



Analysing the Postharvest System in Ghana: Case of Cassava

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August 12 – 14, 2013

Wageningen



Outline

1. Introduction and objectives

2. Cassava Case study

- Postharvest loss
- Centres of Excellence for training and research
- Strategies to minimize losses

Why the study?

- To identify priority commodities of national economic importance with opportunities for value addition in Ghana
- To provide a methodological framework for assessing and understanding the status of postharvest knowledge systems

Ghana and Agriculture

- **Ghana:** - Located on the West Coast of Africa
 - Population is approx. 25 million

Agro-ecological zones

— Guinea/Sudan Savannah

- Upper East Region
- Upper West Region
- Northern

— Derived Savannah

- Brong Ahafo Region

— Forest zone

- Ashanti Region
- Western Region
- Eastern Region

— Coastal Zone

- Central Region
- Volta Region
- Greater Accra Region

Ghana and Agriculture

- Agriculture continues to contribute the largest share to the Gross Domestic Product (GDP) in Ghana
- Agriculture is predominantly practised on smallholder, family-operated farms using rudimentary technology to produce about 80% of Ghana's total agricultural output
- It is estimated that about 2.74 million households operate a farm or keep livestock
- According to the 2000 census, 50.6% of the labour force, or 4.2 million people, are directly engaged in agriculture

Objectives of case study

1. Identify the top ten locally produced crops based on the available production and consumption statistics and to identify commodities that have been earmarked for food security in Ghana
2. To identify the top priority commodity of national economic importance with opportunities for value addition
3. Document the existing methods of processing along the supply or value chain.
4. Determine the main areas where postharvest losses occur and estimate the losses
5. Assess the status of postharvest knowledge - handling, processing and packaging facilities, and capability for engineering and equipment design
6. Compare the existing practices to the current state of the art/knowledge of postharvest handling based on literature and document the differences.
7. Identify the centre(s) of knowledge/excellence in teaching and research on postharvest and the major areas of focus
8. Assess the human, infrastructural and institutional capacity and readiness to generate, disseminate and use postharvest knowledge across the value chain
9. Determine what additional data is needed to guide policy and strategic interventions to improve the postharvest knowledge system based on findings.

Top priority commodities in Ghana

Commodities earmarked by Ghana for food security

- Maize
- Rice
- Cassava
- Yam
- Cowpeas

Top ten commodities based on consumption and production

- Cassava
- Yam
- Plantain
- Maize
- Cocoyam
- Rice
- Groundnut
- Cowpeas
- Sorghum
- Millet

Identify top priority commodity

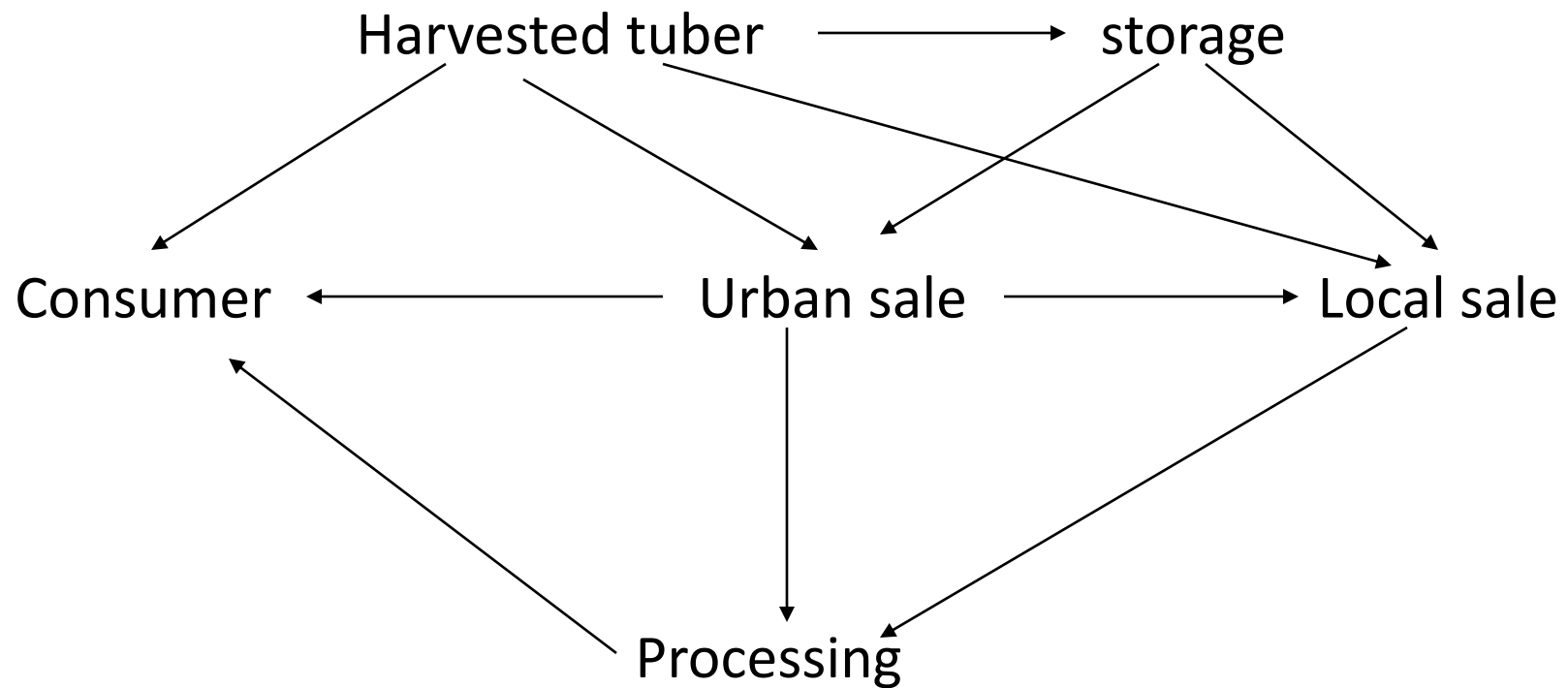
- Cassava ranked second after maize – **Reasons as follows:**
 - Demand for cassava is expected to continue to grow strongly due to its wide-ranging applications for food and processing into many products eg. starch, flour, feed etc.
 - Even though lower in terms of preference, more resilient to regularly occurring drought conditions in places where it is grown and across the region.
 - Has the highest potential for value addition and use as export crop.
 - Preservation methods to keep it over time are widely known.
 - Several value added forms at college level and potential for production of commodities of export.
 - Large market and easy to process

Cassava

- Cassava is a crop with very low production cost, extremely resilient, and performs well on marginal lands
- Cassava is grown throughout Ghana and it is cultivated as a monocrop or intercropped, either as the dominant or subsidiary crop
- The bulk of the nation's cassava is produced in the south and middle belt of Ghana
 - accounts for roughly 78% of the total cassava production in Ghana

Postharvest handling of Cassava

- **Postharvest handling of cassava is very simple**



Cassava Postharvest loss (Literature)

- FAO data (2009) estimates post-harvest losses for root crops in Ghana are of the order of 15 to 30 percent
- Rickard *et al* (1992) indicated low levels of physical post-harvest loss of cassava and estimated losses unlikely to exceed 5 percent
 - Figures usually do not indicate at which stage of the chain the losses occurred and variations in production centres
 - In addition, available data often do not differentiate between post-harvest deterioration of fresh cassava and loss of processed products
- Estimates of total loss recorded along the value chain by Egyir *et al* in 2008 are 25.46% and 11.48% in the major and minor seasons respectively
 - Highest loss recorded during harvesting and assembling on the farm - damage

Processing cassava into Gari



Cassava Postharvest loss

- According to the farmers and gari processors in Manchie, the cassava tubers begin to deteriorate within a day or two after harvesting therefore processing has to be done immediately after harvesting
- Although cassava is such a perishable commodity, there are no effective methods available for prolonging the shelf-life of the tubers after harvesting so the only method used currently is **delayed harvesting**
- Harvesting of the cassava in Manchie is done manually by pulling the root out of the ground where the soil is wet/soft or by the aid of a machete when the soil is very dry
- Harvesting is done early in the morning by the processors and used in the same day or harvested in the evening and used in the morning of the next day
 - This is to ensure that the cassava does not deteriorate

Cassava Postharvest loss

- Varieties that are best used for gari processing are “Bankye hema” meaning “cassava queen”, “Tech” or “Benin”
 - varieties introduced by the extension workers with others
 - Processors identified varieties above as best suited for gari processing through trial and error
- Farmers in Manchie have very little to do with the cassava after it has been cultivated
 - Harvesting is done by the processors
 - The cassava is sold by demarcating a section of the farm and selling to the processors
 - The processor has no choice if the cassava that is harvested are small in size or of low quality

Cassava Postharvest loss

- Peeling of the cassava is mainly done at the traditional level using sharp knives
- Peels are sliced off the whole roots taking off some of the edible white parts
- The processors indicated that slicing the peels off was a faster method and although they tend to lose some of the edible parts, the amount lost is minimal in terms of time conserved for other processes
- Roasting is done with open fires using cast iron pans
- Traditionally, one processor roasts the sieved mash until the dry and crisp gari is obtained
 - In Manchie, however, it was observed that roasting of the pressed mash is usually done as a team with between 3 – 4 processors roasting
 - The first processor will roast till it reaches a particular moisture content and then it is transferred to a second processor until it reaches the last processor who will roast till it reaches the required moisture content for gari
 - The processors indicated that the roasting is done in this manner to ensure uniformity in the final product and this method is less time consuming

Cassava Postharvest loss

- Discussion with the farmers and processors in Manchie showed that postharvest loss in cassava is **very minimal** especially since the cassava is harvested for processing
- Major factor for postharvest loss is deterioration but since the harvested cassava in Manchie is used for processing almost immediately, such loss is not recorded
- Egyir et al (2008) indicated that the average loss recorded for cassava during harvesting in the dry seasons is 2%
 - This figure is also largely due to physical loss such as breaking up of the root etc
- In Manchie, cassava for processing (grating) if used immediately after harvesting can utilize physically damaged roots, such a loss will not be recorded
- The processors indicated that loss for them is usually financial due to decrease in price or an increase in the prices of some raw materials
- **To obtain hotspots for cassava loss, discussions should be held with farmers during the wet season and in areas where the cassava is sent to markets for retailing**

Centres of Excellence for Postharvest Training and Research

Instituion	Department	Major focus area
University of Ghana	Crop Science (Postharvest Unit)	Physiology, processing and preservation, quality assurance, pathology and Pest management
	Agricultural engineering	Preservation and storage: Equipment design
	Agricultural economics and agri-business	Marketing and managerial aspects of agri-food business and agro processing
	Food Science	Processing and quality assurance
	Agricultural Extension	Technology dissemination
University of Cape-Coast	Agricultural Education	General Postharvest
University for Development Studies	Agricultural Technology	General Postharvest
Kwame Nkrumah University of Science and Technology	Agricultural Engineering	Preservation and storage: Equipment design
Ministry of Food and Agriculture	Agricultural Engineering Services Directorate	Equipment design
	Policy Planning Monitoring and Evaluation Directorate	Policy
	Agricultural Extension	Technology dissemination

Centres of Excellence for Postharvest Training and Research

Instituion	Department	Major focus area
Council for Scientific and Industrial Research	Food Research Institute	Food Safety, Processing, Equipment design
	Crop Research Institute	Technology development and dissemination
	Savannah Agricultural Research Institute	Technology development and dissemination
Ministry of Trade and Industry	Ghana Atomic Energy Commission	Pest management (Irradiation)
	Ghana Food and Drugs Authority	Regulatory Agency
	Ghana Standards Authority	Regulatory Agency

Areas needing intervention

(Gari processing in Manchie)

- Processors indicated they purchase cassava from the farmers by the size of the land which means if high yielding varieties are cultivated, it will also increase their gains
 - There is therefore the need to educate the farmers on using high yielding varieties and also educated on the need to adopt new and improved technologies
- Food safety issues were hardly addressed by the processors during the interview
 - Poor hygienic conditions were observed at the processing area and therefore the processors will need to be given some basic training on food safety and good hygienic practices.
 - There should be some stricter standards in place to monitor the production of gari for the local and export markets
- Knowledge on cassava and gari processing was acquired by processors through trial and error
 - It would therefore be best if the extension services for this industry were strengthened so as to provide the needed service to the industry.
- Access to the international markets by the gari processors was an area they requested for support. They indicated that they have the potential to produce larger quantities of gari but they have limited access to international markets and therefore would appreciate some knowledge on how to access those markets.

Strategies to Minimize Postharvest Loss in Cassava

- According to FASDEP II (2007), the Government of Ghana now intends to focus its efforts for greater effectiveness, sustainability and equity in impacts
- A value chain approach to agricultural development will be adopted with value addition and market access given more attention
- Efforts will be intensified to build capacity towards meeting challenges of quality standards in the international market
 - Focus will be on increasing productivity along the value chain
 - Improving standards in local markets and food safety

Strategies to Minimize Postharvest Loss in Cassava.....1/2

- FASDEP II has identified various areas that need attention along the postharvest value chain of cassava
- Some of the specific interventions are as follows:
 - Develop improved cassava varieties to meet various demands
 - Create awareness of existing improved varieties and their uses
 - Update protocols for GAPs in cassava production
 - Introduce improve technologies for production and processing of cassava
 - Support farmers to acquire knowledge and skills for adoption of technologies for cassava production and processing
 - Develop and promote utilisation of variety of products form cassava

Strategies to Minimize Postharvest Loss in Cassava.....2/2

- Improve market access by strengthening linkages among stakeholders in the cassava value chain.
- Collaboration with the private sector to build capacity of individuals and companies to produce and or assemble appropriate agricultural machinery, tools, and other equipment locally.
- Facilitate the establishment of mechanisation services provision centres, and machinery hire/ purchase and lease schemes that also have adequate backup of spare parts for all machinery and equipment.
- Develop human capacity in agricultural machinery management, operation and maintenance within the public and private sectors.

Problems Encountered in Traditional Processing of Cassava

- Literature from late 1990s (MOFA/FAO document) indicated the following:
- Several problems are encountered during traditional processing which have created an urgent need for mechanization and upgrading of processing
- Operations are often uneconomical because the product is not properly costed
 - for instance, there is heavy reliance on family labour which is not perceived as cost
- Operations are carried out on a very small-scale and the areas of manufacture may be unorganized and scattered
- The processing procedures are labour intensive and time consuming and mostly carried out manually
- Operations are not adequately mechanized because processors cannot afford equipment and do not have access to capital

Problems Encountered in Traditional Processing of Cassava

- Processing is often carried out under unhygienic conditions and some unsanitary practices such as improper effluent disposal during the dewatering of cassava mash have adverse effect on the environment
- Some operations such as the roasting of *gari* on open fires present a risk to the health of the processors
- Products may be of inconsistent organoleptic and microbiological quality because no formal quality system is applied during processing to assure the quality of the product
- There is rudimentary packaging of products
- **More than 10 years later ?????**



**Thank you for
the attention**

