Postharvest losses in Africa - Analytical review and synthesis

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Key messages: most important findings of the present review project

Evidence of postharvest losses (PHLs) is scanty and spotty

The magnitude of losses is often exaggerated because of poor loss assessment methodology

Loss is often economic loss rather than physical product loss

PHL research should be conducted in a way to generate innovations that are effective in reducing losses and improving income
Plan of the presentation

1. What is the development challenge, the idea the project is about?
2. Innovation: what is new?
3. What are the results of the project?
4. What are the key implications?
What is the development challenge, the idea?

How to feed 9.1 billion people with safe food by 2050?

Food security and food safety are major problems in SSA.

Postharvest losses are constraints to food security in SSA.

Annual value of PHLs for grain alone in SSA was estimated exceeding USD4 Billion.
What is the development challenge, the idea?

Global food crisis (2006)
Increasing food prices
Rising food prices contribute to food insecurity
Food Riots in many countries of SSA

Price volatility continued in Africa after the crisis
High prices- Weak and inefficient market

Figure 1. Food Prices and Rioting, 2007-2008

WFP, 2011
What is the development challenge, the idea?

Renewed interest to mitigate PH losses as part of effort to overcome food insecurity and poverty in food deficit countries

Aim

Provide evidences on PHLs and PH innovations in SSA through a comprehensive and systematic review

Research questions

What are the hotspots of PHLs and the magnitude of losses along commodity value chains?

What are the appropriate strategies used for the mitigation of losses?
Innovation: what is new?

Project sites located in different parts of SSA
Benin and Ghana (West Africa)
Kenya and Tanzania (East Africa)
Malawi and Mozambique (Southern Africa)

More PH works have been conducted in West Africa compared to East Africa and Southern Africa

Possibility of technologies transferred from West to East and Southern Africa
Innovation: what is new?

Multi-disciplinary approach with national experts

Two national consultants: one postharvest specialist and one agricultural economist

Inception workshop to develop and validate the review methodology in collaboration with national consultants and international experts

Results validation workshop involving other experts in postharvest
Innovation: what is new?

- Systematic
- Comprehensive
- Screening almost all the available literature
- Focus not only on technical but also on socio economic components
## Quick comparison with other reviews

<table>
<thead>
<tr>
<th></th>
<th>ICIPE/IDRC</th>
<th>FAO/World Bank</th>
<th>AGRA</th>
<th>APHLIS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commodity</strong></td>
<td>Many including fruits and vegetable and animal products</td>
<td>Only grains</td>
<td>Many except fruits and vegetable and animal products</td>
<td>Only cereals</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Comprehensive and systematic screening of all available literature Value chain</td>
<td>Experts survey (Subjective) Review of project reports</td>
<td>Estimation Value chain</td>
<td>Simulation Value chain</td>
</tr>
<tr>
<td><strong>Data</strong></td>
<td>Actual from screened literature</td>
<td>FAOSTAT, APHLIS &amp; other sources</td>
<td>FAOSTAT &amp; other not screened literature</td>
<td>Estimation based on adjusted data</td>
</tr>
</tbody>
</table>
What are the results?

<table>
<thead>
<tr>
<th>Country</th>
<th>Cereals</th>
<th>Grain Legumes</th>
<th>Fruits</th>
<th>Vegetables</th>
<th>Roots &amp; Tubers</th>
<th>Animal Products</th>
<th>Oil Crops</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanzania</td>
<td>16</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>16</td>
<td>3</td>
<td>0</td>
<td>42</td>
</tr>
<tr>
<td>Kenya</td>
<td>14</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td>Malawi</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Mozambique</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Ghana</td>
<td>15</td>
<td>10</td>
<td>4</td>
<td>7</td>
<td>14</td>
<td>3</td>
<td>2</td>
<td>55</td>
</tr>
<tr>
<td>Benin</td>
<td>44</td>
<td>8</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>71</td>
</tr>
</tbody>
</table>
What are the results?

<table>
<thead>
<tr>
<th>Country</th>
<th>Maize</th>
<th>Rice</th>
<th>Beans</th>
<th>Mango</th>
<th>Fish</th>
<th>Cowpeas</th>
<th>Tomato</th>
<th>Yam</th>
<th>Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanzania</td>
<td>3.8 - 21.5</td>
<td>-</td>
<td>14.7 - 17.5</td>
<td>28.3 - 43.8</td>
<td>7 - 30.2</td>
<td>-</td>
<td>14</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kenya</td>
<td>21-24</td>
<td>-</td>
<td>7.7</td>
<td>25.1 - 44.4</td>
<td>-</td>
<td>-</td>
<td>1-10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Malawi</td>
<td>7.6 - 28</td>
<td>8 - 26.9</td>
<td>4.2 - 9.1</td>
<td>-</td>
<td>18-22</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mozambique</td>
<td>11-47</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>39-58</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>12.6</td>
</tr>
<tr>
<td>Ghana</td>
<td>10 - 18</td>
<td>5.5 - 9</td>
<td>-</td>
<td>36- 60.6</td>
<td>11.2 - 31.9</td>
<td>1.1 - 10</td>
<td>20.5 - 30.4</td>
<td>22-39</td>
<td>-</td>
</tr>
<tr>
<td>Benin</td>
<td>10-45</td>
<td>2.8</td>
<td>-</td>
<td>49.5 - 81.7</td>
<td>23.3 - 30.8</td>
<td>29.6 - 60.8</td>
<td>25-40</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
What are the results?

Most research work use methodologies that don’t take into account store withdrawals during storage.

Some methodologies give a PHL value for a limited period in the storage season and not the overall loss throughout the year.

Some measurements of losses are not along the whole postharvest value chain system.

There are no generally replicable methods for evaluating postharvest losses of fresh produce (most methods are subjective).

Intrinsic limitations of methodologies under practical conditions: different methodologies > same aspect = different result.

Discrepancies in sample heterogeneity: some results represent findings in single locality, others are averages of a number of localities/districts.
What are the results?

PHLs evidence exists but scanty and spotty

Often PHLs are generally exaggerated

Most research works were concentrated on On-farm storage

Assessment of losses and postharvest innovations from the perspective of entire value chains is limited

Loss assessments target physical losses, assessing weight loss of commodity that becomes unfit for human consumption
What are the results?

Loss is often economic loss rather than physical product loss

Few studies on the adoption of mitigation strategies were conducted

Information on cost of loss reduction and economic benefit of innovations are lacking

Improved technologies are often not economically feasible at the smallholder scale levels and there are local methods that are easy to use and may be as effective and less costly
What are the results?

IDRC made a good decision by funding this project.

Gathering evidence on current PHLs, will help not only in planning for mitigation interventions but will also help to measure progress against any PHLs reduction target.

Results of the project are based on well screened literature with a set of criteria developed by national and international experts in PH.
What are the results?

A wide dissemination of the outputs (research reports, policy brief, journal articles and database) of the project in the participating countries will enhance the success of the project.

Information about the project have been shared with World Resource Institutes (WRI) and BMZ/GIZ.

This project added to the existing knowledge that PHLs are often exaggerated and that information are lacking for the whole value chain.

It also helped identifying gap and outlook for postharvest research and innovations.
What are the implications?

The present review lays the foundation for many research organizations as well as development agencies in search of information on PHLs for proposal development.

The gaps identified in terms of research and innovation can be used by IDRC for call for proposals.
What are the implications?

Results of the present review are being compiled for the development of journal articles by each country:

Six (06) articles have been submitted to icipe by collaborators for review.

For each country there is opportunity to conduct more rigorous field studies for PHLs assessment using a systematic methodology.
What are the implications?

Results of the present review point at opportunities for relevant improvements to PH systems. This can be tested through:

1- Improving income generation through alternative use of products unfit for human consumption and postharvest by-products

2- Enhancing nutrition, food hygiene, and public health through postharvest processing and value addition

3- Promoting export of commodities through management of aflatoxin contamination
What are the implications?

Role that ICIPE may play in leading research on postharvest: we see icipe as a coordinating institution in order to avoid duplication of research activities.

Also, icipe has the expertise to conduct its own research activities and at the same time playing the role of research coordination.
What are the implications?

How a PHL project should look like?

- Holistic with value chain perspective
- Participatory for technology development
- Should have a component of cost-benefit analysis
- Market oriented
- Should have a component of knowledge management and dissemination
- Should have component of adoption study
- Should have a component of impact assessment
Thank you for your attention