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Food loss Assessment Study on Maize and Sunflower Value chains in Uganda – Causes and Recommended Solutions and Strategies

H. Muyinza[1], M. Otim[2], W. Nanyeenya[2] and M Annette[3]

[1]National Agricultural Research Organisation and National Focal Point RBA Project
[2]Consultants, Uganda
[3]UN Food Agriculture Organization (FAO)
Correspondent: Email: *hmuyinza14@gmail.com*

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Introduction and Background

- Post-harvest losses are high estimated at 30% on cereals, 40-50 % on root crops (World Bank report 2011)
- Losses are particularly high at smallholder level in Uganda
- Yet accurate estimates of the magnitude of losses and waste are still lacking, in developing countries
- Thus accurate estimates and critical loss points needed to be identified
- Viable and cost effective options for loss reduction were also needed

Context/rationale

- **Study was done as part of a project under the 3 UN agencies efforts to reduce postharvest losses in Uganda**

• **Project title:**	Mainstreaming food loss reduction initiatives for smallholders in food- deficit areas (RBA/GLO/001/SWI)
• **UN's agencies:**	FAO, WFP, IFAD based in Rome
• **Financial partner:**	Swiss Agency for Development and Cooperation (SDC)
• **Period of Study:**	October 2015-April 2016
• **Reference policy:**	Commitments taken by African Heads of State in Malabo, in 2014.
• **Study's regions:**	**Apac and Lira districts in Northern Uganda**
• **Crops:**	**maize and sunflower**

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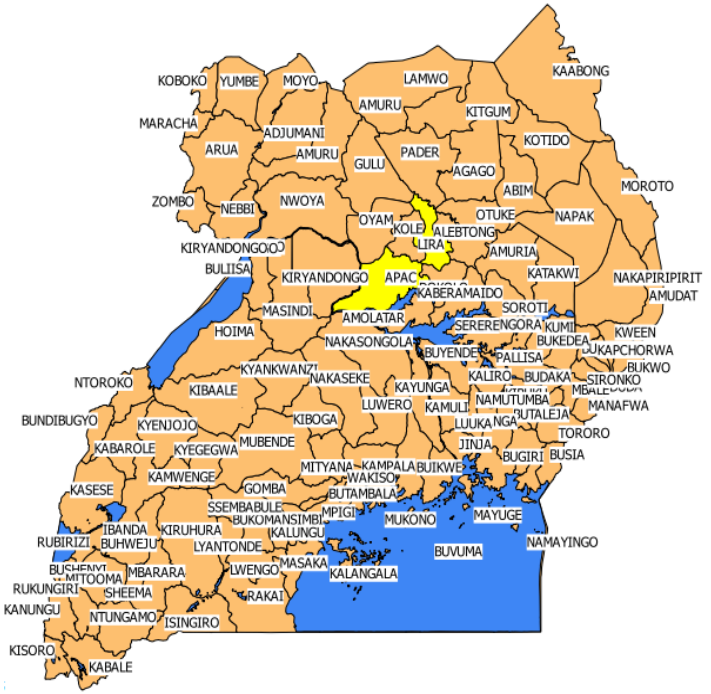
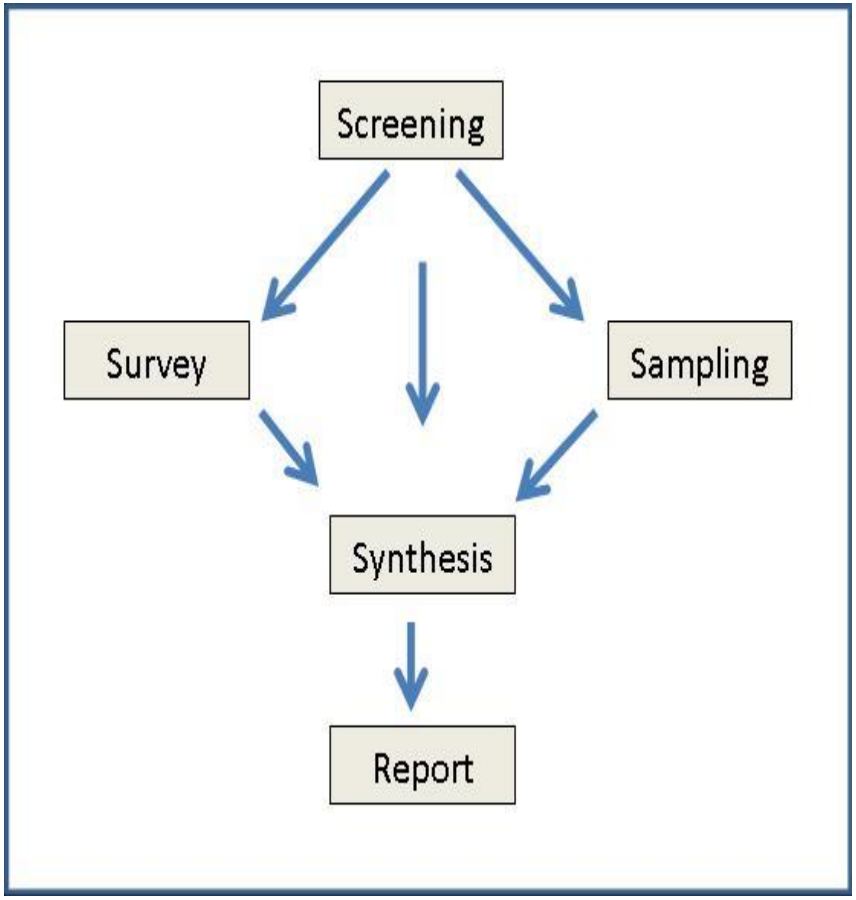
Aim of the study and methodology

- Assess the levels of food losses
- Identify critical points along the selected food supply chains (FSCs)
- Analyze major causes of these losses
- Propose appropriate and feasible solutions and strategies in order to reduce food losses
- Test and validate the proposed options



Case study Methodology



- Preliminary Screening of Food Losses ('Screening'). Based on secondary data, documentation and reports, and expert consultations
- Survey Food Loss Assessment ('Survey').-provided some indicative levels based on the observations, direct measurements and responses from sampled supply chain actors
- Load Tracking and Sampling Assessment ('Sampling')
- Monitoring and Solution Finding ('Synthesis'). Was used to develop an intervention

Maize and sunflower loss assessments

- case study methodology developed by FAO under the Save Food initiative was used
- adapted to specific conditions and local context in Northern Uganda

2 Key crops

- Maize: major food security crop and important non-traditional export with export earnings of above USD 42.3 million in 2013
- Sunflower: high potential for income generation especially in N. Uganda

Results

Critical loss points

- Following review of literature and through key informant interview
- Harvesting
- Storage and associated grain processing stages
- Milling identified as critical loss points

Causes of losses

1. Harvesting causes

-Carelessness and insufficient supervision thus spillage

-Lack of proper harvesting tools for both maize and sunflower

2. Storage causes

-grain contamination - ground drying

-Improper threshing - damage

-poor storage facilities - rodent attack and leakage thus grain spoilage

-Storage pest damage - loss in quality and rushed sales

3. **Causes of Milling losses include**

-Spillage
-Poor pre-treatments resulting in grain contamination at this stage
-Lack of proper maintenance

Level of losses at critical points

Crop	Critical point	% loss	Loss factor	Food loss Stage sampled
Maize	**Harvesting**	**3.3**	Spillage,	
	Storage	**17**	pest damage and aflatoxin	**Farmers**
	Milling	**5**	spillage	Millers
Sunflower	**Harvesting**	**2**	spillage	farmers
	Drying	**5**	Contamination and spillage	farmers
	Storage at **Millers** points	**35%**	Mould and aflatoxin and spillage	Millers' stores

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Quality of farmers' maize after 3 month storage

Maize samples evaluated	district	*% Insect damage grain	Moisture content	% mechanical damage	% discoloration	% debri	Proportion of samples with aflatoxin (above 10ppb)
8	Lira	11.2	12.4	0.6	3.1	0.7	1/3
10	Apac	20	12.2	1.6	2.1	0.7	1/2
UGC standard (%)	≤	1.0	14	*5.5	*5.5	-	0
Mean		15.6	12.3	1.1	2.6	0.7	

Costs of sunflower recommended options

Equipment	Unit cost	Life span (yrs)	Qty	Yearly cost of investment	Yearly cost of operation	Yearly total cost (USD)	Value of stored grain (USD)	Cost Recovery time (yrs)
*Metal silo (750 l	**350**	10	5	1750	0	1750	1294	2
Plastic silo (500l)	**37.5**	10	7	262.5	0	262.5	1294	1
Cemented drying yard (for 10 HH)	**2440**	30	1	2440	0	2440	12940	1
Tarpauline	**9.4**	1	3	28.2	0	28.2	1294	1
Community store (for10 households)	**12,500**	30	1	12,500	416.6	12,916.6	12,940	1

*750 ml metal silos are prefered by farmers for sunflower

Recommended solutions

Sunflower

- Capacity building of farmers and millers on improved harvesting, drying and storage
- Use of tarpaulines to reduce grain contamination
- Use of 500, 750 and 3 t silos
- Group storage in 2 t cacoons

Cost of recommended Maize technologies

Equipment	Unit cost	Life span	Qty	Yearly cost of investment	Yearly cost of operation	Yearly total cost (USD)	Value of stored grain (USD)	Cost Recovery time (years)
Maize crib	780	10	1	780		780	620	6
Tarpauline	9.5	2	2	19	0		620	
Metallic silo (500 l)	160	10	1	160	0	160	620	1
Plastic silo (300l)	37.5	10	10	75	0	75		1
3t- Metal silo	350	20	1	0	0	350	930	2
30 t ware house	12,500	30	1	828.3	10	13262.3		1
Hermetic bag	2.12	2	8		0	16.96		1
Motorised shellers (for whole subcounty)	2000	15	10	2000	0.63 per bag			2

Recommended solutions and their ease of acquisition in project area

Maize technologies

-3t -silos can be fabricated at EATREC, metal silos can be easily purchased from Lira

-Also motorised shellers can be operated as a business and result in reduced losses at farmer group level.

-Can be built locally by private workshops in Lira town and at the Agricultural Engineering and Appropriate Technology Research Institute (AEATRI).

-Reduce shelling cost from USD 0.94 per 120 kg-bag when using a stick to USD 0.63 when using a motorized sheller.

WFP has engaged some local NGOs and these are involved in the promotion of the metal silos and plastic bin given out at 50% subsidy.

-Additionally the project already is piloting the use of the 750kg metal silo, drying yard and grain safe cacoon for sunflower loss reduction

-Maize pilots are being done promoting use of hermetic bag, maize crib, 750 kg metal silo and 500kg plastic silo and storage in ware house for maize

-All the technologies are being piloted using the 50% subsidy model where the funds generated are retained by the groups to enable another farmer get the technology in the next round

The technologies for loss reduction piloted

Maize crib

Super bag

750 l- metal silo

2 t- cacoon

500l -plastic silo

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Additional strategic interventions needed

- Capacity building of farmers, traders and millers on improved grain handling and storage
- Promote grain marketing by promoting communal storage and marketing enterprises to improve grain market access
- -Encourage household grain storage in units including storage in superbags, metal silos, plastic silos to enhance hh food security
- -Set up bi-laws that encourage proper drying of grain and critical observation of safety levels especially with respect to aflatoxin

Other strategies

- Need to organise more private sector engagement to address the issue of loss reduction
- Multi-stakeholder approach will be the best approach to combat post harvest loss issues
- Support is needed to finance the strategy especially from our UN partners and other donor agencies

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THANK YOU

Hunger can be eliminated in our lifetimes.