eastern Uganda: Association with Traditional Processing and Storage Practices. *Journal of Biological Sciences*, 10: 718-729.
- Balagopalan, 2002. Cassava utilization in food, feed and industry. In: *Cassava: Biology, Production and Utilization*. Hillocks, J.M. Tresh and A.C. Belloti (eds). CIAT. Colombia, pp. 301-318.
- Nweke, 1994. Outlook on Agriculture, 1994, Cassava processing in sub-Saharan Africa: the implications for expanding cassava production. pp 197-205.

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