Collection and evaluation of food waste prevention actions

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2. Overview of the collected actions
3. The actions evaluation process
4. Key findings and challenges

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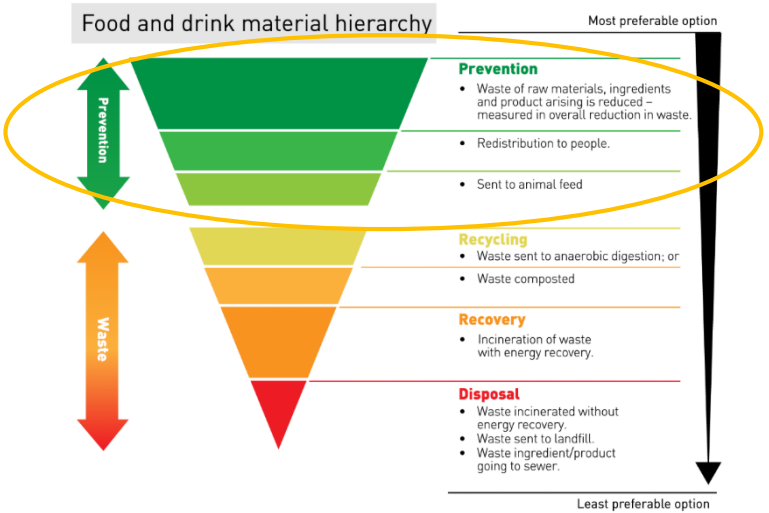
Context of the work

SDG 12

TARGET 12.3 - By 2030, halve per capita global **food waste** at the retail and consumer levels and reduce **food losses** along production and supply chains, including post-harvest losses



WRAP (2018)

Performance of the prevention actions?

EC Pilot exercise

Collection and evaluation of food waste prevention actions

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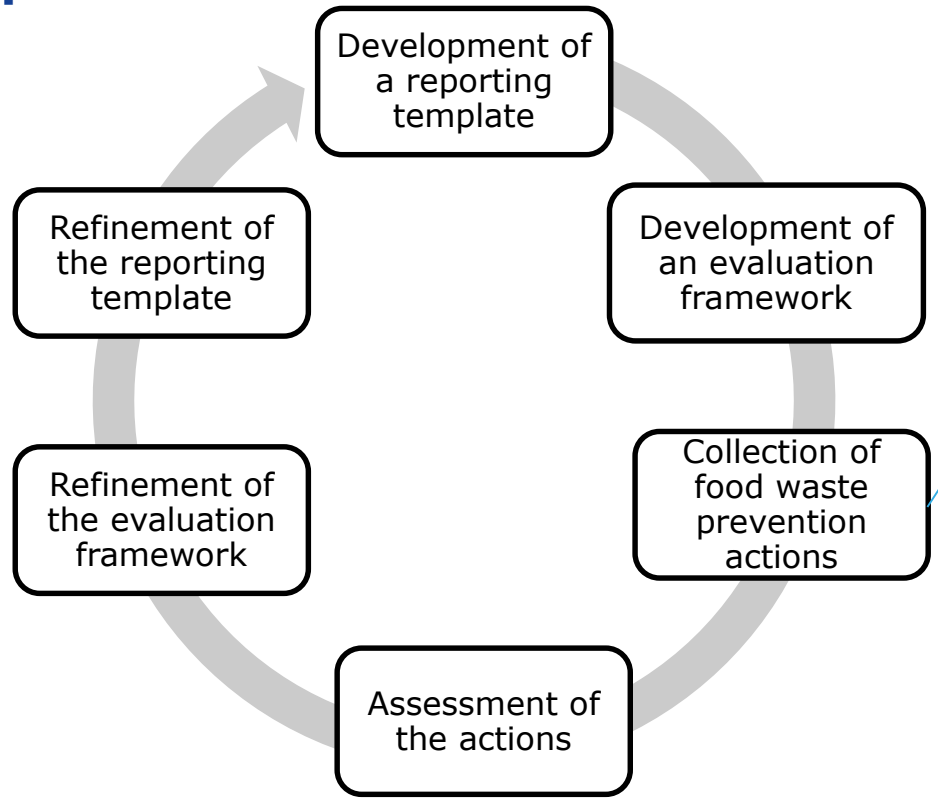
Food waste prevention actions evaluation
Development process



- Redistribution
- Food valorisation
- Consumers behaviour change
- Supply chain efficiency
- Food waste prevention governance

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EVALUATION FRAMEWORK

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Food waste prevention actions evaluation framework: Criteria selected

QUALITY OF THE ACTION DESIGN	• Definition of the action aims and objectives • Strategy to achieve the objectives • Existence of a monitoring system
EFFECTIVENESS *	• Degree to which the action was successful in producing the desired result, i.e. in reaching the objectives
EFFICIENCY *	• The capacity to reach a desired result with the least time/cost/effort
SUSTAINABILITY OVER TIME	• Existence of a long term strategy to ensure the continuity of the action (e.g. organizational support, economic sustainability)
TRANSFERABILITY AND SCALABILITY	• Degree to which transferability and scalability were considered in the design of the action or implemented
INTERSECTORIAL COOPERATION	• Existence of cooperation between different sectors of the society • How is this cooperation is organized

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Food waste prevention actions evaluation framework:

Effectiveness

The effectiveness of a prevention action reflects to which degree the action is **successful** in producing the desired result, i.e. **in reaching the objectives**

'**S**pecific – target a specific area for improvement.

Measurable – quantify or at least suggest an indicator of progress.

Assignable – specify who will do it.

Realistic – state what results can realistically be achieved, given available resources.

Time-related – specify when the result(s) can be achieved.'

(Doran, 1981 p .36)

EXAMPLE OF SMART OBJECTIVE

to obtain a 10% decrease of the

amount of food waste generated

in 2018 compared with 2017

Key **P**erformance **I**ndicator

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Food waste prevention actions evaluation framework:

Effectiveness

'Input objectives', that refer to something the practitioner has done and are largely a measure of the effort/activity of putting in place the prevention actions (e.g. to distribute 5000 leaflets in one month);

'Outcomes objectives', that relate to an intermediate change that happens as a result of the actions one has taken (e.g. to ensure that 2500 households are aware of the campaign); and,

'Impact objectives' that reflect a tangible change that has occurred because of the inputs and outcomes (e.g. to achieve a 20% reduction in the food waste generated in the households).

WRAP 2010 'Improving the Performance of Waste Diversion Schemes: A Good Practice Guide to Monitoring and Evaluation'

Food waste prevention actions evaluation framework:

Efficiency

Food waste prevented	Food waste prevented
Economic	Net economic benefit (benefit for society minus cost)
Environmental	Net environmental savings (avoided environmental impacts)
Social	Social benefits (e.g. the number of meals donated, people learning new skills etc.)
Outreach/ Behavior change	Input or outcome indicators associated to e.g. number of people reached by a campaign, number of people that changed behaviour towards food waste

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Food waste prevention actions evaluation framework:

Efficiency

$$\text{Economic efficiency} = \frac{\text{Net economic benefits}}{\text{Cost of the action}}$$

$$\text{Environmental efficiency} = \frac{\text{Net environmental savings}}{\text{Cost of the action}}$$

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Food waste prevention actions evaluation framework:

$$\textbf{Economic efficiency} = \frac{\textbf{Net economic benefits}}{\textbf{Cost of the action}} = \frac{A+B-C}{C} \; or \; \frac{R+B-C}{C}$$

	Supply chain efficiency	Consumer behavior change	Redistribution (donating surplus food)	Redistribution (selling surplus food)
Cost savings from food waste prevention	A = avoided purchase of raw material B = avoided food waste disposal	A = avoided purchase of groceries B = avoided food waste disposal	A = avoided purchase of groceries B = avoided food waste disposal	B = avoided food waste disposal
Revenue				R = revenue from selling surplus food
Cost of the action	C = fixed and variable costs	C = fixed and variable costs	C = fixed and variable costs	C = fixed and variable costs

Who pays/benefits:

- Food manufacturers, retailers, food services
- Households
- National and local government
- Charities

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Food waste prevention actions evaluation framework

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	Redistribution (donating surplus food)
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Revenue	
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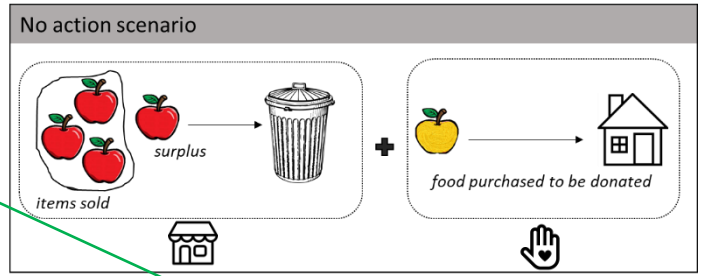

Who pays/benefits:

- Food manufacturers, retailers, food services
- National and local government
- Households
- Charities

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Food waste prevention actions evaluation framework:

Environmental Efficiency

Environmental impacts calculated using life cycle assessment (LCA):

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Calculator for costs/environmental impacts calculation

Action name	Country	Action type	Stage of the supply chain	Action cost in €	Waste treatment option
Stop Food Waste	Spain	Consumer behaviour change	Households	100000	Other/Unknown

GO RESET

Food waste prevented

Type	Amount
bread	100
FRUIT	500
VEGETABLES	500

Select Unit *
- Kg
- Tonnes
- Mega Tonnes

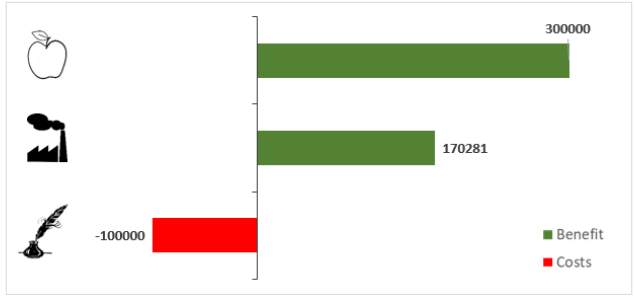
* *for liquids assume 1 litre = 1 kg*

Value of food waste prevented 300000 Euros

Action resources

Paper used (leaflets, letters)	2000	Approximate number
Transport distances		Km
Electricity use		kWh

Cost benefit analysis

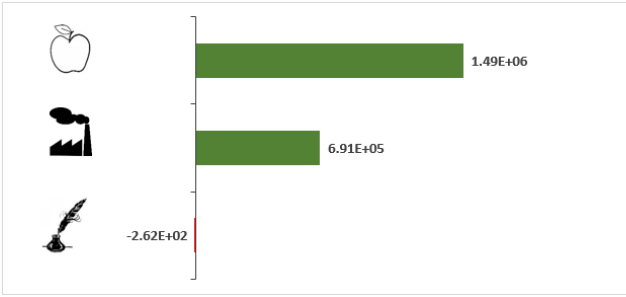


saved food avoided waste treatment action

Cost of action	-100000 €
Savings from avoided treatment	170281 €
Savings from avoided food production	300000 €
Total net savings	**370281 €**

Environmental savings

Climate Change



Climate Change

Impact of action	-2.62E+02	kg CO2 eq
Impact of avoided treatment	6.91E+05	kg CO2 eq
Impact of saved food	1.49E+06	kg CO2 eq
Total	**2.18E+06**	**kg CO2 eq**

ASSESSMENT OF ACTIONS SUBMITTED

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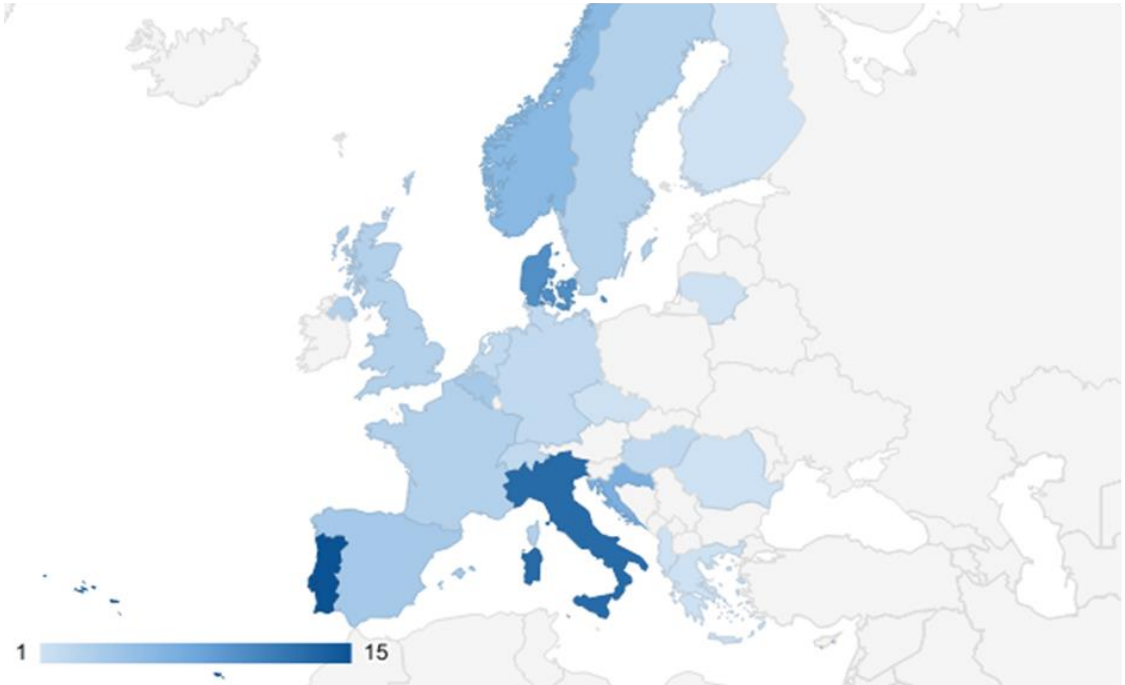
Overview of the actions collected



Country	Reported actions
Albania	1
Belgium	4
Croatia	7
Czech Republic	1
Denmark	10
Finland	1
France	3
Germany	2
Greece	1
Hungary	2
Italy	13
Lithuania	1
Netherlands	2
Norway	7
Portugal	15
Romania	1
Spain	4
Sweden	3
Switzerland	2
United Kingdom	3
International	7
Total	**91**

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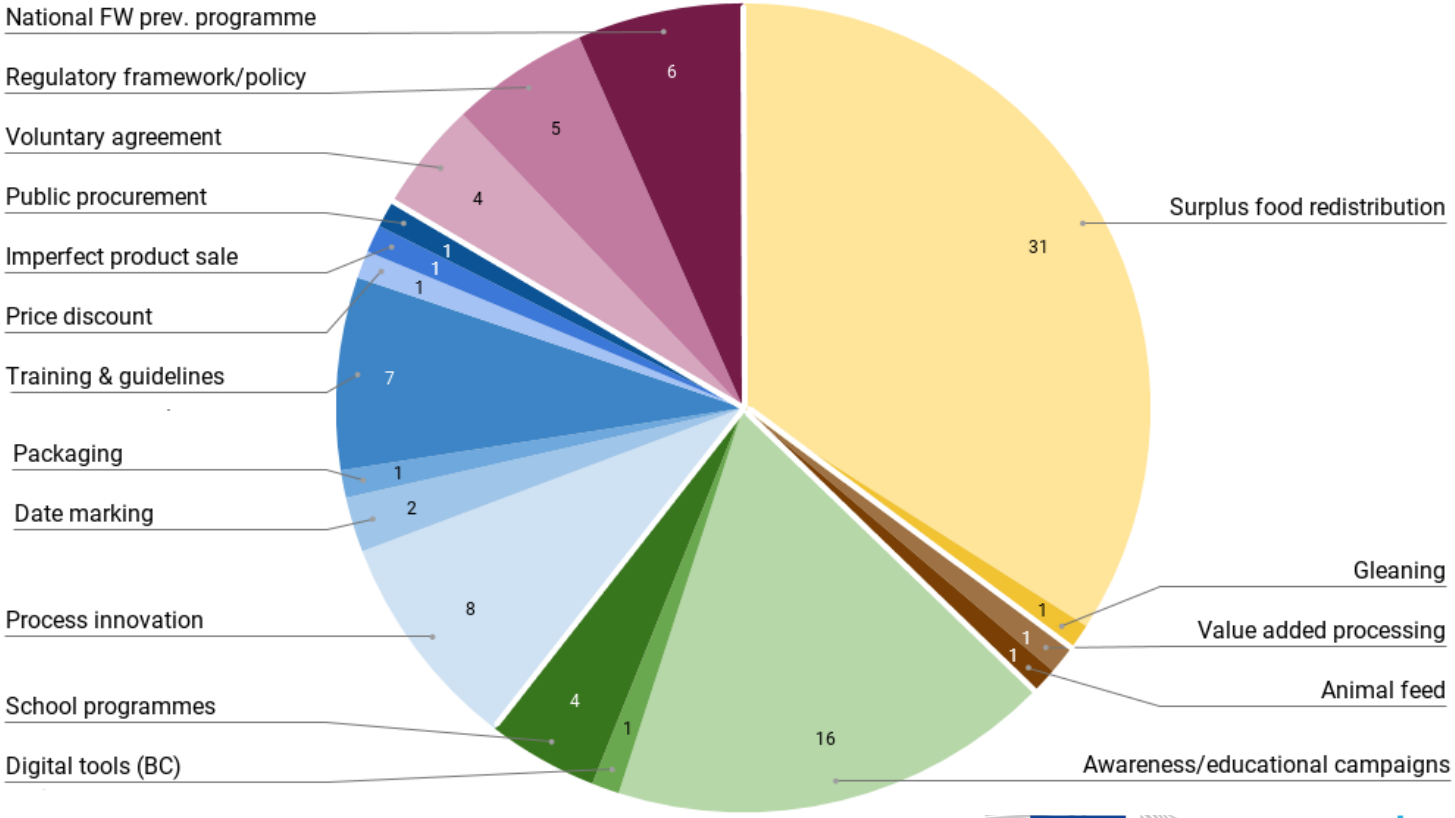
Type of prevention actions and Overview of the actions collected

Type
Redistribution
Food valorization
Consumers behavior change
Supply chain efficiency
Food waste prevention governance



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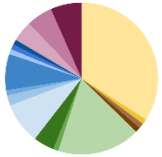
Provision of the amount of food waste prevented



Only for those that provided an amount of food waste prevented and a cost it was possible to evaluate the economic and environmental efficiency

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Evaluation process

1. **Screening of the reported actions for each type**

2. **A general evaluation of the actions reported for each criterion, including an assessment of the quality of the data provided**

3. **Selected actions presented in factsheets**

4. **Suggestions for actions' implementation**.

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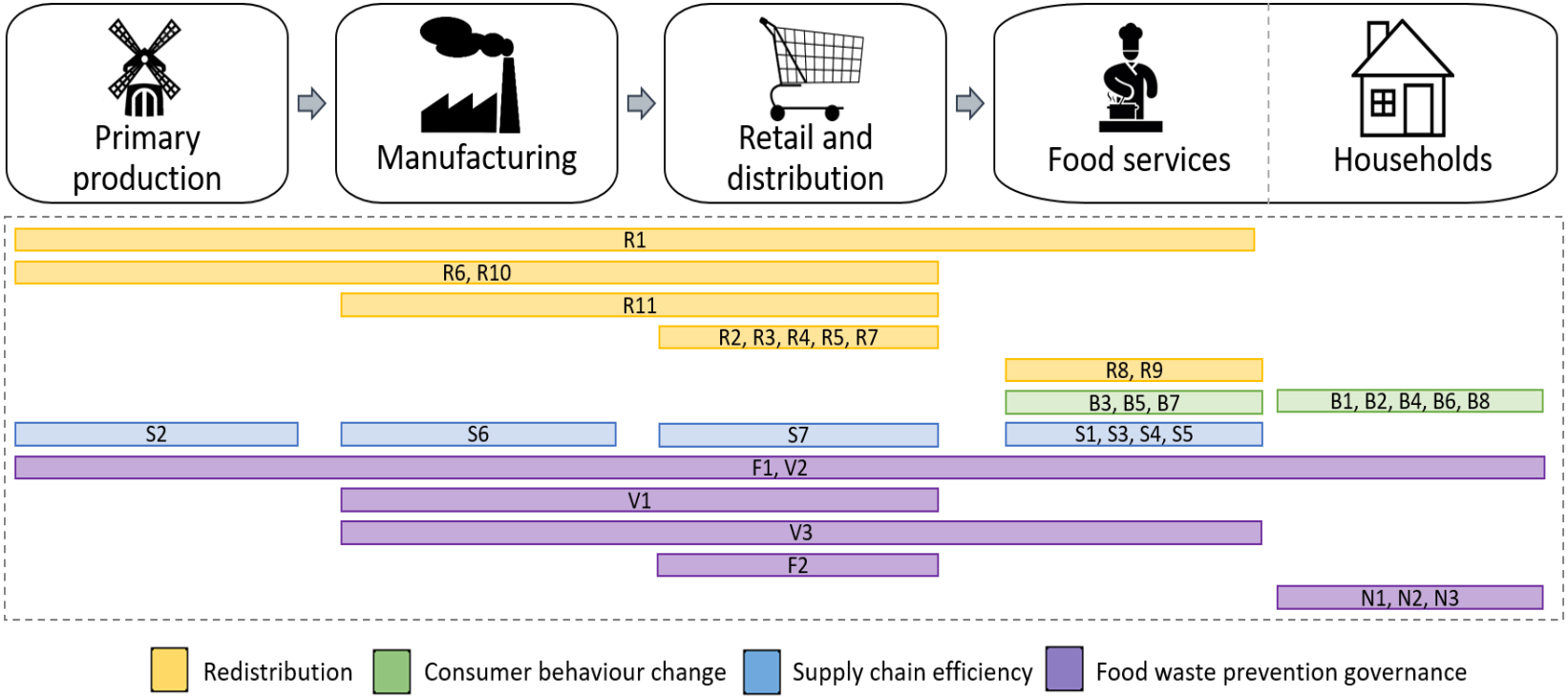
Summary of actions presented in factsheets



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Key findings of the evaluation

- The assessment of the actions' **effectiveness** was limited by data availability. The **main gap** was the **definition of SMART objectives**, **related KPIs**, and a **monitoring system** to track their progress towards achieving their goal(s).

- A high **variability of the data related to the different actions was reported**

- It is important to be aware of **socio-demographic** and other **context-related factors** that may **influence the results of the action**.

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Suggestions for monitoring and reporting prevention actions

- It is crucial to **define SMART objectives**, **related KPIs**, and a **monitoring system** to **establish a baseline and track the progress** of an action towards achieving its goal(s).

- To **evaluate the efficiency** of a food waste prevention action is **crucial to fully capture the total cost and benefits of the action implementation**, which should reflect all the resources used to implement the action and the multiple possible benefits.

- **Measurements** of the food waste amounts should be done following a **defined methodology** clearly stating what is the **definition of food waste used in the accounting exercise.**

- **KPIs should be defined according to the type of action.** The distinction between actions in which is feasible to account for food waste prevented vs those where this is not possible was taken into account when suggesting KPIs.

Redistribution

Amount of food redistributed
kg and/or number of meals

Amount of fresh fruit/meat/dairy redistributed

Number of food insecure people reached

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Consumers behaviour change

Actions measuring food waste reduction obtained

IMPACT OBJECTIVES

food waste generated in one year *per capita/per household*

food waste generated per meal served

Actions measuring a reported increase in awareness/behavioural change (surveys, diaries, focus groups..)

OUTCOME OBJECTIVES

share of people reporting a change in behaviour

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Supply chain efficiency

Actions based on the implementation of process/product innovations to reduce food waste

IMPACT OBJECTIVES

food waste generated per kg sold

food waste generated per kg produced

food waste generated per meal served

Actions that provide information, training or tools to implement or to track success of practical measures to reduce food waste

OUTCOME OBJECTIVES

Number of businesses entering the program

Number of businesses tracking food waste

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Food waste prevention governance

- Voluntary Agreements and National Food Waste Prevention Programmes are a combination of actions that are within the previous types presented

  - Ideally a KPI would be used to measure the overall impact of the action: amount of food waste prevented

  - Each action that constitutes the programme/agreement can be evaluated using the adequate KPI

- For regulatory frameworks, there is the need to account the resources used for the action design and implementation because zero cost is unrealistic

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Challenges

- **Indicators and data may differ** from one typology of action to another
- Very difficult to make any **comparison between the actions**
- Accounting for **voluntary** work
- Difficult to account comprehensively for **burdens and benefits** when many different actors are involved
- Assessing effective reduction of waste when a **change in behaviour** is stated
- How to ensure **transfer of good practices**, including interaction between those providing similar actions but reporting very different outcomes.

- ***Maximising FW reduction per resource input***
- ***Multiple societal benefits***
- ***Sustainability over time***
- ***Systemic changes***

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Acknowledgements

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