

Value-Added Processing of Ghanaian Traditional foods

James Owusu-Kwarteng, PhD.

University for Development Studies

Faculty of Applied Science

Navrongo Campus, Ghana

Thematic seminar on value chains research

Tanzania Commission for Science and Technology

Dar es Salaam, Tanzania

28th October, 2014



content

- Introduction –brief
- Value addition along the Ghanaian traditional food chain –
 - Objectives & requirements
- Examples of value-added food processing in Ghana and key lessons
- Thematic areas to address
- Conclusions

Introduction

- There are clear indications that Agro-industries are having a significant global impact on economic development and poverty reduction.
- However, the **full potential** of agro-industries as an engine for growth has not yet been realized in many developing countries, including Ghana; predominantly due to a lack of competitive value chains
- African agricultural products compete in international and domestic markets with the exporters and imported products of Asia, Europe, and the Americas
- Developing **competitive agro-industries** is crucial for generating **employment and income opportunities** in Africa

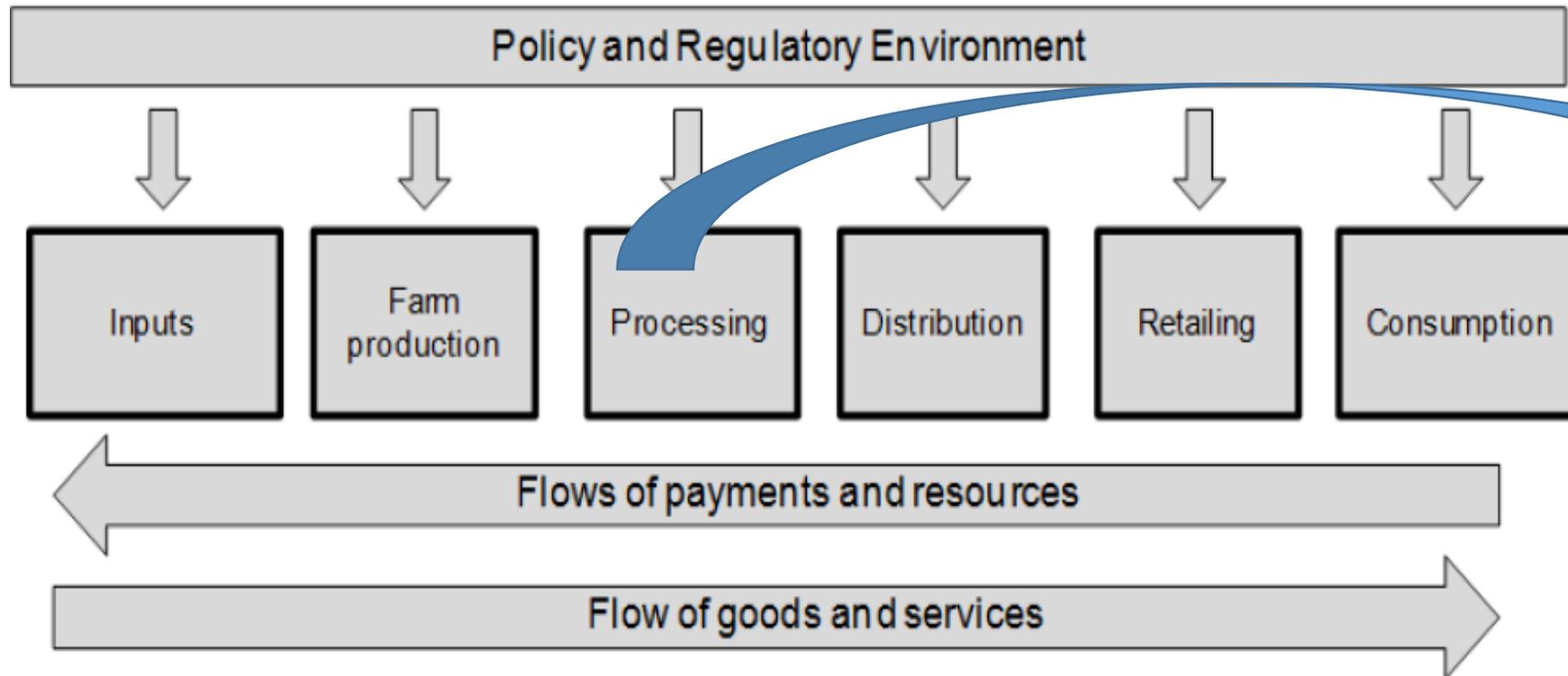
Introduction

- To achieve economic growth through agriculture, African countries need to increase the competitiveness of the **value chains** which take crops to consumers (local and international markets).
- To achieve economic growth that is **sustainable and reduces poverty** in Ghana, **value chains** must operate with expanded opportunities for traditional food producers and processors
- Traditional food processing (small-medium scale) constitute about 70% of agri-food processing in Ghana
- Traditional food processing is an important activity in the informal sector of the Ghanaian economy and provides a means of livelihood for a large number of rural and urban dwellers

Value addition along the food chain

➤ From production to consumption

- ✓ Increasing production is *necessary but not sufficient* to capture and maximize all the benefits from agriculture
- ✓ Developments in food production must occur in tandem with agro-processing



Average post-harvest losses are estimated at over 40%



Traditional food value chains



¢X

- Small scale/home based
- Majority of producers often women
- Operations are labour intensive & time consuming
- Lack of quality assurance & management systems
- Often fermented (spontaneously)
- Poor packaging

¢X+15

Requirements to cross over

¢X+90

Higher income
improved Nutrition
Healthy and Safety assured
Avoiding post harvest losses
Accessible markets (local and international)
Etc.



Value addition along the food chain

- Requirements for increased value addition along the traditional food chain
 - **Research, Innovation and technology transfer** is a key driver of economic growth through creation, diffusion and use of knowledge
 - **Educated staffs** are required in all step of the food chain (**Capacity building**)
 - **Technical development strategies** are required in order to develop value added food products with better returns to **farmers and processors**
 - **A strong collaboration** between the public and the private sector in Africa and beyond; including **accredited analytical laboratories** and **consultancy services**

Value addition along the food chain

➤ Research, innovation and technology transfer

1. Improving fermentation and other processing technologies – Gari production



Peeled cassava



grating



de-watering
& fermentation



roasting



packaging

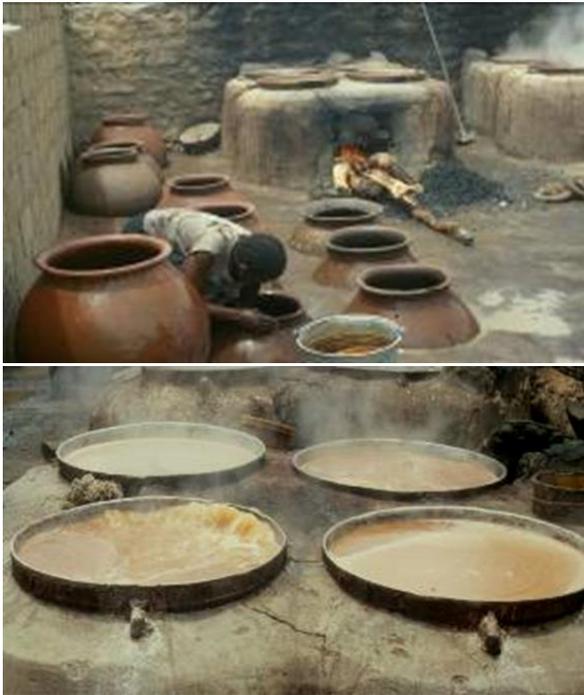


Sustainable Ghanaian beer production

Yeasts optimized for traditional African beer production is required!!!

- Starter cultures developed and tested in our research under DANIDA funded FFU project

Saccharomyces cerevisiae yeasts isolated from indigenous sorghum beer ("Pito")



Traditional beer 'pito' brewing



Pito brewing pilot plant at Food Research Institute, Ghana (transfer of technology to industry?)

Improving fermentation technologies – cocoa beans in Ghana



"... Tray 10 Fermentation" is a term for a perfect fermentation of the cocoa beans. The beans ferment in stacks of 10 cm high trays. This allow the beans to aerate evenly and perfectly in the process."

Traditional heap fermentation

Improved tray fermentation

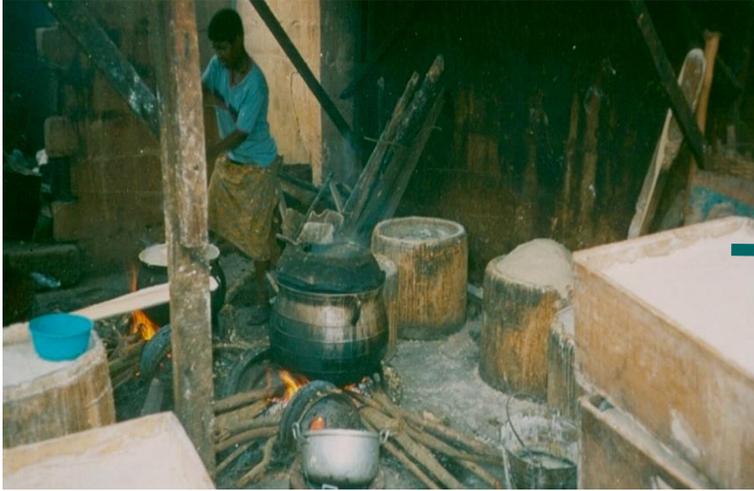
From value addition process in Africa – to quality products in Europe – higher incomes

Advantages moving from heap to tray fermentations:

- More homogenous fermentation
- Better aeration – increased acetic acid concentration and lower levels of molds
- Reduced loss of cocoa beans
- Better quality of the beans – higher price
- Less labor-intensive

"...We (Anthon Berg) use a quite new fermentation technique developed by "The Coco Research Institute of Ghana". We call the technique "Tray 10 fermentation". A designation for the perfect fermentation of cocoa beans."

Improved starter culture and up-scaling 'kenkey' production in Ghana



- ✓ Upgrading of wooden fermenter to hygienic design
- ✓ Introduction of HACCP standards
- ✓ Use of starter cultures introduced
- ✓ Optimized aroma formation
- ✓ Binding of aflatoxin B1 by yeasts (aflatoxin binding starter cultures)

Other products studied under DANIDA projects

1. Millet based (cereal) - *fura and koko*
2. Protein rich seed condiments – *dawadawa and kantong*
3. Milk – traditional yoghurt (*nunu*)

Research on these products have included the following;

- ✓ Fermentation microorganisms characterized based on modern molecular techniques
- ✓ Safety and probiotics potential studied
- ✓ Starter cultures proposed and tested
- ✓ Upgrading of some processing technologies
- ✓ Introduction of good manufacturing/Hygienic practices (GMP/GHP)
- ✓ Value addition for enhanced nutrition (through cereal-legume blends)

Capacity building – a multidisciplinary approach

➤ Research projects

1. DANIDA-ENRECA capacity building projects through project titled '*capability building for research and quality assurance in traditional food processing in West Africa*'
2. '*Value-added processing of underutilized savanna tree seeds for improved food security and income generation in West Africa*', 09-072KU
3. '*Preserving African food microorganisms for green growth*', 13-04KU

- Training visits and exchange programs
- Education (BSc, MSc, PhD)
- Continuing education
- Transfer of knowledge to SMEs, consultancy
- Quality assurance in the food industry(GMP/HACCP)
- Establishment of laboratory facilities, implementation of equipment and analytical protocols
- Accreditation of laboratories (GLP/ISO17025)



Accredited laboratories in West Africa

**First accredited laboratory in West Africa:
Food research Institute (FRI), CSIR, Accra, Ghana**

**ISO 17025 standard
(Food analyses)**

Sponsor: Danida and EU

- **FRI and DANIDA assisted University for Development Studies and other institution to establish Good laboratory practices geared toward accreditations**



Collaborations and Partnerships

Partners: Universities, technological research institutes, enterprises – governmental organisations, embassies, NGOs, women organisations etc

Examples:

- African network (North-South; South-South) through Danida-projects
- PPPs (Public Private Partnership)

*UDS-DANIDA laboratory has MoU with Ghana Food and Drugs Authority to carry out microbiological analysis on food and water samples in northern Ghana

Thematic areas to address

- 1. Innovation and technology research** : To develop a competitive agribusiness industry through value-addition, it is crucial to invest in agro-processing research and technology. This must be coupled with access to knowledge, and technology inputs for food processors to help improve their capacity.
- 2. Access to financial resources** (*Accessing technologies is not always affordable*) : Capital constraints seriously impede the adoption and application of developed technologies by traditional food processors and hinders innovation. It is therefore important to support SMEs and informal processors with financial resources to make the sector sustainable and inclusive.



Thematic areas to address cont'd

3. Meeting quality standards and certifications: The challenge is to start incorporating **certification systems** that would fulfil the local-regional requirements, and international requirements if the final target is the export market.

- There is a gap in the knowledge of basic principles like GMP, HACCP..., their implementation, and in the availability of local certification bodies that could make the process accessible and cost effective even for small and medium scale food processors.



4. Involving and organising informal food processors:

- Creating cooperatives and other forms of producer and processor organisations is important to give smallholder groups access to the benefits of increased agri-investment.
- Cooperatives can help increase linkages between smallholders and other actors in the value chain.
- They increase access to markets, increase smallholders' bargaining power and give investors security of supply.

Conclusions

1. **Value-addition along the food chain** from agricultural production to the consumer is important for alleviation of poverty and malnutrition in Africa (Ghana)
2. There is a '**big Potential**' to alleviate poverty and malnutrition and generate incomes through **value-added food processing** dedicated both local and international markets coupled with enhanced trade opportunities
3. Research, Innovation, Technology transfer (from the public to the private sector) and financing are important requirements
4. **Quality systems** to document the quality and safety of traditional foods should be introduced to prevent new trade barriers

Acknowledgements

1. DANIDA and other partners
2. Prof. Mogens Jakobsen – University of Copenhagen
3. Prof. Lene Jespersen – University of Copenhagen
4. Dr. Wisdom Amua-Awua – Food Research Institute, Ghana
5. Prof. K Tano-Debrah – University of Ghana, Legon

THANK YOU