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# **cities2030**

## **Cities Regions Food Systems Labs Prototyping Guidelines & Toolkit**



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## Legislation

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## Introduction

The main goal of CITIES2030 is to create a future proof and effective Urban food systems and ecosystems. Project aims to connect short food supply chains, gathering cities and regions, consumers, strategic and complement industry partners, the civil society, start-ups and enterprises, leading universities and research. This objective will be achieved via multiple tools, one of them is development of Cities Region Food System Labs that will enable policy developments and innovation actions to improve cities and regions food ecosystems resilience and sustainability.

CRFS Labs Prototyping Guidelines & Toolkit gives an overview of the main concepts and definition for development CRFS Labs – City Region Food Systems, CRFS Labs, food system innovations as well provides guidelines and tools for developing CRFS Policy & Living labs and mapping most prospective innovations.

The guidelines are developed based on [Cities2030 pilot partners survey results](#), studies of international organizations, research institutes and the academic literature on CRFS and food system innovation. CRFS Labs Prototyping Guidelines & Toolkit is drafted by Università luav di Venezia (P38) and Latvian Rural Forum (P25), every CITIES2030 partner is welcome to contribute to the development of the document.

## 1. Definitions

The following definitions are constructed from the scientific literature and adapted to the needs of Cities2030 activities. These definitions therefore seek to be detailed enough to meet the needs of the partners who will be working on the Labs, but general enough to accommodate different cases and scales. For this reason, we imagine that we will be able to further refine these definitions as the work of the Labs progresses.

### Cities Regions Food Systems (CRFS)

In 2015, the Cities Regions Food Systems Alliance provided this definition for CRFS:

the complex network of actors, processes and relationships to do with food production, processing, marketing, and consumption that exist in a given geographical region that includes a more or less concentrated urban center and its surrounding peri-urban and rural hinterland; a regional landscape across which flows of people, goods and ecosystem services are managed. The term 'city region' refers not only to megacities and the immediate proximate rural and agricultural areas surrounding them, but also to small and medium-sized towns that can serve to link the more remote small-scale producers and their agricultural value chains to urban centers and markets in developing countries . . . Improved rural-urban connectivity is

critical to achieve sustainable food systems, and the city region food system framework provides a manageable approach (Blay-Palmer et al., 2018).

CRFS is differentiated from existing approaches including alternative food networks, short food supply chains, urban-rural linkages, sustainable food systems, foodsheds, bioregions, territorial development, and integrated policy frameworks (Jennings et al., 2015).

In the face of complex social, economic, and ecological challenges, the CRFS approach provides an integrative, holistic conceptual approach and analytical basis to improve food system dynamics.

A sustainable, resilient CRFS aspires to enhance sustainability across scales and sectors as it:

- *Increases access to food.* Both rural and urban residents in a given city region have access to sufficient, nutritious, safe, and affordable food. It supports a local food culture and sense of identity;
- *Generates decent jobs and income.* It provides a vibrant and sustainable regional food economy with fair and decent jobs and income opportunities for small-scale producers and businesses involved in food production, processing, wholesale and retail marketing, and other related sectors (such as input supply, training, and services) in rural, peri-urban, and urban areas in a given city region;
- *Increases the region's resilience* against shocks and lessens the dependence on distant supply sources;
- *Fosters rural-urban linkages.* It connects food, nutrient, and resource flows across urban and rural areas (i.e., the use of urban organic wastes and wastewater as resources in the urban agro-food system) and prevents/reduces food wastes in a given city region. It harnesses more integrated urban-rural relations, strengthens social relations between consumer and producers, and promotes the inclusiveness of smallholder (and urban farmers) and vulnerable groups across the supply chain;
- *Promotes ecosystem and natural resources management.* It promotes agro-ecological diversity and protects urban ecology/ecosystems. The ecological footprint of the city region food system is minimized from production to consumption, and it lowers greenhouse gas emission in food transport, processing, packaging, and waste management;
- *Supports participatory governance.* It fosters food policy and appropriate regulations in the context of urban and territorial planning. It also fosters transparency and ownership across the food supply chain (Dubbeling, 2016).

## Living labs and Policy labs

Living Labs (LL) have become a well-known concept mainly used in the context of collaborative development to solve complex societal needs. Over the last couple of decades, the Living labs term has been applied in varied contexts and processes. The living lab term and approaches are constantly evolving, there is no one universal definition of Living Labs.

The concept of Living lab was first proposed in the 1990s as an experimental facility resembling a living environment, where researchers observed users trying new technology. Later, the Living lab concept was expanded and applied as a test bed for investigating and experimenting with new ICT services in the real-life settings and environment of the potential users. The user was considered a "subject and target for experiments". Later around 2010, living lab was often taken as "a place for co-creation with users". In the most recent definition of living labs, users are regarded as "partners that create a service together". In this way, living labs became a co-creation place or process, where various stakeholders including developers and users conducted innovation together (Yasuoka et al 2018).

The European Network of Living Labs (ENoLL) defines **Living Labs** as user-centered, open innovation ecosystems based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings. They operate as intermediaries among citizens, research organisations, companies, cities and regions for joint value co-creation, rapid prototyping or validation to scale up innovation and businesses. LLs have common elements but multiple different implementations.

**Policy labs** (PL) is less used concept, however similar to living labs are designed to build a coalition through participation of diverse communities, "to tackle complex societal problems, using network-centered governance that focuses more on promoting, enabling and partnering and is characterized by a shared vision, cooperation, flexibility, and continuous learning" (FIT4FOOD2030, 2020).

Policy Labs approach policy issues through a creative, design, or user-oriented perspective and are created with the intent of stimulating innovation in public policy design. The main aim is to organize experiments to test proposed policies. PLs work for or within a government entity or public administration, and contribute to the shaping or implementation of public policies. The majority of Policy Labs focus on two areas of the policy cycle: assisting in the formulation and shaping of new policy initiatives and implementing new actions around established policies.

Key element for the success of policy labs is to sympathize, understand and engage with the participants that are present—recognizing their mix of perspectives, expertise and the values they bring to the table. This may mean inviting people who are assumed to have opposing views on the topic to be discussed and using the Policy Lab as a forum to consider different points of view, which may shed light on barriers to implement changes. (Hinrichs-Krapels et al 2020).

PLs undertake a wide range of activities such as preparing prospective studies, organizing creativity workshops, or instilling a sense of empowerment in civil servants through training and other

learning activities. The policy labs work at a local, regional or national level, depending on how responsibilities are divided in a country. The activities and processes of PLs are highly dependent on their regional or national context.

The policy labs draw out a wide range of perspectives to ensure that options and ideas are challenged and deliberated. The process can include preparatory work such as mapping of policies, plans, resources and regulations; monitoring policy contents, contexts, actors and processes; and identifying barriers and enablers of change. Collaborative workshops are the most common form to bring together diverse stakeholders - the wider community of policy and practice (Hinrichs-Krapels et al 2020).

Living Labs and Policy Labs definitions highlight several common features - both provide co-innovative settings, in which multiple stakeholders jointly test, develop and co-create solutions. They are defined as user-centered, open innovation ecosystems based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings. LLs and PLs are practice-driven organizations that facilitate and foster open, collaborative innovation, as well as real-life environments or arenas where both open innovation and user innovation processes can be studied and subject to experiments and where new solutions are developed. The goal of both types of Labs is to make an impact by developing new products, services, processes, policies, strategies on a small scale and to find solutions that can be implemented on a larger scale. Solutions are found in a real-life and co-creating setting in which different stakeholders give shape to the innovation process.

## Cities2030 region and cities partners experience and vision on Living Labs & Policy Labs

To build a common ground of knowledge and experience on the PL and LL, a questionnaire was distributed among the pilot partners, on their experiences with LL and PL in the field of food system and understanding of the most suitable definition of LLs and PLs. The [results of the survey](#) show that for most partners the development of LL and PL in the food systems will be a new experience, therefore there is a great demand for more knowledge in the fields of methodology on LL/PL governance, problem solving/ decision making methodology, action monitoring and impact assessment. For the development of Labs, the partners are well secured in terms of human resources, partners and stakeholders network and communication tools, but support is needed for data on CRFS in their pilot area, some partners also pointed to insufficient financial resources.

Regarding the definition of Living and Policy labs, several partners admitted that ENoll definition for Living lab and FIT4FOOD2030 definition for Policy Lab are in line with their understanding of the Policy and Living labs, clarifying that the labs shall seek to draw out a wide range of perspectives and views to ensure that options and ideas are challenged and deliberated. Policy labs should include creating new networks, collaborations and partnerships between academics and



policy-makers; synthesizing available evidence on a policy topic in a robust and accessible format; and providing timely access to evidence relevant to a policy issue. However, the most of partners consider that both labs number of similar features - both provide co-innovative settings, involve multiple stakeholders, are user-centered, open innovation ecosystems, based on a systematic user co-creation approach, integrating research and innovation processes in real-life communities and settings, that is why they do not see the need to separate LL and PL.

## CRFS Labs within the Cities2030

CRFS Labs is an umbrella term (fig. 2) for multi-sectoral and multi-disciplinary collaboration that takes place to develop different types of innovation and increase the ability to tackle complexity and challenges in different environments. The goal of the CRFS Labs is to **generate CRFS knowledge** and make an impact by developing **innovation in CRFS practices** - new products, services, processes (CRFS Living labs) and **sustainable policy frameworks** (CRFS Policy labs) on a small scale and to find solutions that can be implemented on a larger scale.

The aim of CRFS Labs is to design solutions (actions or policies) not only *for* citizens but also design these solutions *with* them. This way, user involvement is not limited to passive feedback, gathered through different voice-of-the-customer methods. The approach is rather co-creative and encourages all relevant stakeholders to work together. (..)

CRFS labs involve different CRFS stakeholders and actors and are oriented towards different objectives: CRFS Policy labs towards new food-related policies, while CRFS Living labs towards the innovation of actions. However both of them have several common features - both types of labs provide **co-innovative, user-centered**, open and collaborative innovation ecosystem, in which **multiple stakeholders and actors of CRFS** using **multi-method** approach jointly identify ideas or challenges on any CRFS level (local, city, regional, national, international) and generate, produce, test, develop and **co-create innovation** processes and solutions for **real life** communities and settings.

Cities2030 pilot partners - city or region according to their specific needs of CRFS, may develop the CRFS labs that integrate both - Policy and Living labs elements, as well can focus primary on different scale practical driven innovation development or on systematic long-term solutions at the policy level (policy assessment, funding, legislation, improvements in the decision-making process, guidance, values, etc.).

The table below (fig. 1) indicates that partners are planning to apply different approaches for CRFS labs development - to integrate both - Policy and Living labs or to develop either Living lab or Policy lab for particular CRFS thematic areas.

	P3 BRUG, BELGIUM	P5 IAAD, TURKEY	P8 VEGO, CROATIA	P12 INTO, FINLAND	P15 BRH, GERMANY	P18 QUAR, SPAIN	P32 VIZ, ITALY	P23 FFI, ITALY	P24 VPR, LATVIA	P28 IASI, ROMANIA	P40 CITAG, FRANCE	P10 VEJLE, DENMARK
Production		L&PL	LL	L&PL	LL	L&PL		LL	LL	LL	L&PL	
Processing	LL	L&PL							LL	LL		
Distribution	LL	L&PL			LL				LL	LL	L&PL	
Markets		L&PL	PL	L&PL	LL	L&PL		L&PL		LL		
Consumption	LL	L&PL		L&PL	L&PL	L&PL		L&PL		PL	L&PL	
Waste		L&PL	PL	L&PL	LL	L&PL		L&PL		PL		
Security		L&PL			LL					PL		
Ecosystem services		L&PL	PL		LL			PL	L&PL	PL	L&PL	
Livelihood, growth		L&PL		L&PL	L&PL					PL		
Inclusion, equality	LL	L&PL		L&PL				L&PL	L&PL	PL	L&PL	
Policy/decision making		L&PL		L&PL	L&PL	L&PL		PL	L&PL	PL		
Other		L&PL										L&PL
Don't know yet	PL						L&PL					

LL – Living Labs; PL – Policy Labs; L&PL – Living Labs and Policy Labs

Fig. 1 - Cities2030 partners are planning to apply different approaches for CRFS labs development.

For example, Vidzeme region (Latvia) within the Cities2030 will address the Green Public Procurement issue in public catering services provided by municipal organisations. Currently a lot of public procurement is organised based on the cheapest price, so also import production is provided in the catering. The aim is to integrate more local production in those procurement. Within the CRFS Labs the Vidzeme region addresses municipalities and farmers/producers/ retailers to understand in what ways their collaboration could be strengthened (CRFS Living Lab) and will promote these solutions and their application to other territories, integration of aspects into the laws and policies (CRFS Policy Lab).

The focus of IASI (Romania) will be on increasing urban sustainability. Planned activities of CRFS Living Lab will be the development and co-creation (feedback, evaluation, improvement). Like in the more developed countries of Western Europe, the need to shorten the agri-food sector supply chains and, implicitly, the revival of traditional domestic agriculture are becoming more and more stringent in present day Romania. Both issues are driven mainly by the changing attitudes and mindsets of end consumers, on issues such as nutrition, sustainable agriculture, and environmental conservation. The need to implement concrete actions in the medium and long term, aimed at raising the awareness/re-education of end consumers on the acquisition and consumption of local agri-food products, can also be noted at present.

The focus of CRFS Labs of Seinäjoki (Finland) will be on the Healthy Kids of Seinäjoki, their nutrition and empowerment and engagement of communities and stakeholders around them.

Bremerhaven (Germany) will develop the CRFS Policy lab to strengthen the resilience of CRFS by enhancing the capacity of local governments and food stakeholders to address the threat of the global nutrition crisis (overweight, obesity and diet-related disease, undernutrition). The food systems need to be repositioned from just supplying food to providing high-quality diets for all. More emphasis must be given to positioning agricultural growth as a way to improve diet quality, rather than merely delivering sufficient calories. This will require policy initiatives to encompass trade, the environment and health, which leverage the power of the private sector and empower consumers to demand better diets.

In the light of these examples, it is more important than ever to align two levels: on the one hand, the issues that CRFS Labs propose in terms of innovation; on the other hand, the trend scenario of regional and/or local scale policies affecting the food system. Therefore, in implementing the work of the CRFS Labs, continuous feedback between the two levels will be fundamental in order to ensure coherence between the ambitions of the CRFS Labs and the territorial management of the food system.

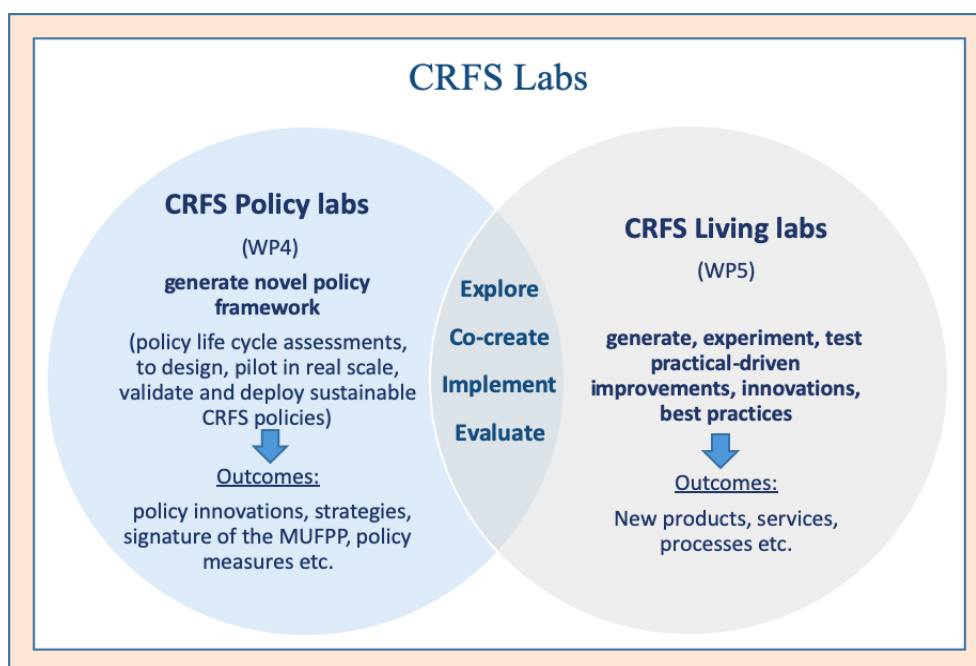


Fig. 2 - CRFS labs is an umbrella for multi-sectoral and multi-disciplinary collaboration. According to a site-specific case, CRFS Labs partners can develop different forms, roles, activities for Policy Labs and/or Living Labs.

As can be seen from the proposed definitions, CRFS Labs (Living labs and Policy Labs), although partially variable in form and structure, will share the fundamental objectives of the project.

## 2. CRFS Labs prototypes

In order to organize the work for setting up the CRFS Labs prototypes, it is important to take into account the complexity of the food system itself, and the amplitude of a CRFS stakeholders arena. As FIT4FOOD aware us:

Food and living labs are great platforms for transformation. But setting up and running a lab is a challenging, yet do-able, multi-step process. Labs need to have an appropriate Lab design and communication strategy, and need to engage in thorough food system mapping, stakeholder identification, stakeholder communication, and multi-stakeholder event design. To incite (food) system transformation, a lab can be the facilitator of citizen consultation, visioning activities, and educational module co-creation and testing. In these activities, lab coordinators and participants benefit greatly from 'deep listening' and 'DLA reflection' skills ([FIT4FOOD 2030](#)).

It is therefore important to define as clearly as possible not only the methodology to be applied in the construction of CRFS Labs, but also to have an operational reference, a structure capable of guiding cities and regions in the construction of CRFS Labs that are as complete and inclusive as possible.

CRFS Labs could resemble a quasi-experimental approach, and this includes four main phases:

### A. To understand and to explore CRFS: recognising the paths of change

Starting from the present condition of the food system considered (with particular attention to vulnerabilities and obstacles identified in WP3, T.3.2 and T.3.3), the stakeholders and trends taking place in the CRFS, which characterise all the possible scales (local, regional, national, etc.) of work of the CRFS Labs, should be identified and analysed. Detecting these characterising aspects facilitates the identification of possible paths of innovation and experimentation that the CRFS Lab could undertake in order to achieve the goals of increased resilience and sustainability (see reference to Dubbeling in section 1 of this same document).

This is also the problem definition phase which will guide the main working trajectories of the CRFS Labs. This means assessing current habits and practices related to the food system, focusing in particular on the most urgent critical issues, taking into account the specific contexts in which these critical issues occur.

To do this, an indispensable step will be to identify and map all the actors in the CRFS ecosystem that could be involved in the Cities2030 and CRFS Labs' work and experiment (more on CRFS Alliance see in WP3 T3.1). In the process of identifying CRFS actors and stakeholders it is recommended to use the Quadruple Helix approach - to include representatives from science (universities, research institutes etc.), business (producers, farmers etc.), society (NGO, communities, citizens) and public sector (policy makers, local & regional administrations, ministries etc.). The map of potential

stakeholders can be constructed from the food journey map (Fig. 3), which identifies 6 of the 10 Cities2030 key thematic, i.e. those corresponding to the different stages of the value chain. The remaining 4 key thematics - **security, ecosystem services, livelihood and growth, inclusion and equity** - will make it possible to identify potential stakeholders who cannot be univocally referred to one of the value chain phases (such as associations or institutions involved in recovering edible food surpluses and redistributing them to the needy, chambers of commerce, research institutions, etc.).

		FOOD JOURNEY STAKEHOLDERS' MAP					
		PRODUCTION	PROCESSING	DISTRIBUTION	MARKETS	CONSUMPTION	WASTE
CRFS Lab	Policy Lab (PL)	(State, Ministry of Agriculture), Region, City, City-Region, Metropolitan City, Municipalities, water reclamation consortia, CAP funds management national and local agencies, professional sector associations	(State), Region, City, City-Region, Metropolitan City, Municipalities, professional sector associations	(State, Ministry of Transports), Region, City, City-Region, Metropolitan City, Municipalities, professional sector associations	Region, City, City-Region, Metropolitan City, Municipalities, professional sector associations	(State), Region, City, City-Region, Metropolitan City, Municipalities, consumer protection associations	(State), Region, City, City-Region, Metropolitan City, Municipalities, professional sector associations
	Living Lab (LL)	PL + producers, farmers, fishermen, agri-tourism sector workers, agronomy experts	PL + producers, transformation SME, agro-food enterprises, local and niche brands, big national brands, packaging sector workers, manufacture experts	PL + transport SME, transporters, local logistic enterprises, national and international big players, logistic platform and inter-hub management, logistic experts	PL + farmers/fisherman, large-scale retail trade players, distribution sector associations, Alternative Food Networks actors, direct sellers, farmer's market, neighborhood shops, fair trade purchasing groups, distribution experts	PL + consumers, ho.re.ca. workers and enterprises, schools, hospitals, care services, charitable associations, fair trade purchasing groups, consumption experts	PL + waste management enterprises, producers, consumers, ho.re.ca. workers and enterprises, schools, hospitals, care services, charitable associations, fair trade purchasing groups, energy producers, packaging producers, waste management experts

Fig. 3 - CRFS labs should involve as many stakeholders as possible who are directly or indirectly involved in the food system, in accordance with the different stages of the supply chain.

## B. To set up CRFS Lab: organising resources and time available

In order to set up CRFS Labs, it is necessary to understand who, why, where and how will organise the Labs, to provide the environment that facilitates the exchange of knowledge, experiences, ideas and ambitions for innovation.

To do this, some fundamental components have to be taken into account:

The **PEOPLE** to be involved in CRFS Labs. The Food Journey stakeholder map could be used to identify possible participants in CSFS Labs (individuals, associations, businesses, networks, organisations, groups, communities, etc.). This component also includes capacity building and training activities of the involved participants.

The **PRIORITIES** that can put on the table for discussion (including problems, challenges, risks, obstacles, opportunities, identified in previous phase (T.3.2./3.3));

The **PLACES**, physical or virtual where CRFS Labs will be based, where all CRFS activities will take place - a neighbourhood, a single building, a public space, a landscape, an abandoned area, a forum, a website, etc.;

The **PLATFORM**, physical or virtual, i.e. the system chosen for the exchange of information, learning, debate, analysis and intuition.

The **RESOURCES** (human, technological, infrastructural, financial, organisational) needed for CRFS Labs to start operate and rely during the experiments and innovation practices are available.

Once the components of CRFS Labs are understood, it is possible to organise specific activities with carefully selected stakeholders with different but complementary competences, in order to deepen one or more ongoing challenges and work co-creatively to develop concepts, ideas, solutions to be put in place to achieve resilience and sustainability objectives. This step becomes crucial to plan and activate innovative and experimental processes efficiently.

In setting up and managing CRFS Labs is crucial to maintain a systems approach to food-related issues. This means that, although some experiments may concern a particular phase of the supply chain, the suggested methodology or innovation favours transversal interaction between the various actors and in different food supply chain phases:

**PRODUCTION:** the phase of production of raw materials (fruit and vegetables, meat and milk);

**PROCESSING:** the phase of transformation of raw materials into processed food products;

**DISTRIBUTION:** the phase where food products are stored and prepared for wholesale or retail sale;

**MARKETING:** the phase where food products are distributed through large or small scale channels for sale;

**CONSUMPTION:** the phase where food products are purchased, cooked and consumed;

**WASTE/REUSE:** the phase in which food products complete their life cycle and become waste or are discarded.

The cross-sectional interaction multiplies the possibilities for experimentation and possible paths for innovation, which must take into account the interdependence between the stages of the chain. Similarly, in case studies where there is a need to identify different clusters of participants between CRFS LL and PL, it is important to foresee activities able to make participants and stakeholders interact, in order to ensure coherence between the policy making approach and the experimenting approach.

### C. To co-create, to co-design, to experiment: real-life testing of proposed innovative activities

In the previous phase some possible trajectories for change were identified, as well as some initial hypotheses regarding activities and innovations that CRFS Labs may undertake. In this phase, the effort should focus on the collaboration and co-creation process that are the key elements for the innovation. The innovation process involves all active actors and stakeholders providing the open environment for free circulation and exchange of knowledge that could be transformed into sustainable solutions for CRFS. The activities proposed by CRFS Labs participants for experimentation of the innovative solutions may take various forms - from tangible products to intangible processes, but the main objective is to facilitate the testing of the possible 'future state' of the CRFS under consideration.

The first task of this phase is to **stimulate collaboration between the CRFS Labs' participants/stakeholders** in the construction of shared ideas and projects, in order to build and/or consolidate co-creative networks between food system actors and identify collaborative solutions to critical issues in the food system.

A second task concerns the **planning and assessment of the feasibility of the co-creation activity**, through the preliminary studies focus on the timing, costs and risks of the activity itself before the field test.

A third task of the phase is **to test and experiment the proposed actions and activities**.

In summary, the experimentation phase tests the activities proposed by the CRFS Labs as far as possible in a real-life context and allows a decision to be made on whether to return to the exploration phase to iterate on the solution, or to proceed to the phase of evaluating the impacts of the experimentation.

#### **D. To evaluate: monitoring and learning**

The final phase consists of evaluating the innovation of the proposed action or policy, including general learning and insights from the whole experiment, in order to improve and transfer to others, in case the experiment is validated by positive and satisfactory results.

The evaluation phase makes it possible to generate a "post-measurement" of the intervention and to compare it with the "pre-measurement", illustrating the potential impact and added value created by the innovation. The aim is to launch and implement the innovation in the local area and evaluate the feedback.

At this stage, it is crucial to understand what benefits the activation of the proposed action or policy is able to provide, and how such activation can improve the current condition of the CRFS considered.

Finally, the evaluation of the results and/or effects of an activity or policy should allow CRFS Labs to consider an upscaling approach to the tested innovation.

#### **Risk assessment** *(suggestions to be developed/integrated)*

The development and management of CRFS Labs is not an easy process, as it involves many different stakeholders who probably have not worked together so far, and innovations inherently are unpredictable, risky and time consuming.

Aspects worth paying attention to when setting up and managing CRFS Labs:

- Availability of crucial social, economic, administrative components and participants;
- Possible political changes in the local administrative context in the period of the CRFS Labs implementation period and later;
- Continuity in the development and implementation of projects and experiments over time;
- Impact of the COVID-19 pandemic on CRFS Lab activities, including stakeholders engagement restrictions;
- Communication and collaboration between diverse stakeholders (previous conflicts between actors/stakeholders/groups of the food system involved people);
- Motivation and engagement of CRFS Labs outcomes users (local inhabitants, NGO sector organisation, municipalities, SME etc.)
- Geographical/physical distance between CRFS Labs actors and participants and between them and CRFS Lab headquarters;
- Continuity of labs activities after Cities2030 project closure.



To assess the impact of risk on CRFS Labs, a risk assessment matrix can be used. Risk matrix evaluates the risk by focusing on the probability of potential risk. It allows you to identify the things that could go wrong and weighting the potential damage. This helps to prioritize problems and plan actions and measures for risk mitigation.

	Consequences				
Likelihood	Insignificant	Minor	Moderate	Major	Critical
Rare	<b>LOW</b> Routine management	<b>LOW</b> Routine management	<b>LOW</b> Routine management	<b>MEDIUM</b> Specific responsibility and mitigation measures	<b>HIGH</b> specific mitigation measures, quarterly management review
Unlikely	<b>LOW</b> Routine management	<b>LOW</b> Routine management	<b>MEDIUM</b> Specific responsibility and mitigation measures	<b>MEDIUM</b> Specific responsibility and mitigation measures	<b>HIGH</b> specific mitigation measures, quarterly management review
Possible	<b>LOW</b> Routine management	<b>MEDIUM</b> Specific responsibility and mitigation measures	<b>MEDIUM</b> Specific responsibility and mitigation measures	<b>HIGH</b> specific mitigation measures, quarterly management review	<b>HIGH</b> specific mitigation measures, quarterly management review
Likely	<b>MEDIUM</b> Specific responsibility and mitigation measures	<b>MEDIUM</b> Specific responsibility and mitigation measures	<b>HIGH</b> specific mitigation measures, quarterly management review	<b>HIGH</b> specific mitigation measures, quarterly management review	<b>EXTREME</b> Specific mitigation measures, monthly management review
Almost certain	<b>MEDIUM</b> Specific responsibility and mitigation measures	<b>MEDIUM</b> Specific responsibility and mitigation measures	<b>HIGH</b> specific mitigation measures, quarterly management review	<b>EXTREME</b> Specific mitigation measures, monthly management review	<b>EXTREME</b> Specific mitigation measures, monthly management review

Fig. 3. Risk assessment matrix

Once the potential risks are identified and assessed, the next step is to develop a risk mitigation plan to set out risk minimizing or eliminating measures, monitoring procedures as well as assign responsibilities.

## 3. Requirements and Objectives for the follower cities

With the aim to facilitate the uptake by others (city-to-region) of the CITIES2030 approach, and in order to foster city region food systems as a vehicle for broader urban resilience (climate, social, economic) a network of follower cities will be identified.

The basic requirements and the minimum objectives to be achieved by a follower city are:

- The signature of the Milan Urban Food Policy Pact, as a starting point for an awareness of the need to include food system issues in the urban and/or regional agenda of an inhabited and nurtured territory;
- The willingness to set up a CRFS Lab, as a key instrument of adherence to the objectives and, in particular, to the methodology proposed by the partners of Cities2030, to identify innovative actions and policies, in order to follow a path similar to that of the cities and regions already involved in CITIES2030;
- To run at least one forum on innovative actions or policies, useful to maintain the focus on the effectiveness of the proposed activities, on the involvement of stakeholders, on the impacts that the innovations proposed or produced by the labs will have on the food system.

## 4. CRFS Labs and Innovation

### Innovation

As it was previously explained, CRFS Labs provides a co-innovative, user-centered, open and collaborative innovation ecosystem. The concept of innovation has very diverse definitions. Hundreds of them have been created worldwide to express the nature of innovation. Innovations are most often discussed in the business context, but they are also implemented in the public sector.

Oslo Manual 4th edition (OECD) provides a comprehensive definition that is applicable to any institutional unit in any sector, including the business sector, public entities and non-profit institutions: *“An **innovation** is a new or improved product or process (or a combination thereof) that differs significantly from the unit’s previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process).* (OECD/ Eurostat, 2018: 20).

The differences between innovations in both sectors are that public sector investments operate with a political logic and create a politically defined public good for serving citizens’ needs. Business innovations, in contrast, conceptualize brand new products, processes, and ideas, or approach existing ones in new ways to gain competitiveness in the market.

Business sector innovations	Public sector innovations
Product: Goods Services	Products: Services
Business process: Production of goods & services Distribution and logistics Information and communication systems Administration & management Product & business development process Marketing and sales	Processes or methods of organization
	Methods of communication
Systems	Systems

Fig.4. Innovations types in business and public sectors (source: Oslo Manual 2018, Copenhagen Manual 2021)

Public vs. private sector innovation	Logic	Purpose	Copying	External collaborations	Risk propensity
Public	Politics	Public good	Free	Predominantly horizontal	Low
Private	Market	Competitive advantage	Copyright	Predominantly vertical	High

Fig. 5. Differences in innovative practices in the public and private sectors (Copenhagen Manual, 2021)

CRFS Labs may include stakeholders from both sectors, as well as innovation can be developed with impacts on both sectors. Therefore, CRFS Labs innovation can combine the characteristics of innovation in both sectors – for example, external collaboration can be established both horizontally – involving different actors of relevant subsectors (e.g. various city council departments) and vertical collaborations up and down the value chain (e.g. customers, suppliers).

## Food system innovation

The food system is a complex web of actors, interactions and activities of the food value chain involving the production, processing, transport, consumption and disposal, it also includes the policy environment, economics of food production, its sustainability, the impact on the natural environment, cultural norms and population health. Innovation permeates all elements of the food system, can be a transformation of one element or a redeployment of several linked elements to create a more sustainable food system. Within the Cities2030 project the innovation is used in the most comprehensive way applying to any innovative or already existing product, service, approach, policy, process, mechanism or system that is currently implemented with successful results to enhance and contribute to the sustainability of urban food systems.



Fig.6 Food System innovation (Source: <https://www.systemsinnovation.io>)

## Drivers for food systems innovation

The sources for innovation in the food systems are various, the studies of international organisations and research institutes, identify different drivers that lead to the innovation and transformation of the food system (see e.g. SWAC/OECD 2021, Kennedy et al 2020). The most common drivers that define the way food is produced, traded, delivered, consumed and overall shape the future of food systems, are:

- **Demographic** - population growth, urbanisation and settlement patterns have shifted the region's food system towards cities and towns. Food value chains are getting longer, including more stakeholders, logistics, wholesale, retail, which requires designing effective food system policies and solutions involving new actors and dimensions.
- **Economic** drivers like income, prices, trade have an effect on incomes, consumption and investments that lead to changes along the entire food value chain as well as the broader food system.

- **Socio-cultural** - locally available resources, social values, traditions, attitudes and cultures create a great spatial variation of food systems (food, diets, models of production, processing, distribution, consumption). In turn, global migration trends, urbanization, mobility of ideas influence food-producing, cooking and consumption habits.
- **Policies, regulations & governance** – various policy instruments like laws, regulations, investments, subsidies affect all elements of food systems – producers, trade system, consumers etc.
- **Innovation, technology & infrastructure** accelerate transformations in food production, consumption and policy. They provide opportunities for improving efficiency and organisation of production processes and developing more sustainable and resilient food value chains, increasing connectivity and information flows between food system stakeholders and digitalisation of food systems.
- **Environmental** drivers address natural resources available, pollution and climate. Food production is highly reliant on the availability of natural resources like water, land, forest biodiversity etc.

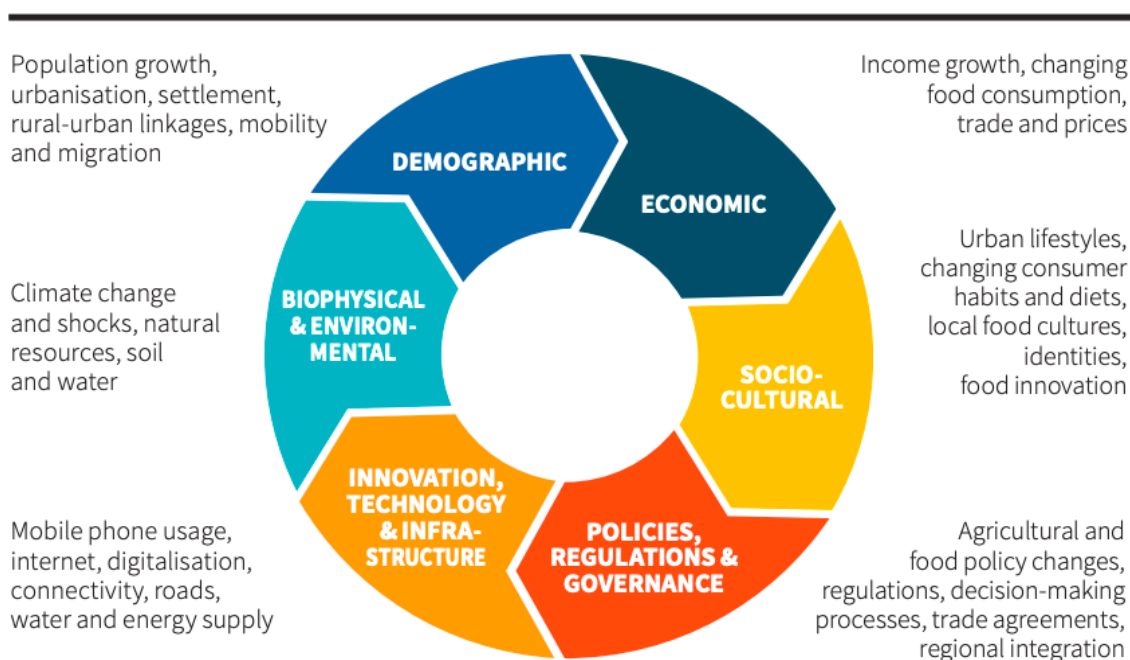


Fig.7. Drivers shaping the future of food systems (SWAC/OECD, 2021)

All these drivers are highly interrelated and influence food-related activities, stakeholders, food systems actors and outcomes. Understanding these drivers and their interactions is crucial in informing and designing food systems and policies ([SWAC/OECD \(2021\)](#)).

The study on European cities (EUROCITY) that are already working on food-related policy or projects (including Living labs), discovered 6 types of **innovation dynamics**:

- emphasis on **community buy-in**: developing or implementing food policies, cities councils or governments use bottom-up approach and see their role as a facilitator, emphasizing the involvement of civil society and focusing on community-led solutions and innovations;
- enhancing **participation in the governance system**: cities apply innovative governance approaches and mechanisms that aim to enhance civil society participation in the design and implementation of food policies;
- **local empowerment** as a policy goal: cities empower all food system actors and enhance social inclusion, devising initiatives that target the most vulnerable segments of their populations;
- **shortening food supply chains** – reducing social & physical distance between producers and consumers, facilitating localness and seasonality of the food;
- **systemic thinking** - cities develop an innovative systemic approach to food policy by moving beyond the production-consumption divide that historically characterises food policy-making, cities are focusing their intervention on other stages of the food chain, particularly waste, which they see as “a key governance challenge”.
- **translocalism** – cities establish translocal networks that aim to enhance knowledge exchange and cooperation between urban areas.

More information and examples of cities' experience in creating food strategies and innovation see at [“Food in cities: study on innovation for a sustainable and healthy production, delivery and consumption of food in cities’ project”](#) (EUROCITIES, City of Milan, Cardiff University, 2017).

## Stakeholders within the innovation in the CRFS Labs

One of the key elements for the open innovation ecosystem in CRFS Labs is the involvement of different stakeholders (for identification of the stakeholders, see “Food journey stakeholders map” fig. 3). The innovation co-creation process in the Labs depends on which food systems actor drives their activities. There could be: utilizer-driven, enabler-driven, provider-driven and user-driven types of the living lab. Each type has a different actor that plays the most active role as the principal promoter of innovation activities (Leminen, Westerlund & Nyström, 2012).

	Utilizer-driven	Enabler-driven	Provider-driven	User-driven
<b>Purpose</b>	Strategic R&D activity with present objectives	Strategy developed through action	Operations development through increased knowledge	Problem-solving by collaborative accomplishments
<b>Organization</b>	Network forms around a utilizer, who organizes action for rapid knowledge results	Network forms around a region (regional development) or a funded project (e.g., public funding)	Network forms around a provider organization	Network initiated by stakeholders & users lacks formal coordination mechanisms
<b>Action</b>	Utilizer guides information collection from the users and promotes knowledge creation that support the achievement of present goals	Information is collected and used together and knowledge is co-created in the network	Information is collected for immediate or postponed use; new knowledge is based on the information that the provider gets from others	Information is not collected formally and builds upon stakeholders & users interests; knowledge is utilized in the network to help the user community
<b>Outcomes</b>	New knowledge for products and business development	Guided strategy change into a preferred direction	New knowledge supporting operations development	Solutions to users everyday-life problems

Fig.8. Characteristics of different types of living labs as open-innovation networks (Leminen, Westerlund & Nyström, 2012).

Depending on the purpose and needed outcomes, the CRFS Labs elaborate stakeholders engagement level and approach.

## Innovation breakthroughs related to food systems

Transformation in the food system is ongoing, innovation is invented, created, tested and developed in all elements of the food system. The International Food Policy Research Institute pointed out that the most critical innovations to ensuring that the food systems address many of the world's most pressing problems in human and environmental health will be innovations in technology, policies, and institutions ([IFPRI, 2018](#)).

In turn, FIT4FOOD2030 identified the most potential research and innovation breakthroughs in food systems in the following areas and processes:



New inputs in society education about food systems	Bioeconomy	New agriculture	Blockchain
Change in dietary habits	Circular economy	Smart farming	The future ICT
Empowered consumers	New industrial processes	New aquaculture	
New Policies and Management	New systems for sustainable trade	New breeding techniques	
Developments in Food Analysis	New packaging solutions	Biotechnology	
		New ingredients e.g. "cultured meat"	

Fig. 9. Research and innovation breakthroughs in food systems (Source: FIT4FOOD2030, 2018)

The Global Knowledge Initiative (GKI) reacting on the World Economic Forum Scenarios Analysis on Shaping the Future of Global Food Systems (2017) that predicted that "global food systems in 2030 teetering between unsustainable production and consumption and torn between isolationism and collaboration" identified prospective emerging innovations for the food systems within the next 20 years (see fig. 9). The most prospective innovations were evaluated by a set of criteria:

- **Affordability** - income range of individuals and institutions who could afford the innovation
- **Usability** - the amount of training required for the end-user to effectively use the innovation
- **Scalability** - the point in the diffusion process at which the innovation could be scaled within 5 years
- **Sustainability** - length of time that external support would be required before the innovation is accepted, adopted, and provides benefits
- **Energy considerations** - the type of energy access required to deploy and operate the innovation
- **Smallholder benefits** - the percentage of benefits that would likely accrue to smallholder farmers
- **PHL reduction potential** - innovations potential to reduce current levels of post-harvest loss'
- **Environmental impact** - innovations likely impact, either positive or negative, on the environment

AWARENESS & CAPACITY BUILDING	BUSINESS MODEL	DATA	ENERGY	LIFE SCIENCES & ENGINEERING	PACKAGING & PROCESSING	STORAGE & TRANSPORT
Behavioral economics for agriculture	Community/kickstarter-supported agriculture	Aflatoxin detection and reduction technologies	2 <sup>nd</sup> generation biofuels from edible biomass	1-MCP technology	Automated sorting and packaging	Adaptable reefer containers
Fee-based extension services	Farm-to-fork virtual marketplace	Blockchain logistics	Battery technologies	Antimicrobial fogging	Cellulose crating and packaging materials	Biosequestration of carbon in crop storage
Global PHL accounting protocol	Farming as a service	Distribution system mapping	On-farm solar preservation	Biodegradable coatings	Cooperative packaging solutions	Crates adapted for smallholder supply chains
Legislative support for farmer cooperatives	First-loss capital guarantee for PHL reduction	Early warning systems for plant disease and pests	Smart grids for agriculture	Bio-waste consumer goods	Dehydration for smallholders	Cold chain as a service
Mobile education centers	Multinational corporation anchor buyers	Fiber optic biosensors		Genetically engineered loss-resistant crops	Ethylene absorption technologies	Drone delivery of fresh produce
Open-source platform for PHL innovations	Private sector innovation and incubation hub	Government satellites for agriculture		Kilobots	Irradiation for smallholder value chains	Evaporative cooling systems
Public awareness campaigns to reduce PHL	Specialty marketing for PHL-prone crops	Hyperspectral imaging		Microbes for agriculture	Mobile packhouses	Micro-warehousing and shipping
		Improved traceability technologies		Nanomaterials for PHL reduction	Modular factories	Micro cold transport
		Low-cost moisture meters		Plant-based protein alternatives	Near-farm mobile processing	Mobile pre-cooling
		Millimeter wave sensors		Silk fibroin coating	Smart packaging	Retrofitted cold storage for smallholder value chains
		Mobile ethylene monitoring				Uber for produce delivery
		Open-source supply chain planning				Unmanned first-mile transport
		Open-source PHL mapping				
		Post-harvest data to improve access to finance				
		Smart sensors				

Fig. 10. Prospective innovations identified by [GKI](#)

Innovation and good practices in CRFS within the Cities2030 project are collected within the Agrifood Digital Innovation Hub: <https://mapping.dih-agrifood.com/> (for CRFS innovations that are developed or owned by Cities2030 partners or stakeholders) and [google form](#) (for CRFS innovations known to partners from publicly available resources).

## Tools for innovation mapping & evaluation

The section offers tools and methods for assessing whether selected innovations are feasible, in line with available resources and which area is addressed.

- **Innovation flowchart**

The Innovation Flowchart gives a detailed overview of the various stages in an innovation process, listing the activities, requirements and goals of each stage. These include an overview of the different stakeholders, expertise, skills, activities and resources (incl. finances) that might be needed in order to succeed. The structured overview this tool provides, helps to review where Labs are in the innovation process, and to organise the next steps. This tool helps to spot opportunities for growth by helping understand which resources to focus on. It allows to understand where Labs are in the process and whether all the aspects that need are considered.

STAGE	SPECIALIST SKILLS REQUIRED	EXAMPLE ACTIVITIES & TOOLS	RISK LEVEL AND HANDLING	FINANCE REQUIRED	KINDS OF EVIDENCE GENERATED	GOAL
1 Exploring opportunities & challenges	→	→	→	→	→	→
2 Generating Ideas	→	→	→	→	→	→
3 Developing & testing	→	→	→	→	→	→
4 Making the case	→	→	→	→	→	→
5 Delivering and implementing	→	→	→	→	→	→
6 Growing, scaling and spreading	→	→	→	→	→	→
7 Changing systems	→	→	→	→	→	→

Fig.11. The Innovation Flowchart ( Nesta Innovation Flowchart)

- **Innovation landscape**

For the initial mapping the innovation landscape can be used U.Ehlert approach which is based on an assumption that innovation is the desired output of a process, it means - the **demand** for that output **is defined by the problems that need to be solved**. Another process is related **to the supply of ideas as the key input**; ideas for what could be a potential solution. The innovation process takes place between the input and the output - the ideas that solve the problems are identified and implemented.

The innovation landscape is divided into four different quadrants. The first quadrant looks at known problems and known ideas. The result of the innovation in this quadrant usually is optimising existing products, processes, or services and increasing the profit margin without increasing their functionality.

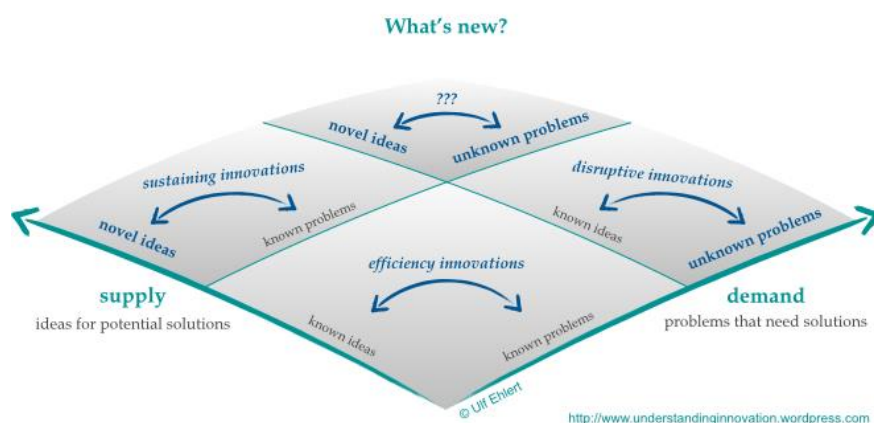


Fig.12. Innovation landscape matrix (Ehkert, 2014)

The 2nd quadrant deals with known problems but needs the generation of novel ideas to develop solutions. This quadrant generates sustaining innovation that replaces an existing product or service with an improved one. The 3rd quadrant (disruptive innovation) addresses unknown problems or challenges that may be either truly new or only unacknowledged so far. In either case, the solution is sought through applying known ideas. The focus is on employing the available inventory of ideas in novel ways to develop a solution.

The 4th quadrant deals with unknown problems and novel ideas. Part of the challenge in this quadrant is in the famous unknown unknowns: "If I don't know (or don't acknowledge) that I have a problem, how could I possibly solve it?" That becomes truly wicked when there's no idea for a possible solution either.

- **Now-wow-how** is a bit similar approach - Now-wow-how matrix allows to categorize innovation according to how challenging could be the implementation of innovation and how innovative is the solution:

**Ease of implementation:** how easy or difficult are these innovations to be implemented within the current structure, assets, and capabilities (incl. technical, organizational, financial resources and capacities).

**Level of newness:** are innovations expected to be incremental or disruptive? The matrix helps to narrow down or scale up the ideas, categorize them, and select the WOW ones - those ideas that are both innovative and feasible

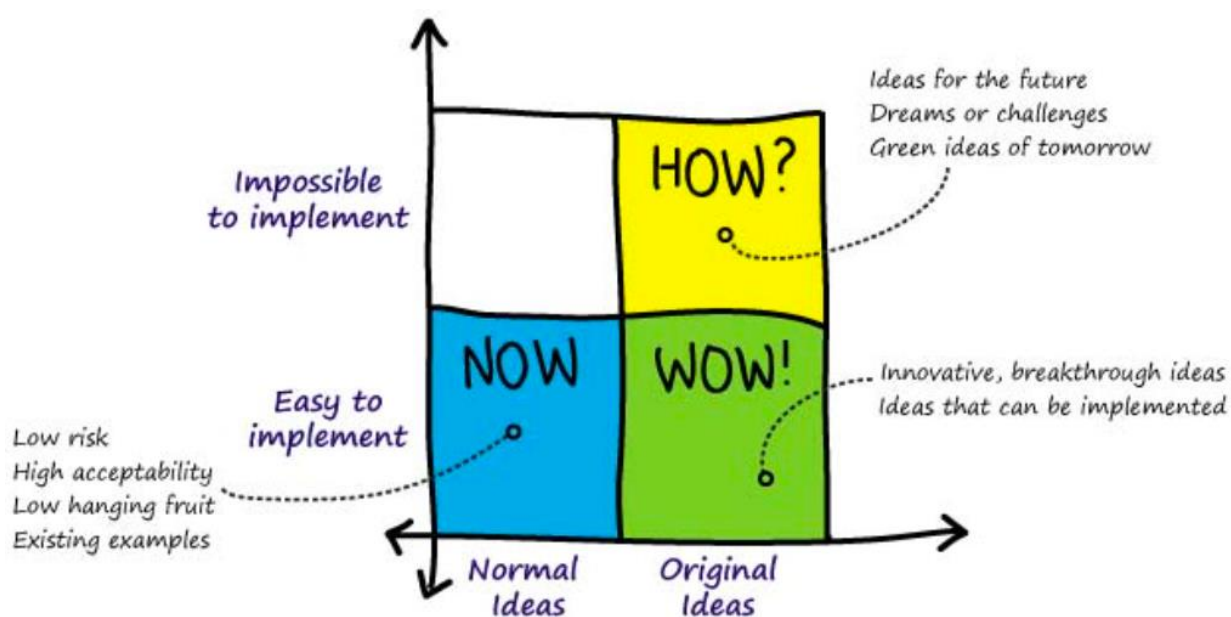


Fig. 13. Now-wow-how matrix (source: Gamestorming.com)

- **A PESTEL analysis** allows map innovation depending on its Political, Economic, Social, Technological, Environmental and Legal character:

P	E	S	T	E	L
Innovations related to e.g. governmental policy, trade, tax policies	Innovations related to e.g. economic growth, employment	Innovations related to e.g. health, safety, culture, lifestyles, behaviour	Innovations related to e.g. technology, technological change & awareness	Innovations related to e.g. climate change, pollution prevention, environmental policies	Innovations related to e.g. consumer protection

All above-mentioned methods can be used and modified by CRFS Labs according to the Lab's needs and purposes. More tools can be found on the [Food Systems Innovation Toolkit](#).



### Useful links to exploring innovations, trends in food systems:

- Food in Cities: Study on Innovation for a Sustainable and Healthy Production, Delivery, and Consumption of Food in Cities  
<https://www.milanurbanfoodpolicypact.org/wp-content/uploads/2021/08/Eurocities-Food-in-Cities.pdf>
- Innovating the future of food systems: A global scan for the innovations needed to transform food systems in emerging markets by 2035  
<http://globalknowledgeinitiative.org/wp-content/uploads/2018/01/GKI-Innovating-the-Future-of-Food-Systems-Report-October-2017.pdf>
- Mapping of trends in food systems and related R&I policy frameworks  
[https://fit4food2030.eu/wp-content/uploads/2018/10/Trends\\_V4\\_14\\_08\\_2018-attachment-compressed.pdf](https://fit4food2030.eu/wp-content/uploads/2018/10/Trends_V4_14_08_2018-attachment-compressed.pdf)
- Eight megatrends in Nordic-Baltic food systems <http://norden.diva-portal.org/smash/get/diva2:1506755/FULLTEXT01.pdf>
- Inspirational source for experiments and solution within the CRFS Labs  
<https://www.milanurbanfoodpolicypact.org/milan-pact-awards/milan-pact-awards-2020/>

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### **Good practices to be inspired:**

Cité de l'agriculture: <https://cite-agriculture.fr/>

Startup week end in Reggio Emilia: <https://futurefood.network/startup-weekend-reggio-emilia-your-idea-in-54-hours/>

Latvian Food Bioeconomy cluster: <https://clustercollaboration.eu/cluster-organisations/latvian-food-bioeconomy-cluster>

Bruges Food Lab: <https://www.brugsfoodlab.be/>

VRAC project <https://vrac-asso.org/notre-reseau/>

Marseille Alchemist: <https://alchimistes.co/compostage-bouches-du-rhone/>

<https://www.milanurbanfoodpolicypact.org/>

Food policy for Canada <https://foodpolicyforcanada.info.yorku.ca/backgrounder/>