Cutting food loss where it matters: Leveraging digital solutions for Greener Trade and less waste
UNECE’s Impact Initiatives

Liliana Annovazzi-Jakab
Head, Agricultural Standards Unit
United Nations Economic Commission for Europe
UNECE

November 2019
Food loss and waste (FLW) is the decrease in quantity or quality of food along the food supply chain.

Food loss occurs along the food supply chain from harvest up to, but not including, the retail level.

Food waste occurs at the retail and consumption levels.

Source: FAO, 2019
Measuring at global level

FAO’s new estimates for food loss are a big step towards action

1/3 of food is lost or wasted
FAO raised awareness on food loss and waste with a global estimate in 2011

SDG Target 12.3 reflects growing attention to the issue

Creation of two indices to measure progress towards this target

**FOOD LOSS INDEX**

**FOOD WASTE INDEX**

Source: FAO, 2019
Food Loss and Waste reduce the efficiency and the sustainability of food systems and negatively impacts food security.

Food Loss and Waste impact the current and future availability of increasingly scarce resources, needlessly produce greenhouse gas emissions contributing to global warming and climate change.

Source: FAO, 2019
Addressing food loss and waste
Possible policy options and actions

Inclusion in (for example):
• policies directed to agricultural development
• public investment plans
• support to various food system actors
• food chain regulations
• fiscal policies
• trade policies and regulations
• food safety and consumer protection regulations
• social protection and food security policies
• sustainable development policies
• environmental protection policies

**Important:**
• Interdependencies
• Different locations for interventions

• Food waste:
  • policy frameworks/ objectives set at national level,
  • management, funding and implementation - local authorities and municipalities that overseeing waste collection, waste management and recycling services.

Source: FAO, 2019
Agri trade and Food Loss and Waste
The challenge in numbers

2030 – 2.1 billion tons

1.6 Billion Tons

Food loss and waste

2030 – $1.5 trillion

$1.2 Trillion

Revenue loss

2030 – $1.5 trillion

$1.2 Trillion

Revenue loss

870 Million People

Hunger

8%

Greenhouse gas emission
Caused by food lost/waste

Source:
UNFAO, BCG Flow model
UNFAO, BCG Flow model
UNFAO, BCG Flow model
UNFAO, World resources institute
Example: From 2015 to May 2018:

- 105 fully loaded standard trucks or 2730 fully loaded industrial pallets
- Lost monetary purchase value in 2017 7.9 Mio Euro (up from 2.07 Mio in 2015)
Foregone trade opportunities? Food Loss
Example: Mangoes

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Production(MT)</td>
<td>1372386</td>
<td>1487324</td>
<td>1504815</td>
<td>1794235</td>
<td>1969742</td>
<td><strong>2.023.902</strong></td>
</tr>
<tr>
<td>Export (MT)</td>
<td>126</td>
<td>122</td>
<td>95</td>
<td>160</td>
<td>580</td>
<td><strong>665</strong></td>
</tr>
</tbody>
</table>

Source: Department of Agricultural Extension, Ministry of Agriculture, Bangladesh
65% of Exports are agricultural

75% small-scale production and 30-35% lost pre-shipment while around 3.4 million Kenyans are severely food insecure and 309,000 have been internally displaced due to food insecurity and drought.

80% of the country is arid and semi-arid marked by inefficiencies in food systems, which lead to high prices and insufficient market supplies, limiting the availability of, and access to, food.

Source: Kenya Agricultural Research Centre
Food lost and wasted
Foregone/new opportunities

FACT:

Food Loss at the early and pre-retail stages in the agri supply chains

Remain massive in all countries.
Digital transformation of agri trade: Agriculture - one of the least funded sectors worldwide. Yet, occupies fundamental role for countries and people. And, faces major global challenges: climate change, soil depletion, pollution, increasing demand, weak productivity growth, less and less available productive land.
Quality matters
Good quality in the chain increases incomes and prevents food loss

**UNECE Quality for trade since 1949**

Over 100 voluntary marketing/quality standards, guides (Handling guide, Simple measuring methodology) and 1000 experts

Fresh fruit and vegetables, nuts, dried fruit, meat, eggs, seed potatoes

**UNECE Food Loss/Waste:**
Quality matters but constant review of quality standards for agricultural produce. Focus on losses in the trade process before it reaches the consumer and even retail.
The neglected business case for digital agri trade and data collection:

#Food loss and waste
CIRCULAR ECONOMY IN ACTION

UNECE: Linking missing food with missing buyers
Impact solutions – the facts

Poor visibility over the extent of the problem and a lack of consumer awareness

Insufficient supply and demand data (source: BCG report 2018)

CURRENT focus:
Prevent (biggest profit – reducing inefficiencies in operating costs (in FFV e.g. identification of hot spots, special technology, extending shelf life)
Redistribute – mostly at retail and hospitality levels, for profit or charity
Valorize – technology that uses wasted food to create value in another form (e.g. beer made of wasted bread)

What we found:
1. Lack of innovative, digital food waste trade solutions going beyond consumer focused Apps.
2. No holistic digital solution for agri trade of food fallen off main supply chains
Creating and enabling alternative flexible and fast reacting trade supply chains for food currently lost or wasted along the entire supply chain

SELLERS: Producers, Farmers, Traders, Packers, Importers

BUYERS: traders, packers, hospitality sector, wholesalers, institutional buyers, charity, government
UNECE’s 2 component approach

Focus – bringing invisible food to the surface through alternative flexible and fast reacting trade supply chains for food currently lost or wasted along the entire supply chain
Component 1: The marketplace B2B or B2G – blockchain supported

- Farmers
  The production level of fruits and vegetables

- Distributor
  Farmer’s direct point of contact for prospective buyers for the fresh produce.

- Food Processors
  Companies that further process the fresh produce

- Packing Stations
  Fresh produce packed for various business needs

- Wholesalers, Importer
  Fresh produce packed for various business needs

Why invisible/surplus?
- Not matching visual standards.
- Order cancellation Time limitations.
- Excess production

Online Marketplace
Online marketplace that provides opportunity to participants (businesses and governments) of supply chain to sell their Invisible products directly to end consumers.

Invisible/Surplus Food

Compost back to Farmers

Biomass – energy producers
Compost, Industry, textile, vegan market segments

Buyers
Processors, By-product Manufacturer
Hospitality
Shops
Government procurement, NGOs, Charities (DONATIONS)

UNECE
Component 2: Food loss data generation - the benefits for governments

GOVERNMENTS
To plan interventions, policies to prevent and reduce losses and waste, limit environmental impact, ensure food security and improved extension services, support sustainable, circular food systems SDG implementations

Systematic measurements and Data generation, efficiency gains, planning and extension services tool in Component 2

Water/resource use efficiency measurement

Food lost = Invisible/Surplus Food

Farmers, production level
Distributor, buyer
Packing stations or Processors
Logistics hot points (domestic and export)
Wholesalers at destination, importers, domestic

Sustainable Development Goals
WHY UN BLOCKCHAIN

Hosted and Managed by the UN Systems to establish trust and transparency

Complete digitalization of farming actions through track and trace

Trusted reporting and global standard adoption
Circular economy in action
2 Component Food Loss Management System

Making invisible food available
• A web-based platform to buy and sell agricultural produce that would otherwise be lost or wasted – commercial venture
• Makes available and repurposes to alternative buyers, currently “invisible” produce.
• Provides edible lost food for alternative consumption and nonedible for biogas, compost or alternative processing
• Creates a channel for government agencies, NGOs, charities to effectively reach producers.
• Deeper insights about the market to producers, government agencies, other interested parties to plan and analyze trends.
• Measurements of water and other resources used (to improve efficiency)
• Direct and instant access to larger markets (local, regional, international) for producers (incl. small producers).
• Trust and traceability enabled by state-of-the-art Blockchain technology
Circular economy in action
Food loss management system

The Steps

- **Scalable and adaptable** model for all countries.
- **Local use first** – cross-border use later
- **Plug-ins for:**
  - existing systems (e.g. traceability or certification)
  - donations (charity)
  - compost (back to the farmer)
  - biomass solutions
  - transport solutions
  - water use and efficiency measurement
  - [Consumer interface at later stage]
- **Pilots in selected countries**
- **Strong partners** at domestic level (governments, NGOs, Private sector) to ensure long-term ownership and maintenance
Circular economy in action
Impactful SDG implementation

A circular economy solution spanning across all UNECE Divisions to enable impactful SDG implementation in partnerships
Status and progress - pilots

Seed money and origin: UNDA 11 Food Loss project

- UN OICT
  Bangkok
- Pilots Advancing
- Private sector and academia
- UNECE experts and Ministries
- PR and events
- RCs and UN agencies
IMPACT? Circular economy

ENVIRONMENTAL
• Reduction of the huge environmental impact of food that is currently lost
• Circular economy
• Alignment to the government’s environmental mandates and possibility of projections and simulations

ECONOMIC
• More inclusive production systems for all parties to the supply chain including women and youth
• More efficient agricultural trade and distribution mechanisms
• Strong incentive to bring together for small-scale producers to improve their competitiveness and market power

SOCIAL
• Improved social awareness of how and how much food is produced and repurposed
WHAT OUR SOLUTION WILL BRING?

Circular economy implementation tool – intervention before loss becomes waste

A centralized online marketplace to reduce food loss and food waste in full circularity and improved traceable efficiency
A fully traceable system that brings in trust and confidence to the buyers

Additional income possibilities and employment for women and youth

Increased possibilities to improve food security including facilitating sourcing of food donations

Address Sustainable Development Goals (SDG) e.g. 2, 7, 8, 12, 13

Collaboration of governments, private sector, academia, innovation hubs, NGO’s, certification bodies, logistics and distribution players in a single platform

Quantify, track, monitor and report the food waste impact annually every year at all levels (including small-scale farmers)

Availability of data currently unavailable to governments and producers for better forecasting, planning policies and interventions at hotspots

The new alternative B2b and B2G supply chains will create more direct and new links and help find alternative uses for food otherwise lost. And, remains, as biomass and compost.
Thank you

Liliana Annovazzi-Jakab
Head, Agricultural Standards Unit
United Nations Economic Commission for Europe
UNECE

November 2019