Overview

Introducing the Food Waste and Spoilage initiative

Taking a systems approach

Examining strategic elements

Shaping an innovative strategy

Assessing potential trade-offs
Introducing the food waste and spoilage challenge
Global Food Waste & Spoilage

• Approximately one-third of food produced for human consumption worldwide is lost or wasted (FAO 2011)
  o Amounts to approximately 1.3 billion tons of food lost or wasted annually

• Negative outcomes of food wastage include:
  o Reduced farmer incomes
  o Increased consumer costs
  o Unnecessary burden on ecosystems (WRI 2013)
Food loss in Sub-Saharan Africa

Approximations by stage in the value chain

Production (i.e., during or just after harvest): 39%
Handling & Storage: 37%
Processing: 7%
Distribution & Marketing: 13%
Consumption: 5%

Compared to Europe:

Production: 23%
Handling & Storage: 12%
Processing: 5%
Distribution & Marketing: 9%
Consumption: 52%

Source: (WRI 2013)
Estimates of loss by crop/country

Causes of losses vary by crop/country; massive market opportunity exists to stem these losses in Africa

Source: Dalberg 2014, using FAO data & desk research.
Burden of food loss high for smallholder farmers

• Lose up to 15% of their income due to food loss
• Many also food insecure, putting further stress on poor families
• Addressing food loss through innovative solutions could prove transformative for millions of poor and vulnerable people

Against this background, The Rockefeller Foundation launched its initiative on Food Waste and Spoilage
The Food Waste and Spoilage Initiative

- Seeks to identify innovative solutions to food loss challenges that have potential for impact at scale
- Aims to ensure the affordability, accessibility, adoption, and awareness of high-potential solutions to reduce food loss

Initiative Goal

Two million African smallholder farmers have greater income and economic opportunities, improved resilience, and increased food and nutritional security through reduced post harvest loss in the food crop value chain by 2020
Taking a systems approach to reduce food loss
Why a systems approach?

• Causes of food crop loss both complex and interrelated
  o Changes made in one segment of the value chain may put unexpected pressures elsewhere in value chain
  o Incentives that work for one group may run counter to those required by another group

• Important to have holistic understanding for what it takes to create positive, sustainable impact
Goal: integrated solutions to food loss challenge
GKI: Engaging Stakeholders, Sourcing Solutions

- Global non-profit with operations in Africa, Asia, and the US
- Mission: to enable researchers, innovators and others to solve development-related challenges in science, technology, & innovation

GKI’s model for Collaborative Innovation building momentum globally

| In Rwanda: addressing taste defect in specialty coffee | In Kenya: developing business models for rainwater harvesting | In Uganda: network formation for sweet potato/banana tissue culture industry |
Our approach

Identify key bottlenecks / opportunities

Nov 2013 — Jan 2014

Assess resources available & needed for high priority opportunities

Feb — March 2014

Envision creative solutions using resources available

June 2014

Connect actors and resources poised to bring solutions to life

Fall 2014
Activity #1: Problem Framing

120 expert participants
6 Countries: Ghana, Kenya, Nigeria, Malaysia, Mexico, US
590 opportunities to reduce PHL identified
200 innovations currently in-use to address PHL
47 potential “Big Win” opportunities prioritized
29 additional areas of convergence identified
Potential Big Wins: Kenya

**Share success stories**  
in reducing PHL through improved storage

**Facilitate bulking**  
and group marketing

**Support policy**  
on post harvest interventions

**Institute standards**  
for processed goods

**Get businesses to invest**  
in farmer training on storage solutions

**Access mobile dryers**  
during rainy seasons

**Finance**  
to acquire storage solutions

**Build awareness**  
of promising storage options

**Get farmers to understand value**  
of storage solutions AND primary processing / preservation
Potential Big Wins: Ghana

Access improved PH techs
from university and other researchers

Train on standards
for post harvest handling

Provide a ready market
for farmers through contracts and other means

Effectively disseminate
improved PH technologies

Diversify incomes
of smallholder farmers

Improve record-keeping
of smallholder farmers

Link buyers and producers
through a common platform

Ensure coordination
of agricultural policy / implementation programs

Sustainably intensify
farm output at a decreased price

Resource extensionists
to be effective agents for PHL mitigation
Potential Big Wins: Mexico

Build leadership & vision
for long-term collaboration on PHL

Transform farmers
into PHL experts

Improve political attractiveness
of confronting PHL

Introduce technology
for reducing PHL across the value chain

Implement financing
for PHL-related trainings

Multiply impact
of existing efforts to reduce PHL

Identify potential
for agricultural output in regions

Extend storage life
of high-value products

Boost access to credit
for PH investments among smallholders
What we’ve learned so far

(1) Case studies of programs addressing aspects of PHL challenge prioritized by experts

- How might we scale the use of innovative handling and storage technologies?
  - Hermetic storage for grains
  - Cool storage for horticulture
  - Vegetable preservation

(2) Assessing:
- What resources available to address this issue?
- What resources needed to address at scale?
GKI Activity #2:
Resource Assessment

- Result: A comprehensive set of case studies and a visualization of resources available
Examining elements of an integrated strategy to reduce food loss
Two emerging strategies to reduce PHL

1. **STAPLE CROPS**: Spur adoption of post harvest management solutions through optimized financing and distribution models

2. **PERISHABLE CROPS**: Transform supply chains through processing and value addition
Staple Crops: Spur adoption of post harvest management solutions through optimized financing and distribution models

Rationale:
• Many affordable, easy to use solutions for PH management of staple crops exist
• Uptake remains limited due to compounding issues:
  o Limited financing
  o Weak distribution channels
  o Low awareness of utility and market benefit among users
• These available resources go underutilized; PHL persists
**Perishable Crops:** Transform supply chains through processing and value addition

**Rationale:**
- High rates of loss due to short shelf-life of perishables
- Processing offers way to create shelf-stable products and boost on/near-farm incomes
- Processing underutilized as a strategy for reducing PHL
  - **Weak linkages** between farms & processors (e.g., transport, communication)
  - **Limited awareness** of opportunities (e.g., market demand, available outlets)
  - **Financing gaps**
About the strategies

• At the surface, generally accepted approaches for reducing PHL

• Premium on:
  • Finding new, creative ways to thread needle between existing investments
  • Identifying catalytic investments that can unlock new value and leverage other capital

Our goal for today:
Elicit YOUR analysis, experience and creativity to develop and test six elements of a strategy that might be combined into an integrated initiative
Learn your team’s innovation challenge!
<table>
<thead>
<tr>
<th></th>
<th>Element 1: Distribution Channels</th>
<th>Element 2: Credit facilities suitable for PHL</th>
<th>Element 3: Selling power of FBO’s</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staple crops</strong></td>
<td>Charity Mutegi (IITA)*</td>
<td>Bertie Hamman (Standard Bank)</td>
<td>Victor Saavdera (CIMMYT)</td>
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<td>George Marechera (AATF)</td>
<td>Mike Gunderson (Purdue)</td>
<td>Peter Breitenbach (Vodafone)</td>
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<td>Ed Mabaya (Cornell)</td>
<td>Jacques Taylor (John Deere Financial)*</td>
<td>Mpule Kweilgobe (Project Leverage)</td>
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<td>John Vandenheuvel (Africa Atlantic Holdings)</td>
<td>Vicki Wilde (BMGF)</td>
<td>John Purchase (Agbiz)*</td>
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<td>Otavio Celedonio (IMEA)</td>
<td>Carlos da Silva (FAO)</td>
<td>Bayella Thiam (Novus International)</td>
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<td>Devika Daga (Google)</td>
<td>Kenneth Simons (Boston Consulting Group)</td>
<td>Diale Mokgojwa (Standard Bank)</td>
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<tr>
<td><strong>Perishable crops</strong></td>
<td>Element 1: Shorten distance between farm and processor</td>
<td>Element 2: Financing mechanisms to lower risk of investing in processing</td>
<td>Element 3: Avail farm-level market information</td>
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<td></td>
<td>Kristian Moeller (Global GAP)</td>
<td>Bian Li (Project Leverage)</td>
<td>Saj Dutta (EAG)</td>
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<td>Mardla Nkomo (TechnoServe)</td>
<td>Frank Obeng (EDAIF)</td>
<td>Thomas Herlehey (Land O’Lakes)</td>
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<td>Mohammed Diarra (Nestle)</td>
<td>Emma Green (IGD)</td>
<td>Caryn Formby (ADC delegate)</td>
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<td>Thad Simons (Novus Intl)*</td>
<td>Stephen Hayes (CCA)*</td>
<td>Markus Frank (BASF)</td>
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<td>Jani Tuomala (Bridgespan)</td>
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Staple Crops: Optimized financing & distribution models for PH management solutions

Element A
How might we optimize distribution channels for a proven PH technology? [Team will select one technology to explore]

Element B
How might we establish credit facilities suitable for mitigating post harvest loss in staple crops?

Element C
How might we boost the selling power and market access of farmer-based organizations?
**Perishable Crops:** Transform supply chains through processing and value addition

**Element A:** How might we shorten the supply chain of perishable crops destined for processing facilities?

**Element B:** How might we develop new finance mechanisms that lower the risk profile of investing in processing?

**Element C:** How might we radically improve farm-level access to transparent, timely market information?
Common elements across strategies

• Market-led orientation
  o Understand demand first
  o Private sector engagement

• Aggregation schemes
  • Farmer based organizations
  • Collection centers
  • Community storage options

• Information and communication technologies
  • Market information
  • Financial incentives
  • Training materials
Shaping an innovative strategy
Work of today

1. **Design strategies** to address six elements of the PHL challenge
   - Build on what is known
   - **Experiment** with what hasn’t been tried before; Be creative
   - Think big about potential for impact

2. **Assess triple bottom line trade-offs** associated with strategies
   - What dimensions of **health, wealth, and environment** matter most to PHL?
   - What potential outcomes come out strongest? What are the trade-offs within and across strategies?
How? Strategy Mapping

• Design tool for rapid-prototyping
  o Put groups’ ideas into one place, and organize/refine as you go
  o Bring proposed approach into focus by considering what needs to be done and who needs to do it to bring ideas to life

Ask yourselves:
What really needs to change to reduce PHL at scale in Africa? And, what outcomes can be achieved by implementing your ideas?
Example:
How might we scale access to locally available storage solutions, such as mud silos?

Ideas might include…

<table>
<thead>
<tr>
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<th>Outputs / Outcomes</th>
<th>Actors</th>
<th>Resources</th>
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<tr>
<td>Equip artisans to build businesses around mud silo construction</td>
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<td>Platform for value chain coordination</td>
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But lists don’t help us clarify...

- What **sequence** of activities maximizes impact?
- What intermediate outputs are **inputs** into broader change?
- What **feedback loops** are needed among specific activities, actors, and resources to achieve desired outcomes?
A few ground rules for today

**Practice empathy:** Listen and learn from others

**Defer judgment:** Hold off on forming opinions too quickly

**Connect the dots:** Look up and out from specific intervention points

**Think big:** Push the boundaries of what’s possible

**Be optimistic:** Ask yourself “How might we do what hasn’t been done before?”

Imagine if...
A little inspiration...
Let’s begin!
Assessing potential trade-offs
The outcomes we seek

Potential impact

By 2023, 2 million SHFs have greater income and economic opportunities, improved resilience, and increased food and nutritional security

Potential high-level outcomes

- SHFs and value chain actors have improved incomes due to higher volume (and potentially prices)
- Producers and consumers have increased availability and affordability of health foods, nutritional quality of crops increased by better handling and storage
- Producers supply more people without increasing production reducing ecosystem impact
- More gender equitable employment opportunities on and near farm for un- and underemployed women and youth
By 2023, 2 million SHFs have greater income and economic opportunities, improved resilience, and increased food and nutritional security.

Potential impact

Potential high-level outcomes

[Actor X] improved wealth

[Actor X] improved health

Reduced ecosystem impacts

INDICATOR: 1

INDICATOR: 2

INDICATOR: 3:

INDICATOR 1:

INDICATOR 2:

INDICATOR 3:
Example:
How might we scale access to locally available storage solutions, such as mud silos?

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Example: Increasing access to mud silos

A strategy to scale access to locally available storage solutions, specifically mud silos

<table>
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<th>Strategy element to be measured</th>
<th>Potential high-level outcomes</th>
<th>Possible indicators</th>
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<tr>
<td>[Focus: SHF] improved wealth</td>
<td></td>
<td>INDICATOR 1: Increase in % crop sold</td>
</tr>
<tr>
<td>[Focus: consumer] improved health</td>
<td></td>
<td>INDICATOR 2: Reap ROI within 1 year</td>
</tr>
<tr>
<td>Reduced ecosystem impacts</td>
<td></td>
<td>INDICATOR 3: Increase in price elicited for stored crop</td>
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<td></td>
<td></td>
<td>INDICATOR 1: Increase in caloric intake</td>
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<td></td>
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<td>INDICATOR 2: Reduction in stunting</td>
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<td>INDICATOR 3: Reduction in wasting</td>
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<td></td>
<td></td>
<td>INDICATOR 1: Reduction in water loss</td>
</tr>
<tr>
<td></td>
<td></td>
<td>INDICATOR 2: Increased percentage of harvested crop consumed</td>
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<tr>
<td></td>
<td></td>
<td>INDICATOR 3: Increased efficiency in pesticide use</td>
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Using indicators to explore trade-offs

By 2023, 2 million SHFs have greater income and economic opportunities, improved resilience, and increased food and nutritional security.