2nd Meeting

Navigating Reliable Diagnoses for Measuring Food Losses in the Primary Sector of the Supply Chain

11/04/24

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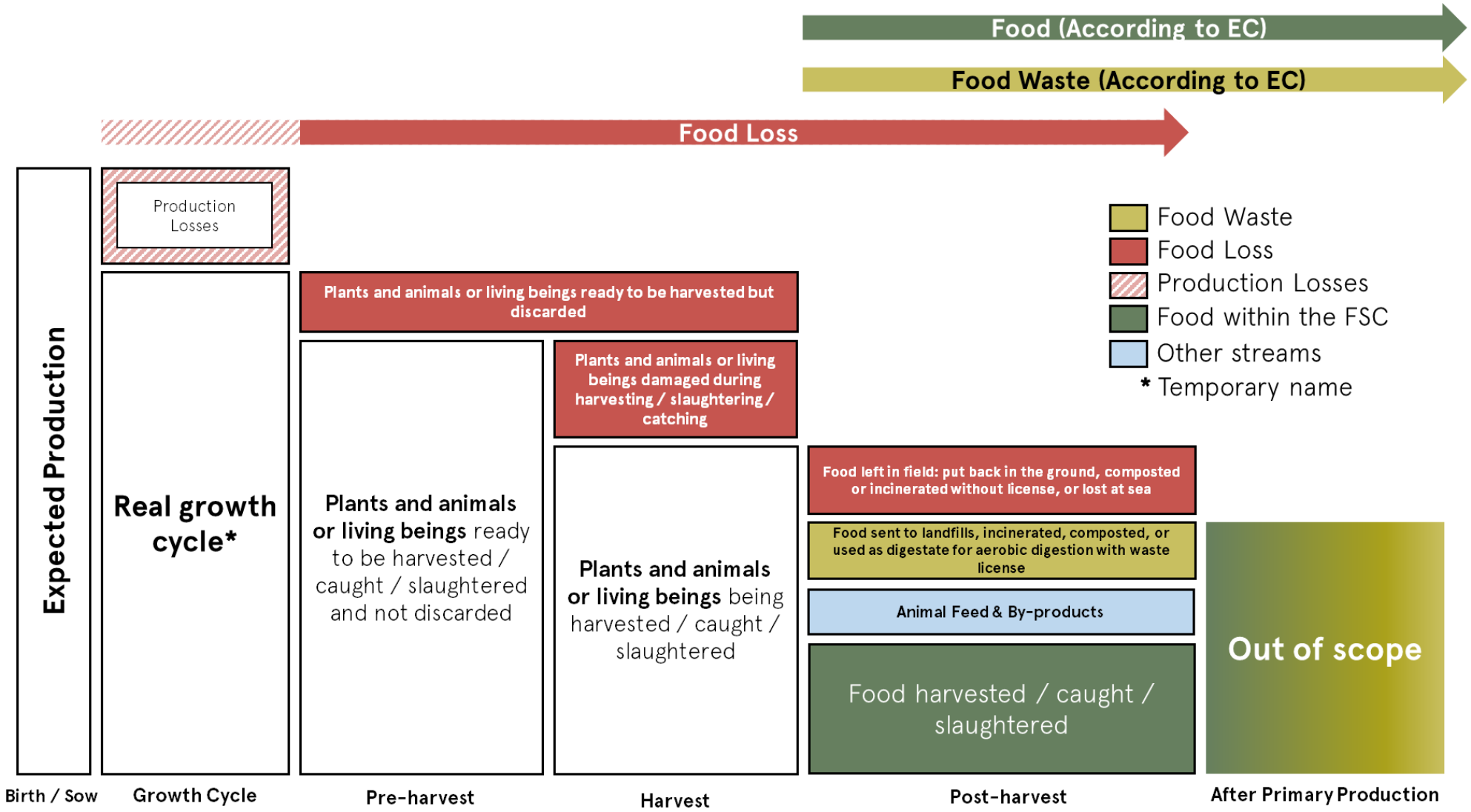
1. FOLOU Definitional Framework of Food Losses

FL Definitional Framework

Food loss is any harvest-mature plant, animal or living being (including inedible parts) that is not successfully harvested, as well as food removed from the supply chain during post-harvest phase that does not become animal feed, by-product or food waste

FL Definitional Framework



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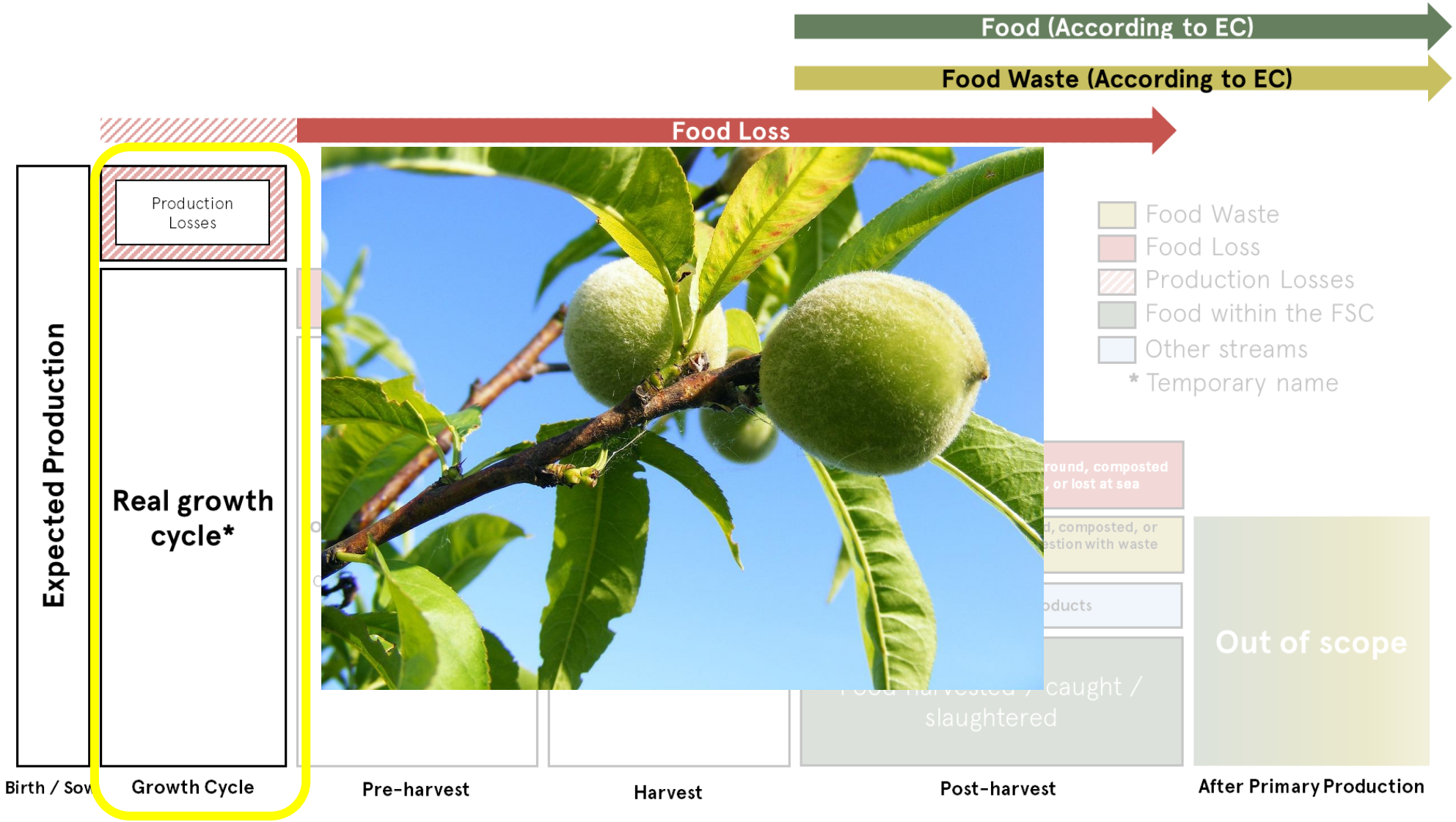

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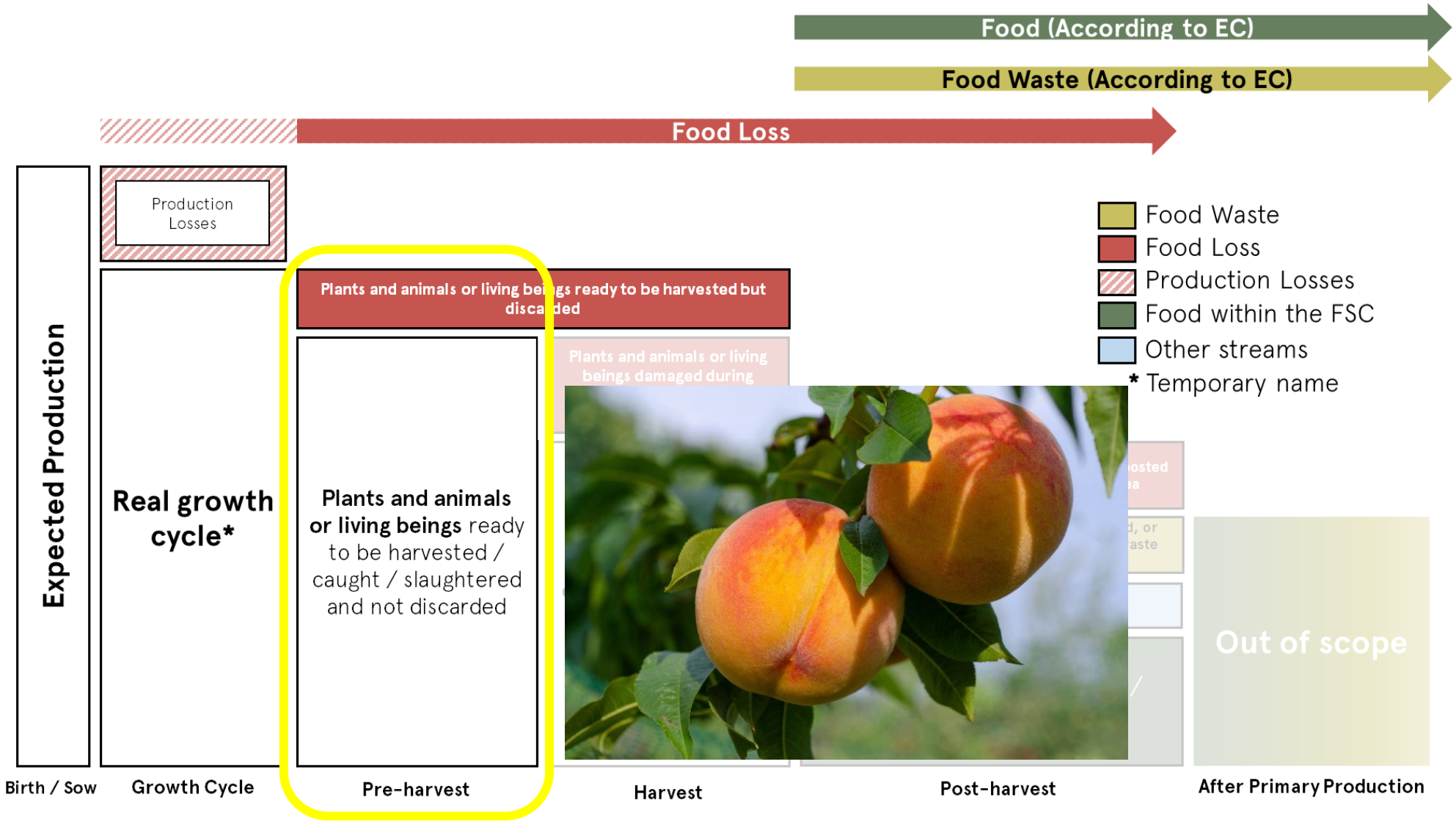
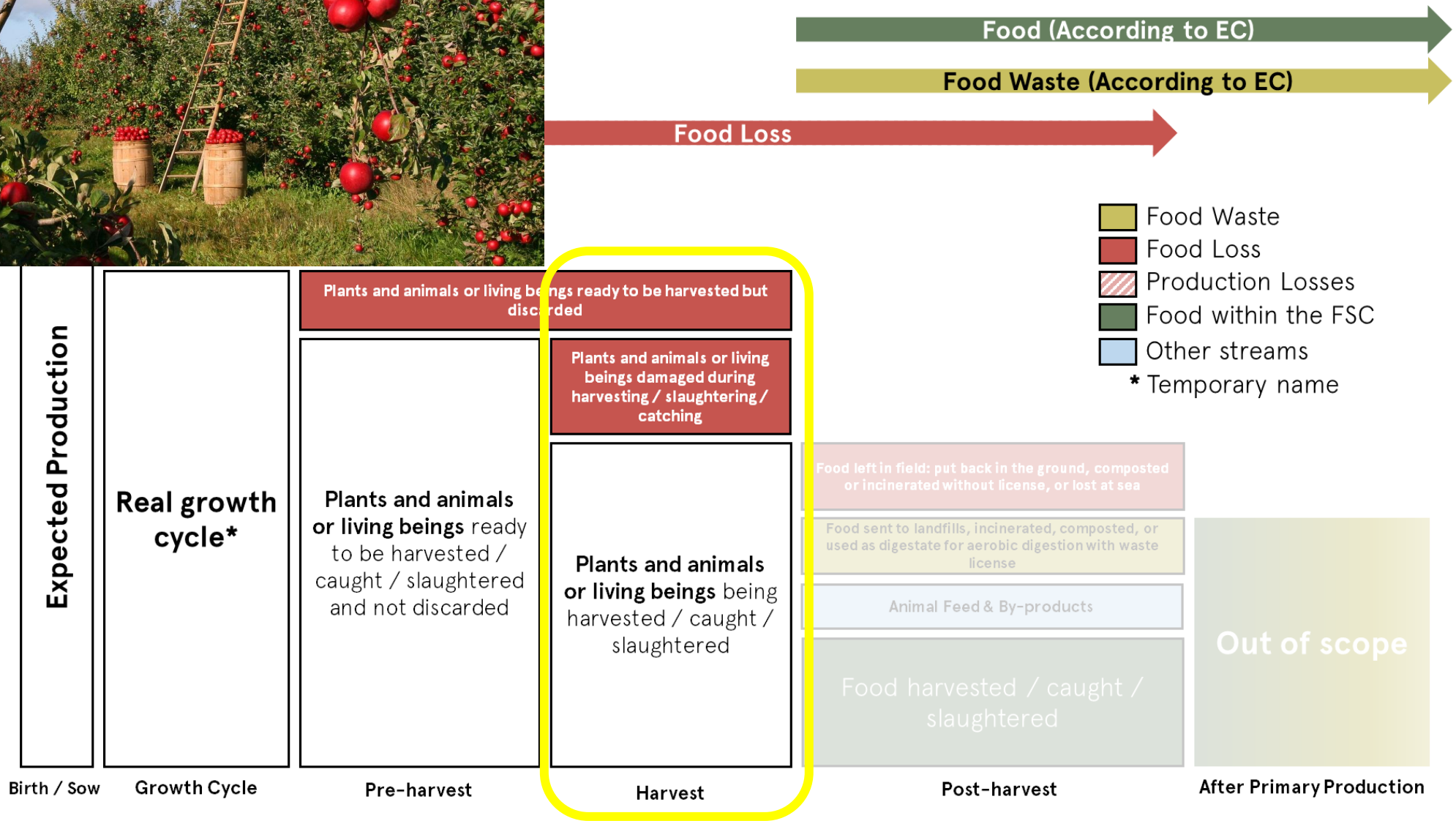
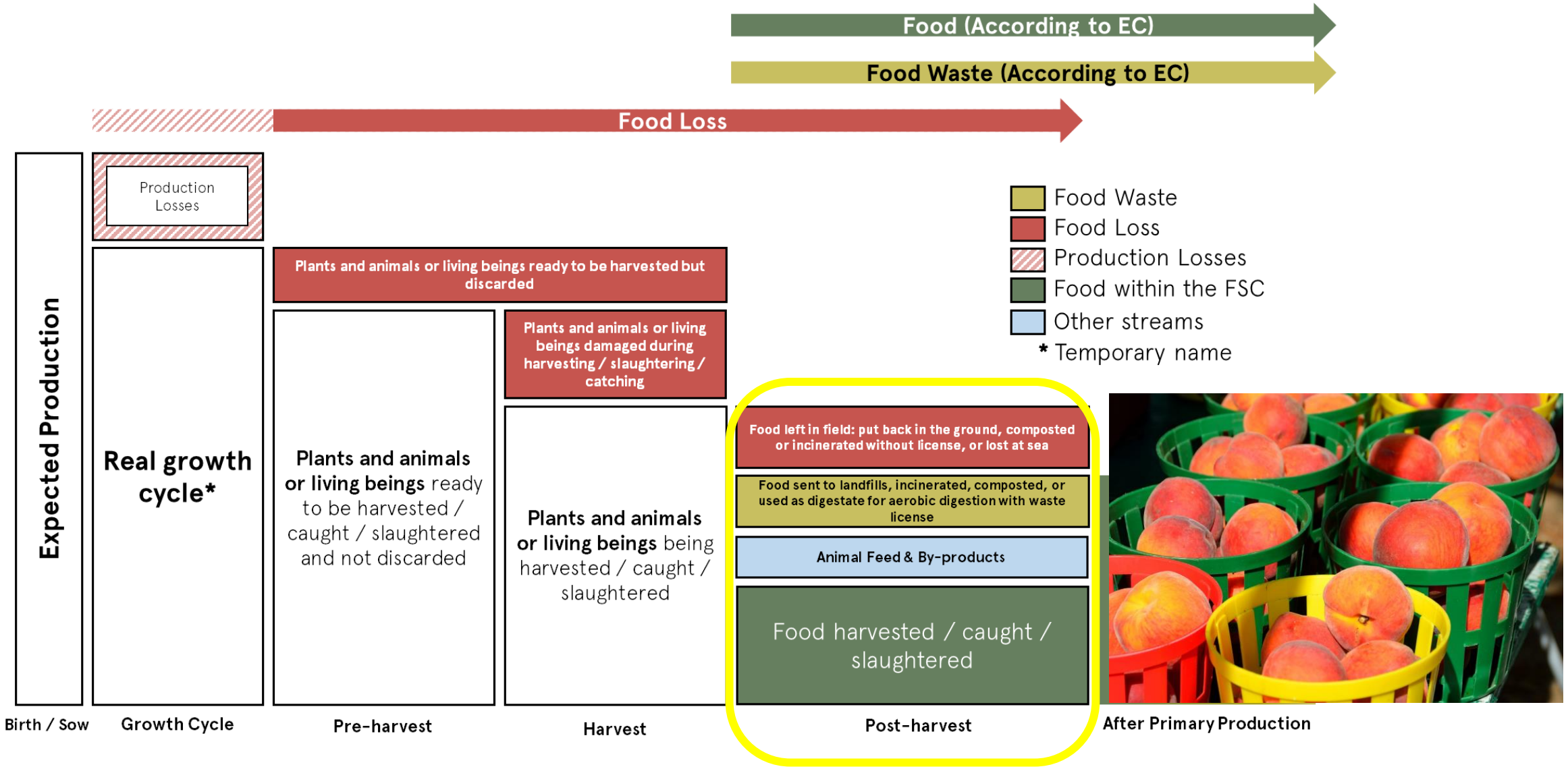


Framework


Food (According to EC)
Food Waste (According to EC)
Food Loss
Food Waste
Food Loss
Production Losses
Food within the FSC
Other streams
* Temporary name
Expected Production
Real growth cycle*
Plants and animals or living beings ready to be harvested but discarded
Plants and animals or living beings damaged during harvesting / slaughtering / catching
Plants and animals or living beings ready to be harvested / caught / slaughtered and not discarded
Plants and animals or living beings being harvested / caught / slaughtered
Food left in field: put back in the ground, composted or incinerated without license, or lost at sea
Food sent to landfills, incinerated, composted, or used as digestate for aerobic digestion with waste license
Animal Feed & By-products
Food harvested / caught / slaughtered
Out of scope
Birth / Sow
Growth Cycle
Pre-harvest
Harvest
Post-harvest
After Primary Production

FL Definitional Framework



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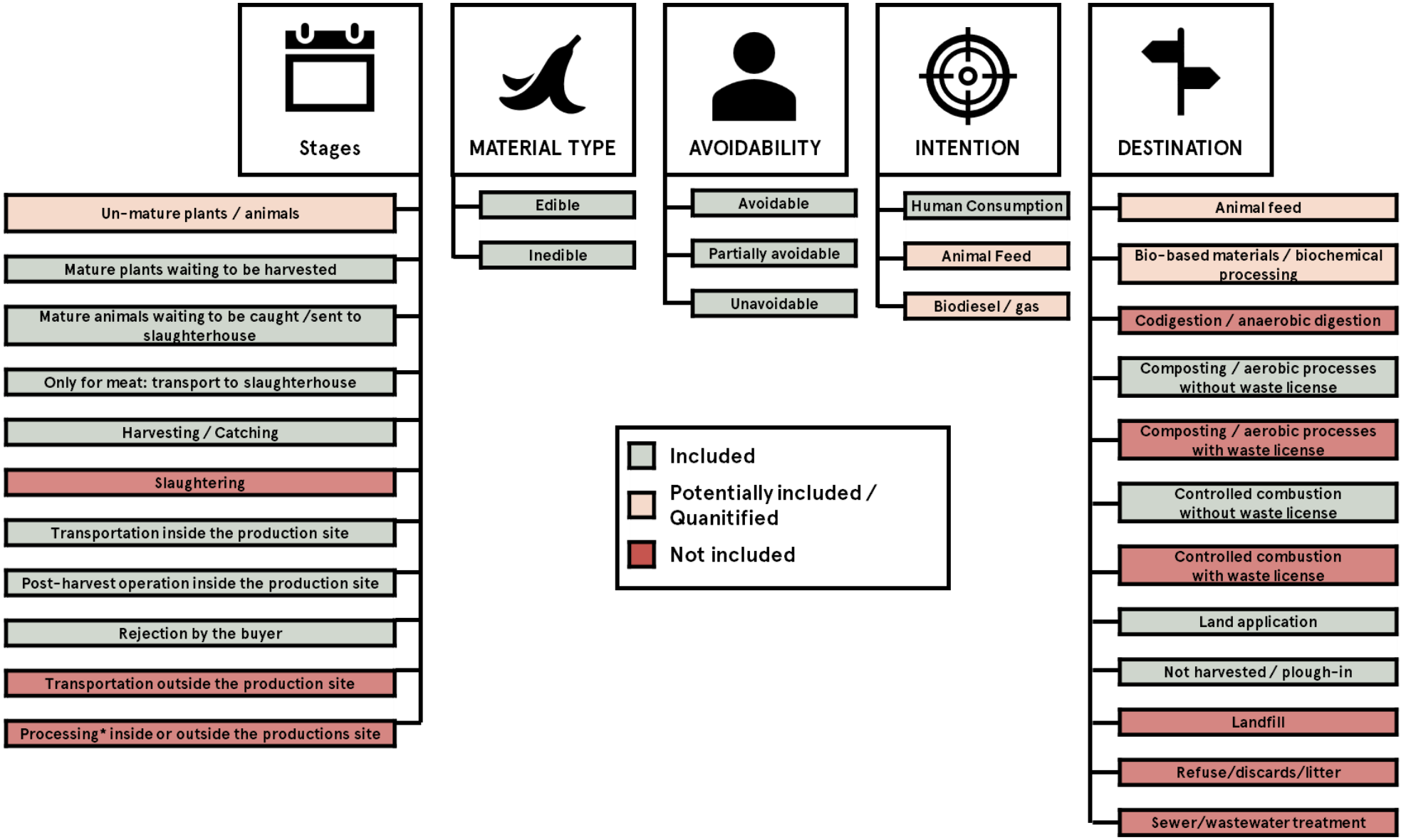

Webinar:
Defining Food Loss in the European Union Framework – Challenges and Significance

Scan me

https://www.folou.eu/webinar-series-kickoff-defining-food-loss-in-the-european-union-framework-challenges-and-significance/

2. Quantification Manual of Food Losses

Quantification Manual of FL

Road map

State of the art

FOLOU Partners

Espigoladors expertise

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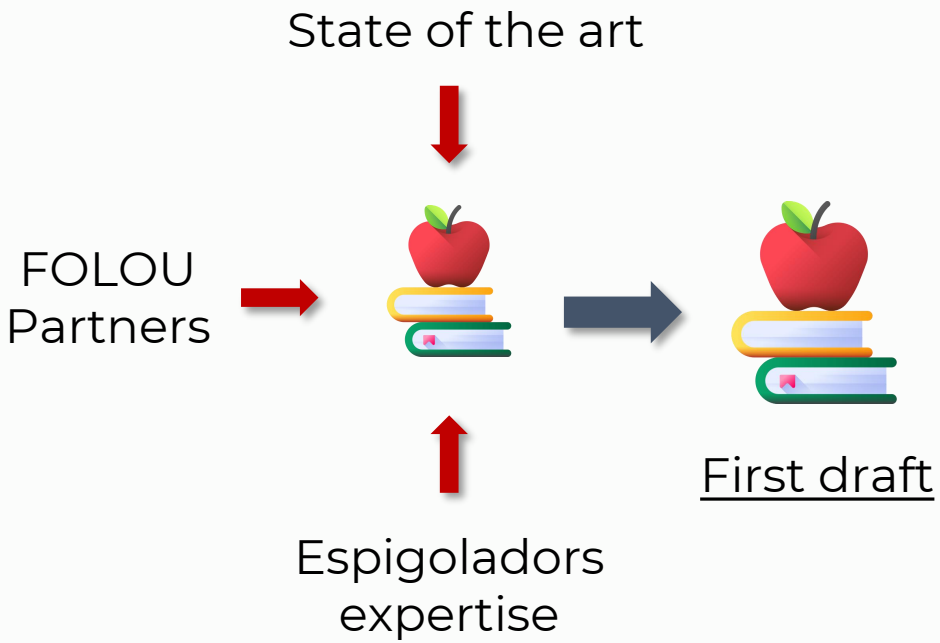
Road map



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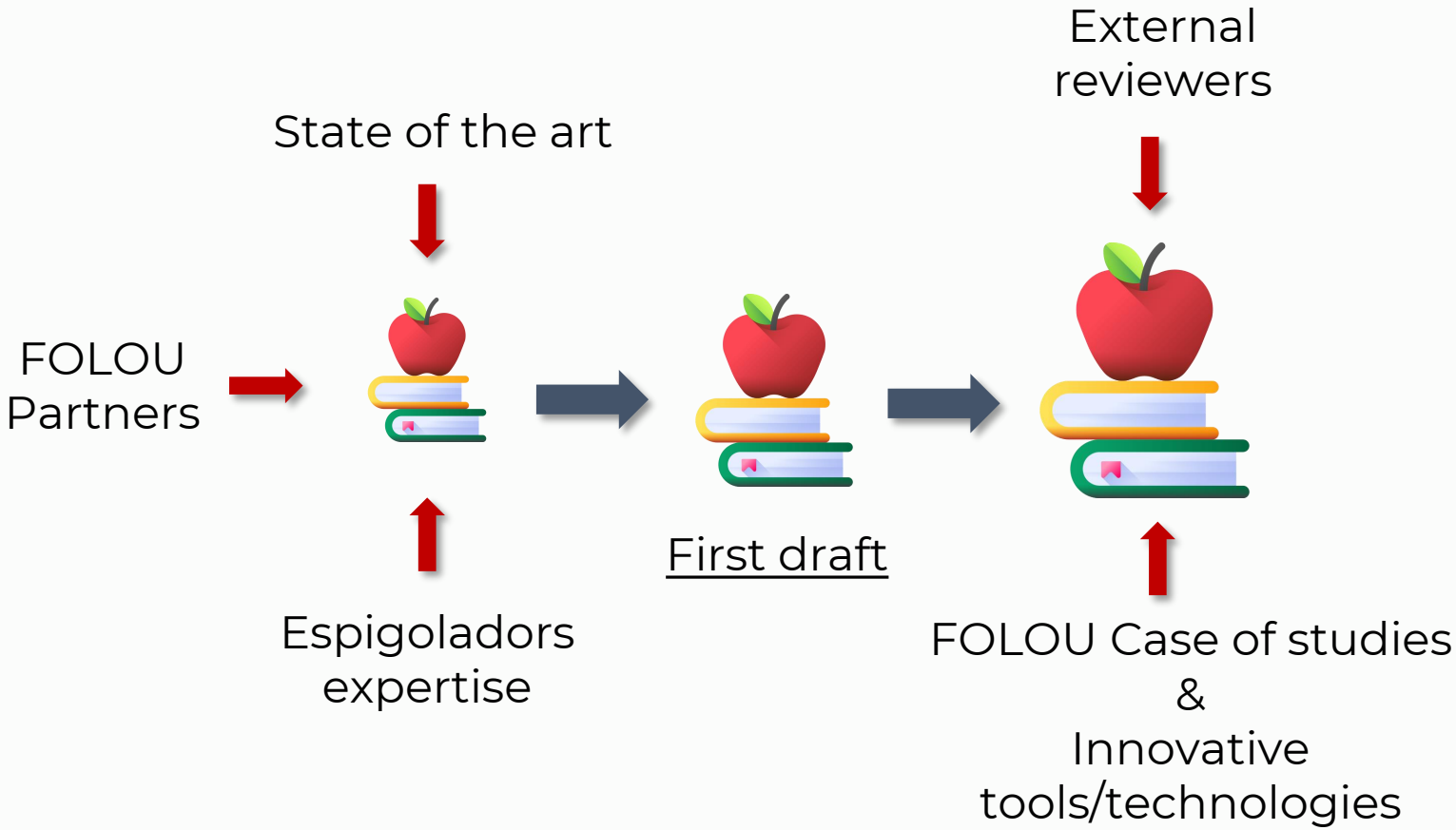
Road map



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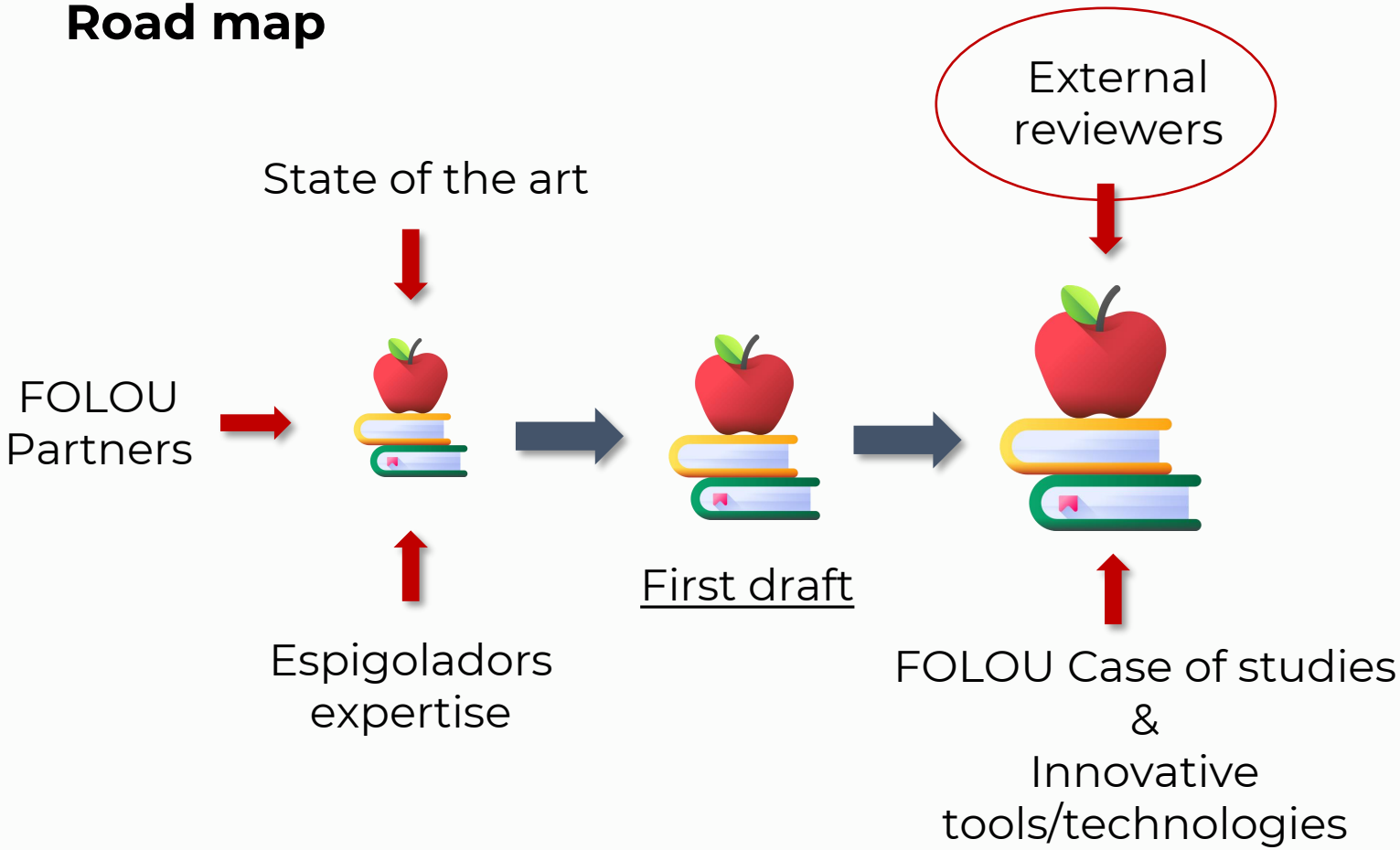

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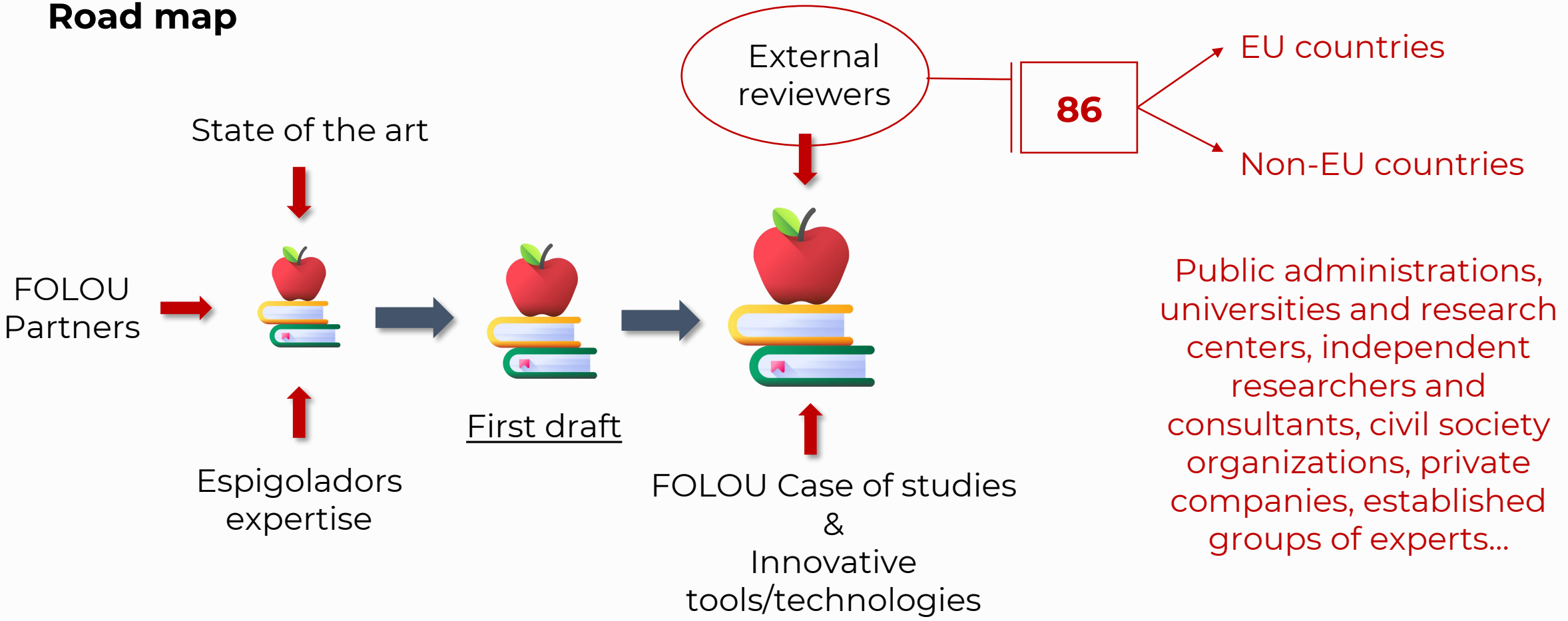

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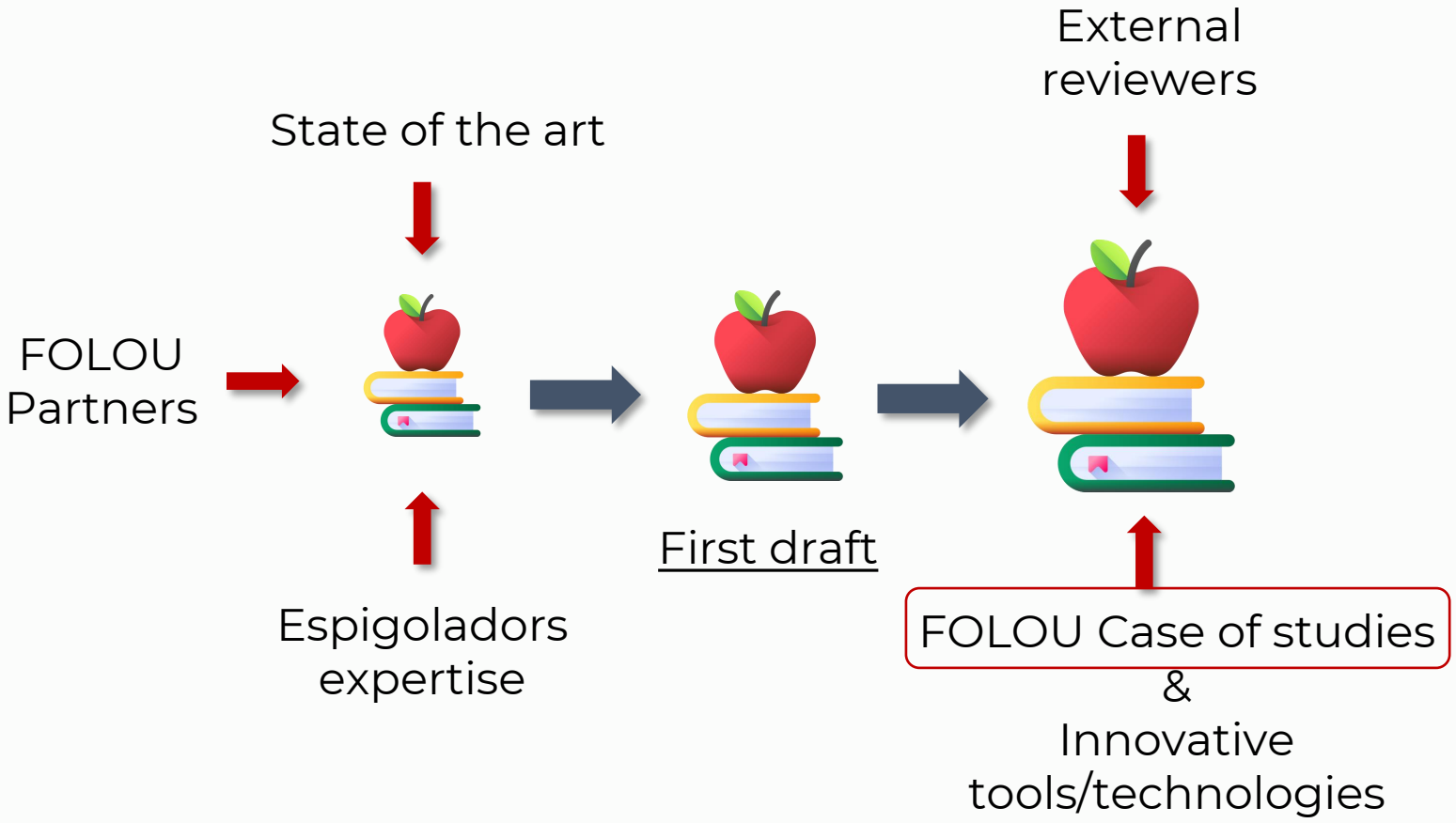

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Case of studies

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Case of studies

Fruits and vegetables

- Apples
- Pears
- Tomatoes
- Peaches and nectarines
- Cabbages
- Lettuces
- Additional:
  - Artichokes
  - Citrus trees (oranges and mandarins)

Spain

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Case of studies

Fruits and vegetables

Cereals (maize) → Italy

Quantification Manual of FL

Case of studies

Fruits and vegetables

Cereals (maize)

Roots and tubers (potatoes) → Belgium

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Case of studies

Fruits and vegetables

Cereals (maize)

Roots and tubers (potatoes)

Dairy (milk) → Ireland & The Netherlands

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Case of studies

Fruits and vegetables

Cereals (maize)

Roots and tubers (potatoes)

Dairy (milk)

Aquaculture (fish) (salmon) → Norway

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Case of studies

Fruits and vegetables

Cereals (maize)

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Aquaculture (seafood) (mussels) → Italy

Quantification Manual of FL

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- Conventional
- Organic
- Agroecological

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Case of studies

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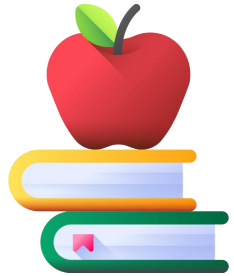

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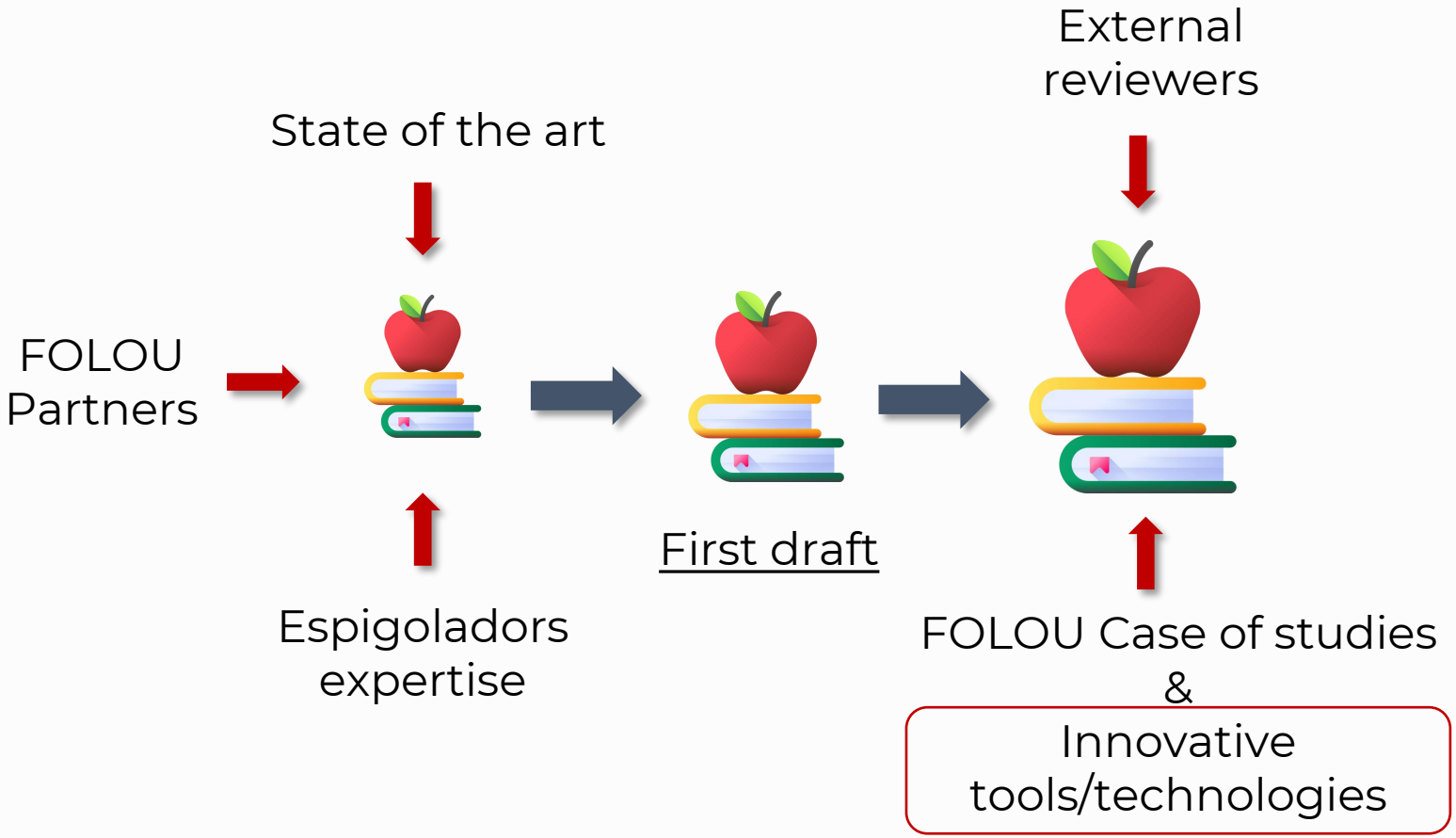

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FOLOU Innovative tools/technologies

- Harnessing Vision-Based Metrics for Quantifying Food Loss in Cauliflower Fields

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FOLOU Innovative tools/technologies

- Counting apples and apple quality with drones and AI

Good quality

Medium quality

Bad quality

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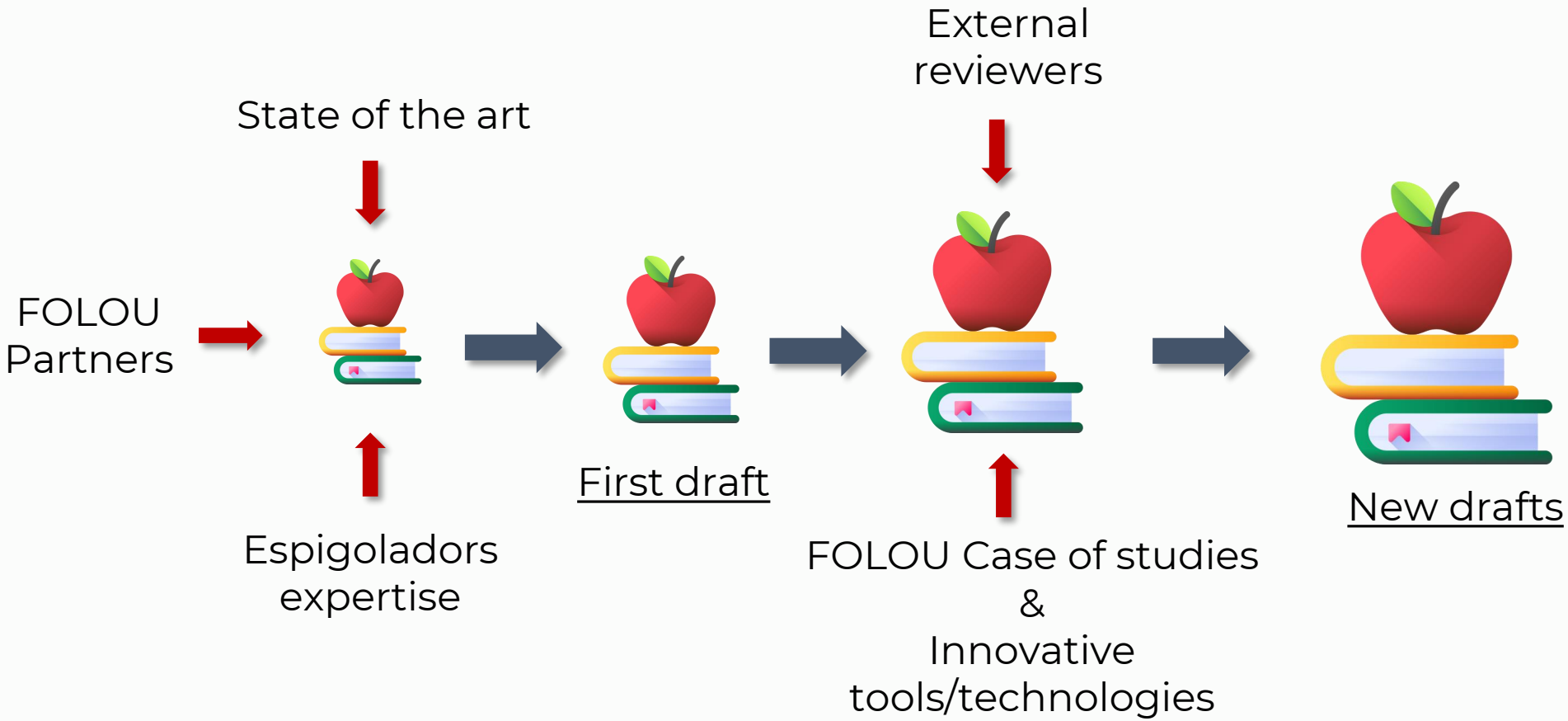

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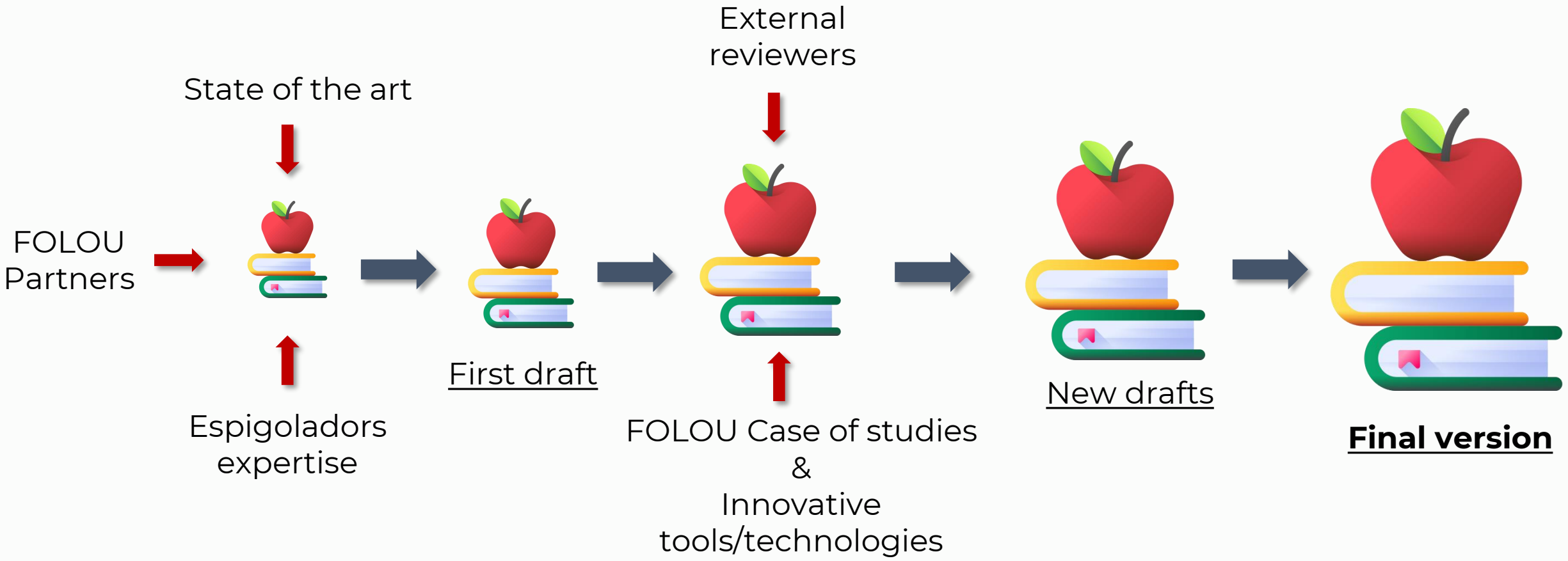

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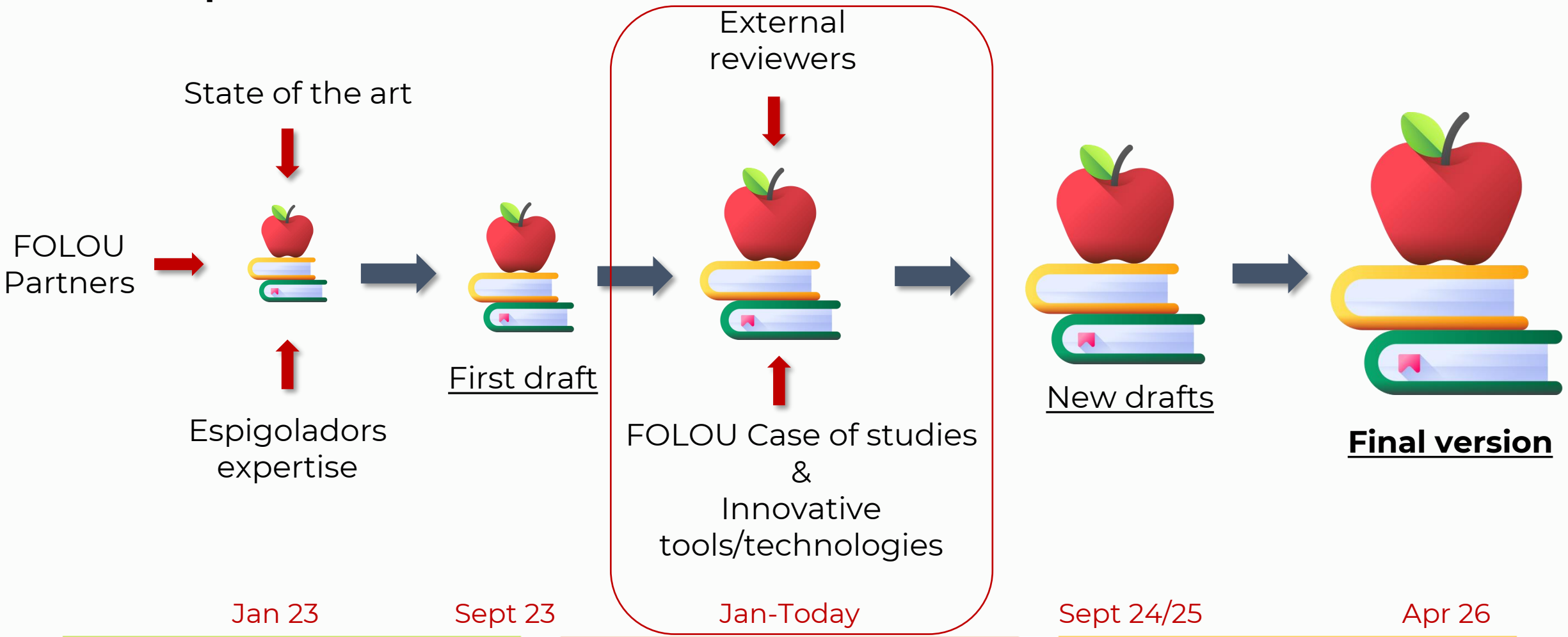
Road map

Current status



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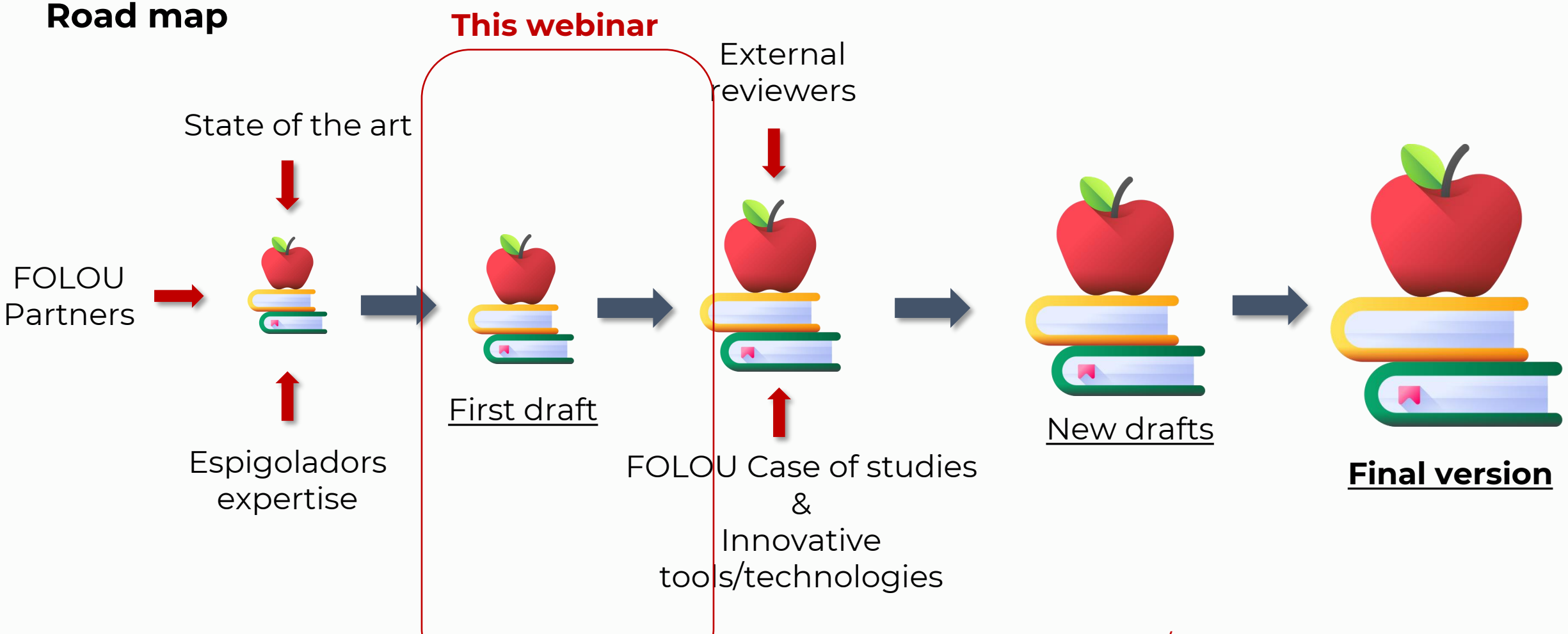

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Main structure

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Main structure

- WHAT?
- WHERE?
- HOW?
- WHEN?

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Main structure

- WHAT?
- WHERE?
- HOW?
- WHEN?

2 main approaches:

Public administration
(Territorial level)

Farmers, cooperatives or
Specific research
(Plot/Farm/Company level)

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Main structure

- WHAT?
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- HOW?

27.9.2019 EN Official Journal of the European Union L 248/77

COMMISSION DELEGATED DECISION (EU) 2019/1597

of 3 May 2019

supplementing Directive 2008/98/EC of the European Parliament and of the Council as regards a common methodology and minimum quality requirements for the uniform measurement of levels of food waste

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- HOW?

Table 6. Methodology for the in-depth measurement of food waste recommended by the Delegated Decision

<table>
<tr><th>Stage of the food supply chain</th><th colspan="5">Methods of measurement</th></tr>
<tr><td>Primary production</td><td rowspan="5">Direct measurement</td><td rowspan="3">Mass balance</td><td></td><td colspan="2">- Questionnaires and interviews
- Coefficients and production statistics
- Waste composition analysis</td></tr>
<tr><td>Processing and manufacturing</td><td rowspan="3">Waste composition analysis</td><td rowspan="2">Counting/scanning</td><td></td></tr>
<tr><td>Retail and other distribution of food</td><td rowspan="3">Diaries</td></tr>
<tr><td>Restaurants and food services</td><td rowspan="2"></td><td></td></tr>
<tr><td>Households</td><td></td><td></td></tr>
</table>

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- HOW?

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Stage of the food supply chain	Methods of measurement				
Primary production	Direct measurement	Mass balance		- Questionnaires and interviews - Coefficients and production statistics - Waste composition analysis	
Processing and manufacturing					
Retail and other distribution of food			Waste composition analysis	Counting/scanning	
Restaurants and food services					Diaries
Households					

Quantitative approach

Qualitative approach

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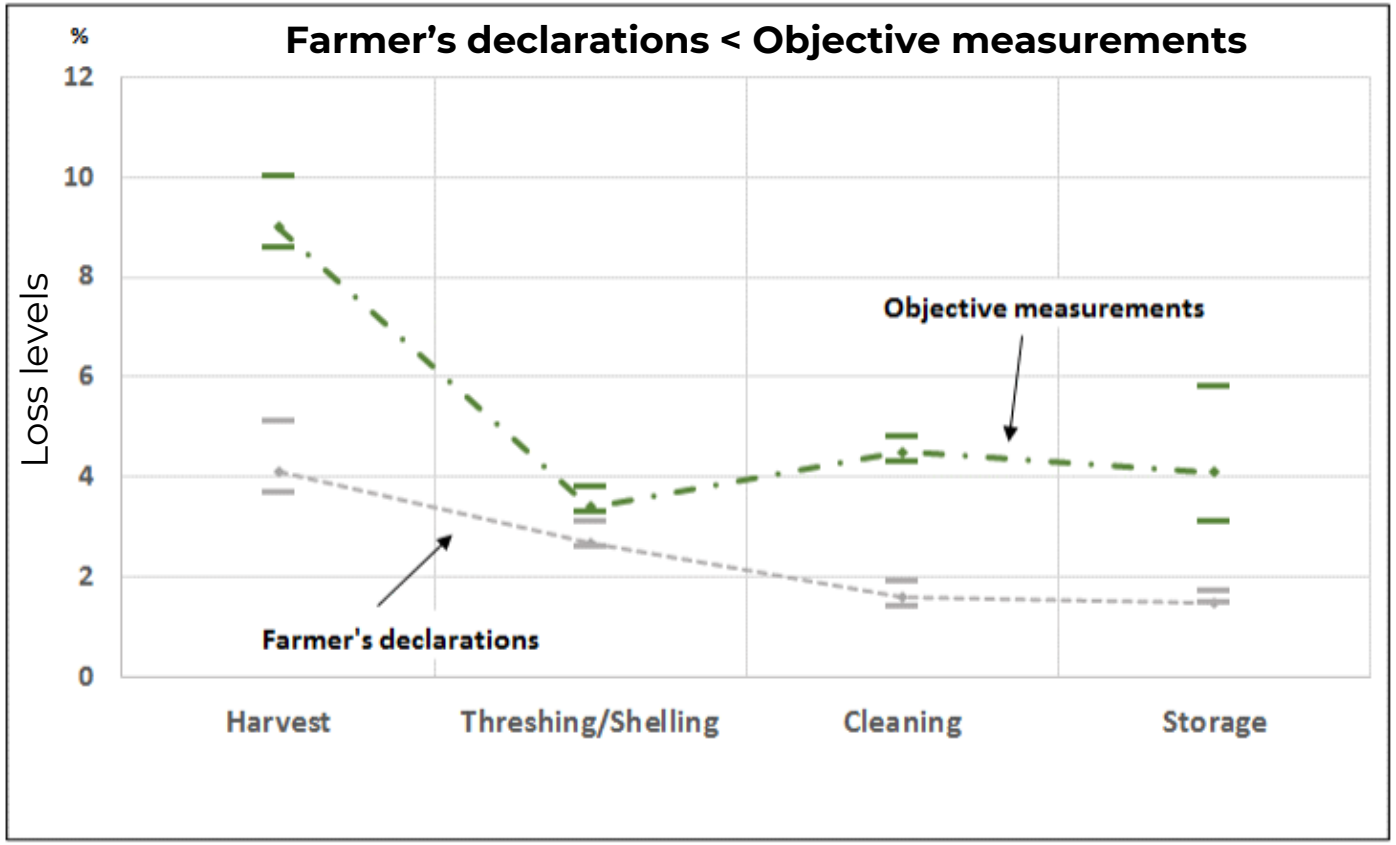
- HOW?



Source: FAO Guidelines on the measurement of harvest and post-harvest losses. Recommendations on the design of a harvest and post-harvest loss statistics system for food grains (cereals and pulses) 2018.

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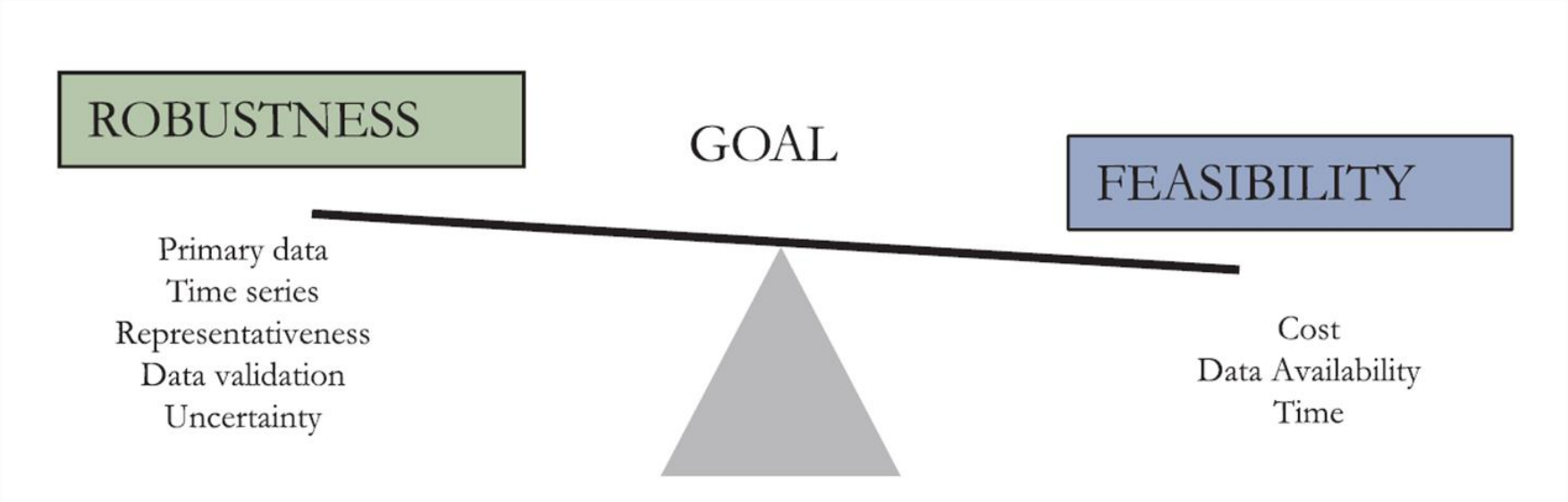
- HOW?



Source: Corrado, S.; Caldeira, C.; Eriksson, M.; Hanssen, O.J.; Hauser, H.E.; van Holsteijn, F.; Liu, G.; Östergren, K.; Parry, A.; Secondi, L.; et al. Food waste accounting methodologies: Challenges, opportunities, and further advancements. Glob. Food Sec. 2019.

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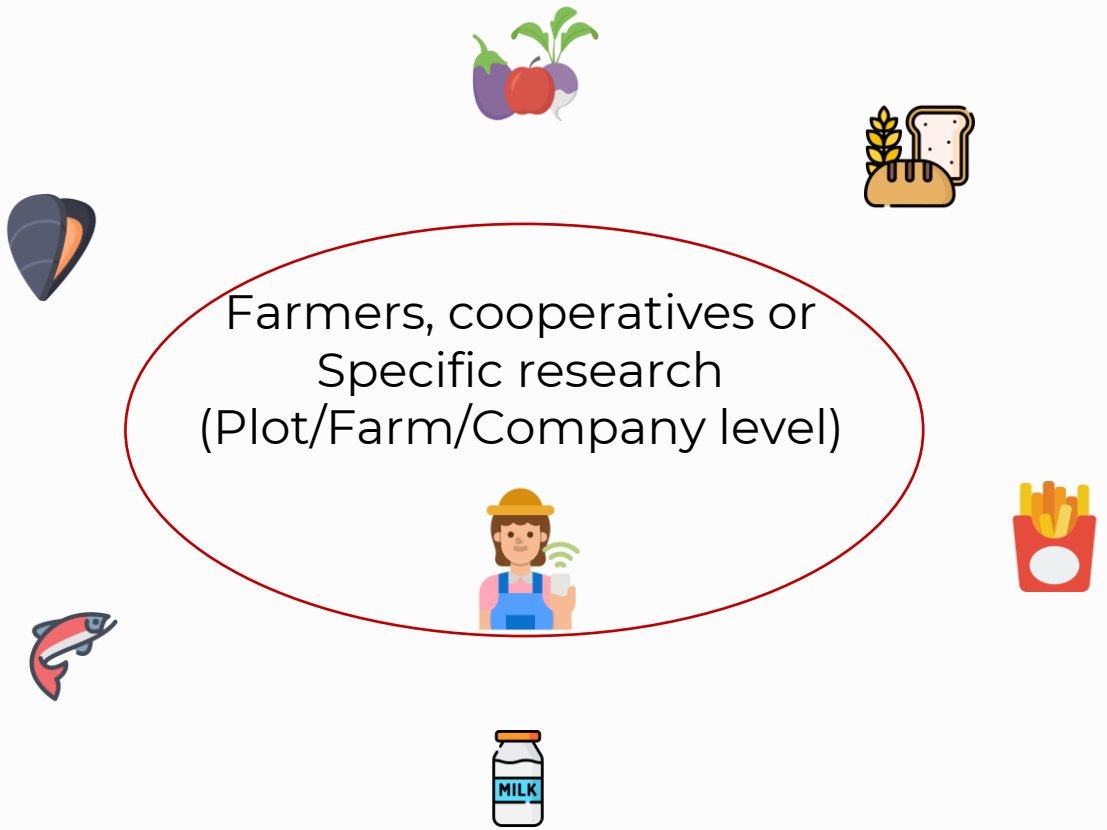
- HOW?



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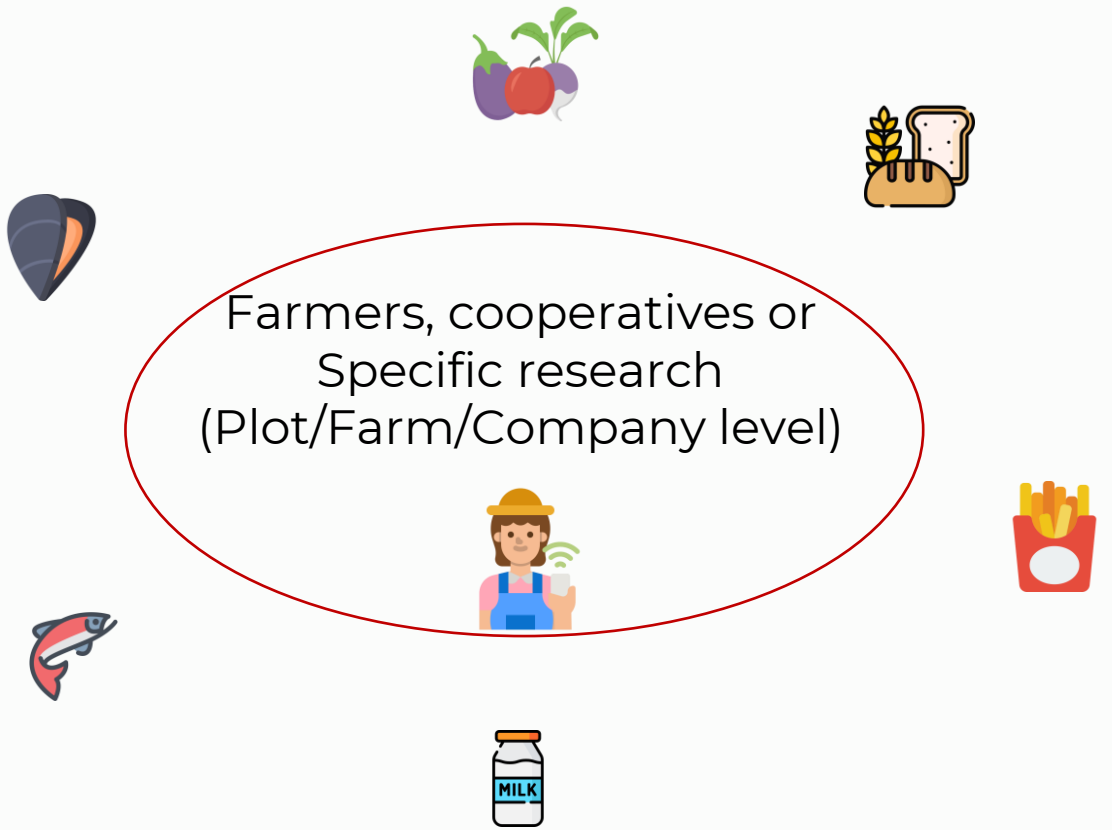

1st Draft:
Crops oriented

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- HOW?

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- HOW?

  ➢ 1. Qualitative approach

(Quantification manual)
Please go to 3.4.1. Gathering information through qualitative methods for each plot

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- HOW?

  ➢ 1. Qualitative approach ⟷ **Engagement of primary sectors**

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Table 12. Recommended information to collect through qualitative methods.
An example.

Basic data of the plot	
Name of the interviewee: Isabel García	**Position of the interviewee:** Owner of the farm and farmer
Farm ID	27_County_9
Plot ID	27_County_9_A
Location	County 9. Region X
Crop(s)	Tomatoes
Area/surface of the analyzed parcel (ha): 3,7	
Type of soil:	Clayish
Seed variety	Solanum lycopersicum
Plant spacing	70 cm
Rows number: 21	**Rows spacing:** 1.8 metres
Method of irrigation	Drip irrigation
Main characteristics of this year's production	
Average yield in the plot (tonnes/ha): 85	**Estimated yield for this year. (tonnes/ha):** 60
Main reasons for the differences between average and estimated production: the drought in recent years will significantly reduce tomato production.	
Marketable production of the estimated yield: 75%	**Main parameters to be considered as marketable"** (size, shape, appearance quality, etc): Size and colour.
Of the marketable production, what proportion will be considered as the first category? What will be the difference in remuneration compared to the other categories? Approximately 80% will be in the first category. Then, there will be 15% in the second category, with a 60% decrease in remuneration, and the remaining 5% will be for industrial use with no remuneration.	
Have these parameters been similar or more demanding in the last 10 years? Why? The level of demands has been increasing over the last years, especially regarding the color, as the market does not accept tomatoes with a very red hue as it considers them excessively ripe	

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Main characteristics of the harvesting process
Brief description of the harvesting process: Approximately five harvests are conducted, usually one per week. The tomatoes are hand-picked, detaching the fruit from the plant by applying pressure with the thumb on the calyx. Hired personnel employed by the farm owner are involved in the harvesting process. The fruits are packed in single-layer crates, preserving the calyx along with part of the stem. For plant sanitation purposes, any fruits that have fallen to the ground or are discarded during the harvest for any reason are removed from the cultivation area. The tomatoes are then transferred from the harvest containers to larger containers known as "field bins," which are large wooden or plastic crates. These field bins are loaded onto a truck for transportation to the sorting and packing facility.

Number of cuts per agricultural campaign: 5
In terms of production and discards, would these cuts be of equal volume? (Yes/No): No
Which cuts would have the highest production level and what proportion would the rest have in relation to them? The first one. The others are: 2nd cut: (60% of production from first cut) / 3rd: 45% / 4th: 40% and 5th: 40%.
Estimated harvest calendar: 1st cut: 4th July / 2nd cut: 11th July / 3rd cut: 18th July / 4th cut: 25th July and 5th cut: 1st August

Estimated harvest schedule:

What amount of the total production will be discarded from when a product is mature enough to be harvested until it has been harvested?

- Kilos/ha:
- Tonnes/ha: 17
- % from total production: 20%

Main reasons (see reasons): A2 and B1

Reasons:

A. Aesthetic criteria or environmental conditions
1) Damaged during handling.
2) Out of size/colour/commercial shape
3) Affected by pests/diseases/birds
4) Not suitable crop for the terrain
5) Adverse environmental conditions
6) Others

B. Insufficient price
1) Market saturation
2) End of season: low demand
3) Production/harvest/post-harvest costs
4) Others

C. Inadequate personnel availability
1) Lack of timely help to harvest production peaks
2) Personnel dedicated to other tasks
3) Unable to find qualified personnel to hire
4) Others

D. Unable to find where to sell the product in good condition
1) Regular buyers do not want it
2) The cooperative with which the production was agreed cannot sell it
3) Customers for whom it was produced have breached the agreement
4) Excess production that does not need to be sold
5) Others

E. Inadequate infrastructure
1) Lack of infrastructure
2) Existing infrastructure is in poor condition
3) Others

F. Processing industry
1) Does not exist
2) Saturated
3) Does not meet quality requirements for processing
4) Others

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- HOW?

  - 1. Qualitative approach

  - 2. Quantitative approach

(Quantification manual)
Please go to 3.3.2. Collection of information for each quantified plot

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Table 11. Basic form for data collection for each analyzed parcel/plot. An example.

Date: 14/07/23		**Author**: Claudia
Farm ID	27_County_9	
Plot ID	27_County_9_A	
Crop: Tomatoes	**Type of agricultural practices (conventional, organic, or agroecological):** Conventional	
Area/surface of the analyzed parcel:	- Hectares: 3.7	
Approximate production of the parcel throughout the year:	- Kilos:	- Tonnes: 296
Harvested volumes		
Volume of the total production that has been harvested in the plot:	- % from total production: 76% - Kilos: - Tonnes**:** 225	
Volume of the total production that has been harvested AND it has had an economic yield for the producer?:	- % from total production: 61% - Kilos: - Tonnes**:** 180	

Main reasons for the volume harvested with no economic yield for the producer:	Main reasons (see reasons): D2
Final destination of the production harvested with no economic yield for the producer:	Animal feed

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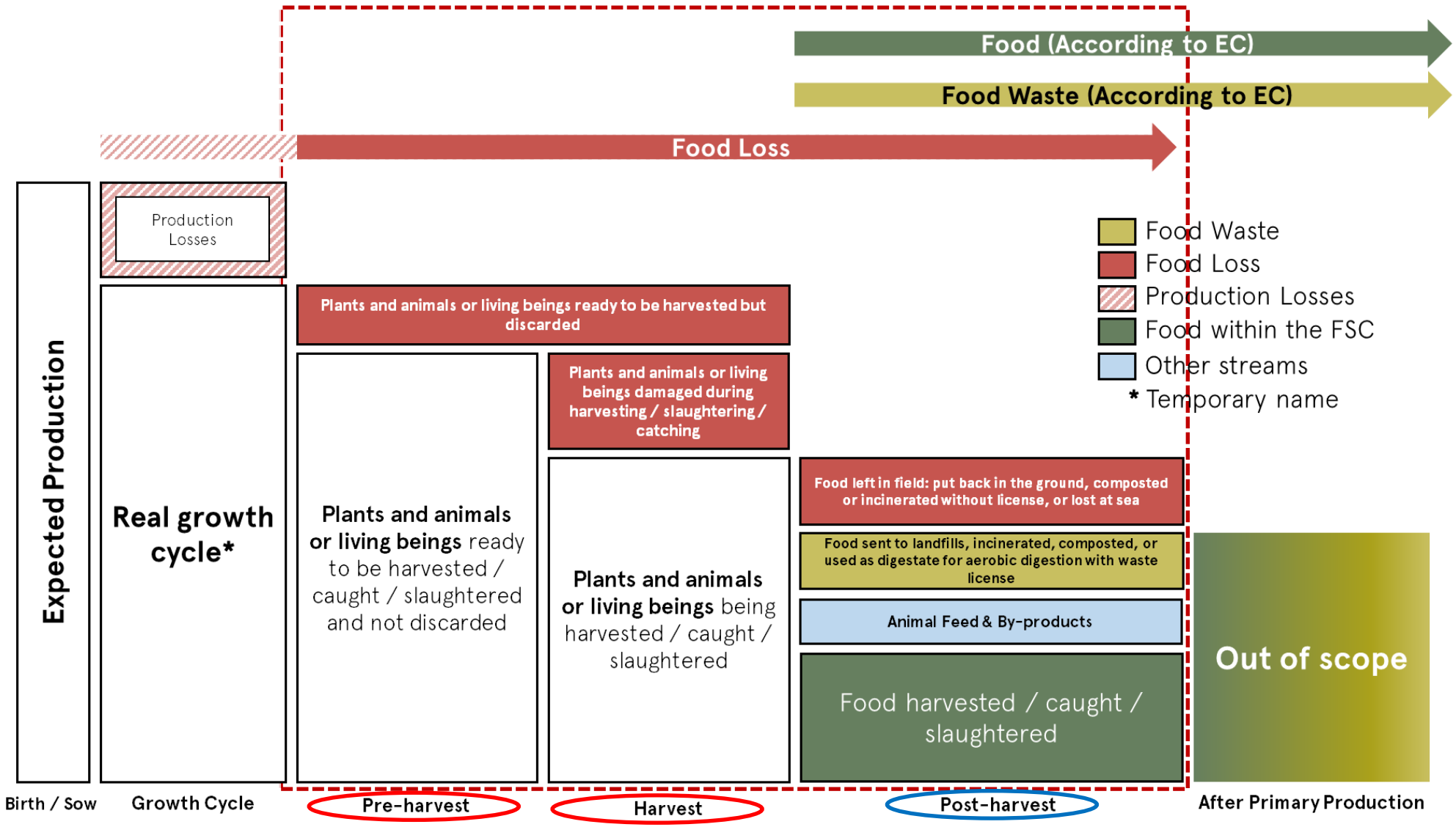
Open Access Article

Direct Measurement of Mass and Economic Harvest and Post-Harvest Losses in Spanish Persimmon Primary Production

by Maria-Angeles Fernandez-Zamudio [1,*], Héctor Barco [2] and Felicitas Schneider [3]

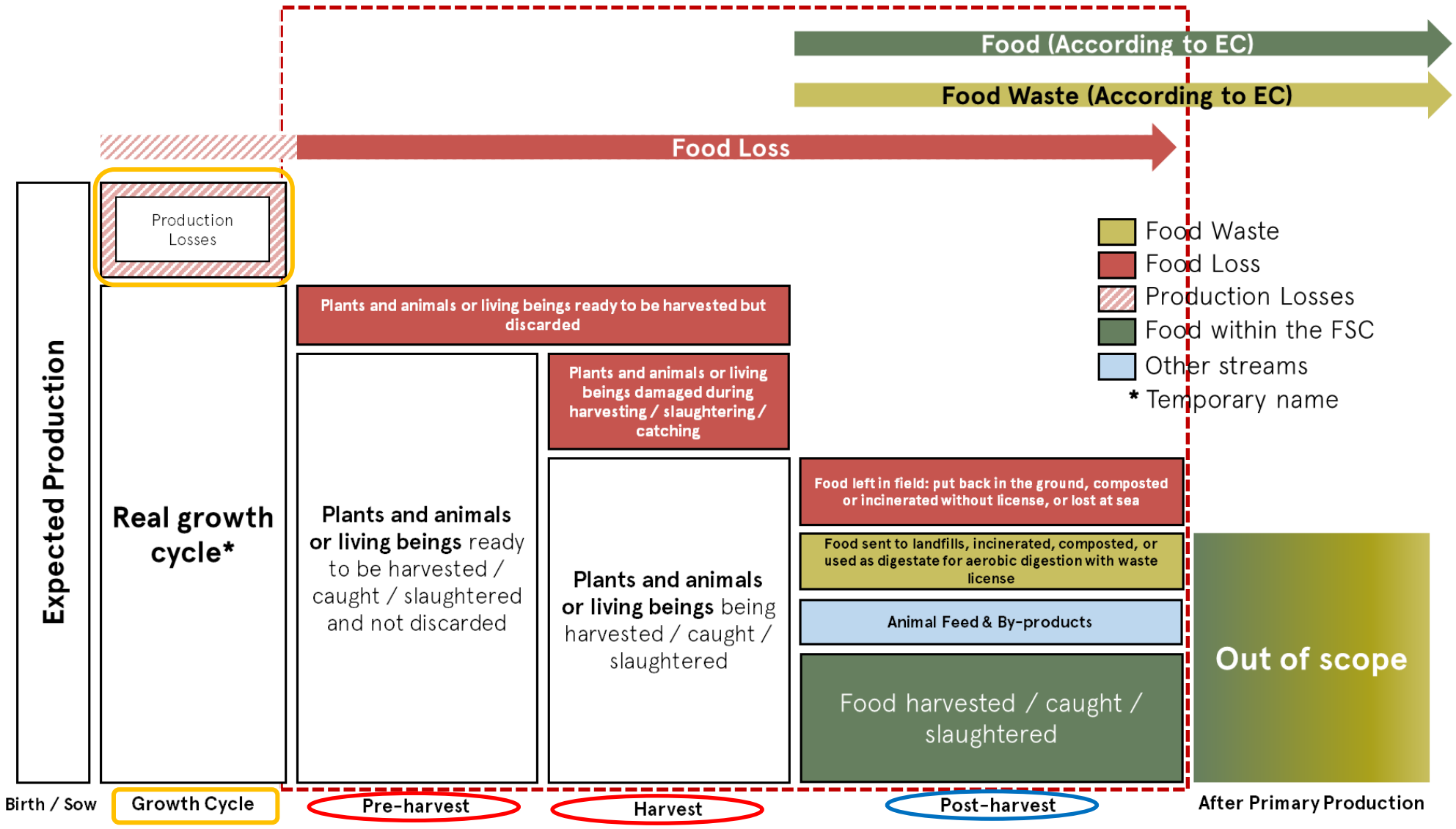
Losses volumes		
Volume of total production that has been discarded/lost before reaching maturity to be harvested:	- % from total production: 3% - Kilos: - Tonnes: 12	Main reasons (see reasons): A3 and A5
Volume of total production that has been discarded/lost AFTER reaching maturity to be harvested and BEFORE harvesting:	- % from total production: 15% - Kilos: - Tonnes: 44	Main reasons (see reasons): A2
Volume of total production that has been discarded/lost DURING harvesting:	- % from total production: 5% - Kilos: - Tonnes: 15	Main reasons (see reasons): A2 and C3

Food losses concept



Losses volumes		
Volume of total production that has been discarded/lost before reaching maturity to be harvested:	- % from total production: 3% - Kilos: - Tonnes: 12	Main reasons (see reasons): A3 and A5
Volume of total production that has been discarded/lost AFTER reaching maturity to be harvested and BEFORE harvesting:	- % from total production: 15% - Kilos: - Tonnes: 44	Main reasons (see reasons): A2
Volume of total production that has been discarded/lost DURING harvesting:	- % from total production: 5% - Kilos: - Tonnes: 15	Main reasons (see reasons): A2 and C3

Food losses + production losses



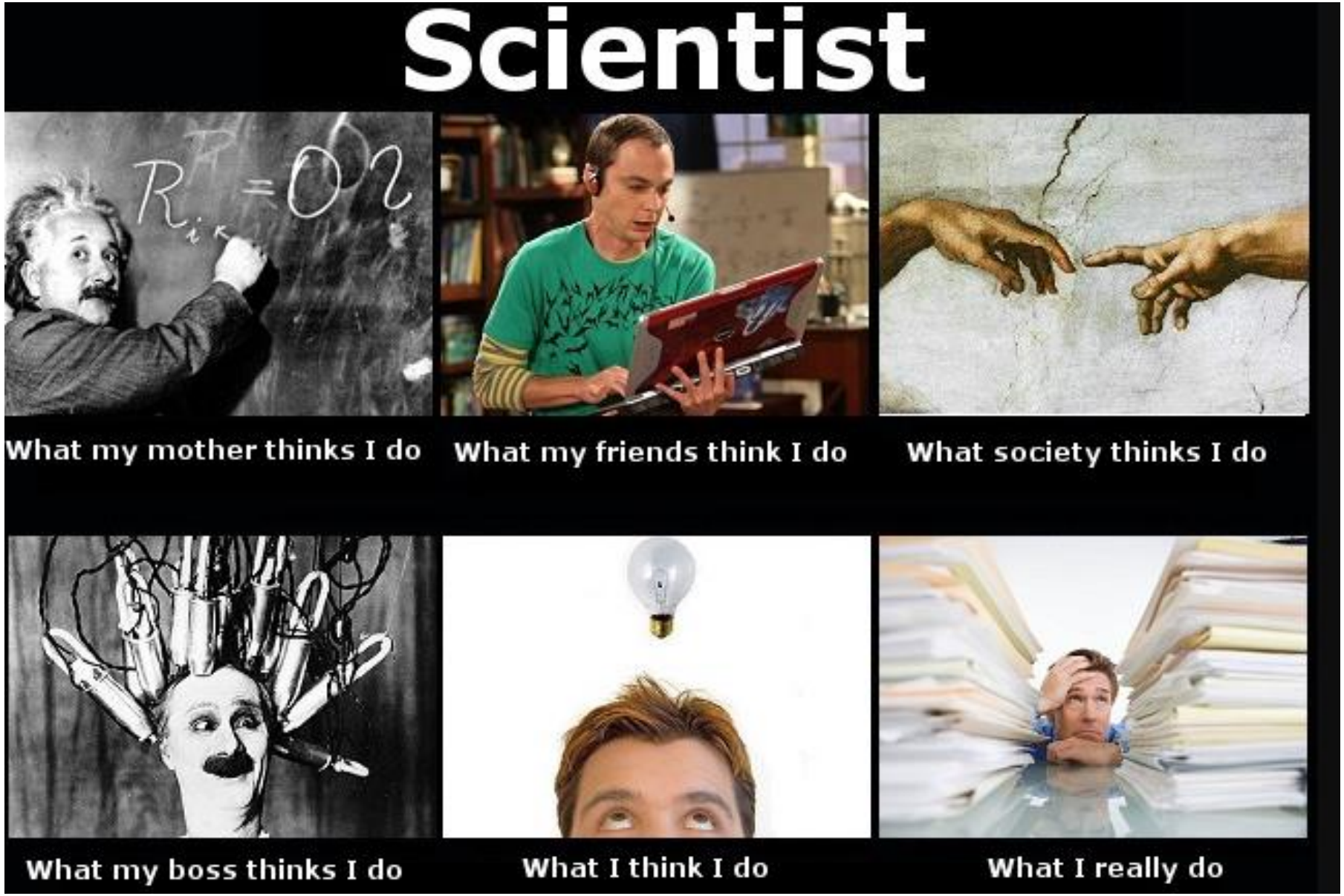
Losses volumes		
Volume of total production that has been discarded/lost before reaching maturity to be harvested:	- % from total production: 3% - Kilos: - Tonnes: 12	Main reasons (see reasons): A3 and A5
Volume of total production that has been discarded/lost AFTER reaching maturity to be harvested and BEFORE harvesting:	- % from total production: 15% - Kilos: - Tonnes: 44	Main reasons (see reasons): A2
Volume of total production that has been discarded/lost DURING harvesting:	- % from total production: 5% - Kilos: - Tonnes: 15	Main reasons (see reasons): A2 and C3
Methods of measurements: A. Before reaching maturity to be harvested: VII B. AFTER reaching maturity to be harvested and BEFORE harvesting: I (10% total plot) + VII C. DURING harvesting: I (50% total plot) + VII		

Methods of measurements:	
I. Direct measurement (weighing or volumetric assessment). II. Scanning/Counting III. Waste composition analysis IV. Diaries	V. Mass balance VI. Coefficients VII. Questionnaires and interviews VIII. Others

Losses volumes		
Volume of total production that has been discarded/lost before reaching maturity to be harvested:	- % from total production: 3% - Kilos: - Tonnes: 12	Main reasons (see reasons): A3 and A5
Volume of total production that has been discarded/lost AFTER reaching maturity to be harvested and BEFORE harvesting:	- % from total production: 15% - Kilos: - Tonnes: 44	Main reasons (see reasons): A2
Volume of total production that has been discarded/lost DURING harvesting:	- % from total production: 5% - Kilos: - Tonnes: 15	Main reasons (see reasons): A2 and C3

Reasons:	
A. Aesthetic criteria or environmental conditions 1) Damaged during handling. 2) Out of size/colour/commercial shape 3) Affected by pests/diseases/birds 4) Not suitable crop for the terrain 5) Adverse environmental conditions 6) Others	**D. Unable to find where to sell the product in good condition** 1) Regular buyers do not want it 2) The cooperative with which the production was agreed cannot sell it 3) Customers for whom it was produced have breached the agreement 4) Excess production that does not need to be sold 5) Others
B. Insufficient price 1) Market saturation 2) End of season: low demand 3) Production/harvest/post-harvest costs 4) Others	**E. Inadequate infrastructure** 1) Lack of infrastructure 2) Existing infrastructure is in poor condition 3) Others
C. Inadequate personnel availability 1) Lack of timely help to harvest production peaks 2) Personnel dedicated to other tasks 3) Unable to find qualified personnel to hire	**F. Processing industry** 1) Does not exist 2) Saturated 3) Does not meet quality requirements for processing

Losses perceived VS Real losses



Quantification Manual of FL

- HOW? (**Main Challenges**)

Losses volumes		
Volume of total production that has been discarded/lost before reaching maturity to be harvested:	- % from total production: 3% - Kilos: - Tonnes: 12	Main reasons (see reasons): A3 and A5
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3. Main challenges identified to measure food loss

Quantification Manual of FL

- HOW? (**Main Challenges**)

  ✓ 1. Starting point of food loss

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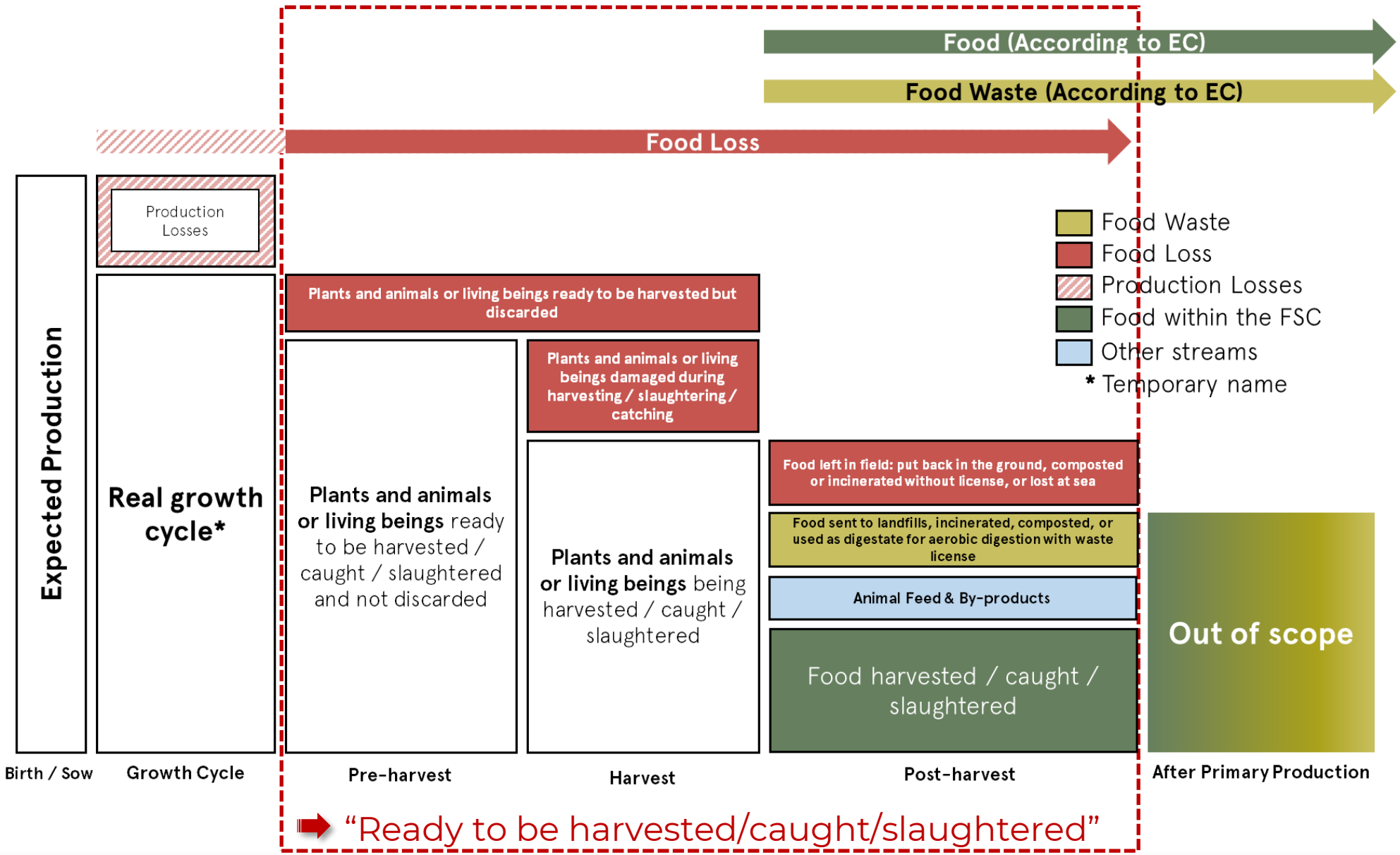
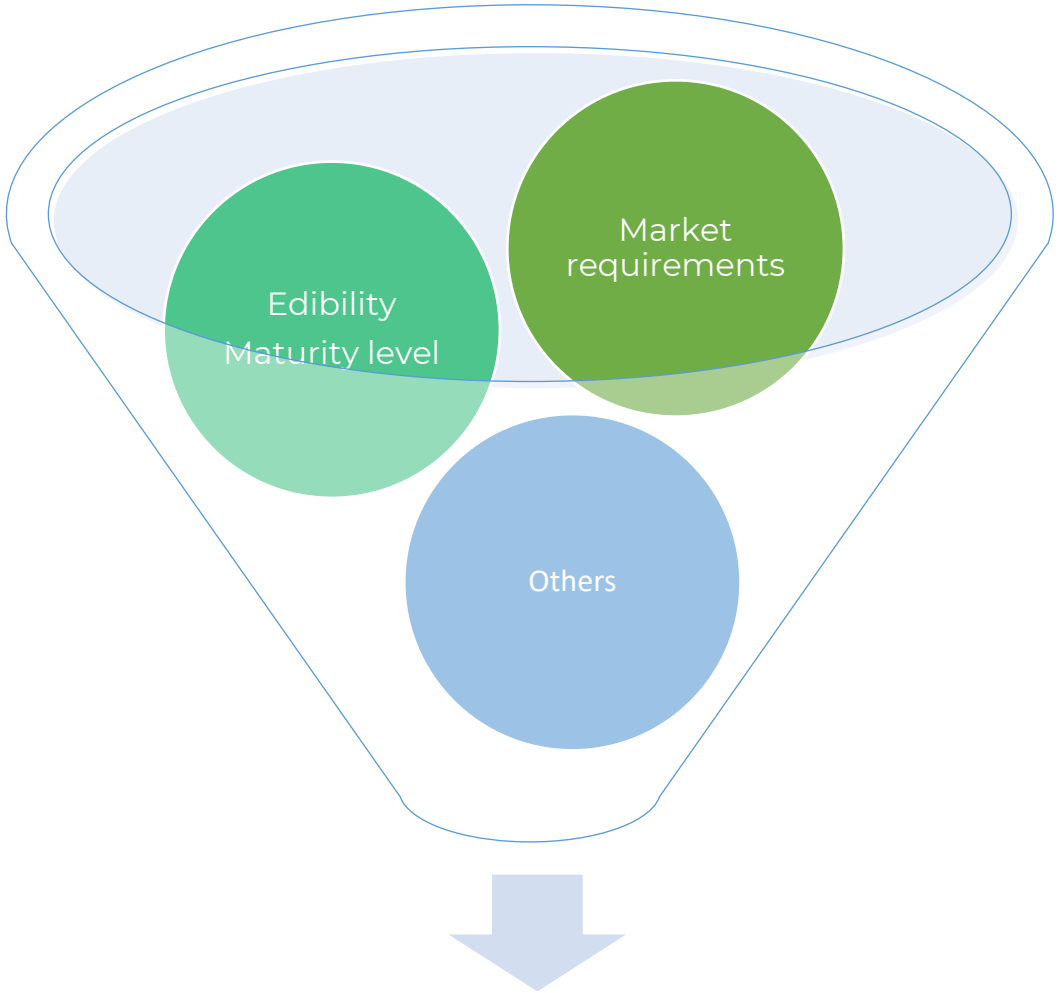
Main challenges: 1. Starting point of food losses

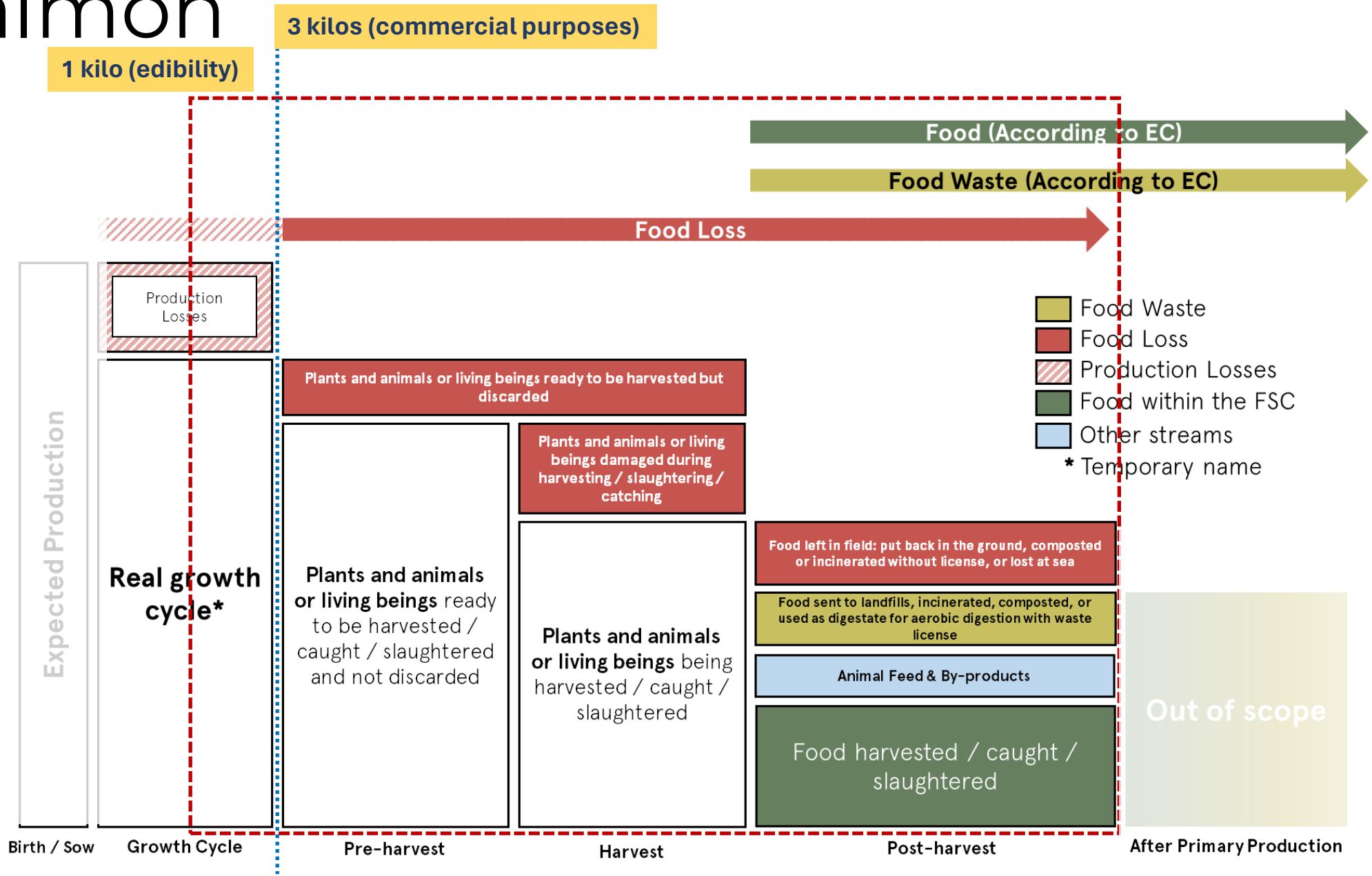


Main challenges: 1. Starting point of food losses



Ready to be harvested/caught/slaughtered

Salmon


3 kilos (commercial purposes)
1 kilo (edibility)
Food (According to EC)
Food Waste (According to EC)
Food Loss
Production Losses
Food Waste
Food Loss
Production Losses
Food within the FSC
Other streams
* Temporary name
Expected Production
Real growth cycle*
Plants and animals or living beings ready to be harvested but discarded
Plants and animals or living beings damaged during harvesting / slaughtering / catching
Plants and animals or living beings ready to be harvested / caught / slaughtered and not discarded
Plants and animals or living beings being harvested / caught / slaughtered
Food left in field: put back in the ground, composted or incinerated without license, or lost at sea
Food sent to landfills, incinerated, composted, or used as digestate for aerobic digestion with waste license
Animal Feed & By-products
Food harvested / caught / slaughtered
Out of scope
Birth / Sow
Growth Cycle
Pre-harvest
Harvest
Post-harvest
After Primary Production

Quantification Manual of FL

- HOW? (**Main Challenges**)

  ✓ 1. Starting point of food losses ➡ Dialogue with the sectors

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Quantification Manual of FL

- HOW? (**Main Challenges**)

✓ 1. Starting point of food losses → Dialogue with the sectors

↑

Engagement of primary sectors

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Quantification Manual of FL

- HOW? (**Main Challenges**)

  ✓ 1. Starting point of food losses

  ✓ 2. Sampling area

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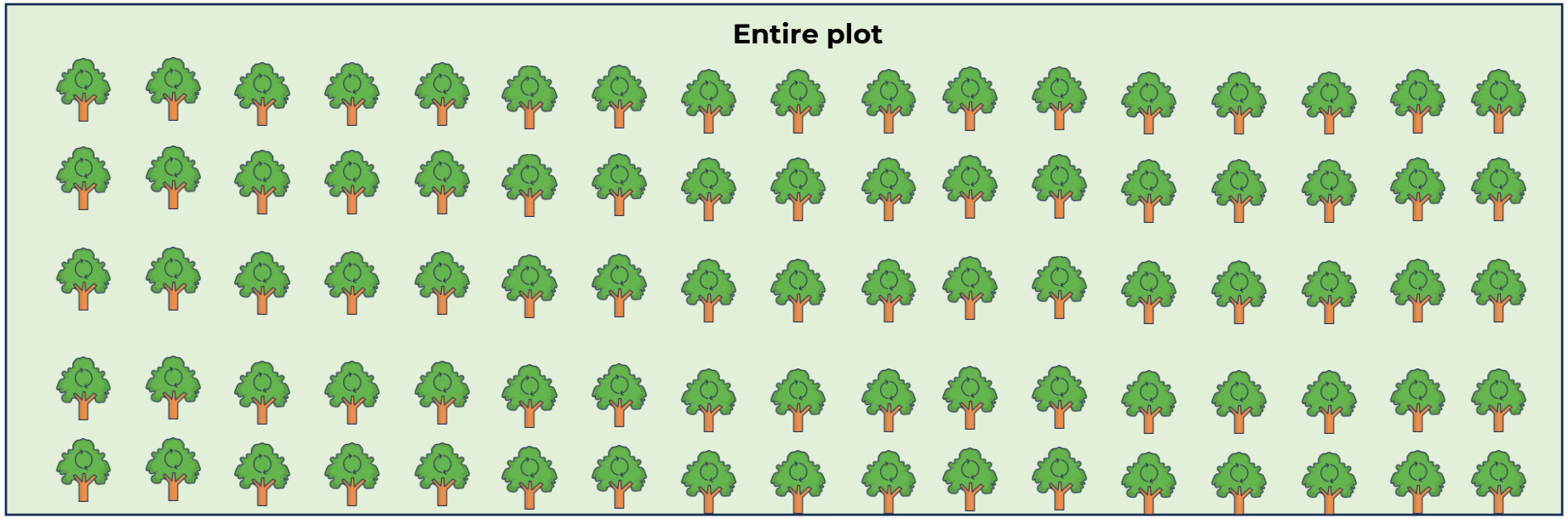
Main challenges: 2. Sampling area



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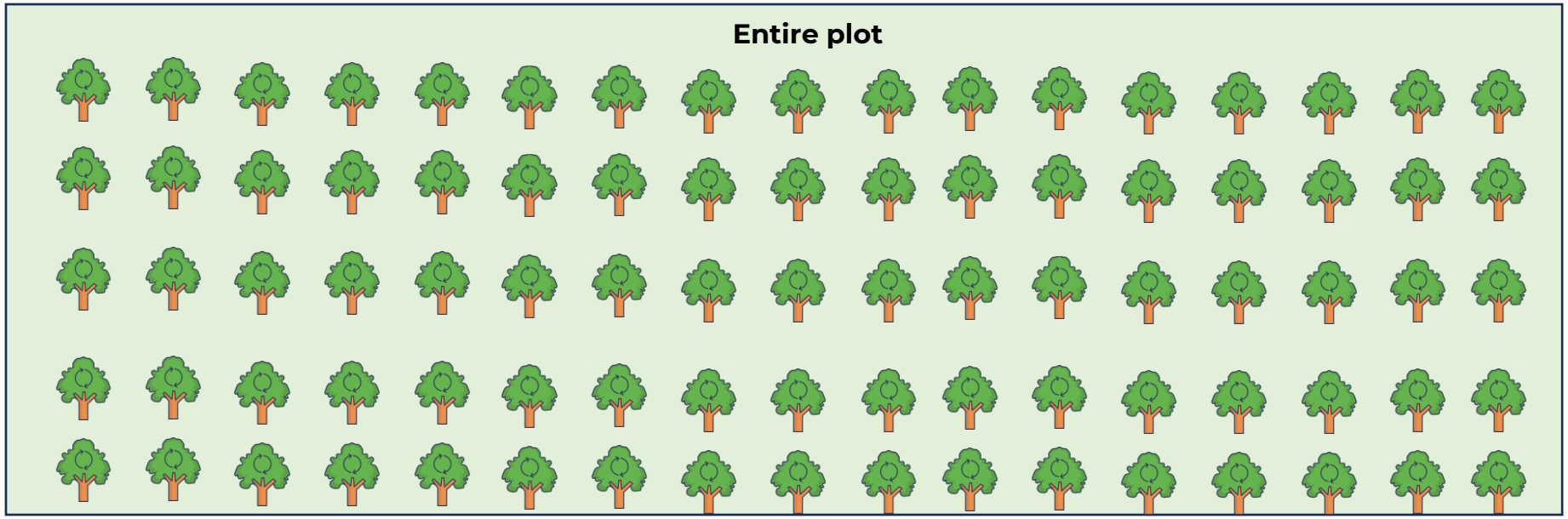
Main challenges: 2. Sampling area

- Literature reviewed: 0.1% / 1% / 10%



Funded by the
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Main challenges: 2. Sampling area

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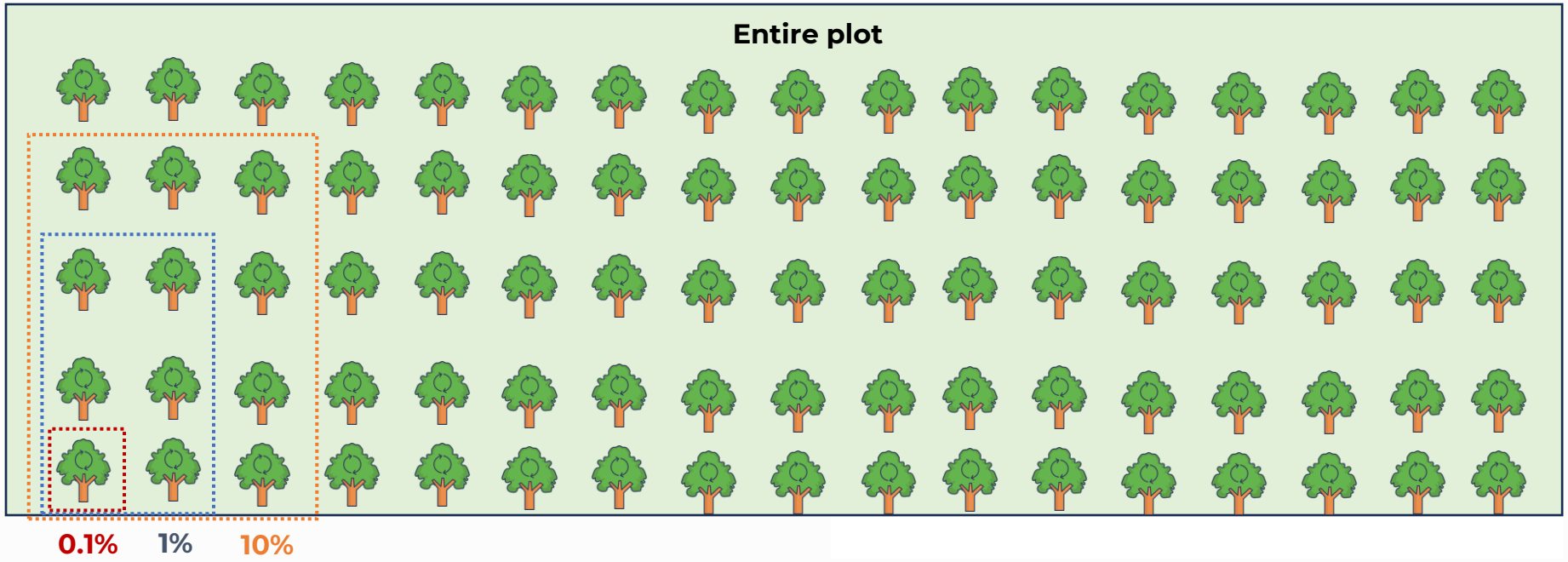

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Main challenges: 2. Sampling area

- Literature reviewed: 0.1% / 1% / 10%

-- Quantification manual (1st draft) proposal:

a) Percentages below 0.1% of the total plot: insufficient measurements.

b) Percentages between 0.1% and 1%: sufficient but limited measurements.

c) Percentages between 1% and 10%: significant measurements.

d) Percentages above 10%: desirable measurements.

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Main challenges: 2. Sampling area

- Literature reviewed: 0.1% / 1% / 10%

-- Quantification manual (1st draft) proposal:

-- Quantification manual (2nd draft) proposal:

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Main challenges: 2. Sampling area

- Literature reviewed: 0.1% / 1% / 10%

-- Quantification manual (1st draft) proposal:

-- Quantification manual (2nd draft) proposal:

- External experts
- Case of studies 

- New technologies

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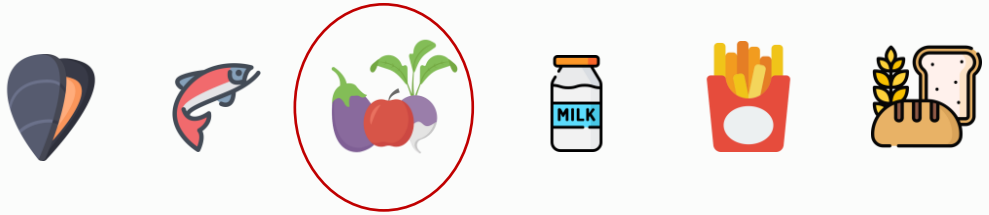
Main challenges: 2. Sampling area

- Literature reviewed: 0.1% / 1% / 10%

-- Quantification manual (1st draft) proposal:

-- Quantification manual (2nd draft) proposal:

- External experts
- Case of studies 

- New technologies

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Main challenges: 2. Sampling area

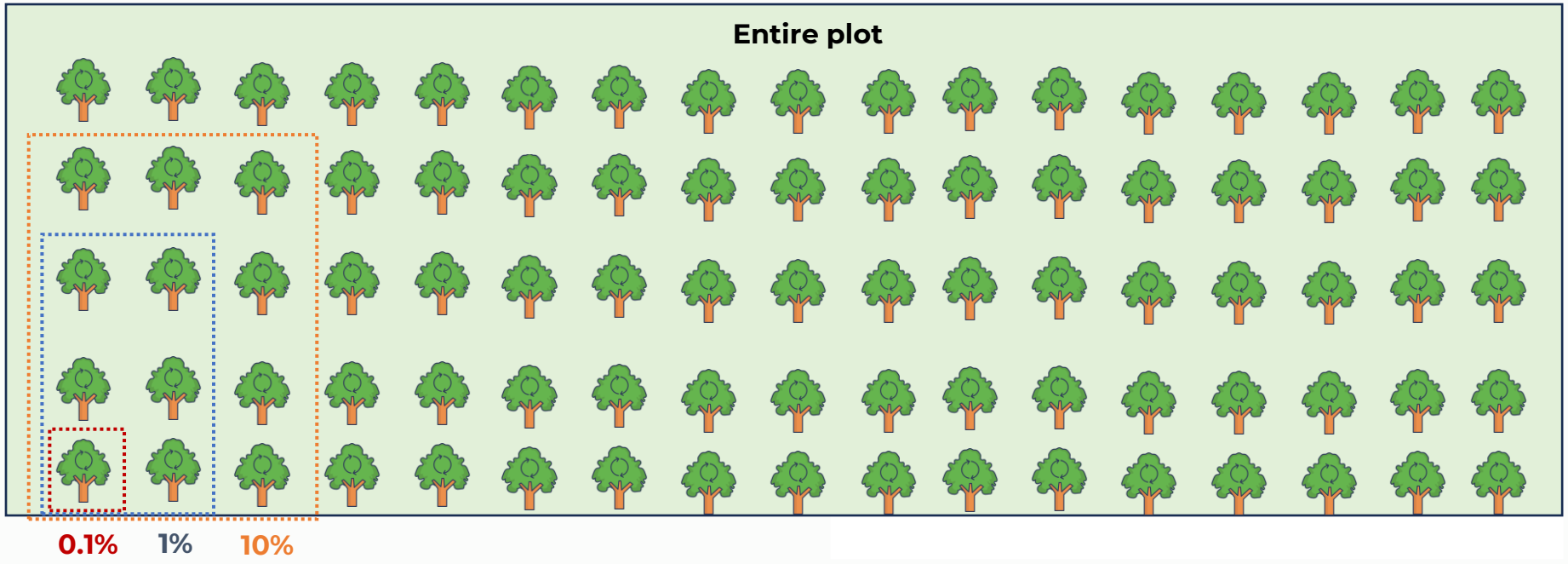
- Literature reviewed: 0.1% / 1% / 10%

0,1% - Total estimation

1% - Total estimation

+1% - Total estimation

Compare results ← **Total gleaning plot (100%)**



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Quantification Manual of FL

- HOW? (**Main Challenges**)

  ✓ 1. Starting point of food losses

  ✓ 2. Sampling area

  ✓ 3. Cuts (if applicable. Only crops)

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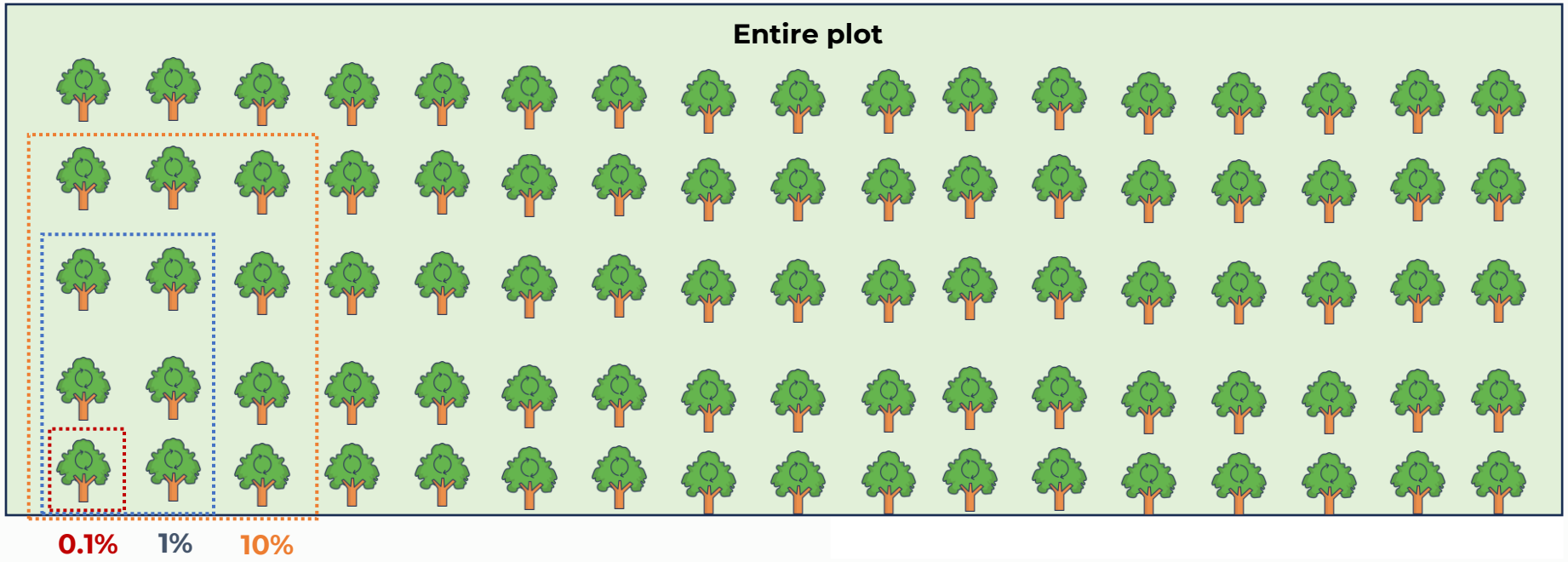
Main challenges: 3. Cuts (if applicable. Only crops)

- Sampling area: 0.1% / 1% / 10%

- Cuts (Single / Multiple) (only for crops)



E.g. 3 cuts per year

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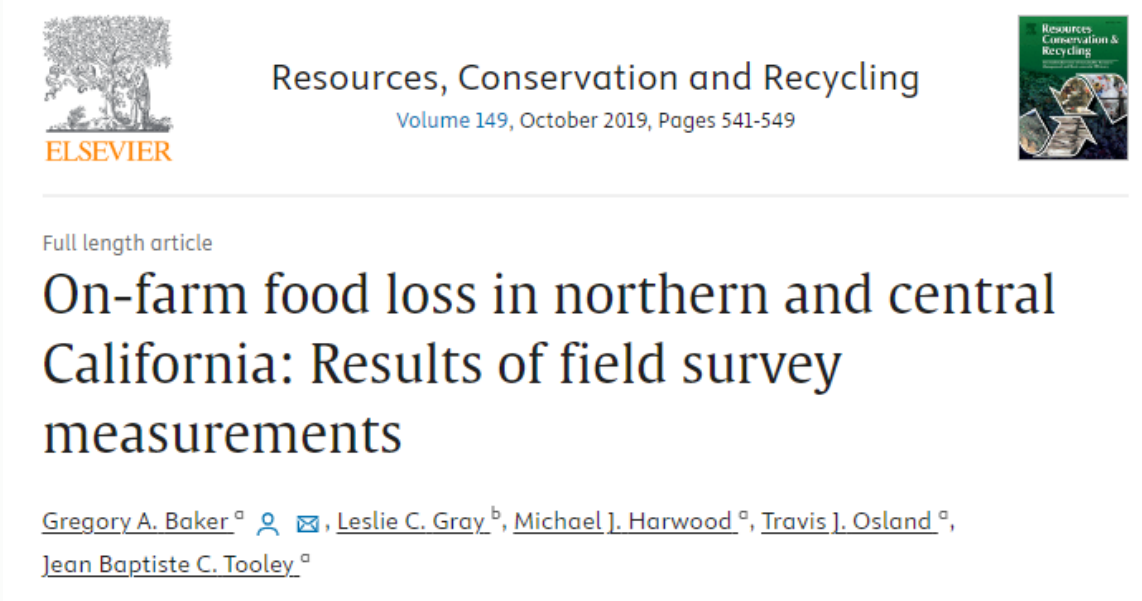
Main challenges: 3. Cuts (if applicable. Only crops)

- Sampling area: 0.1% / 1% / 10%

- Cuts (Single / Multiple) (only for crops)

-- Quantification manual (1st draft) proposal:



ELSEVIER

Resources, Conservation and Recycling

Volume 149, October 2019, Pages 541-549

Full length article

On-farm food loss in northern and central California: Results of field survey measurements

Gregory A. Baker [a], Leslie C. Gray [b], Michael J. Harwood [a], Travis J. Osland [a], Jean Baptiste C. Tooley [a]

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Main challenges: 3. Cuts (if applicable. Only crops)

- 1. Qualitative approach

(Quantification manual)
Please go to 3.4.1. Gathering information through qualitative methods for each plot

Main characteristics of the harvesting process
Brief description of the harvesting process: Approximately five harvests are conducted, usually one per week. The tomatoes are hand-picked, detaching the fruit from the plant by applying pressure with the thumb on the calyx. Hired personnel employed by the farm owner are involved in the harvesting process. The fruits are packed in single-layer crates, preserving the calyx along with part of the stem. For plant sanitation purposes, any fruits that have fallen to the ground or are discarded during the harvest for any reason are removed from the cultivation area. The tomatoes are then transferred from the harvest containers to larger containers known as "field bins," which are large wooden or plastic crates. These field bins are loaded onto a truck for transportation to the sorting and packing facility.

Number of cuts per agricultural campaign: 5
In terms of production and discards, would these cuts be of equal volume? (Yes/No): No
Which cuts would have the highest production level and what proportion would the rest have in relation to them? The first one. The others are: 2nd cut: (60% of production from first cut) / 3rd: 45% / 4th: 40% and 5th: 40%.
Estimated harvest calendar: 1st cut: 4th July / 2nd cut: 11th July / 3rd cut: 18th July / 4th cut: 25th July and 5th cut: 1st August

Quantification Manual of FL

- HOW? (**Main Challenges**)

  ✓ 1. Starting point of food losses

  ✓ 2. Sampling area

  ✓ 3. Cuts (if applicable. Only crops)

  ✓ 4. Pre-harvest VS Harvest losses

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Quantification Manual of FL

- HOW? (**Main Challenges**)

  ✓ 1. Starting point of food losses

  ✓ 2. Sampling area

  ✓ 3. Cuts (if applicable. Only crops)

  ✓ 4. Pre-harvest VS Harvest losses

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Main challenges: 4. Pre-harvest VS Harvest losses

- ✓ **Example: Pre-harvest measurements: oranges**

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Source: Zitroladors project. WWF & Espigoladors

Main challenges: 4. Pre-harvest VS Harvest losses

- ✓ **Example: Pre-harvest measurements: oranges**

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Source: Zitroladors project. WWF & Espigoladors

Main challenges: 4. Pre-harvest VS Harvest losses

- ✓ **Example: Pre-harvest measurements: oranges**

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Source: Zitroladors project. WWF & Espigoladors

Main challenges: 4. Pre-harvest VS Harvest losses

- ✓ **Example: Pre-harvest measurements: oranges**

® WWF/Santi Donaire

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Source: Zitroladors project. WWF & Espigoladors

Main challenges: 4. Pre-harvest VS Harvest losses

- ✓ **Example: Harvest measurements: oranges**

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Source: Zitroladors project. WWF & Espigoladors

Main challenges: 4. Pre-harvest VS Harvest losses

- ✓ **Example: Harvest measurements: oranges**

® WWF/Santi Donaire

® WWF/Santi Donaire

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Source: Zitroladors project. WWF & Espigoladors

Quantification Manual of FL

- HOW? (**Main Challenges**)

  - ✓ 1. Starting point of food losses
  - ✓ 2. Sampling area
  - ✓ 3. Cuts (if applicable. Only crops)
  - ✓ 4. Pre-harvest VS Harvest losses
  - ✓ 5. Identify/quantify main reasons of food losses

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Main challenges: 5. Identify/quantify main reasons

-- Quantification manual (1st draft) proposal:

ELSEVIER

Agricultural Systems

Volume 167, November 2018, Pages 136-142

Field measurement in vegetable crops indicates need for reevaluation of on-farm food loss estimates in North America

Lisa K. Johnson [a], Rebecca D. Dunning [a], Chris C. Gunter [a], J. Dara Bloom [b], Michael D. Boyette [c], Nancy G. Creamer [a]

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Main challenges: 5. Identify/quantify main reasons

-- Quantification manual (1st draft) proposal:

- Marketable and edible
- Edible but non-marketable
- Inedible and non-marketable

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Main challenges: 5. Identify/quantify main reasons

✓ **Example: Food losses measurements: citrus trees**

Inedible and non-marketable

Edible but non-marketable

Edible and marketable

Edible and marketable

Edible but non-marketable

Inedible and non-marketable

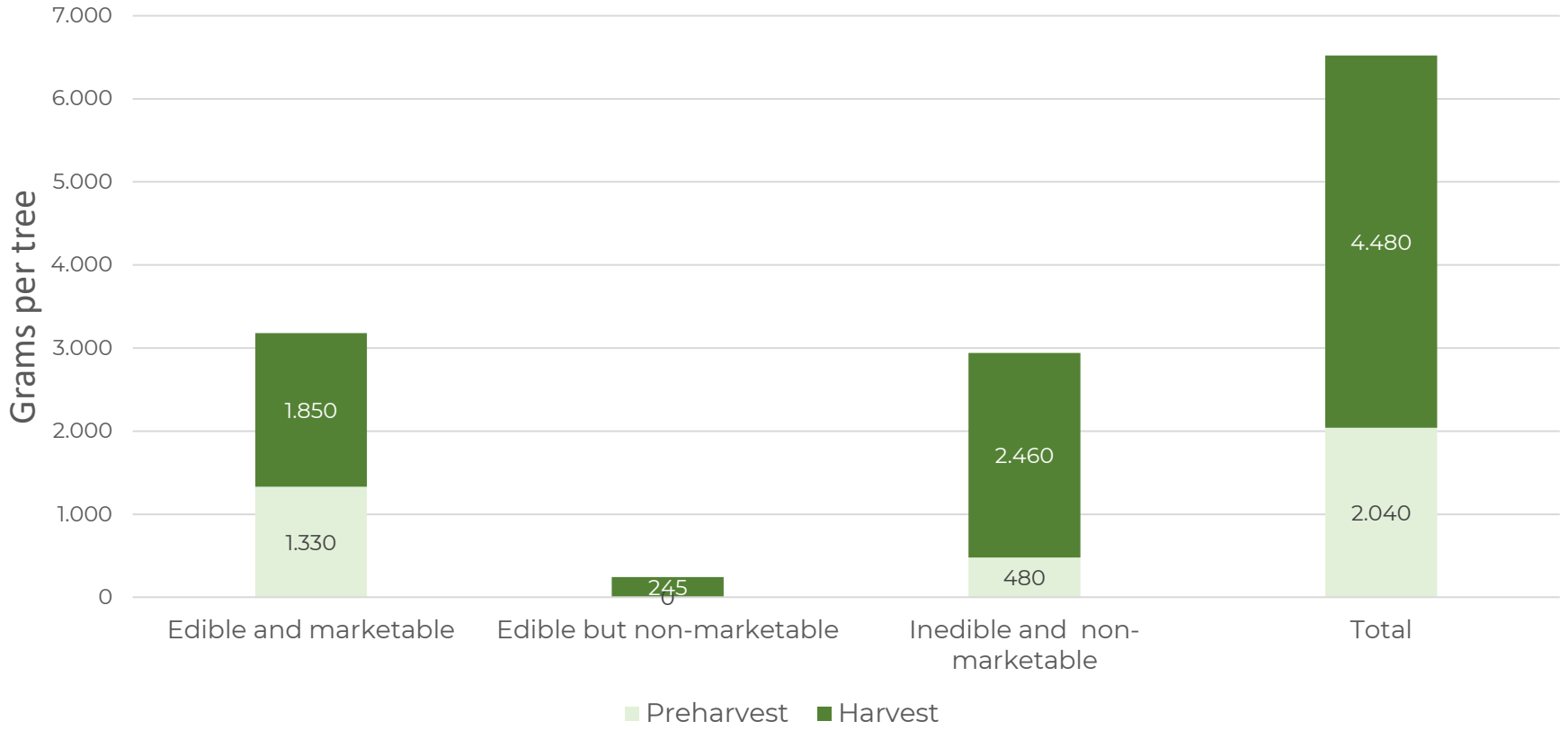
Source: Zitroladors project. WWF & Espigoladors

WWF espigoladors

Main challenges: 5. Identify/quantify main reasons

✓ **Example: Food losses measurements: orange trees**

Summary of pre-harvest and harvest stage measurements in Plot 2, grams per tree. (Using median data)

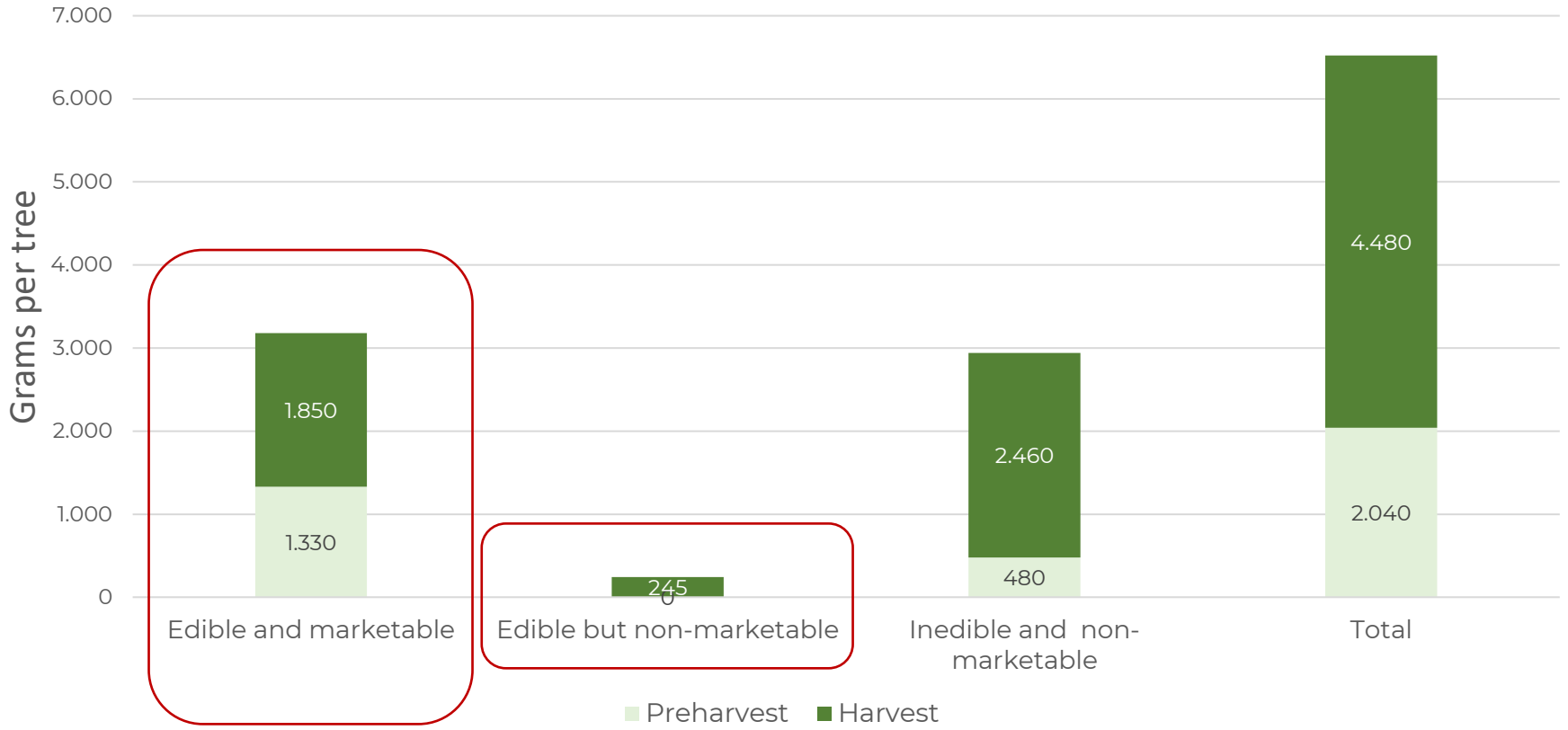


Source: Zitroladors project. WWF & Espigoladors

Main challenges: 5. Identify/quantify main reasons

✓ **Example: Food losses measurements: orange trees**

Summary of pre-harvest and harvest stage measurements in Plot 2, grams per tree. (Using median data)



Source: Zitroladors project. WWF & Espigoladors

Main challenges: 5. Identify/quantify main reasons

✓ **Example: Food losses measurements: citrus trees**

Edible and Marketable	Edible but Marketable by law (not by the market)	Edible but non-marketable	Inedible and non-marketable
67-103 mm	53-67 mm	<53mm and >103mm	

Source: Zitroladors project. WWF & Espigoladors

Main challenges: 5. Identify/quantify main reasons

- Marketable and edible
- Edible but non-marketable
- Inedible and non-marketable

Reasons:	
A. Aesthetic criteria or environmental conditions 1) Damaged during handling. 2) Out of size/colour/commercial shape 3) Affected by pests/diseases/birds 4) Not suitable crop for the terrain 5) Adverse environmental conditions 6) Others	**D. Unable to find where to sell the product in good condition** 1) Regular buyers do not want it 2) The cooperative with which the production was agreed cannot sell it 3) Customers for whom it was produced have breached the agreement 4) Excess production that does not need to be sold 5) Others
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Quantification Manual of FL

- HOW? (**Main Challenges**)

  - ✓ 1. Starting point of food losses
  - ✓ 2. Sampling area
  - ✓ 3. Cuts (if applicable. Only crops)
  - ✓ 4. Pre-harvest VS Harvest losses
  - ✓ 5. Identify/quantify main reasons of food losses
  - ✓ 6. Measuring the diversity

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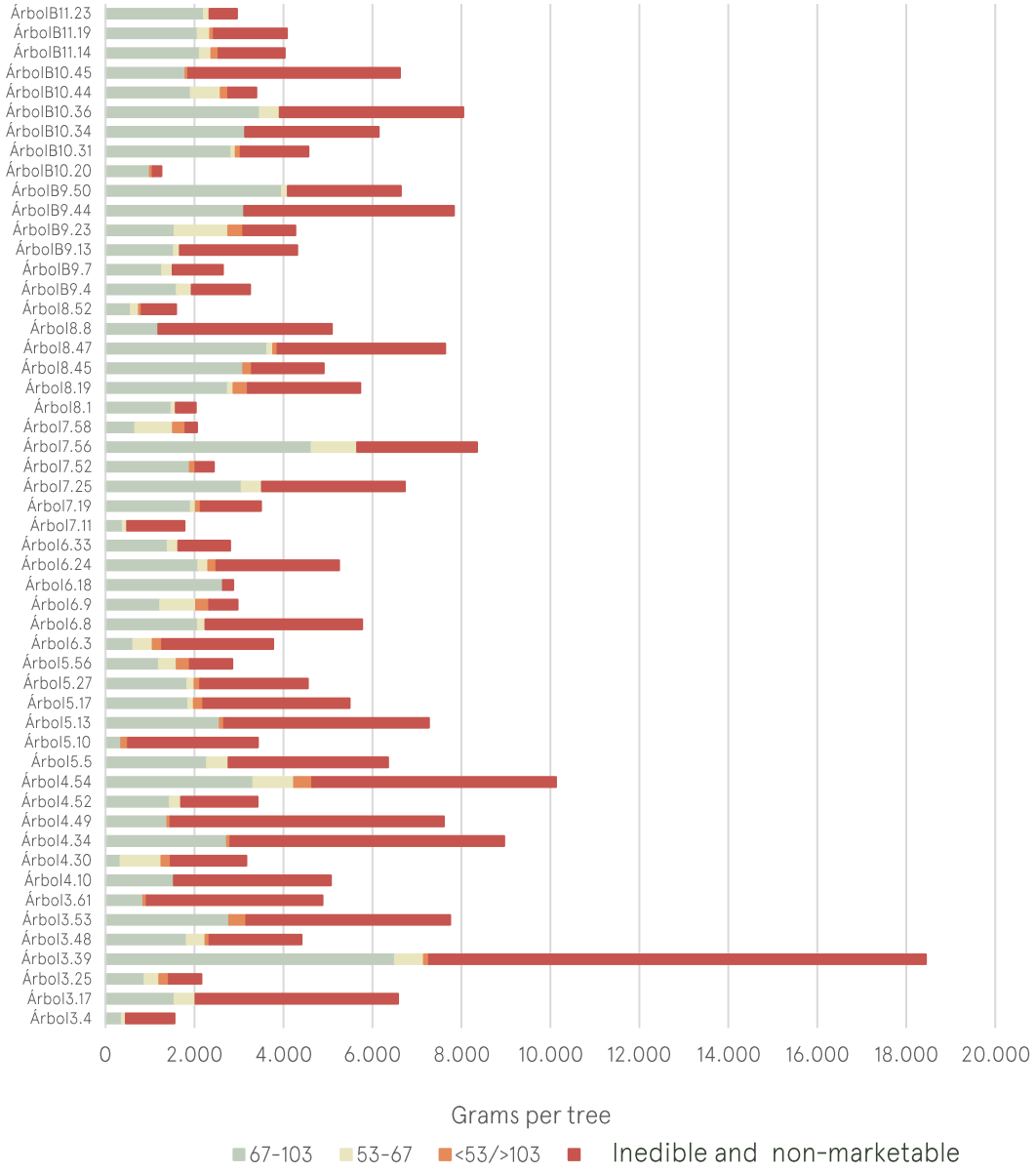
Main challenges: 6. Measuring the diversity

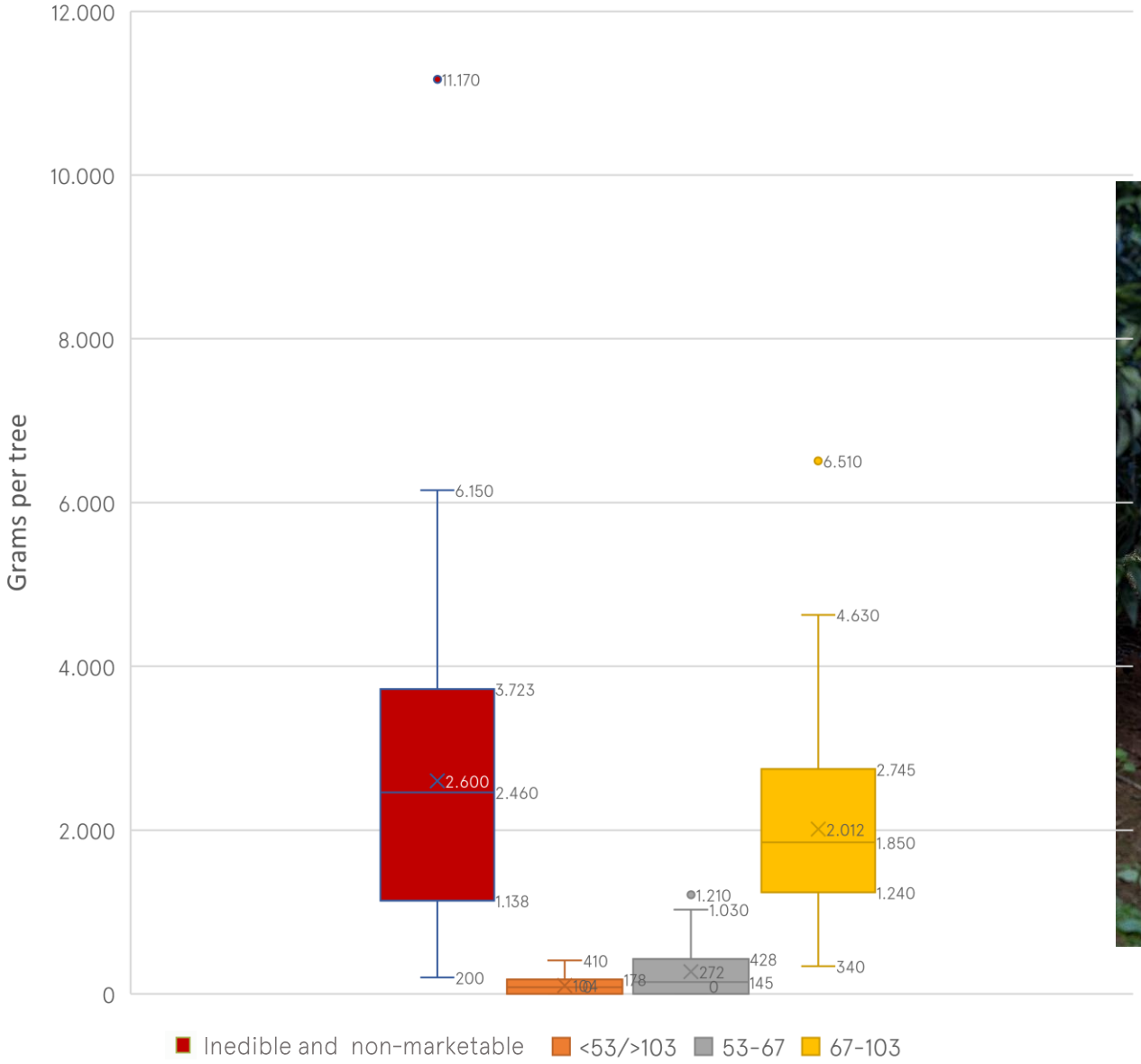


Quantification of harvest losses in Plot 2, orange trees

Source: Zitroladors project. WWF & Espigoladors

WWF espigoladors

Main challenges: 6. Measuring the diversity



Quantification of harvest losses in Plot 2, orange trees

Source: Zitroladors project. WWF & Espigoladors

WWF espigoladors

4. Key contributions/reflections from the external experts

Key contributions/reflections

1. The possibility of including new tools within the manual to help measure food losses

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Key contributions/reflections

1. The possibility of including new tools within the manual to help measure food losses

Specific meetings/interviews:

- Analyze the potential of the tool
- If it has potential, its improvement in specific aspects of loss quantification is analyzed for its inclusion in specific chapters

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Key contributions/reflections

1. The possibility of including new tools within the manual to help measure food losses

2. The importance of emphasizing from the beginning of the manual that the reduction of food losses and waste should be seen as an opportunity for improvement in the productive sector

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3. The importance of using semi-structured interviews for qualitative analysis:

   - Exploring farmers' perceptions, giving them the opportunity to expand upon or even raise new unforeseen topics.

   - Better suited to complex issues that significantly affect the volume of losses

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3. The importance of using semi-structured interviews for qualitative analysis:

   - Exploring farmers' perceptions, giving them the opportunity to expand upon or even raise new unforeseen topics.

   - Better suited to complex issues that significantly affect the volume of losses

   ↓

   Identifying how farmers determine when it is time to stop harvesting a given crop

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Key contributions/reflections

1. The possibility of including new tools within the manual to help measure food losses
2. The importance of emphasizing from the beginning of the manual that the reduction of food losses and waste should be seen as an opportunity for improvement in the productive sector
3. The importance of using semi-structured interviews for qualitative analysis
4. Agreement on the necessity of measuring losses perceived and real losses

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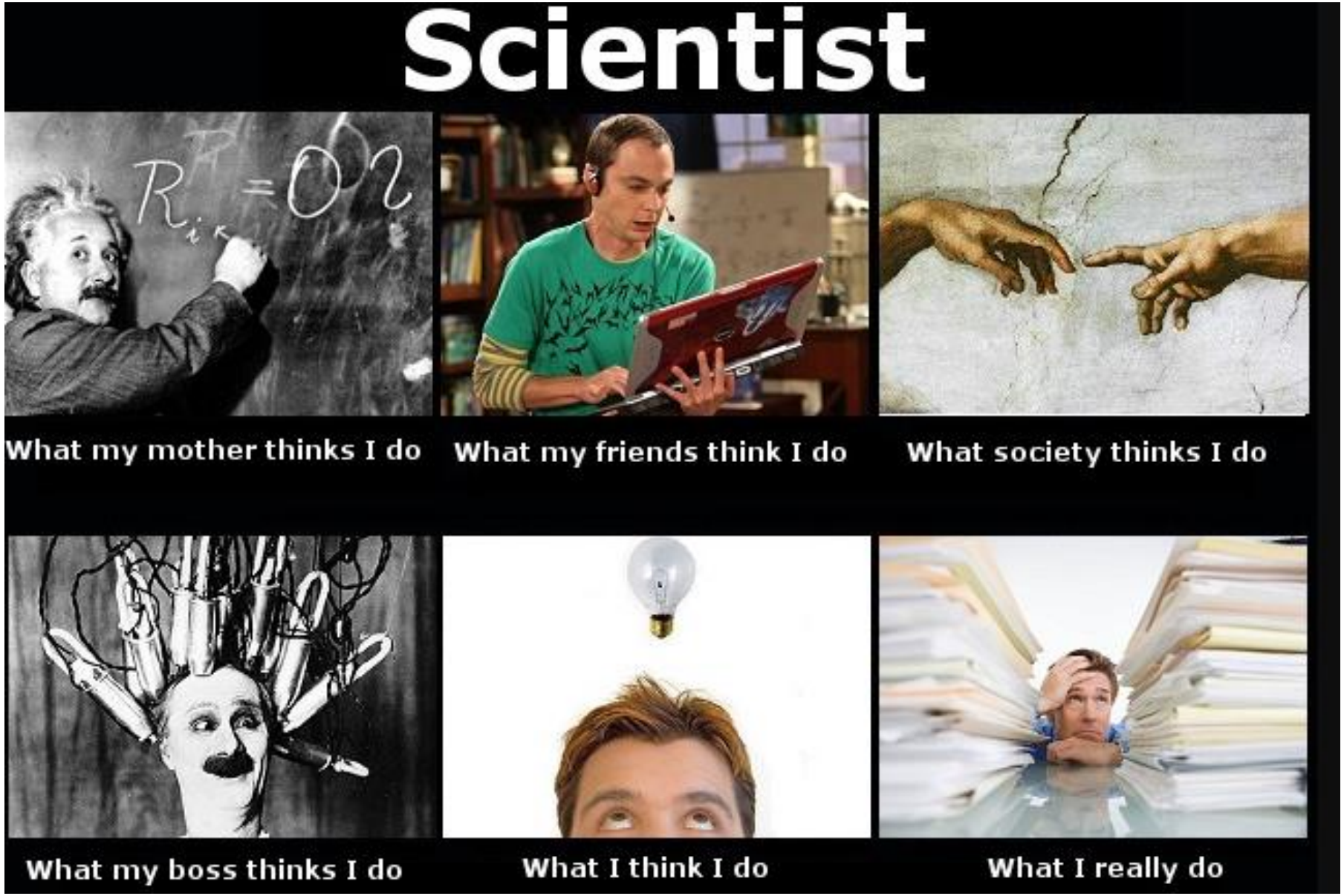
Losses perceived VS Real losses



Key contributions/reflections

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5. Emphasize the importance of measuring over several years to analyze the complexity of this system, not just on a one-time basis.

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Key contributions/reflections

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3. The importance of using semi-structured interviews for qualitative analysis
4. Agreement on the necessity of measuring losses perceived and real losses
5. Emphasize the importance of measuring over several years to analyze the complexity of this system, not just on a one-time basis.
6. Create a step-by-step manual that is very concise and visual

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European Union

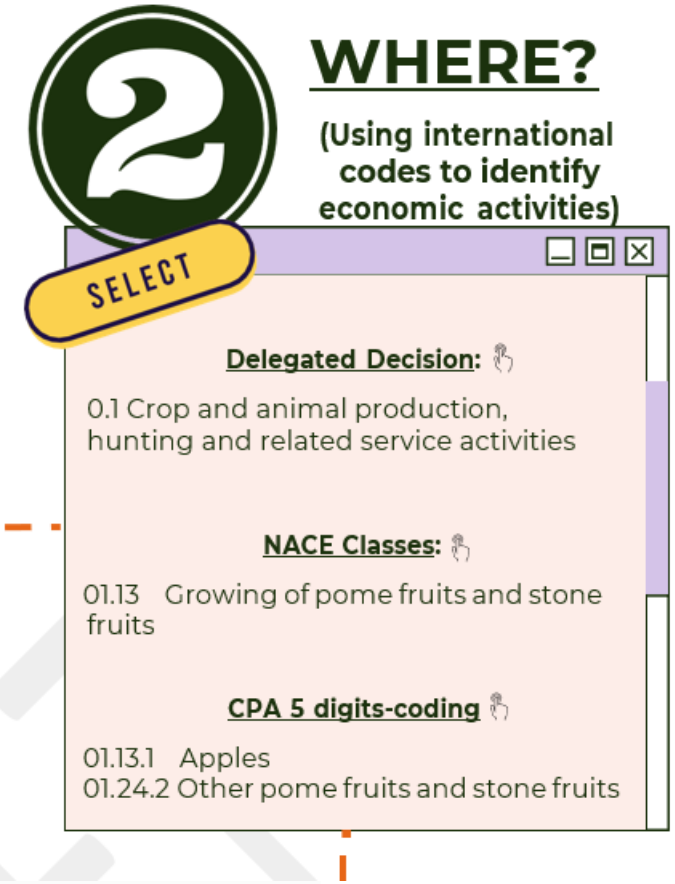
Key contributions/reflections

Funded by the European Union

Key contributions/reflections

FOOD LOSSES MEASUREMENT

Pilot 1.A Apples and Pears



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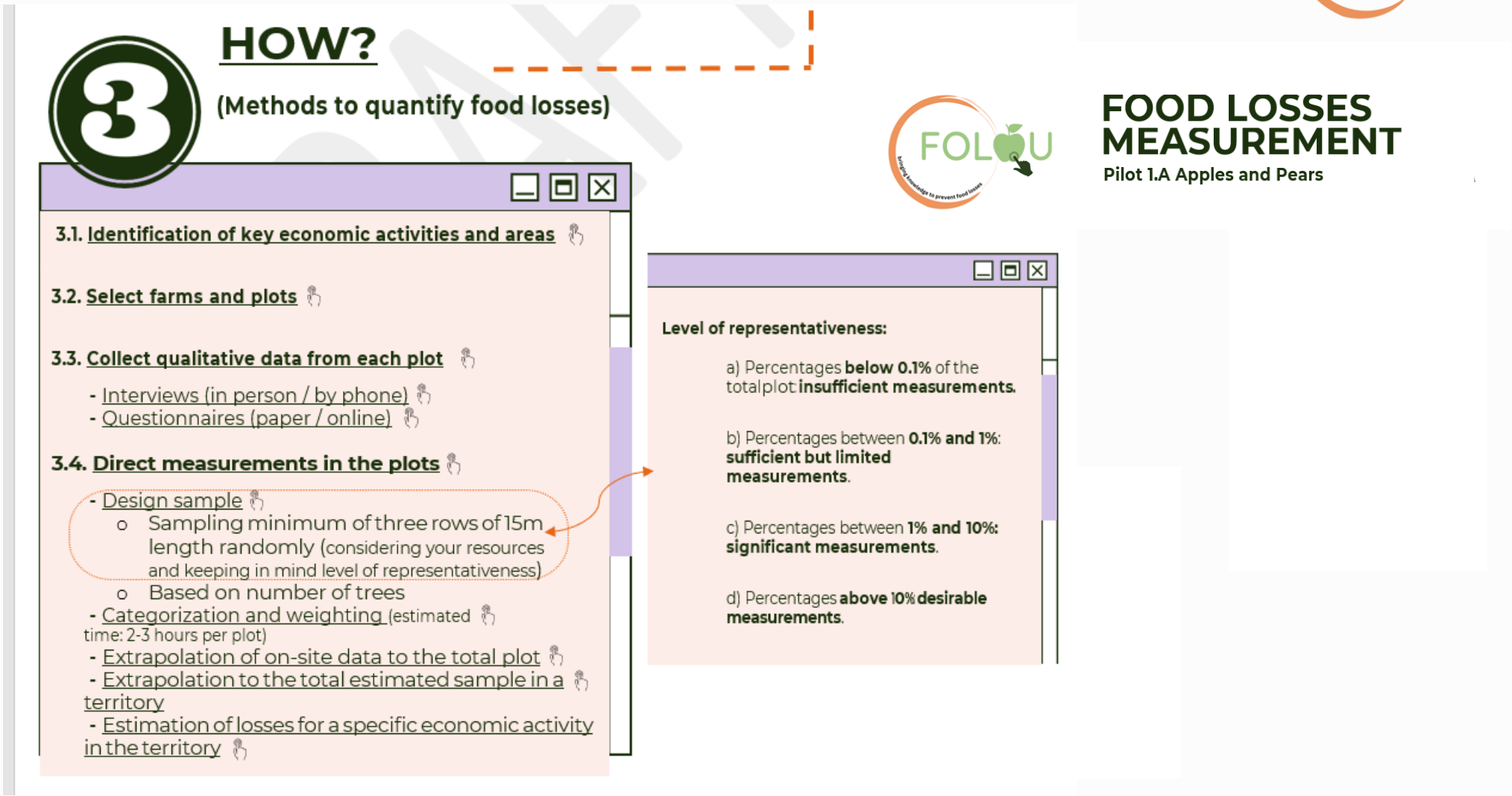
Key contributions/reflections



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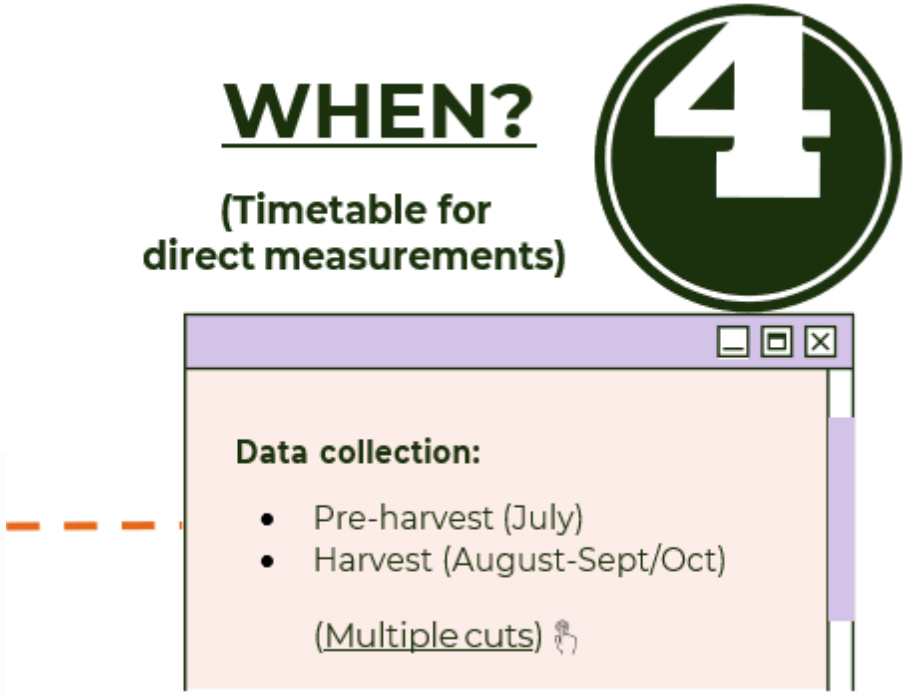
Key contributions/reflections

FOOD LOSSES MEASUREMENT

Pilot 1.A Apples and Pears



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Please Don’t Panic and

STRESS THE MANUAL

Dynamic activity

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To be part of this adventure

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To be part of this adventure

Registry as an External Expert of FOLOU

Scan me!

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To be part of this adventure

Registry as an External Expert of FOLOU

Scan me!

We will send you an email with the following documents:

- FOLOU Definitional Framework of Food Losses
- Quantification Manual of Food Losses

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Emails with comments

Attached documents with comments

Videocalls

Others

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Meeting 3 of 3

Unveiling the Essence

Tackling the Challenge of Quantifying Food Losses Across All Fronts – Local, Regional and National Perspectives

Join our third meeting

- Date: May 23th, 2024.
- Time: 11.00h- 13.00h (GMT+2)

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Thank you very much!

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