Issues in post-harvest development of root and tuber crops

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Introduction

Why post-harvest?

- Contributes to income generation and employment
- Extends storability of commodities
- Contributes to commercial/industrial development
- Ensures safety of certain products
- Necessary component of commodity development.

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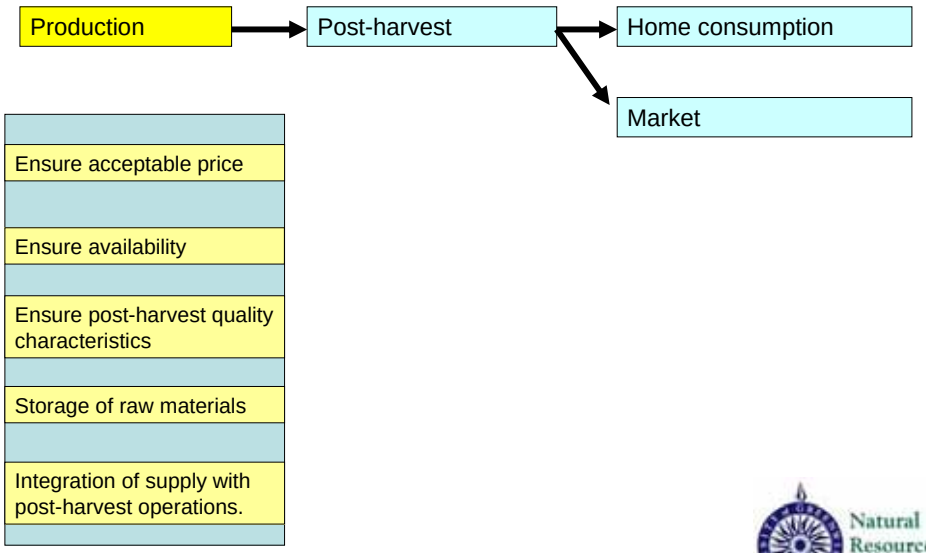
Issues in post-harvest development



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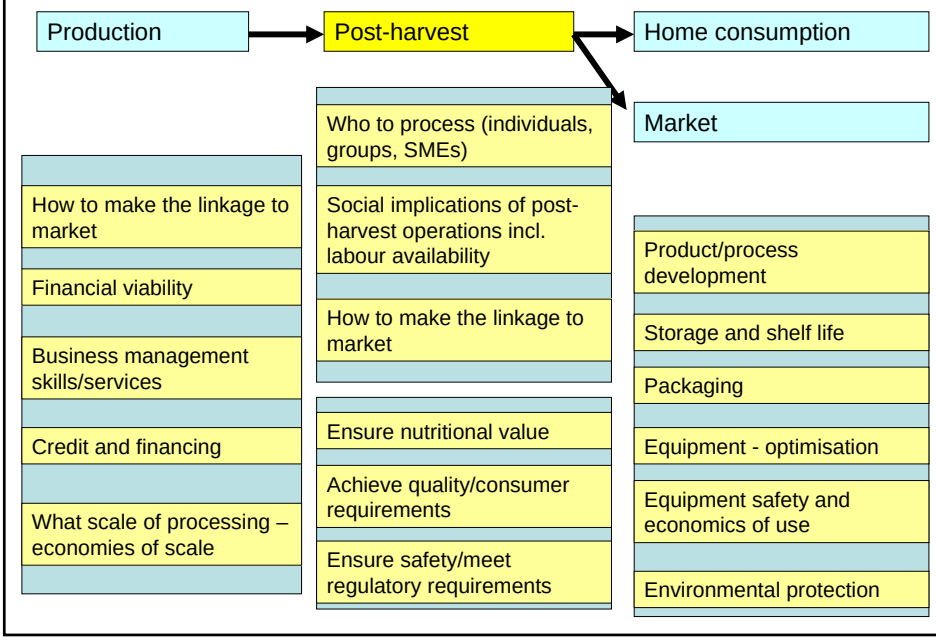
Issues in post-harvest development



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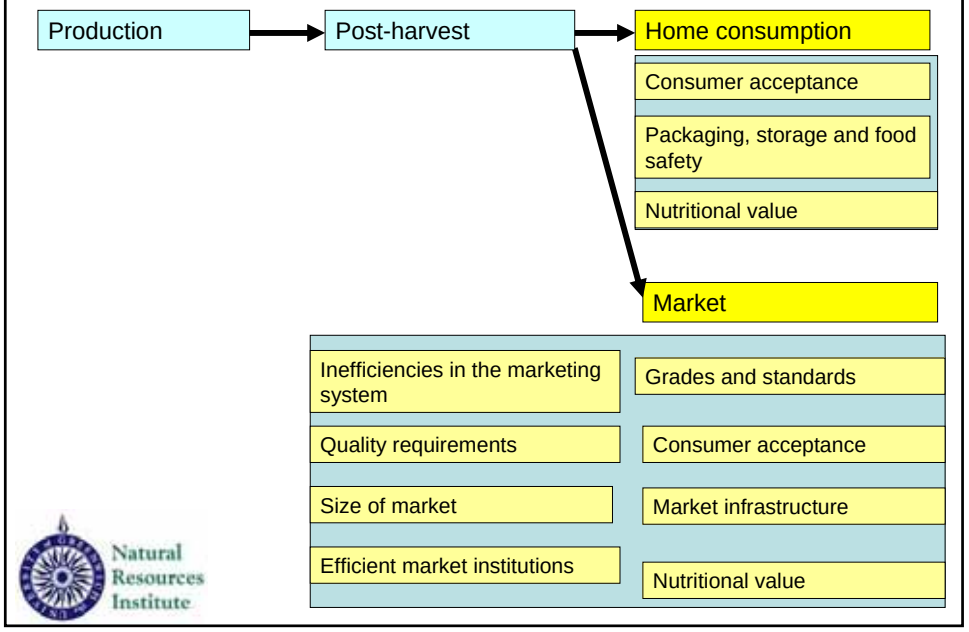

Issues in post-harvest development

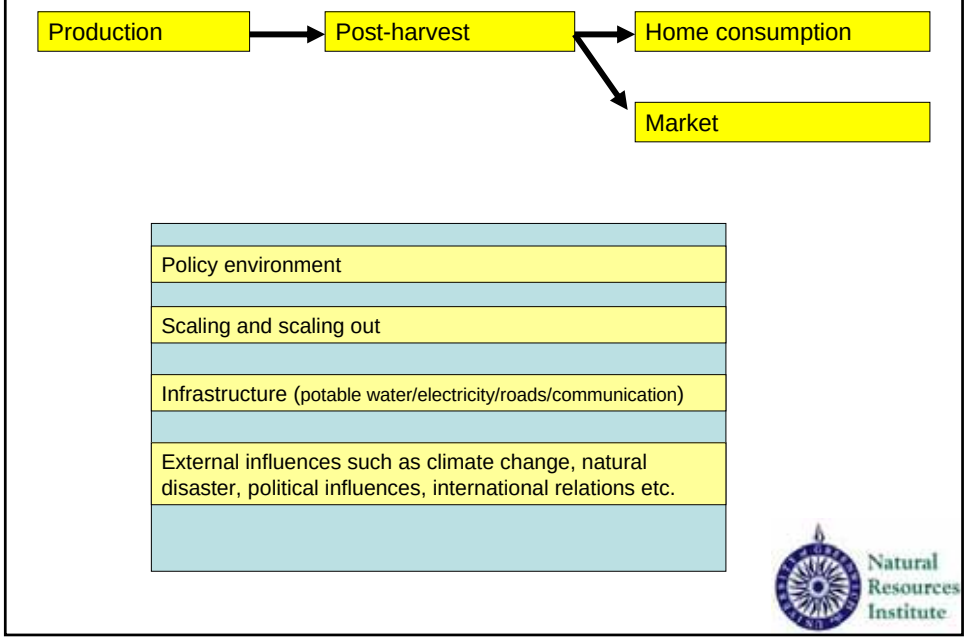

Illustration of specific issues

- Linking farmers to markets
- Meeting consumer and customer needs

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Linking farmers to markets

- Understanding demand
- Making the critical linkages

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Understanding demand

Industrial options for high-grade cassava flour in Ghana

Industry	Current Product	Locally produced cassava-based alternative	Quality requirements	Market potential (Tonnes of fresh cassava)
Plywood	Imported wheat flour	High-grade cassava flour	**High** – Finely milled (0.25mm), white flour, low fibre, not fermented, with high paste viscosity and stability.	17,000-34,000 Tonnes
Paperboard	Imported glue, based on maize starch	Adhesive made from high-grade cassava flour	**High** –As for plywood.	21,000 Tonnes
Textiles	Imported and locally produced maize starch Imported cassava starch	High-grade cassava flour	**High** – Finely milled (0.25mm), white flour, low fibre, no odour or taints, and not fermented, with high paste viscosity and stability.	17,000 Tonnes
Sugar Syrups	Mostly imported sugars	High-grade cassava flour converted into sugar syrup using plant enzymes	**High** –As for textiles, but paste viscosity and stability are not important.	251,000 Tonnes
Industrial alcohol	Mostly imported, with small amount of local production.	High-grade cassava flour converted to sugar, then fermented and distilled to produce 96% industrial ethyl alcohol	**High** –As for sugar syrups.	56,000 Tonnes
Bakery products	Imported wheat flour	High-grade cassava flour	**High** – Similar to textiles.	90,000 Tonnes*
Total market requirement (Tonnes fresh cassava)				**452,000 – 469,000 Tonnes**

* Assuming a 10% replacement of imported wheat flour with high-grade cassava flour.

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Market integration problem

Chipping system developed capable of producing high quality chips in 2 days.

Farmers' will to produce

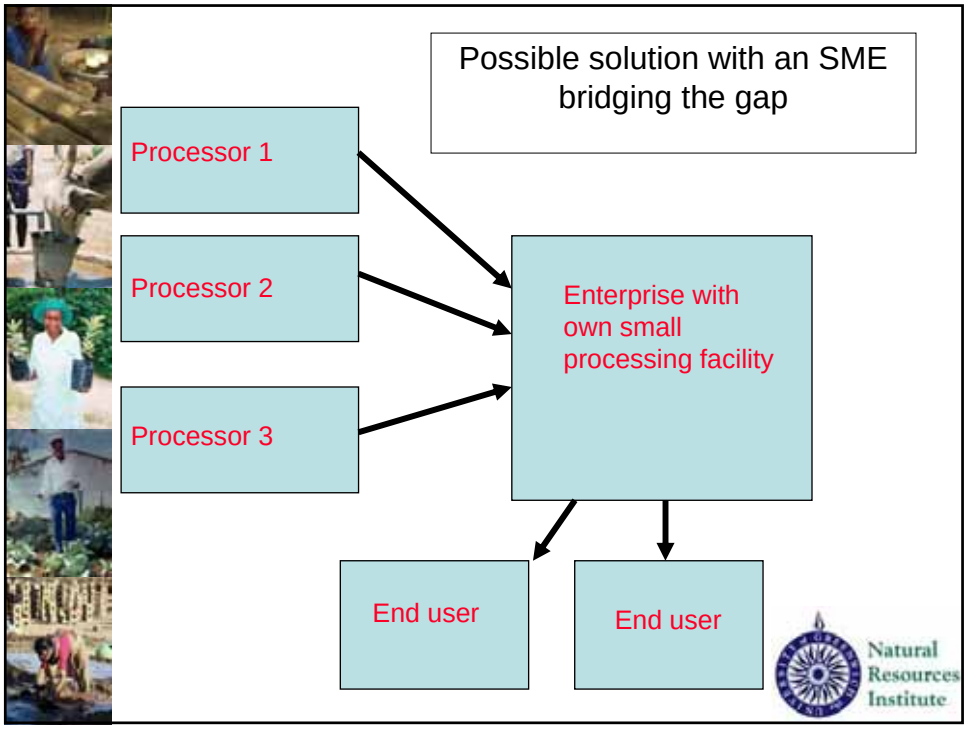
Is someone willing to buy.

Missing was someone to work with farmers, support them and provide linkage to feed millers – major problem.

Livestock farmers' will to use if someone supplies

Fitness for use of chips

- poultry - competitive growth rates and 10% cost saving
- Pigs - 30% increase in growth rate


Possible solution with an SME bridging the gap
Processor 1
Processor 2
Processor 3
Enterprise with own small processing facility
End user
End user
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FFGL in Ghana making cassava grits for high quality cassava flour

Pilot level dried fufu processing in Nigeria

6 trained small scale processing groups producing traditional wet fufu

Sell wet fermented paste to intermediate level processors

Pilot facility dries fufu to produce dry fufu

Dry fufu sold to urban markets

5 MT/month since 2002 With 100% sales

Processors benefit from increased sales of product – accessing urban market which otherwise would be inaccessible

Profitable with 100% sales record.

Employs 3 people per 5T/month of dried product

Consumers benefit by availability of shelf stable product.

Replicated in 10 other locations in Nigeria

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Criteria for identification of potential entrepreneurs, should include:

- Access to capital;
- Access to processing facilities and commercial transport;
- Relevant manufacturing experience;
- Proven business record;
- Proven record on quality;
- Understanding of the market system and issues involved;
- Willingness to support farmers and primary processors for mutual gain.

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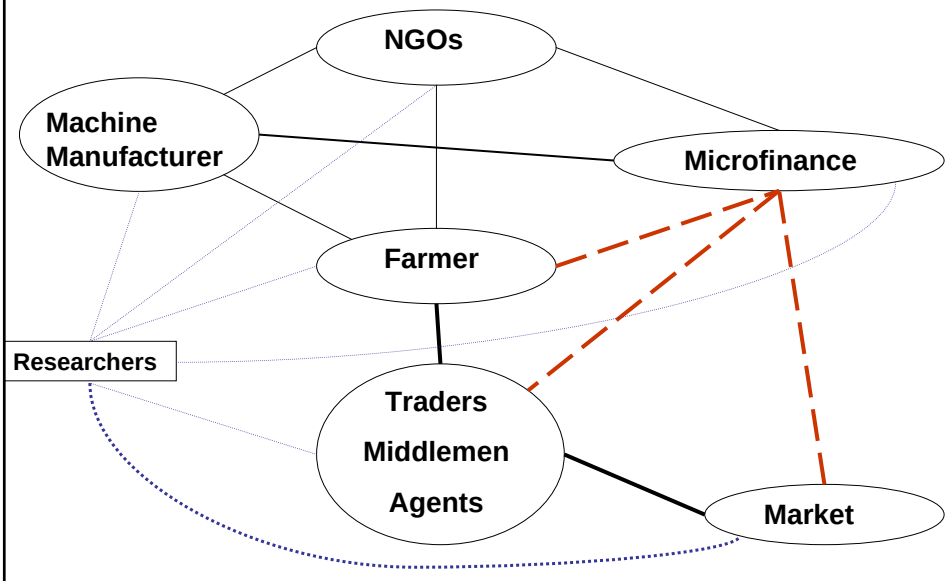
Commercialisation of cassava in Lake Zone of Tanzania.

- Who is ready for commercialisation?
  - Existing farmer groups more successful than new groups
  - Regular support necessary
  - Individual processors – difficult to access markets
  - Access to capital major problem, even for a group hence focus on manual chipping machine costing fraction of cost of motorised.
- Market linkages are essential
  - linkage established between a farmers group and a Dar es Salaam-based supermarket. The branch now sells the cassava flour prepared from chips processed by the Group
- Lack of credit was a problem
  - Access to **credit** in rural areas is especially limited
- Key to success was linkages between actors



Meeting customer and consumer needs

- Understanding consumer acceptance
- Ensuring quality and safety of products

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Understanding consumer acceptance

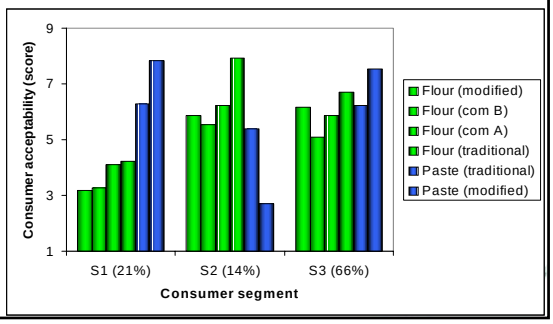
•evaluate the acceptability of 6 types of fufu produced by different processes.

•Included new convenience products (fufu flours) and pastes by a process that reduced environmental waste

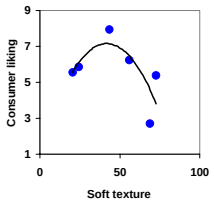
• tested large numbers of consumers - Lagos (n=91), Ibadan (n=121) and Abeokuta (n=99)

•Overall, the most acceptable fufu was that produced using the new environmentally friendly approach

•There were 3 classes of consumer



- Majority group found all fufu's acceptable, a smaller group preferred the pastes to the flours and a niche group preferred the flours to the pastes
- Consumer's liked the pastes because they were shiny, creamy and soft and the flours because they were sticky and had a raw cassava odour
- The strong odour and taste of fufu meant that the relationship between the sensory attributes and consumer acceptance was often not linear



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Applying HACCP principles in small-scale cassava processing

- The application of HACCP principles to small scale 'fufu' processing in Nigeria has improved the quality of the products and enhanced the sanitary standards of the processing centres.

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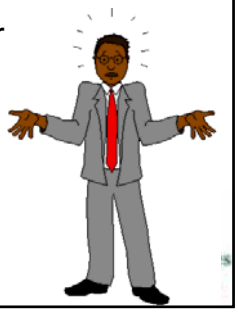
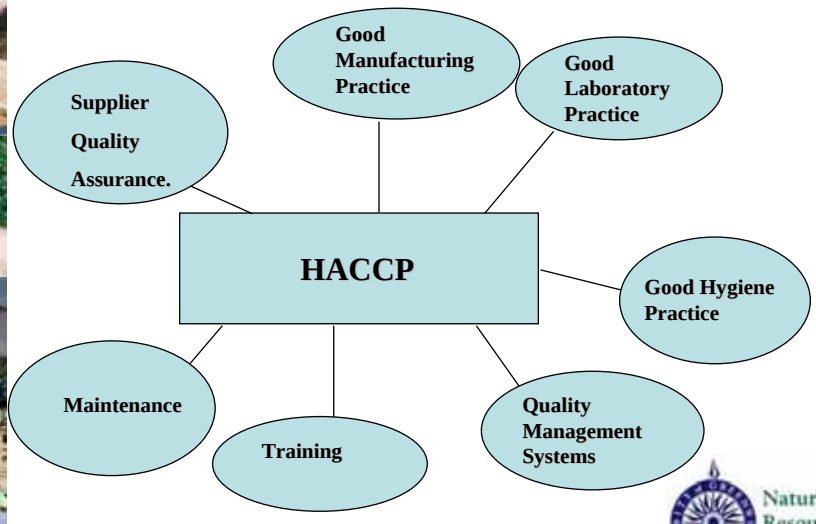
Improving the safety of foods produced by SMEs

- Many small and medium scale cassava processors lack facilities and training that might lead to unsafe products
- Food safety management systems can help them to produce safer products and also manage their processes better
- How can this be applied?



HACCP as a Foundation



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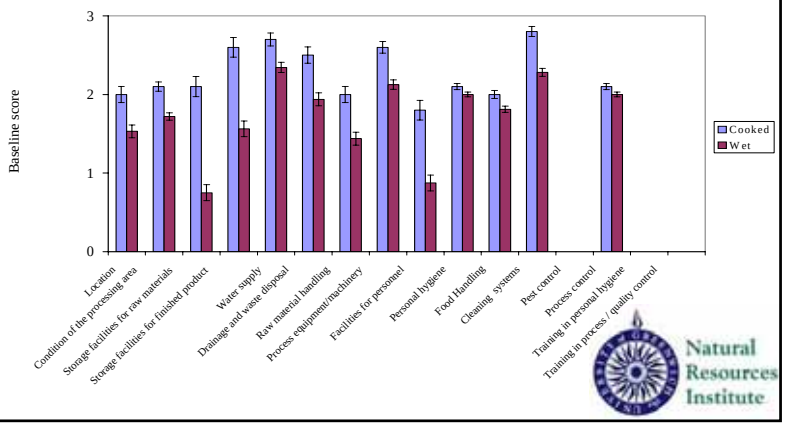
- Used HACCP principles for the approach
- Developed a simple scoring system for assessing large number of SMEs
- Categorised processors according to their scores
- Helped to focus research and training



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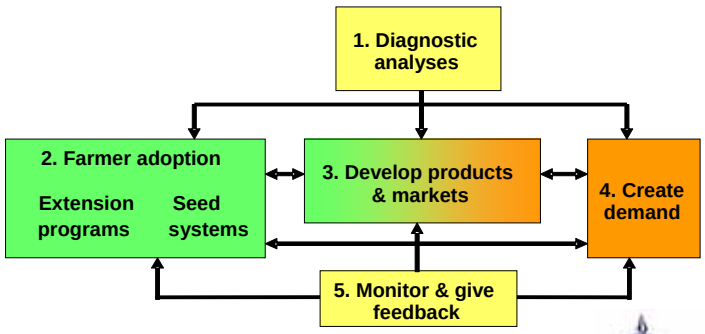
Challenge of scaling-up and replication

HarvestPlus
Breeding Crops for Better Nutrition

Aim: to bring biofortified crops (OFSP) to end users.

Marketing and Product Development Component



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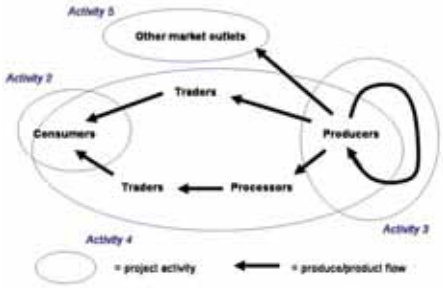

Draw on **pilot level** experience

Diagnostics

Replication in ca. 60 villages with extension staff more experienced in production issued than in marketing and processing issues.

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Conclusions

- Post-harvest systems can be complex, but they can be managed if take a holistic-market orientated perspective.
- Main challenges
  - Cost-effective scaling-up and scaling-out
  - Ensuring robustness in the face of changing economic conditions.

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Acknowledgements

CPHP
Crop Post-Harvest Programme

Cassava SMEs

HarvestPlus
Breeding Crops for Better Nutrition

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