LOWINFOOD

Multi-actor design of low-waste food value chains through the demonstration of innovative solutions to reduce food loss and waste

GA No. 101000439

D1.4. SOCIO-ECONOMIC DATA COLLECTION PROTOCOL

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All the LOWINFOOD partners contributed to this deliverable through the consultation process and the elaboration of the questionnaires.

A draft version of the deliverable has been reviewed by ISUN, HUA, UNIBO, UNITUS, ELH, and BOKU.

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LOWINFOOD Consortium

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2	Alma Mater Studiorum Università di Bologna	UNIBO	Italy
3	Sveriges Lantbruksuniversitet	SLU	Sweden
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5	The James Hutton Institute	JHI	United Kingdom
6	Universitaet Fuer Bodenkultur Wien	BOKU	Austria
7	Tampereen Korkeakoulusaatio SR	TAU	Finland
8	Charokopeio Panepistimio	HUA	Greece
9	Osterreichisches Okologieinstitut	AIE	Austria
10	Elhuyar Fundazioa	ELH	Spain
11	Matomatic AB	MATO	Sweden
12	Unverschwendet GmbH	UNV	Austria
13	Akademie Deutsches Baeckerhandwerknord GGmbH	ADB	Germany
14	Foresightee	FOR	Belgium
15	Leroma GmbH	LER	Germany
16	Mitakus Analytics UG	MITA	Germany
17	Kitro SA	KITRO	Switzerland
18	Regione Emilia Romagna	RER	Italy
19	Pianeta Cospea srl	PICO	Italy
20	Cogzum Bulgaria OOD	COZ	Bulgaria
21	Uppsala Kommun	UPP	Sweden
22	Recuperiamo srl	REG	Italy
23	Antegon GmbH	FT	Germany
24	Confederazione Nazionale dell'Artigianato e della piccola e media impresa Associazione di Viterbo e Civitavecchia	CNA	Italy
25	Assemblee des Regions Europeennes Fruitieres Legumieres et Horticoles	ARE	France
26	L.V.L Anonymi Emporiki Toyristiki Kksenodoxeiaki Kataskevastiki Etaireia	BLU	Greece
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Summary

The LOWINFOOD socio-economic data collection document outlines the common structure, objectives and methods for collection of socio-economic data. The objective of the data protocol is to ensure the usability and quality of data collected for the socio-economic impact assessment of the innovations targeting food loss and waste (FLW). To this end, it is essential to standardise the data collection over time (baseline vs. after implementation) and among staff and research institutions to enable comparisons across innovations and between different demonstrations of the same innovation. The data collection protocol will elaborate further on the procedure for execution of data collection, monitoring, and evaluation.

This document summarises the consultation process followed to operationalise the data collection and complements the methodological framework in D1.1. Annex 1 includes the final list of the socio-economic indicators, and the question templates for the indicators in the management survey. Annex 2 is a template for the online staff surveys. Annex 3 provides further information about the specific innovations, and the consultation with innovators and data facilitators. The resulting questionnaires that will be used to collect data in WP2-5 are provided as Annex 4.

The protocol for the collection of socio-economic data is a live document. This protocol will remain the main reference for socio-economics data collection throughout the project; nonetheless it might undergo changes and adjustments during the data collection process, based on challenges and opportunities identified, and its implementation will be progressively adapted when needed.

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Introduction to the deliverable

LOWINFOOD is a project committed to co-design, together with actors of the food chain, low-waste value chains by supporting the demonstration of a portfolio of innovations in a set of value chains particularly concerned by food loss and waste (fruits & vegetables, bakery products and fish), as well as in at-home and out-of-home consumption. Each of these value chains corresponds to a single Work Package (WP) of the project.

The innovations are selected among promising solutions that have already been developed and tested by some partners of the consortium, with the aim to provide the necessary demonstration and upscale to allow market replication.

The LOWINFOOD consortium comprises 27 entities, located in 12 different countries, and ranging from universities and research institutes to start-ups, foundations, associations, and companies working in the food sector. During the 52 months of the project, the partners are committed to complete 30 tasks and to deliver 60 outputs (deliverables).

This deliverable (D1.4) presents the indicators that will be used for the socio-economic evaluation of the LOWINFOOD innovations, including some background information about how the final list of indicators was defined, and the procedures for data collection. The evaluation of the socio-economic impact of innovations addressing food waste at a certain level of the supply chain is challenging, due to the sensitivity of economic data for companies; the intrinsic complexity of socio-economic phenomena (with spill-over effects downstream and upstream in the supply chains and at geographical level); and the consequent lack of datasets to establish a benchmark, differently from ecological indicators. For this reason, quantitative data from the accounts of the firms involved in the demonstrations will be complemented (and when needed, replaced) by qualitative and quantitative measures from surveys. For the same reason, most indicators will concern the conditions of the firm adopting the innovation, although spill-overs and broader impacts in terms of jobs will also be captured. A particular attention will be devoted to gender aspects, by both disaggregating the indicators by gender when relevant (e.g. employment), and through the collection of ad hoc indicators.

For further information on the methodology and approach for other evaluation dimensions (efficacy and environmental impact), please refer to complementing deliverables within WP1 (see Figure 1). These deliverables are dedicated respectively to methodological discussions and the application of the multi-actor approach (D1.1); the efficacy of the innovations (D1.3); and the evaluation of environmental impact (D1.2). Additionally, this deliverable includes draft questionnaires for the stakeholders affected by each innovation to collect data for the evaluation (see Annex 4).

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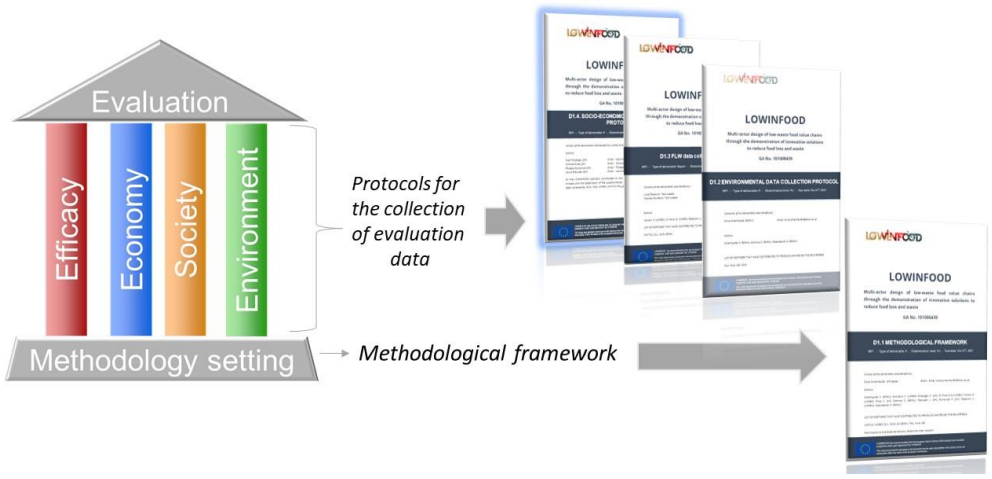

Figure 1: *Dimensions of the evaluation of LOWINFOOD's innovations and dedicated deliverables within the first year of the project*

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1. Introduction to the socio-economic evaluation task

Task 1.3 "Evaluation of economic and social impact of FLW reduction through innovations" analyses the economic and social impacts of food loss and waste (FLW) reduction resulting from the implementation of the various innovations on food value chains as analysed in WP2-5. The James Hutton Institute (JHI) leads Task 1.3 and is the main responsible of socio-economic assessment reported into this deliverable. However, other academic partners in WP1 also provide feedback and insights to Task 1.3 when relevant, as indicated in the grant agreement. The socio-economic impact assessment follows the timeline indicated in Figure 2 and these phases will be explained in further detail in the following sections.

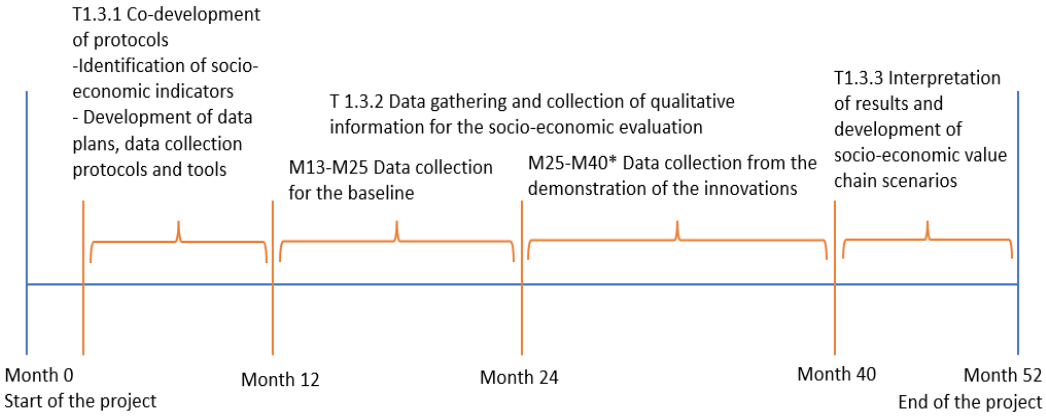

Figure 2: *Data collection schedule for the socio-economic impact evaluation task (T1.3) in the LOWINFOOD project.*

2. Preparation phase

In the preparation phase, the innovations were analysed and relevant stakeholders were mapped. The objective of the data collection is defined as measuring the outcome of the innovations in terms of environmental, economic, social and efficacy benefits.

2.1 Construction of Key Performance Indicators (KPIs)

The key socio-economic performance indicators were constructed reviewing previous H2020 projects on food loss and waste, such as FP7 FUSIONS, H2020 REFRESH, and H2020 SAVINGFOOD that investigate efficient management of food and drinks supply chains and further economic and innovation literature as detailed in D1.1. The JHI developed a preliminary list of indicators. WP1 partners (ISUN, UNITUS, HAU, AIE, UNIBO, and BOKU) examined the list, commented and complemented it with additional indicators, or proposed to move them to other sections with a focus on their areas of expertise (e.g., food waste quantification UNIBO, social indicators HAU, gender aspect Elhuyar). The final list of socio-economic indicators was thus elaborated with the feedback of the academic

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partners in WP1. After the final list of indicators was agreed upon and consolidated, the indicators were adapted to each supply chain and/or innovation by identifying indicators that can be calculated for all the supply chains comparatively, and others that are supply-chain or innovation-specific.

3. Data collection

The data collection phase is divided into two periods: (1) the period before the demonstration, to construct the baseline; and (2) the period after the demonstration to capture the outcome of the innovation. For each relevant supply chain, a set of Key Performance Indicators (KPIs) for the socio-economic impact analysis, e.g. output-to input ratio, production cost or worked hours per unit of output, are defined as further explained in D1.1. The KPIs are henceforth referred to as indicators. The changes between baseline and the after-implementation values of KPIs are used to assess the socio-economic and other impacts of the innovations demonstrated in the framework of the H2020 LOWINFOOD project. It is important that the two data collection periods are comparable, for example the baseline period must not be in winter if the innovation demonstration month is in summer. These periods should be very close, or in similar periods of the year. This would minimize bias risk on data collection that involve panellist and/or responders that could be affect by the intrinsic seasonality of production and consumption patterns of certain value chains.

In both periods, the data collection tasks will be conducted by the innovation partners and/or the end users of the innovation (e.g., firms, school canteens, or households) operating in the value chains and facilitated by the relevant task leaders in WP2-5 for the case study locations involved in the demonstration. The demonstration partners have committed to gathering data for socio-economic and other impact assessments. The task leaders also contributed to the construction of standardised questionnaire(s). These standardised questionnaires will be used to run surveys with firm management and staff or household members, and finally to fill the Excel documents that will be used for collecting quantitative and continuous data flows. The qualitative indicators will be measured at the start (for baseline) and the end of the demonstration period.

The quantitative indicators, such as fixed and variable costs, quantities of inputs and outputs before and after the innovation implementation, etc., will be derived from firms' accounts (financial statement sheets) where technical and economic data are usually reported. Figures of the main processes/phases affected by the innovation will be reported to relevant data facilitators and to T1.3 task leader at periodic intervals. The periodical reporting provides two benefits. The first is to realise if there are any misunderstandings about the data collection objectives, units or components and to address them before the end of relevant data collection period. The second benefit is to account for possible variability and seasonality, and to improve statistical estimates of economic and social impacts of food waste and loss reduction achieved through the implementation of innovations.

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A gender perspective will be adopted to ensure **gender equality** throughout the evaluation. Where relevant, the data will be collected disaggregated by sex using the categories *female, male, other*, and *prefer not to say*. This approach will provide visibility to different gender identities. The data collection process will also account for multiple inequalities and for women's needs.

Both vertical and horizontal segregation will be assessed by asking participants about their position and sector to which they belong to in their company. The age of the involved staff and household members as well as their survey satisfaction and feedback of survey respondents will also be detected through staff surveys

3.1 Methods for data collection

Specific actions on data collection for each pilot are necessary, as each pilot is in different state of progress. Due to the various types of innovations covered in the project, the data can be collected in various ways, such as face-to-face and online surveys; qualitative and quantitative questionnaires to be administered during participatory stakeholder events in the case of educational activities; online and offline food waste diaries in the case of household consumption; compositional analysis of firms' and households' waste; and company and online platform records (Cicatiello, 2021a).

The method for data collection, either copying the figures from company accounts, or using the **Excel template** provided by the WP1 evaluation team, will not affect the impact analysis as long as the right type of data is collected and for the right purpose. In the reporting of quantitative information, approximations are acceptable but expectations, or perceptions of indicators that are actually quantifiable are not. For instance, the behavioural change of staff members is uncountable, therefore suitable for qualitative assessment, while the indicators related to profitability are quantitative and already collected by companies. Therefore, data from the companies' financial accounts cannot be replaced by yes/no responses alone. The scale of quantifiable changes in the profitability indicators is also critical for the impact analysis. Therefore, regularly noting down the figures concerning costs and profits during the baseline and demonstration periods is essential. These ex-ante and ex post figures can be reported to the evaluation team either directly or by calculating the average percentual change. If the quality of the data obtained will not be satisfactory, or the sample size will be too small, the quantitative data will be complemented by qualitative information by means of interviews. The assessment will later be broadened through the supply chain scenarios.

There will be two main methods of reporting the data collected for the socio-economic indicators. The first one is through **staff and management questionnaires (Annexes 1, 2, and 4).** The surveys will be used to capture the changes in the organisations implementing the innovation. The indicators related to organisation will be reported by the management survey while more individual aspects such as the awareness and the attitude of the staff involved in the innovation should be responded individually. Both questionnaires will be administered before, during, and after the implementation of the innovation (with some

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variation depending on the local context), with each demonstration partner organisation. To assure that the data collected is sufficient quality to serve the purposes of evaluation at the end, it is advised that the responses to the questionnaires are checked by the innovation task leaders before being shared with T1.3 leaders. In the case of poor, random or blank responses, the demonstration partners should be contacted by the task leaders to fill these gaps.

When possible, the management of questionnaires (i.e. questionnaires with representatives from participating stakeholders for social innovations, and with adopters for technological innovations) should be filled through brief phone or online calls in the local language at the convenience of the respondent to reduce their burden. These interactions are also instrumental to avoid possible misunderstandings and explain to firm management how to conduct the questionnaires with their own staff, household, customers, or teachers if relevant. In the case of social innovations, further interviews with participants and expert consultation with data facilitators might be needed to better conceptualise the qualitative changes in a certain location or supply chain.

The second method is the use of **Excel sheets** or csv sheets for the collection of quantitative data (mostly economic impact related indicators, e.g. quantities of products traded and their prices). The Excel sheets are used to capture the quantitative data especially in technological innovations with regular and irregular transactions taking place in their diverse platforms, apps, and digital environments. The Excel sheet format will allow the visualisation of missing data, and is a widely known and used software, also available in Open Access version. Similarly, regular consultations with data facilitators during the data collection period will help draw conclusions, particularly about possible reasons for lack of data or difficulties in data provision, and how these could be addressed.

As for external factors that could have affected the outcome indicators (e.g., food prices), the demonstration partners familiar with the sector and the local context must inform the evaluation team about any additional external factors that should be considered in the assessment of the indicators. Such additional information would be extremely valuable for the correct conceptualisation and interpretation of the data (e.g., seasonality, other changes in the production system which could have affected the price, etc.). While the evaluation team cannot acquire this background information about external factors for the innovations whose potential adopters are not project partners and are potentially many and scattered around the world (e.g., the Leroma B2B platform), the demonstration companies who are also project partners and with fewer end-users should be able to provide such input.

The qualitative and quantitative socio-economic indicators, how they are grouped, and how each one will be captured is provided in the Annex 1.

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4. Data analysis

The data collected will be organised into a standard dataset for each innovation and context of implementation. Descriptive statistics will be calculated and, when relevant and possible (i.e. depending on sample size), appropriate statistical tests will be used to assess the significance of diachronic (pre and post innovation) changes in qualitative and quantitative indicators and other relevant aspects such as participation and redistribution of benefits across groups, primarily from a gender perspective. For innovations in which a sufficiently large data sample is collected at the end of the demonstration phase, explorative multivariate analyses will be implemented. Using these results as well as other qualitative insights from partners and the literature, supply chain scenarios will be developed. The results from the socio-economic impact assessment of the innovations will be presented in an accessible format to facilitate feedback to stakeholder partners and to provide scientific evidence to policymakers at the EU, national and local level.

5. Data management

The protection of personal data and ethical principles for the management of personal data in the LOWINFOOD project is outlined in D8.1 and D8.2 (Cicatiello, 2021a, 2021b). Some of the tasks involve the collection of data on human subjects, both as individuals and as households. A subset of the data collected from human subjects for the project can be classified as Personal Data (i.e. any information that relates to an identified or identifiable individual, including different pieces of information which can lead to the identification of a person when put together (Cicatiello, 2021a, 2021b)). Personal data of individuals are expected to be collected in LOWINFOOD Tasks T3.2, T3.3, T4.1, T5.5, and T5.6, and the socio-economic data returns from these tasks will be minimised, stored, and processed in compliance with the principles stated in D8.2. No cross-country transfer of personal data will take place, with the datasets being anonymised before being shared with T1.3 leaders.

6. Evaluation

The impact evaluation will provide evidence for future policy interventions and aid to the participating stakeholders' decision-making regarding the continuation, replication or scaling-up of the innovations in different contexts, which will be assessed against resulting costs (CONSENSO Interreg project, 2018).

In the socio-economic impact evaluation, the extent to which innovations against FWL affect the economy (firm performance and wider economy) and society will be assessed. In any evaluation processes, it is critical to isolate whether the changes resulted solely from an intervention, and to account for impacts only attributable to the innovation (OECD/Eurostat, 2018). This might be particularly complex in the case of socio-economic outcomes. Therefore, as well as the baseline measurements, external factors such as local

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policies and price structures will be analysed and considered in the interpretation of the outcomes (as suggested by Komendantova et al., 2012).

To become more familiar with the innovations, the T1.3 leading team have already carried out consultations with task leaders and data facilitators in each innovation, as featured in Annex 3. In the impact evaluation, to interpret evaluation findings reference will be made to relevant and established frameworks in the literature for innovation evaluation (e.g., the Oslo Manual for collecting and interpreting data on innovation (OECD/Eurostat, 2018)). Innovation models used to relate the initial aim to the final outcome, such as a logic model (McLaughlin & Jordan, 1999) and programme theory (Weiss, 1998) will be also considered. This will allow for broader and more precise implications to be drawn from the statistical analysis of the quantitative data and the qualitative assessments of management, staff and household survey and interviews conducted, when relevant.

Finally, it is important to understand who benefitted from the innovation, and to assess the fairness of the redistribution outcomes of the innovations, especially in terms of gender equality. Thus, both the innovations' implementation processes and their outcomes will be assessed in terms of gender equality, by collecting stakeholders (including employees' and household members') data disintegrated by demographic attributes, as required by the gender-related project deliverable (LOWINFOOD, 2021).

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Annex 1: Final list of socio-economic indicators

The data will be reported back to the researchers in the form of **Excel sheets, management and staff surveys**. The management and staff surveys are tools to report the outcome of measurements and monitoring that take place before the innovation (baseline) period, and after the innovation period. The same data has to be recorded during both periods

In the Table A1.1 below, key socio-economic impact indicators, their relevant units, and required frequency of data collection are summarised.

Table A1.1: Socio economic performance indicators

Category/Indicators	Unit	Frequency of monitoring and records[1]
Economic indicators		
1. Change in direct input costs (food inputs)	% (Possibly qualitative with ranking)	Before adoption (along the baseline assessment period), then along the implementation period
2. Change in fixed costs due to the innovation (e.g. storage space)	% (Possibly qualitative with ranking)	Before adoption (along the baseline assessment period), then during the implementation period
3. Change in variable costs due to the innovation (e.g. energy, water)	% (Possibly qualitative with ranking)	Before adoption (along the baseline assessment period), then during the implementation period
4. Change in organic waste management costs	% (Possibly qualitative with ranking)	Before adoption (along the baseline assessment period), then during the implementation period
5. Change in the selling price of the product(s) involved	%	Before adoption (along the baseline assessment period), then during the implementation period
6. Creation of new income streams	Qualitative data	One-time, towards the end of the project
7. Rate of return on investment	%	One-time, towards the end of the project
8. Change in access to subsidies and/or other financial benefits	Qualitative data	One-time, towards the end of the project
9. Change in total value of sales of the product(s) involved	%	Before adoption (along the baseline period), then during the implementation period

[1] "Along the measurement period" refers to period of measurement to control for seasonality (e.g., food costs during the measurement periods, one before and the other after innovation adoption); further indications on measurement, calculation methods, and how often the reporting should take place are embedded in the innovation-specific questionnaires.

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10. Change in total hours worked, disaggregated by gender	%	Before adoption (along the baseline assessment period), then during the implementation period
11. New partnerships upstream and horizontally	Qual-quant data (Number and type of connections)	One-time, towards the end of the project
12. Downstream diversification (e.g. number and type of buyers)	Qual-quant data (Number and type of connections)	One-time, towards the end of the project
13. Change in the productivity of material inputs (input-output ratio)	%	Before adoption (along the baseline assessment period), then during the implementation period
Social indicators		
14. Change in awareness of the food waste problem of the staff and management	Qualitative data	During baseline period and after the innovation adoption.
15. Change in attitude towards reduction of food waste of the staff and management	Qualitative data	During baseline period and after the innovation adoption.
16. Change in the number of jobs (and full time equivalents), disaggregated by gender	Quantitative data (Number of FTE)	One-time, towards the end of the project
17. Similar technological change in other companies (e.g., request to adopt the same innovation)	Quantitative data Number of companies	One-time, towards the end of the project
18. Vertical segregation	Quantitative data (Number of staff)	One-time, towards the end of the project
19. Horizontal segregation	Quantitative data (Number of staff)	One-time, towards the end of the project
20. Share of genders interviewed	Quantitative data (Number of staff)	One-time, towards the end of the project
21. Survey satisfaction	Quantitative data (Number of staff)	One-time, towards the end of the project

There will be two different groups of stakeholders in terms of socio-economic impact analysis. The first group is the end-users innovation, such as the bakeries, schools, restaurants and companies that took part in the various technological or social/stakeholder innovations in the scope of LOWINFOOD project (A). The data collected from them will be

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used to understand the economic gains and behavioural change in innovation users implementing the innovation.

The second group is the innovation providers and supporting organisations (B). Through this analysis the added value created from the project is assessed. The particularly relevant added value aspects for the LOWINFOOD project are supporting local SMEs, start-ups and other innovative companies such as app and platform developers and delivering desired outcome in terms of FWL prevention and reduction for supporting organisations such as regional governments or sectorial associations.

In each group, the questions listed here are expected to be covered in the data returns based on the measurements and monitoring activities that occur both in baseline and innovation adoption periods.

A) Economic and social impact indicators relevant for the end-users of the innovations

The set of questions in the **management survey** have to be answered by a management representative in each demonstration partner. This person will fill in the survey to report the resulting data from measurements made and records created in two comparable periods i) before the implementation of the innovation; ii) after the implementation of the innovation.

First, the date of the survey and the name of the person conducting the survey or the interview (if it is conducted in this format) and some general characteristics of the participating organisation (e.g. location, number of staff or household numbers, annual turnover) must be provided at the start of management surveys. Some of the general characteristics might not be applicable to all innovation partners (such as charities, schools or households), these should be filled as “Not applicable” or “NA”.

Profitability

1. Change in direct input costs – food inputs (applicable for innovations used in enterprises using food as raw ingredient (e.g. restaurants, canteens, food processors, charities) or, in general, for the main input (e.g. ethanol producers).

> Option 1 (preferable): total amount of food (or ingredient) inputs used in the production process during a measurement period (kg, tons) * average unitary price of food inputs during the measurement period

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Option 2: total expenditure on food or ingredient inputs during the measurement period[2]

Exemplary question format from the questionnaires: *What is the cost (unitary market price x number of unit used) for each of your food related inputs in the absence of the innovation?*

What is the cost (unitary price during the innovation x number of unit used) for each of your food related inputs as a result of the innovation?

2. Change in fixed costs due to the innovation (e.g. storage space, equipment purchase, rent, or insurance etc.) – any relevant cost that does not change directly with the size of production depending on the product and the supply chain.

Option 1 (preferable): The cost of each classified item of (fixed) cost that occurs in the operations over the measurement period * frequency of the cost

Option 2[3]: The list of relevant fixed cost items that occur in the operations over the measurement period and the unitary change in each of these fixed cost items between the measurement periods before and after the innovation[4]. If any prices are missing, at worst listed items' costs can be estimated based on the average market prices for the material or the service in the case study location.

Exemplary question format from the questionnaires: *What are the relevant fixed costs before the implementation of the innovation (e.g. additional/new capital investment, storage space etc.)?* – any relevant cost that change with the size of production depending on the product and the supply chain.

What are the relevant fixed costs after the implementation of the innovation (e.g. additional/new capital investment, storage space etc.)?

3. Change in variable costs due to innovation (e.g. energy, water, refrigeration depending on the product and the supply chain).

Option 1 (preferable): The cost of each classified item of (variable) cost that occurs in the operations over the measurement period * frequency of the cost

Option 2: The types of variable costs that occur in the operations of the innovator over the baseline period and the total cost of each over measurement period.

[2] The demonstration partners do not need to categorise the costs as fixed or variable if they can provide the cost structure in their supply chains and provide the company accounts.
[3] From here onwards, Option 2 represents the less preferable/more compromised option.
[4] Most of the fixed costs, unlike variable ones, might be one-off payments anyways.

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Exemplary question format from the questionnaires: *What are the variable costs before the implementation of the innovation?*

What are the variable costs after the implementation of the innovation?

4. Change in organic waste management costs

Option 1 (preferable): The type and the amount of organic waste[5] * organic waste collection[6] related charges for the specific disposal type (if relevant disintegrated by different options of disposal) + qualitative specification of the nature (on-off, proportional, fixed) of the cost

Option 2: If the amount and type of waste, disintegrated as organic and inorganic, is already collected and provided for the environmental impact assessment in LOWINFOOD, this can be used also for calculating this indicator, complemented with information about whether organic waste has a unit or average economic value or disposal charge in the relevant local administration, and how much that value or cost would be.

Exemplary question format from the questionnaires: *In the absence of the innovation, in what ways do you dispose of the wasted or lost food materials (e.g. livestock feed, ethanol producers, waste collection)? Do you make a profit from this disposal route? If yes, how much €s per unit in each alternative?*

If you dispose it without making any profit, what is the average cost of organic waste disposal for your organisation per month? Is it a fixed cost independent of the amount or does it vary with the quantity of waste disposed? How much is the unit/ fixed cost?

5. Change in the market price of the product

For the innovations that already provide the unitary change in the output before and after the innovation in other assessments, only the change in the market price of the product (or produce) sold should be measured.

Exemplary question format from the questionnaires: *What are the selling price(s) of the product(s) addressed by the innovation before adopting the innovation (baseline) and after adoption?*

6. Creation of new income streams

[5] This could potentially include also compostable packaging; this information should thus be recorded.

[6] Waste collection charges might be fixed costs or might have tiered system like commercial wastewater collection service in each the location. and this pricing structure can be indicated accordingly in the blocks.

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The names of new food products to be sold on the market (including food products which were already sold before but were re-branded, or whose packaging was changed to reflect the use of the innovation, e.g. a sustainability label) created during the duration of LOWINFOOD as a result of participating in the innovation.

Exemplary question format from the questionnaires: *Are there new income streams resulting from the innovation?*

If you answered yes to the previous question, please indicate the type of new income streams and how much is gained.

7. Rate of return on investment

Option 1 (preferable): Net value gained from time and financial investment in the innovation (increase in the profits because the innovation reduced variable / fixed / waste disposal costs, increased sales or increased product prices) and total cost of implementing the innovation.

Option 2: An estimation of the net value gained, based on (Indicator 1,2,3,4,5) / (30% of the "estimated eligible costs" for the organisation in the LOWINFOOD grant agreement) *100

Exemplary question format from the questionnaires: *What is the total cost (e.g. labour, technology, energy etc.) of implementing the innovation for your organisation?*

Then this figure will be divided by the overall financial benefit of the project (sum of the changes in the input, variable and fixed costs, change in sales, change in prices, new income streams, new financial subsidies) based on the data for the indicators above. [otherwise: *What is the total net gain of implementing the innovation for your organisation?*]

8. Change in access to subsidies and/or other financial benefits

Subsidies and/or other monetary benefits (in Euros) received due to waste reduction (specifying if these are one-time, periodical, fixed or proportional to the amount of waste).

Exemplary question format from the questionnaires: *Are there new subsidies and/or other monetary benefits received as results of food waste reduction after the innovation? If you answered yes to the previous question, please indicate their value in Euros.*

If you received any subsidies and/or other monetary benefits as results of waste reduction, please specify whether these are (multiple choices possible):

- *One-off*
- *Periodic*

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- *Fixed*
- *Proportional to the quantity of waste*
- *Other (please specify)*

Scale

9. Change in the total value of sales of the product(s) involved

Option 1: Total number of the units sold x unitary price

Exemplary question format from the questionnaires: *What are the prices of the products before the innovation during the baseline period? How many units of each product are sold on average per month before the innovation?*
What are the average prices of the products addressed by the innovation after the innovation? How many units of each product are sold on average per month after the innovation?

10. Change in total hours worked, disaggregated by gender

Option 1: The number of hours worked by each employee[7] (disaggregated by gender and position in the company)

Exemplary question format from the questionnaires: *Please indicate, the number of Full-Time Equivalent jobs in the organisation before the innovation (if this is only a share of time of one or more employees, please indicate the change in total hours worked), disaggregated by gender and position.*

Please indicate, disaggregated by gender and position, the number of Full-Time Equivalent jobs in the organisation after the innovation resulting from the implementation of the innovation (if this is only a share of time of one or more employees, please indicate the change in total hours worked).

Or the following can be asked one time at the end of the innovation:

Please indicate, disaggregated by gender, the type of position/job title, the number of Full-Time Equivalent jobs in the organisation that were created (or lost) as a result of the implementation of the innovation (if this is only a share of time of one or more employees, please indicate the change in total hours worked. Please specify how many hours is a Full-Time Equivalent[8].

[7] Only employees that are using the innovation. For instance, fruit and vegetable producers.
[8] According to Eurostat statistics, the number of full-time equivalent hours changes in different European countries and for different employment types (e.g., employees, freelance/own account workers,

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	Number of jobs created	Number of jobs lost	Change in total hours worked
Female			
Male			
Other			

11 & 12. New partnerships upstream and horizontally and Downstream diversification (e.g. number and type of buyers, sellers; sectorial and out of sector contacts)

The number and type of new buyers and sellers with which the respondent company came into contact with as a result of their involvement in the innovation + willingness to continue the relationship (assessed on a Likert scale from "very likely" to "very unlikely").

Exemplary question format from the questionnaires (covering both diversification and new partnerships): *Did you establish new contacts or agreements with other actors of the chain as a result of your involvement in the innovation? What type of contacts are these (e.g. downstream actors like suppliers; upstream actors like customers/buyers; competitors in your own sector; companies from other sectors, etc.)?*

If yes, how likely is that you continue these relationships on a 1 (very unlikely) to 5 (very likely) scale? Please use the table below to indicate and use as many lines as necessary to indicate a new contact.

Progressive number[9]	Type of relationship (buyer, seller, etc.)	Formal contractual agreement (yes/not)	Likelihood of continuing relationships				
			Very unlikely	Somewhat likely	Neither likely nor unlikely	Somewhat likely	Very likely
1							
2							
3							
4							
…							

Competitiveness

13. Change in the productivity of material inputs (input-output ratio)

employers, contributors to family business, etc.). The average for each country will be used, also considering the differences between different employment types in the amount of hours of typically worked in a full time position in Europe.

[9] The progressive number, starting at 1 and increasing by 1 at each row, is used to list the relationships created without the need to provide the names of the contacts.

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Option 1: Amount (kg/tons/pieces per week) of input / Amount of output (e.g. kg/tons/pieces per week)- either consumed at home or school or sold in the market depending on the innovation (kg/tons/pieces/final products[10] per week)

Exemplary question format from the questionnaires: *What is the amount of each input items purchased in an average week ? What is the amount of the same items thrown away in an average week (including unavoidable waste)?*

This question does not need to be answered if the amounts of inputs to productions, the amount of organic waste and the resulting output from production is already detailed before and after the innovation in the previous questions.

SOCIAL INDICATORS AT ENTERPRISE LEVEL

14 & 15. Change in the awareness of the food waste problem of the staff and management (or participants in the dialogue or educational events) of the food waste problem. Change in the attitude towards reduction of food waste of the staff and management (or participants in the dialogue or educational events) towards the reduction of food waste.

Self-assessment of concerns for, and commitment to, food waste reduction (Likert scale, from "a lot" to "not at all") by the respondent and by each of the employees involved in managing the food product transfer.

Exemplary question format from the questionnaires (covering both awareness and commitment): *To what extent do you agree with the following statements? (to be answered individually by the staff members also indicating gender, position and department, education and age as part of the survey.)*

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
Food loss and waste are major issues for the sustainability of the food systems in general					
Food loss and waste are major issues in [insert the name of your sector here]					
Food loss and waste are major issues in [insert here the type of your organisation]					

[10] A dish in a restaurant or canteen, a batch of bakery products, a meal at home or at a charity are examples of a final product sold or consumed by piece.

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I am concerned about the economic costs of food loss and waste in [insert here the type of your organisation]					
I am concerned about the environmental impact of the food loss and waste in [insert here the type of your organisation]					
I am committed to reduce the food loss in [insert here the type of your organisation]					

The questions related to changes in awareness and attitude of staff members as a result of the innovation will be individually answered by each involved staff member through the **staff surveys**. Only the staff members, including managerial ones, directly involved in the innovation have to fill out the staff surveys. A copy of both the online and mobile phone compatible staff survey prepared by the James Hutton Institute are included in Annex 2.

COMMUNITY-(SOCIETY-) AND SUPPLY CHAIN LEVEL INDICATORS

16. Change in the number of jobs, disaggregated by gender

Option 1: Number of people employed in the company, the type of contracts and hours, disaggregated by gender, and the position in the company

17. Similar technological change in other companies (e.g., request to adopt the same innovation):

Exemplary question format from the questionnaires: *Please indicate if you have informed other companies of the innovation. If yes, what is the number of other companies you have informed of the innovation you have taken part in (e.g. dialogue, platform, software etc.)? How many of these companies declared to be interested in it? How many of them have already started using the innovation?*

GENDER-RELATED INDICATORS

18. Vertical segregation

List of people who have contributed to different tasks related to the innovation (e.g. transferring the product, from making contacts to the delivery of the product); for each person, specify the gender and the job grade.

Exemplary question format from the questionnaires: *Please indicate the list of staff members who have contributed at different tasks related to the innovation in your organisation (e.g. transferring the product, from making contacts to the delivery of the product) and for each person please indicate their gender, company sector, and job grade.*

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19. Horizontal segregation

This indicator will only be measured for social and stakeholder innovations that bring users from different organisations in their implementation, and for large companies. In the latter case, the indicator will be measured through the answers concerning the sector of the company where the involved employees work (see indicator 18 above).

20. Share of genders interviewed for the staff and the management surveys before and after the innovation.

At the beginning of each questionnaire (staff and management surveys conducted before and after the innovation adoption), there must be a demographics section capturing age, education, position, and gender information of the respondent.

21. Survey satisfaction

At the end of each questionnaire (survey), there must be a question asking for the respondents' satisfaction with the survey. The answers will be analysed by gender.

Exemplary question format from the questionnaires: *Please indicate your level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"].*

B) Economic impact indicators relevant for innovator and supporting organisation partners

The set of questions in the **management survey** have to be answered by innovation providers, and supporting organisations if applicable, in each demonstration partner. This person will fill in the survey to report the resulting data from measurements made and records created in two comparable periods, i) before the implementation of the innovation; ii) after the implementation of the innovation.

First, the date of the survey and the name of the person conducting the survey or interview (if it is conducted in this format) and some general characteristics of the participating organisation (e.g. location, number of staff or household numbers, annual turnover) must be provided at the start of management surveys. Some of the general characteristics might not be applicable to all innovation partners (such as charities, schools or households), then these should be filled as "Not applicable" or "NA".

6. Creation of new income streams

The number (and name) on new food products to be sold on the market created over the duration of LOWINFOOD as a result of participating in the innovation.

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Exemplary question format from the questionnaires: *Are there any new products or services that company offers resulting from the innovation?*

If you answered yes to the previous question, please list each product and the service and indicate the market price of each.

7. Rate of return on your investment from taking part the LOWINFOOD project :

Have you incurred in any additional costs as a result of implementing the innovation ? If yes, please provide an estimate in Euros.

If the additional costs are not provided, the ROI will be calculated as the sum of financial gains from the innovation (derived from questions above) divided by the "estimated eligible costs" for the organisation in the LOWINFOOD grant agreement (%).

8. Change in access to subsidies and/or other financial benefits

Subsidies/other monetary benefits (in Euros) received due to waste reduction (specifying if these are one-time, periodical, fixed or proportional to the amount of waste).

Exemplary question format from the questionnaires: *Are there new subsidies and/or other monetary benefits received as results of food waste reduction after the innovation? If you answered yes to the previous question, please indicate their value in Euros.*

If you received any subsidies and/or other monetary benefits as results of waste reduction, please specify whether these are (multiple choices possible):

- *One-off*
- *Periodic*
- *Fixed*
- *Proportional to the quantity of waste*
- *Other (please specify)*

11 & 12. New partnerships upstream and horizontally and Downstream diversification (e.g. number and type of buyers, sellers; sectorial and out of sector contacts)

The number and type of new buyers and sellers with which the respondent company came into contact with as a result of their involvement in the innovation + willingness to continue the relationship (assessed on a Likert scale from "very likely" to "very unlikely").

Exemplary question format from the questionnaires: *Did you establish new contacts or agreements with other actors of the chain as a result of your involvement in*

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the innovation? What type of contacts (e.g. downstream actors like suppliers; other retailers, others) are these?

If yes, how likely is that you continue these relationships on a 1 (very unlikely) to 5 (very likely) scale? Please use the table below to indicate and use as many lines as necessary to indicate a new contact.

Progressive number[11]	Type of relationship (buyer, seller, etc.)	Formal contractual agreement (yes/not)	Likelihood of continuing relationships				
			Very unlikely	Somewhat likely	Neither likely nor unlikely	Somewhat likely	Very likely
1							
2							
3							
4							
…							

Please indicate, disaggregated by gender, the number of Full-Time Equivalent jobs in the organisation before the innovation (if this is only a share of time of one or more employees, please indicate the change in total hours worked).

16. Change in the number of jobs, disaggregated by gender

Please indicate, disaggregated by gender, the number of Full-Time Equivalent jobs in the organisation after the innovation (if this is only a share of time of one or more employees, please indicate the change in total hours worked)

Or the following can be asked one time at the end of the innovation:

Please indicate, disaggregated by gender, the type of position/job title, the number of Full-Time Equivalent jobs in the organisation that were created (or lost) as a result of the implementation of the innovation (if this is only a share of time of one or more employees, please indicate the change in total hours worked). Please specify how many hours is a Full-Time Equivalent.

	Number of jobs created	Number of jobs lost	Change in total hours worked
Female			
Male			
Other			

[11] The progressive number, starting at 1 and increasing by 1 at each row, is used to list the relationships created without the need to provide the names of the contacts.

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Table A1.2: The target survey respondent group in each innovation

Task	Innovation	Innovation providing partners	Demon. location	Innovation end-users[12]
T 2.1	Regione Emilia-Romagna (RER) platform	RER	Italy	Producers' Organization (PO), Association of Producers' organizations (APO)
T 2.2	Unverschwendet (UNV) cooperation agreements	UNV	Austria	Farmer; Restaurant; Food processor
T 2.3	LEROMA B2B platform	LEROMA	International	Buyers and sellers[13]
T 2.4	FORESIGHTEE sales forecasting software	FORE-SIGHTEE	Italy	Each participating retailers' staff
T 3.1	SLU- New supplier-retailer agreements	Social innovation by academic partners	Sweden Finland	Each participant in the dialogue
T 3.2	Associazione di Viterbo e Civitavecchia (CNA) bakery stakeholder dialogue	CNA	Italy	Each participant in the dialogue
T 3.3	FoodTracks (FT)-bakery demand planning software	FT	Germany	Bakeries' staff members
T 4.1	Fish supply chain dialogue James Hutton Institute	Social innovation by academic partners	Scotland	Participants in the dialogue
T 4.2	LEROMA B2B platform	LEROMA	International	Buyers and sellers
T 5.1	Kitro-smart bin	KITRO	Greece	Restaurants/hotels' staff members
T 5.2	Mitakus-web-based platform ingredient demand prediction	MITAKUS	Sweden Germany	Restaurant/canteens' members
T 5.3	SLU/AIE educational innovation	Social innovation by academic partners	Sweden Austria	Schoolteachers and kitchen staff in school

[12] Only the staff members directly involved in the innovation will fill in the staff surveys.
[13] These business stakeholders could further be classified as producers (e.g. fishing companies), processors, waste/ by-product processors, wholesalers, retailers, food services (e.g. catering company, canteens restaurants), other (please specify) for LEROMA and JHI stakeholder innovation.

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T 5.4	Matomatic plate waste tracker	MATO-MATIC	Sweden	Restaurants' staff members
			Germany	
T 5.5	CozZo-mobile app for at-home food management	CozZo	Austria	Household members
			Greece	
			Finland	
T 5.6	Regusto	Regusto	Italy	Restaurant staff, app users

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Annex 2: Staff survey template for the innovations end-users

The survey will be developed using the Qualtrics online platform, and will be filled online by respondents.

Thank you for agreeing to take part in this LOWINFOOD survey.

Q1. Which innovation have you participated in?

- ☐ Regione Emilia-Romagna (RER) platform
- ☐ Unverschwendet (UNV) cooperation agreements
- ☐ LEROMA B2B platform
- ☐ FORESIGHTEE sales forecasting software
- ☐ Swedish University of Agricultural Sciences (SLU)- New supplier-retailer agreements
- ☐ Associazione di Viterbo e Civitavecchia (CNA) bakery stakeholder dialogue
- ☐ FoodTracks – bakery demand planning software
- ☐ Fish supply chain dialogue James Hutton Institute
- ☐ Kitro-smart bin
- ☐ Mitakus-web based platform ingredient demand prediction
- ☐ Swedish University of Agricultural Sciences (SLU)/Austrian Institute for Ecology (AIE) educational innovation
- ☐ Matomatic-plate waste tracker
- ☐ CozZo-mobile app for at-home food management
- ☐ Regusto-mobile app for take-aways

If you selected 'CozZo-mobile app' please skip to question 6

Q2. What is your organisations name? .....

Q3. What sector is your company in?[14] .....

Q4. What is your position in the company? .....

Q5. What is your role in the organisation?[15]

- ☐ Contract or temporary worker
- ☐ Permanent contact staff without managerial duties
- ☐ Sector or department manager
- ☐ Executive level manager
- ☐ Owner
- ☐ Other (please specify)

[14] To be replaced by a closed-ended question for specific innovations.

[15] This could later replace the open-ended question Q4.

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Q6. What is your responsibility in the innovation?

- ☐ I am the only person in charge of implementing the innovation
- ☐ I am one of the main people involved in the innovation
- ☐ I use or help with the innovation without a decision-making role
- ☐ I am distantly involved in the use or support of the innovation
- ☐ Other (please specify)

Q7. How long have you been using the innovation?

- ☐ Since the innovation was introduced (any duration)
- ☐ After introduction: less than 1 month
- ☐ After introduction: 1 to 3 months
- ☐ After introduction: 3 to 6 months
- ☐ After introduction: 6 months to 1 year
- ☐ After introduction: 1 to 2 years
- ☐ After introduction: more than 2 years

Q8. What is your age?

- ☐ Under 18
- ☐ 18-24
- ☐ 25-34
- ☐ 35-44
- ☐ 45-54
- ☐ 55-64
- ☐ 65 or more

Q9. Which country are you based in?

- ☐ Austria
- ☐ Finland
- ☐ Germany
- ☐ Greece
- ☐ Italy
- ☐ UK
- ☐ Sweden
- ☐ Other (please specify

Q10. What is your gender?

- ☐ Female
- ☐ Male
- ☐ Other (please state in your own words)
- ☐ Prefer not to say

Q11. What is your current level of education?

- ☐ No qualifications
- ☐ Primary school education
- ☐ High school or equivalent qualification
- ☐ Trade/technical/vocational training
- ☐ University or college undergraduate degree
- ☐ Post graduate education (masters or PhD degree)

Q11. To what extent do you agree with the following statements?
(Please tick in the box which applies to your answer)

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
Food loss and waste are major issues for the sustainability of the food system in general					
Food loss and waste are major issues in the sector that I work					

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Food loss and waste and major issues in the organisation that I work					
I am concerned about the economic costs of food loss and waste in the organisation where I work					
I am concerned about the environmental impact of the food loss and waste in the organisation where I work					
I am committed to reducing the food loss in the organisation where I work					

Q12. Are you satisfied with this survey?

- Not at all satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat satisfied
- Very satisfied

Q13. If you have any additional comments, please write them:

Thank you for your participation

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Annex 3: Consultations with data facilitators

This section reports a list of the innovations and of the questions asked by the socio-economic evaluation team to the innovators and data facilitators during the consultation in order to better target the questionnaires.

WP 2 Fruit and vegetable supply chain

WP2 focuses on innovations that target FWL in the fruit and vegetable supply chain, considering different aspects such as prevention of F&V loss in agricultural production, redistribution and recovery of F&V waste and improved demand forecasting in retailers. Four innovations (RER software, UNV social and organisational innovation, Leroma and Foresightee platforms) are demonstrated in WP2.

Task 2.1 RER (data facilitator: **UNIBO**)

RER software is an institutional organisation innovation promoted by a regional government. It is a software created by Common Agricultural Policy (CAP) responsible institutions to share data about losses and surplus products in the production/wholesale interface. It manages withdraws of fruits & vegetables by producer organisations (PO and APO) within the CAP payments system and the donation of the withdrawn products to charities and their sale to ethanol producers at reduced prices.

Correspondence with data facilitators

1. What are the unit and time frames for measuring the (surplus) transfers in RER (kilos/tonnes of unharvested/raw materials per day/week/month/year)? Is this different from the usual transactions between stakeholders in the sector?

2. How regular (and predictable) are the transfers (withdrawals in RER)? In RER, are the receivers of the withdrawn agricultural products limited to only energy producers and charities (if they are not sold to retail as usual)?

3. What is the cost structure for disposing of organic waste (fixed per unit, increasing with each additional unit, decreasing with each additional unit etc.) for agricultural producers in the possible countries identified by Assemblée des Régions Europeéennes Fruitiéres, Légumières et Horticoles (ARELFH)?

4. How is the food waste or organic waste defined in the jurisdiction where these two innovations take place? Is there a regional or national legislation targeting food waste in the case study area?

5. Are these compensations, interventions etc. new additions in the platform or do they exist in the prototype in use since 2012? If later, is it possible to have some output metadata to see what

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kind of information/variables at user, transaction and aggregate level are already kept and processed in the system that is accessible through LOWINFOOD?

6. What are the typical reasons for withdrawal in the region? What is the type (e.g. what type of fruit and vegetable are most likely to be withdrawn) and the unit (e.g. tonnes, kilos?) of the (activated) "withdrawals"? Is it possible to see the statistics sets from the prototype platform between 2012 and 2021?

7. Do the units or the amounts transferred change with whether the withdrawn amount is sent to a charity (e.g. smaller amounts, kilos etc. are acceptable but must be of x quality) or to an ethanol plant (e.g. there is a minimum kilo or tonnes for delivery, the quality does not matter)? What do the charities use the food products for (human consumption or other uses)?

8. What is meant by "intervention" in Task 2.1? What do intervention prices refer to? What does the original price refer to?

9. The intervention price is 100% of the original price in the case of donation to charities, and intervention price 2 is 50% of the original price paid if the agricultural products are sent to the ethanol production plant. How is it decided whether the surplus goes to the charity and the farmers get fully funded, or the surplus goes to an ethanol plant, and they get the half price? In the latter case, do the farmers receive the other half of the compensation from the ethanol plant?

11. If APOs or POs receive and redistribute the compensations based on intervention prices to their members, who coordinates and what happens to unorganised producers (if any) taking part in the same interventions? Is there any difference in terms of conditions between the members of APOs and POs and not organised agricultural producers in RER?

12. How much do the unit intervention prices typically/historically compare to the average unit market prices for the same produce? (It does not have to be precise but overall estimations based on the previous years' data or if not available, the observations/anecdotes are sufficient). Are the intervention prices 1 and 2 fixed each year/harvest ex ante, or dynamically adjusted to the original market price of the produce?

Task 2.2 UNV F&V supply chain innovation (data facilitator: **BOKU**)

UNV demonstrates the institutional and social innovation in T2.2. It acts as a cooperation system between farmers and food processors, and restaurants by facilitating the sale of edible and healthy produce to restaurants and food processors. Thus the loss of otherwise healthy and edible products that do not reach the final consumers due to changes in retailers' demand and aesthetic standards is prevented.

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Correspondence with data facilitators

1. In the cooperation agreement, what is the unit of measurements for the transfers between the farmers and (food processors and) restaurants in the UNV innovation to avoid food waste? For instance, different innovations can record the material flow as:

2. Is this unit different from the usual transaction unit between stakeholders in the sector and if so, how?

3. *How regular (and predictable) are the transfers through innovation expected to be, e.g. one-off transfers between different stakeholders or continuous transfers of the predictable volume of flows)?*

4. *Do the food processor or restaurants targeted in the UNV innovation have specific characteristics in common (e.g. environmentally conscious market segment etc.), or are they regular enterprises chosen based on previous collaboration with UNV?*

5. *How many farmer and gastronomy recruits are anticipated in the network?*

6. What is the cost structure for disposing of organic waste (fixed per unit, increasing with each additional unit, decreasing with each additional unit etc.) for the farmers with a surplus?

7. How is food waste or organic waste defined in the jurisdiction where the innovation takes place? Is there a regional or national legislation targeting food waste in the case study area?

8. What factors determine the surplus volume (e.g. seasonality etc.)?

9. What does B-goods mentioned in T 2.2 description in the LOWINFOOD Grant Agreement mean?

10. What are the logistical problems that prevent establishing a stable network between agriculture and gastronomy? Surplus food occurs only occasionally. This makes a network very unstable.

11. Are the network participants already recruited before the project, or will they be recruited during the project?

12. What is the representation in the network regarding farmers and restaurants, assuming UNV is the single distributer, i.e. how many farmers or restaurants are involved?

13. What would happen to the edible produce that cannot end up in the supermarket without this innovation? Do they go to waste or are they sold to processors etc. at a lower price than the market? (To understand the potential gain from the innovation and the opportunity cost in its absence).

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14. Who pays the transactional costs of new arrangements (e.g. transport) between farmers and the surplus receivers?

15.*How will the transfer prices in the cooperation agreements be determined and how will they compare to the market prices available to the restaurants (set by farmers/processors ex ante or negotiated each year)?*

Task 2.3 Leroma (data facilitators: **ISUN** and **Leroma**)

Leroma platform is an organisational and technological innovation. It is a business-to-business (B2B) digital marketplace for food commodities, bridging producers and the food industry and allowing the sale of products that are not accepted in the market / excess quantities. The platform is applied to fruit and vegetable supply chain in WP2 and the fish supply chain in Task 4.2.

Correspondence with data facilitators

1.What are the unit for the surplus transfers in this innovation? (For instance, different innovations can record the surplus that exchanged hands as: kg of cooked food/portion of meals day/ week/month/year; kg/tonnes of unharvested/raw material (packed or not) day/week/month/year or kg/tonnes of processed/unprocessed ingredients day/week/month/year?)

2. How is this different from the usual unit of transaction between stakeholders in the sector (if it is)?

3. *How regular (and predictable) are the transfers, when applicable? For example, do they tend to be one-off transfers between different stakeholders vs continuous transfers-reliable/ predictable flow each year/month etc. Transfers are not predictable. Surpluses occur spontaneously due to mostly unforeseeable circumstances.*

4.What is the structure of costs in food and vegetable trade (what costs are fixed; what costs change with production level etc.)?

5.What is the cost structure for disposing of organic waste (fixed per unit, increasing with each additional unit, decreasing with each additional unit etc.) for the vegetable producers in the platform and in the case study countries/areas?

6.How is food waste or organic waste defined in the jurisdiction where the innovation takes place? Is there a regional or national legislation targeting food waste in the case study area?

7.How can Leroma customers be categorised? What type of end users use the platform (Big company vs small company, private vs public interest; business to business vs individuals) and are they different from the regular customers of retail and processors for the fruit and vegetable

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sector?

8.What factors determine the selling price and volume of the transfers sales (e.g. seasonality, etc.)? How do the prices compare to the market prices that producers usually receive?

9.Does Leroma provide support services (facilitating storage, transport, insurance, providing legal and food safety guidance or monitoring etc.) in the case of national or global transfers? Does it involve the practical aspects of the transaction as exemplified above, or does it only bring together buyers and sellers of food materials?

10. In T2.3, what is the scope of Leroma? Only limited to fruits and vegetables that are unharvested and left on the field due to economic reasons/cosmetic defects/nearly expired/quality deficiencies, or any tradable food product?

Task 2.4 Foresightee BV (data facilitator: **UNITUS**)

Foresightee BV is a software based artificial intelligence. It uses historical sale data of each store to train a machine-learning algorithm and improves the accuracy of sales forecasts at retail stores. It has already been tested in a supermarket in Belgium. In task 2.4, it will be demonstrated in three countries, with three stores per country.

Correspondence with data facilitators

1. Under the assumption that the food transfers are regular and predictable as historical data is used to predict the future pattern, what is the unit and time frame of transfers in this innovation? (For instance, different innovations can record the material flow as: Kilos/tonnes of raw material day/week/month/year Kilos/tonnes of processed/unprocessed ingredients day/week/month/year etc.; Number of items day/week/month/year)?

2. What variable costs for the supermarkets (e.g. transport, storage, refrigeration due to more efficient ordering) can be saved in the case study areas?

3. What is the cost structure for disposing of organic waste for supermarkets or food retail (fixed per unit, increasing with each additional unit, decreasing with each additional unit etc.) in the case study areas?

4. How is food waste or organic waste defined in the jurisdictions that the innovation takes place? Is there a regional or national legislation targeting food waste in the case study areas?

5. Are the supermarkets involved in the platform different than regular supermarkets in any way? Does the optimisation of orders through the platform affect the pricing dynamics in these supermarkets?

6. Are the previous Belgian supermarket test results available? (This is to see what the form of

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output metadata is and how it can be structured, and if the data currently collected can be used to measure the indicators). Is the data directly available to the retailers and store managers or the innovator/platform provides them recommendations for the orders directly?

7. What does "packed fruit and vegetable (F&V)" include and is the packed F&V the only type of product considered in the scope of this task? Any packed F&V with an expiry date, or specifically processed products or unprocessed that are fresh and perishable?

8. What external parameters are used in Foresightee when predicting trends? How are the price reductions and other relevant sales campaigns categorised?

9. Other than at the store level, at what levels (supermarket chain, each packed product etc.) can the data be collected and reported?

10. What kind of order planning and management methods would be used in the supermarkets in the absence of Foresightee?

WP 3 Bakery supply chain

This work package aims to reduce the waste of bread along the supply chain, starting from production in bakeries up to waste at consumer level. The cheap prices breads and extremely short shelf life are the main sources of large amounts of waste created in bread supply. To address waste, not only better management of demand but also supply chain collaboration is required. Three innovations are demonstrated in WP3 to address each relevant aspects of waste creation in bread supply chain.

Task 3.1 Supplier-retailer agreements innovation (data facilitator: **SLU**)

T3.3 demonstrates a managerial innovation that targets the take back agreements that separate the waste management from source management in the bakery supply chain and disincentivising waste reducing interventions for retailers. It establishes new supplier/ retailer agreements for bakery products, avoiding take-back agreements that are a main source of waste in this sector and introduces new managerial innovations for more optimised production and efficient logistics.

Correspondence with data facilitators

1.In the LOWINFOOD Grant Agreement, bakeries commit to providing records on the quantity of bread throughout the activity. Will they also be recording the amount of bread waste in their activities? What is the unit of measurement in the innovation (e.g. number of produced and wasted items per day/week/month/year for participating bakery?). Is it similar to the typical units in the bakery supply chain?

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2. What kind of qualitative data will be collected at the round table discussion at the meetings?

3. Up to 10 bakeries for each country are to take part in 3-5 meetings. Is there already a list of these bakeries? Are these chains, or large bakery firms, or independent small medium size enterprises?

4. Is it only the bakeries and bakery associations that will attend the meetings, or will there be other stakeholders such as retailers from the bakery supply chain? What will be the role of bakery associations and are they expected to provide the project any form of data throughout the activity?

5. What will be the output of the process? (This is to understand how the measurement of socio-economic impact of the innovation can be reviewed. If the expected outcome is a roadmap rather than an actual change in production or waste during the timeframe of the project, maybe it is possible to speculate about the potential impact that will come out of the roadmap under different scenarios).

6. Are the supermarkets (retailers) obliged to pay a fee for each unit they send-back or can all unsold units be returned at no cost?

7. Is the bread waste generated by the supermarket defined by the amount of unsold and expired bread? And according to the take-back agreements, is it the only share of the bread that belongs to the supplier? (This is needed to understand if there is any conflict of interest in reducing waste for specific stakeholder, what is the profit structure, if the suppliers earn a profit from the amount of the bread sold to the supermarket or to the consumers).

8. Does the supplier pay the supermarket a commission for selling their bread, or does the supermarket contract the bakery to supply them a fixed number of bread loaves or bakery items per day/week etc., paying them accordingly for the full batch, sold or unsold to the customer?

Task 3.2 Stakeholder dialogue for supplier-retailer interactions (data facilitator: **TAU**)

T3.2. demonstrates a social and organisational innovation by initiating and promoting a stakeholder dialogue to develop guidelines against FLW in bakeries and their branches to improve the efficiency of the production and marketing operations.

Correspondence with data facilitators

1. Bakeries commit to providing records on the quantity of bread throughout the activity. Will they also be recording the amount of bread waste in their activities? What is the unit of measurement in the innovation (e.g. number of produced and wasted items per day/week/month/year for participating bakeries) Is it similar to the typical units in the bakery supply chain?

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2. What kind of qualitative data will be collected at the round table discussion at the meetings?

3. Up to 10 bakeries for each country are to take part in 3-5 meetings. Is there already a list of these bakeries? Are these chains, or large bakery firms, or independent small medium size enterprises?

4. Is it only the bakeries and bakery association that will attend the meetings, or will there be other stakeholders such as retailers from the bakery supply chain? What will be the role of bakery associations and are they expected to provide the project any form of data throughout the activity?

5. What will be the output of the process? (This is to understand how the measurement of socio-economic impact of the innovation can be reviewed. If the expected outcome is a roadmap rather than an actual change in production or waste during the timeframe of the project, maybe it is possible to speculate about the potential impact that will come out of the roadmap under different scenarios).

Task 3.3 Food Tracks (FT) (data facilitator: **ISUN**)

FT is a software-based technological innovation to optimise bakery demand planning at the production sites and their subsidiaries to reduce overproduction and minimise returned goods. The software gathers past data from the enterprise resource planning system or the cash register and combines these data with external factors to better predict the required amounts of bakery products for each subsidiary and each article individually.

Correspondence with data facilitators

1. What are the units of the transfers in this innovation? For instance, different innovations can record the materials flows as: kg/tonnes of processed/unprocessed ingredients per day/week/ month/year or the number of bakery items per day/week/month/year?

2. How is this different from the usual unit of transaction between stakeholders in the bakery sector? How regular (and predictable) are the transfers? For example, one-off transfers in Leroma between different stakeholders vs continuous transfers with the predictable flow each year/month etc. in FORTSIGHTEE for the supermarkets.

3. How much does data availability and the situational factors (processing and organisation of subsidiaries etc.) change between the individual bakeries involved? Could "organisation specific solutions" interfere with the collection of comparable datasets that would be standardised across participating organisations?

4. What is the structure of costs in the bakery sector (what costs are fixed; what costs change with level of production etc.) that could be optimised with FT? What is the cost structure for disposing of organic waste (fixed per unit, increasing with each additional unit, decreasing with

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each additional unit etc.) for the bakeries?

5. How is food waste or organic waste defined in the jurisdiction and the sector where the innovation takes place? Is there a regional or national legislation targeting food waste in the case study area?

6. Is FT only applicable to the bakery sector/trade, or is it also used in other sectors?

7. What factors determine the selling price and volume of the orders (e.g. seasonality etc.)? How do the prices in FT compare to the usual market prices?

8. What kind of data output could be provided by the software?

9. Can users of the software skip question or selectively fill in the information?

10. Are the three participating bakeries all part of the academy of the German bakery trade, ADB-Nord or is ADB-Nord one of the 3 participating bakeries that will test the app? What is the production and trade volume of each three bakery and how are they linked to the ADB?

WP 4 Fish supply chain

WP4 aims to reduce FLW along the fish supply chain with a focus on Scotland and Germany, where the largest volume of fish lands and where the main access ports in Europe are. Therefore, the waste reduction measures and waste management efficiency in these ports and the national fish supply chains are critical for the rest of *Europe. The fish supply chain is also addressed (WP4) with the demonstration of two innovations; one related to stakeholder dialogue to promote the adoption of innovations and the other one is a B2B online marketplace where waste can be revalorised.

Task 4.1 Supply chain dialogue to identify hotspots of FLW in the fish sector (data facilitator: **JHI**)

A social and managerial innovation to initiate supply chain dialogue and identify hotspots of FLW along the fish supply chain is implemented in T4.1. The dialogue will promote the coordination between fish supply chain actors and the adoption of innovative solutions against FLW. As JHI is in charge of this innovation, only the review of colleagues from innovations are used in the elicitation of the part in the surveys concerning the socio-economic indicators.

This innovation was discussed internally at the James Hutton Institute, which is leading both T1.3 (socio-economic evaluation) and T4.1.

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Task 4.2 Leroma (data facilitator: **ISUN**)

The details about Leroma B2B digital platform and it is implementation is covered above in Task 2.3. In T 4.2 the Leroma platform will be demonstrated to reduce fish loss and waste in the German and Scottish fish supply chains.

This innovation was discussed by the James Hutton Institute, which is leading both T1.3 (socio-economic evaluation) and WP4, in bilateral meetings with ISUN.

WP 5 Households and food services

WP5 addresses the reduction of food waste related to consumption both in households and commercial kitchens. At a consumer level, the food waste does not change with the food categories. It is related to organisational issues in the food services and the behaviour of consumers. Six innovations are demonstrated in WP5. Four of them focus on food waste reduction in food service and the remaining two focus on reducing food waste during at-home consumption.

Task 5.1 KITRO (data facilitator: **ISUN**)

KITRO is a fully automated technological innovation for monitoring the type and quantity of food waste in the food service sector, such as in restaurants, canteens and hotels. Image processing and deep learning technologies are combined with a hardware solution to capture and analyse food waste information. Facilities using KITRO receive detailed insights into their food waste informed by data collected via an online dashboard and can make more informed and optimised management decisions to avoid food waste.

Correspondence with data facilitators

1.What is the unit of measurement for food waste avoided through the innovation (kg or gram of each ingredient share of the dish, ingredient type etc.)?

2. How and at which detail is the food waste disposed of in the bin identified and monitored by combining the weight measurement function with image recognition? By ingredient, by dish in the menu, by % of the portion, grams, etc? (Asking this because economical savings are closely linked with what type of food as well as how many kilos are saved).

3. What is the cost structure for disposing of organic waste (fixed per unit, increasing with each additional unit, decreasing with each additional unit etc.) for restaurants and hotels in Germany, Switzerland and Greece? (This is to understand the direct benefit in terms of reducing waste).

4. How is food waste or organic waste defined in the jurisdictions where the innovation takes place? Is there a regional or national legislation targeting food waste in the case study area?

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5. What are the (three) food service settings? How can the input information and the online dashboard be personalised? What indicator related to food waste is shown on the dashboard?

6. Will there be a specific key account manager from KITRO involved in the LOWINFOOD project? Is there a single account for each establishment and a specific employee will be designated in store to be in charge of the software or multiple users can use the innovation? (This is to understand the pattern of expected participation and how to capture the statistics about it).

7. Is it possible to have metadata and anonymised examples of recommendations that KITRO provided? (This does not have to be real data, just to see what is recorded and what the output is).

8. How precise is the weight and optical measurements and image processing in terms of identifying each food? Does KITRO need to be cleaned after each disposal to measure and correctly identify the consecutive disposals correctly? (This is to understand the precision of the consecutive measurements in case there is a need to consider a sensitivity range also in some of the indicators).

Task 5.2 Mitakus (data facilitator: **ISUN**)

Mitakus' is a technological innovation. It is a web-based software platform that supports the personnel of commercial kitchens and restaurants in the design of menus based on customer preferences and volume by predicting ingredient demand and requirements based on historical data. The forecasts made by the platform help to optimise the purchase of fresh and perishable ingredients by preventing overpreparation and overstocking.

Correspondence with data facilitators

1. What are the unit and time frames of measurement of food waste in this innovation? (For instance, kilos/tonnes of different ingredients per day/week/month/year etc.).

2. What is the cost structure for disposing of organic waste for restaurants and food services (fixed per unit, increasing with each additional unit, decreasing with each additional unit etc.) in Germany and Sweden?

3. How is food waste or organic waste defined in the jurisdictions that the innovation takes place? Is there a regional or national legislation targeting food waste in the case study areas?

4. Are the 6 restaurants involved in the platform different than usual restaurants in the case study area in any way? Does the optimisation of orders through the platform affect their pricing dynamics?

5. Are the previous test results or any metadata available? (To see what the form of data output is and how it can be structured, and if these can be detected through the current questions).

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6. What kind of order planning and management methods would be used in the restaurants and food services without Mitakus? (This is to understand the additional benefit of the innovation).

Task 5.3 Matomatic (data facilitator: **SLU**)

Matomatic is a technological innovation that tracks the plate waste in school canteens to increase children's awareness of food waste. The plate waste is measured by a smart scale and primary school pupils are provided with immediate feedback in a simplified and expressive way about how much plate waste they generate. The aim is to increase children's awareness about food waste and to include gamification elements between participating school canteens. The innovation also enables children to provide feedback to the kitchen staff about why they leave food on their plates, and thus, the future could be planned accordingly.

Correspondence with data facilitators

1. Are Matomatic and the holistic educational innovation in T5.4 implemented in different schools in Uppsala, or are the two innovations somehow connected? Similarly, is Matomatic linked to KITRO somehow, e.g. use of a smart bin for weighting the plate waste content?

2. Does Matomatic consider any prices or other economic information? For comparison, the scale can communicate how much a school has wasted in terms of money, but this is just calculated as a fixed price/kg (set by the user) multiplied with the mass of waste.

3.Does Matomatic sort waste by ingredients or by share of the plate, or measures and reports it just by weight? How does it collate this data (at individual students' level throughout the implementation, per school day, or for each school canteen for each school day/term, etc.)?

4.Is it a mobile app, a platform, or both? Are the kids only told about their plate waste with a tablet next to the bin when they dispose of the leftovers, or also in other forms, e.g. how well they do against other school canteens and when giving feedback to the kitchen staff about whether they did leave food on their plate?

5. Is the registry per meal attendance or per individual? Is it possible to register/capture the students involved by age or grade and gender and get statistics about the participation? The registry is per item added to the waste bin (within a certain time limit) to capture the waste of each individual generating plate waste. All students eat in the canteen every day (unless they are absent), so the age and gender composition of each school will be used as a proxy for the age and gender of the group participating.

6. Is it possible to see a previous or fabricated dataset to understand what kind of data and in which formats are collected through the app?

7. The number of schools involved is not the same in Germany (3-5) and in Sweden (10). Will the

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number of participating students be the same?

8. Are there any policy incentives for reducing food waste in school canteens in the case study countries?

9. Is it possible to collaborate with the kitchen staff or management in these schools to capture their meal preparation costs during the implementation of the project to capture the economic aspects?

Task 5.4 A holistic educational concept (data facilitator: **SLU**)

T5.4 demonstrates a social innovation dealing with developing a holistic educational approach against food waste at schools, and is applicable to schools and various conditions in different EU countries. The innovation originates from the involvement of pupils and kitchen staff of the partnering schools in educational activities focused on raising awareness of the food waste issue.

Correspondence with data facilitators

1. How is waste defined in school canteens? As total plate waste after meals (in kg) or as unsold meals (number of each type of meal per day) or both in quantity (in kg)?

2. Will the outcome and socio-economic impact of the holistic education innovation be assessed through the quantity of food waste generated before and after the educational activities?

3. To better understand the educational concept, is it possible to see the documents relating to the efficacy demonstration of educational meals and kitchen workshops?

4.What kind of data is expected to be collected from the students, teachers and kitchen staff other than the quantity of food prepared? Could the kitchen staff in 24 partnering organisations provide some periodic data to estimate the change in their costs (or profitability) in terms of meal production?

5. Is it possible to register/capture the students, kitchen staff, teachers involved by age or grade and gender in different schools to get statistics about the participation and behavioural change?

6. Can participating students, teachers and kitchen staff fill the survey for social impact indicators about behaviour and attitude change after the questions irrelevant to their case (e.g. making new commercial ties as a result of the innovation etc.) are taken out?

7. What happens to food waste from school canteens in Sweden and Austria when this innovation is not implemented?

Task 5.5 CozZo (data facilitator: **TAU**)

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CozZo is a mobile application that facilitates consumers to keep track of the purchased and cooked food in their household and prevent causes of food waste such as over-purchasing and over-cooking through more deliberate provision decisions and better management of food in their households. CozZo combines a digital shopping planner with automated food and home supplies catalogues. Each food item purchased is added to the consumer's "home catalogue" with calculated expiry dates and reminders, enabling better planning of meals and shopping.

Correspondence with data facilitators

1. How is the price information captured in the household version? Is it only through the receipt scanner or can the user enter prices? What are units for recording the cost information of different items that are not sold in the same units? (How are the actual unit of sale and the unit of measurement matched for different retailers?).

2. Could all the supermarkets and products be recognised and converted? What happens when a product or a shop is not recognised in the system? (The aspect of uncertainty).

3. Are the user's savings from food waste reduction due to better planning calculated/captured and reported to the users? (Profitability aspect of the socio-economic analysis). Are the changes in consumption and spending captured, and how?

4. Is it possible to get any demographic information from the app users (i.e. 500 sample households offered a premium account)? And ask them to fill out a brief survey before and after the start of their subscription?

5. What is the data entry or scan statistics of the app users since 2019 (the percentage who keep decent records, and those who fill in much less, patchily or infrequently? (This is to estimate robustness and uncertainty aspects in the data set that cannot be controlled).

6. Most importantly, CozZo has been a popular app in use since 2019, is it possible to have an anonymised output based on previous user data to visualise which cost and amount information and in which units are captured by default in the system?

Task 5.6 Regusto app (data facilitator: **UNITUS**)

Regusto is a technological innovation in the form of a free mobile app that allows consumers to find the nearest meal offers and restaurants to sell their surplus meals prepared in surplus at a discounted price and track the delivered products up to the bin. The app's aim is a mission not to shift the food between the different stakeholders in the food services value chain but to reduce it along the value chain. Thus, the take-away meals sold on the app as take-ways and lefts-overs brought home through the Regusto Bag are tracked up to the bin of consumers.

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Correspondence with data facilitators

1.Is the single meals unit of transaction in Regusto or can there be other (larger) scale transactions?

2.In which units (% of the meal portion, grams, etc.) and how does the Regusto app identify the share of leftover food at the end of the meal from the uploaded customer pictures? What happens if the customer does not upload this photo?

3.How regular (and predictable) are the transfers (reduced meal sales in Regusto)? Is there a dominant pattern among the type of customers? For instance, in Regusto, how do the average take away customers and the type of customers that consume withdrawn meals differ or are these the same people? Does Regusto also sell the meals at their regular price or only discounted ones?

4.What is the cost structure in the restaurant/catering businesses in Italy (e.g. a rough distinction of what costs are fixed, what costs change with level of production etc.)? This is to understand the direct benefit in terms of reducing waste. What is the cost structure for disposing of organic waste (e.g. fixed per unit, increasing with each additional unit, decreasing with each additional unit etc.) for restaurants in Italy?

5.How is the food waste or organic waste defined in the jurisdiction where the innovation occurs? Is there a regional or national legislation targeting food waste in the case study area?

6.What indicators determine the selling price of the produce or the meals (e.g. the undiscounted price) and are any external factors determining the number of meals that end up on the platform (e.g. seasonality etc.)?

7.Do the users of Regusto have to register with a user account to follow their orders or are only transactions recorded, not the individuals who made it? (Asking this for the purpose of collecting social and gender-based information through the app).

8.What is the timeline of selling food and dynamic discounting on Regusto? What time after going up in the system the unsold meal is considered perished and taken off the system?

9.What is the format of the output data from Regusto and how obligatory is it for consumers to provide data return about the leftovers from their order? What is the return rate among the 500 sample of users? How are these 500 users incentivised to take pictures after consumption different than regular customers? Is there any data output from them or is this going to be collected after the implementation?

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Annex 4: Preliminary Questionnaires

The questionnaires below represent a preliminary version. The consultation between partners conducting the evaluation and partners supporting the demonstration tasks has started, but has not been completed yet ("multi-actor approach", see also D1.1). The final set of questionnaires reaching a consensus will be produced upon distribution or after pre-testing.

Consistency and completeness check

A consistency and completeness check was conducted by evaluation partners:

- UNIBO for efficacy related questions
- JHI for socio-economic related questions
- BOKU for environmental related questions
- ELH for gender related questions
- UNIBO; JHI; BOKU for questions related to the complete questionnaire

Feedback loops

After the consistency and completeness check, data facilitators were asked to accept or decline proposed changes and also include remarks for open discussions. This discussion process is still ongoing. So, several feedback loops will still be necessary before a consolidated version of questionnaires can be finalized.

Parts of the questionnaires which still need to be discussed or consolidated are therefore marked in grey and bold letters.

Clarifications on 'gender equality'

We will include a gender perspective and ensure **gender equality** throughout the evaluation, disaggregating data by sex, accounting for multiple inequalities and for women's needs.

Data will be collected disaggregated by sex using the categories *female, male, other* and *prefer not to say*. In this way different gender identities will have visibility.

The age of the participants will be another indicator to be taken into account. Both

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vertical and horizontal segregation will also be analysed by asking participants about the position and sector to which they belong to, and the satisfaction of each person with the questionnaire will be taken into account.

In the case of the innovation to be carried out at household level, the types of families will be analysed according to the age and sex of each member and an attempt will be made to ensure the participation of different types of families.

T2.1: RER Software for F&V

1 Regional authorities (before implementation)

1a. Questionnaire to be filled by regional authorities at the beginning of the task

A. Regional authority identification

1. Region
2. Nation
3. Department
4. Number of employees in the Department, by gender
5. Number of POs and APOs in the Region
6. Number of charities in the Region
7. Number of ethanol producing plants in the Region

B. Use of S.I.R.: participating actors, type of products, software information

1. How many charities, ethanol producing plants, POs and APOs are participating/willing to participate in the S.I.R. software? [number]
2. Please list the range of products involved in the innovation. [qualitative information]

C. Gender and survey satisfaction

3. Age and gender of the respondent.
4. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

2 Regional authorities (after implementation)

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1b. Questionnaire to be filled by regional authorities at the end of the task

A. Use of S.I.R.: costs, employment, skills, contacts

1. *What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training etc.)? [qualitative information + number]*
2. Have you developed any new streams of income or financial gains (i.e., new products or avoid costs) as a result of participating in the innovation? [yes/no]
    - If yes, please specify their amount and typology [amount in Euro of each new stream]
3. Please list all employees who have been involved in the use of S.I.R. software, by gender, age and role. [department, level of responsibility, if it is a decision-making position or not]
    - Did your company need to hire new personnel (including casual workers) in order to use S.I.R. software? [yes/no]
    - If yes, how many (by gender)? [numeric information and qualitative information]
    - Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]
4. What is the number and type of FTE jobs created for (or lost due to) the implementation of the innovation (if this is only a share of time of one or more employees, indicate the cumulated share in FTE)? In doing this, male female and non-binary employees' hours should be recorded separately. [number and qualitative information]
5. Have you made any new contacts ?What is the type of new contacts you have made in and out of your own sector as a result of your involvement in the S.I.R. Software? [qualitative information]
6. Are you willing to continue the relationships with these new contacts? [Likert scale: from 1 "very unlikely" to 5 "very likely"]
7. Have you suggested or are you willing to suggest the use of S.I.R. Software to other actors? [yes, I did / yes, I will / no]
    - Number and type of actors to which you suggested to use S.I.R. software, if any. [number and qualitative information]
    - Number of those who declared to be interested in it, if possible [num-

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ber]

- Number of those who have adopted it after you informed them, if possible [number]

8. How would you assess the time needed to learn how to properly use S.I.R Software? [Likert scale from 1 "very little" to 5 "too much"]
9. How many employees have developed new skills thanks to the use of S.I.R software, by gender?
   - Technological (use of pc software) [number and qualitative information]
   - Technical (better understanding of how to manage food transactions) [number and qualitative information]
   - Social/relational (with other users of the software, if relevant) [number and qualitative information]

B. Use of S.I.R.: participating actors, type of products, software information

1. How many charities, ethanol producing plants, POs and APOs have participated in the S.I.R. software? [Number for each type of actor]
2. Could you list the range of products involved in the innovation? [qualitative information]
3. Is the type of product registered in the software? [yes/no]
4. Is the region of the POs/APOs listed in the software? [yes/no]
5. Is the region of the surplus food receiver listed in the software? [yes/no]
6. Has the software provider information about the server capacity? [yes/no]
7. *If you had to acquire a new computer to use S.I.R., please specify:*
   - *The location of the server [qualitative information]*
   - *Server capacity [quantitative information]*
   - *Amount of server capacity used for the S.I.R. software [% of total capacity];*
   - *Type of CPU]Intel Skylake/others (please specify)]*
   - *Type of device [tablet or iPad/computer/notebook/smartphone/other (please specify)]*
   - *Computer time used for operations related to S.I.R. [quantitative information]*
   - *Please specify the purposes for which you use the device other than the software, if any [qualitative information].*

C. Use of S.I.R.: software satisfaction

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1. How much do you think that the participation in S.I.R. Software has improved the following aspects?
    - Trust with other stakeholders [Likert scale: from 1 “not at all” to 5 “a lot”]
    - Communication with other stakeholders [Likert scale: from “a lot” to “not at all”]
2. Has participation in the innovation met your expectations? [Likert scale from 1 “At all” to 5 “more than expected”]
3. How would you rate the S.I.R. software? [Likert scale from 1 “poorly” to 5 “very well”]
4. Are you willing to keep participating in the use of the S.I.R. software? [yes/no]

D. Gender and survey satisfaction

1. Age and gender of the respondent.
2. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

3 RER Regione Emilia Romagna (once)

2. Questionnaire to be filled by REGIONE EMILIA ROMAGNA [only one time]

A. Regional authority identification

1. Region
2. Nation
3. Department
4. Number of employees in the Department, by gender
5. Number of POs and APOs in the Region
6. Number of charities in the Region
7. Number of ethanol producing plants in the Region

B. Use of S.I.R.: costs, employment, skills, contacts

1. Have you developed any new streams of income (i.e., new products or avoid costs) as a result of participating in the innovation of each new stream? [Qualitative information]
    - If yes, please specify their amount [quantitative information]

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2. How much has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training, etc.)? [qualitative information + number]
3. Please list all employees who have been involved in the use of S.I.R. software, by gender, age and role. [department, level of responsibility, if it is a decision-making position or not]
4. Did your company need to hire new personnel (including casual workers) in order to use S.I.R. software? [yes/no]
    - If yes, how many (by gender)? [numeric information + qualitative information]
    - Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]
5. What is the number and type of FTE jobs created for (or lost due to) the implementation of the innovation (if this is only a share of time of one or more employees, indicate the cumulated share in FTE)? In doing this, male, female and non-binary employees' hours should be recorded separately. [number and qualitative information]
6. What is the type of new contacts you have made in and out of your own sector as a result of your involvement in the S.I.R. Software? [qualitative information]
7. With how many of these new contacts are you willing to continue the relationship? ? [Likert scale: from 1 "none of them" to 5 "all of them"] - Can you specify particular reasons why you are willing or not to continue the relationship? [open question]
8. How would you assess the time needed to learn how to properly use S.I.R Software? [Likert scale from 1 "very little" to 5 "too much"]
9. How many employees have developed new skills thanks to the use of S.I.R software, by gender?
    - Technological (use of pc software) [number]
    - Technical (better understanding of how to manage food transactions) [number]
    - Social/relational (with other users of the software, if relevant) [number]
10. How many phone calls or emails has RER received due to issues and difficulties related to the use of the software and or with the redistribution of

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surplus food? [number]

- Please list the typologies of issue agencies, charities, ethanol producing plants reported. (i.e. issues with the platform, issues with donations) [qualitative information]

C. Gender and survey satisfaction

1. Age and gender of the respondent
2. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

4 POs and APOs (before implementation)

3a. Questionnaire to be filled by POs and APOs at the beginning of the task

A. Producer organization/Association of producers organization identification

1. Region
2. Nation
3. Number of producers enrolled in the PO/APO in the Department, by gender
4. Number of employees, by gender

B. Food waste: awareness, attitudes and commitment

1. *What is the staff's self-assessment of awareness of food waste levels in the organization? Please disaggregate by gender [Likert scale: from 1 "fully aware" to 5 "not aware at all"]*
2. *Attitude towards food waste: (1) how concerned/worried the respondent is about the problem of food waste in the organization. Please disaggregate by gender [Likert scale: from 1 "very concerned" to 5 "not at all concerned"]; and (2) commitment to reduce/limit food waste in their company. Please disaggregate by gender [Likert scale: from 1 "the main priority" to 5 "not at all a priority"]*

C. Use of S.I.R.: surplus food, costs, employment and waste disposal before the innovation

When answering these questions, please provide data for your

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organization and disaggregate as much as possible the same data at farmers level

1. What are the fixed costs associated with withdrawals disposal, sales to ethanol producers, and donation to charities in the absence of innovation? Fixed costs are defined as costs that do not change with the amount transferred [qualitative information]
    - How much do these costs amount to? [quantitative information]
2. What are the variable costs with withdrawals, payments, deliveries of disposal, sales to ethanol producers, and food donation to charities in the absence of innovation)? Variable fixed costs are defined as costs that change with the amount of food transferred [qualitative information]
    - How much do these costs amount to? [quantitative information]
3. What happened to the surplus food before? [multiple choice: A) Left on the field B) spread onto land C) animal feed D) recycling (composting, ethanol production, biogas production, etc.) E) Municipal solid waste collection F) Other: please specify]
4. How much of the surplus food has to be disposed of through waste processors? [quantitative information]
5. What is the unit or total cost of organic waste disposal (depending on the charging scheme of the disposal service provider)? [quantitative information + multiple choice: flat rate/fixed rate]
6. Are you making profits from your organic waste? [yes/no]
    - If yes, how much? [quantitative information]

D. Gender and survey satisfaction

1. Age and gender of the respondent.
2. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

5 POs and APOs (after implementation)

3b. Questionnaire to be filled by POs and APOs at the end of the task

A. Food waste: awareness, attitudes and commitment

When answering these questions, please provide data for your organization

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and disaggregate as much as possible the same data at farmers level

1. *What is the staff's self-assessment of awareness of food waste levels in the organization? Please disaggregate by gender [Likert scale: from 1 "fully aware" to 5 "not aware at all"]*
2. *Attitude towards food waste: (1) how concerned/worried the respondent is about the problem of food waste in the organization. Please disaggregate by gender [Likert scale: from 1 "very concerned" to 5 "not at all concerned"]; and (2) commitment to reduce/limit food waste in their company. Please disaggregate by gender [Likert scale: from 1 "the main priority" to 5 "not at all a priority"]*

To which extent do you agree to the following statements? (to be answered individually by the staff members also indicating gender, position and age)

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
Food loss and waste are major issues for the sustainability of food systems					
Food loss and waste are major issues in the food production sector					
Food loss and waste are major issues on this organization (or farm)					
I am concerned about the costs of food loss and waste on this farm					
I am concerned about the environmental impact of the food loss and waste					
I am committed to reduce the food loss on this farm					

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B. Participation in the S.I.R. software: difficulty, resources, satisfaction

When answering these questions, please provide data for your organization and disaggregate as much as possible the same data at farmers level

1. Please list all employees who have been involved in the use of S.I.R. software, by gender, age and role. [department, level of responsibility, if it is a decision-making position or not]
    - Did your company need to hire new personnel (including casual workers) in order to use S.I.R. software? [yes/no]
    - If yes, how many (by gender)? [numeric information + qualitative information]
    - Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]
2. What is the number and type of FTE jobs created for (or lost due to) the implementation of the innovation (if this is only a share of time of one or more employees, indicate the cumulated share in FTE)? In doing this, male and female employees' hours should be recorded separately. [quantitative and qualitative information]
3. How many hours per day per person were needed to participate in the platform? Please, if possible, disaggregated by gender [quantitative information]
4. How would you assess the time needed to learn how to properly use S.I.R Software? [Likert scale from 1 "very little" to 5 "too much"]
5. How difficult was it to start using the innovation? [Likert scale: from 1 "not at all" to 5 "more than expected"]
6. How many employees have developed new skills thanks to the use of S.I.R software, by gender? [quantitative information]
    - Technological (use of pc software) [number]
    - Technical (better understanding of how to manage food transactions) [number]
    - Social/relational (with other users of the software, if relevant) [number]
7. What is the type of new contacts you have made in and out of your own

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sector as a result of your involvement in the S.I.R. Software, if any? [qualitative information]

8. With how many of these new contacts are you willing to continue the relationship? ? [Likert scale: from 1 “none of them” to 5 “all of them”]
    - Can you specify particular reasons why you are willing or not to continue the relationship? [open question]
9. Have you suggested or are you willing to suggest the use of S.I.R. Software to other actors? [yes, I did / yes, I will / no]
    - Number and type of actors to which you suggested to use S.I.R. software, if any. [number]
    - Number of those which declared to be interested in, if possible [number]
    - Number of those who have joined it after you informed them, if possible [number]
10. How much do you think that the participation in S.I.R. Software has improved the following aspects?
    - Trust with other stakeholders [Likert scale: from 1 “not at all” to 5 “a lot”]
    - Communication with other stakeholders [Likert scale: from “a lot” to “not at all”]
11. Has participation in the innovation met your expectations? [Likert scale from 1 “At all” to 5 “more than expected”]
12. How would you rate the S.I.R. software? [Likert scale from 1 “poorly” to 5 “very well”]
13. Are you willing to keep participating in the use of the S.I.R. software? [yes/no]

C. Use of S.I.R.: costs, economic benefits, waste, transport and satisfaction

When answering questions number 1, 2, 6, 8, 9, 11, 12, please provide data for your organization and disaggregate as much as possible the same data at farmers level

1. What are the fixed costs associated with withdrawals disposal, sales to ethanol producers, and donation to charities in the absence of innovation? Fixed costs are defined as costs that do not change with the amount trans-

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ferred [qualitative information]
    - How much do these costs amount to? [quantitative information]
2. What are the variable costs with withdrawals, payments, deliveries of disposal, sales to ethanol producers, and food donation to charities in the absence of innovation)? Variable fixed costs are defined as costs that change with the amount of food transferred [qualitative information]
    - How much do these costs amount to? Variable fixed costs are defined as costs that change with the amount of food transferred. [quantitative information]
3. What is the change in the annual balance (due to additional income or avoided cost) resulting from the innovation? [quantitative information]
4. What has been the total cost of implementing the innovation? (e.g. additional/new capital investment, labour, training, etc.) [quantitative information]
5. Have you developed any new streams of income (i.e., new products or avoid costs) as a result of participating in the innovation? [Qualitative information]
    - If yes, please specify their amount [quantitative information]
6. How many recoveries have you successfully completed? [number]
7. How many farmers were able to restore 100% of their production costs thanks to the platform?
    - Please disaggregate the number of farmers by gender and the total number of farmers who will participate in the innovation.
8. How many farmers were able to restore 50% of their production costs thanks to the platform?
    - Please disaggregate the number of farmers by gender and the total number of farmers who will participate in the innovation.
9. How much of the surplus food has to be disposed of through *ethanol producers/or more general waste processors*? [quantitative information]
10. What is the unit or total cost of organic waste disposal (depending on the charging scheme of the disposal service provider)? [quantitative information]
11. Are you making profits from your organic waste? [yes/no]
    - If yes, how much [quantitative information]

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D. Use of S.I.R.: Transportation

1. Who organizes the transport of surplus food to charities/ethanol producing plants, i.e., seller (food surplus supplier)? [qualitative information]
2. Which type of transport is used for surplus food? A) Tractor with single trailer B) tractor with double trailer C) Truck with semi-trailer 28-34t D) Rigid truck 20-26t E) Rigid truck 20-26t with cooling unit F) Other: please specify
    - In the case of a forwarder, which forwarding agency is used? [qualitative information]
3. Which type of fuel is used to transport products to ethanol production? [multiple choice: diesel/vegetable oil/electricity/others, please specify]
4. Is the food distributed to charities packed? [yes/no]
    - If yes, do you use reusable packaging [yes/no]
    - If yes, which type of packaging is used? [reusable/single use]
    - If yes, what is the weight of the packaging in kg per kg distributed food? [quantitative information]
5. Is the food distributed to ethanol producing plants packed?
    - If yes, do you use reusable packaging [yes/no]
    - If yes, which type of packaging is used? [reusable/single use]
    - If yes, what is the weight of the packaging in kg per kg distributed food?
6. Were there any empty returns? [yes/no]
7. Was the same vehicle used for additional orders other than charities/ethanol production plants? [yes/no]
    - If yes, please specify for which additional purposes the same transportation was used [qualitative information
8. Can you indicate the fill rate of the vehicle? [%]
9. Was the surplus food stored before transferring to charities [Yes/No]
10. If yes, please specify: (1) the typology of storage; (2) the time of storage; (3) whether a cooling unit was required; (4) an estimate of the storage cost (electricity, etc.); (5) whether it is a cost you would have incurred regardless of this transaction

E. Gender and survey satisfaction

1. Age and gender of the respondent.
2. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to

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5 “not at all satisfied”]

6 Charitable organizations (before implementation)

4a. Questionnaire to be filled by charitable organizations at the beginning of the task

A. Charitable organization identification

1. Region
2. Nation
3. Number of employees, by gender
4. Number of meals distributed per year
5. How do you provide food to indigent people? [Multiple choice: A) fresh food B) finished or semi-finished products C) prepare food at charity and provide meals D) others]
6. How many meals do you provide per week ?

B. Food waste: awareness, attitudes and commitment

1. What is the staff’s self-assessment of awareness of food waste levels in the charitable organization? Please disaggregate by gender [Likert scale: from 1 “fully aware” to 5 “not aware at all”]
2. Attitude towards food waste: (1) how concerned/worried the respondent is of the problem of food waste in the organization. Please disaggregate by gender [Likert scale: from 1 “very concerned” to 5 “not at all concerned”]; and (2) commitment to reduce/limit food waste in their company. Please disaggregate by gender [Likert scale: from 1 “the main priority” to 5 “not at all a priority”]

C. Gender and survey satisfaction

1. Age and gender of the respondent.
2. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

7 Charitable organizations (after implementation)

4b. Questionnaire to be filled by charitable organizations at the end of the task

A. Food waste: awareness, attitudes and commitment

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1. What is the staff's self-assessment of awareness of food waste levels in the charitable organization? Please disaggregate by gender [Likert scale: from 1 "fully aware" to 5 "not aware at all"]
2. Attitude towards food waste: (1) how concerned/worried the respondent is about the problem of food waste in the organization. Please disaggregate by gender [Likert scale: from 1 "very concerned" to 5 "not at all concerned"]; and (2) commitment to reduce/limit food waste in their company. Please disaggregate by gender [Likert scale: from 1 "the main priority" to 5 "not at all a priority"]

B. Use of S.I.R.: meals and storage

1. *As a result of the innovation, were you able to provide more fruits & vegetables in the meals you distribute? [Likert scale from 1 "no, we provide way less fruits and vegetables in the meals than before" to 5 "yes, we provide more fruits and vegetables in the meals than before"]Is the surplus food stored? [yes/no]*
2. If yes, where is the surplus food stored (i.e., cooling units)? [qualitative information]

C. Use of S.I.R.: costs, employment, skills, contacts, satisfaction

1. What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training, etc.)? [qualitative information + number]
2. Have you developed any new streams of income (i.e., new products or avoid costs) as a result of participating in the innovation? [yes/no + qualitative information]
    - If yes, please specify their amount [quantitative information]
3. Please list all the people who have been involved in the use of S.I.R. software, by gender, job grade (if he/she is volunteering), and role, level of responsibility, if it is a decision-making position or not [list with qualitative information]
4. How many hours per day per person were needed to participate in the platform? Please, if possible, disaggregated by gender [quantitative information]
5. Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]

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6. How would you assess the time needed to learn how to properly use S.I.R Software? [Likert scale from 1 “very little” to 5 “too much”]
7. How difficult was it for the charitable organization to start using the platform? [Likert scale: from 1 ”not all” to 5 “more than expected”]
8. How many employees have developed new skills thanks to the use of S.I.R software (disaggregated by gender: women, men, non-binary)? [quantitative + qualitative information]
    - Technological (use of pc software) [number]
    - Technical (better understanding of how to manage food transactions) [number]
    - Social/relational (with other users of the software, if relevant) [number]
9. Has the innovation met your expectations? [Likert scale from 1 “At all” to 5 “more than expected”]
10. How would you rate the innovation? [Likert scale from 1 “poorly” to 5 “very well”]
11. Are you willing to keep participating in the use of the S.I.R. software? [yes/no]
12. What is the type of new contacts you have made in and out of your own sector as a result of your involvement in the S.I.R. Software? [qualitative information]
13. With how many of these new contacts are you willing to continue the relationship? ? [Likert scale: from 1 “none of them” to 5 “all of them”]
    - Can you specify particular reasons why you are willing or not to continue the relationship? [open question]
14. Have you suggested or are you willing to suggest the use of S.I.R. Software to other actors? [yes, I did / yes, I will / no]
    - Number and type of actors to which you suggested to use S.I.R. software, if any. [quantitative and qualitative information]

D. Gender and survey satisfaction

1. Age and gender of the respondent.
2. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

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8 Ethanol producing plants (before implementation)

5a. Questionnaire to be filled by ethanol producing plants at the beginning of the task

A. Ethanol producing plant identification

3. Region
4. Nation
5. Number of employees, by gender
6. Maximum capacity of the plant and its utilization per year

B. Activities and costs in the absence of the innovation

7. What would be the theoretical cost (unitary cost) of food waste materials you receive through RER if you had purchased these food inputs at their full market price? [quantitative and qualitative information]
8. Did you pay (and if so, how much did you pay) for this input (withdrawals) through RER? (unitary cost of surplus food * unitary amount of the surplus food). [quantitative information]
9. What are the fixed costs of arranging product withdrawals or other sources of food waste for your waste processing plant in the absence of innovation? [qualitative and quantitative information]
10. What and how much are fixed costs of input for ethanol production at your plant in the absence of innovation? Fixed costs are defined as costs that do not change with the amount of food waste transferred [quantitative and qualitative information]
11. What are variable costs of arranging product withdrawals or other sources of food waste for your waste processing plant in the absence of the RER innovation? Variable costs are defined as costs that change with the amount transferred [quantitative and qualitative information]
12. How much are the variable costs of receiving produce withdrawals and disposal e.g. if they also occur in the absence of innovation?

C. Gender and survey satisfaction

13. Age and gender of the respondent.
14. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

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9 Ethanol producing plants (after implementation)

5b. Questionnaire to be filled by ethanol producing plants at the end of the task

A. Food waste: awareness, attitudes and commitment

15. What is the staff's self-assessment of awareness of food waste levels in the ethanol producing plant? Please disaggregate by gender [Likert scale: from 1 "fully aware" to 5 "not aware at all"]
16. Attitude towards food waste: (1) how concerned/worried the respondent is about the problem of food waste in the ethanol producing plant. Please disaggregate by gender [Likert scale: from 1 "very concerned" to 5 "not at all concerned"]; and (2) commitment to reduce/limit food waste in their company. Please disaggregate by gender [Likert scale: from 1 "the main priority" to 5 "not at all a priority"]

B. Use of S.I.R. Software: activities, employment, contacts, satisfaction

17. Do you sell the ethanol to other end users? [yes/no]
    - If yes, how much does the innovation change the value of your sales, or if they charge for processing, how did it change fees? [quantitative information]
18. Does the food received via the S.I.R. software require specific processing steps before using it in the plant (e.g. unpacking)? [yes/no]
19. What is the number of FTE jobs created for (or lost due to) the implementation of the innovation (if this is only a share of time of one or more employees, indicate the cumulated share in FTE)? [quantitative information]
    - For each worker please indicate gender.
    - For each worker please indicate job grade and if he/she is a decision-making position
20. How many hours per day per person were needed to participate in the platform? Please, if possible, disaggregated by gender [quantitative information]
    - Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]
21. How would you assess the time needed to learn how to properly use S.I.R Software? [Likert scale from 1 "very little" to 5 "too much"]
22. Are there any new end users of ethanol and/or surplus suppliers with

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which you came into contact as a result of your involvement in the innovation? [yes/no]

- If yes, how many? [number]
- If yes, which typology of actors? [qualitative information[

23. With how many of these new contacts are you willing to continue the relationship? ? [Likert scale: from 1 “none of them” to 5 “all of them”]
    - Can you specify particular reasons why you are willing or not to continue the relationship? [open question]
24. What is the change in the content and the amount of waste processed? [quantitative information]
25. Please list other activities related to the innovation [qualitative information[
    - If you answered yes to question B2: is the unpacking done manually or automatically? [multiple choice: manually/automatically]
26. Are you willing to suggest the use of S.I.R. Software to other actors? [yes, I did / yes, I will / no]

C. Gender and survey satisfaction

1. Age and gender of the respondent.
2. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

10 Researchers

Information to be retrieved both by the researchers and through the software

IN GENERAL FOR ALL ACTORS

1. What happened to the surplus food before? (if possible)
2. Where did you dispose of it? (if possible)
3. Number of Charities/POs/agencies adopting the S.I.R. software in Emilia-Romagna
4. Location of surplus food ready for redistribution [postcodes]
5. Location of charities [postcodes]

FOR CHARITIES

6. What would be the theoretical cost (unitary cost) of food provision if you had

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purchased these food inputs at their full market price?

7. Did you pay (and if so, how much did you pay) for the food input (withdrawals) through the software? (unitary cost * unitary amount of the food processed or donated).
8. What are the fixed costs of withdrawals and donations in the absence of innovation? (Fixed costs are defined as costs that do not change with the amount of surplus food transferred.)How much do they amount to?
9. What are the variable costs of arranging produce withdrawals and then donating to charities or delivery to waste processors if they also occur in the absence of innovation? Variable fixed costs are defined as costs that change with the amount of surplus food transferred. How much are the variable costs amount to?
10. What are the types of fruit and vegetable that have to be withdrawn?
11. What are the unit amounts of fruit and vegetable that have to be withdrawn?
12. What is the unit or total cost of organic waste disposal (i.e. fixed rate, flat rate etc. depending on the charging scheme of the disposal service provider)?

FOR FARMERS, POs and APOs

13. What are the original market prices of fruit and vegetables the producers produce?
14. How many withdrawals occur for each type (baseline)?
15. What is the price of fruit and vegetables withdrawn for waste processors or any income is created or cost avoided through donations?

We already know answers for questions:
Have you been able to access any subsidies/other monetary benefits as a result of the innovation and resulting transaction? [yes/no]

- How much? Are these one-time, periodical, fixed, or proportional to the amount of waste avoided? [multiple choice question: one-time/ periodical/ fixed/ proportional to the amount of waste avoided]

T2.2 UNV cooperation system for F&V

11 UNV Unverschwendet

Data provided per food transaction:

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1. Food waste amounts:
    - Food redistributed per action: amount in kg and type of food (or per pot, in case of herbs or per portion in case of radish)
    - Have you been able to take over all the surplus food of the farmer? (yes/no)
    - If no, what have been the reasons, why not everything was taken over.
2. Packaging:
    - Is the food which is distributed packed? (Yes/No)
    - Do you also use reusable packaging (Yes/No)
    - What is the weight of the packaging in kg per kg distributed food
    - Which type of packaging is used: (plastic/bio-plastic/paper/cardboard/metal/composite)
3. Transport:
    - What is the postcode of the location, where the surplus food is picked up?
    - What is the postcode of the locations, where the surplus food is distributed to? (provided by delivery note)
    - Which means of transport is used for the food transaction?
        a. tractor with single trailer
        b. tractor with double trailer
        c. truck with semi-trailer 28-34t
        d. rigid truck 20-26t
        e. rigid truck 20-26t with cooling unit
        f. other
    - Does the transport have an empty return? (will be covered by sensitivity analysis if information is not available)
    - What is the fill rate of the transports? (will be covered by sensitivity analysis if information is not available)

Questions to Unverschwendet *(each quarter?):*

1. Number of actors enrolled in the collaboration system:
    - Number of food surplus providers (sellers):
    - Number of food surplus receivers (buyers):
    - Number of food surplus receivers (charities):
    - Other:
2. Number of companies who have been informed of the innovation (e.g. dialogue, platform, software etc.)

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- number of these who declared to be interested in it
- number who have joined it

3. How many hours per day per person are needed to maintain the collaboration system?
   - Number of female persons (in FTE): __ Estimated hours per day: __
   - Number of male persons (in FTE): __ Estimated hours per day: __
4. List of people who have contributed at different tasks related to the innovation
   - transferring the product, gender and position
   - from making contacts to the delivery of the product, gender and position

Questions to Unverschwendet (once):

5. Computer use:
   - Has the software provider information to the server capacity? Where is the server located?
   - How much of the total server capacity is used for the software (in vCPU/CPU in use)?
   - Which type of CPU is used (e.g. Intel Skylake)
   - Do you need to buy new devices to run this software? Or do you use existing devices?
   - Which device do you use (tablet/iPad; computer; notebook; smartphone)
6. Do you use the device solely for the software or do you also use it for other purposes?
7. How long do you use the device per case?

12 Food surplus supplier (after a food transaction)

1. Gender and position of the respondent
2. Area of cultivation: per food product if possible.
3. How often do you produce surplus food
   - Likert-Scale: very often, often, regularly, only occasionally, very seldom)
4. Can you estimate how much of your surplus food can be restored thanks to the collaboration system?
   - 0-10%
   - 10-50%
   - >50%
5. How difficult was it for your company to start using the collaboration system?

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- On a scale from 1 = at all to 5= more than expected,

6. How satisfied is your company with the collaboration system?
   - On a scale from 1 = at all to 5= more than expected,
7. *How many hours per day per person are needed to use the collaboration system (registration)?*
   - *Number of female persons (in FTE): __ Estimated hours per day: __*
   - *Number of male persons (in FTE): __ Estimated hours per day: __*
   - *Number of non-binary persons (in FTE): __ Estimated hours per day: __*

   Or alternative question:

   How do you rate the efforts of applying the collaboration system?
   - *On a scale from 1 = very easy to 5= very complicated,*
8. *Has the staff developed new skills thanks to the participation in the collaboration system? Which typology of new skill has been acquired thanks to the participation in the collaboration system? Please disaggregate by gender*
   - *communication skills: number of females/males/non-binary*
   - *relational skills: number of females/males/non-binary*
   - *technological skills: number of females/males/non-binary*
   - *technical skills: number of females/males/non-binary*
9. Are there new products new income streams resulting from the innovation?
   - Yes/No
10. Are the variable costs covered?
    - Yes/No
11. Have additional costs been occurred as a result of the collaboration system?
    - *Yes/No; If yes, why type of costs and how much*
12. How much do you pay for your organic waste disposal? OR Do you pay for your organic waste disposal?
13. *What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training etc.)*

14. Please list all employees who have been involved in the use of the collaboration system, by gender, age and role. [level of responsibility if it is a decision-making position or not]
15. Did your farm need to hire new personnel (including casual workers) as a result of the innovation

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- If yes, how many (by gender)? [numeric information + qualitative information]
- Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]

- *Have you qualified for an additional funding or subsidy as a result of taking part in the innovation ?*
- *Have you established new business contacts as a result of taking part in this innovation ? If yes, what kind of (upstream, e.g. sellers; downstream e.g., buyers) contacts have you made?*
- *Do you plan to continue working with these new business relationships established through the UNV innovation ?*

16. In the absence of UNV innovation, in what ways do you dispose of your surplus food (e.g. livestock feed, ethanol producers, waste collection)?

17. Are you aware of the problem that we waste too much food?

- *Likert scale from "very aware" to "not aware at all"*

18. Are you committed to reduce food waste?

- *Likert scale, from "a lot" to "not at all"*

19. Has the collaboration system met your expectation?
    - On a scale from 1 = not at all to 5 = more than expected
20. How willing are you to keep using the collaboration system?
21. On a scale from 1 = not at all to 5 = Definitely yes,
22. How satisfied are you with the survey
    - Likert scale from "very satisfied" to "unsatisfied"

Staff survey:

To which extent do you agree to the following statements? (to be answered individually by the staff members also indicating gender, position and age)

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*

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Food loss and waste are major issues for the sustainability of the food systems in general					
Food loss and waste are major issues in the food production sector					
Food loss and waste are major issues on this farm					
I am concerned about the economic costs of food loss and waste on this farm					
I am concerned about the environmental impact of the food loss and waste on this farm					
I am committed to reduce the food loss on this farm					

13 Food surplus receiver (after a food transaction)

To be elaborated.

T2.3 Leroma B2B digital marketplace for F&V

The reference population for the assessment will be represented by the companies who conduct transactions on the Leroma platform. All companies that sell something will fill questionnaire 5 with the single question. The other questionnaires are intended for use in case studies with selected companies. For non-cross-border transactions, all questionnaires are filled in as part of the case studies. The companies based in different countries which are involved in a transaction with the former would only fill a specific questionnaire after the transaction: the purchaser would fill questionnaire 4 and the seller would fill

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questionnaire 3.

14 Platform users (upon registration)

1. Questionnaire to be filled upon registration on the Leroma platform

B. Company identification

1. Name of the company.
2. Stage of the supply chain where the company operates.
   - Primary production
   - Processing
   - Wholesale
   - Retail
   - Distribution
3. Geographical area where the company operates. [postcode]
4. Number of years of operation.
5. Average age of the employees of the company.
6. Number of employees of the company, by gender.

C. Food waste: awareness, attitudes and management

7. Awareness of food waste levels in the company. [Likert scale: from 1 "fully aware" to 5 "not aware at all"]
8. To which extent do you agree with the following statements?

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are a major issue for the sustainability of the food systems in general.					
Food loss and waste are a major issue in our sector.					

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Food loss and waste are a major issue for our company.					
I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					
We are committed to reducing food loss and waste in our company.					

9. Waste management costs of the company during the last year.

D. Gender and survey satisfaction

10. Age and gender of the respondent.
11. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

15 Subset of platform users (at the beginning)

2. Questionnaire to be filled by selected companies as part of a case study at the beginning

A. Production: inputs, outputs and waste

1. Main Fruit & Vegetables (F&V) input used by the company (or mix of products, qualitatively described).
2. Quantity of the main F&V input purchased during the last year.
3. Average price at which you purchased your main F&V input during the last year.

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4. Quantity of F&V input wasted and not recovered during the last year (avoidable, not avoidable, by-products).
5. Ways in which the above waste was used (animal feed, composting, an-aerobic digestion, incineration, discards on land/at sea, Others: please specify). [multiple answer]
6. Main F&] product(s) produced by the company.
7. Quantity of the main F&V product(s) produced and sold during the last year.
8. Average price(s) at which the main F&] product(s) was/were sold during the last year.
9. Quantity of F&V product which was wasted and not recovered during the last year (avoidable, not avoidable, by-products).

B. Gender and survey satisfaction

10. Age and gender of the respondent.
11. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"][16]

16 Seller (after a food transaction)

3. Questionnaire to be filled by the seller (selected companies as part of a case study) after a food transaction

A. Product sold

1. Which product was the object of the transaction?
2. Which amount of product was the object of the transaction, and which was the unit of transaction?
3. Price at which the product was sold.
4. Price at which the product would have been sold on the market for its original use.
5. If the product sold needed to be disposed of, how much would you have spent in terms of waste management costs?

[16] Besides this questionnaire, the staff of the companies involved in the case study who are expected to be using Leroma should fill the staff questionnaire in Appendix 2.

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B. Procedure to sell the product

6. Where was the product located before being transferred [postcode] and where was it moved [postcode]?
7. Did/Will you (or a company hired by you) take care of the transport of the product? [yes/no]
   - If yes, please specify:
   - (1) if this was carried out by you, or you had to involve another company;
   - (2) the means of transport used;
     - Truck with semi-trailer, 28-34 t
     - Rigid truck, 20-26 t
     - Rigid truck, 20-26 t, cooling
     - Tractor, single trailer
     - Tractor, double trailer
     - Other: please specify
   - (3) if it had a cooling unit;
   - (4) the type of fuel used
     - diesel
     - vegetable oil
     - electricity;
   - (5) if there was an empty return (Yes/No);
   - (6) the fill rate of the vehicle (%).
8. Did/Will you (or a company hired by you) take care of the packaging of the product? [yes/no]
   - If yes, please specify:
   - (1) if this was carried out by you, or you had to involve another company;
   - (2) the mass of packaging material for distribution (kg per kg of product);
   - (3) if the packaging is reusable (yes/no).
   - (4) the type of packaging (material)
     - Plastic
     - Bio-plastic
     - Cardboard
     - Metal
     - Paper

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- Composite
- Others: please specify

9. How many working hours (if possible by gender) did/will your employees dedicate to this transaction?
10. Could you estimate the aggregated costs in which you incurred / will incur for making this transaction with Leroma (excluding the Leroma fee)?

C. Preparation of the product traded

11. If the product had to undergo any ad hoc treatments before being sold, please specify:
    (1) type of treatment;
    Possible response options (multiple answers):
    - Unpacking
    - Shredding
    - Heating
    - Hygienisation
    - Other: please specify

    (2) cost (in EUR or GBP/ton).

D. Gender and survey satisfaction

12. Age and gender of the respondent.
13. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

17 Buyer (after a food transaction)

4. Questionnaire to be filled by the purchaser (selected companies as part of a case study) after a food transaction

A. Product purchased

1. Which product was the object of the transaction?
2. Which amount of the product was the object of the transaction, and which was the unit of transaction?
3. Price at which the product was purchased.

B. Procedure to acquire the product

4. Where was the product located before being transferred [postcode] and

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where was it moved [postcode]?

5. Did/Will you (or a company hired by you) take care of the transport of the product? [yes/no]
   - If yes, please specify:

   (1) if this was carried out by you, or you had to involve another company;

   (2) the means of transport used;
   - Truck with semi-trailer, 28-34 t
   - Rigid truck, 20-26 t
   - Rigid truck, 20-26 t, cooling
   - Tractor, single trailer
   - Tractor, double trailer
   - Other: please specify

   (3) if it had a cooling unit;

   (4) the type of fuel used
   - diesel
   - vegetable oil
   - electricity;

   (5) if there was an empty return (Yes/No);

   (6) the fill rate of the vehicle (%).
6. Did/Will you (or a company hired by you) take care of the packaging of the product? [yes/no]
   - If yes, please specify:
   - (1) if this was carried out by you, or you had to involve another company;
   - (2) the mass of packaging material for distribution (kg per kg of product);
   - (3) if the packaging is reusable (yes/no).
   - (4) the type of packaging (material)
     - Plastic
     - Bio-plastic
     - Cardboard
     - Metal
     - Paper
     - Composite
     - Others: please specify
7. How many working hours (if possible by gender) did/will your employees

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dedicate to the transaction?

8. Could you estimate the aggregated costs in which you incurred / will incur for making this transaction with Leroma (excluding the Leroma fee)?

C. Subsequent use of the product traded

9. If the product had to undergo any ad hoc treatment before being used, please specify:
   (1) type of treatment;
   (2) cost for you.

10. Which product did/will you obtain using the food traded, which quantity, and at which price did/will you sell it?

D. Gender and survey satisfaction

11. Age and gender of the respondent.
12. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

18 Seller (during a food transaction)

5. Question to be answered by the seller in the course of every food transaction

What would you have done with the goods if you hadn't been able to sell them on the platform?

- We would have sold them through the usual sales channels
- We would have sold them through other sales channels (please specify)
- We would have disposed of them
- Other (please specify)

19 Subset of platform users (at the end of the demonstration)

6. Questionnaire to be filled at the end of the task by selected companies as part of a case study

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A. Food waste: awareness, attitudes and management

1. Awareness of food waste levels in their company. [Likert scale: from 1 "totally aware" to 5 "not aware at all"]
2. To which extent do you agree with the following statements?[17]

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are a major issue for the sustainability of the food systems in general.					
Food loss and waste are a major issue in our sector.					
Food loss and waste are a major issue for our company.					
I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					
We are committed to reducing food loss and waste in our company.					

[17] All the employees who have been using Leroma should fill the staff questionnaire in Appendix 2.

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3. Waste management costs of the company during the last year.

B. Use of Leroma: employment, costs, contacts, outcomes, satisfaction

4. Please list all employees who have been involved in the use of Leroma, by gender, age and role. [department, level of responsibility]
   - Did your company need to hire new personnel (including casual workers) in order to use Leroma, and how many (by gender)?
5. How would you assess the time needed to learn how to properly use Leroma? [Likert scale from 1 "very little" to 5 "too much"]
6. Are the procedures to use Leroma too many / too complex? [Likert scale: from 1 "not at all" to 7 "yes, a lot"]
7. How many employees have developed new skills thanks to the use of Leroma by gender? Technological (use of mobile app, pc software); Technical (better understanding of how to manage food transactions); Social/relational (with other users of Leroma, if relevant).
8. If you had to acquire a new computer to use Leroma, please specify:
   (1) type of device;
   (2) computer time used for operations related to Leroma.
9. Have you suggested or are you willing to suggest the use of Leroma to other companies? [yes, I did / yes, I will / no]
   - Number of companies to which you suggested to use Leroma, if any.
   - Number of those who declared to be interested in it; number of those who have used it after you informed them.
10. Did you discover new alternative use of your products and/or by-products thanks to Leroma? [yes/no]
    - Did you develop any new streams of income (e.g., new products) as a result of using Leroma? [qualitative information]
11. Were you able to access any subsidies/other monetary benefits as a result of using Leroma? How much? Are these one-time, periodical, fixed, or proportional to the amount of waste avoided?
12. To what extent did Leroma meet your expectations? [Likert scale: from 1 "completely" to 5 "not at all"]
13. Is your company willing to continue using Leroma after the project has come to an end? [yes/no]

C. Management of the products traded

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14. Did some or all of the products traded on Leroma ended up as waste anyway? How often and in which proportion?
15. Concerning the storage of the products traded, please specify:
    (1) the typology of storage;
    (2) the time of storage;
    (3) whether a cooling unit is required;
    (4) whether this is a cost you would have incurred regardless of using Leroma.

D. Gender and survey satisfaction

16. Age and gender of the respondent.
17. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

20 LER Leroma (after implementation)

7. Information to be retrieved by Leroma at the end of the task

1. Number of searches made by each company on the Leroma platform.
2. Number of agreements activated and finalized through the Leroma platform by each company.
3. Number of offers uploaded on the Leroma platform by each company.
4. Number of matches reached by each company.
5. Number of inquiries made to Leroma by potential buyers and sellers from Germany and Scotland (regardless of their registration).
6. Number of companies that registered to Leroma and then dropped out / did not finalise any transaction.

T2.4 FORESIGHTEE software for packed F&V

21 Supermarket (before and after the implementation)

Data collected via sharing of store (supermarket) records

Description	Unit of measure	Period	Timeframe	Frequency

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Quantity and value of F&V products wasted (by item)	kg	Baseline	3 years (2019-2021)	Monthly
Quantity and value of F&V products wasted (by item)	kg	Evaluation	5 months (2022)	Monthly
Sales of F&V products (by item)	€	Baseline	3 years (2019-2021)	Monthly
Sales of F&V products (by item)	€	Evaluation	5 months (2022)	Monthly
Stocks of F&V products (by item)	kg	Baseline	3 years (2019-2021)	Monthly
Stocks of F&V products (by item)	kg	Evaluation	5 months (2022)	Monthly
Orders of F&V products (by item)	kg	Evaluation	5 months (2022)	Monthly
Rate of unsold products out of total products purchased	% on quantity	Baseline	3 years (2019-2021)	Monthly
Rate of unsold products out of total products purchased	% on quantity	Evaluation	5 months (2022)	Monthly
Input costs (purchase price of products)	€ / unit	Baseline	3 years (2019-2021)	Monthly
Input costs (purchase price of products)	€ / unit	Evaluation	5 months (2022)	Monthly
Margins on F&V products sold	%	Baseline	3 years (2019-2021)	Monthly
Margins on F&V products sold	%	Evaluation	5 months (2022)	Monthly

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Questionnaires to supermarkets

Before and after the implementation of the innovation

1. Name and location of the supermarket store
*Name and location:*_____

2. How many stores does the company have?
*Number:*_____

3. Total number of employees in this store
*Men:*_____
*Women:*_____
*Other (as noted in question 14):*_____

4. How many fruits & vegetables products are marketed in this store?
Total number of references: _____
Among which sold by unit: _____
Among which sold by weight: _____

5. Please list the factors that are currently considered in forecasting the sales in the fruits & vegetables department? (For example: the sales volume of last week, you then check the weather,.. to end up with a final sales forecast)

_____

6. Please list the factors that are currently considered in ordering fruits & vegetables? For example: the sales forecast, the stock,.. to end up with a final order.

_____

7. What are the average margins (difference between selling price and purchase cost) of the store? And in the fruits & vegetables department?
Store average margin %: _____
F&V average margin %: _____

8. Out of the total quantity of fruits & vegetables disposed, how much is due to each of the following reasons? (The total must add up to 100%)
Approaching expiration date %: _____
Spoiled %: _____

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Broken packaging %: _____
Other causes (specify) %: _____

9. In what ways are the wasted fruits & vegetables disposed of before (please tick, multiple answers allowed):
donated to charities
animal feed
composting
anaerobic digestion
incineration
Others: please specify_____

Are fruits & vegetables products sold at a reduced price before discarding them? If so, what is the yearly turnover of these promotions?

_____

In any of these ways do you sell your organic waste? If so, how much turnover can be made in each way (unit value x amount)?

_____

10. What is the average cost of organic waste disposal for your organisation per month? Is it a fixed cost independent of the amount or does it vary with the quantity of waste disposed?

_____

The below questions should be asked before the implementation and after the implementation

11. What is the frequency of out-of-stock? What are types of financial losses associated with out-of-stock and how much do they cost each?

12. To which extent do you agree to the following statements? (to be answered individually by each staff members also indicating their gender, position and age)

	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree

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Food loss and waste are major issues for the sustainability of food systems					
Food loss and waste are major issues in the retail sector					
Food loss and waste are major issues in this store					
I am concerned about the costs of food waste in this store					
I am concerned about the environmental impact of the food wasted in this store					
I am committed to reduce the food wasted in this store					
The staff (if possible by gender) of the supermarket are concerned about the costs of the food wasted at this store					
The staff (if possible by gender) of the supermarket are concerned about the environmental impact of the food wasted at this					

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store					
The staff (if possible by gender) of the supermarket are committed to reduce the food wasted at this store					

13. In a scale from 1 (not at all) to 5 (yes, a lot), can you rate your satisfaction for this survey?

□ *1* □ *2* □ *3* □ *4* □ *5*

14. Gender of the respondent

□ *Female* □ *Male* □ *Other* □ *Prefer not to say*

Additional questions to evaluate the implementation of innovation

1. Considering the implementation of the Foresightee software, to which extent do you agree with the following statements?

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
The Foresightee platform met our expectations					
Starting to use the Foresightee platform was difficult					
The staff (if possible by gender) has developed new communication skills					
The staff (if possible by gender) has developed new technical skills					
The staff (if possible by gender) has developed new relational skills					

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The staff (if possible by gender) has developed new technological skills					
This company will continue using Foresightee platform after the demonstration					
Trust with other actors of the chain (suppliers/customers) has increased					
Communication with other actors of the chain (suppliers/customers) has improved					

2. How many members of the staff were involved in the implementation of the innovation?
Men (specify job grade and hours per week): _____
Women (specify job grade and hours per week): _____
Other (specify job grade and hours per week): _____

3. How many employees will need to be trained if the innovation was fully implemented in practice?
Men (specify job grade): _____
Women (specify job grade): _____
Other (specify job grade): _____

4. Will you need to hire new personnel to support the full implementation of the innovation in practice? [yes/no]

5. Will you need to buy new devices to support the full implementation of the innovation? Which device(s)?
_____

6. To which extent do you expect that the Foresightee forecasts can actually be used to decide the quantity of F&V products to be ordered ? Please estimate a % of the orders-related decision that might be based on Foresightee forecasts

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7. Have you followed the indications of Foresightee ? How would you rate your adherence to the recommendations of Foresightee? Has your use Foresightee led to an increase in revenue? If yes, how much in %?

8. Did you establish new contacts or agreements with other actors of the chain as a result of your involvement in the innovation? What type of contacts (e.g. downstream actors like suppliers; other retailers, others) are these?

9. If yes, how likely is that you continue these relationships, assessed on a 1 (very unlikely) to 5 (very likely) scale?

	New agreements (YES/NO)	*Very unlikely*	*Somewhat likely*	*Neither likely nor unlikely*	*Somewhat likely*	*Very likely*
With suppliers						
With other retail companies						
With other actors (specify)						

10. Do you expect a change in the frequency of out-of-stock due to the implementation of the innovation? How much in %.

Management survey to be administered at the end of the demonstration

11. What is your return on investment from participating in this innovation ?

12. Has participating in the innovation led to creation of new income streams ? Please indicate each with the amount.

13. *Did you establish new contacts or agreements with other actors of the chain as a result of your involvement in the innovation? What type of contacts (e.g. downstream actors like suppliers; other retailers, others) are these ?*

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If yes, how likely is it that you continue these relationships on a 1 (very unlikely) to 5 (very likely) scale? Please use the table below to indicate and use as many lines as necessary to indicate a new contact.

Type of new contact/ relationship established	*Number of resulting agreements*	*Likelihood of continuing relationships*				
		Very unlikely	*Somewhat likely*	*Neither likely nor unlikely*	*Somewhat likely*	*Very likely*
Another company from the sector (a competitor)						
A supplier						
A buyer						
Other type of actor (specify)						

22 Innovator (at the end)

Questionnaire to innovator

To be administered at the end of the demonstration

1. Total number of staff in the company

*Men:*_____

*Women:*_____

Other: _____

2. How many actors (retailers/stores) were involved in the demonstration of the Foresightee software?

Number of retailers: _____

Number of stores: _____

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3. How many actors (retailers/stores) were willing to continue the implementation of the roadmap after the project?
Number of retailers: _____
Number of stores: _____

4. How many agreements did you subscribe with new retailers/stores as a result of the implementation of the software?
Number: _____

5. How many contacts (i.e., emails, phone calls) has Foresightee received due to difficulties in implementing the innovation? Which type of issue did the companies experience?

_____

6. How many staff were involved in the implementation of the innovation during LOWINFOOD activities?
Men (specify job grade): _____
Women (specify job grade): _____
Non-binary or other (specify job grade): _____

7. Did the company hire new staff to support the implementation of the innovation? How many?
Men (specify job grade): _____
Women (specify job grade): _____
Non-binary or other (specify job grade): _____

8. How many companies external to the LOWINFOOD consortium have been informed of the innovation? How many of them declared to be interested in it?

_____

9. Location of the server used by Foresightee

_____

10. What is the server capacity? How much of it is in currently in use?

_____

11. Which type of CPU is used to support the software?

_____

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12. Did you need to buy new devices to support the implementation of the innovation? Which device(s) were used?

_____

13. In a scale from 1 (not at all) to 5 (yes, a lot), can you rate your satisfaction for this survey?

□ *1* □ *2* □ *3* □ *4* □ *5*

14. Gender of the respondent

□ Female □ Male □ Other □ Prefer not to say

T3.1 Supplier-retailer agreements

23 Stakeholders

General information:

Name of company:

Type of company (retailer, baker, single store/branch, multiple stores/branches)?

Name of contact person (s):

Number of staff (to be broken down by Male, Female, Other, specify job position)

FLW prevention and reduction (collected through company records and environmental reports)

Amount of food waste before the innovation

Amount of food waste after the innovation food product/food product mix

Type of food waste management operations

Efficacy

Replicability

- Will you promote the supplier/retailer agreements for bakery products without take back agreement to other partners and companies? (yes/no)

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Utility

- Has the innovation met your expectations? (At all, to a certain extent, fully, more than I expected)
- On a scale from 1 = at all to 5= more than expected, how would you rate the innovation?
- Has the staff developed new skills thanks to the participation in the implementation of the innovation? If yes, how many people? Which typology of new skill has been acquired thanks to the implementation of the innovation? (i.e. communication skills, relational skills, technological skills, technical skills) If possible disaggregated by gender: woman, man, non-binary (or other).

User-friendliness

- Are you willing to keep participating in the agreement after the project has ended?
- Which procedures are required for your company to implement the supplier/retailer agreements for bakery products without take back agreement?
- Considering the procedures required by the supplier/retailer agreements for bakery products without take back agreement. On a scale from 1 to 5, do you think there are too many steps?
- Has your trust to other partner increased due to this innovation?
- Has your communication with other actors increased due to this innovation?
- In the absence of the innovation, in what ways do you dispose of the returned bakery products?
- Do you make a profit from this disposal route? If yes, how much per tonne in each alternative?

Socio-economy

Profitability

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- "For each transfer of bakery products which could have ended as waste, please answer the following:
  - Buyer (retailers- bakery store or supermarket): theoretical cost (unitary price) at which the product purchased would have been purchased at its full retail price on the market.
  - Seller (baker): theoretical cost at which the product would have been sold on the market if it could be sold before becoming surplus/waste.
  - Buyer and seller: price at which the product was purchased/sold, if any."

- "For each transfer of bakery products which could have ended as waste, please answer the following:
  - Buyer (retailers- bakery store or supermarket): theoretical cost (per day + total) of storing, transporting and handling the product purchased if this was purchased on the retail market (cumulated cost, including electricity, etc.).
  - Buyer (retailers- bakery store or supermarket): cost (per day + total) of storing, transporting and handling the product from its purchase until its final use (cumulated cost, including electricity, etc.).
  - Seller (baker): theoretical cost (per day + total) of storing the product if this was sold normally on the market (cumulated cost, including electricity, etc.)."
- "Buyer (retailers- bakery store or supermarket): theoretical cost of obtaining one unit of the bakery product purchased if it was purchased on the market (cumulated cost, including electricity, labour, etc.).
  - Buyer (retailers- bakery store or supermarket): cost of managing the bakery product from its acquisition until its sale (cumulated cost, including electricity, labour, transport, planning etc.).
  - Seller (baker): theoretical cost of one unit of the bakery product transferred if it was sold through the usual channels (cumulated cost, including electricity, labour, etc.). Seller (baker): cost of producing the product transferred (cumulated cost, including electricity, labour, etc.)."

- "For each transfer of bakery products which could have ended as waste, please answer the following:
  - Seller (baker): theoretical fixed costs incurred to dispose of the products transferred in case it ended up as waste and needed to be disposed.

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- Seller (baker): theoretical variable costs incurred to dispose of the products transferred in case it ended up as waste and needed to be disposed.
- Buyer (retailers- bakery store or supermarket): fixed costs incurred to dispose of the products purchased in case it ended up as waste anyway and needed to be disposed."
- Buyer (retailers- bakery store or supermarket): variable costs incurred to disposed of the products purchased in case it ended up as waste anyway and needed to be disposed."

- The same as Change in total value of sales of the product(s) involved (the number of units sold x unit price)

- Are there new products or income streams resulting from the innovation? If yes, what and how much are each new streams of income created or costs avoided as a result of participating in the innovation?

- What is the change in the annual balance (due to additional income or avoided cost) resulting from the innovation? What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training etc.)

- Are there any subsidies/other monetary benefits received as a result of waste reduction> If yes, please list each (in Euros) specify if these are one-time, periodical, fixed or proportional to the amount of waste).

- What are the overall expenses (e.g. labour, new equipment purchase etc.) that resulted from participating in this innovation?

Scale

- "For each transfer of bakery products which could have ended as waste, please answer the following:
  - Buyer (retailers- bakery store or supermarket): Value (unitary price + quantity) at which the product received was sold on the market after transformation.
  - Buyer (retailers- bakery store or supermarket): Theoretical value (unitary price + quantity) at which the same quantity of the same product could have been sold on the market if it was normally sourced on the market"

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- "For each transfer of food products which could have ended as waste, please answer the following:
    - Seller (baker): hours of work (for male, female and non-binary employees separately) for managing the product transferred, from making the contact to its delivery to the buyer etc.
    - Seller (baker): theoretical hours of work (for male, female and non-binary employees separately) for managing the product transferred in case it was ending up as waste.
    - Buyer (retailers- bakery store or supermarket): hours of work (for male, female and non-binary separately) for managing the product received from making the contact until its withdrawal and inputting in the production process.
    - Buyer (retailers- bakery store or supermarket): theoretical hours of work (for male, female and non-binary separately) for managing the same product in case it was purchased normally on the market."

- Number and type of new buyers with which they came into contact as a result of their involvement in the innovation + willingness to continue the relationship (assessed on a Likert scale from “very likely” to “very unlikely”).

- Number and type of new buyers and sellers (i.e., downstream, upstream, horizontal; from the sector, out of the sector) with which they came into contact as a result of their involvement in the innovation + willingness to continue the relationship (assessed on a Likert scale from “very likely” to “very unlikely”).

Competitiveness

- "For each transfer of bakery products which could have ended as waste, please answer the following:
    - Buyer (retailers- bakery store or supermarket): quantity (piece) of product to be sold on the market derived from the product transferred.
    - Buyer (retailers- bakery store or supermarket): theoretical quantity (piece) of product to be sold on the market derived from a unit of product similar to the one transferred but sourced from the standard source.
    - Seller (baker): quantity (piece) of food inputs used to derive the product transferred.
    - Seller (baker): theoretical quantity (piece) of food inputs used to derive a

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unit of the product transferred (assuming that this was still in condition to be used for its original goal)."

Behavior

- Self-assessment of awareness of the food waste problem (Likert scale from "very aware" to "not aware at all") by the respondent and by each of the employees involved in managing the food product transferred.
- Self-assessment of concerns for, and commitment to, food waste reduction (Likert scale, from "a lot" to "not at all") by the respondent and by each of the employees involved in managing the food product transferred.
- To which extent do you agree to the following statements? (to be answered individually by the staff members also indicating gender, position and age)

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
Food loss and waste are major issues for the sustainability of the food systems in general					
Food loss and waste are major issues in the [insert the name of your sector here]					
Food loss and waste are major issues [insert here the type of your organisation]					
I am concerned about the economic costs of food loss and waste in [insert here the type of your organisation]					

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I am concerned about the environmental impact of the food loss and waste in this [insert here the type of your organisation]					
I am committed to reduce the food loss in this [insert here the type of your organisation]					

Creation of local jobs?

- All participants: number and type of full time equivalent (FTE) jobs created to manage the food products transferred (if this is only a share of time of one or more employees, indicate the cumulated share in FTE). In doing this, male, female and non-binary employees' hours should be recorded separately.

Spill-over effects

- Number of companies who have been informed of the innovation (e.g. dialogue, platform, software etc.) + number of these who declared to be interested in it + number who have joined it.

Environment:

- How are the surplus bakery products managed? Please estimate the share of used valorisation/disposal pathways.
  donation to charities, food bank (%)___
  reworking (e.g. manufacturing process) (%)__
  valorisation to other food products (e.g. bread crumbs) (%) ___
  animal feed (%)___
  composting (%)___
  anaerobic digestion (%)___
  incineration (%) ___
  discards on land/at sea (%) ___
  Others: please specify (%) ____

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T3.2 Innovating supplier-retailer interactions through stakeholder dialogue

24 Data collection (company records from bakeries)

Data collected via sharing of company records

Description	Unit of measure	Period	Timeframe	Frequency
Bread losses and waste (3 main bakery products)	Kg	Baseline	6 months	Monthly
Bread losses and waste (3 main bakery products)	Kg	Evaluation	6 months	Monthly
Surplus bread produced (3 main bakery products)	Kg	Baseline	one year	Monthly
Surplus bread produced (3 main bakery products)	Kg	Evaluation	one year	Monthly
% surplus bread on total monthly bread production (3 main bakery products)	%	Baseline	one year	Monthly
% surplus bread on total monthly bread production (3 main bakery products)	%	Evaluation	one year	Monthly

25 Bakeries (before and after implementation)

Questionnaires to bakeries

Before and after the implementation of measures against food waste

1. Name and location of the company
*Name and location:*_____

2. How many production branches does the company have?
*Number:*_____

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3. How many own stores does the company have?
*Number:*_____

4. Total number of employees
Male (specify job grade): _____
Female (specify job grade): _____
Other (specify job grade): _____

5. How many types of bakery products does the company produce? Can you list the 3 main (in terms of quantity produced)? And what percentage each has in the overall quantity produced?
*Number:*_____
*Name of main bread types (%):*_____

6. How much of each bakery product does the company typically produce in one day?
*Product 1: kg*_____
*Product 2: kg*_____
*Product 3: kg*_____

7. Through which channels are sold these products (please add % of quantities, considering the average over 1 year)?

Product	*% own store*	*% supermarkets*	*% other retailers*	*% other channels (specify)*
1)				
2)				
3)				

8. How many vehicles does this company use for the distribution of the products?
Number: _____

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9. For each vehicle, can you list the type, fuel, capacity, average km per year?

Vehicle	*Type*	*Fuel*	*Capacity (kg)*	*km/year*
1)				
2)				
3)				
…				

10. Can you estimate the average fill rate of your vehicles during their trips?
*Delivery: % fill rate*_____
*Return: % fill rate*_____
*Empty return: % on total trips*_____

11. What is the unitary amount of **input costs** for producing the main bakery products (possibly broken down by cost categories)?
*Product 1: Euro per unit (or kg)*_____
*Product 2: Euro per unit (or kg)*_____
*Product 3: Euro per unit (or kg)*_____

12. What is the unitary amount of **other variable costs** (such as labour, electricity etc. that change with the amount of production) for producing the main bakery products (possibly broken down by cost categories)?
*Product 1: Euro per unit (or kg)*_____
*Product 2: Euro per unit (or kg)*_____
*Product 3: Euro per unit (or kg)*_____

13. What is the unitary amount of **fixed costs** (such as equipment rent etc. that do not change with the amount of production) for producing the main bakery products (possibly broken down by cost categories)?
*Product 1: Euro per day*_____
*Product 2: Euro per day*_____

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*Product 3: Euro per day*_____

14. What is the average selling price of the main bakery products (Euro)?

Product	*own store*	*supermarkets*	*other retailers*	*other channels (specify)*
1)				
2)				
3)				

15. What is the rate of return on investment of the company during the year?
Rate %: _____

16. What is the quantity of material inputs used to derive 1 kg of each product?
*Product 1: kg of inputs per 1 kg of product*_____
*Product 2: kg of inputs per 1 kg of product*_____
*Product 3: kg of inputs per 1 kg of product*_____

17. What is the weight of the packaging for the main bread products?
*Product 1: kg of packaging per 1 kg of product*_____
*Product 2: kg of packaging per 1 kg of product*_____
*Product 3: kg of packaging per 1 kg of product*_____

18. What material is used to pack each product?
Product 1: _____
Product 2: _____
Product 3: _____

19. To which extent do you agree with the following statements? (to be asked from each staff member involved in the innovation disintegrated by their age, gender, position and department in the company, education)

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	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
Food loss and waste are major challenges for the sustainability of food systems					
Food loss and waste are major issues in the bakery sector					
Food loss and waste are major issues in this company					
I am concerned about the costs of the food wasted during the company's operations					
I am concerned about the environmental impact of the food wasted during the company's operations					
I am committed to reduce the food wasted during the company's operations					
The employees (if possible by gender) are concerned about the costs of the food wasted during the company's operations					
The employees (if possible by gender) are concerned about the environmental impact of the food wasted during the					

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company's operations					
The employees (if possible by gender) are committed to reduce the food wasted during the company's operations					

20. How are the wasted / surplus bakery products managed/ disposed of? Please estimate the share of used valorisation/disposal pathways.

donation to charities, food bank (%)___
reworking (e.g. manufacturing process) (%)__
valorisation to other food products (e.g. bread crumbs) (%) ___
animal feed (%)___
composting (%)___
anaerobic digestion (%)___
incineration (%) ___
discards on land/at sea (%) ___
municipal waste management/private waste management company (%) _____
Others: please specify (%) ____

Do you make a profit from this disposal route ? If yes, how much per tonne in each alternative?

_____

21. What is the cost of disposal? Is it fixed or does it vary with the quantity of waste disposed (per tonne)?

_____

22. On a scale from 1 (not at all) to 5 (yes, a lot), can you rate your satisfaction for this survey?

□ *1* □ *2* □ *3* □ *4* □ *5*

23. Gender of the respondent

□ *Female* □ *Male* □ *Other* □ *Prefer not to say*

Additional questions to evaluate the implementation of the roadmap against food waste (2023)

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1. Considering the roadmap against food waste that has been elaborated as part of the LOWINFOOD project for the bakery sector, to which extent do you agree with the following statements? (to be asked from each staff member involved in the innovation disintegrated by their age, gender, position and department in the company, education)

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
The roadmap against food waste met my expectations					
The roadmap is too complex (e.g. there are too many actions)					
The staff (if possible by gender) has developed new communication skills					
The staff (if possible by gender) has developed new technical/operational skills					
The staff (if possible by gender) has developed new relational skills					
The staff (if possible by gender) has developed new technological/digitalization skills					
This company will continue using the roadmap after the project					

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Trust with other actors of the chain has increased					
Communication with other actors of the chain has improved					
I will promote the Roadmap to other partners/companies					

2. How many hours per day did the implementation of the roadmap require? How many staff were involved?
Male (specify job grade): _____
Female (specify job grade): _____
Other (specify job grade): _____

3. Are there new products or income streams resulting from the innovation? Which ones and how much gain is achieved in each stream?

_____

4. What is the change in the annual balance (due to additional income or avoided cost) resulting from the innovation?

_____

5. What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training etc.)

_____

6. Did you get subsidies or other monetary benefits (in Euro) to implement the roadmap? If yes, please specify the amount and type (one-time, periodical, fixed or proportional to the amount of waste)

_____

7. Did you establish new agreements with other actors of the chain as a result of your involvement in the innovation? If yes, how likely is it that you continue the relationship, assessed on a 1 (very unlikely) to 5 (very likely) scale?

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	New agreements *(YES/NO)*	*Very unlikely*	*Somewhat likely*	*Neither likely nor unlikely*	*Somewhat likely*	*Very likely*
With suppliers						
With buyers						
With other bakeries						

26 CNA and research partners (questionnaire)

Questionnaire to innovator

To be administered after the end of the stakeholder discussion (2022)

1. How many actors (bakeries/retailers) were involved in the stakeholder dialogue?
Number: _____

2. How many actors (bakeries/retailers) were willing to continue the implementation of the roadmap after the project?
Number: _____

3. Which actions are required by companies in order to implement the shared roadmap?
_____

4. How many bakeries decided to quit the innovation due to the difficulty in implementing the actions defined in the shared roadmap?
Number: _____

5. How many staff were involved in the stakeholder discussion?
Male (specify job grade): _____
Female (specify job grade): _____

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Other (specify job grade): _____

6. On a scale from 1 (not at all) to 5 (yes, a lot), can you rate your satisfaction for this survey?

□ *1* □ *2* □ *3* □ *4* □ *5*

7. Gender of the respondent

□ *Female* □ *Male* □ *Other* □ *Prefer not to say*

T3.3 FT Software for bakeries

27 User (before, mid-term, at the end)

Questionnaire for the data collection for the sustainability assessment of the innovation FoodTracks

Date of interview:	Carried out by (ISUN):

Explanations to the survey

The survey is conducted in the form of a personal interview with the persons responsible for the project as the users and as the project partners. Some of the questions will be presented to the interview partners in written form so that they can gather the necessary information in a flexible manner.

There are three survey periods:

- **Before** using FoodTracks (**project beginning**)
- While using FoodTracks (**mid-term**)
- At the ending of the project (**project ending**)

The questions (blocks) marked in yellow must be answered at the middle and end of the project, all other questions must also be answered before using FoodTracks.

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Privacy statement (will be added if required)

Part 1: General data on the organisation

• Name of the organisation:			
• Contact:			
• Number and gender of employees - total: thereof: - Administration: - Production: - Logistics: - Management: - Cleaning: - Sales staff:	female	male	diverse
Description of the bakery in which FoodTracks will be implemented (number of sales stores, integration of cafés/bistros, production site, etc.)			

Part 2: Questionnaire for users

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Waste disposal

1. Do returned goods go to other distribution channels? If yes, can you estimate the share of used pathways?

Food donation to charities/food banks (%)
Reworking (%)
Valorisation to other products (e.g. bread crumbs) (%)
Animal feeding (%)
Composting (%)
Anaerobic digestion (%)
Incineration (%)
Other (%): please specify

2. If so, what product groups are involved and in what quantities? Where are they sold?

Product Group of returned goods	Quantity (in units)	Distribution channel

3. Do you make a profit from any of the utilized distribution channels? If yes, how much € per unit in each product group?

Prerequisites for implementing FoodTracks

4. What resources were necessary to use FoodTracks?
   a. technical infrastructure (new PC, tablet, etc.) - type of computer device
   b. Qualification of employees
   c. Staff deployment (in hours and EUR) necessary for implementation *(by gender and position)*
   d. Staff deployment (in hours and EUR) necessary for daily usage *(by gender and position)*
5. Did you have to train staff to use FoodTracks in your bakery? If yes, how exten-

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sive was the training (staff involved, duration)

Impact of FoodTracks on the business and the employees

6. How has the production planning process changed since you started using FoodTracks?

7. Do you buy less raw materials since you started using FoodTracks? *If yes, how much less in amount? and how much did you save in costs financially as a result ?*

8. Has the production process changed as a result of using FoodTracks (e.g. more baking in the shop or starting work later)?
   Are there any other processes in your company that have changed due to the application of FoodTracks?

9. *Are there new subsidies and/or other monetary benefits received as results of food waste reduction after the innovation? If you answered yes to the previous question, please indicate their value .*

10. *Have there been changes in the selling price of your products since the introduction of FoodTracks, has the use of FoodTracks had an impact on this? If so, please indicate which product and how much per unit.*

11. *Have there been changes in the number of different products produced since the introduction of FoodTracks, has the use of FoodTracks had an impact on this? If so, please indicate which product and how many units.*

12. *Did the use of FoodTracks lead to the creation of additional jobs or the loss of jobs/shares (if yes, share in FTE by gender)?*

13. Are there employees who have acquired new competences through the use of FoodTracks? Please disaggregate by gender
    - *Technological (use of pc software) [number and qualitative information]*
    - *Technical (better understanding of how to manage food transactions) [number and qualitative information]*
    - *Social/relational (with other users of the software, if relevant) [number and qualitative information*

14. Are there non-financial improvements and advantages through the use of

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FoodTracks (e.g. better agreements between sales and production staff, higher motivation, PR effects, increased trust with raw material supplier, improved communication with internal or external partners e.g. supplier)? On a scale of 1-5, how do you rate these benefits (1-low, 5-high)

15. Have other sources of income arisen for you through the use of FoodTracks? If yes, which ones?

16. Have new business contacts resulted for you through the use of FoodTracks (other bakeries, sales outlets, new distribution channels, etc.), if yes, which ones?

17. Has your clientele changed through the use of FoodTracks (are there new / different customer groups)?

18. How has your awareness of food waste changed through the use of FoodTracks? *(open question + scale 1-5: 1-no change, 5-strong change)*?

To which extent do you agree with the following statements? (to be answered individually by the staff members also indicating gender, position and department, education and age)

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
Food loss and waste are major issues for the sustainability of the food systems in general					
Food loss and waste are major issues in [insert the name of your sector here]					
Food loss and waste are major issues in [insert here the type of your organisation]					

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I am concerned about the economic costs of food loss and waste in [insert here the type of your organisation]					
I am concerned about the environmental impact of the food loss and waste in [insert here the type of your organisation]					
I am committed to reduce the food loss in [insert here the type of your organisation]					

19. How has your behaviour changed? Has FoodTracks helped you to waste less food (open question + scale 1-5: 1-no change, 5-strong change)?

20. How has the behaviour of your production and sales staff changed? Has Food-Tracks contributed to them wasting less food (open question + scale 1-5: 1-not a change, 5-significant change (less wastage)?

21. Have you saved costs by using FoodTracks? How high are the savings and to which cost types can they be attributed (e.g. use of goods, energy, personnel, cleaning, disposal of food waste, storage costs, other fixed costs, other variable costs, etc.)?

User-friendliness of FoodTracks

22. How satisfied are you with the following features of FoodTracks (scale 1-5: 1-barely, 5-very satisfied)?
    a. Answering questions
    b. Functions of the application
    c. Ease of use of the application

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23. What features or design elements would you change or add to FoodTracks? (Free text)

Evaluation of FoodTracks

24. Will you continue to use FoodTracks after the end of the project?

25. What were your expectations regarding the use of FoodTracks (e.g. cost savings, food waste reduction)? Were these fulfilled?

26. Have you talked to other institutions about FoodTracks? Have they expressed interest in implementing FoodTracks?

27. Would you recommend FoodTracks to other companies?

28. Please rate the level of difficulty for implementing FoodTracks (scale 1-5, 1-easy, 5-very difficult).

Other questions

29. What is your motivation for using FoodTracks? Please sort the possible reasons in order of decreasing importance (first mentioned most important - last mentioned least important). *(ask only at project beginning)*

    ☐ Other bakeries also participate.

    ☐ We can reduce the workload of the sales staff.

    ☐ We can optimise our ordering process.

    ☐ We are interested in participating in a scientific project.

    ☐ The costs for FoodTracks are partly covered by the project.

    ☐ We can reduce costs in the business.

    ☐ We can reduce food waste.

    ☐ We can act in an environmentally friendly way.

    ☐ Other:

30. Did you get access to further funding through participation in the project (e.g. food waste reduction funding)?

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31. Please list job title, gender, task of the persons (without names) who were involved in the project (from the first meeting, background activity, implementation, PR, etc.).

32. How satisfied are you with this survey *(by gender, scale 1-5, 1-very satisfied, 5 not at all satisfied).*

28 FoodTracks, ADB Nord, ISUN

Part 3: Questions to the partners FoodTracks, ADB Nord and iSuN

Specific questions for FoodTracks related to the bakery _____

Production volume (Data collection period TBD)

1. Which articles were produced in the bakery during the survey period (baseline, mid-term, monitoring) and in what quantities?

Quantity of food wasted (Data collection period TBD)

2. What number of units per item was not sold during the survey period (returns / overproduction)?
   overproduction = (units produced – units sold)*weight per unit

Socio-economic impact

3. What are the prices of the items produced and sold (for the calculation of sales)?

Application of FoodTracks in the bakery

4. How many decisions were made through FoodTracks?
5. How many of the suggestions were used as a decision-making basis for production planning?
6. How much time did the bakery spend working with FoodTracks during the data collection period?

General questions for FoodTracks

7. What are the regular costs of implementing FoodTracks?

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8. Location of the servers
9. Server capacity
10. Type of CPU in use (e.g. Intel Skylake)
11. In how many bakeries has FoodTracks been implemented so far?
12. List of persons (without names), job title, gender, task, who were involved in testing FoodTracks in LOWINFOOD (acquisition, implementation, support, evaluation, etc.).

General questions for ADB Nord

Calculation the costs in the bakeries

13. What are the costs of the items produced? What are the proportions (a-h) in relation to the total costs per item?
    a. *Cost of raw material*
    b. *Energy*
    c. *Personnel*
    d. *Cleaning*
    e. *Waste disposal (does this refer to food waste only or waste in total?)*
    f. *Storage*
    g. *Other fixed costs*
    h. *Other variable costs*
14. List of persons (without names), job title, gender, task, who were involved in testing FoodTracks in LOWINFOOD (acquisition, implementation, supervision, evaluation, etc.).

Calculation of the quantities produced and wasted in the bakeries

15. What are the standard weights of the different bakery products produced?

General questions for iSuN

16. Gender of the interviewee(s) ISUN
17. List of persons (without names), job title, gender, task, who were involved in testing FoodTracks in LOWINFOOD (acquisition, implementation, supervision, evaluation, etc.).

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T4.1 Stakeholder dialogue

The questionnaires were reviewed by the partners in charge of evaluating the efficacy, the socio-economic impact, and the environmental impact of the innovations in LOWINFOOD WP1, to ensure that all the relevant indicators identified are covered. They will be used both in Scotland by JHI, and in Germany by ISUN. To ensure comparability, the same questionnaires will be used in the two countries; however, they might undergo slight revisions after the initial tests (e.g. removal of problematic questions) to optimise data collection given specific country and supply chain conditions.

Questions in *italics* can be removed with priority. Questions in red can be asked only to the buyer or to the seller of food products, or only to the part who bore the costs (in the case of transport and packaging).

29 Stakeholder dialogue participants (upon registration)

Initial questionnaire

To be filled when the company joins the dialogue

A. Company identification and expectations

1. Name of the company.
2. Stage of the supply chain where the company operates (primary production, primary processing, processing (for human consumption), processing (by-products, not for human consumption), wholesale, retail, distribution, food service, other(s): please specify). [multiple answers]
3. Geographical area where you operate (postcode).
4. Number of years of operation (or years of activity of the respondent)
5. Age and gender of the respondent.
6. What do you expect from the dialogue? (qualitative description)
7. Which type of stakeholders would you like to get in touch with?

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8. List the people who will attend activities of the dialogue (if known), by gender, age, and role in the company (department, level of responsibility).

B. General economic characteristics of the company

9. Turnover of the company during the last year. [ranges to be provided]
10. Fixed costs of the company during the last year. [ranges to be provided]
11. Variable costs of the company during the last year (excluding waste management costs). [ranges to be provided]
12. Waste management costs of the company during the last year.

C. Production: inputs, outputs and waste

13. Main fish input used by the company (or mix of products, qualitatively described). [not for fishing companies]
14. Quantity of the main fish input purchased during the last year. [not for fishing companies]
15. Average price at which you purchased your main fish input during the last year. [not for fishing companies]
16. Do you know the quantity of fish input which was wasted and not recovered during the last year (avoidable, not avoidable, by-products)? If not, could you provide an approximate estimate? [not for fishing companies]
17. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea, other(s): please specify). [multiple answers]
18. Main fish product(s) produced by the company.
19. Quantity of the main fish product(s) produced and sold during the last year.
20. Average price(s) at which the main product(s) was/were sold during the last year.

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21. Do you know the quantity of fish product which was wasted and not recovered during the last year (avoidable, not avoidable, by-products)? If not, could you provide an approximate estimate?

22. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea, other(s): please specify). [multiple answers]

D. Employment in the company

23. Number of employees of the company, by gender.

24. Number of hours worked in an average week by the company's employees, by gender.

25. Number of full time equivalent jobs in the company, by gender.

26. Number of local households that are supported by jobs in the company.

E. Food waste: awareness, attitudes and management

27. Awareness of food waste levels in their company. [Likert scale: from 1 "totally aware" to 5 "not aware at all"]

28. To which extent do you agree with the following statements?[18]

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are a major issue for the sustainability of the food systems in general.					
Food loss and waste are a major issue in our					

[18] If the company has more than 10 employees, all the employees who are expected to be involved in the stakeholder dialogue should fill the staff questionnaire in Appendix 2.

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sector.					
Food loss and waste are a major issue for our company.					
I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					
We are committed to reducing food loss and waste in our company.					

29. Are you already implementing any measures to reduce food waste on a regular basis, namely the trading of fish product(s) removed from the supply chain for human consumption? [yes/no]

30. If yes, please specify:
    - The type of product. [qualitative]
    - If the product had to undergo any ad hoc treatment before being sent / after being received, please specify: (1) type(s) of treatment (unpacking, shredding, heating, hygienisation, other(s): please specify) [multiple answers]; (2) cost for you (Euro/ton).
    - Location(s) the buyers/sellers. [postcode(s)]
    - Means of transport generally used to transfer the product: (1) type (truck with semi-trailer, 28-34 t; rigid truck, 20-26 t; rigid truck, 20-26 t, with cooling; tractor, single trailer; tractor, double trailer; other(s): please specify); (2) type of fuel (diesel/vegetable oil/electricity); (3) if there are empty returns (yes/no/don't know); (4) fill rate of the vehicles (%); (5) if other products are transported apart from the product in fo-

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cus (yes/no/I don't know); (6) who pays for it (you / the other party).
- Storage conditions before sending / after receiving (with cooling unit/without; time of storage).
- If the transferring of the product required packaging, please specify: (1) the mass of packaging material (kg per kg of product); (2) whether reusable packaging was used (yes/no); (3) the type of packaging (plastic, bio-plastic, cardboard, paper, metal, composite, other(s): please specify) [multiple answers]; (4) who paid for it (you / the other party).

F. Survey satisfaction

31. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

30 Stakeholder dialogue participants (before final event)

Final questionnaire

To be filled before the 'final stakeholder events'

Company identification

A. Name of the company.

B. Age and gender of the respondent.

General economic characteristics of the company

C. Turnover of the company during the last year. [ranges to be provided]

D. Fixed costs of the company during the last year. [ranges to be provided]

E. Variable costs of the company during the last year (excluding waste management costs). [ranges to be provided]

F. Waste management costs of the company during the last year.

Production: inputs, outputs and waste

G. Did you experience any significant changes in the following aspects compared

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to the initial year of the dialogue? If yes, please specify.

a. Main fish input used by the company (or mix of products, qualitatively described). [not for fishing companies]
b. Quantity of the main fish input purchased during the last year. [not for fishing companies]
c. Average price at which you purchased your main fish input during the last year. [not for fishing companies]
d. Do you know the quantity of fish input which was wasted and not recovered during the last year (avoidable, not avoidable, by-products)? If not, could you provide an approximate estimate? [not for fishing companies]
e. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea, other(s): please specify). [multiple answers]
f. Main fish product(s) produced by the company.
g. Quantity of the main fish product(s) produced and sold during the last year.
h. Average price(s) at which the main product(s) was/were sold during the last year.
i. Do you know the quantity of fish product which was wasted and not recovered during the last year (avoidable, not avoidable, by-products)? If not, could you provide an approximate estimate?
j. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea, other(s): please specify). [multiple answers]

Employment in the company

H. Number of employees of the company, by gender.

I. Number of hours worked in an average week by the company's employees, by *gender.*

J. Number of full time equivalent jobs in the company, by gender.

K. Number of local households that are supported by jobs in the company.

Food waste: awareness, attitudes and management

L. Awareness of food waste levels in their company. [Likert scale: from 1 "totally

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aware" to 5 "not aware at all"]

M. To which extent do you agree with the following statements?[19]

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are a major issue for the sustainability of the food systems in general.					
Food loss and waste are a major issue in our sector.					
Food loss and waste are a major issue for our company.					
I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					
We are committed to reducing food loss and waste in our company.					

[19] All the employees who have been involved in the stakeholder dialogue and/or related food exchanges should fill the staff questionnaire in Appendix 2.

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Participation in the dialogue: employment, costs, contacts, outcomes, satisfaction

N. Please list all employees who have been involved in activities of the dialogue, by gender, age and role (department, level of responsibility).
   - Did your company need to hire new personnel in order to deal with the dialogue and deriving activities, and how many (by gender)?
   - How many hours did you dedicate yearly/monthly/weekly to the dialogue and deriving activities on average?

O. How many employees have developed new skills thanks to the dialogue (by gender)? Technological (use of mobile app, pc software); Technical (better understanding of how the food supply chain works); Social/relational (with other participants in the dialogues).

P. Could you estimate the costs in which you incurred due to your participation in the dialogue? (Please exclude the costs relative to food transactions if any, which were already measured in ad hoc questionnaires; only include day-to-day costs, e.g. travel for attending events)

Q. How many new contacts were generated by the dialogue, divided into buyers, sellers, and partners at the same level of the chain?
   - Willingness of these contacts to continue the relationship. [Likert scale: from 1 “very likely” to 5 “very unlikely”]

R. How much do you think that the dialogue improved the following aspects?
   - Trust with other stakeholders. [Likert scale: from 1 “a lot” to 5 “not at all”]
   - Communication with other stakeholders. [Likert scale: from 1 “a lot” to 5 “not at all”]
   - Interactions and transactions with other stakeholders. [Likert scale: from 1 “a lot” to 5 “not at all”]

S. Did you involve or are you willing to involve other companies in the dialogue (i.e. sharing contacts, joint discussions)? [yes, I did / yes, I will / no]
   - Number of companies who have been informed of the dialogue by you.
   - Number of companies who declared to be interested in it; number of those who have joined it after you informed them.

T. Did you discover new alternative forms of food use thanks to the dialogue?

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[yes/no]

- Did you develop any new streams of income (e.g., new products) as a result of participating in the dialogue? [qualitative]

U. Are the procedures to participate in the stakeholder dialogue too many / too complex? [Likert scale: from 1 “not at all” to 7 “yes, a lot”]

V. In which specific participatory activities of the dialogue did you take part? [list of the activities implemented and multiple answers]

W. Have you been able to access any subsidies/other monetary benefits as a result of the dialogue and resulting transaction? How much? Are these one-time, periodical, fixed, or proportional to the amount of waste avoided?

X. To what extent did the dialogue meet your expectations? [Likert scale: from 1 “much better than expected” to 5 “much worse than expected”, plus 6 “I did not have particular expectations”]

Y. Is your company willing to continue “using” the dialogue after the end of the project? [yes/no]

Survey satisfaction

Z. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

31 Seller (at each food transaction)

Questionnaire for sellers

To be filled by the stakeholders who sell or somehow deliver a food product

Company identification

1. Name of your company

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2. Age and gender of the respondent

3. Did you purchase/acquire a product that could otherwise become waste (buyer), or did you sell/deliver it (seller)? [filtering question: depending on the answer, the stakeholder will either proceed with this questionnaire or continue with the buyer one below]

4. Could you confirm that this transaction was facilitated by the dialogue (e.g. because you got in touch with the buyer during the dialogue)?

Product exchanged

5. Which product was the object of the transaction?

6. Which amount of product was the object of the transaction, and which was the unit of transaction?

7. Which amount of fish input is required to derive the amount of product object of the transaction?

8. Theoretical price at which the fish product / the by-product would have been sold on the market before becoming waste (when its original use was still an option); and after becoming waste (when its original use was not an option anymore), if it could be sold.

9. If the product sold/delivered needed to be disposed of, how much would you have spent in terms of waste management costs?

10. If the product had to undergo any ad hoc treatment before being sold/delivered, please specify: (1) type(s) of treatment (unpacking, shredding, heating, hygienisation, other(s): please specify) [multiple answers]; (2) cost for you (Euro/ton).

11. Price at which the product was sold, if any.

Procedure to transfer the product

12. Where was the product located before being transferred (postcode) and where was it moved (postcode)?

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13. Concerning the means of transport used to transfer the product, please specify: (1) the means of transport (truck with semi-trailer, 28-34 t; rigid truck, 20-26 t; rigid truck, 20-26 t, with cooling; tractor, single trailer; tractor, double trailer; other(s): please specify); (2) the type of fuel used (diesel/vegetable oil/electricity); (3) if there was an empty return (yes/no/don't know); (4) the fill rate of the vehicle (%); (5) if other products were transported apart from the product in focus (yes/no/I don't know); (6) who paid for it (you / the other party).

14. Concerning the storage of the product before sale/delivery, please specify: (1) the typology of storage; (2) the time of storage; (3) whether a cooling unit was required; (4) an estimate of the storage cost (electricity, etc.); (5) whether it is a cost you would have incurred regardless of this transaction.

15. If the transferring of the product required packaging, please specify: (1) the mass of packaging material (kg per kg of product); (2) whether reusable packaging was used (yes/no); (3) the type of packaging (plastic, bio-plastic, cardboard, paper, metal, composite, other: please specify) [multiple answers]; (4) who paid for it (you / the other party).

Additional inputs needed

16. How many working hours (by gender) did you require for managing the product sold/delivered from making the contact to its preparation, until its delivery? To how many FTE jobs do these correspond?

17. How many working hours (by gender) would you have required for managing the product if it was ending up as waste?

18. *Did you have to create one or more positions (including casual workers) to carry out this transaction? Was this position taken by a woman? Would you have created this job even in the absence of the dialogue? (yes/not)*

19. Have you received any subsidies/other monetary benefits (not related to market transactions) as a result of this transaction, and how much?

20. Could you estimate the aggregated costs in which you incurred for making this transaction (communication, transport, staff time, etc.)?

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Survey satisfaction

21. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

32 Buyer (at each food transaction)

Questionnaire for buyers

To be filled by the stakeholders who purchase or somehow acquire a food product

Company identification

1. Name of the company.
2. Age and gender of the respondent.
3. Did you purchase/acquire a product that could otherwise become waste (buyer), or did you sell/deliver it (seller)? [filtering question: depending on the answer, the stakeholder will either proceed with this questionnaire or continue with the seller one above]
4. Could you confirm that this transaction was facilitated by the dialogue (e.g. because you got in touch with the seller during the dialogue)? [yes/no]

Product exchanged

5. Which product was the object of the transaction?
6. Which amount of product was the object of the transaction, and which was the unit of transaction?
7. Theoretical price (unitary) at which the fish product transferred would have been purchased on the market.
8. Total price at which the product was purchased, if any.

Procedure to acquire the product

9. Where was the product located before being transferred (postcode) and where

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was it moved (postcode)?

10. Concerning the means of transport used to transfer the product, please specify: (1) the means of transport (truck with semi-trailer, 28-34 t; rigid truck, 20-26 t; rigid truck, 20-26 t, with cooling; tractor, single trailer; tractor, double trailer; other(s): please specify); (2) the type of fuel used (diesel/vegetable oil/electricity); (3) if there was an empty return (yes/no/don't know); (4) the fill rate of the vehicle (%); (5) if other products were transported apart from the product in focus (yes/no/I don't know); (6) who paid for it (you / the other party).

11. Concerning the storage of the product after purchase/acquisition and before use, please specify: (1) the typology of storage; (2) the time of storage; (3) whether a cooling unit was required; (4) an estimate of the storage cost (electricity, etc.); (5) whether this is a cost you would have incurred regardless of this transaction.

12. If the transferring of the product required packaging, please specify: (1) the mass of packaging material (kg per kg of product); (2) whether reusable packaging was used (yes/no); (3) the type of packaging (plastic, bio-plastic, cardboard, paper, metal, composite, other: please specify) [multiple answers]; (4) who paid for it (you / the other party).

Additional inputs needed

13. How many working hours (by gender) did you require for managing the transaction (from making the contact until its withdrawal and inputting in the production process)? To how many FTE jobs do these correspond?

14. Did you have to create one or more positions (including casual workers) to carry out this transaction? Was this position taken by a woman? Would you have created this job even in the absence of the dialogue? [yes/no]

15. Have you received any subsidies/other monetary benefits (not related to market transactions) as a result of this transaction and how much?

16. Could you estimate the aggregated costs in which you incurred for making this transaction (communication, transport, staff time, etc.)?

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Use of the product

17. If the product had to undergo any ad hoc treatment before being sold/delivered, please specify: (1) type(s) of treatment (unpacking, shredding, heating, hygienisation, other(s): please specify) [multiple answers]; (2) cost for you (Euro/ton).

18. Which final product did you obtain using the product object of the transaction? Did it include other inputs? [qualitative]

19. Which quantity of final product did you obtain using the food object of the transaction? At which price did you sell it?

20. If the product obtained through the transaction replaced a similar product sourced through your standard source, was the rate of transformation into output the same as the standard product?

21. If some or all of the product purchased/acquired ended up as waste anyway, please specify: (1) the amount; (2) related waste management costs.

Survey satisfaction

22. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

T4.2 Leroma B2B digital marketplace for fish

The reference population for the assessment will be represented by the companies who conduct transactions on the Leroma platform and that are based in either Germany or Scotland (or the UK, if the region cannot be identified). All companies that sell something will fill questionnaire 5 with the single question. The other questionnaires are intended for use in case studies with selected companies. For non-cross-border transactions, all questionnaires are filled in as part of the case studies. The companies based in different countries which are involved in a transaction with the former would only fill a specific questionnaire after the transaction: if a product from Germany or Scotland is sold in other countries, the purchaser would fill questionnaire 4; if a product from other countries is sold in

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Germany or Scotland, the seller would fill questionnaire 3.

33 Platform users (upon registration)

Questionnaire to be filled upon registration on the Leroma platform

A. Company identification

1. Name of the company.
2. Stage of the supply chain where the company operates.
    - Primary production
    - Primary processing
    - Processing (for human consumption)
    - Processing (by-products, not for human consumption)
    - Wholesale
    - Retail
    - Distribution
    - Food service
    - Other(s) (please specify)
3. Geographical area where the company operates. [postcode]
4. Number of years of operation.
5. Average age of the employees of the company.
6. Number of employees of the company, by gender.

B. Food waste: awareness, attitudes and management

7. Awareness of food waste levels in the company. [Likert scale: from 1 “fully aware” to 5 “not aware at all”]
8. To which extent do you agree with the following statements?

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree

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Food loss and waste are a major issue for the sustainability of the food systems in general.					
Food loss and waste are a major issue in our sector.					
Food loss and waste are a major issue for our company.					
I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					
We are committed to reducing food loss and waste in our company.					

9. Waste management costs of the company during the last year.

C. Gender and survey satisfaction

10. Age and gender of the respondent.

11. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

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34 Subset of platform users (at the beginning)

Questionnaire to be filled by selected companies as part of a case study at the beginning

A. Production: inputs, outputs and waste

1. Main fish input used by the company (or mix of products, qualitatively described). [not for fishing companies]
2. Quantity of the main fish input purchased during the last year. [not for fishing companies]
3. Average price at which you purchased your main fish input during the last year. [not for fishing companies]
4. Quantity of fish input wasted and not recovered during the last year (avoidable, not avoidable, by-products). [not for fishing companies]
5. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea, Others: please specify). [multiple answer]
6. Main fish product(s) produced by the company.
7. Quantity of the main fish product(s) produced and sold during the last year.
8. Average price(s) at which the main fish product(s) was/were sold during the last year.
9. Quantity of fish product which was wasted and not recovered during the last year (avoidable, not avoidable, by-products).
10. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea). [multiple answer].

B. Gender and survey satisfaction

11. Age and gender of the respondent.

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12. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”][20]

35 Seller (after a food transaction)

Questionnaire to be filled by the seller (selected companies as part of a case study) after a food transaction

A. Product sold

1. Which product was the object of the transaction?
2. Which amount of product was the object of the transaction, and which was the unit of transaction?
3. Price at which the product was sold.
4. Price at which the product would have been sold on the market for its original use.
5. If the product sold needed to be disposed of, how much would you have spent in terms of waste management costs?

B. Procedure to sell the product

6. Where was the product located before being transferred [postcode] and where was it moved [postcode]?
7. Did/Will you (or a company hired by you) take care of the transport of the product? [yes/no]
    - If yes, please specify:
    - (1) if this was carried out by you, or you had to involve another company;
    - (2) the means of transport used;
        - Truck with semi-trailer, 28-34 t
        - Rigid truck, 20-26 t

[20] Besides this questionnaire, the staff of the companies involved in the case study who are expected to be using Leroma should fill the staff questionnaire in Appendix 2.

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- Rigid truck, 20-26 t, cooling
- Tractor, single trailer
- Tractor, double trailer
- Other: please specify

- (3) if it had a cooling unit;
- (4) the type of fuel used
  - diesel
  - vegetable oil
  - electricity;
- (5) if there was an empty return (Yes/No);
- (6) the fill rate of the vehicle (%).

8. Did/Will you (or a company hired by you) take care of the packaging of the product? [yes/no]
   - If yes, please specify:
   - (1) if this was carried out by you, or you had to involve another company;
   - (2) the mass of packaging material for distribution (kg per kg of product);
   - (3) if the packaging is reusable (yes/no).
   - (4) the type of packaging (material)
     - Plastic
     - Bio-plastic
     - Cardboard
     - Metal
     - Paper
     - Composite
     - Others: please specify

9. How many working hours (if possible by gender) did/will your employees dedicate to this transaction?

10. Could you estimate the aggregated costs in which you incurred / will incur for making this transaction with Leroma (excluding the Leroma fee)?

C. Preparation of the product traded

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11. If the product had to undergo any ad hoc treatments before being sold, please specify:
    (1) type of treatment;
        Possible response options (multiple answers):
        - Unpacking
        - Shredding
        - Heating
        - Hygienisation
        - Other: please specify
    (2) cost (in EUR or GBP/ton).

D. Gender and survey satisfaction

12. Age and gender of the respondent.

13. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

36 Buyer (after a food transaction)

Questionnaire to be filled by the purchaser (selected companies as part of a case study) after a food transaction

A. Product purchased

1. Which product was the object of the transaction?

2. Which amount of the product was the object of the transaction, and which was the unit of transaction?

3. Price at which the product was purchased.

B. Procedure to acquire the product

4. Where was the product located before being transferred [postcode] and where was it moved [postcode]?

5. Did/Will you (or a company hired by you) take care of the transport of the product? [yes/no]

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- If yes, please specify:

(1) if this was carried out by you, or you had to involve another company;

(2) the means of transport used;

- Truck with semi-trailer, 28-34 t
- Rigid truck, 20-26 t
- Rigid truck, 20-26 t, cooling
- Tractor, single trailer
- Tractor, double trailer
- Other: please specify

(3) if it had a cooling unit;

(4) the type of fuel used

- diesel
- vegetable oil
- electricity;

(5) if there was an empty return (Yes/No);

(6) the fill rate of the vehicle (%).

6. Did/Will you (or a company hired by you) take care of the packaging of the product? [yes/no]
   - If yes, please specify:
   - (1) if this was carried out by you, or you had to involve another company;
   - (2) the mass of packaging material for distribution (kg per kg of product);
   - (3) if the packaging is reusable (yes/no).
   - (4) the type of packaging (material)
     - Plastic
     - Bio-plastic
     - Cardboard
     - Metal
     - Paper
     - Composite
     - Others: please specify

7. How many working hours (if possible by gender) did/will your employees

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dedicate to the transaction?

8. Could you estimate the aggregated costs in which you incurred / will incur for making this transaction with Leroma (excluding the Leroma fee)?

C. Subsequent use of the product traded

9. If the product had to undergo any ad hoc treatment before being used, please specify:
   (1) type of treatment;
   (2) cost for you.

10. Which product did/will you obtain using the food traded, which quantity, and at which price did/will you sell it?

D. Gender and survey satisfaction

11. Age and gender of the respondent.

12. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

37 Seller (during a food transaction)

Question to be answered by the seller in the course of every food transaction

What would you have done with the goods if you hadn't been able to sell them on the platform?

- We would have sold them through the usual sales channels
- We would have sold them through other sales channels (please specify)
- We would have disposed of them
- Other (please specify)

38 Subset of platform users (at the end of the demonstration)

Questionnaire to be filled at the end of the task (selected companies as part of a case study)

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A. Food waste: awareness, attitudes and management

1. Awareness of food waste levels in their company. [Likert scale: from 1 "totally aware" to 5 "not aware at all"]

2. To which extent do you agree with the following statements?[21]

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are a major issue for the sustainability of the food systems in general.					
Food loss and waste are a major issue in our sector.					
Food loss and waste are a major issue for our company.					
I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					
We are committed to reducing food loss and					

[21] All the employees who have been using Leroma should fill the staff questionnaire in Appendix 2.

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waste in our company.					

3. Waste management costs of the company during the last year.

B. Use of Leroma: employment, costs, contacts, outcomes, satisfaction

4. Please list all employees who have been involved in the use of Leroma, by gender, age and role. [department, level of responsibility]
    - Did your company need to hire new personnel (including casual workers) in order to use Leroma, and how many (by gender)?

5. How would you assess the time needed to learn how to properly use Leroma? [Likert scale from 1 “very little” to 5 “too much”]
    - Are the procedures to use Leroma too many / too complex? [Likert scale: from 1 “not at all” to 7 “yes, a lot”]

6. How many employees have developed new skills thanks to the use of Leroma? Technological (use of mobile app, pc software); Technical (better understanding of how to manage food transactions); Social/relational (with other users of Leroma, if relevant) if possible by gender.

7. If you had to acquire a new computer to use Leroma, please specify:
    (1) the location of your computers;
    (2) server capacity;
    (3) type of CPU;
    (4) type of device;
    (5) computer time used for operations related to Leroma.

8. Have you suggested or are you willing to suggest the use of Leroma to other companies? [yes, I did / yes, I will / no]
    - Number of companies to which you suggested to use Leroma, if any.
    - Number of those who declared to be interested in it; number of those who have used it after you informed them.

9. Did you discover new alternative use of your products and/or by-products thanks to Leroma? [yes/no]
    - Did you develop any new streams of income (e.g., new products) as a

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result of using Leroma? [qualitative information]

10. Were you able to access any subsidies/other monetary benefits as a result of using Leroma? How much? Are these one-time, periodical, fixed, or proportional to the amount of waste avoided?

11. To what extent did Leroma meet your expectations? [Likert scale: from 1 "completely" to 5 "not at all"]

12. Is your company willing to continue using Leroma after the project has come to an end? [yes/no]

C. Management of the products traded

13. Did some or all of the products traded on Leroma ended up as waste anyway? How often and in which proportion?

14. Concerning the storage of the products traded, please specify:
    (1) the typology of storage;
    (2) the time of storage;
    (3) whether a cooling unit is required;
    (4) whether this is a cost you would have incurred regardless of using Leroma.

D. Gender and survey satisfaction

15. Age and gender of the respondent.

16. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

39 LER Leroma (after implementation)

Information to be retrieved by Leroma at the end of the task

1. Number of searches made by each company on the Leroma platform.

2. Number of agreements activated and finalized through the Leroma platform by each company.

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3. Number of offers uploaded on the Leroma platform by each company.
4. Number of matches reached by each company.
5. Number of inquiries made to Leroma by potential buyers and sellers from Germany and Scotland (regardless of their registration).
6. Number of companies that registered to Leroma and then dropped out / did not finalise any transaction.

T5.1 KITRO Innovative bin

40 User (before, mid-term, at the end)

Questionnaire for the data collection for the sustainability assessment of the innovation Kitro

Date of interview:	Carried out by (ISUN):

Explanations to the survey

The survey is conducted in the form of a personal interview with the persons responsible for the project as the users and as the project partners. Some of the questions will be presented to the interview partners in written form so that they can gather the necessary information in a flexible manner.

There are three survey periods:

- **Before** using Kitro (**project beginning**)
- While using Kitro (**mid-term**)
- At the ending of the project (**project ending**)

The questions (blocks) marked in yellow must be answered at the middle and end of the

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project, all other questions must also be answered before using Kitro.

Privacy statement (will be added if required)

Part 1: General data on the organisation

• Name of the organisation:			
• Contact:			
• Number and gender of employ-ees - total:	female	male	diverse

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thereof: - Administration: - Production: - Management: - Cleaning: - Service staff:			

Please describe the organisation in which Kitro is used:

- **Catering system** (regeneration kitchen, cook & chill, cook & hold, etc.)

- **Serving system** (free-Flow, Buffet, Portion sizes etc.)

- **Menu** (e.g. number of menu lines, menu cycles, options to choose menu components)

- **Guests** (average number and deviations, target groups)

- **Other characteristics**

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Part 2: Questionnaire for users

Production of food (data collection period TBD)

7. Please send us the menus for the survey periods.
8. Were there any deviations in the dishes actually prepared (e.g. dishes produced at short notice)? *(entered into the ERP system?)*
9. How many guests were served daily during the data collection period?
10. What quantities (in kg) were produced (production quantity)?

    Production figures from ERP system?

    *Production volume (in kg) = Units of dished produced*weight per unit*
11. How many guests did you cater for daily during the survey period?
12. What was your turnover during the survey period? Is this a regular period or was it affected by unusual events?
13. What is the cost of the prepared dishes? *(can there be a breakdown by dishes/components here or is there an average value?)*
14. Can you provide information on the individual cost items?
15. What are the proportions (a-h) in relation to the costs per dish? Which of the costs would you consider as variable, e.g. changing with the number of dishes produced?
    a. *Raw material*
    b. *Energy*
    c. *Staff*
    d. *Cleaning*
    e. *Waste disposal (Do these refer to food waste only or to total waste?)*

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f. Storage
g. Other fixed cost
h. Other variable cost

Food waste (data collection period TBD)

16. Are there any bins other than those documented by Kitro through which food waste is disposed of?

17. If so, how many are the other bins and what is the proportion of the organic waste that goes to these ?

18. Waste disposal costs: What is the amount of waste disposal costs? What proportion of this is due to food waste? How is food waste disposed of (per tonne, per container, etc.)?

19. Which disposal company collects the waste? Can you provide information on what happens to the waste after collection?

Implementing and using Kitro

20. Which resources were required to use Kitro?
    e. technical Infrastructure (new computer, tablet, etc.)
    f. Qualification of staff
    g. Staff deployment (in hours and EUR) required for the implementation *(by gender)*
    h. Staff deployment (in hours and EUR) for the daily usage of Kitro *(by gender)*

21. Did you have to train staff to use Kitro? If yes, how extensive was the training (staff affected and duration of training)?

Kitro's impact on business operations and employees

22. Has your production planning process changed since you started using Kitro? *If so, please explain in which regard.*

23. Do you buy less raw materials since you started using Kitro? *If there is a change in the raw material purchase, how much is it for each ingredient after*

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the innovation?

How has your input-output productivity changed as a result of the innovation ? Please indicate these figures for before and after the innovation

unit of each raw material purchased (the unit could something like kg per week)

unit of each raw material disposed (the unit could something like kg per week)

number of each dishes produced

24. Are there certain dishes / menu components for which you plan production quantities more specifically since you started using Kitro / receive suggestions for changes from Kitro?

    Has the production process of your dishes changed since you started using Kitro? If so, please explain this change.

25. Are there any other processes in your company that have changed since you started using Kitro? *If so, please explain which processes are these.*

26. If there have been price changes for your items since Kitro was introduced, has the use of Kitro had an impact on this? Could you list the dishes whose selling price has changed and how much per dish ?

27. Have you always used the values suggested by Kitro during the survey period as a basis for your production planning? If not, how many of the suggestions did you use?

28. How many employees have developed new skills thanks to the use of KITRO, by gender?

- *Technological (use of pc software) [number]*
- *Technical (better understanding of how to manage food transactions) [number]*
- *Social/relational (with other users of the software, if relevant) [number]*

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Are there non-financial improvements and benefits through the use of Kitro (e.g. better agreements in the team, higher motivation, PR effects)? On a scale of 1-5, how would you rate these benefits (1 low, 5 high)?

Are there new income streams resulting from the innovation? If you answered yes to the previous question, please indicate the type of new income streams and their value in Euros.

Are there new subsidies and/or other monetary benefits received as results of food waste reduction after the innovation? If you answered yes to the previous question, please indicate their value in Euros.

If you received any subsidies and/or other monetary benefits as results of waste reduction, please specify whether these are (multiple choices possible):
One-off; Periodic; Fixed; Proportional to the quantity of waste; Other (please specify)

29. How has your awareness of food waste changed through the use of Kitro? *(open question + scale 1-5: 1-no change, 5-strong change)*?

    How has the awareness of the issue of food waste of the employees (if possible by gender) in production and service changed through the application of Kitro? (To be filled in by each employee; open question + scale 1-5: 1 - no change, 5 - strong change)?

To which extent do you agree with the following statements? (to be answered individually by the staff members also indicating gender, position and department, education and age[SP1])

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
Food loss and waste are major issues for the sustainability of the food systems in general					

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Food loss and waste are major issues in [insert the name of your sector here]					
Food loss and waste are major issues in [insert here the type of your organisation]					
I am concerned about the economic costs of food loss and waste in [insert here the type of your organisation]					
I am concerned about the environmental impact of the food loss and waste in [insert here the type of your organisation]					
I am committed to reduce the food loss in [insert here the type of your organisation]					

30. How has your behaviour changed? Has Kitro helped you to waste less food *(open question + scale 1-5: 1-no change, 5-strong change)?*

31. How has the behaviour of your production and service staff (if possible by gender) changed? Has Kitro contributed to them wasting less food *(open question + scale 1-5: 1-not a change, 5-significant change (less wastage)?*

32. Have you saved costs by using Kitro? How high are the savings and to which cost types can they be attributed (e.g. use of goods, energy, personnel, cleaning, disposal of food waste, storage costs, other fixed costs, other vari-

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able costs, etc.)?

33. Have other sources of income arisen for you through the use of Kitro? If yes, which ones?

34. Have new business contacts resulted for you through the use of Kitro (other suppliers, new distribution channels, etc.), if yes, which ones?

User-friendliness of Kitro

35. How satisfied are you with the following features of Kitro *(scale 1-5: 1-hardly satisfied, 5-very satisfied)?*
    a. *Quality of the service*
    b. *The dashboard of the innovation*
    c. *The features of the innovation -*
    d. *Ease of use for managers -*
    e. *Ease of use for kitchen staff -*

36. What features or design elements would you change or add to Kitro? (*open question*)

Evaluation of Kitro

37. Will you continue to use Kitro after the end of the project?

38. What expectations did you have when using Kitro with regard to reducing food waste? Were they fulfilled?

39. Have you talked to other institutions about Kitro? Have they expressed interest in implementing Kitro? How likely do you think they are to implement Kitro? *(Scale 1-5, 1-very unlikely, 5-very likely)*

40. Would you recommend Kitro to others?

41. Please rate the degree of difficulty for implementing Kitro:
    (Scale 1-5, 1-easy, 5-very difficult)

Other questions

42. What is your motivation for using Kitro? Please sort the possible reasons in

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order of decreasing importance (first mentioned most important - last mentioned least important). *(ask only at project beginning)*

- ☐ Other restaurants also participate.
- ☐ We can reduce the workload of the staff.
- ☐ We can optimise our production planning process.
- ☐ We are interested in participating in a scientific project.
- ☐ The costs for Kitro are covered by the project.
- ☐ We can reduce costs in the business.
- ☐ We can reduce food waste.
- ☐ We can act in an environmentally friendly way.
- ☐ Other:_____

43. Did you get access to further funding through participation in the project (e.g. food waste reduction funding)?

44. Please list job title, gender, task of the persons (without names) who were involved in the project (from the first meeting, background activity, implementation, PR, etc.).

45. How satisfied are you with this survey *(by gender, scale 1-5, 1-very satisfied, 5 not at all satisfied).*

41 Kitro

Part 3: Questions to the partners Kitro and iSuN

Questions for Kitro

<u>Determining the amount of food waste (Data collection period TBD)</u>

1. At which points in the production and serving process are the Kitro measuring systems placed? What type of waste is collected *(storage, production, serving losses/overproduction, leftover plates)?*

2. How many photos were taken during the data collection period?

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3. How did the use of Kitro/the resulting Kitro suggestions change the waste for certain food waste categories? *Please indicate the quantity and type of food waste*

4. How long does it take users to use Kitro on average each day?

Other questions

5. What are the costs of implementing Kitro?

6. List of persons (without names), job title, gender, task, who were involved in the project.

7. Computer: Location of the server

8. Computer: Server capacity

9. Computer: Type of CPU in use (e.g. Intel Skylake)

10. Technical equipment: Scale (number per user, lifetime)

11. Technical equipment: Type of bin (lifetime, number per user, size, weight, material)

12. Technical equipment: Camera (lifetime, number per user)

13. Business model: Who is the owner of the Kitro devices? Are the devices only used once per restaurant or are they reused again?

42 ISUN

Questions for ISUN

1. *List of persons (without names), job title, gender, task, who were involved in the project.*
2. *Gender of the interviewee(s)*

T5.2 MITAKUS Forecasting software for restaurants

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43 User (before, mid-term, at the end)

Questionnaire for the data collection for the sustainability assessment of the innovation Mitakus

Date of interview:	Carried out by (ISUN):

Explanations to the survey

The survey is conducted in the form of a personal interview with the persons responsible for the project as the user and as the project partners. Some of the questions will be presented to the interview partners in written form so that they can gather the necessary information in a flexible manner.

There are three survey periods:

- **Before** using Mitakus (**project beginning**)
- While using Mitakus (**mid-term**)
- At the ending of the project (**project ending**)

The questions (blocks) marked in yellow must be answered at the middle and end of the project, all other questions must also be answered before using Mitakus.

Privacy statement (will be added)

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Part 1: General information about the organisation (user)

• Name of the organisation:			
• Function of interviewee(s):			
• Number and gender of employ-ees - total:	female	male	diverse
- thereof: o Administration:			
o Production:			
o Service staff:			
o Management:			
o Cleaning:			
o Other Functions:			

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Please describe the organisation in which Mitakus is used:

- **Catering system** (regeneration kitchen, cook & chill, cook & hold, etc.)

- **Serving system** (free-Flow, Buffet, Portion sizes etc.)

- **Menu** (e.g. number of menu lines, menu cycles, options to choose menu components)

- **Guests** (average number and deviations, target groups)

- **Other characteristics**

Part 2: Questionnaire for users

Production of food (data collection period TBD)

1. Please send us the menus including prices for the survey periods.
2. What are the unit weights for each menu / dish?
3. What quantities (units or kg) were produced (production quantity)?
   Production figures for all main menus and side dishes/ other meal components

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from ERP System

Production volume (in kg) = Units produced unit weight*

4. Were there any deviations in the dishes actually prepared (e.g. other quantities or other dishes produced at short notice)? (*entered into the ERP system?)*

5. How large is the deviation between conventional production planning and planning with Mitakus?

Food waste (data collection period TBD)

6. What quantities (number or kg) of dishes produced were not sold (overproduction)? *Sales figures from ERP system*

   *Overproduction (in kg) = (production quantity – units sold) *unit weight*

7. Which quantities of overproduction were reused, which were thrown away (food waste)?

   Food waste = overproduction - food reused

8. Data to determine relative indicators (waste per guest): number of guests *(does the number of transactions documented in the system correspond to the number of guests?)*

Implementing and using Mitakus

9. What resources were necessary to use Mitakus?
   a. Technical infrastructure (new computer, tablet, etc.)
   b. Qualification of the MA
   c. Staff input (in hours and EUR) necessary for implementation (by gender)
   d. Staff input (in hours and EUR) for daily use (by gender)

10. Did you have to train staff to use Mitakus? If yes, how extensive was the training (staff involved, duration)?

Cost of food prepared and waste disposal

11. What is the cost of the dishes prepared? (can a breakdown by

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dish/component be given here or is there an average value?)

12. Can you give details of the individual cost items? What are the proportions (a-h) in terms of cost per dish?
    a. *Cost of raw materials*
    b. *Energy costs*
    c. *Personnel costs*
    d. *Cleaning costs*
    e. *Waste disposal costs (do these relate to food waste only or waste in total?)*
    f. *Storage costs*
    g. *Other fixed costs*
    h. *Other variable costs*

13. Waste disposal costs: What is the amount of waste disposal costs? What proportion of this is caused by food waste? How is the disposal of food waste accounted for (per tonne, per container, etc.)?

Impact of Mitakus on business operations and employees

14. How has your production planning process changed since you started using Mitakus?

15. Has the amount of raw materials purchased changed since you started using Mitakus (*how has it changed*)?

16. Has the production process of your dishes changed since you started using Mitakus?

17. Are there any other processes in your company that have changed since you started using Mitakus?

18. If there have been price changes for your meals since the introduction of Mitakus, has the use of Mitakus had an impact on this?

19. Have you always used the values suggested by Mitakus as a basis for your production planning during the data collection period? If not, how many of the suggestions did you use?

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20. Are there employees who have acquired new competences through the use of Mitakus (e.g. technological, technical, communication skills)? *By gender*

21. Are there non-financial improvements and benefits through the use of Mitakus (e.g. better agreements in the team, higher motivation, PR effects)?

    Open question + On a scale of 1-5, how would you rate these benefits (1 low, 5 high)?

22. How has your awareness of food waste changed as a result of using Mitakus/participating in the project?

    Open question + scale 1-5: 1 no change, 5 strong change

23. How has the awareness of the issue of food waste of the other employees (if possible by gender) who work with Mitakus changed through the use of Mitakus?

    Open question + filling in per MA; scale 1-5: 1 no change, 5 strong change

24. How has your behaviour changed? Has Mitakus contributed to you wasting less food?

    At work, in private - open question + scale 1-5: 1 no change, 5 strong change

25. How has the behaviour of your employees (if possible by gender) changed? Has Mitakus contributed to them wasting less food?

    Open question + scale 1-5: 1 no change, 5 strong change

26. Have you saved costs by using Mitakus? How high are the savings and to which items can they be attributed (e.g. waste disposal costs, energy, personnel costs, use of goods)?

<u>User-friendliness of Mitakus</u>

27. How satisfied are you with the following features of Mitakus?
    Scale 1-5: 1 hardly satisfied, 5 very satisfied
    a. The dashboard of the innovation
    b. The features of the innovation -

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c. Ease of use for managers -
d. Ease of use for kitchen staff -
e. Quality of service
f.

28. Which functions or design elements would you change or add to Mitakus? *(Free text)*

Evaluation of Mitakus

29. Will you continue to use Mitakus after the end of the project?

30. What expectations did you have when using Mitakus with regard to reducing food waste? Were they fulfilled?

31. Have you talked to other institutions about Mitakus? Have they expressed interest in implementing Mitakus?

32. Would you recommend Mitakus to others?

33. Please rate the level of difficulty for implementing Mitakus
Scale 1-5, 1-easy, 5 very difficult

Other questions

34. What is your motivation for using Mitakus? Please sort the possible reasons in order of decreasing importance (first mentioned most important - last mentioned least important). *(ask only at project beginning)*

☐ Other restaurants also participate.
☐ We can reduce the workload of the staff.
☐ We can optimise our production planning process.
☐ We are interested in participating in a scientific project.
☐ The costs for Kitro are covered by the project.
☐ We can reduce costs in the business.
☐ We can reduce food waste.
☐ We can act in an environmentally friendly way.

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☐ Other:_____

35. Did you get access to further funding through participation in the project (e.g. food waste reduction funding)?

36. Please list job title, gender, task of the persons (without names) who were involved in the project (from the first meeting, background activity, implementation, PR, etc.).

37. How satisfied are you with this survey?

    By gender, scale 1-5, 1-very satisfied, 5 not at all satisfied

38. Which disposal company collects the food waste? Can you provide information on what happens to the waste after collection?

Part 3: Questions for the partners Mitakus and iSuN

Questions for innovation partner Mitakus

1. What quantities (units or kg) of dishes produced were not sold (overproduction)? *Sales figures from ERP system*
   *Overproduction (in kg) = (production quantity – units sold) *unit weight*

2. What are the costs of implementing Mitakus?

3. List of persons (without names), job title, gender, task, who were involved in the project.

4. *How many times has Mitakus been integrated in the user system?*

5. *What is the number of companies that started using Mitakus at the piloting test?*

6. Location of the server

7. Server capacity

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8. Type of CPU in use (e.g. Intel Skylake)
9. Type of computer device

45 ISUN

Questions ISUN

10. List of persons (without names), job title, gender, task, who were involved in the project.
11. Genders of the person/s interviewed

T5.3 MATOMATIC

46 User

General information

Name of Kitchen:

Name, position and gender of contact person (s):

Number of staff by gender and position if possible:

Data related to food waste quantities and environmental impact will be collected from company records.

Efficacy

Replicability

- Would you like to continue to use the innovation after the project? (yes/no)
- How many in the staff have been involved in using the innovation? by gender, by role
- Will you promote the innovation to other kitchens? (yes, will / yes, already have/ no)

Utility

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- Are you satisfied with the innovation from Matomatic?
- How much do you think Matomatic helped your activity in reducing the FW?
- How many employees have developed new skills thanks to the use of Matomatic, by gender?
- Technological (use of pc software) [number]
- Technical (better understanding of how to manage food transactions) [number]
- Social/relational (with other users of the software, if relevant) [number]
- Do you think your purchasing habits have changed since your using Matomatic

How useful do you think this innovation is for your kitchen?

User-friendliness

- Which is the investment needed to purchase the innovation?
- Which is the average working hour cost in your company?
- Did you have to hire new personnel in order to use Matomatic? Please provide a short demographic: age, gender, position
- Who in your company is in charge of dealing with MATOMATIC innovation? Please provide a short demographic: age, gender, position
- Has your trust in other partners increased due to this innovation?
- Has your communication with other actors increased due to this innovation?
- How often do you contact Matomatic for issues with their innovation? e.g.: every day; once a week; once per month; once every six months; once a year
- How much do you agree with the following statements?
  - The dashboard of the innovation is good
  - I like the features of the innovation
  - The innovation is easy to use for managers

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- The innovation is easy to use for kitchen staff
- I am satisfied with the service offered by Matomatic

- Open question: What are the features of the innovation you would change or add?
- How difficult was it to start using the innovation on a 1= at all to 5= very difficult scale?
- Hours you dedicate weekly to use Matomatic innovation/Total weekly hours?

Socio-economy

Profitability

- What is the (daily weekly/monthly?) expenditure of the school canteen for meal ingredients?
- What are the fixed costs of food management other than buying the food itself ? (e.g. buying an operating a larger fridge, staff time)
- What are the variable costs of food management other than buying the food itself ? (e.g. packing, electricity and water for dishes and other purposes)
- What are the cost, charge structure and mode of disposing organic waste for an educational unit?
- What is the change in the annual balance (due to additional income or avoided cost) resulting from the innovation? What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training etc.)?

Behaviour

- Has there been a change in awareness in the staff (if possible by gender) and management? Self-assessment of awareness of the food waste problem (Likert scale from “very aware” to “not aware at all”) by the respondent and by each of the employees involved in managing the food product transferred.
- Has there been a change in attitude in the staff (if possible by gender) and

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management? Self-assessment of concerns for, and commitment to, food waste reduction (Likert scale, from “a lot” to “not at all”) by the respondent and by each of the employees involved in managing the food product transferred.

Environment

- How do you manage your food waste? Can you estimate a share of used pathways?

  Food donation to charities/food banks (%)

  Directly to Composting (%)

  Directly to Anaerobic digestion (%)

  Directly to Incineration (%)

  Municipal or commercial solid waste collection system (‘residual waste bin’) (%)

  Separate collection system for organic waste (‘organic waste bin’)(%)

  Other: Please specify (%)

Matomatic

To ask Matomatic once

- Could you provide us with information of the technical equipment used in the innovation? (Type and number of equipment, picture of the equipment, …)
- Who is the owner of the devices? Are the devices only used once or are they re-used?
- Do you use a server for your programme?
- Has the software provider information to the server capacity? Where is the server located?
- How much of the total server capacity is used for the software (in vCPU/CPU in

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use)?

- Which type of CPU is used (e.g. Intel Skylake)
- Do you need to buy new devices to run this software? Or do you use existing devices? Which device do you use (tablet/iPad, computer, notebook, smartphone)

T5.4 SLU/AIE Holistic educational approach

47 User (before and after the implementation)

Questionnaire to evaluate the current situation of food waste at your school

To be able to measure the effectiveness of various innovative approaches to food waste avoidance in schools, the situation before and after the planned activities should be surveyed. The data are not published and are only used to determine whether and to what extent the implementation of the educational concept affects behaviour and the amount of waste generated during lunch.

General Information

Name of the school:

Name, position, and gender of the contact person (s):

Number of students at the school by gender:

Number of students at the buffet by gender:

Number of teachers by gender and position:

Number of administrative staff by gender and position:

Kitchen staff / canteen staff by gender and position:

Type of food preparation:
(Cooked on site, delivered freshly cooked, cook & chill ...)

Contact:

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Type of food serving:
(Serving by kitchen staff, buffet operation, handing out of the ready-made plate, serving of the ready-made plate ...)

Contact:

How does the ordering system work (order time, electronic, rejections, changes ...)?

Date of the survey:

Carrying out the survey:

Notes: *yellow = after application of the innovation*, *grey = still to be clarified*, pink = not to be answered by the schools, *green text = internal and for the interviewer*
Collection of data BEFORE implementation of the educational concept (baseline collection)

Socio-economic considerations

Q1. What is the average expenditure in the school canteen on groceries? (daily / weekly / monthly costs for the purchase of goods; per serving) or

What are the average expenses of the school maintainer for meals? (daily / weekly / monthly cost of meals; average cost per serving)

Q2. What are the fixed costs of managing food apart from the cost of the food itself? (e.g. .: procurement, storage, employee costs) -> important for comparing the effort

Q3. What is the variable cost of food management other than the cost of the food itself? (e.g. .: packaging, electricity and water for dishes and other purposes) -> important for comparing the effort

Q4. What are the disposal costs for excess food and plate scraps for your educational institution? (Differentiation between lunch and general leftovers possible, e.g., buffet, school snacks?) -> important for the comparison of the effort

Q5. How many meals are sold / served each week? (If possible, please specify the type of food / menu composition: number of starters / soups, number of main

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dishes including side dishes, number of desserts; total number of menus) -> possible submission of documents

Please select the appropriate option:

Q6. What is the cost structure for the disposal of kitchen waste, surplus food, and leftover plates? (Costs for certain collection intervals, container volume, weight; bearer of the costs?)

Q7. What are the costs of a meal for the students? (How are the costs made up? Does the school / municipality specify a standard price for meals?) Is there a correlation between the cost and type of certain meals and leftover plates?

Q8. What are the costs of a meal for the school or the school-maintaining organization / municipality? (How are the costs made up? Does the school / municipality specify a standard price for meals?) Is there a correlation between the price and type of certain meals and leftover plates?

Q9. What subsidies / other cash benefits (in euros) do you receive for reducing waste? (Stating whether these are one-off, periodic, fixed, or proportional to the amount of waste) AFTER application of the EDUCATIONAL CONCEPT; Asked about the future: ... can be expected due to the reduction in waste?

Q10. Has the introduction of the educational concept resulted in cost savings? If so, by how much (in EUR) and in what form (less food ordered, less energy used for cooling, ...)? AFTER application of the EDUCATIONAL CONCEPT

Q11. How big is your commitment to reducing food waste? (Likert scale from "very large" to "not available / not yet ...") *(to be answered by the interviewee and all employees (if possible by gender) who are involved in food management.)*

Q12. Has the personnel / hourly workload changed due to the introduction of the educational concept (if possible by gender)? How many jobs (by gender) in full-time equivalents (FTE) were created or cut as a result of the introduction of the educational concept? (If it is only a part of the time of one or more employees, please state the entire proportion of FTEs) AFTER application of the EDUCATIONAL CONCEPT

Q13. Have other organizations / schools been informed of the testing and imple-

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mentation of the educational concept? If yes, how many? Total of all organizations / schools informed

How many of them said they were interested?

How many of them would like to use the EDUCATIONAL CONCEPT? evaluate at the end of the project? Time of the survey - after the demonstration? Later?

Efficiency & Effect after application of the EDUCATIONAL CONCEPT

Q14. Who is responsible for the educational concept at your school? If possible, please indicate the number, age, gender, and area of responsibility.

Q15. Would you like to continue using the educational concept at your school?
Yes / No / Maybe

Q16. How did you get starting the educational concept? Were there any difficulties? What did you like and what didn't you like? Open question!

Q17. How often was something unclear during the use of the educational concept? Are you satisfied with the way you have been helped with occurring problems? Will you recommend the educational concept to other schools?

Q18. How many students have been involved in the educational concept in total? If possible, please indicate the number (per day or per week), age, and gender.

Q19. How many teachers were involved in the educational concept? (informed the class, supervised during lunch ...) *If possible, please indicate the number, age and gender.*

Q20. How many kitchen workers were involved in the educational concept? *If possible, please indicate the number, age and gender.*

Q21. How much additional work do you estimate was required (in h, euros, or number of people) for the educational concept?

Q22. Did you have to organize / hire additional staff (if possible by gender) for the educational concept?

Q23. Has your trust to other partner increased due to this innovation?

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Q24. Has your communication with other actors increased due to this innovation

Q25. Was the educational concept received well by the students during the period (use interval)? Please explain your answer (why was the educational concept well received or why not?) *Definition of the intended usage intervals!*

Q26. Did you continue to use educational concept at your school after completing the survey? How many students (if possible by gender) were involved at the educational concept after completing the survey?

Q27. How useful do you think is the educational concept for your school?

Q28. Were additional purchases or procurements necessary for the implementation of the educational concept? *What was necessary to do/get before starting with the application of the EDUCATIONAL CONCEPT?*

Q29. Are you willing to promote the educational concept to other partners? [yes/no]

Environmental Factors

Although our work mainly deals with plate leftovers, it is important for us to record other food waste along the value chain in order to find out whether food waste has been shifted to other stages and to prove overproduction if applicable.

Q30. How aware are you of the food waste issue? (Please answer the question for the whole team if possible, disaggregate by gender if possible)

Q31. Is food waste separately collected from other solid waste fractions (e.g. packaging or other residual waste)? Yes/No

Q32. How is organic waste currently being disposed of? *(Feeding, composting, biogas plant, thermal utilization, sewage treatment plant?) Please select the appropriate option:*

Q33. How and in which area of the kitchen (plate-leftovers, serving-leftovers / buffet-leftovers, other places) have the leftovers changed due to the use of the EDUCATIONAL CONCEPT (in kilograms)? *Asking for the quantities of the reduction as well as looking at waste-accumulation points in the kitchen!* □ AFTER use

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of the EDUCATIONAL CONCEPT

Q34. Has your ordering / buying behaviour for lunch changed since implementing the educational concept? Yes, …; No, because… AFTER use of the EDUCATIONAL CONCEPT

Q35. Has the educational concept resulted in less food being ordered overall? If so, by how much? (In kilograms per month) AFTER use of the EDUCATIONAL CONCEPT

Thank you for your help in collecting the data! You have made a valuable contribution to reducing food waste.

T5.5 CozZo Mobile app

48 Households (before implementation)

I Baseline questionnaire for households (before the innovation)

Background information of the member of the household who is in charge of food management (shopping, cooking etc.) OR who will most likely use the CozZo app the most.

1. Gender:
   Male
   Female
   Other
   I prefer not to say

2. Age: Year of birth _____

3. Household composition:
   One adult
   One adult + one child
   One adult + two children
   One adult + three or more children
   Two persons/adults without children
   Two persons/adults + one child

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Two persons/adults + two children
Two persons/adults + three or more children
Three or more persons/adults without children
Three or more persons/adults + one child
Three or more persons/adults + two children
Three or more persons/adults + three or more children

4. Optional: Please specify gender and age of other household members:
   _____

5. Total household income (gross income per month in total):
   Less than 1.000 €
   1.000 €–1.999 €
   2.000 €–2.999 €
   3.000 €–3.999 €
   4.000 €–4.999 €
   5.000 €–5.999 €
   6.000 €–6.999 €
   7.000 €–7.999 €
   8.000 €–8.999 €
   9.000€ or more
   I prefer not to say

6. Which of the following describes your current work life situation the best?
   Employed full-time
   Employed part-time
   Unemployed or laid off
   Student
   Stay-at-home parent
   On long-term sick leave
   Retired
   Other: please specify_____

Relative indicators:

7. Household food wasted before the innovation: Frequency of disposal and amount of food wasted

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(In addition to self-assessment, waste amounts are collected by researchers by using separate bins.)

Please indicate the food group and estimate the frequency and amount wasted per each food group in your household:

Food groups:
fruits and berries
vegetables, legumes and fresh herbs
potatoes and potato products
pasta, rice and corn products
meat
fish
eggs
dairy products
bread and rolls
sweet and savoury bakery products
home-made meals
fresh convenience meals
processed vegetable and fruit products
spices
cooking residues and plate/pot waste.
Other, please specify: _____

Frequency (for each food group):
6–7 times per week
3–5 times per week
1–2 times per week
2–3 times per month
about once per month
less often or never

Amount of waste (one portion = about one handful of food):
more than 3 portions
2–3 portions
about 1 portion
½ portion and less or nothing.

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8. Do you collect food waste separately from other solid waste fractions? (Yes/No)
   If yes, together with garden and yard waste (Yes/No)
   Which options do you use for your food waste disposal?
   - Redistributing to other people (e.g. family, friends, neighbours)
   - Feeding to pets (or wild animals)
   - Home-composting
   - Municipal solid waste collection system ('residual waste bin')
   - Separate waste collection system ('organic waste bin')
   - Other: please specify

9. Cost of weekly household food purchasing before the innovation (€)
   a. Estimate (in euros), how much money does your household spend on food weekly (for a regular week, not including e.g., holidays or parties). Please make the estimation by calculating from your shopping receipts or debit/credit card statements.

      _____

Behaviour

10. Reasons for food waste:
    a. In your household, how often does food end up wasted due to the following reasons? (Likert scale 1-5: 1=never due to this, 5=very often due to this)
       The date in the date label has passed.
       The packaging size of the food I bought does not meet my needs and food is left over.
       The food has spoilt (e.g. rotten or become mouldy) before I manage to use them.
       I have prepared too much food for one meal.
       I am not sure whether I can still eat the food and I throw it away just to be safe.
       I don't want to eat the same kind of food for several days at a time.
       I/we didn't like the taste of the food.
       Children leave food uneaten.
       I buy ingredients for a recipe and part of them are left unused.
       I buy food that I later do not fancy eating.
       I/we have bought too much food.

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11. Self-assessment of awareness of the food waste problem:
    a. How aware do you consider to be of the food wasted (amount, composition) in your household? (Likert scale 1–5: 1 = not aware at all, 5 = very aware)

12. Self-assessment of concerns for, and commitment to food waste reduction:
    a. How committed to food waste reduction do you consider to be? (Likert scale 1–5: 1=not at all, 5=very committed)
    b. How much effort have you taken towards reducing food waste in your household? (Likert scale 1–5: 1=no effort at all, 5=a lot of effort)
    c. Please list the kinds of efforts / methods that you have taken towards reducing food waste in your household:
       _____

Consumer habits

13. Frequency of purchases in brick-and-mortar stores
    a. How often do your household members go grocery shopping in brick-and-mortar stores?
       several times a day
       6–7 times per week
       3–5 times per week
       1–2 times per week
       2–3 times per month
       once per month or less

14. Consumer travel for purchases
    a. Which mean of transport do your household members primarily use for their grocery shopping trips?
       car
       bike
       bus
       train
       scooter
       by foot
       other, please specify_____

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15. Frequency of online purchasing
    a. How often do your household members buy groceries online?
       several times a day
       6–7 times per week
       3–5 times per week
       1–2 times per week
       2–3 times per month
       once per month
       5-6 times a year
       2-3 times a year
       less than 2 times a year
       never

16. Frequency of eating out or ordering take-away
    a. How often do your household members eat out (e.g., in restaurants) or order take-away food from restaurants?
       several times a day
       6–7 times per week
       3–5 times per week
       1–2 times per week
       2–3 times per month
       once per month
       5-6 times a year
       2-3 times a year
       less than 2 times a year
       never

Satisfaction with the survey:

17. On a scale from 1 (not at all satisfied) to 5 (very satisfied), can you rate your satisfaction for this survey?

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II Monitoring questionnaire for households (after the innovation)

Background information of the respondent (preferably the same person who has filled the baseline questionnaire):

1. Gender:
   - ☐ Male
   - ☐ Female
   - ☐ Other
   - ☐ I prefer not to say

2. Age: Year of birth _____

3. Household composition:
   - ☐ One adult
   - ☐ One adult + one child
   - ☐ One adult + two children
   - ☐ One adult + three or more children
   - ☐ Two persons/adults without children
   - ☐ Two persons/adults + one child
   - ☐ Two persons/adults + two children
   - ☐ Two persons/adults + three or more children
   - ☐ Three or more persons/adults without children
   - ☐ Three or more persons/adults + one child
   - ☐ Three or more persons/adults + two children
   - ☐ Three or more persons/adults + three or more children

4. Optional: Please specify gender and age of other household members:
   _____

5. Total household income (gross income per month in total):
   - ☐ Less than 1.000 €
   - ☐ 1.000 €–1.999 €
   - ☐ 2.000 €–2.999 €
   - ☐ 3.000 €–3.999 €
   - ☐ 4.000 €–4.999 €
   - ☐ 5.000 €–5.999 €

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- ☐ 6.000 €–6.999 €
- ☐ 7.000 €–7.999 €
- ☐ 8.000 €–8.999 €
- ☐ 9.000€ or more
- ☐ I prefer not to say

6. **Work life situation:** Which of the following describes your current work life situation the best?
   - ☐ Employed full-time
   - ☐ Employed part-time
   - ☐ Unemployed or laid off
   - ☐ Student
   - ☐ Stay-at-home parent
   - ☐ On long-term sick leave
   - ☐ Retired
   - ☐ Other: please specify_____

Relative indicators:

7. Household food wasted after the innovation: Frequency of disposal and amount of food wasted
   (In addition to self-assessment, waste amounts are collected by researchers by using separate bins.)

   Please indicate the food group and estimate the frequency and amount wasted per each food group in your household:
   Food groups:
   - fruits and berries
   - vegetables, legumes and fresh herbs
   - potatoes and potato products
   - pasta, rice and corn products
   - meat
   - fish
   - eggs
   - dairy products
   - bread and rolls
   - sweet and savoury bakery products

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home-made meals
fresh convenience meals
processed vegetable and fruit products
spices
cooking residues and plate/pot waste.
Other, please specify: _____

Frequency (for each food group):
6–7 times per week
3–5 times per week
1–2 times per week
2–3 times per month
about once per month

less often or never
Amount of waste (one portion = about one handful of food):
more than 3 portions
2–3 portions
about 1 portion
½ portion and less or nothing.

8. Cost of weekly household food purchasing before the innovation (€). *This amount excludes occasions of eating out or ordering take-away by household members.*
   a. Estimate, how much money does your household spend on food weekly (for a regular week, not including e.g., holidays or parties) (in euros)?
   _____

Behaviour:

9. Reasons for food waste:
   a. In your household, how often does food end up wasted due to the following reasons? (Likert scale 1-5: 1=never due to this, 5=very often due to this)
   The date in the date label has passed.
   The packaging size of the food I bought does not meet my needs and food is left over.
   The food has spoilt (e.g. rotten or become mouldy) before I manage to use

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them.
I have prepared too much food for one meal.
I am not sure whether I can still eat the food and I throw it away just to be safe.
I don't want to eat the same kind of food for several days at a time.
I/we didn't like the taste of the food.
Children leave food uneaten.
I buy ingredients for a recipe and part of them are left unused.
I buy food that I later do not fancy eating.
I/we have bought too much food.

10. **Self-assessment of awareness of the food waste problem:**
    a. How aware do you consider to be of the food wasted (amount, composition) in your household? (Likert scale 1–5: 1 = not aware at all, 5 = very aware)

11. **Self-assessment of concerns for, and commitment to food waste reduction**:
    a. How committed to food waste reduction do you consider to be? (Likert scale 1–5: 1=not at all, 5=very committed)
    b. How much effort have you taken towards reducing food waste in your household? (Likert scale 1–5: 1=no effort at all, 5=a lot of effort)
    c. Please list the kinds of efforts / methods that you have taken towards reducing food waste in your household:
    _____

Consumer habits:

12. Frequency of purchases in brick-and-mortar stores
    a. How often do your household members go grocery shopping in brick-and-mortar stores?
    several times a day
    6–7 times per week
    3–5 times per week
    1–2 times per week
    2–3 times per month
    once per month or less

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13. Consumer travel for purchases
    a. Which mean of transport do your household members primarily use for their grocery shopping trips?
       car
       bike
       bus
       train
       scooter
       by foot
       other, please specify_____

14. Frequency of online purchasing
    a. How often do your household members buy groceries online?
       several times a day
       6–7 times per week
       3–5 times per week
       1–2 times per week
       2–3 times per month
       once per month
       5-6 times a year
       2-3 times a year
       less than 2 times a year
       never

15. Frequency of eating out or ordering take-away
    a. How often do your household members eat out (e.g., in restaurants) or order take-away food from restaurants?
       several times a day
       6–7 times per week
       3–5 times per week
       1–2 times per week
       2–3 times per month
       once per month
       5-6 times a year
       2-3 times a year
       less than 2 times a year

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never

User-friendliness:

(NB! In addition to these questions, qualitative, open ended questions about user-friendliness of the CozZo app will be included in the same survey; those questions will be decided later)

16. Number of enquiries made for issues with the innovation:
    a. Have you contacted either LOWINFOOD researchers or CozZo customer support about issues related to the use of CozZo app? (Yes/No)
    b. How often have you contacted them?
       Every day
       Few times a week
       Once a week
       Few times a month
       Once a month
       Never

17. Perceived difficulty in the start
    a. How difficult was it to start using the CozZo on a scale from 1 to 5? (Likert scale 1–5: 1=Very difficult, 5 = Very easy)

18. Number of hours spent in using the app:
    a. Please choose all household members who have used the CozZo app and provide background information for all of them (see 12b)
       adult 1
       adult 2
       adult 3
       adult 4
       child 1
       child 2
       child 3
       child 4
       child 5
       other, please specify_____
       other, please specify_____
    b. For each of the household members above, please provide this background

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information: gender (female, male, other, no prefer not to say), age: birth year, role: mostly in charge of food purchases (yes/no), mostly in charge of cooking (yes/no), participates in food purchasing (yes/no), participates in cooking (yes/no)

c. Please evaluate, how many minutes a day (on average) each above family member has dedicated to the use of the CozZo app?

Utility:

19. Weekly savings on consumers' food purchase:
    a. Since you started using the CozZo app, has your household's weekly food purchase cost:
       1=diminished
       2=slightly diminished
       3=stayed the same
       4=slightly increased
       5=increased?

20. Number of shopping lists created in the app:
    a. How many shopping lists have your household members created on the app?

21. Number of recipes created in the app:
    a. How many recipes have your household members created on the app?

22. Time spent in grocery shopping:
    a. Since you started using the CozZo app, has the time your household members spend for grocery shopping:
       1=diminished
       2=slightly diminished
       3=stayed the same
       4=slightly increased
       5=increased?

23. Share of households saying that the innovation met their expectations, and average rating:
    a. How much do you think the CozZo app has helped your household in reducing food waste? (Likert scale 1–5: 1= not at all, 5=a lot)

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b. Do you think your purchasing habits have changed since you started using the CozZo app? (Yes/No)
   □ if Yes: □ open question: Please describe how they have changed:_____
   _____
c. How useful do you think the CozZo app is for improving your household's purchasing habits (e.g., planning, checking inventory etc.)? (Likert scale 1–5: 1=not at all, 5=very useful)

24. Assessment of new skills thanks to the implementation of the innovation.
    a. Please evaluate how much the following skills you have improved thanks to the use of the CozZo app on a scale from 1 to 5. (Likert scale 1–5: 1=no improvement at all, 5= improved a lot)
        i. Technological skills, such as the use of mobile apps
        ii. Better understanding of food management at home (e.g., planning, buying, cooking, storing)

Profitability:

25. Change in direct input costs (food inputs):
    a. How much you consider your household has saved in their weekly food budget as a result of using the CozZo app? (Likert scale 1–5: 1=no savings at all, 5=saved considerable amount)

26. Change in fixed costs due to the innovation (e.g., storage space):
    a. Have your household members made purchases related to food storage as a result of using the CozZo app (e.g., food containers, freezer or fridge)? (Yes/No)
       □ If Yes: Open question: please describe in more detail.
       _____

Replicability:

27. Share of adopting users that are willing to continue applying the innovation:
    a. Do you think you will keep using the app? (Yes/No)

28. Number of users willing to promote the app:
    a. How likely are you to recommend the use of CozZo app to your family, friends, etc. on a scale from 1 to 5? (Likert scale 1–5: 1 = Very unlikely, 5 =

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Very likely)

Satisfaction with the survey:

29. On a scale from 1 (not at all satisfied) to 5 (very satisfied), can you rate your satisfaction for this survey?

Information to be retrieved from COZZO:
Number of downloads
App compatibility with iOS and Android
Number of subscriptions after downloads
App rating in Google Play/App Store
Number of COZZO users keeping interacting with the app after the end of demonstration.

T5.6 REGUSTO Mobile app

50 Restaurants

Questionnaire(s) to be used for the survey on Restaurant
1. Information on the restaurant

I.1. Restaurant name: _____

I.2. Location (province and municipality): _____

<u>Please describe your restaurant activity</u>:

I.3. Main type of cuisine in the restaurant (max 2 choices)

- ☐ Meat based
- ☐ Fish
- ☐ Vegetarian
- ☐ Ethnic cuisine
- ☐ Pizzeria
- ☐ Café/Bar
- ☐ Other (please specify): _____

I.4. Year in which the restaurant activity started:

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_____

I.5. Number of employees by gender and position:

_____

I.6. Number of seats:

_____

I.7. Annual Turnover (Year 2019):

- ☐ Less than 50,000 Euro
- ☐ Between 50,000 and 150,000 Euro
- ☐ More than 150,000 Euro

Focusing on the <u>respondent to the questionnaire</u>:

I.8. Please indicate your job position within the restaurant for which you are conducting the survey (i.e. restaurant owner, restaurant manager, restaurant director, etc.):

Job position_____

I.9. Gender

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to say

I.10. Please indicate your age:_____

I.11. Level of Education:

- ☐ Early childhood education ('less than primary') or no education
- ☐ Primary education
- ☐ Lower secondary education
- ☐ Upper secondary education
- ☐ Short-cycle tertiary education
- ☐ Bachelor's or short-cycle degree
- ☐ Master's degree
- ☐ Doctoral/PhD or equivalent level

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2. The situation before the introduction of REGUSTO innovation

2.1. How aware are you of food waste related issues? Please consider the following scale with 1= not at all aware and 5: extremely/completely aware.

Not at all aware	Slightly aware	Somewhat aware	Moderately aware	Extremely aware
☐	☐	☐	☐	☐
1	2	3	4	5

2.2. Please indicate your level of agreement with the following statement: *"You and your employees involved in food management are committed to reducing food waste".*

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly agree

2.3. Please provide your best estimate on the monthly amount (in kg) of the overall food production in your restaurant

Amount_____ in kg per month

2.4. Please provide your best estimate on the total amount (in kg) of food waste generated monthly in your restaurant's kitchen (kitchen waste)

Amount_____ in kg per month

2.5. Please provide an overall estimate of the percentage of leftovers made by your clients that are thrown into the trash each month compared to the food produced (client waste)

In total _____ %

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2.6. Please indicate what is your average food storage period before the introduction of REGUSTO Innovation. Please distinguish your response among the three categories specified in the table.

FRESH/FRIDGE PRODUCTS	FROZEN PRODUCTS	PANTRY PRODUCTS
☐ Less than 1 day	☐ Less than 1 day	☐ Less than 1 day
☐ 1-2 day	☐ 1-2 day	☐ 1-2 day
☐ 2-3 day	☐ 2-3 day	☐ 2-3 day
☐ 4-6 day	☐ 4-6 day	☐ 4-6 day
☐ More than 1 week	☐ More than 1 week	☐ More than 1 week

2.7. Please provide, approximately, the monthly overall amount of the fixed costs before the introduction of the REGUSTO Innovation

Amount_____ in Euro per month

2.8. Please provide, approximately, the <u>monthly</u> overall amount of the variable costs <u>before the introduction of the REGUSTO Innovation</u>

Amount_____ in Euro per month

2.9. Please indicate the modes of disposing organic waste in your restaurants (more than one answer choice is possible)

- ☐ Sort it as organic waste
- ☐ Undifferentiated garbage
- ☐ Composting
- ☐ Animal feed
- ☐ Anaerobic digestion
- ☐ Incineration
- ☐ Discards on land/at sea
- ☐ Plough-in/not harvested
- ☐ Landfill
- ☐ Sewer
- ☐ Other (please specify): _____

2.10. Taking into consideration the disposal mode(s) indicated in the previous question, please indicate which is, approximately, the total cost (<u>per month</u>) of organic waste disposal in your restaurant

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Amount_____ in Euro per month

52 Users (after implementation)

3. The situation after the introduction of REGUSTO innovation

3.1. After the introduction of Regusto APP within your restaurant, how aware are you of food waste related issues? Please consider the following scale with 1= not at all aware and 5: extremely/completely aware.

Not at all aware	Slightly aware	Somewhat aware	Moderately aware	Extremely aware
☐	☐	☐	☐	☐
1	2	3	4	5

3.2. Please indicate your level of agreement with the following statement:
***"You and your employees involved in food management are committed to reducing food waste after REGUSTO Innovation*?"**

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly agree

3.3. Please indicate the <u>monthly</u> amount (in kg) of the overall food production in your restaurant

Amount_____ in kg

3.4. Please indicate (in kg) the total amount of food waste generated <u>monthly</u> in your restaurant <u>after the introduction of REGUSTO Innovation</u> (kitchen waste)

Amount_____ in kg

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3.5. Please provide an overall estimate of the percentage of uneaten food that <u>each month</u> on average was thrown into the trash compared to the food produced <u>after the introduction of REGUSTO Innovation (client waste)</u>

In total_____ %

Please provide an overall estimate of the percentage of how many transactions were for take-away/for delivery.

_____

3.6. Please indicate what is your average food storage period <u>after the introduction of REGUSTO Innovation?</u> Please distinguish your response among the three categories specified in the table.

FRESH/FRIDGE PRODUCTS	FROZEN PRODUCTS	PANTRY PRODUCTS
☐ Less than 1 day	☐ Less than 1 day	☐ Less than 1 day
☐ 1-2 day	☐ 1-2 day	☐ 1-2 day
☐ 2-3 day	☐ 2-3 day	☐ 2-3 day
☐ 4-6 day	☐ 4-6 day	☐ 4-6 day
☐ More than 1 week	☐ More than 1 week	☐ More than 1 week

<u>Now, we ask you to provide us with some information on costs incurred or avoided after the introduction of REGUSTO innovation and how these have affected the overall budget of the restaurant</u>

3.7. Please provide, approximately, the <u>monthly</u> overall amount of the fixed costs <u>after the introduction of the REGUSTO Innovation:</u>

Amount_____ in Euro

3.8. Please provide, approximately, the monthly overall amount of the variable costs after the introduction of the REGUSTO Innovation:

Amount_____ in Euro

3.9. Consider your situation <u>after the introduction of REGUSTO Innovation</u>: please specify the mode(s) of disposing organic waste in your restau-

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rants. If necessary, it is possible to indicate more than one choice.

- ☐ Sort it as organic waste
- ☐ Undifferentiated garbage
- ☐ Composting
- ☐ Animal feed
- ☐ Anaerobic digestion
- ☐ Incineration
- ☐ Discards on land/at sea
- ☐ Plough-in/not harvested
- ☐ Landfill
- ☐ Sewer
- ☐ Other (please specify): _____

3.10. Taking into consideration the disposal methods indicated in the previous question, please indicate which is, approximately, the total cost (per month) of organic waste disposal in your restaurant, after the introduction of REGUSTO Innovation?

Amount_____ in Euro per month

3.11. Please indicate what are theoretical costs incurred (divided into fixed costs + variable costs) to dispose of the food sold on REGUSTO in case it ended up as waste and needed to be disposed by customers

Fixed costs: amount _____in Euro per month

Variable costs: amount _____ in Euro per month

3.12. Are there new income streams resulting from the REGUSTO Innovation?

- ☐ Yes
- ☐ No

3.13. If you answered yes to the previous question, please indicate an approximate amount and the type of new income streams.

New income streams, approximate amount per month: _____ (in Euro)

Type of Income streams: (please specify)_____

3.14. Are there new avoided costs resulting from the REGUSTO Innovation?

- ☐ Yes
- ☐ No

3.15. If you answered yes to the previous question, please indicate an approximate amount and the type of avoided costs.

Avoided costs, approximate amount per month: _____ (in Euro)

Type of avoided costs (please specify): _____

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3.16. What is the change in the monthly balance (due to additional income or avoided cost) resulting from the innovation?

In total_____%

3.17. Please indicate what has been, approximately, the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training etc.)

Amount_____ in Euro

3.18. Are there new subsidies and/or other monetary benefits received as results of waste reduction after the REGUSTO innovation?

- ☐ Yes
- ☐ No

3.19. If you answered yes to the previous question, please indicate in Euros the subsidies and/or other monetary benefits received as results of waste reduction (specifying whether these are one-off, periodic, fixed or proportional to the quantity of waste)

Amount_____ in Euro

- ☐ One-off
- ☐ Periodic
- ☐ Fixed
- ☐ Proportional to the quantity of waste
- ☐ Other (please specify)

<u>Now, we ask you to focus on the use of the application during the training period</u>

3.20. How many discounted meals, on average, are sold daily?

Open answer_____

3.21. How much does the selling price of products involved change compared to selling them without innovation? Please indicate a positive variation with "+" (i.e. +5% if the price has increased by 5%) and a negative variation with "-" (i.e. -5% if the price has decreased by 5%

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Change: _____%

<u>Now, we ask you some information about the implementation of the innovation</u>

3.22. Is the person in charge of the Regusto implementation different from the respondent to this questionnaire?

- ☐ Yes
- ☐ No

If you answered YES to the previous question, please answer the question below:

3.23. Who in your Restaurant is in charge of dealing with REGUSTO activity/ innovation?

Please indicate the following information

Gender:

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to say

Age: _____

Job Position: _____

3.24. Did your restaurant need to hire new staff to tackle innovation?

- ☐ Yes
- ☐ No

3.25. Please indicate, disaggregated by gender, the number of Full-Time Equivalent jobs created for (or lost due to) the implementation of the Regusto innovation (if this is only a share of time of one or more employees, please indicate the change in total hours worked

	Number of FTE jobs created	Number of FTE jobs lost	Change in total hours worked
Female			

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Male			
Other			

3.26. Please indicate the list of people who have contributed at different tasks related to the innovation (e.g. transferring the product, from making contacts to the delivery of the product) and for each person please indicate gender, company sector and job grade

Open answer _____

3.27. What is the average number (per month) of new buyers (clients or customers if possible by age and gender) with which you came into contact as a result of your involvement in the Regusto innovation?

- ☐ Numbers: _____
- ☐ Type of buyers (open response) : _____

3.28. Do you think there is a willingness to continue the relationship with these new buyers?

- ☐ Extremely unlikely
- ☐ Unlikely
- ☐ Neither likely nor unlikely
- ☐ likely
- ☐ Extremely likely

3.29. Did you have to buy new technological devices to use the Regusto innovation?

- ☐ Yes
- ☐ No, we used the existing devices

3.30. Which kind of electronic devices do you use to use REGUSTO? (More than one answer possible)

- ☐ Tablet / iPad
- ☐ Computer
- ☐ Notebook
- ☐ Smartphone
- ☐ Other (please specify): _____

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3.31. Did you use these devices solely for REGUSTO innovation?

- ☐ Yes
- ☐ No, I also use it for other purposes (please specify the additional purposes:_____)

3.32. How long did you use these devices for each single order?

- ☐ Less than 5 minutes
- ☐ 5-7 minutes
- ☐ 8-10 minutes
- ☐ More than 10 minutes

3.33. How many hours per week are dedicated to use REGUSTO Innovation?

- ☐ Less than 5 hours
- ☐ 6-10 hours
- ☐ 11-25hours
- ☐ 25-40 hours
- ☐ More than 40 hours
- ☐ Other (please specify): _____

4. Your satisfaction towards the innovation

4.1. How would you rate your level of satisfaction with the Regusto Innovation?

- ☐ Very dissatisfied
- ☐ Dissatisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Satisfied
- ☐ Very satisfied

4.2. Please indicate your likelihood of continuing using the Regusto App:

- ☐ Extremely unlikely
- ☐ Unlikely
- ☐ Neither likely nor unlikely
- ☐ likely
- ☐ Extremely likely

4.3. How much are you likely to promote the use of this app to your part-

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ners/friends, family etc…?

- ☐ Extremely unlikely
- ☐ Unlikely
- ☐ Neither likely nor unlikely
- ☐ likely
- ☐ Extremely likely

4.4. What are the features of the innovation you would change or add?

Please specify here your response:

_____

4.5. For each of the following statements, we kindly ask you to indicate your degree of satisfaction by selecting the modality that best represents your position (1 = strongly disagree; 5 = strongly agree):

	Strongly disagree (1)	**Disagree (2)**	**Neither agree nor disagree (3)**	**Agree (4)**	**Strongly agree (5)**
The dashboard of the innovation is good	☐	☐	☐	☐	☐
I like the features of the innovation	☐	☐	☐	☐	☐
The innovation is easy to use for managers	☐	☐	☐	☐	☐
The innovation is easy to use for kitchen staff	☐	☐	☐	☐	☐

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4.6. How difficult was it to start using the Regusto innovation? Please reply below by considering the scale 1 to 5 where 1= very difficult and 5= very easy

Very difficult	Difficult	Neutral: Neither difficult nor easy	Easy	Very easy
☐	☐	☐	☐	☐
1	2	3	4	5

4.7. Considering one week of using the Regusto APP in your restaurant: how often did you contact the Regusto customer service for the app/platform's issues?

- ☐ Every day
- ☐ Three to four times a week
- ☐ Twice a week
- ☐ Once a week
- ☐ Never
- ☐ Other frequency (please specify_____)

4.8. If you contacted the Regusto customer service, have they been able to help you with your problem?

- ☐ Yes, completely
- ☐ Yes, partially
- ☐ No, not at all

4.9. For each of the following statements, we kindly ask you to indicate your degree of satisfaction by selecting the modality that best represents your position (1 = strongly disagree; 5 = strongly agree)

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)

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The Regusto app was important in my activity for reducing FW	☐	☐	☐	☐	☐
The Regusto app was useful for my company	☐	☐	☐	☐	☐
Technological skills (use of mobile app, pc software) have been improved thanks to the use of Regusto innovation	☐	☐	☐	☐	☐
Technical skills (better understanding of how the FSC works) have been improved thanks to the use of Regusto innovation	☐	☐	☐	☐	☐

4.10. Please indicate your degree of satisfaction with the present survey

- ☐ Very dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat satisfied
- ☐ Very satisfied

4.11. Comments and suggestions:

_____

_____

_____

_____

Households

Questionnaire to be used for the survey on consumers/households

I. Information on the use of REGUSTO bag

1.1. What is the name and location of the restaurant service (restaurant, bar, café, etc.) that supplied you with the Regusto bag?

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Name and location (municipality and province):_____

1.2. Which transport did you use for your visit to the restaurant?

- ☐ Walking
- ☐ Bicycle
- ☐ Car
- ☐ Motorcycle
- ☐ City bus
- ☐ Metro/Tram
- ☐ Other (please specify)

1.3. What kind of food did the Regusto bag contain? (possible multiple responses)

- ☐ Appetizer
- ☐ First course
- ☐ Second course
- ☐ Side dish
- ☐ Sandwich
- ☐ Sweet
- ☐ Pizza
- ☐ Other (please specify):_____

1.4. During which meal did you use the Regusto bag?

- ☐ Breakfast
- ☐ Lunch
- ☐ Snack/aperitif
- ☐ Dinner
- ☐ Other (please specify:_____)

1.5. The use of the Regusto bag comes from a take-away meal or from a leftover of a meal consumed in the restaurant?

- ☐ Take away
- ☐ Leftover from a meal in the restaurant
- ☐ Other (specify):_____

1.6. In case it comes from a leftover, what was the main reason that caused it? (only 1 possible response)

- ☐ The portions were too big

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- ☐ I was not hungry
- ☐ I ordered too much food
- ☐ I did not like the meal
- ☐ Other (please specify):_____

1.7. How much food was in the Regusto bag when it was given to you by the restaurant?

Please take a photo and weigh the amount of food in the Regusto bag, just taken from the restaurant, before being consumed. We kindly ask you to take the photo from the top of the bag Regusto at the time of its withdrawal, in order to frame all the bag and the food contained inside.

In total _____ grams

1.8. For how long the food remained in the Regusto bag before being consumed?

- ☐ 6 hours from the time of purchase
- ☐ 6 to 12 hours from the time of purchase
- ☐ 24 hours from the time of purchase
- ☐ I never consumed it again

Where did you store the food remaining in the Regusto bag?

- ☐ in the fridge
- ☐ in the freezer
- ☐ at room temperature
- ☐ other

1.9. After using the Regusto bag, how much was the uneaten food remained in the bag without being consumed?

- ☐ All
- ☐ About half
- ☐ ¼ of the meal
- ☐ Less than ¼ of the meal
- ☐ All the food was eaten

1.10. How many people ate the food in the Regusto bag?

- ☐ 1 person
- ☐ 2-3 people
- ☐ 4-6 people

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- ☐ More than 6 people

1.11. In case a part of the food has not been consumed, please take a photo and weight the amount of food remained in the Regusto bag before throwing it away
In total _____ grams

1.12. In case a part of the food has not been consumed, what was the reason?
- ☐ I was not sure about the hygienic conditions in which I kept it/food safety reasons
- ☐ I forgot it
- ☐ I preferred to eat something else
- ☐ I tried to eat the food that was taken away, but the taste was no longer the same
- ☐ Other (please specify):_____

1.13. Where did you dispose the food that was uneaten from the Regusto bag?

1.14. Please specify if you (and your family) usually carry out any of the following food waste management practices (multiple answers possible):
- ☐ pet feeding
- ☐ home-composting
- ☐ municipal solid waste collection – residual waste bin
- ☐ municipal solid waste collection - organic waste bin
- ☐ other: please specify_____

II. Customer satisfaction section

2.1. Please indicate your likelihood of continuing using the Regusto App:
- ☐ Extremely unlikely
- ☐ Unlikely
- ☐ Neither likely nor unlikely
- ☐ Likely
- ☐ Extremely likely

2.2. How would you rate your experience with the Regusto Innovation?
- ☐ Very dissatisfied
- ☐ Dissatisfied

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- ☐ Neutral: Neither dissatisfied nor satisfied
- ☐ Satisfied
- ☐ Very satisfied

2.3. Please indicate the degree of likelihood of the following questions by considering the scale with 1= not at all aware and 5: extremely/completely aware

(1) Extremely unlikely
(2) Unlikely
(3) Neither likely nor unlikely
(4) Likely
(5) Extremely likely

How much are you likely to promote the use of this app to your partners/friends, family etc…?

☐ Extremely unlikely
☐ Unlikely
☐ Neither likely nor unlikely
☐ Likely
☐ Extremely likely

How much would you be willing to reuse the app?

☐ Extremely unlikely
☐ Unlikely
☐ Neither likely nor unlikely
☐ Likely
☐ Extremely likely

Do you think you saved money from your food purchasing costs thanks to the Regusto innovation?

☐ Extremely unlikely
☐ Unlikely
☐ Neither likely nor unlikely
☐ Likely
☐ Extremely likely

2.4. If you think you saved money from your food purchase costs thanks to

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Regusto innovation, please indicate how much, approximately, you think you have saved for each Regusto bag purchased.

Amount_____ in Euro

Do you think this amount met your expectation on food purchase savings through Regusto?

2.5. How difficult was it to start using the Regusto innovation? Please consider the following scale with 1= very difficult and 5 very easy

☐ 1. Very difficult
☐ 2 Difficult
☐ 3 Neither difficult nor easy
☐ 4 Easy
☐ 5 Very easy

2.6. Please indicate the degree of satisfaction with the survey

- ☐ Very dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat satisfied
- ☐ Very satisfied

2.7 Comments and suggestions:

_____
_____
_____
_____

III. Socio-demographic information

3.1. Gender

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to say

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3.2. Please specify your age: _____

3.3. Please indicate your nationality.

- ☐ Italian
- ☐ Other European country (please specify.....)
- ☐ Non-European country (please specify.....)

3.4. Please indicate your residence

Province: _____

Municipality: _____

3.5. Employment status

- ☐ Permanent employment
- ☐ Fixed-term employment
- ☐ Looking for a job
- ☐ Retired
- ☐ Student
- ☐ Housewife
- ☐ Other professional condition (please specify.....)

3.6. Please indicate your level of education

- ☐ Early childhood education ('less than primary') or no education
- ☐ Primary education
- ☐ Lower secondary education
- ☐ Upper secondary education
- ☐ Short-cycle tertiary education
- ☐ Bachelor's or short-cycle degree
- ☐ Master's degree
- ☐ Doctoral/PhD or equivalent level

3.7. Which of the following categories best describes your monthly and familiar NET income?

PERSONAL MONTHLY NET INCOME	NET HOUSEHOLD MONTHLY INCOME
¨ Less than 500 Euro	¨ Less than 500 Euro
¨ 500-1,000 Euro	¨ 500-1,000 Euro
¨ 1,001-1,500 Euro	¨ 1,001-1,500 Euro
¨ 1,501-2,000 Euro	¨ 1,501-2,000 Euro

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¨ 2,001-3,000 Euro	¨ 2,001-3,000 Euro
¨ More than 3,000 Euro	¨ More than 3,000 Euro

3.8. Please indicate the number of members (by gender and age if possible) in your family (household size). Include yourself in the calculation
Open numeric answer_____

3.9. Please indicate if there are children (under 14 years old) in your family and the corresponding age

- ☐ 1 Age:
- ☐ 2 Age:
- ☐ 3 Age:
- ☐ 4 Age:
- ☐ Other (please specify) Age:

Questions to be retrieved from REGUSTO

App compatibility with Android and iOS
Number of downloads
Number of subscriptions after downloads
Who is paying the bag? (consumer/restaurants/provided by Regusto for free)
Has the software provider information to the server capacity? Where is the server located?
How much of the total server capacity is used for the software (in vCPU/CPU in use)?
Which type of CPU is used (e.g. Intel Skylake)

Questions to Households?

Share of users saying that the innovation met their expectations and average rating
Difficulties in starting using the innovation
Use of the app by gender
Share of users that are willing to continue applying the innovation
Share of users that are willing to promote the use of the innovation
How would you rate your level of satisfaction with the Regusto Innovation?
What are the features of the innovation you would change or add?

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Which means of transport do you use for your restaurant visit?

For each of the following statements, we kindly ask you to indicate your degree of satisfaction by selecting the modality that best represents your position (1 = strongly disagree; 5 = strongly agree):

	Strongly disagree (1)	**Disagree (2)**	**Neither agree nor disagree (3)**	**Agree (4)**	**Strongly agree (5)**
The dashboard of the innovation is good	☐	☐	☐	☐	☐
I like the features of the innovation	☐	☐	☐	☐	☐
The innovation is easy to use for managers	☐	☐	☐	☐	☐
The innovation is easy to use for kitchen staff	☐	☐	☐	☐	☐

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