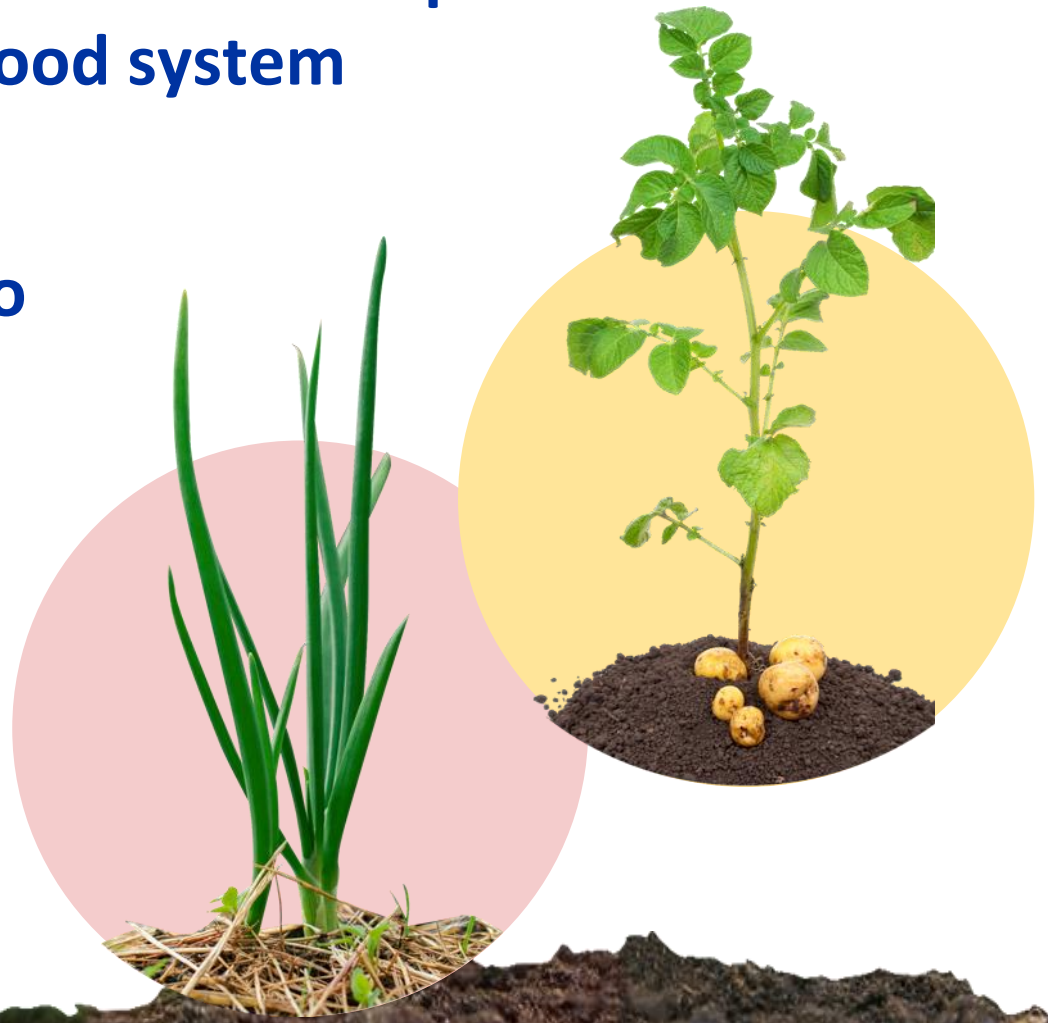
Analysing value chains by combining technology, economic, environmental, social and behavioral aspects – the sustainability dimensions of a food system

Bringing in behavioural perspective to food loss and waste analysis



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Despite efforts to minimize food loss and waste, it remains a significant problem. While good practices and solutions exist, their adoption is often low.

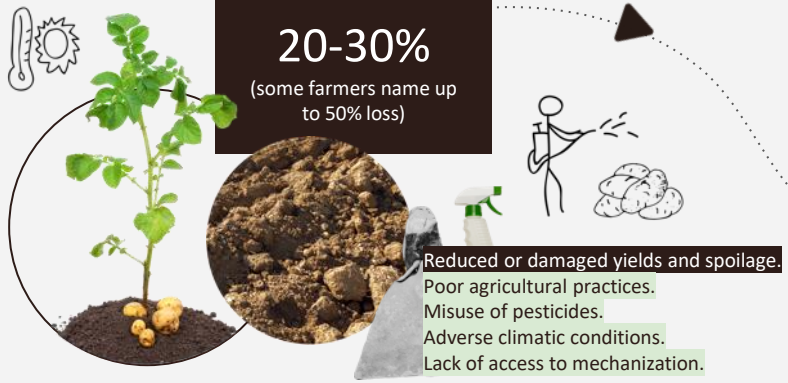
This raises the question: why aren't these solutions being implemented effectively?

A project funded by FAO's Innovations Fund tackled this challenge by analysing food loss and waste in onion and potato value chains in Azerbaijan and Georgia.

The project incorporated a behavioral science framework into its case study methodology.

Potato Journey Map

LOSS POINTS

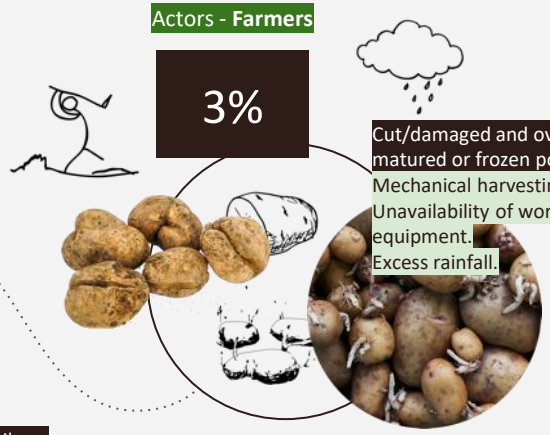


Actors - **Farmers**

20-30%
(some farmers name up to 50% loss)

Reduced or damaged yields and spoilage.
Poor agricultural practices.
Misuse of pesticides.
Adverse climatic conditions.
Lack of access to mechanization.

Growth Period



Actors - **Farmers**

3%

Cut/damaged and over-matured or frozen potatoes.
Mechanical harvesting.
Unavailability of workforce or equipment.
Excess rainfall.

Harvesting

Actors - **Farmers**

10%
(**note:** such loses have been mentioned by only few farmers)

Spoilage and economical loss.
Poor sorting and storage practices.
Weight loss during storage.

Sorting & Storage

Actors - **Farmers & Collectors**

0.5%

Spoilage and economical loss.
Limited financial capacities.
Second sorting stage.

Sales (Farmers)

Actors - **Collectors, Traders & Wholesalers**

Freezing/spoilage.
Vehicle breakdowns (though rare)

Transportation

Actors - **Wholesalers & Traders**

Spoilage.
Long waiting times for stock to clear.

Sales (Wholesale)

Actors - **Retailers**

2%

Spoilage.
Staff negligence.

Sales (Retail)

Onion Journey Map

LOSS POINTS

Actors - **Farmers**

Growth Period

Actors - **Farmers**

1.33%

Onions too small.
Economic infeasibility.

Harvesting

Actors - **Farmers**

0.15%

Rotten, damaged and irregular shaped onions.
Disease.
Cleaning process etc.
Natural causes.

Cleaning, Sorting & Packing

Actors - **Farmers & Collectors**

12.69%

Rotten and sprouted onions.
Disease.
High temperatures.

Storage & Sales (Farmers)

Actors - **Collectors, Traders & Wholesalers**

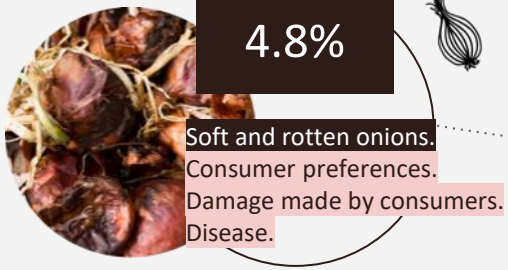
Transportation

Actors - **Wholesalers & Traders**

Sales (Wholesale)

Actors - **Retailers**

4.8%



Soft and rotten onions.
Consumer preferences.
Damage made by consumers.
Disease.

Sales (Retail)

Why Behavioural Science?Food Loss and Waste?

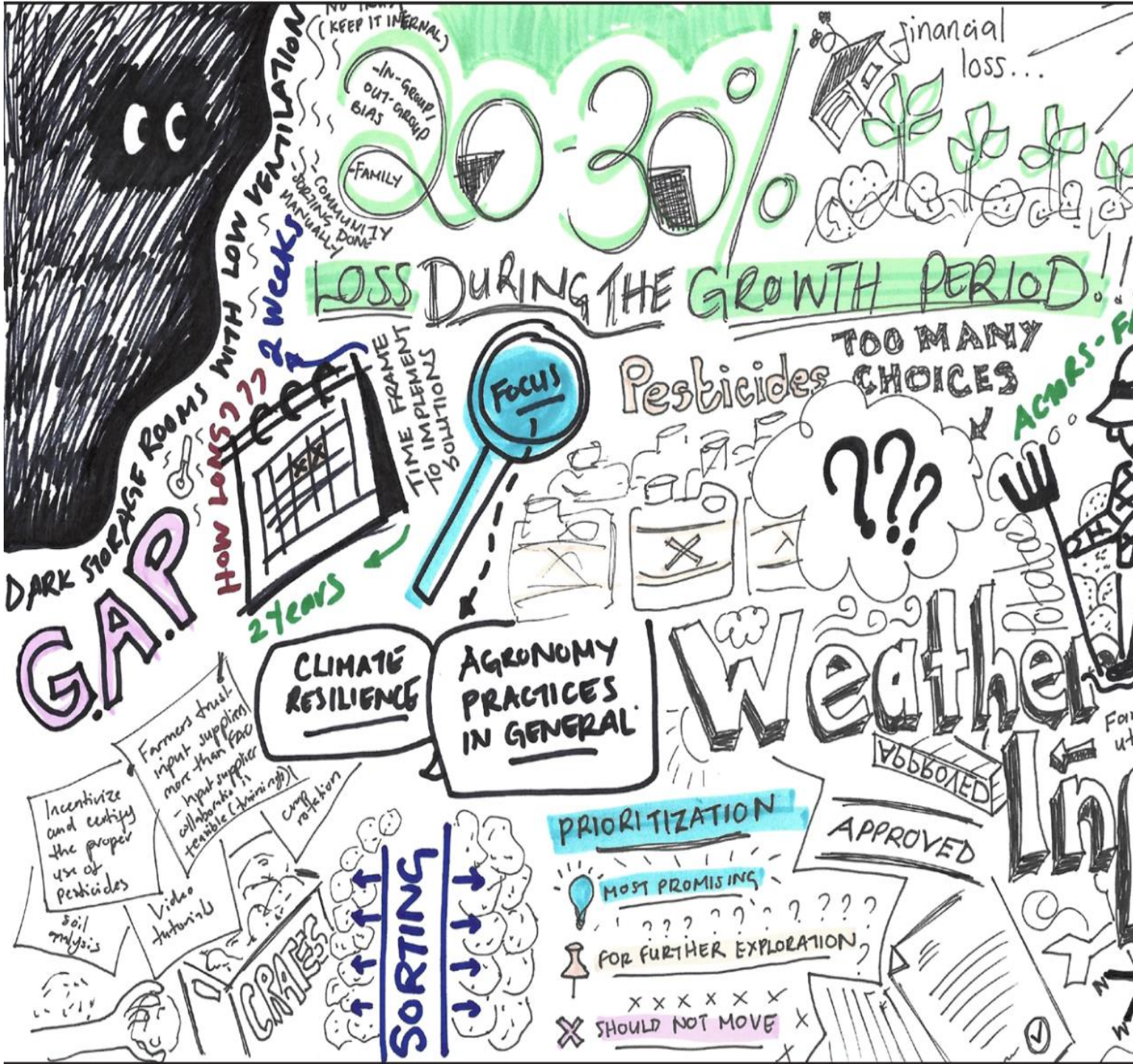
By integrating behavioural analytical approach, the FAO project aimed to:

- Identify behaviours contributing to food loss and waste, along with the barriers to change.
- Design interventions that promote behaviour change for reduced food loss and waste.

In addition to identifying the practices that led or contributed to FLW, FAO explored opportunities for behavioural change along the food value chains (up to retail stage), considering the actors involved.

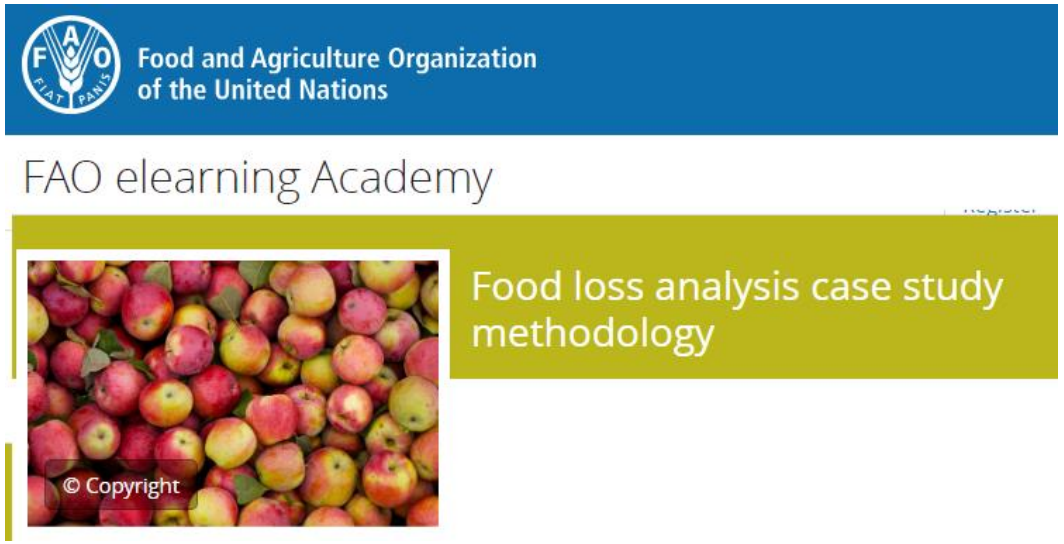
Research process

- Field visits and data collection
- Identifying critical points of loss and associated behaviours
- Developing indicators and hypotheses
- Behavioural design sprint to develop solutions
- Assessing the solutions impact



Value Chain Analysis on Food Losses
in Small-scale Agriculture and Fisheries Subsectors
Causes and Solutions

https://elearning.fao.org/course/view.php?id=374



Objectives

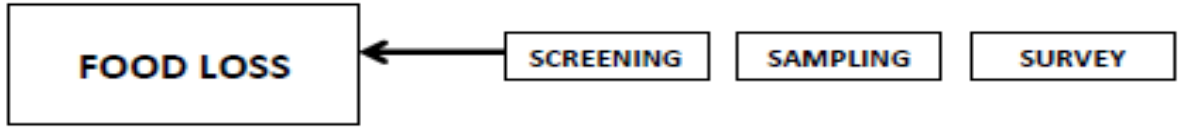
- *identification and quantification of the main causes of food losses;*
- *analysis of the impact and solutions to reduce food losses on their technical and economic feasibility, food quality and safety requirements, social acceptability and environmental sustainability;*
- *concrete proposals to formulate a food loss reduction programme.*

Food Loss Analysis in Small-scale Agriculture and Fisheries Subsectors

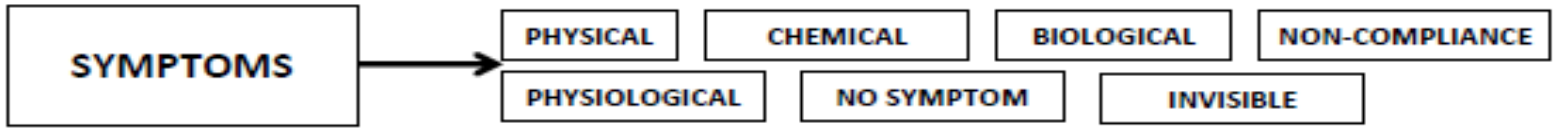
Causes and Solutions

OUTPUT IV-1: CAUSE FINDING DIAGRAM

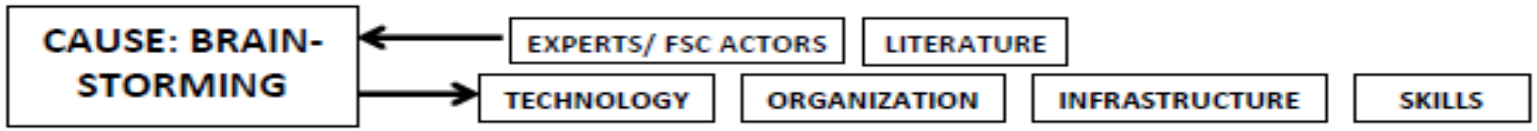
1. Food loss assessment methods have revealed a batch of food products containing *losses or product of low quality*.



2. Identify and describe the *symptoms* that lead to this quantitative / quality loss.



3. Verify the possible *causes* by consultation of experts and literature, and by on-site investigation.



4. Identify the *real cause* of the low quality and subsequent food loss.

5. Find the underlying *reason* for the cause and why the problem hasn't been solved yet.

Findings

The research revealed several key factors influencing food loss and waste, all related to human behavior:

Identity

Farmers' deeply ingrained identity as onion/ potato producers can hinder them from adopting new practices, as they perceive these as a threat to their traditional way of life.

Risk Aversion

The perceived risks associated with unstable prices, unpredictable weather, and limited storage capacity can make farmers hesitant to invest in improved storage solutions.

Social Influence

Social networks and peer influence significantly impact farmers' decisions. While these networks can facilitate knowledge sharing, they can also limit participation in solutions like cooperatives, especially if past experiences were negative.

Trust

Trust plays a critical role in farmers' decision-making, particularly when navigating conflicting information. Farmers rely on trusted sources, but this trust can be influenced by factors like compatibility with their existing beliefs.

By understanding these behavioral factors, the project paves the way for designing interventions that address the root causes of food loss and waste, ultimately leading to more sustainable practices.

Ex-Ante Carbon-balance Tool (ExACT) for Value Chains

Food and Agriculture Organization of the United Nations

https://www.fao.org/in-action/epic/ex-act-tool/suite-of-tools/ex-act-vc/en/

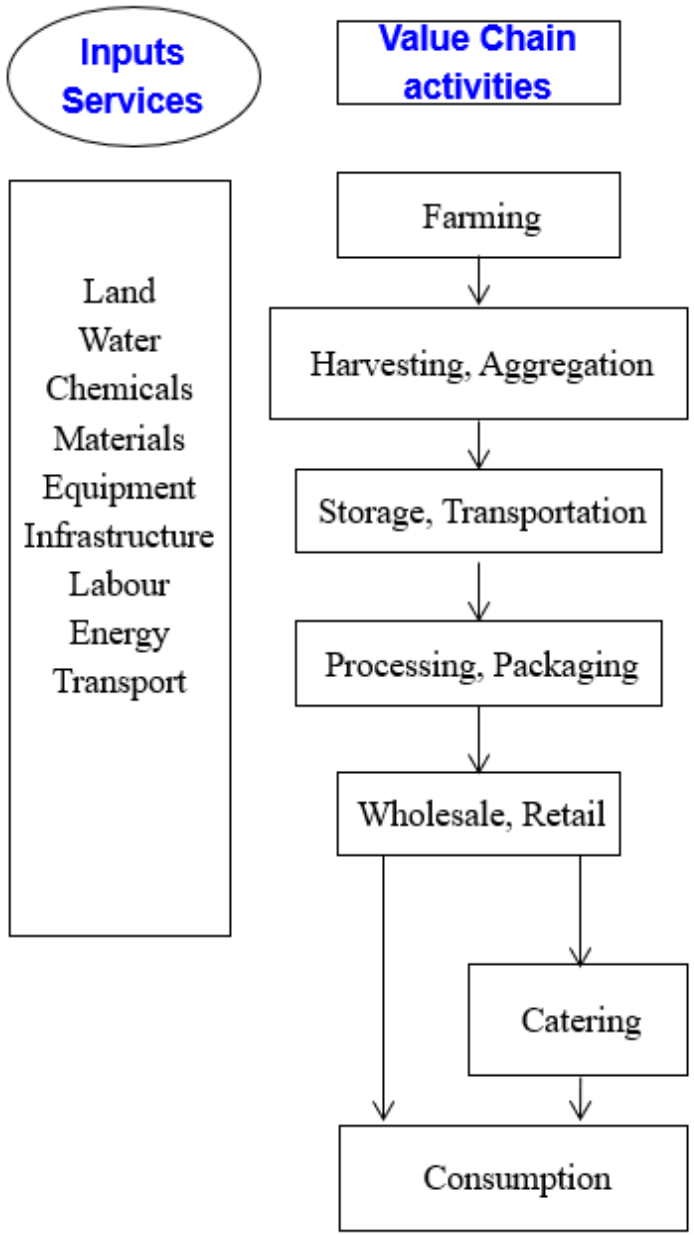
EX-Ante Carbon-balance Tool for value chains

Assessing environmental and socio-economic potential of agri-food value chains

Objectives

- Provide a holistic assessment of agri-food value chains by examining the environmental and socio-economic impact.
- Support policy makers in identifying off -farm sources of greenhouse gas (GHG) emissions, and from farm-to-retail socio-economic benefits when designing projects and policies for low carbon value chains.
- Highlight potential entry points for socio-economic improvements at each stage of the value chain to ensure sustainable development.

Ex-Ante Carbon-balance Tool (ExACT) for Value Chains



Measurements ExACT (basic scenario)

Quantification:

Inputs

Products

Losses

By-products Disposals

Quantification:

GHG Emissions

Economic Costs and Revenue

Value Chain Causal Analysis

Analysis:

VC actors and activities

Reasons for activities

Causes of FLW Reasons of wasting food

Solutions:

Good Practices

Enabling Environment

FLW reduction

Behaviour change

Assessment of **social** acceptability

Scenario 2 ExACT

Quantification:

Good Practices

Enabling Environment

Behaviour change

FLW reduction

Calculation of **environmental** (ghg) and **economic** ($) cost-effectiveness

Multi-disciplinary team of
Sociologist/ Behavioral Scientist, Technologist, Economist, Environment Expert