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small farms
small food businesses and
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Analytical Framework

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Executive summary

The overarching research question developed in the Conceptual Framework conveys the core objective of SALSA (*What is the contribution of small farms and of the related food businesses to sustainable FNS in a wide range of food systems*?) by highlighting that the research follows a systemic approach.

This Analytical Framework (AF) builds upon the Conceptual Framework to identify objectives and methodological steps of such systemic approach and to guide data collection and analysis (to be carried out as part of WP3) in all the reference regions (RR), at NUTS 3 level (identified in WP2). It also serves to analyse and interpret data once they have been collected.

This AF addresses Small Farms (SF) and Small Food Business (SFB) contribution to food and nutrition security from different standpoints: from the perspective of the regional food system into SF/SFB and, vice versa, from the perspective of SF/SFB into the regional food system, combining multiple data collection methods. The following table summarises the three main research hypotheses identified in SALSA, and the relevant analytic questions identified for each one (presented in D. 1.1), in the rows. The columns indicate three macro-phases of the methodology, further described in this AF to address the analytical questions. Each phase will be operationalised through specific data collection protocols developed in subsequent phases (in WP3). It should be noted that these are logical, rather than chronological steps.

Research Hypotheses	Phase 1. Analysis of the food systems	Phase 2. Analysis of the small farms	Phase 3. Analysis of the small farms in the food systems
HP 1: SF is a relevant source of sustainable food production (availability) for many regional food systems	Which are the most relevant food consumption patterns in the different regions, and their relationship with SF and SFB? (WP2 and WP3) Which food system actors and activities are involved in the generation of the FNS outcome in the reference region?	What is the estimated production capacity of SF in each region (together with WP2)?	What are the most significant differences between different regions in Europe regarding the role of SF and SFB in the food systems and towards FNS (comparative analysis in WP3)?
HP 2. SF and SFB provide food and incomes for rural households (access) in many regional food systems	How do SF and related SFB contribute to FNS within the food system?	How are SF and related SFB connected to the food system?	What are the system mechanisms involved in the generation of the outcome? (WP3). How do gender relationships affect features, evolution and contribution to FNS? (WP5) What are the barriers that prevent SF from delivering better FNS outcomes? (WP6).
HP 3. SF and SFB increases food systems' diversity thereby contributing to its resilience (stability)		Which types of SF are identifiable within each region regarding their livelihood strategies and contribution to FNS? (WP3). What are the evolutionary patterns of SF and how they could be profiled in relation to their future perspective? (WP3/WP4).	What are the main trends of change in the food systems and the factors that are perceived as influencing the future role of SF for FNS? (WP4). What are the key regulations and governance arrangements influencing SFs activities? (WP5). What are the enabling conditions that would allow SFs to deliver better FNS outcomes? (WP6). Which typology of SF can be used to frame the identification, systematization and communication of the enabling conditions? (WP6).

Overall, the process follows a regional approach to understand the territorial context and, by means of subsequent comparative analysis, the differences between territories.

Step 1 comprises a preliminary analysis of the food systems identified in each RR, focusing on the balance of production and consumption, based on desk analysis and exploratory interviews with key informants. It will bring to an estimated quantification of a food balance sheet for each RR and to a first draft map of the food system.

Step 2 addresses small farmers, in their connections within regional food systems, to understand their contribution to food and income provisioning in rural household and the extent and characteristics of market integration. The analysis will be carried out through in-depth interviews aimed at gaining a more detailed understanding of how SF/SFB operate.

Step 3 is focused on the analysis and mapping of the food system and sub-systems identifiable within the selected RR. The aim is to explore the role played by the various food system actors, **i**n relation to selected staple food items. This step will bring to the definition of 3-4 specific food maps, always at NUTS 3 level, in which main food systems actors and flows related to specific food consumption patterns are identified and discussed. In order to assess and validate the research outcomes, a final regional workshop (on the regional food system as a whole) will be carried out, particularly focusing on governance and gender issues affecting these small farms and small food businesses.

1. Objectives of the Analytical Framework

1.1 The analytical framework in SALSA

As argued in the Conceptual Framework (CF), the SALSA project examines the contribution of small farms and small food business (SF/SFB) to sustainable food and nutrition security (SFNS).

The analysis foreseen in this AF aims at developing of a typology/profile of regional food systems in the Reference Regions of SALSA. This includes a first assessment of the role of small farms and small food businesses in these systems, with an estimation of the relative quantities of production and consumption, and the relevant processing and distribution patterns, and related fluxes. It also includes an assessment of SF and SFB positioning in the food system, and the limiting and enabling conditions, with a focus on the sustainability of these food systems. The role of small farms is assessed primarily in the interplay between their integration in the market and their relevance for their own household consumption. To be able to tackle the complexity of food systems, only a selected group of staple foods will be analysed.

This Analytical Framework (AF) builds on the CF to identify rationale, objectives and methodological steps for data collection and analysis in WP3. WP3 constitutes the core of the SALSA project, as it is the phase in which most desk and field research activities (data and information gathering) will be carried out in all the reference regions (RR) identified in WP2[1]. This AF is meant both as a guide to help develop and implement the methodologies for data collection in each region, and as a framework to analyse and interpret the data once they have been collected.

The overarching research question on which the CF has been developed

> *What is the contribution of small farms and of the related food businesses to sustainable FNS in a wide range of food systems*?

This question expresses the core objective of SALSA and underlines that the research follows a systemic approach.

By "related food business" we mean that we consider (small) food business as long as it is directly related to small farms activity, either because it is developed by the farm itself, with forms of vertical integration of processing and retailing activities, or because it is an independent business but mostly relying upon small farms' produce. Interviews and focus groups will harvest information useful to better identify these features in each RR.

The AF reflects this overall approach, indicating a three-phases methodology with 1) the analysis of the food system identified in each RR (at NUTS 3 level for Europe), focused on the analysis of a production/consumption balance, 2) the analysis of the contribution of small farms (SF) and of the related food businesses (SFB) to the food systems and to sustainable FNS, and 3) a detailed analysis of the food systems in the RR with focus on the consumption patterns.

[1] The guidelines for the activities related to the validation and integration of WP2 outcomes, in relation to the SENTINEL 2 mapping, are provided by UEvora team in another document.

The process follows a regional approach, which allows to understand the territorial context and the differences between different territories.

1.2 From the conceptual framework to the analytical framework

The CF underlines that the contribution of SF/SFB to SFNS should be analysed with a food system approach. This implies that the activity of SF/SFB will be analysed in the context of a given food system and with reference to its outcomes, as in Figure 1.

Figure 1

In the CF we pointed out that a food system can be analysed starting either from the food production or from food consumption side, which results in the identification of food production and a food consumption system respectively, as in Figure 2.

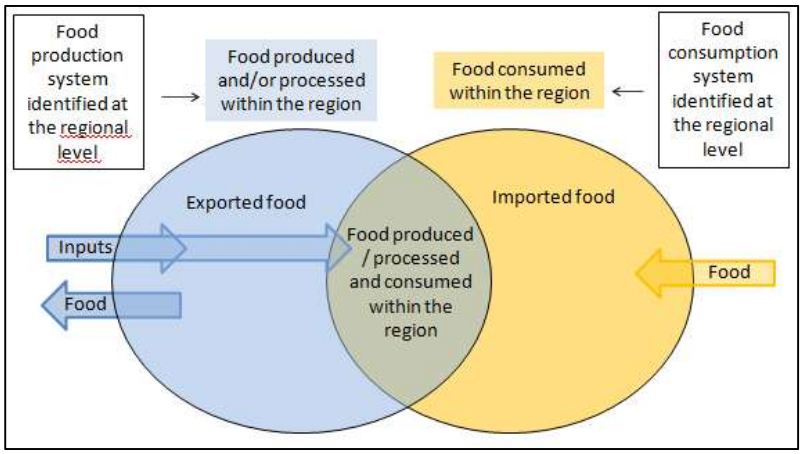

Figure 2 - *Food production and food consumption systems (modified from UNEP 2016)*

1.3 Research questions

Starting from the assumption that SFs contribute to SFNS through their participation in the food system, we can assess which forms this contribution assumes in the various territorial contexts, which contribution they are likely to provide in the future, and which conditions could valorise and strengthen SFs contribution.

Three main hypotheses have been identified and, for each of them, a set of key research questions (and sub-questions) have emerged, been discussed, re-elaborated by partners during the third project meeting (Valencia meeting, 2018).

The following research questions summarise the findings expected from WP3, to be harvested through data collection and analysis and developed in the following WPs. Since WP3 findings will be utilized also in the following WPs, some additional questions have been suggested by the other WP leaders, in addition to the ones more directly pertinent to WP3 and referable to the WP3 specific objectives stated

in the DoW[2]. The informative needs for WP4, 5 and 6 are summarised in Annex 3. WP1 is also interested by the research outcomes, as they will feed the process of refinement and grounding of the CF.

1) H1. SF is a relevant source of sustainable food production for many regional food systems (i.e. AVAILABILITY)

- Which food system actors and activities are involved in the generation of the FNS outcome in the reference region?
    - What are the main actors/nodes in the food system for a particular "key product"?
    - What are key fluxes between the actors in the food system for a particular "key product"? what is the magnitude of these fluxes?
    - Which of the relationships between the nodes are particularly robust and which are vulnerable to shocks and why?
- What is the estimated production capacity of SF in each region
    - What is the estimated production capacity of SFs for key products?
    - How does it differ from official statistics?
- What is the relevance of non-marketed SF production for rural households?
    - How much of the key products consumed in the farm household are produced by the SF itself?
    - Where does the production of key products in SFs go to? (self-consumption, gift, direct sale or short supply chain, market)
- What is the position (and importance) of SF in the regional FNS
    - What is the importance of SF in the production of key products in the RR?
    - Who are the first buyers of the products produced in SF?
    - What is the relative importance of SF in supplying each of the "access points" identified in Q1?
    - Do different farm types imply any differences in answering any of the above 3 questions? how?
    - What are the different "access points" in which consumers access different products within the region?

2) H2. SF and SFB provide food and incomes for rural households in many regional food systems (i.e. ACCESS)

- How are SFB connected to Small farms and the regional food system?
    - What are the different types of SFB?
    - How are they connected to SF?
    - What types of markets do SFB access?
- Which types of SF are identifiable within each region regarding their livelihood strategies and contribution to SFNS?
    - Which types of SFs can be defined across regions?
    - What are the livelihood strategies of each type?

3) H3. SF and SFB increases food systems' diversity so contributing to its resilience (i.e. STABILITY)

[2] A table illustrating the relation between WP3 objectives and these research questions is shown in Annex 4.

- What supports and threatens the role of SF in the food system?
    - What are the system mechanisms supporting the role (supports) of SF and SFB? (Markets, networks, policies, innovations and shocks)
    - What are the system mechanisms weakening the role (risks) of SF and SFB? (Markets, networks, policies, innovations and shocks)
- What have been the trajectories of SF?
    - What is the farmer's history as a farmer?
    - How have SFs adapted to shocks in the past?
- What are SF and SFB perspectives for the future?
    - What would be trajectories of SF and SFB under different conditions (future scenarios)?
    - What factors affect SF vision of the future?
    - What factors will condition SF and SFB (and their contribution to food security) in the future?
    - Which actions (SF and SFB adaptations, governance and regulatory changes, etc.) would be necessary to realise the potential of SF and SFB in contributing to regional food production and food security?
- What are SF resilience strategies to face social, economic and environmental constraints?
    - What are the most common shocks experienced by SF?
    - How do SF cope with these shocks?
    - What are the particularities of SFs that can make them more or less resilient
    - Are SF viable as businesses?
    - How supported are SF (income, regulations, subsidies)?
    - What role does non-farm income play in the viability of SF?
    - What access do SF farms have to different resources (land, capital and labour)

  Do SFB contribute to the resilience of SF?To what extent are SF and SFB equipped to resist or overcome (mechanisms of resilience) challenges and threats arising from alternative future scenarios?

Before presenting and discussing the reasoning and pathways to understand the importance of small farms and small food businesses for sustainable food and nutrition security, the methods that will be employed to address the questions above are summarized. The table below provides overview for each research question.

Research Question	Sub-questions	Info Source[3]
Which food system actors and activities are involved in the generation of the FNS outcome in the reference region?	What are the main actors/nodes in the food system for a particular "key product"?	Key Informants Focus Groups
	What are key fluxes between the actors in the food system for a particular "key product"? what is the magnitude of these fluxes?	Key Informants Focus Groups
	Which of the relationships between the nodes are particularly robust and which are vulnerable to shocks and why?	Key Informants Focus Groups

[3] *More detail on the info source is provided as part of the WP3 methodological guidance.

What is the estimated production capacity of SF in each region	What is the estimated production capacity of SFs for key products?	Questionnaire for farmers' interviews
	How does it differ from official statistics?	Official statistics Key Informants Questionnaire for farmers' interviews
What is the relevance of non-marketed SF production for rural HH?	How much of the key products consumed in the farm household are produced by the SF itself?	Questionnaire for farmers' interviews
	Where does the production of key products in SFs go to? (self-consumption, gift, direct sale or short supply chain, market)	Questionnaire for farmers' interviews
What is the position (and importance) of SF in the Regional FS	What is the importance of SF in the production of KP in the RR?	Key Informants Questionnaire for farmers' interviews
	Who are the first buyers of the products produced in SF?	Key Informants Focus Groups Questionnaire for farmers' interviews
	What is the relative importance of SF in supplying each of the "access points" identified in Q1?	Key Informants Focus Groups
	Do different farm types imply any differences in answering any of the above 3 questions? how?	Focus Groups
	What are the different "access points" in which consumers access different products within the region?	Key Informants Focus Groups
How are SFB connected to Small farms and the regional food system?	What are the different types of SFB?	SFB questionnaire Focus Groups Regional Workshop
	How are they connected to SF?	Questionnaire for farmers' interviews Focus Groups Regional Workshop
	What types of markets do SFB access?	SFB questionnaire Focus Groups Regional Workshop
Which types of SF are identifiable within each region regarding their livelihood strategies and contribution to SFNS?	Which types of SFs can be defined across regions?	Questionnaire for farmers' interviews
	What are the livelihood strategies of each type?	Questionnaire for farmers' interviews
What supports and threatens the role of SF in the food system?	What are the system mechanisms supporting the role (supports) of SF and SFB? (Markets, networks, policies, innovations and shocks)	Workshop Questionnaire for farmers' interviews Key Informants and Focus Groups
	What are the system mechanisms weakening the role (risks) of SF and SFB? (Markets, networks, policies, innovations and shocks)	Workshop Questionnaire for farmers' interviews Key Informants and Focus Groups

What have been the trajectories of SF?	What is the farmer's history as a farmer?	Questionnaire for farmers' interviews
	How have SFs adapted to shocks in the past?	Questionnaire for farmers' interviews
	What would be trajectories of SF and SFB under different conditions (future scenarios)?	Foresight Analysis
What are SF and SFB perspectives for the future?	What factors affect SF vision of the future?	Questionnaire for farmers' interviews
	What factors will condition SF and SFB (and their contribution to food security) in the future?	Foresight Analysis
	Which actions (SF and SFB adaptations, governance and regulatory changes, etc.) would be necessary to realise the potential of SF and SFB in contributing to regional food production and food security?	Foresight Analysis
What are SF resilience strategies to face social, economic and environmental constraints?	What are the most common shocks experienced by SF?	Questionnaire for farmers' interviews Focus Groups and Regional Workshop
	How do SF cope with these shocks?	Questionnaire for farmers' interviews Regional Workshop
	What are the particularities of SFs that can make them more or less resilient (explicit reference to the role of public policies; Explicit role of HH labour - link to types)	Questionnaire for farmers' interviews Focus Groups and Regional Workshop Foresight Analysis
	Are SF viable as businesses?	Questionnaire for farmers' interviews
	How supported are SF (income, regulations, subsidies)?	Questionnaire for farmers' interviews
	What role does non-farm income play in the viability of SF?	Questionnaire for farmers' interviews
	What access do SF farms have to different resources (land, capital and labour)	Questionnaire for farmers' interviews
	Do SFB contribute to the resilience of SF?	Focus Groups and Regional Workshop SFB questions
	To what extent are SF and SFB equipped to resist or overcome (mechanisms of resilience) challenges and threats arising from alternative future scenarios?	Foresight analysis

2. Steps of data collection and analysis

The SALSA project provides different lenses and pathways to understand the importance of SF/SFB for SFNS:

- from the perspective of the role they play within the regional food system (at different geographical levels), which means looking "from the food system into SF/SFB";
- from the perspective of the farms and businesses themselves, which means looking "from SF/SFB into the food system".

We thus follow a diversified approach to data collection and analysis. In more detail, we identify the following three steps for data collection and analysis (anticipated in par. 1.1) whose description will constitute the core of this document (sections 2.1, 2.2 and 2.3 respectively). It is important to underline that these are **logical, rather than chronological**, steps. The specific activities will be carried out over time, according to the GANTT diagram displayed at the end of the document in section 3.

1. **Analysis of the regional food system of the Reference Region (RR) (NUTS 3 level),** which aims at assessing the degree of (potential) self-sufficiency of a region. This step, based on desk analysis and exploratory interviews, will bring to an estimated quantification of a food balance sheet for each RR and also to a first draft map of the food system. *This step addresses Task 3.1 of WP3 as described in the DoW.*

2. **Analysis of contribution of small farmers/small business to Sustainable Food and Nutrition Security in each Reference Region**. The analysis will be carried out through surveys and interviews aimed at gaining a more detailed understanding of how SF/SFB[4] operate (both as producers and as households) and at integrating the information obtained through desk analysis for the definition of the food balance sheet (step 1) and the food system map. *This step addresses Task 3.1 of WP3 as described in the DoW.*

3. **Exploration of consumption model-based food subsystems**. This step is focused on the analysis and mapping of the food system and sub-systems identifiable within the selected RR (NUTS 3). The aim is to explore consumption patterns, highlighting the role played by the various food system actors, **in relation to a selected staple food item.** This step will bring to the definition of 3-4 specific food maps, always at NUTS 3 level, in which main food systems actors and flows related to specific food consumption patterns (for ex. domestic, proximity, agro-industrial) are identified in detail and displayed. *This step addresses Tasks 3.2 and 3.3 of WP3 as described in the DoW[5].*

Further final activities are planned to assess and validate the research outcomes: one or two focus groups on the whole food system in the region and the role of small farms and small food businesses, and one specifically on governance issues affecting these small farms and small food businesses. A

[4] Following what argued in the AF, the main research focus is on SFs. Small food business (SFB) is taken into account as long as it is directly related to small farming activity, both when SFB is represented by on-farm processing and selling, and when it is an independent small scale activity. The consideration of SFB in a farmer-centred approach is hence due to the conviction that the contribution of SFs to SFNS cannot be assessed in isolation from the small scale activities involved in the processing, transportation and retailing (this does not mean that the contribution of SFs to SFNS requires necessarily SFB).

[5] Task 3.4 is addressed by the final workshop (see the last paragraph of this section); Task 3.5 is the comparative and synthesis work to be carried out by the research group.

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specific focus on gender issues should inform the whole analysis and these focus groups. When needed, one focus group on gender issues may be organized. Finally, there will be a final regional workshop. They are described in sections 2.4 and 2.5.

While the regional approach can be systematic (i.e. we can analyse all regions), at the scale of the SF/SFB or the household we are only able to look at a small sample. Given the time and budget limitations, the sample is not likely to be statistically representative, so what we are likely to have is an illustrative description, done through purposive sampling, of what small farms and small food businesses look like in each region and how they integrate and relate to each other and to the food system.

2.1 Analysis of the regional food system

2.1.1 Expected outcomes

The analysis will result in the development of a typology/profile of regional food systems in Europe.

The intermediate outcomes of this first step, based on desk analysis of data available for each reference region, are:

- **A "food balance sheet"** for production and consumption at NUTS 3 level, with an estimation of surpluses and deficits for a set of major commodities (staple foods) in the reference region. This estimation is **not aimed** at having a rigorous statistic of the production and consumption of the food system in the reference region. Rather, it is aiming at estimating the relative importance of SF and SFB in the food system, and it is a basis for developing a conversation with stakeholders around the characteristics and the perspectives of the food system in the RR[6]. In such regards some staple foods will be selected with regard to main regional consumption and production patterns. An example of this assessment is given in table 8.

Table 1: Template for food balance sheet

	Consumption	Production	Surplus / deficit	% surplus / deficit on total consumption
Cereals				
Meat				
Milk				
Vegetables / fruit				
...				

- An assessment of the contribution of small farms to the production of the same set of major commodities in the reference region. An example of this assessment is given in table 9

[6] For example, if SF/SFB are important producers of a food for which the RR is in deficit, their role for FNS in the region will be different (not necessarily stronger) than in the "surplus" case. This will require further investigation, to be carried out in the following research steps.

Table 2: Small farms' contribution

	Production of small farms of the RR	Total production of the RR	Share of small farms on total production
Cereals			
Meat			
Milk			
Vegetables / fruit			
....			

- **Selection of staple food**: identification of a set of agricultural primary products on which the subsequent analyses will be conducted (both on the production and the consumption side). The idea is to find out which are the most significant staple food groups (and products within each group) in each region, according to the types defined above. The selection of staple foods is an outcome expected at the end of this phase 1.

- **A first picture of the regional food system**, with identification of key actors, activities and flows, including both consumption and production sides. The analysis will result in a map like the one shown in Figure 3, where the size of icons and arrows are approximately expressing the quantification of actors and flows (number, quantities...), with a short explanatory narrative. The borders of the food system map could replicate the geographical boundaries of the RR. In the picture the flows (represented by the arrows) should be referred to specific relevant food items or categories. Besides the final map, which is a synthesis map, it is expected that there will be intermediate maps, each one built with reference to one staple food, and where estimations of relative quantities hopefully will be possible to register. The research group will detail and refine this draft map after the production of the maps referred to specific items and food consumption patterns during the dedicated focus groups (see step 3)[7].

As visible in the example, in each RR map three-four consumption patterns should be preliminarily identified. The identification starts from the following tentative classification:

- Domestic pattern → prevalent self-consumption
- Proximity pattern → prevalent local sourcing and short food supply chains
- Agro-industrial pattern → centrality of modern retailing and long food supply chains

However, the desk-based analysis could refine and better ground this initial classification in the actual RR context. Besides, these patterns will be further elaborated and refined in the following steps of the analysis, in particular in the focus groups focused on consumption (step 3).

[7] The figure presents an a-spatial representation of a food system. In a first trial exercise the possibility to develop a spatial map emerged, in which system elements (actors and arrows) are displayed on a map representing the actual RR territory. This option will be further validated through the pilot case study.

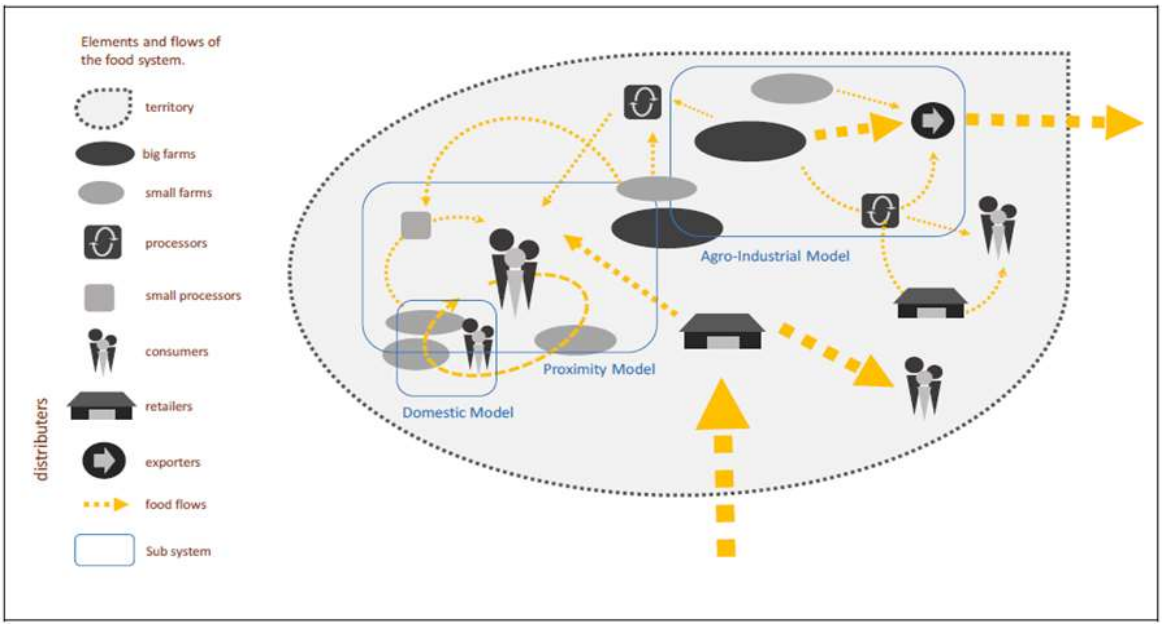


Figure 3 - Food system identified at the territorial level - example of representation.

- **A proposal for small farms typology**, adapted to the RR. This typology should primarily consider: a) the SF degree of markets integration, and b) the degree of the SF household self-sufficiency, as shown in Fig.3. Other dimensions to be considered may be "degree of specialisation in one or more staple foods", as well as "farmers strategies and institutional arrangements they are part of".

Regarding step 1, we propose the following sub-steps. Desk based analysis and expert interviews do not follow a chronological order: they should be carried out in parallel, to inform each other (i.e. key informants confirm desk analysis and vice-versa)[8].

- Background data collection of the reference region
- Identification of key stakeholders
- Exploratory interviews with key informants (also aimed at identifying the main food system components, trends and activities, comprising governance)
- Identification of staple food to be assessed (a common set for all regions to be then adapted, as explained in par. 2.1.3)
- Assessment of food supply, in combination with WP2 which will produce an estimate of production by small farms, for selected staple foods
- Assessment (in quantity) of food demand for selected staple foods
- Compilation of the Balance sheet

[8] The chronological dimension is planned carefully so that the data on production averages collected by interviews to producers (in step 2 of the analysis) can be used to obtain the production estimates at regional level, that will be part of this step (step) 1 of the analysis. As already argued, these are logical rather than strictly chronological steps.

- Characterization of SFs and first identification of SF types
- Estimation of SFs' contribution to the food system in the RR
- Characterization of the regional food system (i.e. map)

2.1.2. Background data collection of the reference region

The analysis starts with the collection of basic demographic and economic data at the RR level with focus on land use, agricultural activity and small farms' presence. A common set of data should be collected in each RR.

The table reports the requested list of indicators on the reference region (NUTS 3 level) concerning demographics, social and economic features. We have taken Lucca province (NUTS 3 level) as an example. On Eurostat (http://ec.europa.eu/eurostat/web/rural-development/data) most data are available at NUTS 3 level. Data at NUTS 3 level not available from Eurostat should be retrieved by each partner at national level, or at other level where the most significant information is available (particular cases possibly in Africa).

Table 3: Main features of the case study area (to be completed including urban/rural population, male/female and age structure)

Feature	Lucca Province (UNIPI RR)	year
Land size (km^2)	1773	2015
Population (thousands people)	391,228	2015
Density (people/km^2)	222,2	2015
GDP (thousand USD/inhabitant)	29200	2011
Total labour force in AWU	7460	2005

More specific information on the agricultural sector will be recorded in a separate table as in the following example:

Table 4: Agriculture in the case study area

Feature	Crop	Lucca Province (UNIPI RR)	year
Total number of holdings		7920	2007
Total agricultural area (ha)		26300	2005
Average farm area		0,30	
N° of farms per farm size			
Area of main crops	*cereals*	4640	2000
	fresh vegetables, melons and strawberries	740	2000
	....	....	....
Number of holdings with livestock		5520	2000
Bovine animals, number		5900	2000
....			
Agricultural area in mountain area		17030	2007
Number of holdings with less than 5 ha AA		6630	2007
Total AA (in ha) of holdings with less than 5 ha AA		9680	2005
% of UAA in the region	Available for all regions from WP2 work		

% of UAA occupied by farms <5ha	"
% of farm units < 5 ha	"
% of farm units < 8 ESU	"

The information regarding production in farms smaller than 5 ha could be not always retrievable or could be imprecise in available statistical data. It will be then possible to obtain or integrate this information through the data collection for the validation of WP2 outcomes carried out by the field researchers during the interviews with SF/SFB (see step 3). The table could be then refined accordingly, before being discussed in the final workshops.

2.1.3 Stakeholders' list

A list of the stakeholders at RR level is prepared by each team responsible for a RR. Main food system stakeholders are identified as a first step towards the selection of key informants for the exploratory interviews and for their involvement in the following research steps (Focus groups). This list should be a reference throughout the overall study.

The stakeholders to be identified should represent the following groups (more than one per group can be identified, so that we can be sure to have at least one representative of main groups in the analysis):

- Producers' cooperatives, consortia
- Farmers
- Slaughtering facilities
- Processors (small / large)
- Wholesalers
- Retailers
- Caterers
- Other small food business
- Exporters
- Importers
- Farm inputs suppliers
- Agricultural services
- Consumers' groups
- Consumers' organizations
- Local administrators and policy makers
- Political leaders and PMs
- NGO's
- Nutritionists
- Traditional and religious leaders (for African)

2.1.4 Interviews with key informants

5 to 10 exploratory interviews will be carried out with key informants, chosen by the research group on the base of the stakeholder list analysis[9]. Informants are expected to provide multidisciplinary expertise pertinent to the region at stake, and to represent different relevant points of view.

Key informants will help research teams to draw the map of the regional food system for the most important food staple groups. They should be able to build an overview on the production patterns, suggest or confirm staple food groups to be selected for the balance sheet (see paragraph 2.1.3) and, very important (as statistical data on consumption is more limited), on the consumption patterns of the RR, and on possible territorial differentiations within the region[10].

Given the diversity of informants, questions are adapted to respondents' roles and background (experts, policy-makers, planners, producers' organizations, retailers' organization, consumers' organizations, etc.).

A specific attention in the selection of the key informants should be given with respect to gender representation and views on the RR food system.

Key expected outcomes are:

- Complementary cross-reference information for integration and validation of quantitative estimations and desk-based analysis.
- Indications on the most relevant staple crops in the RR to be selected for the quantitative assessment.
- Elements to produce a first draft of the food system map, with identification of key nodes and flows.

These interviews are also aimed at gathering information (for WP4) on the key drivers expected to influence small farms' capacity to increase their relative contribution to FNS in the RR in the next 20-30 years[11].

2.1.5. Identification of staple foods

This step consists in the identification of a set of agricultural primary products on which the subsequent analyses will be conducted (both on the production and the consumption side). The idea is to find out which are the most significant staple food groups (and items within each group) in each region.

The selection of staple food items for each RR relies on the necessity to ensure the linkages with the local agricultural context. Regarding figure 2, in each RR the research team should possibly identify:

[9] Informants should have also key knowledge on small farms and small food business on selected staple food (see section 2.2 about step 2 of the research process). In this way the two groups of interviews (see point ***i)*** of par. 2.2.2) could be merged.

[10] It could be possible to set up 'advisory groups' for each RR, for example in the form of Community of Practice. This would give researchers a reason to meet with the same people more than once in a group setting. Advisory groups could be selected from the key informants we interview in this first step 1, asking them to follow the work and contributing again in a later phase.

[11] Specific questions will be indicated by WP4 leader.

- **Two staple food items that are both produced and consumed in the region** (i.e. that rank high in production and also in consumption);
- **One staple food item that is produced in the region but is not consumed**, or consumed little, within the region (i.e. an export crop),
- **One more staple food item, important** in the region for culinary, cultural or social reasons, even if it scores relatively low in production tonnage

It is recommended that the staple food chosen are a mix of staple food items that cover the most important nutrients, in terms of intake of energy, protein, vitamin.

Importance of the staple food item in the RR depends on quantities produced and value generated. In the choice of the staple food, research teams should also consider a relevant (present or potential) role of small farming.

The interviews with key informants (previous step) can give inputs for the selection, in combination with desk data collection and the land cover map produced for WP2. In our pilot case study, we referred to the specific features of the Lucca Province, (e.g. wine grapes were included but it might not be the case for all regions).

Table 5 shows a list of staple food items and groups from which research teams can choose their staple food.

Table 5: Primary agricultural products considered in the analysis

Staple food groups	Staple food item
Cereals	Wheat Barley Oats Maize Rice Other cereals
Oil plants	Rape Sunflower Olive
Vegetables	Vegetables [brassica, bulb, fruiting, leaf, legume, root and stem vegetables] Dried pulses [legumes, beans, dried]
Potatoes	Potatoes
Fruit	Fruit [berries and small fruits, citrus fruits, pome fruits, stone fruits, tree nuts]
Wine grapes	Wine grapes
Animal production	Eggs Milk Cheese Meat (beef, pig and poultry meat) Fish

2.1.6 Analysis of food supply of selected staple food items

In this step, we estimate the regional food supply based on the current production patterns. We want to calculate the quantity of product (per food product category) in tons per year.

We suggest to get this value by multiplying the surfaces per each product category by the yield[12], as in the table below.

Table 6: Estimation of regional food supply per product category

Product categories	Staple food groups	Estimation formula in case data not available	Outcome
Vegetable products	agricultural area of each vegetable category (cereal, oil plant, vegetables, fruits, potatoes, wine grapes) Yields per vegetable group	agricultural area * productive yield of the primary product	Tonnes of product per category of vegetables
Animal products	Meat products (beef, pig and poultry meat)	number of animals for slaughter or fattening * average weight per head * the average yield at slaughter;	Tonnes of meat products
	Dairy products	number of dairy cows * the average yearly production of milk per head;	Tonnes of dairy
	Eggs	number of laying hens* weight of an egg *the number of eggs per hen	Tonnes of eggs
	Fish	Quantity of fish sourced * yield	Tonnes of fish

Data area of main crops and animals are generally available on EUROSTAT (http://ec.europa.eu/eurostat/web/rural-development/data).

Regional (or, if not available, national average yield data) can be taken from the literature or from interviews with key informants.

Production estimates

To overcome the missing information on production values in small farms at the Nuts3 scale, for production estimates, a complementary approach will be used, grounded on innovative remote sensing methods and the analysis of the last generation satellite images, the Sentinel 2 images.

In each region, several steps are considered, based on the analysis of the satellite images:

1. Identification of land cover patterns and application of a mask, leaving everything which is not agriculture out: urban zones, forest, water surfaces. This mask will also leave out as much as possible what is not small scale agriculture: large scale plots.

2. Within the area covered by the small scale farm structure, identification of crops and their spatial distribution pattern. This analysis will focus on the main staples identified and selected for each region. A field validation of sample points is required for this step and statistical classification models for crop type mapping will be applied.

[12] In Africa there is likely to be a lot of mixed cropping / intercropping (different crops in one field). In order to account for this feature it could be possible to carry out focused qualitative analysis. Partners expert on Africa could give suggestions in this regard.

3. The map produced in step 2. Will lead to a calculation of the total area for each crop, in small farms, in the region.

4. Data on production estimates at the plot level will be obtained with interviews to producers and technical staff with accurate knowledge on small farms in the regions. This data is obtained in the field with interviews and through an adapted conversion table, allows to calculate estimated production per staple, per unit of area.

5. Multiplying the total area of each crop by the production estimate per unit of area, an estimate of the total potential production per staple food item, in small farms in the region, is obtained.

A more advanced and exploratory analysis, also based on remote sensing but this time with advanced modelling of real production values along the year, will be applied in a few regions, in an experimental basis. More demanding in field data accuracy and on remote sensing procedures, this analysis will make it possible to test and validate more advanced and accurate methods, but also to validate the methodological approach for estimation of potential production, described above.

2.1.7 Analysis of food demand

The aim of this step is to provide a measure of total consumption in the region by staple food group.

This measure will be obtained by multiplying population number in the region (for age class) by the estimated consumption quantities per head provided by EFSA.

*Consumption = quantities per head (per age class) * population number*

Population number per age class can be retrieved from national statistics. In some regions it should be considered to adjust the resident population by adding tourists visiting the area (considering the average length of the stay, and calculating the proportion in relation to one year consumption, so it is feasible with EFSA data, explained below).

EFSA provides a database "Comprehensive European Food Consumption Database" (https://www.efsa.europa.eu/en/data/food-consumption-data), based on data from twenty Member States with the aim of providing guidance for dietary exposure assessments (attached to this document).

From this database, it is possible to retrieve the average quantity consumed for each product (we suggest to refer to EFSA FoodEx L2 levels of specification, EFSA Food Sub-category in Table 13 - Annex 1**)** per year, by age class[13]). The staple food groups must be the same as the ones considered on the production side. These values can be multiplied by the population numbers (by age class).

This provides a rough indication of the consumption in the RR. The limitations of available data through the EFSA dataset should be kept in mind (e.g. data available for some countries in the EU, collected in different years, national averages which may be far from the regional consumption models, the product categories need to be made homogeneous with the production side etc. Please consult

[13] These data are available only for 19 European countries. When data at country level is not available it is possible to refer to an average data across all countries.

http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2011.2097/full on the Use of EFSA Comprehensive European Food Consumption database).

Table 7 shows the procedure (source) that can be adopted for wheat. For all products see annex 1.

Table 7: From final to primary product using EFSA database

EFSA FOOD SUB-CATEGORY (L2)	PROCESSING YIELD[14]	STAPLE FOOD item	STAPLE FOOD GROUP
Bread and rolls Fine bakery wares Grain milling products	*Milling yield →Yield to bread*	Soft wheat	CEREALS

In the example, the amount of cereals contained in bakery products is calculated by applying an average yield (in the case of bread it is approximately 1kg of bread = 1 kg of cereals) to the processed product.

A different methodology, more based on estimations, should be applied for African regions, where organized data on food consumption are hardly available. An option is to rely upon health services staff, teachers or project data to get some idea of food habits in an area.

2.1.8 Balance sheet

We can now proceed with the construction of a food balance sheet of the reference region, like the one below (elaboration on Lucca province). The balance sheet should consider **at least four staple food items** considered as relevant for the RR according with the previous steps of the data collection (background analysis, interviews to main stakeholders, selection of staple food items, etc).

Table 8: Food balance sheet – Example from Lucca

Food items	consumption (t/year)	production (t/year)	Deficit / surplus	%surplus-deficit on total consumption
Cereals	362.104,91	206.099,94	-156.004,97	-43,08
Vegetal fats	49.594,94	18.238,06	-31.356,88	-63,23
Vegetables	148.718,06	50.905,28	-97.812,78	-65,77
Potatoes	71.642,14	22.930,83	-48.711,31	-67,99
Fruit	501.841,59	123.564,35	-378.277,24	-75,38
Wine	95.471,32	64.540,44	-30.930,88	-32,40
Meat	425.754,85	26.814,49	-398.940,36	-93,70

Source: elaboration on official census data

2.1.9 Contribution of small farms to the food system of the reference region

In this step, we assess the share of small farms' production to the total production of the reference region, for each staple food items.

Small farms are identified as:

[14] Processing yields should be retrieved by each team for each staple food item based on locally available data.

farms < 5 ha and / or < 8 UDE

As data with production of small farm is not often available, we propose to use the area cultivated by small farms for each product category. This data can be easily found in national census data in some countries. In others, it is not available at the scale of Nuts 3. The indicator to be used will be the *share of small farmers' area on the total area cultivated for a given staple,* as in table 9. The analysis based on satellite images and calculation of crop area as well as crop production estimates, will complement this information.

The combination of remote sensing data, with very high spatial resolution and precision, with statistical data and other type of numeric data, is a strong innovative component of SALSA.

The output of this step would be a table like the following one, (elaboration on Lucca province).

Table 9: Small farms' contribution in Lucca province

Food groups	small farms <5 ha (UAA in ha)	Total UAA in ha	% small farms
Cereals	581,99	3190,63	18.2%
Vegetal fats (olive oil)	1912,35	3193,8	60%
Vegetables	302,97	422,29	72%
Potatoes	67,41	162,63	41%
Fruit	1135,81	3505,21	32%
Wine grapes	464,82	1058,04	44%
Meat	14855	73125	20%

2.1.10. Characterization of regional food system

The preceding steps will allow us to identify two variables:

- Surplus vs deficit for each staple food group
- Relevance of small farm production in the RR for each food staple food group

Indicators for each staple food group will be then mapped in a grid like the following: (labels for each staple food group will be mapped in the grid, as in the example).

The figure presents an example of balance sheet for some selected staple food group estimated for the Province of Lucca.

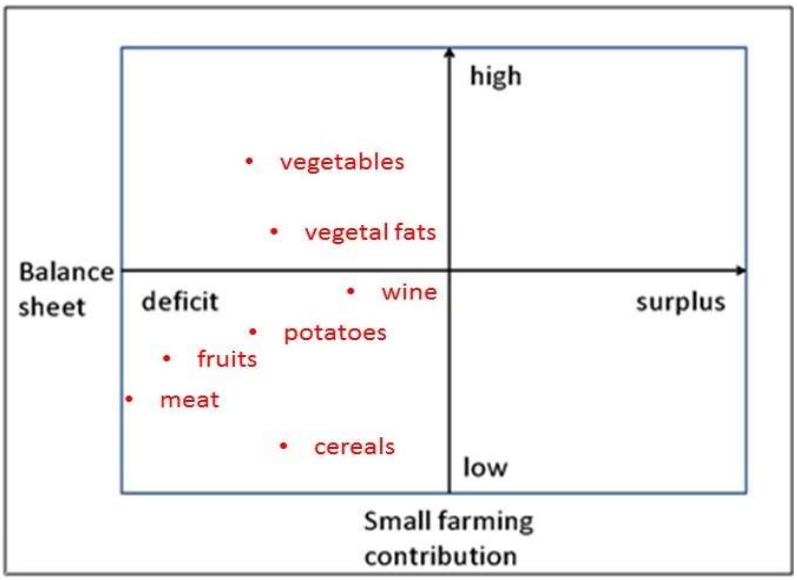


Figure 4 - *Balance sheet and small farms contribution for each staple food group production*

2.2 Analysis of contribution of small farms

2.2.1 Expected outcomes

The fieldwork in this step is aimed at developing a typology of small farms and at assessing the contribution of SF and SFB to FNS within the regional food systems. Given that the data collection through the interviews with small farms cannot be statistically representative, this typology will be useful to showcase and illustrate the range of diversity and strategies used by small farms and small businesses in different contexts.

SFB can also be typified. For our purpose, it is worth looking at a typology based on SFB relations with SFs. Relevant descriptors could be: (i) processing/transport/small hubs/retailing/other supporting services; (ii) internal/external to the farm; (iii) family owned/not.

The outputs of this step, to be achieved through interviews and focus groups, will be the following:

1. Analysis of the distribution of SF and SFB in the region according to given typologies with visual representation of small farms/households' types. The typologies will be adapted to the RR, according to the information collected in this phase. This outcome will be better described in the following sub-paragraph.
2. Description of small farm pathways with case-studies on SF types. A specific attention will be given on the evolutionary trajectories of small farms (from specialised agriculture to part-time farming, connection between farm evolution and household cycle) as well as on the role of male/female relationship into the decision/making process inside the SF/SFB.
3. Assessment of the contribution of small farms to FNS (considering also the possible outcomes on health and environment).
4. Assessment of the sustainability of small farms (in relative terms – considering the sustainability of the food system in the RR overall).

5. Identification of specific needs and requirements of SF and SFB in relation to their strategies, evolution and emerging challenges.

Focus on first outcome: analysis of the distribution of small farms in the region according to given typologies

This analysis can start with a basic typology that will be refined in relation to the research findings (interviews and focus groups described below). The basic typology can be produced using a combination of two indexes connecting the household's and the farm's conditions. With a simple index, such as the percentage of self-consumed food vis-à-vis total household consumption[15], we can classify the different small farms in a continuum of different degrees of self-sufficiency. Other indicators can be used to characterize farms on the basis of their degree of market integration (marketed production on total production). These two indicators will be adapted to the RR conditions, if the need emerges from the first data collected and the interviews with key-informants. Specialisation in one staple product or specific organization/governance elements should inform the typology, in each region. Developing a typology of small farms will allow us to identify patterns across and within regions, as well as to analyse the common and differentiated challenges and opportunities to contribute to FNS.

Thanks to the information gathered with the interviews, small farms will be typified and mapped according to self-sufficiency of the household and to the degree of market integration, as shown in Figure 5[16].

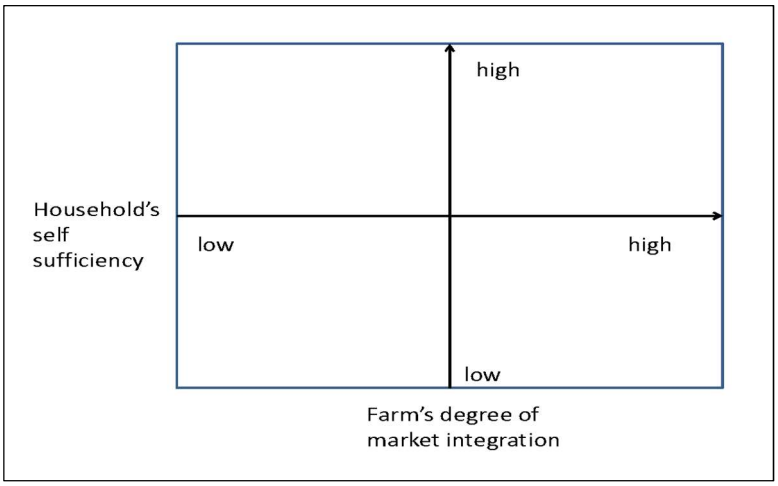


Figure 5 - Small farms typologies according to self-sufficiency and market integration

For the typology refinement, further descriptors should be identified. Among the descriptors we should consider elements like: i) the production capacity / profit potential and ii) the contribution to SFNS in terms of food provision, health and nature preservation, iii) the gender dimension/relationships inside the farm and iv) the farmers' strategy/past evolution and development pathway, which are relevant to the identification of challenges, needs and enabling conditions for small farms[17].

[15] Measurement units are to be decided. Different units (value, volume, calories) present strong and weak points in terms of availability and relevance/pertinence. They could be used together, being complementary.

[16] For the quantification of the two variables we could use quantities (KG) and transform them into calories, or keep as KGs – the same that we will have in the food balance sheet.

[17] It is also possible to adapt the typology suggested by Davidova and Thompson (2014, p.17) for the European farming structures.

2.2.2 The interviews

This task will be accomplished through two activities:

- Interviews with key informants *(i.)*
- Interviews with SF and SFB *(ii.)*

i. Selection of small farmers and small food business

5-10 interviews will be carried out with informants with key knowledge on small farms and small food business. Interviews shall focus on the identification of small farmers and small food businesses.

Semi-structured interviews will be carried out with 30-40 SF and SFB. We suggest to interview at least 25 small farms (with and without on-farm processing and selling) and 5 small food businesses, selected in each RR aiming at representing the diversity of cases within the region. Key informants will be asked to provide information on SF and SFB to help build up the sample.

The selection should be made through a purposive sampling, in the aim to cover the diversity of actors and situations. Criteria for the selection do not necessarily need to be the same for all regions. Possible criteria could be: farm/business or household size (within the given size limits); staple food produced; specialised / diversified farm; location (remoteness; proximity to urban centres or transport infrastructures; morphology); household's off-farm incomes, characters of the main farmer/age, gender, background). The two criteria of the basic typology that will be refined through the interviews (household's self sufficiency and degree of market integration) could also be considered as selection criteria if retrievable in advance.

WP3 leaders will provide a grid that will help research teams to identify the farms to be interviewed.

The following is an example, to be adapted and refined for each reference region.

Table 10: Example of grid for interviews selection

		remote rural area		semi - rural area	
		small household size	big household size	small household size	big household size
wheat	specialized	1	1	1	1
	diversified	1	1	1	1
beef	specialized	1	1	1	1
	diversified	1	1	1	1
tomato	specialized	1	1	1	1
	diversified	1	1	1	1

When possible, interviews may be carried out to both men and women in the same farm. More generally, when possible, family members other than the main farmer should be interviewed, as they are likely to have different perspectives in terms - for example - of vision for the future, and perception of opportunities and challenges. A possibility is to carry out separate interviews, having the main interview with the principal farmer (be that a man or a woman), and then shorter discussions with the other household's members.

2.2.3 Interviews to SF and SFB

i. Contents and format of the interviews to SF and SFB

The interviews complement the information in steps 1 and 2 by helping answer questions such as:

- How are small farms (or SFB) connected to the food system?
- What actors and activities are involved in the generation of the diverse FNS outcomes?
- What are the system mechanisms (technological solutions, logistic arrangements, market channels, organisation of local nets and activities) involved in the generation of the outcomes?
- What are the barriers that prevent small farmers (or SFB) to deliver better FNS outcomes?
- What are the enablers that would allow small farms (or SFB) to deliver better FNS outcomes?
- What are the quantities produced/processed on average for each selected staple crop?
- What are the other outcomes the small farms (or SFB) deliver in support to local health and environment management?

As SF/SFB actors would not normally think of their role in terms of contribution to FNS, this concept will be articulated into more specific/adapted questions, as visible in the interviews outline, below. An interview guide, including a questionnaire section, will be made available in due time. The content of the questionnaire will be based on the following key sections:

1. Introductory questions
2. Farm description
3. Household description.
4. Focus on SF/SFB practices and main outcomes
5. Interaction with the food system
6. Interaction with the local system
7. Perspectives on the future

A more detailed indication on the points to be addressed follows. A set of sub-questions will be specifically developed for the interviews with subsistence farms[18], to address their specific circumstances and needs. With the awareness that there is neither clear nor stable distinction among subsistence, semi-subsistence and other farmers.

1. Introductory questions

- (Main) farmer's education and background
- History of farm[19]: beginning, how the interviewed became farmer, nodal points of the farm trajectory (a specific form for this could be prepared taking into consideration diverse relevant aspect able to introduce changes and organise trajectories -technology, change in the market, change in the

[18] Definitions of subsistence farms are difficult due to the various utilised criteria and to the arbitrary fixing of thresholds, Following (and simplifying) Barnett et al. (1996) and Davidova (2010) we may focus on the following two elements i) the farming activities form a livelihood strategy; (ii) most of the output is consumed directly, whereas only a minor part is marketed.

[19] The SF/SFB history is relevant to have a full picture of the actor's trajectory with attention to his/her motivations and to supporting and hindering factors. This helps for instance on understanding the importance given by the respondent to FNS issues (and to their connection with his/her activity) vis-à-vis other business, social and environmental goals.

techniques, change in the demand, change in the household, that could be displayed as in the example)

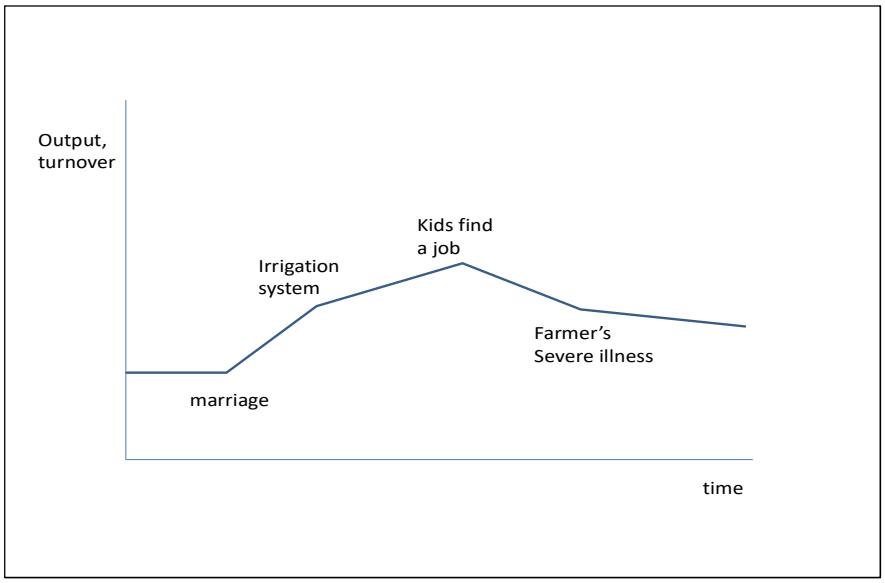


Figure 6 - Example of farm history

2. Farm description

- Description of farm
- Production (area and yields, as well as livestock and livestock products)
- Total turnover
- Costs as a % of total turnover
- Other diverse non-monetary outcomes (in terms of biodiversity, organic, mix crops and diversity, landscape management, health/social services provision)
- Bottlenecks and critical points for the small farm activities and businesses

In some cases, this information can be accessed through a pre-interview or through data available at farmers' organization offices

3. Household description

- Household's description (number of people, gender, ages, ...)
- Household's members' activities in the farm and outside
- Household's food purchasing behaviours
- Consumption and self-consumption households' patterns (here it is particularly important to tailor questions in the case of subsistence farming)
    - Livelihood strategies (of different household members, and of household overall with specific attention to gender dimension)
    - Bottlenecks and critical points for the livelihood strategies
    - Social dimension of household: social services provided to community, family

4. Focus on farms' practices

- Farm endowment
- Relations with suppliers (of seeds, manure, tools and equipment, production services, etc.): relevance, critical points, information flows
- Use of fertilizers / pesticides
- Crop rotations
- Seeds sourcing
- On-farm and off-farm processing activities
- Transportation
    - Farmers' concept of quality and sustainability
    - Environmental impact of the farm / ecosystem services
    - Whether the farm produces to a specific standard (organic or similar) and reasons for this

5. Interaction with the food system

- Relevant regulatory obligations
- Market channels (where they sell, to whom, how often, at what price, whether niche market or mainstream, whether formal or informal...)
- Interplay between with large farms in respect of regional food production and consumption
- Membership of cooperatives or producers' associations
- Collective action (participation to fair, collective labelling schemes, etc.)
- Importance of informal and formal markets for the farm, both for upstream and downstream (e.g. unregistered sales, barter, services exchange, ...)

6. Interaction with the local system

- Participation in local nets and groups
- Participation and organisation with other farms
- Interaction with local institutions and policies (link to WP6)
- Access to main services

7. Perspectives

- Expectations from farming
- Farmers' objectives and priorities
- Farmers' perceptions in connection with the evolution of local food system
- Farmers' perceptions of FNS meaning
- Plans for the future (grow/reduce/keep steady) – different perspectives of men, women, youths.

Interviewers should try to get the respondents to both describe the situation as it is currently, and to assess how it is changing and is likely to change in the future.

In the case of SFB actors, questions will also be adapted. Questions will be asked about their relations with small farming: history, current features and modalities, relevance with regard to their whole activity, strong points and criticalities, trends and expectations for the future.

ii. Data entry

WP3 leaders will provide a data entry tool to store data collected at farm level, so that all data is stored within the same system and therefore can be analysed both jointly and separately. The tool will accommodate both quantitative and qualitative data.

2.3 Exploration of consumption patterns

2.3.1 Expected outcomes

This step is focused on the analysis and mapping of the food system and sub-systems identifiable within the selected RR (NUTS 3). The aim is to explore consumption patterns, highlighting the role played by the various food system actors, **in relation to one or a small number of selected staple food item**. The territorial level of the overall analysis remains at NUTS 3 (the RR), but analysis will be focused on some representative consumption patterns, envisaged in the previous steps.

The expected outcomes of this step are:

- validation of main consumption patterns in the RR drafted in step 1, and their qualification, with an assessment of their relative importance and relation among each other;
- three-four NUTS 3 subsystem maps each related to a food staple item, addressing specific consumption patterns. These maps will be accompanied by an explanatory narrative with the analysis of food system flows.

2.3.2. Selection of the food item and identification/analysis of the consumption patterns

This step will provide an in-depth analysis of consumption patterns around one or few selected staple food item, within the number of the staples considered in the previous analysis.

The selection of the staple food item is done by the research group (within the staples selected for the balance sheet) based on their relevance for the RR (and for the different consumption patterns) and on the relevance (present or potential) of the role of small farming. If possible the same commodity should be selected for all the different consumption patterns within a RR. For example, tomato can be taken as reference commodity and analysis will be carried out with tomato in relation to domestic, proximity and agro-industrial patterns.

The three - four consumption patterns outlined through the interviews with key informants and with small farmers[20], will be investigated in more depth regarding the selected staple food item.

2.3.3. Data collection

Quantitative data will be collected about actors and flows related to the selected food item. Data required are often not available from official statistics. Researchers will work mainly through 'educated guess', starting from available data and making assumptions about missing data.

The food system actors to be considered in the data collection and in the mapping, cover all these categories: food consumers, farmers, producers' cooperatives, slaughtering facilities, processors, wholesalers, retailers, caterers, other small food business, importers and exporters. For all these

[20] A possible additional option would be to dedicate in each RR a student/young researcher in each RR, to study the consumption patterns, combining different sources of information.

groups, quantifications should be made, always limited to the staple food item selected, with regard to their number, their estimated throughput, the number of customers and suppliers[21].

2.3.4. Focus groups with participatory mapping on the food item(s) consumption patterns

Focus groups will make it possible to better understand how communities within different territorial contexts are organized in relation to a specific food item(s), and to understand the different linkages with small farms, and different development opportunities, often missed in one-directional analysis. Hence, territorial differences within the RR, namely remote rural, rural and urban/sub urban, should be considered in the analysis of the maps referred to each consumption model.

For this reason, if relevant in the region, focus groups will be carried out in different areas: for example, rural, semirural, urban (OECD/FAO/UNCDF, 2016). Otherwise the geographical factor is expected to be expressed in focus groups organized so to cover the consumption chain as a whole, for each staple.

3-4 focus groups will be organized in each RR, to analyze the consumption patterns for the selected staple food item(s). In each of these focus groups a participatory mapping exercise will be carried out with the involvement of experts and stakeholders. Each map will represent the sub-systems emerging for that item in that area[22]. The indications harvested will be used by the research groups to better ground and refine and the NUTS-3 level desk based map. Conversation about the map will cover issues like: who are the actors involved, what activities, what material, monetary and information flows link the different actors, what is the specific role of consumers, small farmers and small food business in the specific pattern, what is the quality looked for by consumer, how farms respond to these quality needs.

The representation of the subsystem may involve actors in the food system located outside the RR area (defined by the "territory" borders in the Figure) when their representation is deemed relevant by participants and researchers for a deeper understanding of the subsystem. More external distant sources will be implicitly also considered in the analysis, without necessarily being mapped outside the map borders: they will be ideally located at the external end of the cross-borders arrows.

The focus groups will be articulated according to the following phases:

i. Construction of the subsystem map

A subsystem map - centred on one staple food item (or a staple food group, when it is impossible to separate) is drafted through the participatory exercise with invited experts and stakeholders under the coordination of the research group. Cards with the pictures representing the various actors and arrows of different length and size will be provided to the participants, and displayed on the map[23]. The discussions developed during the exercise are a very important outcome in themselves: they will be recorded to harvest a range of information, opinions and - in case - disagreements.

[21] In particular, useful information can be obtained from retailers, both on the consumers profile and on the origin of the products sold.

[22] Likewise the desk-based map, here it could also be possible develop a spatially referenced picture, in which system elements are displayed on a map representing the actual area borders.

[23] A protocol for the mapping exercise will be prepared by JHI.

ii. Analysis of outcomes in terms of FNS.

The construction of the map and the discussions around it should highlight the main strong and weak points in relation to the system capability to provide FNS, with specific attention to the four dimensions of FNS: availability, access, utilization and stability, as well as the three dimensions of sustainability (social, environmental and economic). Since the map is built around a single food item, this analysis is not meant to be comprehensive of FNS outcomes, but to provide inputs for a broader overall assessment that will be developed by the research group.

iii. Analysis of main factors of change and future trends (also in the light of WP4 and WP5 needs);

The construction and description of the map should be also lead to the identification of the main factors of change currently or predictably working in the food system and to the effects that these factors may have on the activity of SF/SFB (increase/ decline in number, production choices, market channels, relations with subsystems etc.), on the governance issues and on SF/SFB capability to positively impact on FNS[24].

2.4 Focus groups for assessment

2.4.1 Assessment of the role of small farming within the food system

One or two focus group are organised at a late stage of small farm survey at NUTS 3 level, with experts and stakeholders (taking into consideration the gender balance), aimed at assessing the role of SF and SFB in the system in relation to FNS. The focus group will be articulated into three steps.

In the first step, participants will present and discuss the balance sheet (see 2.1.8). Questions related to this step could be:

- Have we chosen the right food staple items to illustrate the food system in the RR?
- Are these figures realistic enough? What have we not taken into consideration?
- What are the implications of this figure in relation to the robustness / vulnerability (social, economic, environmental) of the system? What weaknesses and what potentialities do they show?

In the second step, stakeholders will validate the results of the desk mapping exercise, with attention to the presence and role of SF/SFB, to their connections to the system and the flows they are involved in. The map will be shown to stakeholders and they will be encouraged to propose changes to actors, activities and flows.

In the third step, stakeholders will be invited to use the map as a base of discussion to assess the main contribution of SF/SFB to FNS, comprising possible contributions to vulnerability mitigation. Main contribution will be listed and discussed in connection to the FNS dimension (availability, access, utilization, stability) they are pertinent to.

Attention should be also given to food consumers' groups, by asking questions like:

Which are the more food and nutrition insecure among the consumers' groups identifiable in the food system map? Are there missing weaker vulnerable groups? Which are the vulnerability factors those groups are more exposed / sensitive to?

[24] UPV will provide a list of categories or factors of change so that comparable analyses will be easier.

2.4.2 Final workshop

A participatory workshop will be organised in each RR, at NUTS 3 level, involving all stakeholders engaged in the Focus group work[25]. Reference is to Task 3.4 of WP3 as expressed in the DoW.

The workshop aims to a) validate the local and regional food systems, the production estimation and the linkages between production, marketing and consumption, b) provide an in-depth analysis of critical factors, limitations and potentials of the particular regional food system and FNS, focussing on the role of small farms and small food businesses, and c) provide a (last) opportunity for participants to discuss challenges, opportunities, visions and the way forward (e.g. in terms of emerging policy recommendations) and d) discuss governance issues.

Participants will be given the food system map resulting from the previous activities and the food balance sheet, that will be used as a base for discussion. In addition, the description of the emerging typologies and trajectories for SF/SFB will be provided. The following issues will be addressed in relation to the food systems and with specific regard to SF/SFB.

- types and functioning of markets and role of their main actors
- organizations, networks (how they are governed / how decisions are taken), and formal/informal norms of food production and their effect
- recent changes and innovations, their potential or limits, desired future changes
- SFB relational patterns and arrangements with small farms
    - gender balance of governance actors and its impact; role of youths in governance
    - enabling condition for the expected evolution of SF/SFB and their roles in the regional food system and in support to local systems
    - influence of policies and regulations

When required, and according to the results from the several steps described above, one specific focus group may be organized, with focus on gender issues. It is fore seen than gender issues will emerge from the interviews to key-informants, to SF and SFB and to the already planned focus groups. Nevertheless, in some regions it maybe relevant to organize one more Focus Group with this particular theme and concern.

The results of these workshops and of all analyses and data will be presented in a report and standardized database for each reference region. The following is a tentative list of questions to facilitate the workshop.

1. Vulnerability of the system to factors of change and role of SF/SFB.
2. * what is the role of SF and SFB, and in particular the possible hidden role that SALSA approach has helped revealing ?
   * what are the main factors of change affecting the food system in the RR?
   * what are the actors most exposed to these changes?
   *how, and how much, SF/SFB would be exposed to these changes?

[25] The Task leader will provide a protocol for these workshops.

3. * what may happen when factors of change would intensify? System outcomes relevant for FNS attributable to SF/SFB.
   * what would be the implications of the above-mentioned changes to availability, access, utilization, stability?
   * to which extent these implications would be attributable to SF/SFB?
4. SFs' contribution to resilience of the food system and how that could be increased / enhanced.
   * what is the status of SFs and SFB in the situations above described? Do they perform better or worse than other farms?
   * how SFs can be addressed to improve the resilience of the system? What strategies? what policies? What technologies?

3. WP3 activities and planning

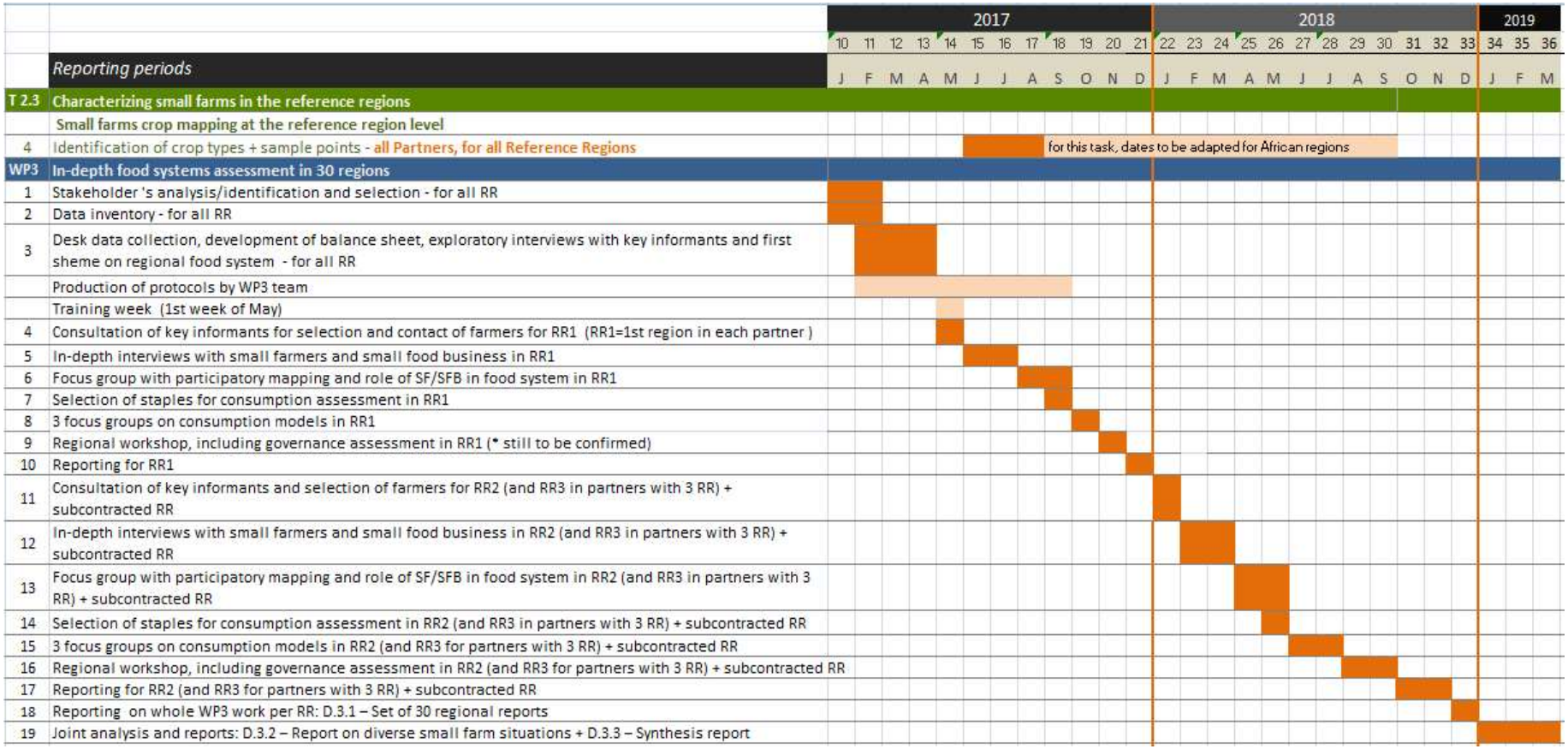
When relevant, detailed protocols of the work to be developed in each RR, including a time-plan, in each step will be distributed along WPs timing, by the WPs leads.

Table 11. WP2 and WP3 activities, main outcomes and deadlines (for the first 10 activities of the following GANTT diagram)

	Activity	Outcomes	Deadline (delivering to WP3 leads)
1	**Stakeholder's analysis – identification and selection – for all RR in partner countries**	List of stakeholders per RR, minimum two per type of stakeholder, with name, affiliation, contact, and willingness to collaborate in SALSA (primary for exploratory interviews, possibly for Community of Practice) *Detailed protocol will be sent 10.02.2017*	**28.02.2017**
2	**Data inventory - for all RR in partner countries**	List of existing data available for each the RRs, for the balance sheet, the exploratory food system, the selection of staples	**28.02.2017**
3	**Desk data collection and exploratory interviews with key informants – for all RR in partner countries**	Food balance sheet First desk-based map of food system for RR Selection of staples to be considered in each RR *Detailed protocol will be sent 10.02.2017*	**30.04.2017**
4	**Consultation key informants – in 1st RR in each partner country**	List of farmers to be interviewed, according to SALSA common sample criteria *Detailed protocol and reporting frame will be sent 30.04.2017*	**30.05.2017**
	WP2 field check of sample points – for all RR	Validation of crop types in pre-identified sample points *Detailed protocol and reporting frame will be sent 31.03.2017*	**from 01.06 to 31.08 in Europe depending on region, other dates for Africa**
5	**In-depth interviews with small farmers and small food business – in 1st RR in each partner country**	Data on a common SALSA data-base Small farms typologies map (market integration / self-sufficiency) Case studies on typologies Data on production estimates for selected staples (to WP2 work) *Detailed protocol and reporting frame will be sent 30.04.2017*	**31.07.2017**
6	**1 -2 Focus group with 1st participatory mapping – in 1st RR in each partner country**	Improved food system map for RR Role of SF/SFB in food system in RR *Detailed protocol and reporting frame will be sent 31.05.2017*	**30.09.2017**
7	**Selection of staples for consumption assessment – in 1st**	Staples of consumption assessment identified Stakeholders to involve in the consumption assessment identified	**30.09.2017**

	RR in each partner country		
8	**2-3 focus groups on consumption - in 1st RR in each partner country**	For the selected staples, consumption models and role of SF/SFB *Detailed protocol and reporting frame will be sent 31.05.2017*	**31.10.2017**
9	**Regional workshop (including governance)**	Validation of RR food system map with focus on SF/SFB Vulnerability assessment and role of SF/SFB in vulnerability mitigation Identification of main SF/SFB contributions to the 4 FNS dimensions Assessment of governance Additional analysis of critical factors, limitations, potentials *Detailed protocol and reporting frame will be sent 30.09.2017*	**30.11.2017**
10	**Reporting for 1st RR in each partner country**	Results and reporting of all steps of the analysis *Detailed protocol and reporting frame will be sent 30.09.2017*	**31.12.2017**

Table. 12. Draft GANTT diagram for WP3 activities (a more detailed to be produced by WP3 and WP2 jointly)



	Reporting periods
T 2.3	Characterizing small farms in the reference regions
	Small farms crop mapping at the reference region level
4	Identification of crop types + sample points - all Partners, for all Reference Regions
WP3	In-depth food systems assessment in 30 regions
1	Stakeholder 's analysis/identification and selection - for all RR
2	Data inventory - for all RR
3	Desk data collection, development of balance sheet, exploratory interviews with key informants and first sheme on regional food system - for all RR
	Production of protocols by WP3 team
	Training week (1st week of May)
4	Consultation of key informants for selection and contact of farmers for RR1 (RR1=1st region in each partner)
5	In-depth interviews with small farmers and small food business in RR1
6	Focus group with participatory mapping and role of SF/SFB in food system in RR1
7	Selection of staples for consumption assessment in RR1
8	3 focus groups on consumption models in RR1
9	Regional workshop, including governance assessment in RR1 (* still to be confirmed)
10	Reporting for RR1
11	Consultation of key informants and selection of farmers for RR2 (and RR3 in partners with 3 RR) + subcontracted RR
12	In-depth interviews with small farmers and small food business in RR2 (and RR3 in partners with 3 RR) + subcontracted RR
13	Focus group with participatory mapping and role of SF/SFB in food system in RR2 (and RR3 in partners with 3 RR) + subcontracted RR
14	Selection of staples for consumption assessment in RR2 (and RR3 in partners with 3 RR) + subcontracted RR
15	3 focus groups on consumption models in RR2 (and RR3 for partners with 3 RR) + subcontracted RR
16	Regional workshop, including governance assessment in RR2 (and RR3 for partners with 3 RR) + subcontracted RR
17	Reporting for RR2 (and RR3 for partners with 3 RR) + subcontracted RR
18	Reporting on whole WP3 work per RR: D.3.1 – Set of 30 regional reports
19	Joint analysis and reports: D.3.2 – Report on diverse small farm situations + D.3.3 – Synthesis report

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Annex 1: List of staple food groups to be taken into consideration

Table 13: From final to primary product using EFSA database.

EFSA FOOD SUB-CATEGORY	PROCESSING YIELD	STAPLE FOOD	STAPLE FOOD GROUP
Bread and rolls Fine bakery wares Grain milling products	*Milling yield* *Yield to bread*	Soft wheat	CEREALS
Pasta (raw) Grain milling products	*Yield to pasta* *Milling yield*	Durum wheat	
Beer and beer-like beverages	*Beer-making*	Barley	
Breakfast cereals	-	Oats	
		Maize	
Grains for human consumption Breakfast cereals Rice-based meals	*Yield to paddy rice*	Rice	
Cereal-based dishes	*Minimum content of primary product*	Other cereals	
Vegetable oils [unspecified] Oilseed	*Oil making*	Rape	OIL PLANTS
		Sunflower	
		Olive	
Berries and small fruits Citrus fruits Dried fruits Fruit juice Fruit nectar Jam, marmalade and other fruit spreads Miscellaneous fruits Mixed fruit and vegetable juice Mixed fruit juice Other fruit products (excl. beverages) Pome fruits Stone fruits Tree nuts Cider	*Minimum content of primary product*	Fruit	FRUIT
Brassica vegetables Bulb vegetables Fruiting vegetables Leaf vegetables Legume vegetables Legumes, beans, green, without pods Prepared salads Ready-to-eat soups Root vegetables Stem vegetables (Fresh) Vegetable products Vegetable juice Vegetable-based meals	*Minimum content of primary product*	Vegetables	VEGETABLES
Legumes, beans, dried	-	Pulses	
Potatoes and potatoes products	-	Potatoes	POTATOES

Molasses and other syrups Sugars	*Yield to sugar*	Sugar beets	SUGAR BEETS
Fortified and liqueur wines Wine	*Wine making*	WINE GRAPE	
Animal fat Cheese Concentrated milk Cream and cream products Fermented milk products Liquid milk	*Yield to butter and cheese; minimum content of primary product*	MILK	
Eggs	-	Eggs	EGGS
Livestock meat Meat-based meals	*Slaughtering yield*	Beef meat	MEAT
Poultry Meat-based meals		Poultry meat	
Preserved meat Sausages Meat-based meals		Pig meat	

Annex 2. SF/SFB contribution to SFNS: core question and current debate

The contribution given by SFs to SFNS has been widely debated in many recent scientific and policy documents. The various forms of contribution already identified provide a starting point for the research process, which aims at validating and integrating them while grounding them on the field research carried out in the RRs.

SFs contribution to availability

- SFs is still a key element of global FNS: there are about 500 millions of SFs in developing countries, supporting about 2 billions people. Up to 80 % of food supply in Asia and sub-Saharan Africa (HLPE 2013).
- Subsistence farming and self-consumption are highly relevant for SFs' livelihood in eastern European countries, in particular among poorer farmers (Davidova et al. 2012; Davidova and Thompson 2014) .
- SFs show impressive productivity, especially for labour-intensive crops, because of favourable incentive structure in self-employed farming and for the high transaction and monitoring costs of hired labour (HLPE, 2011).

SFs contribution to access

- SFs contribute to FNS in three ways: - direct source of food - source of income - lowering food prices (Riesgo et al 2016).
- SFs are often labour-intensive. This gives opportunity for many people to get an income. They occupy a significant cultural, social and economic place in many countries. The number of jobs created is far from negligible (HLPE 2013).

SFs contribution to utilization

- Smallholder agriculture can play a key role in improving dietary patterns, both for smallholders themselves and for urban populations (HLPE 2013).
- SFs diversify their production to meet the food needs for the household and community. For example, a small farm with 1 ha of land may prefer to divide it to cultivate 2 or 3 different food crops, such that the food need of the family can be ensured (from a contribution to the SALSA e-conference).

SFs contribution to stability

- Smallholders keep a share of their production to feed the family and engage in reciprocal relations within the kinship or neighbourhood. This is also a means for being protected from market volatility (HLPE 2013).
- In developed countries subsistence farming is a strategy for low-income or vulnerable households that have access to land and can find a way to escape from market expenditures, especially in times of crisis (HLPE 2013).

FSs contribution to sustainability

From Davidova and Thompson (2014), with regard to “family farming”.

- SFs are more inclined to be mixed, with both crops and livestock, enabling nutrient recycling within the farm and reducing effluent.

- They may utilise more traditional technologies which are better for the environment such as hay-making rather than silage.
- They generally have small fields and this implies more field boundaries preserving more landscape features and biodiversity.
- They are more likely to have longer run objectives of environmental care

Annex 3. Work packages' informative needs

WP3 is the phase of the project in which most of the information should be harvested, to be then analysed and utilized also in the following WPs. Hence, the informative needs for WP4, 5 and 6, summarised in the following, are also taken into account in the construction of this AF, and in particular in the definition of the research methodology and steps.

Informative needs for WP3 "In-depth assessment of food systems in 30 regions"

Production side

- Identification of SF types and estimation of their relative importance;
- Description of each type with common protocol and including livelihood strategies;
- Analysis of different characteristics of the interviewed small farms.

Consumption side

- Food consumption models types and their relative importance;
- Description of each type following a common protocol;
- Estimation of individuals depending on domestic model;
- Estimation of Economic and Nutritional value relative to domestic and proximity;
- Estimation of the share of the region population which can be provided with safe and nutritious food by regional small farms.

Systemic view

- Region-specific components of food system, per region;
- Description of the food system in each region, according to the SALSA model and focus on relations, including detailed description and estimations of fluxes.

Informative needs for WP4 " Participatory foresight analysis"

1. Identification of which factors informants believe will condition the perspectives of small farms and their linkages to SFNS.

Option: to prepare a preliminary list of factor-types (climate and ecological conditions, market structure, institutional framework, demographic dynamics…) to be checked with the informants.

2. WP3 fieldwork should help to identify a number of people (20-30) to be potentially invited to the workshops

3. An adapted version of the main outcomes of WP3 to be presented to the workshops participants.

Informative needs for WP5 " Analysis of the governance of small farmer organizations and food chains"

Common informative needs for food production / food consumption / small food business :

- influence of policies, regulations etc.
- types and functioning of markets
- networks and norms of food production in the region
- recent changes and innovation

Specific for food consumption

- groups considered food insecure
- self-provisioning

Specific for small food business

- types of SFB and relations with small farms

Gender balance of governance actors and its impact

Informative needs for WP6 "Enabling conditions for small farms and small food businesses"

1. A realistic, functional and validated typology of farms and small-food businesses that can be used to identify key types of small farms in each RR and can frame the identification, systematization and communication of the enabling conditions in WP6.

2. Baseline information on the current state-of-play regarding the prevailing enabling conditions – notably those relating to the Institutional, Policy and Governance arrangements for supporting small farmers and food business in a range of relevant domains. These domains might include, for example:

- Empowering small farmers in the governance of food systems
- Building the productive capacity of small farmers
- Promoting sustainable management of agricultural land and water resources by small farmers
- Fostering the development of small food businesses
- Improving the integration of small farmers and food businesses into value chains and markets
- Enhancing rural services and infrastructures for small farmers and food businesses

We could develop a questionnaire / tick-box approach for each of the domains. For example, regarding the integration of SF and SFB into value chains and markets we could ask what policies exist / are targeted at each of the specific phases of value / supply chain development – namely:

- Food / supply chain strategies
- Support for start-ups, innovation, business plans, advice etc.
- Skills acquisition
- Finance for investments
- Co-operation and supply chain organization
- Market access and quality schemes

3. Joint development of 2 WP3 working tools: a) inquiries and interviews applied to farmers; b) structures of the focus groups for collecting feedback from key stakeholders – representatives of producers, consumers, retailers, experts etc.

4. A clear methodology for integrating WP3 with WP6.1 (Identification of specific needs). Should be discussed together at an early stage of the development of WP3 methodology.

Annex 4. WP3 Objectives and AF research questions

WP3 objectives	Related AF research questions
To identify and characterise the region-specific components of food systems...	1. Which food system actors and activities are involved in the generation of the SFNS outcome? 2. What are the system mechanisms involved in the generation of the outcome? (feedbacks, domino effects, niche maintenance, etc)? 3. How are SF and related SFB connected to the food system?
To identify regional consumption patterns and trends...	4. Which are the most relevant food consumption patterns in the different regions, and their relation with SF and SFB? 5. What do SF and related SFB contribute to SFNS within the food system?
To identify the key types of SFs in each reference region...	6. Which types of SF are identifiable within each region regarding their livelihood strategies and contribution to SFNS? 7. What are the evolutionary patterns of SF/SFB and how they could be profiled in relation to their future perspective
To assess the role of SFBs and of the formal and informal markets...	3. How are SF and related SFB connected to the food system?
To characterize the interplay between smaller and larger farms...	1. Which food system actors and activities are involved in the generation of the SFNS outcome? 3. How are SF and related SFB connected to the food system? 8. How sustainable are small farms and small food businesses (as compared to larger farms)? Consider social, environmental and economic sustainability, including resilience.
To provide a reference system for monitoring, assessment and policy development...	9. What are the most significant differences between different regions with regard to role of SF and SFB in the food systems and for FNS in particular? 10. What are the key regulations and governance arrangements influencing SFs activities? (also pertinent to WP5).
Additional question for WP4	11. What are the main trends of change in the food systems and the factors that are perceived as influencing the future role of SFs for SFNS?
Additional question for WP5	12. How do gender relationships might affect features, evolution and contribution to SFNS (WP5).
Additional questions for WP6	13. What are the barriers that prevent small farmers to deliver better FNS outcomes? 14. What are the enabling conditions that would allow SFs to deliver better FNS outcomes? 15. Which typology of SF can be used to frame the identification, systematization and communication of the enabling conditions?

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