



Deliverable 6.3

TOOLKIT FOR USE OF EDUCATIONAL MODULES

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Table of Contents

| | |
|--|----|
| 1. Introduction | 4 |
| 1.1 FIT4FOOD2030 project and its competence-building objectives | 4 |
| 1.2 Purpose of the deliverable | 4 |
| 2. The FIT4FOOD2030 educational modules | 5 |
| 2.1 Educational modules | 5 |
| 2.2 The educational module development phases | 5 |
| 2.2.1 Prototyping | 5 |
| 2.2.2 Piloting | 9 |
| 2.3 Module selection | 10 |
| 2.4 Module adaptation: Some suggestions | 11 |
| 2.5 Overview of the educational modules | 12 |
| 2.5.1 City Lab Amsterdam: Applications in Food and Nutrition Analysis | 12 |
| 2.5.2 City Lab Athens: Eat It, Don't Skip It! | 13 |
| 2.5.4 City Lab Barcelona: Fostering change in your system for the promotion of healthy and sustainable diets. Part I - Validating a system map and identifying areas where changes are needed | 14 |
| 2.5.5 City Lab Barcelona: Fostering change in your system for the promotion of healthy and sustainable diets. Part II - Building visions of concrete areas of the system and action plans for change | 14 |
| 2.5.6. City Lab Budapest: System Thinking for Food System Sustainability..... | 15 |
| 2.5.7 City Lab Budapest: Our Food System and Us | 17 |
| 2.5.8 City Lab Milan: Valuable Market | 17 |
| 2.5.9. City Lab Milan: Visions of Future Food | 18 |
| 2.5.10 City Lab Sofia: I <3 Food | 19 |
| 2.5.11 City Lab Sofia: Nutrition | 19 |
| 2.5.12 City Lab Sofia: Specific features of the food system | 19 |
| 2.5.13. City Lab Tartu: Taste Alternative Protein | 20 |
| 2.5.14 City Lab Tartu: Beeswax Food Wrap | 20 |
| 2.5.15. City Lab Tartu: Food and Vacuum | 21 |
| 3. Analysis of modules per key characteristics | 21 |
| 3.1. Format | 21 |
| 3.2. Type of learning with society | 22 |
| 3.3 Target audiences | 22 |
| 3.4 Implementation contexts | 24 |
| 3.5 Duration | 24 |
| 3.6 Content areas | 25 |
| 5. Next steps | 26 |

| | |
|-------------------------------------|----|
| 6. Educational module annexes | 26 |
|-------------------------------------|----|

1. Introduction

1.1 FIT4FOOD2030 project and its competence-building objectives

FIT4FOOD2030 supports the urgently needed transformation of Research and Innovation (R&I) on Food and Nutrition Security (FNS) in Europe. To achieve that, FIT4FOOD2030 will create a sustainable, multi-stakeholder platform, mobilizing a wide variety of stakeholders at the level of cities, regions, countries, and Europe wide. Known as the FOOD 2030 Platform, this network will make R&I policies on FNS more coherent, build competences of current and future researchers, entrepreneurs, policy-makers and society at large, and raise awareness around FOOD 2030.

The three inter-linked structures of the FOOD 2030 Platform are:

- EU Think Tank: the link between the EC and Member States & Associated Countries, with a global outreach;
- Policy Labs to increase and align public/private R&I policies/programs on FNS, building on and expanding existing national/regional networks; and
- City Labs to develop/pilot action-oriented trainings for students, consumers, researchers and professionals linking Science Centers/Science Shops to networks of the Milan Urban Food Policy Pact cities.

Via the structure of the City Labs, WP6's key objective is to deliver a set of transformative, hands-on future-oriented educational modules on food system Responsible Research and Innovation (RRI) and R&I for primary, secondary and university-level students as well as professionals such as entrepreneurs and social agents. In this context, Responsible Research and Innovation principles have been embedded both in the activities' design process and the activities themselves to foster multi-stakeholder engagement, critical thinking, collaborative learning skills and transdisciplinary approaches to food systems learning.

The City Labs have developed a combined total of 15 educational modules, self-standing units of study or training, that are nevertheless interrelated with other such units and which can be combined in a number of ways to build up a programme of activities. Each contains a detailed step-by-step guide for module delivery and is presented in its integrity in Section 6 with the help of internal hyperlinks.

1.2 Purpose of the deliverable

The objective of Deliverable 6.3 is to present the near-to-final educational modules developed so far, as well as insights for module selection and adaptation by future users. It is recommended that this deliverable is consulted in parallel with Deliverable 6.2 which contains insights from the piloting phase of the educational module development. Nevertheless, some of the broad conclusions from the piloting phase are summarized in Section 2.2.2 of the current document.

It is envisaged that interested users of the educational modules will be able to download the full set of modules, or each module individually from the project website (www.fit4food2030.eu), after

being able to filter the modules according to key characteristics. With this in mind, Deliverable 6.3 groups the modules according to characteristics such as target audience, content area, focus on Food 2030 priorities and so on, as outlined in Section 3.

The deliverable has been compiled based on the educational module guidelines. It is informed by semi-structured interviews carried out by Work Package 6 leads with the City Lab coordinators.

2. The FIT4FOOD2030 educational modules

2.1 Educational modules

The City Labs have developed a combined total of 15 educational modules, self-standing units of study or training, that are nevertheless interrelated with other such units and which can be combined in a number of ways to build up a programme of activities. Each contains a detailed step-by-step guide for module delivery, which can be found in Annexes 1 to 15.

During the educational module development process, each City Lab has taken into consideration their area of expertise (e.g. science centres have significant experience in producing hands-on workshops of shorter duration) and the vision of future-proof food systems developed in their City Lab in order to select the target audience and educational level, the learning approach (deep learning or light learning), the topic (connected with the FOOD 2030 Research & Innovation priorities) and the specific competences addressed by the educational modules they develop.

2.2 The educational module development phases

N.B. This overview makes reference to the methodology developed by FIT4FOOD2030, expected to be published online as part of the FIT4FOOD2030's Tools for Transformation.

2.2.1 Prototyping

City Labs began by **prototyping** (Task 6.3) ideas for educational modules coming from consultations or workshops with City Lab participants. Those ideas were generated using multi-stakeholder co-creation methodology developed by the project's methodology team (WP1, led by VU), and a wealth of bilateral exchanges with City Lab members or other experts recommended by the stakeholder network of the City Lab or already in the local and national networks of the City Lab host organisations (i.e. science centres, science museums, innovative schools, and living labs).

Prototyping allowed those ideas to take a visible, tangible or functional form, namely development into a set of draft guidelines for the delivery of the educational module. Different stakeholders were consulted about it at an early stage of development, allowing improvement without committing too many resources.¹ Guideline drafts gave way to fuller prototypes that specified all the details necessary to run live piloting with the intended audiences of the educational modules. Table 1 gives an overview of potential steps that can be taken to arrive at a viable prototype, based on the experience of the City Labs, while figures 1 to 7 illustrate some of the steps.

¹ See Nesta (2018). 'Proof of concept, prototype, pilot, MVP - what's in a name'. Available online at: <https://www.nesta.org.uk/blog/proof-of-concept-prototype-pilot-mvp-whats-in-a-name/>

Table 1. Potential general steps towards an educational module prototype. Steps A and C are co-creation formats prepared by the methodology design team at Athena Institute, VU Amsterdam (WP1). In practice, the development process varied from City Lab to City Lab.

Step A: Workshop on co-creating competences

With the help of a fictitious persona (see Figure 1 for an example), potentially inspired by real-life actors from national or local (show-) cases, participants brainstorm the steps needed for actors in the food system to acquire skills and knowledge. They compare these with a set of competences cards for Responsible Research and Innovation and food systems competence elaborated by the project, and rate them on a matrix according to their urgency and level of coverage/representations in the current education or (professional) practice (see Figure 3). The outcome of such a workshop could be that modules will go on to address in particular competences under-represented and needed urgently.

Step B: Formulating learning goals.

As a subsequent step, learning goals can be formulated for the competences identified. City Lab coordinators were provided with further guidance on possible taxonomies, including formulating learning goals for Responsible Research and Innovation².

Step C: Co-creating (out-of-the-box) modules

A morphological matrix – a table often used in design processes – is at the heart of this exercise for module design. The first column lists variables needing consideration, and the subsequent columns present possible options or versions the variable can take (see Figure 4). A pre-defined table was prepared with the educational module variables and options in mind. Participants can randomly select options and brainstorm collectively on a module/activity that could respond to all the parameters (Figure 5). Ideas can be presented in a plenary (Figure 6), further selected or combined until a coherent module has been achieved. Some ideas generated during such a workshop are presented in Textbox 1.

Further resources for co-design are available from the EU-funded SySTEM2020 project³ and could be used complementary to the workshop described above:

- Sets of trigger cards to help participants consider the issues of engaging different target audiences and inclusion in designing (informal) learning opportunities
- Matrices and tables for the prioritization of module ideas generated by participants in terms of impact (high to low) and difficulty of implementation (easy to difficult)
- An ideation canvas for refining of module ideas/solutions
- A framework to assess the modules according to utility, viability and feasibility

Step D: Securing stakeholder commitment

² See, for example, the EnRRICH project Deliverable 2.3, 'The EnRRICH Tool for Educators', available online at: https://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Dokumente_Dateien/EnRRICH/D2.3_The_EnRRICH_Tool_for_Educators.pdf

³ See SySTEM2020, Eva Durall, Aalto University, 'Co-design workshop materials', available online at: <https://system2020.education/wp-content/uploads/2019/11/All-resources.pdf>

Developers are encouraged to consider early on who among their network is willing to translate the educational module into a working prototype, or to prototype the module in its early iterations. They could propose different degree of involvement to the network: from consultations on the content of the modules, to module co-authorship, to hosting and being involved in the implementation of the module prototype. An idea tried by the City Lab Milan was providing participants to the co-creation workshops with a postcard (potentially listing the various ways they could be involved), and inviting them to email or call to discuss their preferred role once they have reflected on the co-creating workshop outcomes (Figure 7).

Step E: Co-development of the module

Smaller meetings or interactions can be arranged with stakeholders to gather their input to the modules, pitching ideas, generating commitment and building connections with their activities. The educational module template developed by the project can provide the basis to discuss the different module components in more detail.

When such meetings are unplanned and informal, it might be helpful to write down shortly after some details about the encounter: what prompted the meeting, ideas relevant for module design, decisions or plans for follow-up. Keeping track of such interactions can document how module development occurs and trace back influences and key decisions.

Step F: Testing proof of concept

Doing small tests with one or two users can help demonstrate that an idea is feasible. For example, the coordinator City Lab Tartu went through the educational modules quickly with one user, tried out the hands-on activities and talked through the dialogue methods to receive feedback.

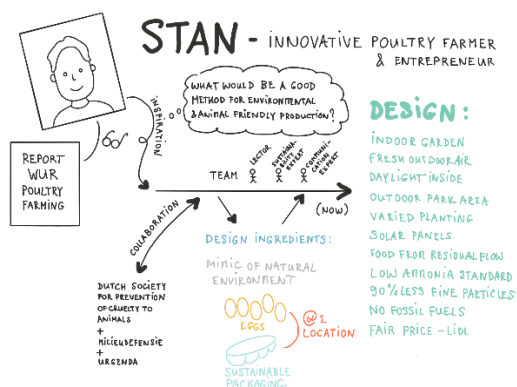


Figure 1. Persona Stan. Developed by the City Lab Amsterdam



Figure 2. Brainstorming. City Lab coordinators' training, Amsterdam, November 2018



Figure 3. Competence matrix produced by the City Lab Tartu

| LEARNER'S LEVEL | PRIMARY SCHOOL | MID SCHOOL | HIGH SCHOOL | EARLY BSc | LATE BSc | EARLY MSc | END MSc | PROFESSIONAL |
|----------------------------|----------------|-------------|-------------|----------------|-------------------|-------------|-------------|--------------|
| Discipline / Field | SCIENCE | SCIENCE | SCIENCE | SCIENCE | SCIENCE | SCIENCE | SCIENCE | SCIENCE |
| INTELLIGENCE / Type | LOGIC SMART | LOGIC SMART | LOGIC SMART | LOGIC SMART | LOGIC SMART | LOGIC SMART | LOGIC SMART | LOGIC SMART |
| FOOD SYSTEM ELEMENTS | PRODUCTION | PRODUCTION | PRODUCTION | PRODUCTION | PRODUCTION | PRODUCTION | PRODUCTION | PRODUCTION |
| FOOD2030 FOOD SYSTEM THEME | PRODUCTION | PRODUCTION | PRODUCTION | PRODUCTION | PRODUCTION | PRODUCTION | PRODUCTION | PRODUCTION |
| WORK (ING) FORMAT | INDIVIDUAL | IN PAIRS | GROUPS | GROUPS | GROUPS | GROUPS | GROUPS | GROUPS |
| INSPIRATION / SOURCE | COMMISSIONER | NEWS | SHOWCASES | SELF-INVENTION | FICTIONAL PROJECT | | | |
| ANOTHER VARIABLE | | | | | | | | |

Figure 4. Pre-defined morphological matrix developed by the City Lab Amsterdam

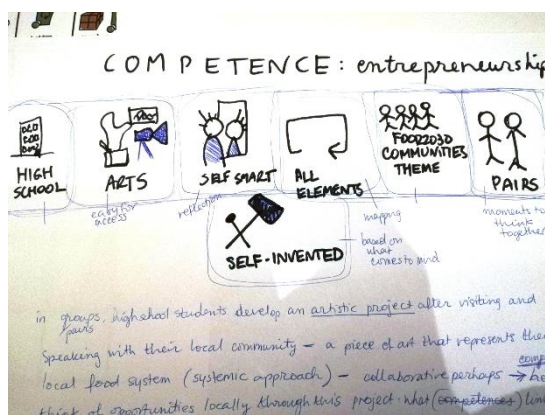


Figure 5. An example of the use of the morphological matrix to generate ideas for a module related to entrepreneurship.

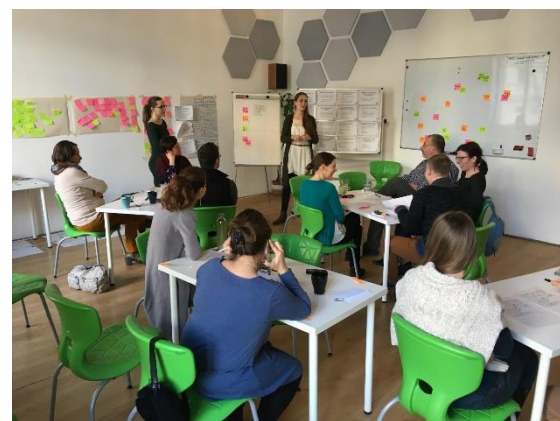


Figure 6. Participants present their module ideas in plenary. City Lab Budapest.



Figure 7. Postcard prepared by City Lab Milan to inspire participants about taking a role in the educational module design phase

Textbox 1. Example of a module idea coming from a group of City Lab participants after using the ‘Co-creating (out-of-the-box) modules’ exercise

Idea 1

“The module would target primary school students. They argued that many of the competencies identified to be necessary for a future-proof food system need to be developed at an early age. The aim of the module would be to introduce students to the food system, and the concept and practice of food system sustainability. It would encompass knowledge about healthy and sustainable diets, and also developing an understanding of how the supply chain operates. They would learn in groups through carrying out small projects. They would participate in various activities from planting vegetables to visiting firms that are active in food production. Older students from high school or university level could take part in the course as mentors or assistant teachers to leverage the effect of peer learning. An additional idea was to create a face for the course, like “Rob the Robot”, and build up the course around a story, such as, “Rob comes back from the future to warn the children that they need to do something urgently in order to avoid a climate crisis”. Already active influencers could act as partners to propagate the course and its message on social media.”

Idea 2

“The module would target the development of the competencies of analytical thinking, conflict management, cooperation, system thinking and future planning through a complex organizational development training. The course would support food system innovators in starting their own social or community enterprises. The idea is based on an already existing training that is offered to CSOs, which could be further developed and specified to the needs of the food system and to the interests and needs of various target groups. The idea of the group was to find those times in life when people are faced with significant decisions, such as the end of high school, and the final year of university studies (BSc or MSc) and target them with the module. In addition to the previously described, they also mentioned professionals who would like to make a significant shift in their professional life after working as an employee of larger organizations for 10-15 years.”

2.2.2 Piloting

In the FIT4FOOD2030 case, **piloting**⁴ (Task 6.4) refers to validating the educational modules ‘live’, in a real context, with a small group of the target audience of the training before implementing or scaling up. Problems are spotted and measures are taken to address them before rolling out the training delivery, to other audiences and in other contexts. At the end of the piloting, it is possible to say that the educational module works in an optimal way and can be taken to the market, i.e. published for external users interested in FIT4FOOD2030 and competence-building.

The piloting process of the 15 FIT4FOOD2030 educational modules took place in schools, science centres and museums, and universities, and reached the target audiences of primary school students (n=20), secondary school students (n=410), high school students (n=85), university students (n=40), professionals (n=71) and mixed groups of adults and children considered as general public (n=258). As expected from the piloting phase, in almost all cases, minor changes were introduced by the educational module developers following the piloting. These changes (and their rationale) are presented in Deliverable 6.2 and are already reflected in the guidelines contained in Section 6, the annexes.

⁴ See Nesta (2018). ‘Proof of concept, prototype, pilot, MVP - what’s in a name’. Available online at: <https://www.nesta.org.uk/blog/proof-of-concept-prototype-pilot-mvp-whats-in-a-name/>

In short, the following aspects, reoccurring across the piloting experiences, can be considered relevant for future users of the educational modules:

- In general, the educational modules worked well in practice, presented interesting topics for participants and triggered discussion and reflection.
- Following the piloting experience, the education module developers chose to add **more structure and guidance** to various components of the educational module (e.g. the AFNSA work groups; adding specific sub-steps to the club meetings of Eat It, Don't Throw It!) to maximise the beneficial outcomes that can be delivered.
- Striking a **good balance between the ambitions of the educational modules and the limited duration of the activities they foresee**: ideally, the modules would go in depth and result in participant confidence about using system thinking tools, rather than simply raise awareness. For the delivery of this objective, City Lab coordinators feel that longer engagement is needed. It was felt, at the prototyping phase, longer durations can be off-putting, especially in the recruitment of participants, and more difficult to fit into certain implementation contexts such as classrooms. Having said that, participants to some of the longer educational modules reported wishing the experience to have been even longer. Perhaps, preparations such as teaser trailers of the educational modules can be helpful in the recruitment, persuading audiences of the value of the module and securing their longer commitment.
- **Real-life stakeholder engagement** is considered a key element of the modules but is difficult to deliver within modules of limited duration. Where the areas of work can be known in advance, module organisers or facilitators can prepare the ground work for engagement (stakeholder identification and invitation to participate in course events e.g. in the cases of modules AFNSA from the City Lab Amsterdam and System Thinking for Food System Sustainability from the City Lab Budapest).
- The **importance of facilitation skills** in achieving the educational modules' objectives, and in particular in creating several kinds of beneficial objectives (making the link between concrete hands-on activities or insights from one aspect of the system and the broader food system perspective; making **connections between the general level of the activity and the personal level of participants, fostering** future-oriented creative thinking.

2.3 Module selection

When selecting from among the educational modules, future users are recommended to have a clear understanding of:

- **Objectives**
 - If timing and resources allow, they could run an exercise of co-creating competences (see Section 2.2.1) with stakeholders to identify the competences considered urgently needed and yet under-represented in education or (professional) practice
- **Resources** (technical, financial, human resources and time)
- **Target audience**, and **stakeholder groups** they would potentially like to engage with.

- To engage a stakeholder group that is not part of their regular audience, it is recommended to frame one's communication accordingly, find the 'multipliers' – individuals or organisations that can mobilise the target group(s) – present them the activity and engage them in the development of the activity and in the communication process.
- The other way around, regular audiences might not always welcome a new type of activity without having been well informed and prepared.

As a subsequent step, when setting up the activity, particular attention should be paid to these key aspects of the planning and execution of the module (for which various tips and examples are available in the guidelines of the module selected):

- The **topic**
- The **venue** and what kind of implementation context it will allow
- The **activity schedule** and **timing**
- **Moderation/facilitation**
 - Advice for facilitators is available from the Hypatia project⁵ on implementing gender-inclusive activities, acknowledging biases and stereotypes and making sure they are not perpetuated in interactions with participants and stakeholders.
- **Communication** around the event
 - Stress the tangential benefits

2.4 Module adaptation: Some suggestions

When considering the adaptation of the module to new implementation contexts, future users of the modules are encouraged to:

- Identify the key differences between the module parameters and their desired implementation context;
- Consult the module guidelines in depth – the module developers suggest variations on steps of the activities and other recommendations – and Section 2.5 where some 'Reflections on adaptation' are collected for each module;
- Invite professionals from their local contexts (e.g. food system specialists, educators with experience working with a target audience) to critically reflect on the design and learning objectives of the educational module, propose adaptations or complementary exercises;
- Not feel limited by a single module's scope: elements of other FIT4FOOD2030 educational modules and external resources⁶ can also be combined to produce a new hybrid module that can meet the target audiences' competence-building needs.

⁵ <http://www.expecteverything.eu/hypatia/gender-facilitation-guidelines/>

⁶ See, for example, the catalogue of 40 sources of content, activities and formats prepared by FIT4FOOD2030 in Deliverable 6.1, available online at: https://fit4food2030.eu/wp-content/uploads/2019/01/FIT4FOOD2030_D6.1_Catalogue-On-Analysis-Of-Contents-Formats-And-Needs-For-Trainings.pdf

2.5 Overview of the educational modules

This section provides a ‘In a nutshell’ description of each of the 15 modules and of key aspects such as stakeholder involvement, considerations for the adaptation process, etc. per City Lab in alphabetical order.

2.5.1 City Lab Amsterdam: Applications in Food and Nutrition Security Analysis

| | |
|------------------------------------|--|
| Audience | Bachelor- and Master-level students |
| Format | University course blending lectures, work groups and project work |
| Duration | Four weeks, full time (± 160 hours) |
| Participants | 10-25 |
| Facilitation | 1 course coordinator, 2-3 ‘coaches’ |
| Difficulty for participants | Beginner in terms of topic, but about 2 years of academic training in any discipline is required. Relatively intense in terms of preparation, with several reading materials in advance of lectures and workgroups |
| Difficulty for facilitators | Facilitators need to have a good understanding of inter- and trans-disciplinary research and its importance for Food and Nutrition Security studies and food system transformation |

The educational module in a nutshell: A four-week full-time course that equips students with the analytical and practical skills necessary for an inter- and trans-disciplinary research approach to Food and Nutrition Security challenges. The course is composed of:

- A series of lectures with contributions from guest lecturers from the food system
- Work groups that build on the lectures with in-depth assignments
- Project work on a real-life problem and delivery of evidence-informed policy advice on a project commissioned by an external institution, such as a city authority or community actor

Stakeholder involvement: food system actors (e.g. municipality, province, civil society actor, etc.) to commission a real-life problem; citizens, local businesses and industry to reflect on problem statement or main research question; researchers from various fields to participate through guest lectures

Reflections on adaptation:

- The module foresees the possibility to involve a key food system actor as project commissioner for the course, to propose a real-life challenge which students can tackle
- Depending on the local context and how solicited stakeholders are, individual stakeholder interviews can be replaced with ‘sensing the field’ – students visit food related events (discussion evenings, debates, conferences, etc.) and could interview stakeholders on the spot
- The following exercises, delivered at various stages of the module, could be adapted for use with different audiences such as professionals and teachers outside of the context of a full-time university course:

- **Newspapers and system understanding assignment:** exploring parts of the food system, its challenges and relevant actors through the collection and discussion on articles from at least three newspapers of different political orientations
- **Mini-interviews assignment:** explore different perspectives on food system transformation and the application of a 'systems approach' from the position of different stakeholders
- **Training on Transformative interviewing:** an interviewing technique that supports interviewees to reflect on actions, identify learning points and set goals for next steps

2.5.2 City Lab Athens: Eat It, Don't Skip It!

| | |
|---------------------|--|
| Audience | High school students (ages 16-17) |
| Format | Interdisciplinary after-school project |
| Duration | 2h per week during school term time (approx. 25 weeks) |
| Participants | 10-15 |
| Facilitation | 2 advisors/guides |

The educational module in a nutshell: Interdisciplinary project for high school students addressing a societal challenge from food and nutrition security perspective by setting up a social enterprise in collaboration with external stakeholders. The activities are carried out as part of a weekly after-school club and the objective is the development of a product (with a related business plan) that tackles the challenge. In their groups, students take on roles found in a real-life enterprise.

Reflections on adaptation:

- The education module is suitable to tackling various challenges relevant to local communities.
- This educational module could also be suitable for use with first year university students in combination with elements from other City Lab modules (e.g. workshops with prototype, competition etc.), or introduced as part of entrepreneurship education in a vocational school.
- The activities could be adjusted to be implemented in a shorter time frame; for example, if the participation in the Virtual Enterprise Competition or the creation of the Business Plan is removed, then fewer teaching hours would be needed.

2.5.3 City Lab Athens: Food Waste

| | |
|---------------------|--|
| Audience | Secondary school students |
| Format | Short classroom course |
| Duration | 2-3 sessions of 1h each (also suitable to 2-3 class periods of 50 min to 1 h each) |
| Participants | 10-15 |
| Facilitation | Min. 1 |

The educational module in a nutshell: triggering awareness about the issue of food waste from a food systems perspective with the help of materials and (local and European) (show)cases. Student feedback focuses on building critical thinking skills and the elaboration of an Action Plan can take the module outside of the classroom.

2.5.4 City Lab Barcelona: [Fostering change in your system for the promotion of healthy and sustainable diets. Part I - Validating a system map and identifying areas where changes are needed](#)

| | |
|---------------------|---|
| Audience | Professionals: broad range of stakeholders |
| Format | Workshop using a problem-based learning approach |
| Duration | 4-5h (plus additional time for coffee breaks) |
| Participants | 20-30 participants divided groups (no larger than 8 to 10 participants) |
| Facilitation | 1 per group |

The educational module in a nutshell: A problem-based learning workshop about understanding the complexity of the system and thinking in a systemic and transdisciplinary way about change:

- Facilitate reflection and learning around the system of promotion of healthy and sustainable diets by building consensus on a shared vision and adapting a pre-designed system map to a local context
- Identify areas of the system where changes are needed

Reflection on adaptation: While this activity has been specifically designed to be implemented in a non-formal education context with professionals that aim to work collectively on a strategy for changing the system of promotion of healthy and sustainable diets in their local context, developers consider that it can be adapted to different circumstances or scenarios. For example, it could take place:

- Within projects aiming to transform the local system of promotion of healthy and sustainable diets
- Within a classroom aiming to build knowledge around the promotion of healthy and sustainable diets
- During a congress for participants to build knowledge around the promotion of healthy and sustainable diets and for organisers to adapt and improve the map with new perspectives

Moreover, the impact of this educational module will be higher if it is linked to further activities following up on the action plans (e.g. at the level of the region, city, neighbourhood, school).

2.5.5 City Lab Barcelona: [Fostering change in your system for the promotion of healthy and sustainable diets. Part II - Building visions for concrete areas of the system and action plans for change](#)

| | |
|-----------------|--|
| Audience | Professionals: broad range of stakeholders |
| Format | Workshop using a problem-based learning approach |
| Duration | 2.5h min. |

| | |
|---------------------|---|
| Participants | 20-30 participants divided groups (no larger than 8 to 10 participants) |
| Facilitation | 1 per group |

The educational module in a nutshell: A problem-based learning workshop to facilitate the development of action plans by building future scenarios and action plans for change:

- Identify leverage points (i.e. the areas to intervene more effectively in the food system) where participants want to see changes and an intervention is needed
- Co-define a vision for the specific area of the system map
- Define an action plan with R&I lines and actions

Reflection on adaptation: While this activity has been specifically designed to be implemented in a non-formal education context with professionals that aim to work collectively on a strategy for changing the system of promotion of healthy and sustainable diets in their local context, developers consider that it can be adapted to different circumstances or scenarios. For example, it could take place:

- Within projects aiming to transform the local system of promotion of healthy and sustainable diets
- Within a classroom aiming to build knowledge around the promotion of healthy and sustainable diets
- During a congress for participants to build knowledge around the promotion of healthy and sustainable diets and for organisers to adapt and improve the map with new perspectives

Moreover, the impact of this educational module will be higher if it is linked to further activities following up on the action plans (e.g. at the level of the region, city, neighbourhood, school).

2.5.6. City Lab Budapest: [System Thinking for Food System Sustainability](#)

| | |
|---------------------|--|
| Audience | University students, professionals, adults (16+) from different backgrounds |
| Format | A course blending workshops, access to content on an online platform and sessions with local stakeholders |
| Duration | Between 22.5-28.5 h split across a 5- to 8-week period <ul style="list-style-type: none"> - 12 h of facilitated workshop time - 7.5 h individual work using the online component - 3 h dedicated to preparation and stakeholder meeting - (optional) 3x2h for group practice |
| Participants | 12-20 |
| Facilitation | Min 1. |

The educational module in a nutshell

Concept: Develop food systems thinking and systems practice abilities via engaging in a co-creative, experiential learning-based process that focuses on a (local) food system challenge:

- Engaging in a (minimum) 5-week-long (see Figure 8.) co-creative systems mapping and systems understanding process in teams
- An online course and learning support system that introduces various food system aspects, dynamics, challenges and opportunities (accessible at <https://courses.essrg.hu/>)
- A variety of stakeholders are consulted by participants on their perception of the actual local food system. Participants are also supported in taking the systems thinking tools into their own professional practices.

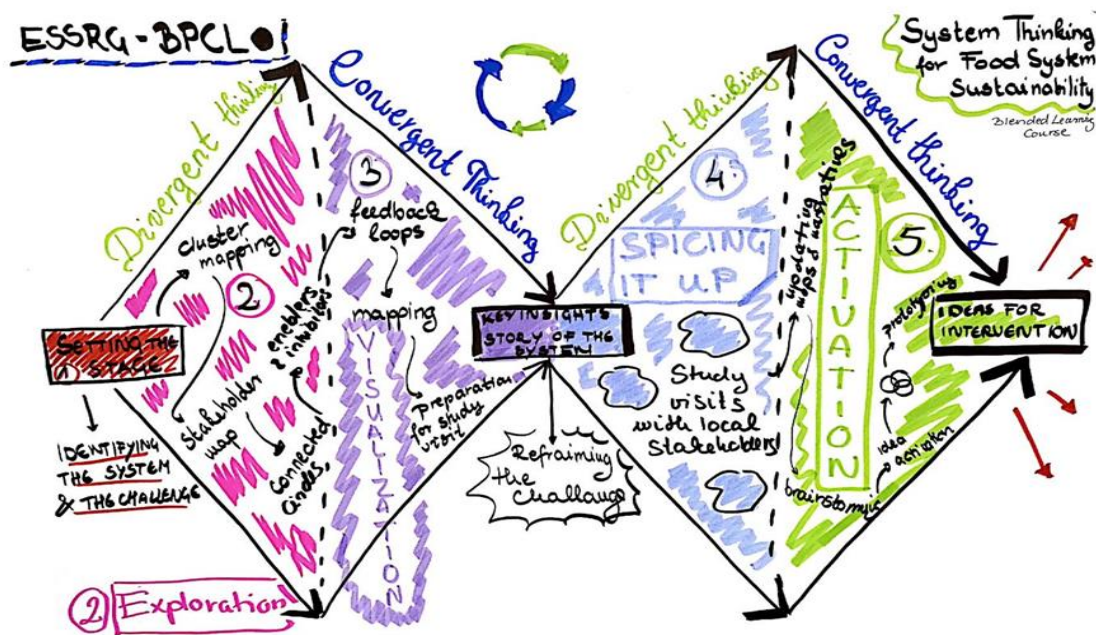


Figure 8. A visual representation of the concepts covered by the 5-week long 'System Thinking for Food System Sustainability' course

Reflection on adaptation

- The module has been tested with the participation of university students and young professionals with diverse backgrounds and is suitable to be offered as an open course for adult learners. It is designed to be implemented as an evening course over the course of several weeks. However, it is also suitable to be implemented in a university setting or in a modified format, can be rolled out with the participation of high school students.
- The online and offline components are designed to support each other; however, they can also be implemented separately. The offline sessions are centred around experimentation and experiential learning that all target the development of the competency of systems thinking. The online learning management system provides the necessary background information and lexical content that participants can build on during the offline sessions.
- The material is also appropriate for learning communities or small groups wishing to create a Community of Practice. In this case, the readings can be processed at home and then discussed in a group setting even without an experienced facilitator.

2.5.7 City Lab Budapest: [Our Food System and Us](#)

| | |
|---------------------|---|
| Audience | University students (ages 18-25) General public (16+) |
| Format | Workshop |
| Duration | At a minimum: 90 min – version aimed at university students 150 min – version aimed at a general public |
| Participants | 10-25 |
| Facilitators | 1 |

The educational module in a nutshell: Using co-creation and reflective exercises to increase self-awareness and generate discussion about the food system and the role and responsibilities of each individual in it

- Guided reflection through association & open discussion
- Developing conceptual maps of the food system in small groups



Figure 9. Participants, in groups of 3-5 people, draw/create a representation of the food system on the flipchart before them. They are free to draw, write, use the post-its, trend cards and pictures and any additional material that they would like.



Figure 10. Example of a concept map made by participants during the prototyping session, 'Technology in the forefront'

2.5.8 City Lab Milan: [Valuable Market](#)

| | |
|---------------------|------------------------------------|
| Audience | Adults; families |
| Format | 2 connected interactive activities |
| Duration | 3h |
| Participants | 10-20, working in groups of 5 |
| Facilitation | Max. 2 |
| Difficulty | Intermediate |

The educational module in a nutshell: Activating citizens in the recovery and redistribution of food and increasing awareness of the issue of food waste and the nutritional value of recovered food, all the while taking part in a concrete action and reflecting on solutions. The module contains two activities:

- Recovering food surplus at risk of becoming food waste at neighbourhood markets
- Experimental activity about the nutritional value of the food collected through an inquiry-based approach and discussion on reasons behind food waste

Stakeholder involvement: vendors, ethical purchasing groups; supermarkets as alternative settings to neighbourhood markets. Nevertheless, the developers consider that it is important to keep a social angle and involve actors active in food poverty. Other ideas include organising the activity in collaboration with training on how to share food, e.g. Too Good To Go (Europe) and Food Cloud (Ireland).

Reflection on adaptation:

- **Implementation context:** neighbourhood market + museum or school lab, or any other space that can be equipped with the utensils necessary for experimentation

2.5.9. City Lab Milan: [Visions of Future Food](#)

| | |
|---------------------|---|
| Audience | High school students; University students |
| Format | Workshop |
| Duration | 1.5h |
| Participants | 20 |
| Facilitation | 1 |
| Difficulty | Intermediate; regarding facilitation skills, manage the visioning process requires specific competences |

The educational module in a nutshell: What will we be eating in the future? A visioning process through the development of a future scenario with artistic tools:

- Creation of a personal meaning map
- Experimental activity on proteins in insects-based food
- A visioning activity leading to future scenarios with novel foods
- With the possible intervention of a researcher

Reflections on adaptation:

- **Implementation contexts:** classrooms, STEM career orientation events, university and research centre open days, etc.
- **Stakeholder involvement:** food system professionals, educational experts, artists



Figure 11. Selection of photographs illustrating the different stages of 'Visions of Future Food'

2.5.10 City Lab Sofia: [I <3 Food](#)

| | |
|---------------------|---|
| Audience | Primary school children (age 9-10) |
| Format | Short school course |
| Duration | 4-5 sessions x 35-40 min; 1 session per week |
| Participants | 10-15 |
| Facilitation | 1-3; facilitation can also be carried out by older students |

The educational module in a nutshell: Learn through gamification about healthy food, food production and food origins. The module consists of five activities: the ABC of food, Traffic lights of food, Food and health. Fruits and Food and health. Fruits II.

2.5.11 City Lab Sofia: [Nutrition](#)

| | |
|---------------------|---|
| Audience | Secondary school children (age 12-13) |
| Format | Short school course |
| Duration | 6 sessions x 45 min; 1 session per week |
| Participants | 10-20 |
| Facilitation | 1-2; facilitation can also be carried out by older students |

The educational module in a nutshell: Learn about nutrition and healthier diets, including example tasks that could be elaborate between courses.

2.5.12 City Lab Sofia: [Specific features of the food system](#)

| | |
|---------------------|--|
| Audience | Professionals: journalists, other food system actors |
| Format | Training |
| Duration | 4 sessions x 1 hour |
| Participants | 30 |

| | |
|---------------------|-----|
| Facilitation | 4-5 |
|---------------------|-----|

The educational module in a nutshell: Training and networking event connecting journalists with the food system perspective and the latest insights from food system professionals, including on new perspectives for transformation

2.5.13. City Lab Tartu: [Taste Alternative Protein](#)

| | |
|---------------------|---|
| Audience | Primary to high school students; families |
| Format | Hands-on workshop |
| Duration | 75 min |
| Participants | 20, teams of 4 |
| Facilitation | 1 |

The educational module in a nutshell: Starting a conversation on alternative proteins through a hands-on activity of preparing seitan patties. The workshop integrates and interlinks the cooking and eating process with discussions of health, sustainability, and scientific analysis.

Stakeholders involvement: restaurant manager, cooking teachers, nutritionists

Reflections on adaptation:

- Curriculum connection: biology topics linked to proteins
 - [An activity card and teacher guide are available](#)
- Possible limitations: ideally, the activity requires cooking equipment and an implementation setting where participants are allowed to consume food

2.5.14 City Lab Tartu: [Beeswax Food Wrap](#)

| | |
|---------------------|--|
| Audience | Secondary and high school students (12+); families |
| Format | Hands-on workshop |
| Duration | 45-60 min |
| Participants | 20, teams of 4 |
| Facilitation | 1 |

The educational module in a nutshell: starting a conversation on food packaging and methods to preserve food through a hands-on activity of making one's own beeswax food wrap

Stakeholder involvement: shops and markets selling packaging-free food; waste management, food preservation and materials experts

Reflections on adaptation:

- Limitations for adaptation: requires some equipment
- Curriculum connection: environmental topics, social and civic education

2.5.15. City Lab Tartu: [Food and Vacuum](#)

| | |
|---------------------|---|
| Audience | Primary to high school students; families |
| Format | Hands-on workshop |
| Duration | 45-60 min |
| Participants | 20, teams of 4 |
| Facilitation | 1 |

The educational module in a nutshell: Discovering how science and research are changing our food system through an exploration of food preservation methods and a hands-on activity, working out the instructions to make one's own vacuum chamber to exemplify vacuum packaging and freeze drying

Stakeholder involvement: nutrition and food preservation experts; innovators; physics teachers

Reflections on adaptation:

- Curriculum connection: the chemistry and physics behind food preservation and vacuum chambers
- [An activity card and teacher guide are available](#)

3. Analysis of modules per key characteristics

An additional aim of this deliverable is to provide a meaningful classification of the educational modules that could eventually be translated into a resource filtering function on the FIT4FOOD2030 website, thus envisaging a more interactive route for potential users of the educational modules. For this purpose, this section classifies the modules according to key characteristics (which are also accompanied by small descriptions) considered relevant for possible users.

3.1. Format

Hands-on/experimental workshops

These are engaging and energising activities, usually of short duration, that involve an element of making/designing using one's hands.

- Taste Alternative Protein!
- Beeswax Food Wrap
- Food and Vacuum
- Valuable market
- Visions of Future Food

Workshops

- Fostering change I (Validating a system map and identifying areas where change is needed)
- Fostering change II (Building visions for concrete areas of the system and action plans for change)
- 'Our Food System and Us'

Courses

These are modules composed of several sessions envisaged for formal education settings, potentially stretching over several weeks or months.

- Applications in Food and Nutrition Security Analysis
- Food Waste
- Nutrition
- System Thinking for Food System Sustainability
- Specific Features of Food Systems

Activity Club

These are modules composed of several sessions that stretch over several weeks or months outside of classroom hours, in an after-school, extra-curricular club context.

- EatIt, Don't Skip It!
- I <3 Food

3.2. Type of learning with society

The educational module development in the FIT4FOOD2030 project was inspired by the EU-funded EnRRICH project and methodologies such as community-based participatory research. For EnRRICH, a key design principle for RRI in higher education is 'education with society'. When it comes to concretely applying this principle in educational modules, the project distinguishes two approaches, a light and a deep approach⁷.

In general terms, the '**deep approach**' describes a real-time and real-life activity where students learn by performing a project that responds to a real need and which is implemented in coordination with actors outside the classroom.

⁷ Tassone, V. and Eppink, H. 2016. EnRRICH Tool for Educators: (Re-)Designing curricula in higher education from a "Responsible Research and Innovation" perspective. EnRRICH project deliverable. URL: https://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Dokumente/Dateien/EnRRICH/D2.3_The_EnRRICH_Tool_for_Educators.pdf.

Table 1. Educational modules taking a 'deep learning' approach

| |
|---|
| City Lab Amsterdam's Applications of Food and Nutrition Security Analysis includes project work on a real-life problem and delivery of evidence-informed policy advice on a project commissioned by an external institution, such as a city authority or community actor, formulating problem statements and main research questions in direct consultation with the commissioner. Piloting included The Food Council Metropolitan Region Amsterdam as Commissioner; the real-life problem, as it was presented by this institution to the students, is available as an Annex of the module. |
| City Lab Athens' Eat It, Don't Skip It! module envisages the setting up of a student enterprise that tackles a concrete societal issue, in connection with stakeholders from the food system. The pilot example resulted in grEATboxes. |
| City Lab Budapest's System Thinking for Food System Sustainability involves consulting a variety of stakeholders on their perception of the local food system. Professionals involved are also supported in taking the systems thinking tools into their own practices. |
| City Lab Barcelona (FIT4FOOD2030 Catalonia)'s problem-based modules Fostering change I (Validating a system map and identifying areas where change is needed) and Fostering change II (Building future scenarios and action plans for change) work towards Action Plans that tackle the transformation towards sustainable and healthy food systems. Stakeholders involved take ownership of the plans. Matchmaking to establish partnerships to carry out the actions can also be envisaged. |

A 'light approach' develops similar competences and discusses similar needs and challenges but confines itself to imparting knowledge in a classroom context, with hypothetical projects. The level of engagement of outside actors is less deep, with site visits, excursions or guest lectures. Implementation tools highlighted by EnRRICH include deliberative methods, dialogic tools, role play for collaborative skills and the design and evaluation of hypothetical projects.

For example, City Lab Athens' module **Food Waste** triggers discussion through the presentation of cases of national initiatives tackling food waste. Students are encouraged to reflect on the differences between approaches and place themselves in the positions of different stakeholders and envisage solutions to the issue.

3.3 Target audiences

Table 2. Clustering of the modules according to their target audience

| | |
|--|---|
| <hr/> <i>Primary school students</i> <hr/> Food and Vacuum I <3 Food Taste Alternative Protein! | <hr/> <i>Secondary school students</i> <hr/> Food and Vacuum Food waste Nutrition Taste Alternative Protein! |
| <hr/> <i>High school children</i> <hr/> Beeswax food wrap Eat It, Don't Skip It! Food and Vacuum Taste Alternative Protein! Visions of Future Food | <hr/> <i>University students</i> <hr/> Applications in Food and Nutrition Security Analysis (AFNSA) System Thinking for Food System Sustainability Our Food System and Us Visions of Future Food |

| | |
|---|--|
| <hr/> <p><i>Adults</i></p> <hr/> <p>Our Food System and Us Valuable market</p> | <hr/> <p><i>Families</i></p> <hr/> <p>Beeswax food wrap Food and Vacuum Taste Alternative Protein! Valuable market</p> |
| <hr/> <p><i>Professionals (e.g. journalists, researchers, etc.)</i></p> <hr/> <p>Fostering change I (Validating a system map and identifying areas where change is needed) Fostering change II (Building visions for concrete areas of the system and action plans) Specific Features of Food System System Thinking for Food System Sustainability</p> | |

3.4 Implementation contexts

With a few exceptions, most modules can be delivered in a host of implementation settings:

- Informal education venue or event (e.g. science centre, science museum, science festival)
- Formal education space (e.g. classroom)
- Community/stakeholder space (e.g. local markets)

3.5 Duration

Table 3. Clustering of the modules according to their duration

| |
|--|
| <hr/> <p><i>About one hour</i></p> <hr/> <p>Beeswax food wrap Food and Vacuum Food waste Taste Alternative Protein!</p> |
| <hr/> <p><i>Several hours to one day</i></p> <hr/> <p>Fostering change I (Validating a system map and identifying areas where change is needed) Fostering change II (B Building visions for concrete areas of the system and action plans) Our Food System and Us Specific Features of Food Systems Valuable market Visions of Future Food</p> |

Several weeks

Applications in Food and Nutrition Security Analysis
 Eat It, Don't Skip It!
 I <3 Food
 Nutrition
 System Thinking for Food System Sustainability

3.6 Content areas

While each educational module aims to bring a food systems perspective, the systematic treatment of the subject and the hands-on engagement moment often begins from a concrete aspect of food systems. A non-exhaustive list of general content areas is presented below, having been built bottom up with a light content analysis of the modules. If necessary, the modules allow for future categorisation.

Table 4. Clustering of the modules according to broad thematic areas

| | | |
|---|---|---|
| <p><i>Sustainable and healthy food and nutrition</i></p> <p>Taste Alternative Protein!</p> <p>Eat It, Don't Skip It!</p> <p>I <3 Food</p> <p>Nutrition</p> | <p><i>Food packaging</i></p> <p>Food and Vacuum</p> <p>Beeswax food wrap</p> | <p><i>Food preservation</i></p> <p>Food and Vacuum</p> <p>Beeswax food wrap</p> |
| <p><i>Food waste</i></p> <p>Beeswax food wrap</p> <p>Eat It, Don't Skip It!</p> <p>Food waste</p> <p>Valuable Market</p> | <p><i>Food system</i></p> <p>Fostering change I (Validating a system map and identifying areas where change is needed)</p> <p>Fostering change II (Building visions for concrete areas of the system and action plans)</p> <p>Our Food System and Us</p> <p>Specific Features of the Food System</p> <p>Visions of Future Food</p> | <p><i>Social and cultural issues around food</i></p> <p>Taste Alternative Protein!</p> <p>Valuable Market</p> <p>Nutrition</p> |

| | | |
|-------------------------------|-------------------------------|--|
| <i>Entrepreneurship</i> | <i>Imagining the future</i> | |
| Eat It, Don't Skip It! | Visions of future food | |

With the same considerations in mind, the modules have also been clustered according to the Food 2030 they tackle, and further subdivided according to whether the priority is considered a main aspect (**bold**), or secondary, as table 5 outlines.

Table 5. Clustering of the modules according to the priorities of the Food 2030 strategy. Bolded arrows indicate that the respective priority is considered to be central to the module, as opposed to secondary.

| Module/FOOD 2030 priority | Nutrition & Health | Climate & Sustainability | Circularity & Resource Efficiency | Innovation & Communities |
|--|-------------------------------|-------------------------------------|--|-------------------------------------|
| Applications in Food and Nutrition Security Analysis | ✓ | ✓ | ✓ | ✓ |
| Beeswax food wrap | ✓ | ✓ | ✓ | ✓ |
| Eat It, Don't Skip It! | ✓ | ✓ | ✓ | ✓ |
| Food and Vacuum | ✓ | | ✓ | ✓ |
| Food waste | ✓ | ✓ | ✓ | ✓ |
| Fostering Change I | ✓ | ✓ | ✓ | ✓ |
| Fostering Change II | ✓ | ✓ | ✓ | ✓ |
| I <3 Food | ✓ | | | |
| Nutrition | ✓ | | | |
| Our Food System and Us | ✓ | ✓ | ✓ | ✓ |
| System Thinking for Food System Sustainability | ✓ | ✓ | ✓ | ✓ |
| Specific Features of the Food System | ✓ | ✓ | ✓ | ✓ |
| Taste Alternative Protein! | ✓ | ✓ | | |
| Valuable Market | ✓ | ✓ | ✓ | ✓ |
| Visions of Future Food | ✓ | ✓ | ✓ | ✓ |

5. Next steps

Deliverable 6.3, Toolkit for use of the educational modules and its annexes are expected to support the access of future users to the educational modules produced by the project: be it the City and Food Labs that will be further implementing these activities until October 2020, or the wider community interested in competences for food system transformation.

Further module development is expected to take place in the year ahead, with citizen science modules, and master classes for professionals currently being considered for development. Where new development takes place, modules will be processed and made accessible to users in line with the work carried out in this Deliverable.

6. Educational modules in full

Download the educational modules as individual files via: <http://gofile.me/3dZRD/HuQXDOhcv>.

Navigate to the educational modules by clicking on their name below. Where other key documents were developed to support the delivery of educational modules, they have been included as separate annexes. Some extra resources are available from some City Labs.

[City Lab Amsterdam – Applications in Food and Nutrition Security Analysis – general template](#)

[City Lab Amsterdam – Applications in Food and Nutrition Security Analysis – annex](#)

[City Lab Athens – EatIt, Don't Waste It! – general template](#)

[City Lab Athens – Food Waste – general template](#)

[City Lab Barcelona: Fostering change I \(Validating a system map and identifying areas where change is needed\) – general template](#)

[City Lab Barcelona: Fostering change II \(Building visions for concrete areas of the system and action plans for change\) – general template](#)

[City Lab Budapest: System Thinking for Food System Sustainability – general template](#)

[City Lab Budapest: System Thinking for Food System Sustainability –annexes](#)

[City Lab Budapest: Our Food System and Us – general template](#)

[City Lab Budapest: Our Food System and Us –annexes](#)

[City Lab Milan: Valuable Market – general template](#)

[City Lab Milan: Visions of Future Food – general template](#)

[City Lab Sofia: I <3 Food – general template](#)

[City Lab Sofia: I <3 Food – annex](#)

[City Lab Sofia: Nutrition – general template](#)

[City Lab Sofia: Nutrition – annex](#)

[City Lab Sofia: Specific Features of the Food System – general template](#)

[City Lab Sofia: Specific Features of the Food System – annex](#)

[City Lab Tartu: Beeswax food wrap – general template](#)

[City Lab Tartu: Food and Vacuum – general template](#)

[City Lab Tartu: Food and Vacuum – extra resource – Activity Guide and Teacher Guide](#)

[City Lab Tartu: Taste Alternative Protein! – general template](#)

[City Lab Tartu: Taste Alternative Protein! – extra resource – Activity Guide and Teacher Guide](#)

Applications in Food and Nutrition Security Analysis (AFNSA)

This module was created by Alanya den Boer together with Marjoleine van der Meij, Renee de Wildt-Liesveld, Barbara Regeer (Athena Institute, VU Amsterdam), with input from the Food Council of the Metropolitan Region Amsterdam, an independent consultant with expertise on systems thinking and food systems, and several informal conversations with food system related stakeholders from the Metropolitan Region Amsterdam. It was based on the University course Applications in Food and Nutrition Security Analysis (part of the minor Global Food Security at VU Amsterdam). A check for scientific accuracy was done by Marjoleine van der Meij and Renee de Wildt-Liesveld.



| | |
|--|--|
| Thematic Area | Food and Nutrition Security (FNS) and food systems in the broad sense |
| Format | University course (Bachelor) |
| Duration | Four-week fulltime course (so a total of ± 160 hours) |
| Type of audience | Bachelor students (no specific study background required) who are interested in inter- and transdisciplinary approaches towards Food and Nutrition Security (FNS). Part of minor Global Food Security Analysis. |
| Age group | Adolescents |
| Number of participants | Between 10 and 25 |
| Prerequisites for participation | If any, e.g. student background (specific, general); familiarity with or awareness of certain concepts etc. |
| Number of facilitators | 2 to 3 facilitators or 'coaches' (depending on the number of students) |
| Overall difficulty | <p>Topic: Beginner; students are introduced to FNS as complex problem and the need for inter- and transdisciplinary research approaches.</p> <p>Preparation: Intermediate; relatively intense course with several reading materials in advance of the lectures and workgroups.</p> |

| | |
|--|---|
| | Facilitation: Beginner; need to have a good understanding of inter- and transdisciplinary research and why this is important for FNS studies and food system transformation. |
|--|---|

OVERVIEW

Lectures: Introduction (lecture 1), Systems approach and transdisciplinarity (lecture 2), In-depth interviewing (lecture 3), Qualitative data analysis (lecture 4), Spatial context of food and health (guest lecture)

Workgroups: which build on these lectures with in-depth assignments.

Project work: students work on a real-life world problem - commissioned by an external institution (from the city or community) - and write a policy advice report. Topic depends on the commissioning institution. See the draft educational module for an example topic which was used within the course at the VU in Amsterdam.

OVERALL AIM

Resolving the complex problem of FNS requires an inter- and transdisciplinary approach, in which actors from different disciplines and with different backgrounds cooperate. This module focusses on the analytical and practical skills necessary to conduct such a inter/transdisciplinary approach in formulating an evidence-informed policy advice. To this end, this module introduces students into the current theories on transdisciplinary research in general and the need for a transdisciplinary approach in FNS Studies more specifically.

SPECIFIC (LEARNING) OBJECTIVES

After the successful completion of this module participants are expected to be able to...

- has an understanding of the term **'food systems'** and the complexity around food systems (transformation)
- can **explain the need for inter/transdisciplinary research** in Food and Nutrition Security (FNS) Studies
- is able to **critically reflect on choices of design in inter/transdisciplinary research** (in the field of FNS Studies)
- is able to conduct an inter/transdisciplinary project in relation to FNS. The student:
 - is able to **find and integrate different relevant literature sources**
 - is able to contribute at an academic level to the execution of the project **related to his/her own disciplinary background**
 - is able to **conduct transformative interviews** that contribute to the research project
 - can **analyse qualitative data** in such a way that it contributes to the research project
 - is able to **integrate qualitative data** with data from literature review and/or analysis of secondary quantitative data
 - is able to set up **valid lines of argumentation**
 - is able to **translate research findings into evidence informed policy advice**
- The student has improved his/her capacity as a professional. The student:
 - can **work effectively together** with other students in a project team

- is able to **coordinate and plan an inter/transdisciplinary project** in such a way that deadlines are kept and the quality of the products are in relation with time invested
- is able to **highlight the results of and defend the recommendations** proposed in the inter/transdisciplinary research in a video-based presentation
- is able to **write a policy advisory report** that is coherent and covers the research project.
- is able to **critically reflect on his/her own capacities and role within the group** and his/her learning process during the research project

SUGGESTED SCENARIO FOR IMPLEMENTATION

This module is intended to be implemented in a formal educational context – University.

TOPICS & COMPETENCES COVERED BY THE ACTIVITY

| | |
|-------------------------|--|
| Thematic area(s) | Food systems in a broad sense. However, within the project work student teams will most probably focus on a more specific topic within FNS (e.g. sustainable agriculture, or approaches on how to facilitate collaboration between food system actors) |
|-------------------------|--|

FOOD2030 Research & Innovation priorities

| Priority | Indicate whether main or secondary | Addressed through |
|---|---|--|
| Circularity & Resource Efficiency | Main, since this course focuses on food systems more in general | Lecture on food systems and transdisciplinarity and related workgroup(s) |
| Innovation & Empowerment of Communities | Main, since this course focuses on food systems more in general | Lecture on food systems and transdisciplinarity and related workgroup(s) |
| Nutrition & Health | Main, since this course focuses on food systems more in general | Lecture on food systems and transdisciplinarity and related workgroup(s) |
| Climate & Sustainability | Main, since this course focuses on food systems more in general | Lecture on food systems and transdisciplinarity and related workgroup(s) |

Responsible Research and Innovation (RRI)

| Related concept | Addressed through |
|--|--|
| RRI will not be introduced to students in an explicit way. However, inter- and transdisciplinarity and inter- and | Lecture on food systems and transdisciplinarity, related work group(s) and project work. |

| | |
|---|---|
| transdisciplinary research approaches are chore within this module. | |
| Research & Innovation (R&I) | |
| Related concept | Addressed through |
| This module does not zoom in on the role of R&I in food system transformation. However, since it is a module for university students, research is chore. Students are taught about the need for inter- and transdisciplinary research approaches for solving complex problems. | Lecture on food systems and transdisciplinarity, related work group(s) and project work. |
| (Food) Systems thinking | |
| <p>The lecture on food systems and transdisciplinarity explicitly addresses the need for system thinking. It also shows some movies to students in this respect. During the workgroups there are several assignments which aim to stimulate system thinking, for instance the:</p> <ul style="list-style-type: none"> ○ ‘Newspaper and system understanding assignment’: This assignment is meant to help students acquire the competence of systems thinking. Students collect food system related articles during four weeks, from at least three different newspapers, including a ‘left-wing’ and a ‘right-wing’ newspaper. Two students will give a 5-minute presentation about their collection of articles at the end of each week. This presentation will be the start of a discussion with the entire group. The following questions are addressed in the presentations: What part of the food system are the articles about? Which part(s) of the food value chain (e.g. production, processing, distribution, consumption, disposal of waste)? What kind of challenges are being addressed (e.g. environmental challenges, health challenges, etc.)? What kind of actors are being mentioned (e.g. different stakeholder categories or not)? Is there a particular framing present within these articles? ○ ‘Stakeholders’ perspectives on a systems approach’: This assignment is aimed to show students that different stakeholders might have different perspectives on food systems and food system transformation, as well as on the meaning an application of a ‘systems approach’. Students are provided with different ‘mini-interviews’ with food system related actors (from the community). A plenary conversation will address the following questions: How do the answers about a ‘systems approach’ relate to what you read in the literature so far (any new aspects, or aspects that are missing)? In what way(s) do the answers about the meaning of and need for a ‘systems approach’ differ between the different stakeholders? | |
| Other competences | |
| Competence | Addressed through |
| Food systems approach competences: Analytical thinking | Integrated within the lecture on food systems and transdisciplinarity and the design and analysis phase of the project work. |
| Multi-stakeholder approach/network building competences: Social intelligence, self- | Integrated within the assignment of ‘team role in relation to educational background: personal development and Belbin’ assignment and the |

| | |
|--|---|
| awareness, multi-perspective, communication ability | ‘stakeholders’ perspectives on a systems approach’ assignment. Furthermore, the competences of social intelligence, self-awareness and communication ability are integrated within the project work, especially through the interactions with the commissioner as well as the engagement (transformative interviewing) with food system related stakeholders. |
| Responsible Research and Innovation competences: involving stakeholders in research data collection/analysis, participatory ability | Integrated via the ‘extended member check’ which means that stakeholders are asked to critically reflect on the data (from their own interview), and are invited to be involved in the data analysis phase. |
| Potential of bringing the arts, socio-economic science and humanities creatively or trans-disciplinarily with the module? | |
| Elements from the arts, socio-economic science and/or humanities are currently not integrated in the module. Since the module is in draft form, and will be piloted in another context it would be possible to upgrade the module to integrate some of these elements. This could be done by inviting people from these fields to critically reflect on the design and learning objectives of the course. It would also be a possibility to invite people from this fields to see if and how they (would) address the issue of food (systems) and systems thinking to come up with creative assignments for the work groups. | |

| TARGET AUDIENCE | |
|---|---|
| Audience category | <i>University-level students (Bachelor)</i> |
| Recommended number of participants | Between 10 and 25 |
| Recommended age | Between 19 and 29 |
| Prerequisites | <i>No specific educational background is required. An interest in food systems and transdisciplinary research is important.</i> |

| OPTIONS FOR MULTI-STAKEHOLDER ENGAGEMENT | |
|--|--------------------------------|
| Stakeholder | Role envisaged in the activity |
| Academic person with expertise in spatial dimensions of food systems, and/or ‘foodscapes’ (links between food systems, infrastructure, spatial planning, architecture, etc.) | To provide a guest lecture |

| | |
|--|---|
| Academic person with expertise in the field of transition studies, social practice theory, etc. | |
| Academic person with substantial experience in doing inter- and transdisciplinary research (could be in any field) | |
| Citizen(s) | During the data collection phase of the project work (to interview them, but also to invite them to reflect on the problem statement/main research question for instance) |
| Local business | During the data collection phase of the project work (to interview them, but also to invite them to reflect on the problem statement/main research question for instance) |
| Prominent food system related actor, such as a Food Policy Council (if possible) | To provide a guest lecture on their work, followed by an interactive discussion |

SETTING UP THE MODULE

FACILITATION/DELIVERY

This module needs one or two persons who can coordinate the entire module. This person needs to be able to invite (guest)lecturers, and is main responsible person for the communication to students.

Besides, the module needs two or three facilitators or 'coaches' (depending on the number of students). These coaches need to have some knowledge or experience with FNS studies and inter- and transdisciplinary research to be able to guide the students. This is important since students need to be stimulated to critically think about the meaning and need for inter- and transdisciplinary research approaches to be able to upgrade the 'transdisciplinary level' of their own project work. It is also important that coaches have some experience with guiding a project that is commissioned by an external institution, since this can lead to certain tensions during the execution of the project (e.g. tension between expectations of commissioner and academic objectives of the course).

RESOURCES

Physical materials

| Resource name | Picture | Number |
|---|---------|------------------------------------|
| PowerPoint presentations for the lectures | - | - |
| Printed picture of Overview of four types of listening of Theory U (on A3) (Training 1) | | One for each workgroup (so 2 to 3) |

| | | |
|---|---|--|
| Listening self-observation template (Training 1) | | For each student one (so between 10 and 25) |
| Printed mini-interviews (on A4) (assignment workgroup 2) | - | For each student one copy of each mini-interview |
| Printed picture of the Donut Economy (on A3) (assignment workgroup 2) | | One for each workgroup (so 2 or 3) |
| Useful links, videos, articles | | |
| See Annex 1. 'Food systems library' | | |
| PREPARING THE SETTING | | |
| Workgroups need to have an interactive setting, i.e. a setting in which students can work together in their team. | | |

| DETAILED DESCRIPTION OF THE MODULE SCRIPT | |
|---|-------------|
| Step | Competences |
| Please refer to the Annex. | |

| |
|---|
| REFERENCES Competences from competence cards (D1.4 Tools and Training Guidelines for guiding lab activities), based on Tassone, Valentina and Hansje Eppick. 2016. "The EnRRICH tool for educators: (Re-) Designing curricula in higher education from a "Responsible Research and Innovation" perspective". EnRRICH project. 30 June. Self-observation-sheet: D1.4 Tools and Training Guidelines for guiding lab activities |
|---|

Picture on the Donut Economy: Raworth, K. (2018). Doughnut economics. Seven ways to think like a 21st century Economist. Random House UK.

Overview of four types of listening of Theory U: U-Lab: Transforming business, society, and self. Source book (2015).

Educational Module

Amsterdam City Lab

Applications in Food and Nutrition Security
Analysis (AFNSA)



Table of Contents

| | |
|--|----|
| 1. Introduction to the document and process..... | 39 |
| 2. Introduction and design module..... | 39 |
| 3. Competences and learning objectives | 40 |
| Competences..... | 40 |
| Learning objectives..... | 41 |
| 4. Lectures..... | 42 |
| 5. Working on a real-world problem..... | 44 |
| 6. Workgroups and trainings..... | 45 |
| 7. The (research & innovation) food systems library..... | 59 |
| 8. Assessment | 62 |
| 9. Appendices..... | 63 |
| Appendix 1. Content of the policy advice report | 63 |
| Appendix 2. Example of a real-life project proposal | 65 |
| Appendix 3. Giving feedback | 66 |
| Appendix 4. Inspiring questions for transformative interviewing (Training 1) | 67 |
| Appendix 5. Learning Self Observation Template (Training 1)..... | 69 |
| Appendix 6. Assessment criteria | 70 |

1. Introduction to the document and process

This module was developed as part of the EU-project FIT4FOOD2030. To stimulate the transformation towards a future-proof food system it is crucial to develop competences (knowledge, attitude and skills). This module is targeted at undergraduate students who are interested to learn more about food systems and food system transformation. This module is the result of a transformation of the existing undergraduate course called 'Applications in Food and Nutrition Security Analysis'. This course was transformed in co-creation with stakeholders from the Metropolitan Region Amsterdam (MRA), such as people working within local food production initiatives and policy makers working on food system transformation. During conversations with those different stakeholders, it was investigated what kind of competences they think are crucial in order to contribute to food system transformation. Moreover, academic experts working in fields related to (food) system transformation were consulted with regard to (didactic) strategies to stimulate the acquisition of key competences such as systems thinking. The module will be piloted and feedback from participants will be incorporated to further improve the module.

2. Introduction and design module

Food and nutrition security (FNS) is a key priority in development cooperation and central to broader debates on environmental and social sustainability. FNS not only focuses on building resilience to food crises and ensuring that no one is left hungry, it also battles the alarming increase in obesity in the developed world. Malnutrition (referring to both under- and over-nutrition in the same population) is increasingly problematic and the result of a complex system of factors, including economic, agro-ecological, technical, health and cultural aspects. Furthermore, food systems are linked to severe and persistent environmental problems, such as biodiversity loss, greenhouse gas emissions and resource scarcity. **Resolving the complex problem of FNS therefore requires an inter- and transdisciplinary approach**, in which actors from different disciplines and with different backgrounds, including the people who are malnourished, cooperate.

Inter/transdisciplinarity is an emerging discipline in which qualitative research approaches and analytical methods are developed to connect relevant parts of different disciplines and integrate different types of knowledge (e.g. knowledge from academics, policy makers, citizens, etc.) to solve complex problems such as food and nutrition security. A transdisciplinary approach is often taken in formulating an evidence-informed policy advice to address specific problems. Based on the analysis and integration of the positions, perspectives and experiences of different actors, sometimes combined with quantitative data, advice is given on what intervention would be most effective in resolving the problem under study.

This module will focus on the competences (knowledge, attitude and skills) necessary to conduct such a inter/transdisciplinary approach in formulating an evidence-informed policy advice. To this end, this module introduces students into the current theories on transdisciplinary research in general and the need for a transdisciplinary approach in FNS Studies in specific. It also highlights main challenges around inter/transdisciplinary research. Moreover, this module offers an introduction to semi-structured transformative interviews as a research method to study complex problems and opportunities for intervention. During several lectures and workgroups, designing, conducting and analysing interviews will be discussed and practiced with.

Students will further train other professional skills such as managing projects and collaborative team work. From the very first day, students are part of a project team that will work on a project to develop an evidence informed policy advice to address a specific problem in FNS. **Students are confronted with a real policy problem from an external commissioning institution.** Within four weeks they will

collect data by literature review and (transformative) interviews (and analysis of databases) to conduct an inter/transdisciplinary analysis on the basis of which they provide an advice. Results of the research are presented in an advisory report and a (video) presentation.

Target group, structure and work forms

AFNSA is part of the minor Global Food Security Analysis and is open for Bachelor students with an interest in food systems, policy and learning and practicing with inter- and transdisciplinary research. The module is designed as a four-week course and consists of lectures, project work with workgroups, training sessions and a video-presentation. In addition, students will practice with discussing and summarizing relevant scientific articles using the CARQ-method (see Chapter 5). The total study time is ± 160 hours. The different elements have approximately the following study time:

| Module element | Hours | Total hours |
|--------------------|------------|-------------|
| Lectures | 4 x 2 h | 8 |
| Training sessions | 3 + 2 h | 5 |
| Workgroups | 7 x 2 h | 14 |
| Project work | - | 120 |
| Video-presentation | 1 x 2 h | 2 |
| CARQ assignment | 6 x 45 min | 4-5 |

3. Competences and learning objectives

The aim of this module is to stimulate the acquisition of several key competences for sustainability, in this case related to FNS. This section starts with an overview of competences linked to this module. Competence acquisition requires operationalization of competences into specific learning objectives⁸.

Competences

The above-mentioned learning objectives are linked to several competences⁹ that were identified as important based on stakeholder consultations and (grey) literature, including:

- Food systems approach competences: *analytical thinking, systems thinking*
- Multi-stakeholder approach/network building competences: *social intelligence, self-awareness, multi-perspective, communication ability*
- Research and Innovation system competences: *navigating complexity or wickedness, openness and transparency, pro-active, critical thinking, transdisciplinary collaboration*
- Responsible Research and Innovation competences: *involving stakeholders in research data collection/analysis, participatory ability*

⁸ Wiek, A., Bernstein, M.J., Foley, W., Cohen, M., Forrest, N., et al. (2015). *Operationalising competencies in higher education for sustainable development. Handbook of Higher Education for Sustainable Development*. Routledge, London, 241-260.

⁹ Competences from competence cards (D1.4 Tools and Training Guidelines for guiding lab activities of the FIT4FOOD2030 project), based on Tassone, Valentina and Hansje Eppick. 2016. "The EnRRICH tool for educators: (Re-) Designing curricula in higher education from a "Responsible Research and Innovation" perspective". EnRRICH project. 30 June.

These competences are primarily linked to the module outputs: the policy advice report and the video-presentation. However, they are also linked to the different assignments during the workgroups. Chapter 5 include references to which competences are related to the specific assignments.

Learning objectives

After the successful completion of this educational module, the student...

- has an understanding of the term **‘food systems’** and the complexity around food systems (transformation)
- can **explain the need for inter/transdisciplinary research** in Food and Nutrition Security (FNS) Studies
- is able to **critically reflect on choices of design in inter/transdisciplinary research** (in the field of FNS Studies)
- is able to conduct an inter/transdisciplinary project in relation to FNS. The student:
 - is able to **find and integrate different relevant literature sources**
 - is able to contribute at an academic level to the execution of the project **related to his/her own disciplinary background**
 - is able to **conduct transformative interviews** that contribute to the research project
 - can **analyse qualitative data** in such a way that it contributes to the research project
 - is able to **integrate qualitative data** with data from literature review and/or analysis of secondary quantitative data
 - is able to set up **valid lines of argumentation**
 - is able to **translate research findings into evidence informed policy advice**
- The student has improved his/her capacity as a professional. The student:
 - can **work effectively together** with other students in a project team
 - is able to **coordinate and plan an inter/transdisciplinary project** in such a way that deadlines are kept and the quality of the products are in relation with time invested
 - is able to **highlight the results of and defend the recommendations** proposed in the inter/transdisciplinary research in a video-based presentation
 - is able to **write a policy advisory report** that is coherent and covers the research project.
 - is able to **critically reflect on his/her own capacities and role within the group** and his/her learning process during the research project

4. Lectures

The module consists of five lectures (all compulsory) in which different models and theories regarding inter/transdisciplinarity in FNS are discussed. Below is a brief overview of the purpose and content per lecture.

Introduction lecture (week 1)

In this lecture students are briefly introduced to the topic of FNS and FNS as a complex problem, as well as to the term 'food system' and 'inter-and transdisciplinary research'. After this, learning objectives, work forms and deadlines of the module are showed to the students. Finally, students are introduced to the real-life projects that are chosen for this module. At the end of the lecture students will choose which real-life project they wish to work on for the coming four weeks.

PowerPoint slides as inspiration for this lecture can be found separately.

Lecture systems approach & transdisciplinarity (week 1)

This lecture zooms in on a systems approach and transdisciplinarity for food system transformation, meaning an introduction to systems thinking (and how it relates to their own project), different types of research and the need for transdisciplinary research processes to stimulate transformation. PowerPoint slides as inspiration for this lecture can be found separately.

In advance of this lecture students are supposed to (at least) read the following:

- Bunders J.F., Broerse J.E., Keil F., Pohl C., Scholz R.W., Zweekhorst M.B. (2010) How can transdisciplinary research contribute to knowledge democracy? In: in 't Veld R. (eds) Knowledge Democracy. Springer, Berlin, Heidelberg. https://link.springer.com/chapter/10.1007%2F978-3-642-11381-9_11?LI=true
- Hammond, R.A. & Dubé, L. (2012). A systems science perspective and transdisciplinary models for food and nutrition security. *PNAS*, 109 (31); 12356-12363
- Gill et al. (2018). A Systems Approach to Research and Innovation for Food System Transformation. Policy Brief 1, published by FIT4FOOD2030.
- Parsons, K., Hawkes, C., Wells, R. (2019). What is the food system? A Food policy perspective. In: Rethinking Food Policy: A Fresh Approach to Policy and Practice. London: Centre for Food Policy.
- Ruben, R., Verhagen, J., & Plaisier, C. (2019). The Challenge of Food Systems Research: What Difference Does it Make? *Sustainability*, 11(1), 171.

Lecture in-depth interviewing and qualitative data analysis (week 2)

This lecture introduces students to qualitative research methods, in particular in-depth interviewing. While this lecture will primarily focus on interviewing as a research method in general, the workgroup related to this lecture zooms in on **transformative** interviewing in particular.

This lecture also introduces students to the basics of qualitative data analysis, including an explanation of deductive and inductive research, different types of data analysis (e.g. content, thematic, grounded) and coding (e.g. axial, open, selective coding), and approaches to increase research validity. PowerPoint slides as inspiration for this lecture can be found separately.

In advance of this lecture students are supposed to (at least) read the following:

- Gray, D.E. (2013). *Doing Research in the Real World*. SAGE.
Chapter 7. Research design qualitative methods
Chapter 8. Research design: Mixed Methods
Chapter 15. Interviewing
- Gray, D.E. (2013). *Doing Research in the Real World*. SAGE.
Chapter 23. Analysing and Presenting Qualitative Data

(guest) Lecture spatial context of food and health (week 2)

The spatial context of food and health is a highly relevant topic within FNS studies, since the food system has several spatial dimensions. This lecture aims to stimulate the geographical imagination of students. Furthermore, it aims to inspire students to integrate quantitative aspects in their own research project (to make it mixed methods), by briefly introducing students to the importance of spatial analysis and the different research approaches related to such an analysis.

In advance of the guest lecture students formulate two to three questions in duos. To be able to formulate these questions, students are provided with an abstract of the presentation in advance and/or specific literature (see the box below). Students also need to do some desk research, focusing on the organization the guest lecturer works at, the function and role of this guest lecturer and the issues he or she is going to cover. Students will send these questions to their coach no later than 1 hour before the guest lecture.

In advance of this lecture students are supposed to (at least) read the following:

- Verburg, P.H., Mertz, O., Karl-Heinz, E., Haberl, H., & Wu, W. (2013). Land system change and food security: towards multi-scale land system solutions. *Environmental Sustainability*. 5(5), 494-502.
<https://doi.org/10.1016/j.cosust.2013.07.003>

Alternatives

There are of course several alternative subjects for this guest lecture on the spatial context of food and health. For instance, a guest lecture on **sustainable (urban) food systems planning** would be highly interesting and suitable within this module. Such a lecture could focus on **foodscapes**, defined as places and spaces where food is produced, processed, acquired, distributed, consumed and the waste processed¹⁰. The term 'foodscape' is increasingly being used within several disciplines, such as spatial design and planning, health promotion (ref.), and food studies. It is used to describe our food environments and assess the impact of food choices and behaviour. Since our food systems could be seen as **complex systems**, a lecture on **transition theory, system innovation and/or social practice theory** would be highly relevant as well¹¹.

Another possibility would be to prepare a guest lecture about the EU-project FIT4FOOD2030 itself. This will be inspiring, because it gives the possibility to provide real-life examples of how food system transformation is tried to stimulate in practice. It would also be possible to ask one of the **community**

¹⁰ Wiskerke, H. & Verhoeven, S. (2018). *Flourishing foodscapes. Design for city-region food systems*. Valiz.

¹¹ Spaargaren, G., Oosterveer, P. & Loeber, A. (2012). *Food Practices in Transition. Changing Food Consumption, Retail and Production in the Age of Reflexive Modernity*. Routledge.

partners to give a guest lecture, for instance a representative from the Food Policy Council (in case this party is not the commissioner).

5. Working on a real-world problem

The added value of working on a real-world problem

Working on a real-world problem which is commissioned by an external institution has added value on academic, professional and personal level¹². An important aspect is that students deepen their understanding of scientific theories by linking theory and practice. This of course requires an appropriate link between the theories that are central within the module and the real-world project. Since the project needs to meet the expectations of the commissioner as well as the academic objectives of the module, students learn to formulate a problem statement and main research question in consultation with their commissioner. On professional and personal level students learn to improve their communication skills and might discover new interests. Furthermore, working on a real-world problem might be inspiring for students and/or increase their motivation, since they could immediately experience the value of their work.

Focus and commissioning institution

AFNSA could either have a European and/or city focus, an international focus, or a combination of those. However, working with a commissioner from the city or community is advantageous since this makes it possible for students to directly engage with the commissioner and their relevant stakeholders. Especially in the context of transdisciplinary research direct engagement with stakeholders is beneficial. This is also in line with the idea of Community Service Learning, which is a form of education in which students work on existing societal issues by using their academic skills which is not only beneficial for students and the academic institution itself but also for the specific (international) community³.

Transdisciplinarity of the real-world problem

Within this module, teams of 5 to 10 students collect data by literature review and semi-structured (transformative) interviews (and analysis of databases) to conduct an inter/transdisciplinary analysis on the basis of which they provide a policy advice to their external commissioner (see *Appendix 1* for an overview of the content of the report). This means that students need to reach an interdisciplinary synthesis of the collected information in consultation with their external commissioner. Since AFNSA is designed as a four-week course it is unlikely that the research project has a 'high' level of transdisciplinarity, characterized by e.g. co-creation of knowledge, a mutual learning process, an emergent design and an explicit integration of different types of knowledge. However, attention is paid to these transdisciplinary features in several ways via:

- Engagement with at least three **different types of stakeholders** relevant to their project to be able to get a deeper understanding of the existence of different perspectives regarding the real-world problem;
- A **reflection on problem statement and research question** together with these stakeholders;
- A training on **transformative interviewing** (rather than basic interviewing only) (see chapter 5);
- An **extended member check** to increase stakeholder participation during this phase (data analysis phase) of the project (see chapter 5, workgroup X) and;

¹² Community Service Learning: <https://www.vu.nl/en/about-vu-amsterdam/mission-and-profile/csl/index.aspx>

- A focus on **transdisciplinary research methods and knowledge co-creation** during one of the workgroups (see chapter 5, workgroup X).

Example case: The Food Council Metropolitan Region Amsterdam as Commissioner

One of the external commissioning institutions within AFNSA at the VU University Amsterdam is the Food Council Metropolitan Region Amsterdam (FC MRA). It is increasingly recognised that cities play important roles with regard to food system transformation. Food policy councils (FPCs) are a relatively new phenomenon and are now being set up in several cities around the world. Generally, FPCs aim to engage public, private and academic parties to strengthen the structure of the regional food system and aim to advise local authorities¹³. Since the FC MRA was recently launched it would like to gain a better understanding of the perspectives of different food system related stakeholders on the role of the FC MRA. *Appendix 2* presents the real-world problem description of the FC MRA as how it was presented to the students.

FPCs form an interesting party for this module. However, if this is not applicable because there is no FPC in the region where this module will be tried out, there are several other options. Below is a general overview of what kind of parties might be interesting to invite as external commissioning institution within the course:

- **Municipality** – department working on food system related issues
- **Province** – department working on food system related issues
- **Non-governmental organisation** working on food system related issues
- **Research or academic institution** working on food system related issues

Be aware:

In some communities or cities (like Amsterdam) it might be possible that certain stakeholders (especially entrepreneurs or start-ups) are contacted by students for different projects (too) frequently. Therefore, it is important to be aware of the situation in your specific community or city before students start to engage with stakeholders. Discuss this with the commissioning institution as well. 'Sensing the field' would be a good alternative. This means that visit a number of food related events (discussion evenings, debates, conferences, etc.) and interview people on the spot (which requires different skills and techniques).

6. Workgroups and trainings

Workgroups of this module are guided by a 'coach' and are all scheduled for three hours. This coach could be a junior researcher, PhD student or post-doc. The coach is not the one making the decisions concerning the research project but will rather advice and support the students in making those decisions. This chapter includes an overview of the content of the workgroups. Each sub-chapter below starts with an overview of workgroup elements (assignments and/or activities), duration of these elements and related competences.

Workgroup 1 (week 1)

The objective of this first workgroup is to let students get to know each other, to discuss the importance of effective team meetings and to give a more detailed explanation of the real-life case

¹³ Gill et al. (2018). *A Systems Approach to Research and Innovation for Food System Transformation*. Policy Brief 1, published by FIT4FOOD2030.

they are going to work on for the coming weeks. Two-third of this workgroup is dedicated to personal development and competence building, which is important to start with at the beginning of this module.

| Workgroup element | Duration | Competences (if applicable) |
|--|-------------|---|
| Getting to know each other | 15 – 20 min | - |
| In-depth introduction to the real-life project | 10 min | - |
| Effective team meetings | 10 min | - |
| Introduction newspaper assignment | 10 min | - |
| Team role in relation to educational background: personal development and Belbin | 115 min | <i>Critical thinking, Self-reflection</i> |
| Introduction CARQ seminars | 20 min | - |

Getting to know each other

This introduction round is meant to let student get to know each other in a fun way. It is not necessary to already ask for their experiences regarding inter- and transdisciplinary research approaches (this will be part of the last assignment of the workgroup; *‘Team role in relation to educational background: personal development and Belbin’*). Ask students to talk to their neighbours. After 5 minutes each student will introduce the person left to his/her (name, educational background, hobbies, etc.). There are of course several other ways to let student get to know each other.

In-depth introduction to the real-life project

This session is meant to give a more elaborate explanation of the real-life project. This can be done with a PowerPoint presentation, a movie, and/or other materials. Make sure that students understand the project/problem description correctly. Let them brainstorm on the problem statement and research question.

Effective team meetings

Since this is in intensive module it is important to tell students about the need for a strict planning during the first workgroup.

Your project team embodies a working force of about 7 x 1 months. However, you will also lose time in project meetings to discuss results, analysis, interview design, etc. Your main challenge is to gain time by efficiently organized project team meetings. This teamwork has to be learned, and is one of the objectives of the module. Therefore, specific attention is paid to working in a project team and team building. The roles of chairman and secretary of the meeting will for example rotate, so that you all get the opportunity to train the necessary skills. All project teams have a coach that guides and monitors the project work. You will have a meeting with your coach each week on a fixed moment in time. However, to train your skills in project management and taking ownership, you as a group will be responsible for organizing extra meetings with your coach if necessary/needed. Some flexibility is therefore required. Overall, you will meet up with your coach two-three times a week.

The project resembles a “real-world” policy job. This implies working hours from 9.00 - 17.00. You are requested not to come late to the lectures and workshops. The remainder of the time you as a team

are responsible for your activities. During the first project meeting, you will plan your time management and roles. If you have an important appointment that has been planned by an external organisation (e.g. exam for driver license, hospital visit) or is by definition not your responsibility of planning (e.g. funeral, wedding, etc.) discuss with your colleagues in the team how you will compensate that time. Remember, you are jointly responsible for the end product. Inform your coach about the arrangement you agreed on, and in case of illness or other unplanned absences, please inform your project team members, your coach and the module coordinator.

Introduction to newspapers and system understanding

Introduce students to the ‘newspaper and system understanding’ assignment. This assignment is meant to help students acquire the competence of systems thinking. Ask two students to collect all food system related articles they can find from this moment on. Ask them to collect articles from at least three different newspapers, including a ‘left-wing’ and a ‘right-wing’ newspaper. Two students will give a 5-minute presentation about their collection of articles at the end of each week. This presentation will be the start of a discussion with the entire group. Ask students to include the following in their pitch:

- *What part of the food system are the articles about? Which part(s) of the food value chain (e.g. production, processing, distribution, consumption, disposal of waste)?*
- *What kind of challenges are being addressed (e.g. environmental challenges, health challenges, etc.)?*
- *What kind of actors are being mentioned (e.g. different stakeholder categories or not)?*
- *Is there a particular framing present within these articles?*

Team role in relation to educational background: personal development and Belbin

In this session, students extensively explore their default or most preferred role in team work through the (well-known) Belbin test. In an additional reflection exercise, students explore how their background education (Bachelor/Major) may have contributed to their Belbin outcome in addition to their personal traits. In this way insight is generated into whether students already have experience with inter- and/or transdisciplinary research and what kind of ontological and epistemological perspective they have. Also, students learn to analyse their own strengths and weaknesses and based on that create a personal development plan for expanding their team work role repertoire in line with the Belbin typology.

Preparation

Ask students to do the Belbin test before this session (e.g. via <https://www.123test.com/team-roles-test/>) and bring their result to the session.

Outline of the session

1. (15 min) Engage in a plenary conversation with the group:
 - Try to unravel which students discovered that they are e.g. ‘plants’; what commonalities can they identify e.g. in working on a (new) project?
 - Walk through all the roles (see the list below in Figure 1).
 - Try to emphasize that each role has strengths and weaknesses. In case students are unhappy with their outcome, emphasize that the outcome may differ in each project/context/setting, and may change over lifetime. The outcome only says something about your most preferred role. Multiple roles may apply to one person, and of course people are not to be put in boxes, but sometimes a box-like division does help in pin pointing important strengths, weaknesses and personal traits.

2. (20 min) Reflect with the students on the following questions:
 - What was taught to you about the purpose of science?
Probing questions: 'In how far were you educated to discover 'the truth'?' and 'Is there a ONE AND THE ONLY truth?'
 - How did teachers in your Bachelor (Major) frame the relationship between science and society?
Probing questions: 'In how far were you educated to be 'objective'?', 'Is it possible to be objective?', 'Where does subjectivity come in when you perform scientific research?', 'Is it possible to be a 'neutral' scientist?', 'In how far were you taught to stay away from values, emotions and (stakeholder) interests when doing research?'
 - In how far was it common in your educational background to interact with societal actors during the research process?
 - If you would not limit science-society interaction to communication by the end of a project (e.g. a public presentation about your findings), when in the scientific research process do you see opportunities to interact with society (including citizens, but also public and/or private parties)? For example, in order to align or anticipate with your research to societal interests?
 - In what skills were you taught to excel as a scientist?
Probing questions: 'Was there attention for (developing) social skills?'
3. (15 min) Ask students (e.g. in pairs/duos or in bigger groups) to relate the answers of the discussion/dialogue held in part 2 to their Belbin outcomes. In how far do they see a particular relationship between their background education and their Belbin outcome? In other words, in how far do they consider themselves as being framed in performing team work by their background education?

Possible examples:

- Some educational tracks teach students to completely ignore or exclude values, emotions, and societal viewpoints in doing research. Students of these tracks may be more likely (but not surely) to discover that their Belbin outcome is 'monitor' or 'specialist', being focused on facts and outcomes. Or in the contrary, students with such 'value-free science' being taught during their Bachelor that have the plant as Belbin outcome, may discover why they always felt an outlier.
- Some educational tracks teach students to collaborate with various other disciplines and/or professionals from 'practice'. In such projects, the insights of these collaborators are taught to be valuable to the research process and/or outcomes. Students of these tracks may be more likely (but not surely) to discover that their Belbin outcome is 'team worker', or maybe a specialist, to operate as a specific actor in the project.

Exchange the relationships that the duo-students identified in a plenary conversation. Unravel similarities and differences. Note that to our best knowledge, little is known about these relationships. Students and teachers will therefore need to explore the identification of these links themselves.










| Team Role | Contribution | Allowable Weaknesses |
|---|--|---|
| Plant  | Creative, imaginative, free-thinking. Generates ideas and solves difficult problems. | Ignores incidentals. Too preoccupied to communicate effectively. |
| Resource Investigator  | Outgoing, enthusiastic, communicative. Explores opportunities and develops contacts. | Over-optimistic. Loses interest once initial enthusiasm has passed. |
| Co-ordinator  | Mature, confident, identifies talent. Clarifies goals. Delegates effectively. | Can be seen as manipulative. Offloads own share of the work. |
| Shaper  | Challenging, dynamic, thrives on pressure. Has the drive and courage to overcome obstacles. | Prone to provocation. Offends peoples feelings. |
| Monitor Evaluator  | Sober, strategic and discerning. Sees all options and judges accurately. | Lacks drive and ability to inspire others. Can be overly critical. |
| Teamworker  | Co-operative, perceptive and diplomatic. Listens and averts friction. | Indecisive in crunch situations. Avoids confrontation. |
| Implementer  | Practical, reliable, efficient. Turns ideas into actions and organises work that needs to be done. | Somewhat inflexible. Slow to respond to new possibilities. |
| Completer Finisher  | Painstaking, conscientious, anxious. Searches out errors. Polishes and perfects. | Inclined to worry unduly. Reluctant to delegate. |
| Specialist  | Single-minded, self-starting, dedicated. Provides knowledge and skills in rare supply. | Contributes only on a narrow front. Dwells on technicalities. |

Figure 1. Overview of the Belbin roles.

- (20 min) Place students in their team/group and ask them to discuss the meaning of the outcome for their group composition and teamwork to be done. Ideally a team composition is based on complementary roles. However, this is not always the case, which raises possible risks (and sometimes opportunities). E.g. in case there are multiple plants in one team, there is a chance that the team aims for generating a multitude of super-creative ideas. On the other hand, there is a chance as well that the team keeps exploring new ideas, and forgets to take decisions.

With the Belbin outcome in mind, how should they divide traditional team roles among the members? Think about the chairman, secretary (minute maker), planner, information manager, (internal and/or external) communication responsible, etc.

Also give them the task to make a team work contract. Who does what and when during the project? How to deal with malfunctioning team members, etc. See an example [here](#) or Google 'team work contract template' (web or images).

- (20 min) With the Belin outcomes in mind, ask students to make a personal top 5 core quality list. Skills, knowledge or attitudes that are useful in teamwork in which they (think that they) excel. Let students discuss their lists within their group.

Ask one student to share her/his list in a plenary conversation. Choose one core quality and draw a 'core quadrant' on the board, see Figure 2. Fill in the core quadrant with the students in class. The principles: if a core quality is exaggerated, it becomes a pitfall. Think about core quality

‘creativity’; too much creativity can make one’s work directionless (not always the case), which is then a pitfall of creativity. A pitfall, however, has a positive opposite, which results in a challenge (for the person with the identified core quality). For example, from directionless to direction-oriented. An exaggerated form of this challenge is an allergy to the person with the initial core quality. For example, extremely direction-oriented people can allow little space for creativity, which is a disaster to work with for creative people.

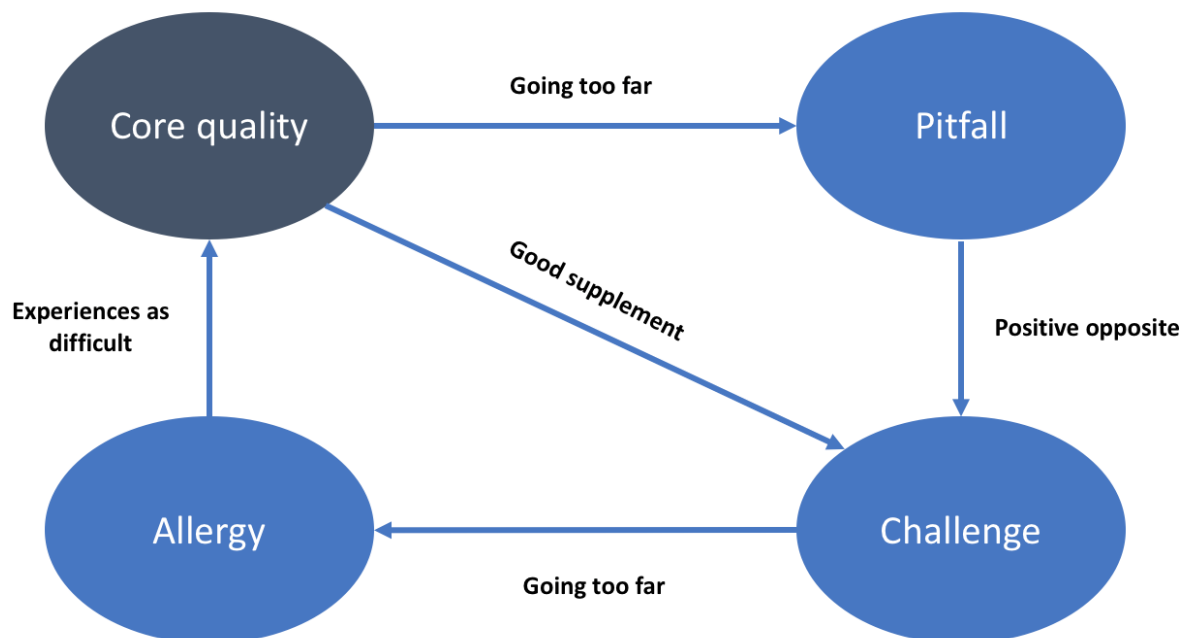


Figure 2. The core quadrant (in principle).

6. (15 min) Let students individually make the core quadrant for their full top-5 list of core qualities. Once the challenges of their core qualities are discovered, instruct them to seek a connection between their challenges and the Belbin role(s) that they were not associated with in their test outcome. Based on this, ask students to explore whether group members have a Belbin role that includes these challenges as core quality, so that these students could regularly check in to give each other feedback during the course of the project. Instruct students to make a personal development plan based on these ‘challenges’ and under-explored Belbin roles. Their challenges are their personal ‘points for improvement’ to be practices during the (team work) project.

Introduction CARQ seminars

To work collectively towards a better understanding of the (scientific) literature pertinent to the topic of FNS and inter-and transdisciplinarity, the CARQ-method is used within this module, which stands for:

- **Core quotation** (a phrase or sentence of the article that according to you presents the key message of the whole article), accompanied with the
- **Argumentative structure** of the article or chapter to illumine this quotation; a discussion of
- **Relations** the article has (with what you know from other contexts, with other texts discussed in the module, with non-central issues dealt with in the text, with assignments you are currently working on, with your focus group project, *et cetera*). Finally, present fellow students with
- **Questions** that are formulated in such fashion as to *stimulate discussion*.

During each workgroup 2 students will discuss two selected articles which are preceded by a brief presentation by one of the students (i.e., no longer than 15 minutes), following the CARQ-method.

Students are not allowed to use powerpoint slides, but they can use handouts and/or use the black- or whiteboard during the discussion. After the presentation of the article a discussion with peers will follow, based on the questions that presentations end with. The presenter needs to make sure that that attention is paid to:

1. *What the content of the article means for students following Applications in Food and Nutrition Security Analysis;*
2. *What the content of the article means for the assignment the students are working on.*

The persons who are in charge of the CARQ presentation act as chair for the CARQ-part of the seminar, including facilitation of the discussion following the presentation. Only if necessary, the seminar coach will intervene to highlight important issues, or to deepen or structure the discussion.

The goal of discussion questions is to train students in arguing in favour and/or against a certain position they have encountered in the text at issue, such that they deepen their understanding of the text, the theories it puts forwards and the concepts it mobilizes. This can be done in many different ways. For instance, one can ask questions of the following structure:

- *“Based on the argumentation that we have just presented, how would [the author of the text at issue] think about the following situation /theory/ counter argument [...elaboration...].” Or*
- *“In contemporary public discourse, I have recently encountered that someone took position x; what would [the author of the text at issue] think about that?”*

Questions like these concerns applications of theories or concepts encountered in their readings. Ideally, students would add their own hypothesis to questions such as these, based on their reading of the text. Specifying what makes them uncertain about this interpretation makes their contribution even stronger, as this invites an open exchange of ideas.

- *“[Author of the text at issue] argues x, but [other author] argues the exact opposite. Which position is most plausible/ convincing/ relevant for our purposes/ consistent/...?”*

This type of questions has much to do with *relationships*. Make sure students explain why they think this is an important question to answer.

Planning

CARQ seminars are planned for work groups 2, 3, 4, 5 and 6. During workgroup 1 the CARQ method will be explained. During the last workgroup students do not have to present two articles and can focus on their end product. The schedule is as follows:

| Workgroup | Resources |
|-------------------|--|
| 2 (week 1) | <ul style="list-style-type: none"> ○ Ruben, R., Verhagen, J., & Plaisier, C. (2019). The Challenge of Food Systems Research: What Difference Does it Make? <i>Sustainability</i>, 11(1), 171. ○ Gill, M. et al. (2018). A Systems Approach to Research and Innovation for Food System Transformation |
| 3 (week 2) | <ul style="list-style-type: none"> ○ Bunders J.F., Broerse J.E., Keil F., Pohl C., Scholz R.W., Zweekhorst M.B. (2010) How can transdisciplinary research contribute to knowledge democracy? In: in 't Veld R. (eds) |

| | |
|-------------------|--|
| | <p>Knowledge Democracy. Springer, Berlin, Heidelberg. https://link.springer.com/chapter/10.1007%2F978-3-642-11381-9_11?LI=true</p> <ul style="list-style-type: none"> Ivanov et al. (2016). CASI: Strategic Outline of Public Engagement in the Development of Sustainability Research Policies and Programmes . Findings of the CASI Project. |
| 4 (week 3) | <ul style="list-style-type: none"> Krom, de, M.P.M.M. & Muilwijk, H. Multiplicity of Perspectives on Sustainable Food: Moving Beyond Discursive Path Dependency in Food Policy. <i>Sustainability</i>, 11(10), 2773. Parsons, K., Hawkes, C., Wells, R. What is the food system? A Food policy perspective. In: Rethinking Food Policy: A Fresh Approach to Policy and Practice. London: Centre for Food Policy. |
| 5 (week 3) | <ul style="list-style-type: none"> Fazey, I., Schöpke, N., Caniglia, G., Patterson, J., Hultman, J. et al. (2018). Ten essentials for action-oriented and second order energy transitions, transformations and climate change research. <i>Energy Research & Social Science</i>, 40: 54-70. Sonnino, R., Tegoni, C.L.S. & de Cunto, A. (2018). The challenge of systemic food change: Insights from cities. <i>Cities</i>. |
| 6 (week 3) | <ul style="list-style-type: none"> Moragues-Faus, A., Sonnino, R. and Marsden, T. (2017). Exploring European food system vulnerabilities: Towards integrated food security governance. <i>Environmental Science and Policy</i>, 75: 184-215. http://dx.doi.org/10.1016/j.envsci.2017.05.015 Caron, P., Ferrero y de Loma-Osorio, G., Nabarro, D., Hainzelin, E. Guillou, M., ... Verburg, G. (2018). Food systems for sustainable development: proposals for a profound four-part transformation. <i>Agronomy for Sustainable Development</i>, 38(14). https://doi.org/10.1007/s13593-018-0519-1 |

Workgroup 2 (week 1)

This workgroup builds on lecture 2 (food systems and transdisciplinarity).

| Workgroup element | Duration | Competences (if applicable) |
|--|----------|---|
| CARQ seminar | 45 min | <i>Critical thinking</i> |
| Research question, problem statement and the commissioners' interview | 30 min | <i>Critical thinking</i> |
| Newspapers and system understanding | 30 min | <i>Systems thinking</i> |
| Project work | 60 min | <i>Collaboration, interpersonal competences</i> |

CARQ seminar

See description of this assignment on page 14.

Research question, problem statement and the commissioners' interview

First part of this session is meant to reflect on the problem description and research question of the students.

After this the importance of an interview with the commissioner needs to be explained. Although students received materials about the real-life societal issue, they will need additional and more in-depth information from the commissioner to be able to do the research and write the policy advice report. The interview with the commissioner will be conducted by the entire project team or two

representatives of the group. The interview will be more like an informal conversation with the aim to unravel the needs and expectations of the commissioner regarding the project.

Have the students think about what questions to ask: what information do they need from the commissioner? Stress that it is also important to think about the answers the commissioner will give: with what answers are they satisfied?

Students will invite the commissioner themselves and will write a summary of the conversation afterwards. Make sure the interview is scheduled between workgroup 2 and workgroup 3.

Newspapers and system understanding

See the description of this assignment on page 10.

Project work

Give students time to work on their project. Walk around and answer any questions.

Workgroup 3 (week 2)

| Workgroup element | Duration | Competences (if applicable) |
|--|----------|--|
| CARQ seminar | 45 min | <i>Critical thinking</i> |
| Newspapers and system understanding | 30 min | <i>Systems thinking</i> |
| Transdisciplinary research approaches | 30 min | <i>Transdisciplinary competences</i> |
| Developing the (transformative) interview design | 60 min | <i>Critical thinking, systems thinking</i> |

CARQ seminar

See description of this assignment on page 14.

Newspapers and system understanding

See the description of this assignment on page 10.

Transdisciplinary research approaches

This session is meant to zoom in on transdisciplinarity and features of transdisciplinarity such as knowledge co-creation. Lecture 2 does focus on different types of research and transdisciplinarity. However, approaches and methodologies linked to transdisciplinary research are not covered in the lecture. To be able to increase the level of transdisciplinarity of their project work it is important to zoom in on the features of this type of research during the workgroup.

Let students watch the following movies on transdisciplinarity:

- The Transdisciplinary approach - <https://youtu.be/x5xGi9EFCSY> (4 min)
- Why Transdisciplinarity? - <https://youtu.be/8iMov3PuMk4> (3 min)

Engage in a plenary conversation. Start with asking students to reflect on these movies. After this ask them to think about their own project: How could they increase the transdisciplinarity of their project? Which approaches or research methods do spark their interest and which of them would be appropriate for their own project (also if they would not really use these methods)? During which phases of the project? etc.

Developing the (transformative) interview design

Start with a reflection on the interview with the commissioner: what does the outcomes mean for the project?

After this let students brainstorm about who to interview: what types of stakeholders (at least three different types) are they planning to engage with and why? Also, let them work on their interview design based on lecture 2 (in-depth interviewing) (training 1 on *transformative interviewing* will be on the next day).

Workgroup 4 (week 2)

| Workgroup element | Duration | Competences (if applicable) |
|-------------------------------------|----------|---|
| CARQ seminar | 45 min | <i>Critical thinking</i> |
| Newspapers and system understanding | 30 min | <i>Systems thinking</i> |
| Project work | 90 min | <i>Collaboration, interpersonal competences</i> |

CARQ seminar

See description of this assignment on page 14.

Newspapers and system understanding

See the description of this assignment on page 10.

Project work

Give students time to work on their project. Walk around and answer any questions.

Workgroup 5 (week 3)

| Workgroup element | Duration | Competences (if applicable) |
|-------------------------------------|-----------|-----------------------------|
| CARQ seminar | 45 min | <i>Critical thinking</i> |
| Newspapers and system understanding | 30 min | <i>Systems thinking</i> |
| Project work | 1,5 hours | |

CARQ seminar

See description of this assignment on page 14.

Newspapers and system understanding

See the description of this assignment on page 10.

Project work

Give students time to work on their project. Walk around and answer any questions.

Workgroup 6 (week 3)

| Workgroup element | Duration | Competences (if applicable) |
|-------------------------------------|----------|--|
| CARQ seminar | 45 min | |
| Newspapers and system understanding | 30 min | <i>Systems thinking</i> |
| Giving feedback | 30 min | Social intelligence, self-awareness, communication ability |
| Checking in with the commissioner | 45 min | Social intelligence, self-awareness, communication ability |
| Project work | 30 min | <i>Collaboration, interpersonal competences</i> |

CARQ seminar

See description of this assignment on page 14.

Newspapers and system understanding

See the description of this assignment on page 10.

Giving feedback

Provide students with information on how to give feedback (Appendix 3) in advance of this workgroup¹⁴, and ask students to give each other feedback based on these guidelines. Also link to the personal development assignment of week 1 by asking students to read each other's' personal development plan in advance. After the feedback round ask students to update their personal development plans.

Checking in with the commissioner

Reserve part of this workgroup to let student check in with their commissioner to investigate whether the research project is still in line with the needs and expectations of the commissioner. This can be done face-to-face or via a (teleconference) call.

¹⁴ Boud, D. (1991) *Implementing Student Self-Assessment*, HERDSA Green Guide 5, Campbelltown: Higher Education Research and Development Society of Australasia
 McGill and Beatty (in "Action learning: A practitioner's guide", London: Kogan Page, 1994, p. 159-163) provide useful suggestions about giving effective feedback.

Project work

Give students time to work on their project. Walk around and answer any questions.

Workgroup 7 (week 4)

| Workgroup element | Duration | Competences (if applicable) |
|---|----------|---|
| CARQ seminar | 45 min | Critical thinking |
| Newspapers and system understanding | 30 min | <i>Systems thinking</i> |
| Explanation of extended member check and project work | 45 min | <i>Participatory ability</i> |
| Coming back to Belbin and the personal development plan | 30 min | - |
| Project work | 30 min | <i>Collaboration, interpersonal competences</i> |

CARQ seminar

See description of this assignment on page 14.

Newspapers and system understanding

See the description on page 10.

Explanation of extended member check and project work

Explain the added value of an extended member check in order to increase the transdisciplinarity of the project. An extended member check means that students send their transformative interview transcripts as well as their interpretation of the transcript to the stakeholders. In this way stakeholder have the opportunity to change or add aspects to the transcript. If stakeholders are interested they could also be invited to be engaged during the analysis phase (with e.g. developing a coding scheme).

Coming back to Belbin and personal development plan

During work group 1 everyone made the Belbin test and created a personal development plan. This session is meant to come back to this personal development plan. Ask students to look at their personal plans again and ask them to write down what they think they learned so far and what they would like to develop further.

Project work

Let students work on their project. Walk around and answer any questions.

Training 1. Transformative Interviewing (week 1)

| Workgroup element | Duration | Competences (if applicable) |
|-------------------|----------|-----------------------------|
|-------------------|----------|-----------------------------|

| | | |
|---|--------|---|
| Exercising transformative interviewing | 80 min | Social intelligence, self-awareness, communication ability, |
| Project work | 40 min | <i>Collaboration, interpersonal competences</i> |

Since the module is scheduled to last only four weeks, it is important to zoom in on interview skills relatively early on. Therefore, try to schedule this 2-hour training in the first part of the module.

Exercising transformative interviewing

In this training session, students learn to act as a (temporal) change agent in a (food) system by means of conducting (transdisciplinary) research. While doing research, one can shape interactions with stakeholders in such a way that they incite (transformative) change within, among or between stakeholders in the system, including the self (alias the student as a researcher).

Various types of research have transformative capacities, for example action research, participatory observation and reflexive monitoring¹⁵. In such research, researchers become part of a particular community or network and can organize ‘interventions’ that shape or transform (practices in) the community or network.

One tangible tool for such a change agent-like researcher is ‘transformative interviewing’. The term does not exist as such in scholarly literature, but we can deduce it from the RMA kind-of interviewing techniques⁷, and Theory U principles for transformative change¹⁶. In the former, interviewers ask interviewees to reflect on performed tasks, identify key learning points in relation to originally set objectives, and set goals for the next steps in performing a particular task (see an example in, e.g., Van der Meij et al., 2016). The latter, Theory U, pleads for a specific form of communication (in particular ‘generative listening’) to support transformative change. In the exercises below, students explore transformative interviewing by discovering communication principles in line with Theory U.

1. (20 min) Ask students to watch two YouTube videos before the session:
 - Otto Scharmer on four levels of listening: <https://youtu.be/eLfXpRkVZal> (8 min)
 - Otto Scharmer on generative listening: <https://youtu.be/dlAYK6zaKDg> (13 min)

Reflect with the students on the four levels of listening as explained in the videos. The major differences are as follows (also see Figure 1 for an overview):

- Downloading: Listening from your own habits and to what you already know, in order to reconfirm this. We usually notice ourselves saying or thinking ‘of course’, ‘right’, and ‘ahuh’ in this level of listening.
- Factual listening: Noting new information that differs from what you already know/expect. This can be noticed when you think ‘oh?’, or ‘really?’.
- Empathizing: Listening from the other person’s perspective and feeling an emotional connection. Key reactions on this level are ‘ahhww, poor you!’, or ‘yeah, super nice!’.
- Generative listening: Connecting to an emerging future and possibilities that link to who you really are. On this level, excitement in terms of ‘wow!’ or new visions of the person you are talking with, or new visions of yourself, may arise. Most importantly, generative listening covers a way of listening that is closer to ‘sensing’ what your conversation partner aspires, and helping this person

¹⁵ Mierlo, van, B., Regeer, B. J., Amstel, van, M., Arkesteijn, M., Beekman, V., Bunders - Aelen, J. G. F., ... Leeuwis, C. (2010). *Reflexive monitoring in action. A guide for monitoring system innovation projects*. oisterwijk: BOXPress.

¹⁶ U.Lab: Transforming business, society, and self. Source Book (2015).

through questioning, listening and/or acting in such a way that the person can further shape these aspirations. Like the conductor of the orchestra senses what his solo-singer is capable of (even without the singer himself being aware of it), and shapes further conditions for the singer to further realize his capability.

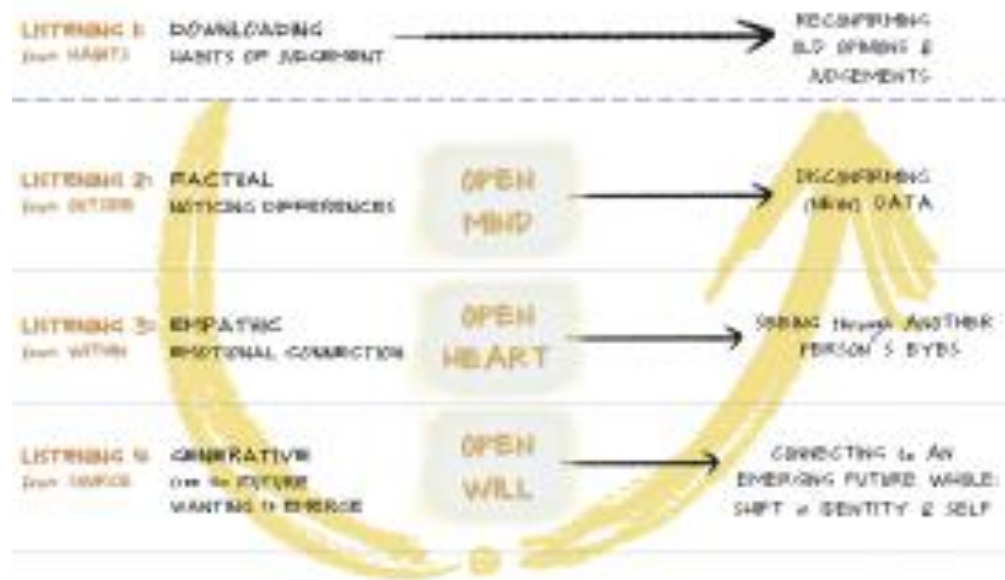


Figure 3: Overview of four types of listening of Theory U

In the next steps we further explore two concrete ‘generative listening’ exercises that can be used as a tool in transformative interviewing. Reflection on one’s own listening skills is the focal asset in the first exercise, creating a connection between personal drives and transformation, is central in the second.

2. (20 min) The following exercise embraces the listening principles of Theory U and helps people to train in generative listening. Ask students to pair with somebody they have not or hardly spoken with so far. The task is:
 - Engage in a conversation on ideas about your personal role in changing R&I on food systems. One student takes the lead in speaking; the other is not responding but just listening. After ±5-10 min the other person takes a turn to speak. Best is to look at a point on the horizon (not at each other).
 - After finishing this, use the listening self-observation template to monitor your listening skills (see below).

Facilitate a plenary dialogue with the students to reflect on the exercise (‘How did the students experience the exercise?’). Motivate students to repeat this exercise with a stakeholder with who(m) a connection is desirable, e.g. for doing research or for network expansion.

3. (30 min) Instruct students to pair with a (new) person. Take this person for a walk, e.g. outside in a green area. Either interview this person or engage in a dialogue about the following three questions:
 - Who am I/why are you?
 - Why am I doing my work/why are you doing your work? (work motivation)
 - What would I/you need to fully realize my/your work motivation?

It is advisable to let one person speak at a time; the listener does not necessarily have to ask questions within one answering round (see previous exercise). This allows more openness for what is actually being said (and little worries about which deepening questions to pose). Furthermore, it is advisable to both look in the same direction/in front of you (and not in each other's eyes), to literally look at 'the future'. In case of rain, place two chairs in front of a window with a good view, and look outside (so you do not look in each other's eyes). This exercise can also be done as a self-reflection exercise, e.g. by journaling about your answers to the three questions for yourself. Such reflection can help change makers to keep their transformative network activities/actions connected to themselves.

After the students returned, facilitate a plenary conversation about the exercise ('How did the students experience the exercise?'). Motivate students to repeat this exercise with a stakeholder with who(m) a connection is desirable, e.g. for doing research or for network expansion.

4. (10 min) The exercises performed so far during this session form the key to transformative interviewing.

Transformative interviewing: what does it mean for your own case?

The mode that students got into while performing the exercises is the mode one would like when interacting with stakeholders too. In addition to such listening, and holding simple conversations about questions such as 'Who am I/why are you? Why am I doing my work/why are you doing your work? What would I/you need to fully realize my/your work motivation?', the questions listed in Appendix 4 can be a suitable database to delve from for the set-up of transformative interviewing guides (derived from the Theory U MOOC Source Book¹⁷). In addition to covering (several of) such questions, generative listening will convert the interview into a transformative interview. See Appendix 5 for an example of a 'Learning Self Observation Template'

After students have learnt about transformative interviewing ask them to link these lessons to their own project. Let them revise their interview design (of workgroup 3) based on this training.

Training 2. Data Analysis (week 3)

This training is meant to focus on quantitative data analysis methods. Description can be found elsewhere.

7. The (research & innovation) food systems library

Below is an overview of articles, books and documents that are chore and recommended within this module.

Qualitative data collection and analysis

Chore

- Gray, D.E. (2013). *Doing Research in the Real World*. SAGE.
 Chapter 7. Research design qualitative methods
 Chapter 8. Research design: Mixed Methods
 Chapter 15. Interviewing
 Chapter 23. Analysing and Presenting Qualitative Data

¹⁷ U.Lab: Transforming business, society, and self. Source Book (2015).

Further reading

- Gray, D.E. (2013). *Doing Research in the Real World*. SAGE.
Chapter 3. Selecting and Planning Research proposals
Chapter 22. Analysing and Presenting Quantitative Data
Chapter 24. Writing up the Research

Complex problems, systems thinking and transdisciplinarity:

Chore

- Bunders J.F., Broerse J.E., Keil F., Pohl C., Scholz R.W., Zweekhorst M.B. (2010) How can transdisciplinary research contribute to knowledge democracy? In: in 't Veld R. (eds) *Knowledge Democracy*. Springer, Berlin, Heidelberg. https://link.springer.com/chapter/10.1007%2F978-3-642-11381-9_11?LI=true

Further reading

- Booth Sweeney, L. & Meadows, D. (2013). *The Systems Thinking Playbook. Exercises to stretch and build learning and systems thinking capabilities*. Chelsea Green Publishing Co.
- Meadows, D. (2015). *Thinking in Systems. A Primer*. Chelsea Green Publishing Co.
- Schuitmaker (2012). *Identifying and unravelling persistent problems*. Technological Forecasting and Social Change Volume 79, Issue 6, July 2012, Pages 1021–1031
<http://www.sciencedirect.com/science/article/pii/S0040162512000224>
- Regeer, B. & Bunders, J.F.G. (2009). Knowledge co-creation: Interaction between science and society. *A transdisciplinary approach to complex societal issues*. A Preliminary study of the RMNO (Advisory Council for Spatial Planning, Nature and the Environment).
- Pohl, C. & Hadorn G.H. (2008) Methodological challenges of transdisciplinary research. *Natures Sciences Sociétés*. 16:111-121.
<http://www.nssjournal.org/articles/nss/pdf/2008/02/nss8204.pdf>
- Stock, P. and Burton, R.J.F. (2011) Defining Terms for Integrated (Multi-Inter-Trans-Disciplinary) Sustainability Research. *Sustainability*. 3 (8), 1090-113.
<http://www.mdpi.com/20711050/3/8/1090>
- Pohl, C. (2001). How to bridge between natural and social sciences? An analysis of three approaches to transdisciplinary from the Swiss and German field of environmental research. *Natures Sciences Societies*, 9(3), 37-46.
- Jahn, T., Bergmann, M., & Keil, F. (2012). Transdisciplinarity: Between mainstreaming and marginalization. *Ecological Economics*, 79, 1-1
- Sarkki, S., Heikkinen, H. I., & Karjalainen, T. P. (2013). Sensitivity in transdisciplinary projects: A case of reindeer management in Finland. *Land use policy*, 34, 183-192.

Systems thinking and/or transdisciplinarity in relation to food systems (transformation)

Chore

- Ruben, R., Verhagen, J., & Plaisier, C. (2019). The Challenge of Food Systems Research: What Difference Does it Make? *Sustainability*, 11(1), 171.
- Hammond, R.A. & Dubé, L. (2012). A systems science perspective and transdisciplinary models for food and nutrition security. *PNAS*, 109 (31); 12356-12363
- Gill et al. (2018). *A Systems Approach to Research and Innovation for Food System Transformation*. Policy Brief 1, published by FIT4FOOD2030.

- Ingram, J. (2011). A food systems approach to researching food security and its interactions with global environmental change. *Food Security*. 3: 417–431. DOI 10.1007/s12571-011-0149-9

Further reading

- Metabolic (n.d.). Using systems thinking to transform society. The European Food System as a Case Study. Commissioned by WWF.nl.
- Ericksen, P. J. (2008). Conceptualizing food systems for global environmental change research. *Global Environmental Change*, 18 234-245.
- Meynard et al. (2017). Designing coupled innovations for the sustainability transition of agrifood systems. *Agricultural Systems* 157: 330-339. <http://dx.doi.org/10.1016/j.agsy.2016.08.002>
- Rayner, G., Barling, D. & Lang, T. (2008). Sustainable Food Systems in Europe: Policies, Realities and Futures. *Journal of Hunger & Environmental Nutrition*, 3:2-3, 145-168, DOI: 10.1080/19320240802243209
- Burchi, F., Fanzo, J. & Frison, E. The Role of Food and Nutrition Systems Approaches in Tackling Hidden Hunger (2011). *International Journal of Environmental Research and Public Health*. 8, 358-373; doi:10.3390/ijerph8020358
- Food Ethics Council (2018). *For whom? Questioning the food and farming research agenda*. A special edition magazine from the Food Ethics Council.
- Simons, L. (2014). *Changing the food game. Market Transformation Strategies for Sustainable agriculture*. Taylor & Francis Ltd.
- Gaitán-Cremaschi, D., Klerkx, L., Duncan, J., Trienekens, J., Huenchuleo, C. (2019). Characterizing diversity of food systems in view of sustainability transitions: A review. *Agronomy for Sustainable Development*, 39:1.

Food systems and policy

Chore

- IPES FOOD (2019). Towards a Common Food Policy for the European Union. The policy reform and realignment that is required to build sustainable food systems in Europe.
- Parsons, K., Hawkes, C., Wells, R. What is the food system? A Food policy perspective. In: *Rethinking Food Policy: A Fresh Approach to Policy and Practice*. London: Centre for Food Policy.

Further reading

- Barling, D., Lang, T. & Caraher, M. (2002). Joined-up Food Policy? The Trials of Governance, Public Policy and the Food System. *Social Policy & Administration*. 36 (6), 556-574.

Food Policy Councils and food system transformation (in case the real-life case is commissioned by a Food Policy Council)

Chore

- Schiff, R. (2008) The Role of Food Policy Councils in Developing Sustainable Food Systems. *Journal of Hunger & Environmental Nutrition*, 3:2-3, 206-228, DOI: 10.1080/19320240802244017

Further reading

- American Planning Association (2011). *Food Policy Councils. Helping local, regional, and state governments address food system challenges*. Food Systems Planning Briefing paper, American Planning Association's Planning and Community Health Research Center.

- Clayton ML, Frattaroli S, Palmer A, Pollack KM (2015) The Role of Partnerships in U.S. Food Policy Council Policy Activities. PLoS ONE 10(4): e0122870. doi: 10.1371/journal.pone.0122870

Additional materials to get a better understanding of how food systems are related to several disciplines and sectors

- Wiskerke, H. & Verhoeven, S. (2018). *Flourishing foodscapes. Design for city-region food systems*. Valiz.

Dutch materials related to food systems and policy

- Krom, de, M. & Muilwijk, H. (2018). Perspectieven op duurzaam voedsel. Pluriformiteit in debat en beleid, Den Haag: PBL.
- Muilwijk, H. et al. (2018), Voedsel in Nederland: verduurzaming bewerkstelligen in een veelvormig systeem, Den Haag: PBL.
- Nederland Verbeeld. Een andere blik op vraagstukken rond de leefomgeving. Voedsel, energie en mobiliteit: <https://www.pbl.nl/publicaties/2012/nederland-verbeeld>
- Candel, J. (2018). De opkomst van voedselbeleid: voorbij de tekentafel. *Beleid en Maatschappij*, 45 (4). doi: 10.5553/BenM/138900692018045004002

8. Assessment

This chapter gives an example overview of what the grade could be based on if this module is part of the curriculum of a Bachelor student.

The grade is based on the group grades for the report and the video presentation and an individual assessment of the performance in the project. To pass, all parts have to be concluded with the grade of 5.5 or higher. The student's final mark is built up as follows:

| Percentage of total grade | Part of the module | Team or individual grade |
|---------------------------|---|--------------------------|
| 35% | Report that reflects the research (problem, methods, results, advice) conducted by the project team | Team grade |
| 25% | Video presentation on the results of the research | Team grade |
| 40% | Personal performance in the project based on: 1. the assessment of the students' contribution to the team by the coach, based on: a) the students' contribution to the project team through peer assessment b) participation during project meetings c) portfolio of activities per student | Individual grade |

| | | |
|--|---|--|
| | 2. the assessment of the CARQ assignment (50% of grade) | |
|--|---|--|

The assessment criteria for the policy advisory report, the video-presentation, personal performance and CARQ assignment are presented in appendix 6.

9. Appendices

Appendix 1. Content of the policy advice report

| Object | Content |
|------------------------------|---|
| Cover page | Title, subtitle (optional), name of the author(s), picture/graphics/illustration (optional, yet recommended) |
| Title page | Title, subtitle (optional), name of the author(s) AND place and date of publication, name of organization/institute/university you work for, 'assignment board' and document identification number (optional) |
| Preface | Information about the reasons for writing the report, the intended audience, the authors and acknowledgement of people who were of assistance in completing the report. The acknowledgements can, however, also be placed in a separate chapter at the end of the report (as is more customary in the UK and US). About 1-2 pages. |
| Executive summary | The summary comprises around 1000 words. It gives a brief overview of the problem, the main research question, the sub-research questions and the approach, but focuses mainly on the conclusions and recommendations of the report. |
| Table of contents | <p>Chapters, paragraphs and numbering of pages. N.B there are a number of rules concerning how certain chapters are placed in the table of contents:</p> <ul style="list-style-type: none"> ○ Table of contents: The preface, summary, list of abbreviations, explanatory list of words, list of symbols. The appendices are not considered to be chapters and therefore receive no chapter-numbering in the table of contents, but are all listed in order of appearance in the report. ○ Pages: The cover page, title page, preface and the table of contents are not numbered. The executive summary is, in the case of policy and advisory reports, numbered in a different way than the rest of the report e.g. with roman numbering or characters (a, b, c, ...). |
| List of abbreviations | List of abbreviations and the full description of the term that is abbreviated. Using a list of abbreviations saves you the time and effort to write every abbreviation in full the first time you use it in your report. |
| First part | <p>This part includes the following elements:</p> <p>An introduction, including</p> <ul style="list-style-type: none"> ○ A problem definition |

| | |
|----------------------------------|---|
| | <ul style="list-style-type: none"> ○ A short problem statement ○ A research objective (what you promise to produce) ○ The main research question ○ Contextual background, including an actor map <p>A theoretical background and a conceptual framework; including a part on food systems as complex problem</p> <p>Sub questions derived from your conceptual model</p> <p>Methodology (in past tense)</p> <ul style="list-style-type: none"> ○ Justify the choice for your methods with an emphasis on inter- and or transdisciplinary aspects of your research ○ Design of (transformative) interviews in general and the (transformative) interview questions in specific (and include: operationalization of concepts, interview procedures). ○ The used analysis of the qualitative results (detailed analytical approach) and how you performed the extended member check. ○ Structure of the report <p>Note: these elements need to be structured in multiple chapters (the exact structure is up to you)</p> |
| Middle part | <p>Core-chapter(s) on the results of your research. You usually end with a comparison or analysis of the research findings. That is a rearrangement of your data (both from the literature and (transformative) interviews) according the conceptual framework. In these chapters, generally 1 sub-research question is analysed per 1 (sub)chapter. You might end with a chapter on analysis in which you rearrange your data according to the conceptual framework, taking all results together → answering the main research question. Analysis is not a condensed summary of you results.</p> |
| Conclusion and discussion | <p>What insights are gained? Answering of your research sub-questions and the main research question. No new ideas/results are introduced in the conclusion. Also, a conclusion needs to be delivered in crisp and clear rational language; understandable for everyone without reading the entire report (often policymakers tend to read the introduction, conclusion and recommendations when scanning a report).</p> <p>Discussion: Place your conclusions within current relevant scientific literature; see also your contextual background in the beginning (how do your conclusion deviate/strengthen/ weaken this literature). Anticipate to critical remarks from an outsider reading your report (e.g., too less interviews) and argue why that critic is not that important for your conclusions (e.g., see actor chart, those are the main actors). Conclusion is not a condensed summary of you results. Discussion is 20% methodological and 80% contextual (might be speculative).</p> |
| Recommendations | <p>Formulate around 3 alternatives (i.e. policy advice). Listing the pro-contras of each alternative. This is based on the future steps that can be taken which emerge from the</p> |

| | |
|---------------------------|---|
| | results/conclusion - with each recommendation try to answer the questions: why? who? how? The gold is in the details. |
| List of references | <p>In text: between brackets (author, year). If two authors, list both. If more than two authors then first author et al.</p> <p>In reference list:</p> <p>Book: authors, year, title, place of publisher, publisher</p> <ul style="list-style-type: none"> • Example: Stake, R.E. (2004) <i>Standards-Based and Responsive Evaluation</i>. Thousand Oaks, CA: Sage. <p>Book chapter: authors, year, book chapter, editors, book title, place of publisher, publisher, pages</p> <ul style="list-style-type: none"> • Example: Mitcham, C. (1999) "Why the public should participate in technical decision making". In: R. von Schomberg (ed.) <i>Democratising technology: theory and practice of a deliberative technology policy</i>. Hengelo: International centre for human and public affairs: 39-50. <p>Article: authors, year, title, journal (volume, number), pages</p> <ul style="list-style-type: none"> • Example: Paterson, M. and Higgs, J. (2005) Using hermeneutics as a qualitative research approach in professional practice. <i>The Qualitative Report</i> 10(2): 339-357 |

Appendix 2. Example of a real-life project proposal

Commissioner: Food Council Metropolitan Region Amsterdam
Initiator and mission

Food Council MRA is the meeting point of citizens' initiatives in the food chain. **FC MRA wants to promote mutual contacts and exchanges between these initiatives.** In addition, **FC MRA wants to promote that the citizens' initiatives in politics are well-understood and that the bottom-up and top-down efforts will therefore reinforce each other.** In short, opportunities are used more quickly and, above all, more effectively. The Food Council organizes meetings where issues in the food chain are put on the agenda. This is done in collaboration with the food network of the MRA-in-the-making. The food network is a joint venture between governments, companies, research and educational institutions (triple helix) that have signed a regional food manifesto (will be provided). This manifesto has been prepared by the Food Council MRA. The Food Council functions as a do-platform and advice board for the food network MRA. **It bundles citizens' initiatives (quadruple helix) and bridges the world of governments, large companies and educational institutions.** The **FC MRA also promotes professionalisation of these citizens' initiatives**, for example, initiators are encouraged to substantiate their story with figures.

Project goal

With this project, **FC MRA aims to map out civil initiatives in the form of an online atlas.** It maps out citizens' initiatives committed to making the food chain more sustainable in the MRA. **This makes it easier for these parties to come into contact with each other**, so that the food initiatives can grow in size, quantity and quality. The atlas covers all sectors in the food chain, all themes of food preservation and all areas of MRA up to neighbourhood level. **FC MRA aims to forge regional and urban coalitions thus inciting reflexive learning and political action on provincial, metropolitan, municipal and**

neighbourhood level. Ultimately, students are challenged to conceive **recommendations for collaborative food governance on provincial, metropolitan and municipal policy levels.**

Method

For the construction of the atlas, the project "Veldtest Tafelatlas" of the central government programme *Duurzaam Door*, in which representative networks are referred to as tables, is connected. In the (still experimental) table atlas, each network has a list of members, a top list of the (food) issues that members want to put on the agenda, an up-to-date overview of their projects and ideas to tackle those issues and a set of indicators that they use to urgency or progress. The atlas also presents total overviews and statistics for each area. For the initial filling of the atlas, existing networks are invited for self-notification. In addition, inventory interviews are conducted with the use of students. In addition, the project group can also report on initiatives and networks editorially. The maintenance of the atlas is divided over existing and new networks in the food chain in the MRA, each of which can map their part of the chain. For this purpose, the networks, for example a knowledge network, an industry organization or a chain consultation, are given the management of their card or sub-card in the atlas.

Assignment

The FC MRA would like to know which civil initiatives aiming to change the current unsustainable food system into a more sustainable, healthy and transparent one can currently be identified in the MRA. The FC MRA also aims to acquire more insight into the most promising agents of change.

The FC MRA would like the students to investigate the following questions:

- Which civil initiatives committed to make the food chain more sustainable do exist in the MRA? Specify by geographical level of scale: regional, municipal, neighbourhood. Basic characteristics to be identified: website, mission statement, contact.
- Which coalitions (clusters) do exist? To what extent are the initiatives linked to each other (e.g. mutual exchange of information and experiences, collaborations, etc.)?
- What kind of role do these initiatives envisage for the FC MRA, regarding alignment and stimulation of mutual exchange between these initiatives?
- What is the perceived role of regional and/or municipal government in the emerging field of food policy?

Appendix 3. Giving feedback

Feedback can be given two ways: through **constructive feedback** or through **praise and criticism**. Don't fall into the trap of giving praise and criticism on team members' performance. Constructive feedback is information-specific, issue-focused, and based on observations. It comes in two varieties:

- Positive feedback is news or input to a team member about an effort well done.
- Negative feedback is news to a team member about an effort that needs improvement. Negative feedback doesn't mean a terrible performance, but rather a performance in which the outcomes delivered should be better. So negative is not a negative word in this case.

Praise and criticism are both personal judgments about a performance effort or outcome, with praise being a favourable judgment and criticism, an unfavourable judgment. Information given is general and vague, focused on the person, and based on opinions or feelings. The guidelines for giving constructive feedback fall into four categories: content, manner, timing, and frequency.

Content is what you say in the constructive feedback.

- In your first sentence, identify the topic or issue that the feedback will be about.
- Provide the specifics of what occurred. Avoid general comments and clarify pronouns such as “it,” “that,” etc. Be descriptive rather than evaluative. Focus feedback on observations, rather than inferences.
- Without the specifics, you only have praise or criticism. Start each key point with an “I” message, such as, “I have noticed,” “I have observed,” “I have seen,” or when the need exists to pass on feedback from others, “I have had reported to me.” “I” messages help you be issue-focused and get into the specifics. Notice “all,” “never,” “always,” etc., and ask to get more specificity. Often these words are arbitrary limits on behaviour.

Manner is how you say the constructive feedback. As you may know, how you say something often carries more weight than what you have to say — manner is an important element when giving feedback.

- Be direct when delivering your message and be clear about what you want to say. Get to the point and avoid beating around the bush. Both negative and positive feedback should be given in a straightforward manner.
- Emphasize the positive. This isn’t being collusive in the person’s dilemma.
- Refer to behaviour that can be changed.
- Avoid “need to” phrases, which send implied messages that something didn’t go well. For example, “Jane, you need to get your reports turned in on time, and you need to spell check them.” This message is not really performance feedback. It implies that Jane did not do something well with her reports, but it doesn’t report exactly what happened. Providing clarity on what occurred is the aim of feedback.
- Be sincere and avoid giving mixed messages. Sincerity says that you mean what you say with care and respect. Mixed messages are referred to as “yes, but” messages. For example, “John, you have worked hard on this project, but...” What follows is something the person is not doing well and is the real point of the message. The word “but,” along with its cousins “however” and “although,” when said in the middle of a thought, creates contradictions or mixed messages. In essence, putting “but” in the middle tells the other person, “Don’t believe a thing I said before.”
- In positive feedback situations, express appreciation. Appreciation alone is praise. Yet when you add it to the specifics of constructive feedback, your message carries an extra oomph of sincerity. For example: “Sue, your handling of all the processing work while John did the call-backs made for an efficient effort and showed good teamwork. Everything you did was accurate, as well. Thanks so much for helping out. Such initiative is a real value to the team.”

Appendix 4. Inspiring questions for transformative interviewing (Training 1)

1. Over the past days and weeks, what did you notice about your (emerging) self?
2. Who have been your “Guardian Angels” (helpers) in your life’s journey so far?
3. Crack: Where do you feel the future in your life and work right now?
4. Frustration: What about your current work and/or personal life frustrates you the most?
5. Happiness: What are your most important sources of energy and happiness in your life and work?
6. Helicopter: Watch yourself from above (as if in a helicopter). What are you doing? What are you trying to do in this stage of your professional and personal journey? Helicopter II: Watch your collective journey from above: what are you trying to do collectively in the present stage of your collective journey?
7. Listen to your young self: Look at your current situation from the viewpoint of you as a young person, at the beginning of your journey: What does that young person have to say to you?
8. Footprint: Imagine you could fast-forward to the very last moments of your life, when it is time for you to pass on. Now look back on your life’s journey as a whole. What would you want to see at that moment? What footprint do you want to leave behind on the planet?

9. From that future point of view: What advice have you given to your current self?
10. Now return again to the present and crystallize what it is that you want to create: your vision and intention for the next 3-5 years. What vision and intention do you have for yourself and your work? What are some essential core elements of the future that you want to create in your personal, professional, and social life? Describe or draw as concretely as possible the images and elements that occur to you.
11. Letting-go: What would you have to let go of in order to bring your vision into reality? What is the old stuff that must die? What is the old skin (behaviours, assumptions, etc.) that you need to shed?
12. People: Who can help you make your highest future possibilities a reality? Who might be your core helpers and partners?
13. Action: If you were to take on the project of bringing your intention into reality, what practical first steps would you take over the next 3 days?

Appendix 5. Learning Self Observation Template (Training 1)

SELF OBSERVATION SHEET

In your listening, how much (%) did you apply...

DOWNLOADING

LISTENING FROM YOUR OWN HABITS
TO (RE-)CONFIRM WHAT YOU ALREADY KNOW

FACTUAL LISTENING

NOTING NEW STUFF COMPARED TO WHAT
YOU KNEW/EXPECTED

EMPATHIZING

LISTENING FROM THE OTHER PERSON'S PERSPECTIVE
FEELING AN EMOTIONAL CONNECTION

GENERATIVE LISTENING

CONNECTING TO AN EMERGING FUTURE/
POSSIBILITIES THAT LINK TO WHO YOU REALLY ARE

[DERIVED FROM U-LAB, MIT]

Appendix 6. Assessment criteria

Policy advisory report

| Unsatisfactory (u) | Satisfactory (s) | Good (g) | Excellent (e) |
|--|---|---|---|
| Summary (approx. 2 pages) / abstract (200-300 words) | | | |
| Not fulfilling the criteria of 'Satisfactory' | <ul style="list-style-type: none"> - The choice for summary or abstract is appropriate to report/article size - The context, problem statement, research question, methodology used, results, conclusion and discussion are clearly summarized | As 'Satisfactory' and additionally: <ul style="list-style-type: none"> - To the point - Coherent and logically sound | As 'Good' and additionally: <ul style="list-style-type: none"> - Ready for scientific - publication - Can be read independently of source - Conveys the purpose of the research in relation to the field |
| Introduction: Dublin descriptors | | | |
| <i>Problem description, context analysis, scientific background</i> | | | |
| Not fulfilling the criteria of 'Satisfactory' | Is able to: <ul style="list-style-type: none"> - Select, order and summarize information; focus on essential elements; and recognize connections. - Demonstrate knowledge and understanding of the societal problem - Formulate a clear and relevant research question | As 'Satisfactory' and additionally: <ul style="list-style-type: none"> -The analysis of the problem is clear and relevant - Appropriate use of the relevant scientific literature - Describe the interdisciplinary context to support the relevance of the research problem- - Placement within field of research | As 'Good' and additionally: <ul style="list-style-type: none"> - Demonstrates a good insight and understanding of the societal problem. - Demonstrates mastery of the topic - Thorough analysis of the context and problem - Extensive use of the relevant scientific literature. - Contributes to field of research |
| Concepts and theory: Dublin descriptors and literature search | | | |
| <i>Relevant theoretical concepts and models, study questions</i> | | | |
| Not fulfilling the criteria of 'Satisfactory' | Is able to: <ul style="list-style-type: none"> - Select and explain relevant theoretical | As 'Satisfactory' and additionally: <ul style="list-style-type: none"> - Demonstrates understanding and | As 'Good' and additionally: <ul style="list-style-type: none"> - Can integrate, expand on, or modify and justify the |

| | | | |
|---|--|---|--|
| | <p>models and concepts in the field of specialization</p> <ul style="list-style-type: none"> - On the basis of relevant theoretical models and concepts formulate relevant study questions. - The study questions satisfactorily cover the main question | <p>explanation of the (theoretical) model/concept</p> <ul style="list-style-type: none"> - Justify the choice of and relate the theoretical models and concepts | <p>(theoretical) models and concepts</p> |
| Methods (2d) <i>Design, choice of variables, expressing and justifying methodology, description and justification of data processing</i> | | | |
| Not fulfilling the criteria of 'Satisfactory' | <p>Is able to:</p> <ul style="list-style-type: none"> - Justify the methodology of research - describe the effects of the chosen methods in the field of research - Understand the effect on the quality of data - Apply these understandings to his/her own project | <p>As 'Satisfactory' and additionally:</p> <ul style="list-style-type: none"> - Student is capable of a critical and thorough description and justification of the methods used including issues related to the ethical conduct of research - discusses the effects of different (chosen) methods | <p>As 'Good' and additionally:</p> <ul style="list-style-type: none"> - Student masters the link between the used methodology and data quality and acknowledges and remedies any limitations herein |
| Results and execution <i>Data processing (qualitative and quantitative), logical and complete presentation of data</i> | | | |
| Not fulfilling the criteria of 'Satisfactory' | <p>Is able to</p> <ul style="list-style-type: none"> - Present the results in a complete and adequate manner. - Select and order information, distinguish essentials from trivialities and recognize connections, while justifying your choices. | <p>As 'Satisfactory' and additionally:</p> <ul style="list-style-type: none"> - Resulting data are well presented and can be useful as a starting-point for publication, if additional data are collected - Data is validated | <p>As 'Good' and additionally:</p> <ul style="list-style-type: none"> - Student shows an independent, complete and thorough analysis of data, with an excellent presentation thereof |
| Discussion and conclusions and ability to critically evaluate <i>Structure of arguments, conclusions, link to research problem, comparison with other studies, strength and limitations of the study</i> | | | |

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| Not fulfilling the criteria of 'Satisfactory' | <p>Is able to:</p> <ul style="list-style-type: none"> - Answer your research question in a clear and univocal way. <p>Connect the findings to the theoretical background in order to answer the research question</p> <ul style="list-style-type: none"> - Show satisfactory knowledge of the field of research to discuss the results - Discuss the findings using additional relevant literature - Formulate strengths and limitations of the study - Formulate recommendations - Draw a sound conclusion | <p>As 'Satisfactory' and additionally:</p> <ul style="list-style-type: none"> - Deal with all the different aspects in a critical manner - Discuss the findings, taking into account the relevance of the research in science and society using a wide variety of scientific literature - Discuss limitations and their implications - Make recommendations and make these explicit for the target group(s) - Draw convincing conclusions | <p>As 'Good' and additionally:</p> <ul style="list-style-type: none"> - Present a concise (but complete) evaluation of the findings in the light of the theoretical background - Reflect critically on the effect of the limitations on the findings of the study |
| <p>Structure and organisation</p> <p><i>General structure, clarity of organization, coherence in line of thought</i></p> | | | |
| Not fulfilling the criteria of 'Satisfactory' | <p>Is able to:</p> <ul style="list-style-type: none"> - Show coherence in line of thought: the problem definition, the theoretical background, the methods, the analysis and the conclusion and discussion are logical connected (but may be superficial at some points) - Provide structure, division in chapters, headings and subheadings - Organize content clearly - Treat references correctly - Provide a clear layout | <p>As 'Satisfactory' and additionally:</p> <ul style="list-style-type: none"> - Show coherence in line of thought with scientific quality: the problem definition, the theoretical background, the methods, the analysis and the conclusion and discussion are logically connected. - Well-chosen references - Layout adds to understanding of the text | <p>As 'Good' and additionally:</p> <ul style="list-style-type: none"> - Show coherence in line of thought with in-depth scientific quality: the problem definition, the theoretical background, the methods, the analysis and the conclusion and discussion are logically connected |

| Scientific and English writing skills | | | |
|--|---|---|--|
| Not fulfilling the criteria for 'Satisfactory' | <p>Is able to:</p> <ul style="list-style-type: none"> - Produce a text that might contain some language errors and ambiguous sentences - Presents the figures, tables and references in a clear way - Write acceptable English - Write in a readable and understandable way | <p>As 'Satisfactory' and additionally:</p> <ul style="list-style-type: none"> - Demonstrate good use of language, including grammar and spelling | <p>As 'Good' and additionally:</p> <ul style="list-style-type: none"> - Demonstrate ability to write a text that is ready for publication |

Video-presentation

| Unsatisfactory (u) | Satisfactory (s) | Good (g) | Excellent (e) |
|--|---|---|--|
| Summary (approx. 2 pages) / abstract (200-300 words) | | | |
| Not fulfilling the criteria of 'Satisfactory' | <p>Is able to</p> <ul style="list-style-type: none"> - Make a video from which the viewer mostly understands the topic and might remember the video. Some introduced themes/topics may distract from message. - Use Images/ Graphics and information used within the video has little or no relevance to the points discussed and/ or the topic | <p>As 'Satisfactory' and additionally:</p> <ul style="list-style-type: none"> - Make a video from which the viewer is left with general understanding and will remember the video. - Show a fair amount of creativity displayed, but lacks "oomph!" - Images/ Graphics and information used within the video has moderate relevance to the points discussed and/ or the topic. | <p>As 'Good' and additionally:</p> <ul style="list-style-type: none"> - Make a video from which the viewer is left with a strong understanding of the topic, will remember the video, and feels like they want to learn more. - Shows excellent creativity, has appropriate levels of "oomph" within the video. - Images/ Graphics and information used within the video are highly relevant to the points discussed and/ or the topic. |
| Scientific content Structure and thread of arguments, clarity of conclusion | | | |

| | | | |
|---|--|--|---|
| Not fulfilling the criteria of 'Satisfactory' | <p>Is able to:</p> <ul style="list-style-type: none"> - Produce a video presentation with a clear structure with question, methods, results, conclusion and discussion nicely summarized and a logical thread of argument - Place the research in a broader scientific context | <p>As 'Satisfactory' and additionally:</p> <ul style="list-style-type: none"> - Content of presentation is well structured and content is well chosen; (suits the results of research and fits the audience) - Conclusions are clear and appropriate - Gives direction to future research | <p>As 'Good' and additionally:</p> <ul style="list-style-type: none"> - Demonstrate strong line of argumentation - Provide convincing conclusions which stimulate further debate |
| Ability to hold a discussion based on the presentation | | | |
| Not fulfilling the criteria of 'Satisfactory' | <p>Is able to</p> <ul style="list-style-type: none"> - Responds to questions - Provide answers based on the research conducted | <p>As 'Satisfactory' and additionally:</p> <ul style="list-style-type: none"> - Provide answers which are to the point and show a broad view of the subject - Reflect on own research - Demonstrate good interaction with the audience | <p>As 'Good' and additionally:</p> <ul style="list-style-type: none"> - Respond to questions in convincing way - Demonstrate and show a deep and thorough knowledge and insight of the research field - Demonstrate excellence in the discussion |

Personal performance

| Attitude | |
|--|---|
| Social skills and responsiveness to feedback | |
| Not fulfilling the criteria for 'pass' | <p>Is able to:</p> <ul style="list-style-type: none"> - Collaborate - Openly and respectfully communicate internally and externally - Ask for advice, and feedback, - Reflect on feedback - Incorporate feedback |

| Self-reflection | |
|--|---|
| Not fulfilling the criteria for 'pass' | <ul style="list-style-type: none"> - Formulates personal learning objectives (personal development plan) and assess own progress - Critically evaluates own performance, both introspectively and in discussion with others (during peer feedback round). - Shows ability to revise own judgments, views and behaviour |
| Motivation and scientific curiosity | |
| Not fulfilling the criteria for 'pass' | <ul style="list-style-type: none"> - Is clearly interested in scientific inter- and transdisciplinary research and sees this as an essential component of complex societal issues - Is committed to the subject - Works no less than 8 hrs. a day - Demonstrates enthusiasm and involvement in the research topic and area - Participates in formal/informal placement activities - Shows a desire to contribute to the field of research |
| Ownership of project during placement | |
| Not fulfilling the criteria for 'pass' | <ul style="list-style-type: none"> - Works independently, and reflects on his/her own activities, work processes and skills - Takes action and initiative to overcome problems and to achieve the best results |
| Initiative | |
| Not fulfilling the criteria for 'pass' | <ul style="list-style-type: none"> - Independently acquires and critically assesses information during the research - Takes action to perform the research and is able to change plans when necessary, in cooperation with the coach - Is looking for opportunities to learn and to develop |
| Code of conduct | |
| Not fulfilling the criteria for 'pass' | <ul style="list-style-type: none"> - No plagiarism - Unbiased use of and presentation of data - Critical |

| Execution | | | |
|--|---|---|---|
| Unsatisfactory (U) | Satisfactory (S) | Good (G) | Excellent (E) |
| Work pace and planning | | | |
| Not fulfilling the criteria for 'satisfactory' | <p>Is able to</p> <ul style="list-style-type: none"> - Keep up with the planning and is flexible enough to make new plans when necessary - Produce satisfactory products and quality in relation to time invested | <p>As 'Satisfactory' and additionally:</p> <ul style="list-style-type: none"> - Is a good planner and well able to combine and plan different tasks - Produce more than expected products in terms of quantity <i>or</i> quality in relation to time invested | <p>As 'Good' and additionally:</p> <ul style="list-style-type: none"> - Able to anticipate on unforeseen and longer-term tasks - Produce more than expected products in terms of quantity <i>and</i> quality in relation to time invested |
| Practical research skills and execution | | | |
| Not fulfilling the criteria for 'satisfactory' | <p>Is able to (with some guidance):</p> <ul style="list-style-type: none"> - Review scientific literature - Develop an adequate research plan (problem statement, objectives, research questions, research approach, research methods, and planning) - Collect the data using appropriate (transdisciplinary) methods adequately. - Analyse data (in collaboration with stakeholders via extended member check) and, if needed, employ appropriate computer software - Exhibit learning and reflection on the limitations of the study - Exhibit learning and reflection on the level of transdisciplinarity of the project and how the | <p>As 'Satisfactory' and additionally:</p> <ul style="list-style-type: none"> - Has the competence and initiative to conduct the methods and review more independently. - Exhibits in-depth learning and reflection - Good analytical skills | <p>As 'Good' and additionally:</p> <ul style="list-style-type: none"> - Employs thorough data analysis. - Able to iterate between the meta and in-depth level |

| | | | |
|--|--|---|--|
| | transdisciplinarity could be increased - Demonstrate accuracy in data collection, storage and processing | | |
| Communication and collaboration | | | |
| Not fulfilling the criteria for 'satisfactory' | Is able to (with guidance): - Communicate research conclusions, knowledge and rationales underpinning them, to specialist and non-specialist audiences, clearly and unambiguously - Collaborate with researchers from various scientific disciplines as well professionals and policy makers related to the food system, policymakers and the general public (if applicable) | A 'Satisfactory' but with minimal guidance | As 'Good' and additionally expand and/or develop a (new) network |
| Developing insights | | | |
| Not fulfilling the criteria for 'satisfactory' | Is able to (with guidance): - Apply scientific knowledge to formulate solutions/advice for a complex societal problem in the context of food systems | As satisfactory: - Can make essential contributions to scientific discussion about plans, results and consequences of research | As 'Good' but with minimal guidance |

CARQ assignment

| Content | | | |
|---|---|--|---|
| Student shows that he/she understands the matter discussed within the article I/S/G | Student answers all questions (CARQ) formulated in the assignment I/S/G | Student clearly builds on and links to module material I/S/G | Student clearly build on his/her experience in doing inter/transdisciplinary research I/S/G |

| Form | | |
|-----------------------------|---------|--------|
| Structure and argumentation | English | Length |
| I/S/G | I/S/G | I/S/G |

City Lab Athens – Eat It, Don't Skip It!



This module was created internally in Ellinogermaniki Agogi, host of the City Lab Athens, through internal meetings among teachers from the general curriculum who facilitate student projects, the Research and Development Department, Physical Education Department, and informed by meetings and interactions of students and their facilitators with external experts who acted as consultants during the student projects (e.g., Prolepsis Institute, Boroume, SEVT).



AT A GLANCE

| | |
|--|--|
| Thematic Area | food waste, food systems, student enterprise, social entrepreneurship, business plan, |
| Format | student interdisciplinary project |
| Duration | 25 sessions of 2h per week, and additional external meetings and interactions with stakeholders |
| Type of audience | high school students |
| Age group | 16-17 years |
| Number of participants | ~20 students |
| Prerequisites for participation | None |
| Number of facilitators | 2 min. |
| Overall difficulty | Intermediate Topic: food systems Preparation: brainstorming Facilitation: advising/guiding |

OVERVIEW

The project is an interdisciplinary student project combining elements from the food nutrition systems and setting up a (social) enterprise addressing grand societal challenges (food malnutrition, resource scarcity, etc.)

OVERALL AIM

The mission of the student virtual enterprise (after being defined during the brainstorming session among students) is to be set up in a responsible way; thus “Nothing to go wasted”
This has been addressed in multiple ways from the recycled paper of the food package to the contents.

SPECIFIC (LEARNING) OBJECTIVES

Learning outcomes as well as the final products/outcomes of the student enterprise are co-developed with the students with the support of external experts by setting meetings (face to face or online ones are taking place in different stages of the project in order to get feedback).

- Knowledge/concepts: FNS, food waste, recycling, obesity, healthy food choices, *Resource efficiency, sustainability, package materials*, advertising, apprentice, auction, auctioneer, be creative and innovative, business, business plan, civic responsibility, customer, entrepreneur, entrepreneur profile, fill a need, know your customer and product, market, marketing, profit, self-taught, social entrepreneur.
- Skills: active listening, analyzing information, brainstorming, creative thinking, critical thinking, decision-making, deductive reasoning, following directions, group work, interpreting information, oral and written communication, problem-solving, self-assessment, taking responsibility, digital skills, self-confidence, spot resources and opportunities.
- Attitudes: resilience and adaptability, participatory ability, self-regulation and other self-oriented competences

SUGGESTED SCENARIO FOR IMPLEMENTATION

Implementation can be quite flexible; a transdisciplinary project in a classroom context up to an activity club including classroom and out of classroom activities (e.g. interactions with experts, open presentations/participation in exhibitions/contests)

TOPICS & COMPETENCES COVERED BY THE ACTIVITY

| | |
|-------------------------|---|
| Thematic area(s) | food health, food waste, sustainability, recycling, social entrepreneurship |
|-------------------------|---|

FOOD2030 Research & Innovation priorities

| Priority | Indicate whether main or secondary | Addressed through |
|---|------------------------------------|--|
| Circularity & Resource Efficiency | Main | Goal of the enterprise/mission statement: "Nothing gets wasted" |
| Innovation & Empowerment of Communities | Secondary | <p>Innovative pedagogical approach, students working on grand societal challenges with an innovative approach.</p> <p>The empowerment and well-being of communities is considered since the final product offers a direct solution:</p> <ul style="list-style-type: none"> • To parents, that don't have the time to prepare a healthy snack for their children at school. • Adults that don't have the necessary time to prepare a healthy snack for getting at work. • People that are out of house many hours and need a healthy snack in a low price. • People who exercise in outdoor facilities and in between need a healthy snack. |
| Nutrition & Health | Main | Goal of the enterprise/ Mission statement; The final product is made |

| | | |
|--|------|---|
| | | taking under consideration these issues |
| Climate & Sustainability | Main | Goal of the enterprise/Mission statement: "Nothing gets wasted"/Food producing school |
| Responsible Research and Innovation (RRI) | | |
| Related concept | | Addressed through |
| The module adopts a deep learning approach addressing the 3 RRI principles: - Education for society (principle 1) - Education with society (principle 2) - Education to whole persons (principle 3) | | Project Interdisciplinarity |
| shared responsibility among diverse stakeholders and enterprise members | | Enterprise mission statement (addressing societal challenges and working following an RRI approach) |
| students empowered and responsible for outcomes that meet societal challenges (ethically acceptable, sustainable and socially desirable outcomes) | | The goal is that customers is that customers will be bigger institutions such as schools, companies and states that could cover the needs of vulnerable groups (such as under emergency or immigrants). |
| RRI competence framework <ul style="list-style-type: none"> • Anticipation • Reflexivity • Responsiveness • Inclusiveness | | Students are guided to work on the project following such an approach that addresses these competences. More specifically (the following cluster of competences are addressed): <ul style="list-style-type: none"> • Anticipation and future-oriented competency inherent in setting the enterprise vision/mission statement, revisiting it, and setting the business plan. • Communication: for the presentation of final outcomes and participation in European contests and exhibitions openness to dialogue as well as multi-perspective, inter-cultural communication is needed. • Collaboration: 'collaboration' and 'collaborative learning skills' needed among students as well as with the external 'multi-stakeholder engagement'. |
| Creativity | | Inherent to the inter-disciplinary project as students are asked to devise innovative ways of addressing grand societal challenges |
| Critical thinking | | Needed in order to implement the project |
| Empowerment for transformation and acting as change agents | | Students become empowered to act towards societal changes and challenges is also one of |

| | |
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| | the elements that can be elicited from the reports. |
| Transdisciplinarity (of the project itself) | Complex challenges; facilitating inputs from across scientific and non-scientific stakeholder communities and facilitating a systemic way of addressing the challenges |
| Reflexivity and awareness | Students are asked to work on societal challenges and to reflect on how they can support addressing them with their final outcomes |
| Responsibility | Sense of individual responsibility (enabled by self-regulation via self-control, self-efficacy, problem solving and adaptability) and shared responsibility among students/enterprise members towards making trade-offs to advance towards R&I that addresses grand challenges |

(Food) Systems thinking

System thinking is inherent in the project, since seen as a whole the project is about how to tackle a complex and ill-defined problem. The project is about working in a systemic way and addressing two fields: FNS and enterprise (both being systems). Activities such as recognising and understanding relationships; analysing complex systems, different domains; dealing with uncertainty and ambiguity are integrated in the project.

Other competences

| Competence | Addressed through |
|------------------------|---------------------------------------|
| Entrepreneurial skills | Inherent to the nature of the project |

TARGET AUDIENCE

| | |
|---|--|
| Audience category | Students of secondary & upper secondary school |
| Recommended number of participants | 10-15 |
| Recommended age | 14-17 |
| Prerequisites | e.g. student background (specific, general); attendance of previous activities; visit of exhibition; awareness of certain concepts etc. None; learning goals and competences can be achieved during the course of the project |

OPTIONS FOR MULTI-STAKEHOLDER ENGAGEMENT

| Stakeholder | Role envisaged in the activity |
|--|--------------------------------|
| <p>There is room for all types of stakeholders to be included for the successful implementation of the project. Actually, one of the steps of the project is to record all possible contacts with different roles that could support the formation and running of the student enterprise (e.g. Steps:</p> <ul style="list-style-type: none"> Record the contacts and make a diagram as the below. Write your name in the center. Write down the names of your contacts as well as their field in the external circle. Compare the graphs Formulate teams and select the ones to collaborate with (that could support you) | |

SETTING UP THE MODULE

FACILITATION/DELIVERY

- Teachers/facilitators aware of how to facilitate interdisciplinary projects
- Teachers/facilitators aware of the basics of FNS & forming a student enterprise

RESOURCES

Physical materials

| Resource name | Picture | Number |
|--|---------|--------|
| Sticky notes in 3 different colours for the brainstorming sessions | | 30 |
| Laptops | | |
| Students need to find the necessary resources e.g. via sponsorships (part of the learning process) in order to get hold of the items needed in order to run their enterprise | | |

Useful links, videos, articles

- Saving Food resources e.g. https://boroume.savingfood.eu/intro_new/gr/default.asp
- FoodBank, Redirect Project
- FNS resources
- Prolepsis Institute resources
- Federation of Hellenic Food Industries

PREPARING THE SETTING

- Flexible arrangements that allow collaboration among students & facilitators

- Use of laptops

DETAILED DESCRIPTION OF THE MODULE SCRIPT

Step

Feel

Students are presented initial resources (as a trigger for further discussion) regarding raising international societal concerns such as sustainable healthy eating, food waste and resource efficiency.

Then they are asked to investigate further and find their own references in order to get familiarised with these challenges.

Imagine

Provided the raising international concerns regarding sustainable healthy eating, food waste and resource efficiency students are advised to contribute to these challenges and find solutions via the operation of a virtual enterprise, e.g. students might follow the approach where schools are transformed in food producing ones. Opening up schools and with use of innovative approaches can help communities and municipalities in finding solutions to these problems.

Students are encouraged to think about the societal challenges (e.g. scarcity of resources, obesity and malnutrition, the factors that might lead to these and to think about possible solutions. At first students get familiarised with nutrition and diet, healthy and unhealthy food, different nutrients, nutritional value and they discuss their personal views and everyday dietary habits, resource efficiency and circularity. Then they need to think about entrepreneurial opportunities and challenges in order to address the above challenges.

Create

1. Familiarisation of students with societal challenges (e.g. healthy nutrition and diet)

The teacher uses a variety of educational resources (online, videos, newspaper articles etc.) in order to provoke a discussion about nutrition and modern nutrition habits. Issues such as healthy and unhealthy food, different nutrients and nutritional value are tackled. Students share their personal views and everyday dietary and lifestyle habits.

2. Visit of experts to our school and organizing meetings out of school (e.g. Dietitian-Nutritionist and stakeholders from industry/business)

3. Setting the enterprise vision/mission statement (initial idea and market research)

- Brainstorming sessions, where members of the enterprise participate
- Question to be answered: what's the vision?
- Member need to define the products, services, markets competition, target audience/customers etc. as well as define the enterprise strategy
- Mission needs to be revisited in order to confirm it's short, concise and clear

In the specific case the entrepreneurial idea is the creation of a cost-effective package, a snack box, that contains healthy food products produced in the school. The food products selected fulfill

the following criteria: seasonality, low percentages of sodium and sugar, whole meal flour, Greek originality and local production.

The package will be available in 3 different versions that will fulfill the needs of people who follow a healthy diet, vegan diet and for children (junior version). on the package via a QR code the consumer will be directed to an online platform where he could find useful information for the caloric uptake and nutritional value of food, as well as suggested ways for a healthy way of living and physical activity.

4. Roles and tasks

The key to success in setting up an enterprise is the collaboration among people with different skills. All members of the student enterprise have at least 3 roles:

- Shareholder,
- Clerk,
- Member of the Board of Directors.

Students need to allocate roles and tasks and ensure smooth collaboration among them.

5. Setting up a business plan

6. Innovation

- The production can be done in schools themselves aspiring to become an active community component
- Schools producing products, packages and looking for collaborations and sponsorships prevents waste in all levels by sending leftovers in initiatives such as social cooking promoting recycling
- The package is designed so as to facilitate transfer (small recyclable materials)
- Low cost.

Share

- Participate in exhibitions and Competitions in order to present the outcomes and final products
- Present the results and outcomes of the project to our parents and the school community in an event specifically organised for this purpose at the end of the school year.

ANNEXES

The milestones of the Virtual Enterprise (school year: 2018-2019)

| | |
|---|------------------|
| Kick-off | October 2018 |
| Naming the virtual Enterprise & application of product approval- Application for participating in the Athens Exhibition | Mid-January 2019 |
| Student Virtual Enterprise Exhibitions (Trade Fair 2018) in Athens | March 2019 |

| | |
|--|--------------------|
| Greek contest «Best Virtual Enterprise 2019» | May 2019 |
| European Contest «Best Company of the Year 2019» | July 2019 (France) |

City Lab Athens: Food Waste

Food Waste

This module was created internally in Ellinogermaniki Agogi, host of the City Lab Athens, through internal meetings among teachers from the general curriculum who facilitate student projects, the Research and Development Department, Physical Education Department, and was informed by meetings with external experts active in the field (e.g., Boroume, Attica FoodBank, Redirect).



AT A GLANCE

| | |
|--|--|
| Thematic Area | food waste, food systems |
| Format | Classroom lecture |
| Duration | 1 class period |
| Type of audience | Secondary school students |
| Age group | 12-15-year olds |
| Number of participants | 25-30; suitable for the whole class |
| Prerequisites for participation | None |
| Number of facilitators | 1 minimum |
| Overall difficulty | <p>Beginner</p> <p>Topic: an introduction to food waste</p> <p>Preparation: video watching by students</p> <p>Facilitation: consists of advising or guiding</p> |

OVERVIEW

The module has the goal to raise awareness about the issue of food waste. Introduction materials acting as trigger for discussion and presentation of cases (local/European ones) in order to collect students' feedback.

OVERALL AIM

The module has the goal to raise awareness (content knowledge) about the issue of food waste and to develop students' critical thinking. The module could be further enhanced to a deep-learning module with students taking actions and actually implementing/piloting their solutions for reduction of food waste.

SUGGESTED SCENARIO FOR IMPLEMENTATION

The module could be implemented:

- in class (face to face) with printed cards and a projector presenting the resources and/or
- purely online as a module in the Open Schools for Open Societies (OSOS) repository (<https://portal.opendiscovery.space.eu/>)

TARGET AUDIENCE

| | |
|---|---------------------------|
| Audience category | Secondary school students |
| Recommended number of participants | 25-30 |
| Recommended age | 12-15-year-old students |
| Prerequisites | None |

DETAILED DESCRIPTION OF THE MODULE SCRIPT

Step

Feel

Teacher/Facilitator introduces:

- Presents pictures of selected FNS challenges to the students' which step by step introduce /problematize students around the issue of food waste,
- Pictures of positive local trends are also presented and discussed
- With guiding questions teacher problematizes students
- FNS concept is introduced and in discussion the systemic nature of FNS is highlighted. Systemic reflection was introduced by guiding the discussion on the fact that food waste can take place in all of the processes/steps of the food system

Resources:

- (FNS, Chapter 1) <https://foodsource.org.uk/chapter/1-overview-food-system-challenges>

Teacher:

- presents showcases around food waste (national and local ones if applicable) to students.

Resources (videos):

Local cases

- Boroume/SavingFood, https://www.youtube.com/watch?time_continue=6&v=VErZcyxzHGE&feature=emb_logo
- Redirect, <https://www.youtube.com/watch?v=KtowT0qpeFA>

Guiding questions:

- What caught your eye in the video we just watched?
- What is this initiative about? How does the specific initiative handle the issue of food waste?
- What is the difference in the approach between the cases in the way that they handle food waste?

Guiding the discussion for students to realise:

- the extent of environmental resources (e.g. water) that go wasted as well /need to be consumed for the production of e.g. 1 loaf of bread
- that implications can be apart from financial (obvious), societal/ethical and environmental
- on the levels of food wasted at various points from farm to fork to gut and back.
- The terms of carbon food footprint and food insecurity are introduced (students are not aware of these terms)

International cases (suggested)

- Feeding the 5000 (FIT4FOOD2030 Showcase)
- FareShare
- GrowUpUrban Farms (FIT4FOOD2030 Showcase)
- Winnow (FIT4FOOD2030 Showcase)
- KromKommer (FIT4FOOD2030 Showcase)
- FoodWINproject

Imagine

Students in small groups plan their own solution /project/action plan/breakthrough in order to address food waste;

- Potential field of application: their home, their school canteen, the school garden; the students were able to take different roles, e.g. restaurant owner

Possible extension/alternatively (to make it a deep learning module; min 1 teaching period and out of class activities)

Students

- make a survey (with a paper-based questionnaire or the myBigO app) to record their peers' daily practices at their homes, school canteens policy, local restaurants or other institutions' policies (e.g., hospitals)

have meetings with external stakeholders in order to get mentoring/feedback for devising their solution in order to address food waste.

Create (from this phase and on expansion to a deep learning module)

Students develop and pilot/implement their own solutions/projects/action plans for food waste prevention;

Potential field of application: their school canteen, their home

Students:

- make a survey to record their peers' daily practices (at their homes, or the school canteen policy),
- have meetings with externals in order to get mentoring for implementing a solution in order to address food waste.

Students are guided/suggested to collaborate in this effort, with CSOs, NGOs, e.g. in Greece: <https://boroume.savingfood.eu/en-us/Donor-Registration> or the local municipality (social store) e.g. in Greece: <http://www.pallini.gr/pages/koinoniko-pantopoleio>.

If more than one teaching periods are available, the Teacher could:

- Ask students to make their own research (e.g. literature review, via web or contacting experts) in order to spot other interesting showcases (focusing on local ones)
- Make reference also to the 17 UN Sustainable goals; focusing particularly on Goal 12: Responsible consumption and productions and Goal 2: Zero Hunger
- Present the concept of Responsible Research and Innovation
- Present more showcases around food waste (international, national and local ones if applicable) to students.
- Ask students to pick up one of the showcases to discuss in groups of 3-4 students then critically assess them and write down possible enablers and barriers for their wide implementation
- Provide some examples of criteria (e.g. how successful, adaptable, applicable the showcases could be in other contexts, effective) and invites students in groups to think about the criteria that matter to them and rank them. Then, the discussion is done in the plenary; each team delegate presenting and finally reaching to a consensus.
- Ask students to write down mottos for preventing food waste and finally students vote for the most successful ones.

Share

Students:

- write an article to the blog of their school, in the school newspaper
- organise a thematic evening in the end of the school year where they present the outcomes of their project to their families and local stakeholders, as well as recommendations for citizen conscience (mottos)
- publish their projects to the Open School Journal for Open Society (describing the systemic approach they followed)

ANNEXES

Powerpoint presentation, available separately

City Lab Barcelona/FIT4FOOD2030 Catalonia: Fostering change I (Validating a system map and identifying areas where changes are needed)

Fostering change in your system for the promotion of healthy and sustainable diets

Part 1: Validating a system map and identifying areas where changes are needed

This module and the system map that it uses were developed by the Living Lab for Health at IrsiCaixa (Rosina Malagrida, Marina Pino) based on the results obtained within the FIT4FOOD2030 Catalonia's network during two series of workshops that took place in Barcelona during September 2018 and March 2019 with the involvement of more than 55 actors from the region of Catalonia. This activity is based on the previous work developed in this region with a high investment in human resources. Our hypothesis is that it could be used in other regions in order to make it more cost-effective. However, we have not tested if the map can be useful for other regions. With this activity we invite you to test its effectiveness in other contexts.

**Living Lab
for Health**

IrsiCaixa
Institut de Recerca de la Sida

AT A GLANCE

| | |
|-------------------------|--|
| Thematic Area | Food systems, healthy and sustainable food, health promotion, Responsible Research and Innovation (RRI), system approach |
| Format | Workshop with a problem-based learning approach. It is also recommended to conduct previous interviews with local key stakeholders identified among the target audience to validate the map and the format of the workshop |
| Duration | 4-5h (plus extra time for coffee breaks) |
| Type of audience | <p>Stakeholders representing different sectors and disciplines related to food systems: research and innovation communities, industry representatives, policy makers, civil society organisations and the education community.</p> <p>Some examples are: policy makers in charge of food innovation, public health experts, health care providers, patients' associations, consumers' organisations, food and agriculture producers and industry, researchers working in a wide variety of disciplines, innovators, research and innovation funding organisations,</p> |

| | |
|--|--|
| | <p>educators, communicators and journalists and environmental organisations.</p> <p>However, it can also be adapted to other audiences such as students in Higher Education (as the activity covers a wide range of disciplines, it can be appropriate for different degrees and subjects)</p> |
| Age group | 18-99 |
| Number of participants | Recommended maximum 20-30 people divided in groups depending on the number of facilitators |
| Prerequisites for participation | <p>None</p> <p>However, the level of knowledge needed will differ depending on the expected results.</p> |
| Number of facilitators | 1 facilitator per group (we recommend groups no larger than 8 to 10 participants) |
| Overall difficulty | <p>Topic: Intermediate. The participants work on the complexity of the food system and the need to move towards collective action and collective research & innovation using a system and transdisciplinarity approach and following the process requirements described within the Responsible Research and Innovation (RRI) framework.</p> <p>Preparation: Intermediate</p> <p>Facilitation: Expert. Need to have some knowledge on food systems, systems approach, RRI and transdisciplinarity.</p> |

OVERVIEW

This activity aims to:

- 1) Facilitate reflection and learning around the system of promotion of healthy and sustainable diets by building consensus on a shared vision and adapting a pre-designed system map to a local context
- 2) Identify areas of the system where changes are needed

OVERALL AIM

This activity is focused on the challenge of promotion of healthy and sustainable diets. It facilitates the necessary learning to open meaningful conversations around the present complexity of the system and the needs to change.

The participants are invited to exchange their perspectives and experiences around the challenge and to check if its main problems and behaviours are represented in a system map facilitated by the organisers. They adapt it with their inputs to their local context and then they identify areas where change is needed. They gain a sense of urgency to think and work in a more systemic and transdisciplinary manner to change the system starting during a follow up activity (part 2).

Through this activity, each participant becomes a “systemic change agent” and gains knowledge and competencies to reflect and better understand its local system, exploring the interconnections happening between different subsystems and variables.

SPECIFIC (LEARNING) OBJECTIVES

A list of the learning objectives that students must reach by working through this module is detailed below. The aims are normally broken down into three categories (conceptual, procedural and behavioural).

Conceptual objectives

- Understand the complexity of the system and the need to address its problems taking into account different variables identified within academic disciplines or by stakeholders’ perspectives.
- Examine the dynamics among food, health, society and the environment and how they relate to each other.
- Contribute to build knowledge about the key variables that play a key role in the current dynamics in the food system in regard to the system of promotion of healthy and sustainable diets.
- Describe and speculate about system changes and areas where each participant would like to see change.

Procedural objectives

- Participate in debates on the system of promotion of healthy and sustainable diets and its related variables.
- Facilitate mutual learning among different stakeholders and academic disciplines
- Take decisions taking into account the complexity with the different perspectives and disciplines.
- Apply system approach methodologies.
- Reflect on the importance of system approach as a problem-solving method.

Behavioural objectives

- Align participants with a shared purpose or vision for the system.
- Gain awareness of the importance to promote individual, organizational and systemic changes towards a more healthy and sustainable food system.
- Self-reflection on individual’s, organizational’s and systemic roles in the system and its potential to contribute towards change.

- Form an opinion and be able to participate in an informed debate around the promotion of healthy and sustainable diets with a systemic vision.

SUGGESTED SCENARIO FOR IMPLEMENTATION

This activity has been specifically designed to be implemented in a non-formal education context with professionals that aim to work collectively on a strategy for changing the system of promotion of healthy and sustainable diets in their local context. However, we believe it can be adapted to different circumstances or scenarios. For example, it could take place:

- Within projects aiming to transform the local system of promotion of healthy and sustainable diets
- Within a classroom aiming to build knowledge around the promotion of healthy and sustainable diets
- During a congress for participants to build knowledge around the promotion of healthy and sustainable diets and for organisers to adapt and improve the map with new perspectives

TOPICS & COMPETENCES COVERED BY THE ACTIVITY

| | |
|-------------------------|---|
| Thematic area(s) | Food systems integrating a wide diversity of disciplines (see “type of audience” above), healthy and sustainable food, Responsible Research and Innovation (RRI), system approach |
|-------------------------|---|

FOOD2030 Research & Innovation priorities

| <i>Priority</i> | <i>Indicate whether main or secondary</i> | <i>Addressed through</i> |
|---|---|--|
| Circularity & Resource Efficiency | Secondary (for environmental resources) | Not covered |
| | Main (resource efficiency for human and economic resources) | The activity aims to build a collective strategy with the aim to improve resource efficiency in the system. |
| Innovation & Empowerment of Communities | Main | Through a system approach, participants are encouraged to understand differently the food system, seeing not just parts but the whole system itself. This process helps to change current innovation processes by avoiding linear thinking, and promoting solutions developed, prototyped and tested using |

| | | |
|--|-----------|---|
| | | multistakeholder and iterative experiments to gain feedback and make sure that the solutions are more adapted to the different stakeholders' needs. The final aim is to develop solutions that have a higher impact. |
| Nutrition & Health | Main | The overall aim of activity, which is to promote food and nutrition security within the participants' local context, among other objectives. |
| Climate & Sustainability | Secondary | The inclusion of one variable in the map (e.g. sustainability), although this aspect is not covered in depth as it was not a priority of this activity. |
| Responsible Research and Innovation (RRI) | | |
| <i>Related concept</i> | | <i>Addressed through</i> |
| "Responsible research and innovation is an approach that anticipates and assesses potential implications ... | | Collective deliberations among different stakeholders that analyse and carry out future oriented reflection on the potential implications of the current dynamics and on how to change them. |
| ...and societal expectations with regard to research and innovation, ... | | The process involved a wide variety of perspectives to make sure that their needs and expectations are taken into account. |
| ...with the aim to foster the design of inclusive and sustainable research and innovation." | | The stakeholders identify areas where change is needed, which in the follow up activity (part 2) will be translated into a plan with research and innovation lines and actions. Therefore, the plan will be defined with the inclusion of stakeholders who will collectively prioritize them taking into account sustainability criteria. |
| Research & Innovation (R&I) | | |
| <i>Related concept</i> | | <i>Addressed through</i> |
| Research and Innovation lines | | Validation and adaptation of the system map: the map serves as a tool to identify relevant areas of the food system where either actions |

| | |
|--|---|
| | or research and innovation lines can lead to desired changes. |
| (Food) Systems thinking | |
| Through the systemic map, participants better understand the complexity of the system with its interconnections between variables and stakeholders involved in the promotion of a healthy and sustainable food system. It leads participants to develop critical thinking skills and to become aware of how changes in one part of the system affect other parts. It also fosters participants to build self-awareness and self-agency to understand and address the complex problems in their local context with an RRI and systems approach. | |
| Potential of bringing the arts, socio-economic science and humanities creatively or trans-disciplinarily with the module? | |
| This module includes socio-economic and humanities expertise, as the map was developed taking into account some experts in these fields. The participants to be invited (see “type of audience”) also include these disciplines. | |

| | |
|---|--|
| TARGET AUDIENCE | |
| Audience category | Professionals representing different stakeholders and academic disciplines, but it can be also adapted to general public or other audiences such as students in Higher Education |
| Recommended number of participants | Between 20- 30 participants. If the workshop happens to have low profile attendees, we recommend to organise further workshops to assure diversity of expertise until data saturation. |
| Recommended age | From 18 |
| Prerequisites | Advanced knowledge is not needed but if the aim is to build a robust system map, the more knowledge participants have, the richer the result will be. |

| | |
|---|---------------------------------------|
| OPTIONS FOR MULTI-STAKEHOLDER ENGAGEMENT | |
| <i>Stakeholder</i> | <i>Role envisaged in the activity</i> |
| Other stakeholder such as students, families, local businesses or citizens can be involved in the educational module. | Participants |

SETTING UP THE MODULE


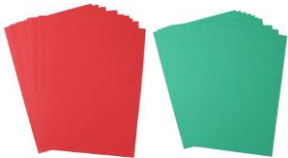


FACILITATION/DELIVERY

The facilitator should:

- Create a comfortable environment
- Develop a structure that allows participation from all the members that makes their ideas heard
- Support all the ideas that have been said
- Make a good management of the time spent
- Send a summary of the results to all participants after the workshop and invite them to validate the resulting map online. If more workshops are organised, the results of all of them can be shared and all participants can give feedback until online consensus is reached.

RESOURCES

Physical materials

| <i>Resource name</i> | <i>Picture</i> | <i>Number</i> |
|-------------------------------------|---|--|
| Sticky notes in 2 different colours |  | 50 |
| Green and red cards |  | 50 of each colour |
| System map and evaluation form |  | 1 system map for each workgroup, one to be displayed on the wall (bigger copy) and one evaluation form per participant |
| Flipchart or blackboard |  | One to display the map where different areas will be highlighted. |

| | | |
|---|---|-------------------------------|
| Office supplies (pencils, pens, marker pens, blank sheets, etc.). |  | Minimum 1 set per participant |
|---|---|-------------------------------|

Useful links, videos, articles

- Food2030 [strategy](#)
- [Play decide](#) around food systems
- Methodologies for visioning Food Systems from [Deliverable 1.1](#) of FIT4FOOD2030
- [Video on food system](#)'s complexity developed by The Lancet

PREPARING THE SETTING

- Room with several tables and chairs for working in groups of 5-7 people
- Flipchart to display the system map
- Tables for keeping the materials
- Tables for the facilitators
- Computer

DETAILED DESCRIPTION OF THE MODULE SCRIPT

Steps

1. Welcome and presentation of the objectives and the program. Presentation of the attendees. Signature of an informed consent (previously approved by an Ethical Committee).

Recommended duration: 30 min

2. Exploration and analysis of the current food system. Recommended duration: 1h and 15 min

Ask participants to reflect about the problems and opportunities of the current food system. Distribute marker pens, green and red cards among the tables (6-10 of each). Explain that they will need to write down the opportunities in green cards, whereas the obstacles will be written down in the red cards (maximum of 8-10 words per card). Participants are invited to reflect individually, and then to share their perspectives with the rest of the group and agree on cards to present.

After that, the results of each group are presented and the facilitator clusters them. After each participant presents one card, the other groups also add cards in case they belong to the same cluster. Once all the information is clustered, she reflects on the results and explains participants that in the following session on visioning, the exploration of the current food system is important when defining an achievable vision.

3. Development of a shared vision Recommended duration: 60 min.

Visioning is a methodology used to create a shared strategy that aims to achieve a desired future. Stakeholders reflect on what they would like to see or happen in the Food System and its interconnected subsystems.

Within the FIT4FOOD2030 Project several methodologies for vision development have been described. Find below a possible methodology adapted from the project:

- Divided in several groups, ask participants to think about an upcoming year (e.g. 2030) and envisage what changes have happened within the Food System that have allowed to promote healthy and sustainable food.
- Ask them to write down their thoughts on at least 2 post-it or A5 papers (only one idea per post-it or paper) and then to share with the work group.
- Once there is consensus within the work group, ask participants to share their vision with the rest of the groups. Each group shares its post-it's while they present them to the rest of participants.
- The facilitator, clusters them and, once all the information is clustered, she reflects on the results and possible different perspectives among actors.

Ask participants for a final consensus of the **vision**: ask them to reflect if anything is missing and if they agree on it.

Note: if the organisers have previously organised workshops with the participants where they already defined a vision, they can alternatively ask participants to validate the existing vision.

Optional supporting materials can be found in the Food2030 [strategy](#) of the EC: the FOOD2030 cyclic figure, FOOD2030 definition of a future-proof food system and FOOD2030 four priority areas, and the video presenting the strategy.

Before starting with the visioning exercise, if the participants are not experts in the field, other optional activities can be offered such as: the card game around food issues called [play decide](#), one methodology that uses photos as a starting point for analysing the food system, its opportunities and obstacles and the transformation needed that can be founded in [Deliverable 1.1](#), or display a [video on food system](#)'s complexity developed by The Lancet.

3. Reflection around the areas of the system where participants would like to see changes

3.1 Reflection around the current food system and adaptation and validation of the map to participants' local context *Recommended duration: 1h and 30min*

On the basis of the system map facilitated by The Living Lab for Health at IrsiCaixa, participants split up in different groups. If they are experts, they will split among common interests, such as: social, economic, education, communication...

They are handed out a paper copy of the system map. They start to observe its different variables and their interconnections by starting to focus on one particular group of interconnected variables. They are asked to analyse the dynamics and reflect on the following questions:

- *Is the map useful for understanding the current dynamics and their causes and consequences?*
- *Do you agree with the dynamics described?*
- *Would you recommend improvements?*

- *Are variables and/or, interconnections missing?*

Participants edit the map by adding comments, variables, and new connections drawing on the map with pens.

3.2 Identification of areas where changes should happen *Recommended duration: 20min*

In groups, participants reflect on the edited system map:

Where would you like to see changes?

Indicate with a marker pen areas including some variables which they think are the most interesting to provoke change, i.e. which are the leverage areas, taking into account aspects such as urgency and feasibility.

Presentation of the results to the other work groups. As the participants present, all the areas are marked on one single map which is displayed on the wall.

4. Wrap up and evaluation. *Recommended duration: 15 min*

The facilitator leads a reflection on the different areas where participants think there should be change. She invites them to come to the follow up activity (part 2) to design a strategy to implement changes in these areas.

She thanks all the participants for their contribution. Finally, she asks participants to fill in the evaluation form.

Before leaving the room, the facilitator takes notes of the vision obtained and also pictures of the post its and the map with the areas where change is needed marked with a pen, to make sure they will be available during the follow up activity (part 2).

DEVELOPERS

This module was developed by The Living Lab for Health at IrsiCaixa (Rosina Malagrida, Marina Pino) based on the results obtained within the FIT4FOOD2030 Catalonia's network during two series of workshops that took place in Barcelona during September 2018 and March 2019.

A check for scientific accuracy was done in a previous version of the map, which was later simplified into a new version with a smaller number of variables. This new version will be checked in future workshops. The English language translation will be checked at the end of this process.

REFERENCES

http://educators.brainpop.com/wp-content/uploads/2014/07/IOP_QDesignPack_SystemsThinking_1.0.pdf

ANNEXES

"FIT4FOOD2030_Catalonia_evaluation_forms"

"FIT4FOOD2030_Catalonia_system_map"

Fostering change in your healthy and sustainable food system with a system approach and strategic conversations

Part 2: Building visions for concrete areas of the system and action plans for change

This module and the system map that it uses were developed by the Living Lab for Health at IrsiCaixa (Rosina Malagrida, Marina Pino) based on the results obtained within the FIT4FOOD2030 Catalonia's network during two series of workshops that took place in Barcelona during September 2018 and March 2019 with the involvement of more than 55 actors from the region of Catalonia. This activity is based on the previous work developed in this region with a high investment in human resources. Our hypothesis is that it could be used in other regions in order to make it more cost-effective. However, we have not tested if the map can be useful for other regions. With this activity we invite you to test its effectiveness in other contexts.

**Living Lab
for Health**

IrsiCaixa
Institut de Recerca de la Sida

AT A GLANCE

| | |
|-------------------------|--|
| Thematic Area | Food systems, healthy and sustainable food, health promotion, Responsible Research and Innovation (RRI) |
| Format | Workshop with a problem based learning approach + previous interviews with local key stakeholders identified among the target audience to validate the format of the workshop |
| Duration | 2h 30min (add extra time for coffee breaks) |
| Type of audience | <p>Stakeholders representing different sectors and disciplines related to food systems: research and innovation communities, industry, policy makers, civil society organisations and the education community.</p> <p>Some examples are: policy makers in charge of food innovation, public health experts, health care providers, patients' associations, consumers' organisations, food and agriculture producers and industry, researchers working in a wide variety of disciplines, innovators, research and innovation funding organisations,</p> |

| | |
|--|--|
| | <p>educators, communicators and journalists and environmental organisations.</p> <p>However, it can also be adapted to general public or other audiences such as students in Higher Education (as the activity covers a wide range of disciplines, it can be appropriate for different degrees and subjects)</p> |
| Age group | 18-99 |
| Number of participants | Recommended 20-30 people divided in groups depending on the number of facilitators (|
| Prerequisites for participation | <p>None</p> <p>However, the level of knowledge needed will differ depending on the expected results</p> |
| Number of facilitators | 1 facilitator per group (we recommend groups no larger than 8 to 10 participants) |
| Overall difficulty | <p>Topic: Intermediate. The participants work on the complexity of the food system and the need to move towards collective action and collective research & innovation using a system and transdisciplinarity approach and Responsible Research and Innovation (RRI).</p> <p>Preparation: Intermediate</p> <p>Facilitation: Expert. Need to have some knowledge on food systems, systems thinking, RRI and transdisciplinarity.</p> |

OVERVIEW

This activity aims to:

- 1) Identify leverage points (i.e. the areas to intervene more effectively in the food system) where participants want to see change and an intervention is needed.
- 2) Co-define a vision for the specific area of the system map
- 3) Define an action plan with R&I lines and actions

OVERALL AIM

This activity facilitates the development of action plans to move towards the desired system of promotion of healthy and sustainable diets envisaged during the first workshop by working in different challenges and identifying leverage points.

The learning is facilitated by the identification of key variables that could help to move the system towards change.

SPECIFIC (LEARNING) OBJECTIVES

A list of the learning objectives that students must reach by working through this module is detailed below. The aims are normally broken down into three categories (conceptual, procedural and behavioural).

Conceptual objectives:

- Understand the complexity of the system and the need to address its problems taking into account different factors, academic disciplines and actors
- Understand the need to work in a transdisciplinary manner when defining possible solutions

Procedural objectives

- Apply system approach methodologies
- Apply visioning methodologies
- Facilitate mutual learning among different stakeholders and academic disciplines
- Participate in debates on the system of promotion of healthy and sustainable diets and its related variables
- Take decisions taking into account the complexity with the different perspectives and disciplines
- Design roadmaps for change through the development of action plans
- Reflect if better solutions are achieved through collective actions

Behavioural objectives

- Align participants with a shared purpose or vision for concrete areas of the system
- Gain awareness of the importance to promote changes towards a more healthy and sustainable food system
- Self-reflection on individual's roles in the system and its potential to contribute towards change
- Form an opinion and be able to debate different aspects regarding the promotion of healthy and sustainable diets

This activity has been specifically designed to be implemented in a non-formal education context with professionals that aim to work collectively on a strategy for change in their local context. However, we believe it can be adapted to different circumstances or scenarios. For example, it could take place:

- Within projects aiming to transform the local food system
- Within a classroom aiming to build knowledge around the food system
- During a science festival to build knowledge around the food system





| TOPICS & COMPETENCES COVERED BY THE ACTIVITY | | |
|--|---|---|
| Thematic area(s) | | Food systems, healthy and sustainable food, health promotion, RRI, system approach |
| FOOD2030 Research & Innovation priorities | | |
| <i>Priority</i> | <i>Indicate whether main or secondary</i> | <i>Addressed through</i> |
| Circularity & Resource Efficiency | Secondary (for environmental resources) | Not covered |
| | Main (resource efficiency for human and economic resources) | The activity aims to build a collective strategy with the aim to improve resource efficiency in the system. |
| Innovation & Empowerment of Communities | Main | Through a system approach, participants are encouraged to understand differently the food system, seeing not just parts but the whole system itself. This process helps to change current innovation processes by avoiding linear thinking, and promoting solutions developed, prototyped and tested using multistakeholder and iterative experiments to gain feedback and make sure that the solutions are more adapted to the different stakeholders' needs. The final aim is to develop solutions that have a higher impact. |
| Nutrition & Health | Main | The overall aim of activity, which is to promote food and nutrition security within the participants' local context, among other objectives. |
| Climate & Sustainability | Secondary | The inclusion of one variable in the map (e.g. sustainability), although this aspect is not covered in depth as it was not a priority of this activity. |

| Responsible Research and Innovation (RRI) | |
|---|---|
| <i>Related concept</i> | <i>Addressed through</i> |
| “Responsible research and innovation is an approach that anticipates and assesses potential implications ... | Collective deliberations among different stakeholders that analyse and carry out future oriented reflection on the potential implications of the current dynamics and on how to change them |
| ...and societal expectations with regard to research and innovation, ... | The process involved a wide variety of perspectives to make sure that their needs and expectations are taken into account |
| ...with the aim to foster the design of inclusive and sustainable research and innovation.” | The stakeholders identify areas where change is needed, which in the follow up activity (part 2) will be translated into a plan with research and innovation lines and actions. Therefore, the plan will be defined with the inclusion of stakeholders who will collectively prioritize them taking into account sustainability criteria. |
| Research & Innovation (R&I) | |
| <i>Related concept</i> | <i>Addressed through</i> |
| Research and Innovation lines | Validation and adaptation of the system map: the map serves as a tool to identify relevant areas of the food system where either actions or research and innovation lines can lead to changes. Based on this reflection, participants design an action plan targeted to the areas identified. |
| (Food) Systems thinking | |
| Through the development of action plans, participants realize that the potential solutions outlined in the action plans need to take into account in which part of the system they are located and which connections might have with other parts of the system. It leads participants to reflect on potential non- compartmentalized solutions that embrace complexity. | |
| Potential of bringing the arts, socio-economic science and humanities creatively or trans-disciplinarily with the module? | |
| This module includes socio-economic and humanities expertise, as the map was developed taking into account some experts in these fields. The participants to be invited (see “type of audience”) also include these disciplines. | |

| TARGET AUDIENCE | |
|---|---|
| Audience category | Professionals representing different stakeholders and academic disciplines, but it can be also adapted to general public or other audiences such as students in Higher Education |
| Recommended number of participants | Between 20-30 participants. If the workshop happens to have low profile attendees, we recommend to organise further workshops to assure diversity of expertise until data saturation. |
| Recommended age | From 18 |
| Prerequisites | Advanced knowledge is not needed but if the aim is to build a robust system map, the more knowledge participants have, the richer the result will be. |

| OPTIONS FOR MULTI-STAKEHOLDER ENGAGEMENT | |
|---|---------------------------------------|
| <i>Stakeholder</i> | <i>Role envisaged in the activity</i> |
| Other stakeholder such as students, families, local businesses or citizens can be involved in the educational module. | Participants |

| SETTING UP THE MODULE |
|---|
| FACILITATION/DELIVERY |
| <p>The facilitator should:</p> <ul style="list-style-type: none"> ○ Create a comfortable environment ○ Develop a structure that allows participation from all the members that makes their ideas heard ○ Support all the ideas that have been said ○ Make a good management of the time spent ○ Send a summary of the results to all participants after the workshop and invite them to validate the resulting R&I action plans. If more workshops are organised, the results of all of them can be shared and all participants can give feedback until online consensus is reached. |

| RESOURCES | | |
|---|---|---|
| <i>Physical materials</i> | | |
| <i>Resource name</i> | <i>Picture</i> | <i>Number</i> |
| Sticky notes in 2 different colours |  | 50 |
| System map |  | 1 for each workgroup and the map that was displayed on the wall during part 1 where the areas where change is needed were highlighted |
| Flipchart |  | 1 per workgroup and one to display the map with the areas highlighted. |
| Office supplies (pencils, pens, marker pens, blank sheets, etc.). |  | Minimum 1 material per participant |
| Vision obtained during part 1 and picture of the map with the areas where change is needed highlighted | Copies of a document written by the facilitator | 1 per each participant |
| Scenario and R&I action plans template | See document "FIT4FOOD2030 Catalonia_scenario&action plan" | 1 per each group of participants |
| PREPARING THE SETTING | | |
| <ul style="list-style-type: none"> • Room with several tables and chairs for working in groups of 5-7 people. • Flipchart to display the system map and other flipcharts to design the action plans. • Tables for keeping the materials • Tables for the facilitators | | |

- Computer

DETAILED DESCRIPTION OF THE MODULE SCRIPT

Step

1. Welcome and presentation of the objectives and the program. Presentation of the attendees. Signature of an informed consent (previously approved by an Ethical Committee).

Recommended duration: 15 min

2. Design of the prototypes of scenarios and roadmaps *Recommended duration: 1h*

Prior to the activity, facilitators replicate on each flipchart the document “*Fit4Food Catalonia scenario & action plan*” in order to adapt it to a bigger size. The systems map are distributed for each table, as well as the other materials: paper describing the vision and a picture of the map with the areas where change is needed marked (obtained in part 1), sticky notes, pencils, pens, etc...

2.1 Participants individually read the **vision** defined during part 1 and revise the system map on the wall where the areas where change is needed are highlighted. As a group, participants **identify key variables/factors** where they would like to focus their strategic plan for change:

Imagine you are now in 2030 and you have been successful. Which factors from the map have been key to achieve the vision defined during part 1, and have enabled us to be more successful in improving the subsystem?

They mark a total of 3-5 factors on their map and they are also written on the “*Fit4Food Catalonia_scenario&action plan*” document.

2.2 Individually, they reflect on the specific variables on which they would like to see changes for 2030 and write elements for a **new vision** focused on those. The elements are written by each participant on a post it. Then they share the post its and arrive to a consensus on a **shared vision for their strategic plan for 2030**. They write it on the “*FIT4FOOD2030 Catalonia_scenario&action plan*” document.

2.3 As a group, participants decide on the **boundaries of the strategic plan** where they want to see this vision achieved (international, national, local, specific context...).

3. Development of action plans *Recommended duration: 1h*

Using the flipchart, participants identify **R&I lines** and **actions** targeted at different key variables or factors (at individual, organizational and systemic levels). They also identify the **stakeholders** that should collaborate and the **part of the process** where they will be engaged.

Finally, each group explains the results to the other group(s).

4. Wrap up and evaluation *Recommended duration: 15 min*

The facilitator leads a reflection on the different variables where participants think there should be change and thanks all the input for R&I lines and actions.

She explains that she will distribute the final visions and R&I lines and actions with an online tool where participants will be able to put them in order of priority and to express their commitment to contribute in future workshops.

She invites them to think if future meetings would be interesting for their implementation and whether they think that it would be worth starting to constitute a transformative network.

She thanks all the participants for their contribution. Finally, she asks participants to fill in the evaluation form.

DEVELOPERS

This module was developed by The Living Lab for Health at IrsiCaixa (Rosina Malagrida, Marina Pino) based on the results obtained within the FIT4FOOD2030 Catalonia's network during two series of workshops that took place in Barcelona during September 2018 and March 2019.

A check for scientific accuracy was done in a previous version of the map, which was later simplified into a new version with a smaller number of variables. This new version will be checked in future workshops. The English language translation will be checked at the end of this process.

REFERENCES

Helen P. N. Hughes, Chris W. Clegg, Lucy E. Bolton & Lauren C. Machon (2017) Systems scenarios: a tool for facilitating the socio-technical design of work systems, *Ergonomics*, 60:10, 1319-1335, DOI: [10.1080/00140139.2017.1288272](https://doi.org/10.1080/00140139.2017.1288272)

ANNEXES

"FIT4FOOD2030 Catalonia_scenario&action plan"

"FIT4FOOD2030 Catalonia_evaluation_forms"

"FIT4FOOD2030_Catalonia_system_map"

City Lab Budapest: System Thinking for Food System Sustainability – template

Systems Thinking for Food System Sustainability

This module was created by Diana Szakál (ESSRG) incorporating insights from discussions with Bálint Balázs (ESSRG) and results and insights derived from individual stakeholder consultations and workshops. Parts of the module were inspired by and/or incorporate elements of the following materials developed by FIT4FOOD2030 project partners: trend cards, showcases, and the food systems diagram.


AT A GLANCE

| | |
|--|---|
| Thematic Area | Food systems, system thinking, systems practice |
| Format | <ul style="list-style-type: none"> - 4 x 3hr co-creative, experiential workshops (spread across 5-8 weeks) - Online learning platform with 7.5 hours' worth of content available to participants simultaneously - Local stakeholder engagement via individual sessions |
| Duration | <ul style="list-style-type: none"> - 12 hours of facilitated workshop time - 7.5 hours individual work using the online component - 3 hours dedicated to preparation and stakeholder meeting - Optional: additional 3x2hrs for group practice |
| Type of audience | Open (university students, professionals, etc.) |
| Age group | Open, but recommended for 16+ |
| Number of participants | 12 - 20 |
| Prerequisites for participation | There are no prerequisites |
| Number of facilitators | Minimum 1 |
| Overall difficulty | <p>Topic: <i>intermediate</i></p> <p>Preparation: <i>intermediate</i></p> <p>Facilitation: <i>intermediate/advanced</i></p> |

OVERVIEW

The current module offers a blended approach incorporating offline facilitated sessions, stakeholder consultations, individual and group home study, as well as, an online learning platform.

During the offline component of the course, participants are guided through a co-creative, experiential learning based process towards deeper system understanding. They form teams of 3-4 people and choose a real challenge from their local food system that they would like to work on. Course members are introduced to various systems thinking and systems practice methodologies that target developing their ability to organize their thinking, manage complexity and instead of being overwhelmed by it, use it as a fertile soil for spotting new opportunities. The activities and reflections of the course aim to support participants in first recognizing, and then increasing their sphere of influence and finding their own ways to create positive impact in the food system, let it be via their individual behaviour, small communities or respective organizations.

The online component encourages participants to think critically about various ways food impacts the health of the population, society at large and our natural environment currently and in the future. It supports users in developing a deeper understanding of how the different aspects of a system influence each other and how a system itself is affected by its context. Participants are guided through four prevalent perspectives of our food system (mainstream, sociology, ecology and health), reflecting on the main trends that supported the development of the paradigm, the key challenges, approaches and tools, as well as, the blind spots of the perspective. The learning management system of the course includes weekly readings and a database of additional resources, articles, videos and stories from the field for students who wish to explore further about the topics on their own.

The module supports participants on their own learning journey regarding their role and responsibilities within our global food system, increasing self-awareness, by reflection and (co-)creation exercises. By the end of the course participants will have created and reflected on their own map of the food system in an iterative process, as well as, have taken part in several individual experiments and self-reflection exercises with regards to their food system related habits.

OVERALL AIM

The course aims to spread food system thinking and encourage participants to approach the food system holistically and critically and with multiple perspectives in mind, while taking responsibility for their own actions as a member of the system.

SPECIFIC (LEARNING) OBJECTIVES

After the successful completion of this module participants are expected to be able to...

- Identifying the main elements of the food system
- Describe the most prevalent paradigms that exist with regards to the food system
- Examine the food system from a critical perspective

- Explain how diet, food production, the environment, equity, population and resources inter-relate to impact each other
- Reflect on their own role and responsibility as a food system actor more clearly and consciously
- Point out the main challenges and controversies that exist within the food system
- Apply a systemic approach to a given problem or challenge
- Use various system thinking tools and methods that can support navigating complexity
- Contribute to (inter/transdisciplinary) collaborative projects more effectively

SUGGESTED SCENARIO FOR IMPLEMENTATION

The module has already been tested with the participation of **university students** and **young professionals with diverse backgrounds** and is suitable to be offered as an **open course for adult learners**.

It is designed to be implemented as an evening course over the course of several weeks. However, it is also suitable to be implemented in a university setting or in a modified format, can be rolled out with the participation of high school students.

The online and offline components are designed to support each other; however, they can also be implemented separately. The offline sessions are centred around experimentation and experiential learning that all target the development of the competency of systems thinking. The online learning management system provides the necessary background information and lexical content that participants can build on during the offline sessions.

The material is also appropriate for learning communities or small groups wishing to create a Community of Practice. In this case, the readings can be processed at home and then discussed in a group setting even without an experienced facilitator.

TOPICS & COMPETENCES COVERED BY THE ACTIVITY

Thematic area(s)

General food system approach

FOOD2030 Research & Innovation priorities

All four main priorities are given focus during the course. The extent to which each of them is dealt with in detail during the offline component depends on what specific food system challenge participants decide to work on.

| <i>Priority</i> | <i>Indicate whether main or secondary</i> | <i>Addressed through</i> |
|---|---|---|
| Circularity & Resource Efficiency | Secondary | The importance of circularity and reducing environmental footprint is mentioned various times in the online component |
| Innovation & Empowerment of Communities | Main | Addressed in Chapter 5 of the online component |

| | | |
|--|------|---|
| Nutrition & Health | Main | Addressed in Chapter 4 of the online component |
| Climate & Sustainability | Main | Addressed in Chapter 3 of the online component |
| Responsible Research and Innovation (RRI) | | |
| <i>Related concept</i> | | <i>Addressed through</i> |
| Self-awareness | | Reflective exercises both in the online and offline component |
| Responsible long-term thinking | | Future trends, challenges |
| (Transdisciplinary) collaboration | | Participants need to collaborate in creating and reviewing their conceptual maps of the food system |
| Future-oriented ethical abilities | | Considering ethical aspects in the environmental, health and social equity realms |
| Research & Innovation (R&I) | | |
| <i>Related concept</i> | | <i>Addressed through</i> |
| Analytical thinking | | Practicing breaking down complex information |
| Critical thinking | | Specific learning objective |
| Navigating complexity or wickedness | | Going through an iterative system understanding process, conscious reflection on divergent and convergent phases of the process, creating a systems map |
| Pro-activity | | Choosing a challenge, finding a stakeholder to discuss their map with |
| (Food) Systems thinking | | |
| <p>The whole module is focused on and designed around the development of food system thinking. The offline component contains various exercises that target the development of this competency, such as, specific reflection questions, tools for system analyses understanding, as well as, the creation of shared conceptual maps of the food system. It is further supported by the content and the theoretical component of the online course: each chapter is dedicated to a different perspective of the food system, highlighting how the given perspective influences other systems.</p> | | |
| Other competences | | |
| <i>Competence</i> | | <i>Addressed through</i> |

| | |
|--|---|
| Sense making | Addressed through the process of iterative concept map creation |
| Social intelligence | Collaborative group work, stakeholder meeting |
| Communication ability | Group work, presentations, stakeholder meeting and interview |
| Potential of bringing the arts, socio-economic science and humanities creatively or trans-disciplinarily with the module? | |
| <p>The socio-economic perspective is integrated in the course. Visualization and drawing-based methods are also integrated into the course.</p> <p>In addition to this, self-reflection exercises can be altered to bring in components from arts and/or humanities.</p> | |

| TARGET AUDIENCE | |
|---|--|
| Audience category | Open (university students, professionals, etc.) |
| Recommended number of participants | 12 - 20 |
| Recommended age | Open, but recommended for 16+ |
| Prerequisites | There are no prerequisites – it is possible to join from any disciplines and fields – as the course builds on the principles of transdisciplinarity and leverages the power in bringing together different perspectives. |

OPTIONS FOR MULTI-STAKEHOLDER ENGAGEMENT

| <i>Stakeholder</i> | <i>Role envisaged in the activity</i> |
|--|---|
| Stakeholders from different parts of the food system that represent the different perspectives that the module incorporates (agronomist, economist, sociologist, health specialist/nutritionist and someone who works in environmental conservation) | Each stakeholder will be asked to participate in an interview from which an approximately 5 minutes long video will be prepared and incorporated in the module |
| Various members of the FIT4FOOD2030 Budapest community, mostly from the private and the civil sector | Besides sharing their experience and knowledge in the framework of individual meetings with participants, stakeholders are envisaged to play a crucial role in the activity in the following ways: 1) guest lecturers during the facilitated session, 2) partners in organizing field trips and visit their organizations, 3) by providing cases for participants to work on. |

SETTING UP THE MODULE

FACILITATION/DELIVERY

See Annex 1 – Separate document

RESOURCES

Physical materials

See Annex 1 – Separate document

Useful links, videos, articles

See Annex 1 – Separate document

PREPARING THE SETTING

See Annex 1 – Separate document

DETAILED DESCRIPTION OF THE MODULE SCRIPT

Please see Annexes 1, 2 and 3.

DEVELOPERS

This module was created by Diana Szakál (ESSRG) incorporating insights from discussions with Bálint Balázs (ESSRG) and results and insights derived from individual stakeholder consultations and workshops. Parts of the module were inspired by and/or incorporate elements of the following materials developed by FIT4FOOD2030 project partners: trend cards, showcases, and the food systems diagram.

REFERENCES

References are detailed in the Annexes.

ANNEXES

1. ANNEX 1: details the structure and content of the course
2. ANNEX 2: Power Point slides that accompany the offline, facilitated sessions
3. ANNEX 3: Script for guided visualization exercise used in the first session

System Thinking for Food System Sustainability

A Blended learning course on
Food System Thinking & Practice developed by
the Budapest City Lab

TABLE OF CONTENTS

| | |
|--|-----|
| TABLE OF CONTENTS | 119 |
| LEARNING OBJECTIVES AND COMPETENCES | 120 |
| Course objectives..... | 120 |
| Competencies | 120 |
| Course Architecture..... | 122 |
| PART I OFFLINE LEARNING WORKSHOPS..... | 0 |
| Introduction..... | 0 |
| WORKSHOP 1: SETTING THE STAGE | 1 |
| WORKSHOP 2: EXPLORATION | 5 |
| WORKSHOP 3: VISUALIZATION & DEVELOPING THE STORY OF THE SYSTEM | 8 |
| WORKSHOP 4: SPICING IT UP..... | 10 |
| WORKSHOP 5: ACTIVATION & INTEGRATION | 10 |
| Questions and facilitation guide for post-course feedback | 12 |
| Additional resources about Systems Thinking and Practice..... | 13 |
| Example of flyer for student recruitment..... | 14 |
| PART II Online Learning Support System | 15 |
| INTRODUCTION | 15 |
| KEY MESSAGES OF THE COURSE..... | 15 |
| REFERENCES | 16 |

LEARNING OBJECTIVES AND COMPETENCES

Course objectives

- support participants on their own learning journey regarding their role and responsibilities within our global food system (self-awareness)
- encourage participants to think deeply about many of the different ways food impacts the health of the population, society at large and our natural environment currently and in the future (develop critical, responsible and long-term thinking)
- introduce participants to the basics of systems thinking, how the different aspects of a system influence one another and how a system itself is affected by its context
- provide practical tools and methods for system analyses and understanding
- guide participants through a process of understanding the systemic forces connected to a challenge present in the local food system in teams ((transdisciplinary) collaboration, navigating complexity, agency, proactivity)
- saw the seeds of a Community of Practice and create opportunities for network development

“Transformative learning involves experiencing a deep, structural shift in the basic premises of thought, feelings, and actions. It is a shift of consciousness that dramatically and irreversibly alters our way of being in the world” (O’Sullivan, 1999, p 237).

After the successful completion of this educational module, the participant will be able to...

- demonstrate a general understanding of the term ‘food systems’ and how diet, food production, the environment inter-relate and impact each other
- identify the main elements of the food system
- point out some of the key challenges and controversies that exist within the food system
- describe the most prevalent paradigms that exist with regards to the food system
- reflect on his/her own role and responsibility as a food system actor more clearly and consciously
- apply a systemic approach to a given problem or challenge
- use various system thinking tools and methods that can support navigating complexity
- contribute to (inter/transdisciplinary) collaborative projects more effectively

Competencies

Competencies are highly context dependent and therefore, the development of any course need to reflect the specific needs of the local environment. In the case of this educational module, the identification of the necessary competencies came from combining the general needs from literature and international assessment carried out in several European cities with the competence needs defined by local stakeholders of the Budapest City lab (members of CSOs, businesses, policy makers, educational and research institutions who are active in the local food system). The online component of the course aims to serve a broader audience, while the offline component can be specifically targeted, adapted to the needs of the local community. This supports the adaptation and implementation of the module in various contexts.

The successful completion of the course contributes to the development of various competences:

- *Food systems thinking*
- **Multi-stakeholder approach/network building competences:** *social intelligence, self-awareness, multi-perspective, communication ability*
- **Research and Innovation system competences:** Analytical thinking, Critical thinking, *navigating complexity or wickedness, pro-activity*
- **Responsible Research and Innovation competences:** Responsible long-term thinking, (Transdisciplinary) collaboration, Future-oriented ethical abilities
- *Sense making*

Course Architecture





PART I

OFFLINE LEARNING WORKSHOPS

Introduction

Our food system is a primary example of complex, adaptive systems, thus in order to successfully intervene and initiate changes that could potentially support the system in evolving and transforming into a healthier and more sustainable state a systemic approach is necessary. Gaining a deeper understanding of system thinking and system practice methodologies will guide participants in developing their ability to organize their thinking, manage complexity and instead of being overwhelmed by it, use it as a fertile soil for spotting new opportunities as well as avoiding potential risks and threats. The activities and reflections of the course aim to support participants in first recognizing and then increasing their sphere of influence and finding their own ways to creating positive impact in the food system, let it be via their individual behaviour, small communities or respective organizations.

Methodology, Format and Target Group

The offline part of the module integrates various methods used in system thinking, system practice, human centred design, system oriented and disruptive design.

All the offline sessions are designed to be highly interactive, with most of the learning exercises centred around co-creation and collaboration. All sessions are based on the principles and methodology of experiential learning, including activities that support participants in each stage of the learning cycle, and paying special attention to both active experimentation and conscious reflection.

The module is divided into *3-hour-long learning workshops* with at least a week in between the offline sessions to allow participants ample time to not only process the supporting materials available via the [online Learning Management System](#), but to also carry out additional research about their chosen challenge in the local environment.

The course has already been tested with the participation of *university students* and *young professionals with diverse backgrounds* and is suitable to be offered as an *open course for adult learners*. In addition, its modified format is planned to be tested in a secondary school setting.

TIPS FOR FACILITATION

The timing of the workshop as it is now, **presents the minimum time requirements to be able to carry out the tasks**. This requires the facilitator to be highly skilled in managing the group, paying attention to which teams need more support and being rather strict at times.



As a rule of thumb, allow 30% more time for the workshops than the planned time requirement. So, for example, in the case of not adding additional material and/or aims to the sessions detailed below, in order

In addition, if possible, it is advisable to lengthen the course, e.g. from 5 weeks to 8 weeks, and including offline sessions where participants are not shown any new material but are simply given the space and time to deepen their understanding of the tools and the local food system.

to have a more relaxed working atmosphere it is **advisable to add an extra hour of working time**.

In order to keep the focus and also help the participants feel relaxed, it is important to discuss the **framework of the course and the expectations** of the participants in the beginning. In addition to dedicating time for this during the first session, it is advisable to include a brief recap in each workshop during the check-in process that details the aims, the planned timeline (including breaks, etc.) and the guidelines of cooperation. This is an **iterative, organic and co-creative process**, so for instance, guidelines can be adapted (e.g. asking participants to stop talking when somebody puts their hand in the air and follow the example, until the whole room is silent – it is an easy and relaxed way to get back the focus after team work – was introduced during the first pilot of the course by one of the participants), or participants can be reminded of the agreement that the group collectively made during the first session.

WORKSHOP 1: SETTING THE STAGE

During the first learning workshop participants are introduced to the system thinking and system practice approach of food systems. They learn about the general characteristics of complex, adaptive systems and discuss why and how the food system can be considered as a complex and dynamic system, as well as, the advantages and disadvantages of a systemic approach.

During this introductory session, course members take part in exercises that facilitate getting to know each other, forming teams, as well as, defining the challenge in the local food system that they would like to focus on during the course. In this process they are also encouraged to reflect on their individual motivations that lead them to choose the specific challenge they would like to tackle.

Outline of the workshop:

| Name of Session | Aim of session | Stage of the Double Dimond |
|--------------------------|--|---|
| Setting the stage | <ul style="list-style-type: none"> *team formation *support participants in getting to know each other *initiate the group development process *understand why system thinking is useful and necessary for food system sustainability *general introduction about systems & the food system *channel the previous knowledge and experience of participants *each team chooses a challenge *support participants in getting comfortable | BRIEF, understanding and choosing a challenge |

| | | |
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| | with the process *create an environment conducive to learning | |
|--|--|--|

| <i>Duration</i> | <i>Activity</i> | <i>Brief description of activity</i> | <i>Materials needed</i> |
|-----------------|-----------------------------------|--|---|
| 00:10:00 | Introduction | <ul style="list-style-type: none"> *Introduce the general aims of the course and the community of practice workshops. *Introduction of the facilitator and the context of the course *Share personal story about my connection to the course and why System Thinking and FSS are important. *Talk about the practical framework (food & drinks, bathroom, limited time - policy about being late - mutual respect) | Intro presentation slides ¹⁸ |
| 00:10:00 | Check-in & Icebreaker | <p>Version A) Participants stand in a circle. Each of them introduces themselves together with a “signature movement”. The name together with the movement is repeated by the whole group.</p> <p>Version B) Gift Circle Exercise: Participants stand in a circle; one person says their name and gives an imagined gift to the one on the left of her/him. The receiving person thanks the giver (saying also their name and what they imagine they received. E.g. "Thank you, Carla, for this beautiful apple". Then say her/his name and gives a gift to the next person. (It is not important to name what the giver imagined giving.)</p> | |
| 00:10:00 | Understanding Expectations | <p>Give participants around 3 – 5 minutes to write down their answers individually to the following questions and put them up on a wall:</p> <ul style="list-style-type: none"> *"When will I feel that it was worth for me to participate in this course?" *"What am I willing to give/contribute in order for the course to be successful?" (What can you bring for your team?) *"What will help me to learn and in bringing in my talents and gifts"? (What do you ask from others?) <p>Group the post-its and reflect on them in</p> | Post-its in 3 different colours for each question. 3 big sheets on the wall with the questions written on them. |

¹⁸ Please See ANNEX 2 for all the slides that accompany the offline facilitated sessions.

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| | | the plenary. Highlight all the resources that participants mentioned that they are bringing to the course. If appropriate, mention the unique possibility to network with all other participants. Finally, reflect on their expectations: what are the aspects that can be realistically covered by the course and what are the aspects that fall out of its scope. | |
| 00:10:00 | Setting Guidelines | Ask participants to reflect on what guidelines they would think could help the cooperation and mutual learning in the coming 5 weeks. Create a common document based on expectations, participant reflections, and own suggestions (punctuality, telephone use, being present, giving feedback, etc.) Bring this sheet for each consecutive session and place it in a visible area. | Big sheet with "Guidelines of Cooperation" written on it. |
| 00:05:00 | Introduction of the journey | Introducing participants to the process and the journey they are going to take together and how the online and offline parts support each other. | Presentation slide that details the course architecture and main concepts |
| 00:20:00 | The Systems Game | Commonly used systems practice exercise that supports participants gaining embodied experience about the common mechanisms of systems. A version developed by REOS can be found here: https://reospartners.com/publications/the-systems-game-module/ | Large empty space. |
| 00:20:00 | Introduction to system thinking and the food system | General introduction about System Thinking, Design Thinking, the double diamond model. What do we mean by the food system? Collect associations from the participants. The global food system - local food system. | Intro presentation slides |
| 00:10:00 | BREAK | | |
| 00:05:00 | Guided visualization | The facilitator asks participants to find a comfortable seat and reads the script of the guided visualization. | Text of the visualization printed. For detailed script see ANNEX 3 |
| 00:30:00 | Individual Reflection & | To get to the vision that you imagined, what needs to change in the current food | post-its for each person |

| | | | |
|----------|-------------------------------|--|--|
| | Team formation | <p>system? Ask participants to write down their answer to this question (3 minutes). What is a challenge that you personally feel motivated to solve? What part of the food system you feel personally called to change/work on? (5 min) Each person comes up and briefly explain their personal motivation (their relationship to the food system) and the challenge that they feel called to work on and puts up their post it on the wall. The next person comes up, explains motivation and decides whether wants to join a previously defined challenge or start a new one. (<i>Can you connect to any of the previous challenges or would you like to start a new group?</i>) [possible variation: prepare various pictures of the FS, place them out on the floor as inspiration - ask participants to choose one or draw something that represents the challenge that they want to work on]</p> | [food system picture cards – prepared set in the light learning Annex 1] |
| 00:40:00 | Refining the challenge | <p>Newly formed teams come together and agree on the challenge that they want to tackle. Support them in choosing a challenge that is complex enough that it requires a systems approach, but not too complex so that it could not be addressed in the short timeframe of the course. Example questions: How well does the team understand the nature of the challenge? Does it target a short-term fix or long term, sustainable change? They also set a long-term shared vision that they aim towards. (If time allows, they also define a closer milestone that can help the system move towards the desired change.) Ask teams to also agree on the communication channels they want to use (the LMS of the course allows for group communication as well).</p> | Sheets for writing out their vision and milestone. |
| 00:10:00 | Check out | <p>Ask participants to place up their "guiding stars" on the wall. Ask them if anybody has any questions or comments that they would like to share in plenary and offer the possibility to write down their feedback and/questions on post-its and leave them</p> | Prepared feedback wall, post its, blue tech. |

| | | | |
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| | | on a designated area ("Feedback wall"). Ask everyone to stand in a circle and say 1 word that sums up for the experience of the first offline session for them. | |
|--|--|--|--|

Our food system as a complex, adaptive system:

- It is a system of subsystems.
- It is characterized by non-linear system dynamics.
- It is full of unpredictable, emergent properties.
- The magnitude of the intervention does not necessarily correlate with the magnitude of the results/outcomes.
- Complex interplay and interwovenness of system components.
- Cause and effect can be temporally and spatially distant. ("The system has a memory"¹⁹, present behaviour at one location of the system can have consequences on other locations, subsystems both in the present and in the future).
- The notion of tipping points.
- Systemic boundaries are unclear.
- Feedback loops are present in the system. (The concept of viscous and virtuous cycles).

WORKSHOP 2: EXPLORATION

During the second workshop, participants start to explore the dynamics and basic causal relationships present in local food system via the method of *connection circle diagram*. They identify the main elements, actors, institutions of the system first individually then collectively and make connections among the elements. At this stage of the process they are encouraged to think broadly, explore without zooming in on any focal point in order to understand the main forces that drive the food system. While they define system boundaries at a local level, they are encouraged to look at the broader context and how the local food system they are analysing connects into our global food system. This is also supported by the online materials that they can access in between sessions.

In the second half of the workshop, participants start to examine the system from the perspective of the desired change they defined in the first workshop and work toward identifying elements and processes that either hinder or support the transformation of the system towards the desired direction.

Outline of the workshop:

| <i>Name of Session</i> | <i>Aim of session</i> | <i>Stage of the Double Dimond</i> |
|------------------------|---|-----------------------------------|
| Exploration | *provide specific tools for system understanding *develop system thinking, divergent thinking, collaboration *support participants in gaining a deeper understanding of the local food system and | Research phase, divergent |

¹⁹ Hueston W & McLeod A. (2012)

| | | |
|--|--|--|
| | prepare for the mapping phase by: *understanding the main elements, parts and agents of the FS *identifying connections among them *identifying the main driving forces within the system | |
|--|--|--|

| <i>Duration</i> | <i>Activity</i> | <i>Brief description of activity</i> | <i>Materials needed</i> |
|-----------------|---|---|--------------------------------------|
| 00:10:00 | Alternative use game | Participants gather in their small teams. They receive one reusable drinking bottle (empty)/ or a glass jar. They pass it around, while each person says a different thing that the bottle/jar could be used for. The aim is to make the round as quick as possible and go for the numbers. After 4-5 minutes stop the game and ask each team to share in plenary some of the most creative, unusual or weird ideas that came up. | Bottle/jar for each team. |
| 00:10:00 | Starting presentation check in | Share where you are in the process. Introduce participants to the aims and goals of the session: exploration, experimenting with different system thinking tools. Highlight that the aim of this workshop is not to find a solution yet! Introduce the cluster mapping exercise. | Intro presentation slides. |
| 00:25:00 | Free association Mapping | Based on their chosen challenge, participants decide on the boundaries of the system that they are working with. Engage in free brainwriting process and placing down all their associations about the system on post its. They start to connect and cluster the ideas that are related. | Large sheets, pens, post - its. |
| 00:15:00 | Stakeholder map <i>Optional: can be left out if the group needs more time</i> | Brainwriting all the stakeholders that are connected to their challenge on post its. | Large sheets, pens, post - its. |
| 00:30:00 | Connected Circles map | Here participants place the main themes and clusters and stakeholders identified in the | Large sheets with pre-drawn circles. |

| | | | |
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| | | <p>previous exercises along a circle. Then they start to connect the nodes on the circle. Present various possibilities for using this exercise, depending on what the team considers important.</p> <ol style="list-style-type: none"> 1. Connecting various actors 2. Focusing on variables of the system 3. Examining the flows of e.g. information, material, etc. | |
| 00:15:00 | <i>Designing the guiding question for further exploration</i> | <p>At this phase teams need to create a specific question about: "Why their chosen system works a certain way?" Explain the importance of neither being too broad nor too narrow. They can reframe the question after learning more about the system.</p> | Examples of framing questions on ppt. |
| 00:15:00 | <i>Driving forces</i> | <p>At this phase teams start to look at the driving forces within the system. What are the forces that support transformation towards a healthier system and what are the forces that inhibit change? Team members brainstorm enablers and inhibitors on two different coloured post-its. Encourage them to write as many as they can.</p> | Pink and blue post-its. |
| 00:15:00 | | Then cluster them into themes. | Two big sheets/team with Enablers and Inhibitors written on them. |
| 00:20:00 | | Teams choose the most important clusters to continue to work with. For these 2-3 clusters or main themes they start to list various causes that lead to a certain system variable to manifest. Then they also list what kind of consequences it has for the overall functioning of the system. | prepared sheets for causes and effects |

| | | | |
|----------|------------------------|--|---|
| 00:15:00 | "Research plan" | Each team decides what kind of information would be the most useful for deepening their understanding of the local system and chooses the relevant research methods. Realistically, these methods should be not too time consuming so they would be able to carry out their research until the following week. | ppt slide with potential research methods |
| 00:10:00 | Check out | Each person sums up the experience in two words. 1: How do you feel now? 2: What was the most important learning point from today? /What are you taking home? Mention the wall of feedback again. | |

WORKSHOP 3: VISUALIZATION & DEVELOPING THE STORY OF THE SYSTEM

Based on the exploratory work of the previous weeks, participants create a visual representation of the local food system that captures important actors, activities and the dynamics of various pressures and responses. Building on the previously identified elements and processes of the system, the aim is to identify and make the underlying dynamics of the system visible.

This map will constitute as the base of further exploration, and a tool for identifying potential leverage points for intervening in the system for increasing its overall health and sustainability.

Outline of the workshop:

| Name of Session | Aim of session | Stage of the Double Dimond |
|----------------------|--|------------------------------------|
| Visualization | <ul style="list-style-type: none"> *putting it all together and creating a complex system map * provide space for feedback and reflection * support participants in their preparation for the stakeholder visit | Divergent and Convergent, Re-Brief |

| Duration | Activity | Brief description of activity | Materials needed |
|----------|----------------------------------|--|--------------------------------|
| 00:10:00 | Systems thinking embodied | Ask participants to share some concepts and abstract ideas about systems. Put them all up on a board/flipchart. Examples: interconnectedness, | Prepared concepts written down |

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| | | | |
|----------|--|---|---|
| | | emergence, dynamic, flexibility, circular, shared responsibility, complexity, curiosity, etc. Then ask them to create statues or moving constellations as a group that represent one concept. (Can be repeated a couple times. | |
| 00:05:00 | <i>Introduction to the session</i> | Briefly explain the framework and agenda for the day. | Agenda prepared on flipchart. |
| 00:30:00 | <i>Feedback Loops</i> | Each group traces back where they left off with their system analyses at the previous workshop, paying special attention to their main question. Then they are presented with a short introduction on vicious, virtuous, stabilizing and stagnating cycles. | Powerpoint slides about feedback loops. Arrows and cards that support feedback loop creation. |
| 00:30:00 | <i>The relationships of loops</i> | The teams are asked to rearrange their developed loops, looking at how they might connect and intend to understand the underlying dynamics that drive their chosen system. | |
| 00:30:00 | <i>Putting it all together</i> | Bringing together the results of all their previous exploration, teams create a visual representation of their chosen system. | Large space, post its, tape, pens. |
| 00:15:00 | <i>Preparation for short presentation</i> | | |

| | | | |
|----------|--|---|--|
| 00:20:00 | Mini presentations and feedback | Each group has two minutes to present their key insights and then 3 minutes to receive questions, as well as, comments and feedback from the other teams. | Timer, cards to signal how much time they have left. |
| 00:30:00 | Preparation for the study visit | Present the guidelines for the stakeholder meetings. | Short presentation. Linking to materials available at the online platform. |
| 00:10:00 | Check out | Ask participant how they are feeling and if there is anything that they would like to focus on during the last session. Ask if anybody has further questions, feedback that concerns the whole group. | |

WORKSHOP 4: SPICING IT UP

Based on the themes and challenges that the participants identify during the first workshop as the focus of their work and learning, they will need to organize a stakeholder meeting for the 4th week of the course. The aim of the meeting is to re-iterate their prepared systems maps and ask for the feedback of the relevant local food system actor.

In order for these meetings to go successfully, make it clear for participant during the first session that it is their task to find an interviewee. Keep close communication with them and remind them often that local actors are busy and need to be contacted in advance.

In addition, offer them your help in connecting with actors from your network. A great way to ensure that each team will find a relevant actor to talk with is to already connect with a diverse set of actors from the local food system and agree with them about their potential involvement in the course.

WORKSHOP 5: ACTIVATION & INTEGRATION

During the last facilitated session, participants finalize their system's map and define a strategy for intervention and the next steps they want to take.

Each team presents their narrative to the group and receives feedback and questions from other teams.

| <i>Name of Session</i> | <i>Aim of session</i> | <i>Stage of the Double Dimond</i> |
|------------------------|-----------------------|-----------------------------------|
|------------------------|-----------------------|-----------------------------------|

| | | |
|-------------------|---|---------------------------|
| Activation | *integration * updating their systems map based on the stakeholder visit experiences | Divergent and Convergent, |
|-------------------|---|---------------------------|

| <i>Duration</i> | <i>Activity</i> | <i>Brief description of activity</i> | <i>Materials needed</i> |
|-----------------|---|--|--|
| 00:15:00 | Check in | Opening Circle where each person shares how they are and what was the most significant learning point for them from the field visit. | |
| 00:05:00 | Narrative of a system & agenda | Short presentation | Agenda on flipchart |
| 00:80:00 | Integration and updating the maps. | The teams update their maps and integrate the new information that they have learned during their field visits, as well as, from reading the last two chapters of the online course. They focus on deriving the key insights from the process and develop the story or narrative of their system and prepare for the final presentation of their map. Make sure to check in with each team regularly and support them in their process. This time is available for them to go deeper into exercises that they need more time for and also transfer their map into KUMU if they had not done so | All materials that teams have created in the previous session. |

| | | | |
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| | | before their stakeholder visit. | |
| 00:10:00 | BREAK | | |
| 00:52:00 | Presentation of maps and narratives | Each team has 5 minutes to present and then 6 minutes for feedback and questions. | |
| 00:18:00 | Closing circle | Taking a bowl of yarn, we go around in a circle where each person shares how was the course experience for them and what they are taking with them. | Yarn |

Questions and facilitation guide for post-course feedback

- Has the way you think about the food system or its sub-systems changed and in what way?
- Has the way you see your role within the food system changed and in what way?
- How will you take your food systems practice forward?
- What is the biggest practical thing you will do differently as a result of this course?

Evaluation and Feedback Session *System Thinking for Food System Sustainability Course*

INTRODUCTION - 5 min.

Facilitator introduces himself + intro to the session objective, timeframe, expected norms of behaviour
*The main aim of the discussion is to receive honest feedback about both the online and the offline component of the **System Thinking for Food System Sustainability Course**, focusing on what went well, what aspects they enjoyed, as well as, what could have been better/done differently in order to make the course even better for next time.*

Timeframe: 1.5 hours

Guidelines to be shared with participants before the session: *there is no need to agree; listen to each other - one person talks at a time; it is going to be recorded (recording will be handled carefully, data gathered will be only used for the development of the course and stored in an anonymised format)*

GENERAL FEEDBACK - 25 min.

1. Please create a schematic drawing (e.g. timeline) about your learning experience over the past five weeks. Indicate the best parts/highlight, as well as, low points if you experienced any.
2. What are the three most important things that you have **learnt** by participating in the course? (First writing down, then sharing)

The OFFLINE Workshops - 30 min.

1. Please tell about your experience regarding the **facilitation** of the sessions.
 - Was the facilitator able to effectively support you on your learning journey?
 - What could she have done differently?
 - How easy was to understand, follow directions?
2. Did you find the **structure and the methodology** used conducive to your learning?

The ONLINE Component - 20 min

1. **What would you have needed to increase your engagement in the platform?**
2. ***Please share any bugs/difficulties that you might have encountered when using the system.***

Closing - 10 min

1. **What could have made the course (both online and offline components considered) even better?**

Additional resources about Systems Thinking and Practice

- Articles on [systemsthinker](#)
- [Toward Principles for Enhancing the Resilience of Ecosystem Services](#) by Kimberly Bowman et. Al
- [Systems Archetypes at a Glance](#) by Daniel Kim and Colleen Lannon
- [The art and science of systems change](#) by Joe Hsueh
- [The art of systems thinking in driving sustainable transformation](#) by Jo Confino
- [Systems Grantmaking Resource Guide – Causal Loop Mapping](#)
- [Open Source your Analysis: Participatory Approaches to Systems Mapping](#) by Adapt Research and Consulting
- [Three Keys to Unlocking Systems-Level Change](#) by Susan Misra and Jamaica Maxwell

Example of flyer for student recruitment

In cooperation with Impact HUB BP

TAMING THE ELEPHANT: SYSTEM THINKING FOR FOOD SYSTEM SUSTAINABILITY

Develop your system thinking ability &
increase your sphere of influence for
positive social & environmental change

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PART II

Online Learning Support System

The online learning platform can be accessed
via:

www.courses.essrg.hu

INTRODUCTION

The online learning platform is created with the following guiding principles in mind:

- Provide content and background information for students who are taking part in the offline, facilitated sessions of the course
- Go beyond sharing information by facilitating student engagement, interaction, social learning
- Include exercises and activities that leverage the power of experiential learning and active student engagement

Students are encouraged to complete all exercises, reflection and activity modules for best results. However, facilitators can pick and choose what parts of the online course they deem relevant for the local context.

KEY MESSAGES OF THE COURSE

- Our Food System is highly complex.
- The system is already broken in many ways and is under pressure.
- Several of the identified global trends are likely to increase the existing pressures and create intense challenges in the future unless the food system undergoes radical transformation.
- The food system can be approached from various perspectives. The current course focuses on the following perspectives: environmentalist, agronomist, sociologist, economist and health.
- The dynamics of the food system is highly interwoven with the dynamics present in several other systems and sub-systems, such as, ecological system of our planet, the economic sub-system and our society. There are often trade-offs between the aims and goals of these systems and sub-systems.
- We have underlying assumptions (paradigm, perspective) that shape how we think, speak, act and interact.
- These underlying assumptions, world views, interests can be/are in conflict with each other.
- The fact that we have been doing things in a certain way, does not mean that we should keep doing them the same way or that that is the only way to do things. Underlying assumptions also need to be questioned and revised in order to create sustainable transformation on a systemic level.
- System thinking and a holistic perspective is necessary for finding solutions for the pressing challenges, since creating “the best solution” from one aspect can have hazardous consequences for another.
- Personal and collective responsibility are both key for positive transformation.
- It is idealistic to think that we can change the situation on our own. Therefore, it is essential to understand our role and place within the system in order to know how we can contribute and take responsibility.

“Agriculture and food systems must evolve if we are to survive as a planet” (TEEB, 2018, p. IV)

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UN (2019). About the Sustainable Development goals. Accessible at:
<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

Additional Resources

CHAPTER 1

- Food System – an overview. History and power structures. Accessible at:
<https://www.youtube.com/watch?v=1xvIP5vW2BU>

CHAPTER 2

- Feeding 9 billion video series. Accessible at
<https://www.youtube.com/watch?v=raSHAqV8K9c&list=PLr2L6TB8fh8Gbpb-K1ioZlwJ2il1yDhF7>
- Agriculture: The Basics of Our Industrial Food System in 5 minutes. Accessible at:
<https://www.youtube.com/watch?v=04T23houM4s>

CHAPTER 3

- BBC – Climate Change the Facts. Accessible at:
<https://www.youtube.com/watch?v=0ypaUH57MO4>
- Global calculator: A tool to model the world's energy, land and food systems. Accessible at:
<http://tool.globalcalculator.org>
- Change the goal – 1/7 Doughnut Economics: <https://youtu.be/Mkg2XMTWV4g>
- Why it's time for Doughnut Economics: <https://youtu.be/1BHOflzxPjl>
- Introducing the Doughnut 1.0: <https://youtu.be/CqJL-cM8gb4>

CHAPTER 4

- Sustainable diets and public health - Tim Lang. Accessible at:
https://www.youtube.com/watch?time_continue=1&v=ANKWQWwObH4

CHAPTER 5

- Cultivating equality in the food system | Danielle Nierenberg | TEDxManhattan. Accessible at:
<https://www.youtube.com/watch?v=zqSrobaD5sA>

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“Our food system and us”

“Develop your System Thinking -

"Where does your breakfast come from?"

This module was created by Diana Szakál (ESSRG) incorporating the results and insights derived from individual stakeholder consultations and workshops with the members of the Budapest Food City Lab. Special acknowledgement for Janka Horváth, Márta Fekete, the students of Semmelweis University, Valeriano Donzelli and the members of the Inspiral Club for their support and cooperation in the two-stage piloting process. The workshop also incorporates the trend cards developed by the FIT4FOOD2030 project.



AT A GLANCE

| | |
|--|---|
| Thematic Area | food systems, reflection on individual roles and responsibilities within the food system |
| Format | workshop |
| Duration | Approx. 90 - 150 minutes (Depends on the number of participants and their willingness to share) |
| Type of audience | A: University students, B: General Public |
| Age group | A: 18 – 25 B: 16 ⁺ |
| Number of participants | 10 - 20 |
| Prerequisites for participation | There are no prerequisites |
| Number of facilitators | 1 |
| Overall difficulty | Topic: intermediate (the facilitator needs to have general knowledge of the food system) |

| | |
|--|--|
| | <p>in order to be able to ask the adequate guiding questions)</p> <p>Preparation: beginner</p> <p>Facilitation: intermediate</p> |
|--|--|

OVERVIEW

The educational module uses various reflective and co-creational exercises in order to increase self-awareness and generate discussion about the food system and the role and responsibility of each individual in it. It is organized in a workshop format, where the facilitator guides participants through the creative process of developing shared conceptual maps of the food system. The learning journey of participants starts from establishing a relationship with the abstract concept of food systems via association and open discussion. Then they are guided through a process of self-reflection regarding where the food that they eat comes from and what journey it needs to take in order to land on their plate. The facilitator aids the process of exploration by guiding questions and plenary reflection. All this preparatory work enables participants to visualize their mental representations of the food system in small groups and develop various competences.

OVERALL AIM

The overall aims of the module are to introduce food system thinking, increase participants' awareness of important issues and trends within the food system and encourage reflection regarding individual roles and responsibilities.

SPECIFIC (LEARNING) OBJECTIVES

After the successful completion of this module participants are expected to be able to...

- Reflect on their own role and responsibility as a food system actor more clearly and consciously
- Demonstrate a basic understanding of the complexity and interwovenness of the food system
- Understand how the journey of a specific food item can influence the natural environment, human health and communities
- Identify opportunities for behavioral change in their own life

SUGGESTED SCENARIO FOR IMPLEMENTATION

This activity could take place at a university level setting as an introductory lesson in a longer course on food systems or incorporated into courses where gaining basic understanding of the complexity and the interconnectedness of food systems is desired. It might also be adapted to a secondary school context and offer it as a workshop or open lesson. In addition, it could also be offered as an

open workshop in a setting where it is ensured that participants stay for the whole duration of the workshop.

TOPICS & COMPETENCES COVERED BY THE ACTIVITY

| | |
|-------------------------|--------------------------|
| Thematic area(s) | food system more broadly |
|-------------------------|--------------------------|

FOOD2030 Research & Innovation priorities

| <i>Priority</i> | <i>Indicate whether main or secondary</i> | <i>Addressed through</i> |
|---|---|---|
| Circularity & Resource Efficiency | secondary | The guiding questions of the facilitator during exercises |
| Innovation & Empowerment of Communities | secondary | The guiding questions of the facilitator during exercises |
| Nutrition & Health | secondary | The guiding questions of the facilitator during exercises, reflection on own role and food choices |
| Climate & Sustainability | Main/secondary | The guiding questions of the facilitator, the introduction of the model of “Doughnut economics” ²⁰ , reflection on own role and the “Journey of my breakfast” exercise |

Responsible Research and Innovation (RRI)

| <i>Related concept</i> | <i>Addressed through</i> |
|-----------------------------------|--|
| Self-awareness | Associative and self-reflective exercises. The role of the facilitator in asking adequate guiding questions is key here. |
| (Transdisciplinary) collaboration | Participants need to collaborate in creating their conceptual maps of the food system |

²⁰ Raworth, K. (2017). *Kate Raworth exploring doughnut economics. What on Earth is the Doughnut?...* Accessible at <https://www.kateraworth.com/doughnut/>

| | |
|--|--|
| Ethical thinking | Considering ethical aspects in the environmental, health and social equity realms |
| Responsible long-term thinking | Doughnut, future trends, reflecting on the impact |
| Participatory ability | Exercises throughout the workshop |
| Research & Innovation (R&I) | |
| <i>Related concept</i> | <i>Addressed through</i> |
| Analytical thinking | The inclusion of trend cards in the process of concept map creation, “Journey of my breakfast” |
| Critical thinking | Critical reflection questions by the facilitator – placing emphasis at each step on the interconnections between food system – natural environment – human health etc. |
| (Food) Systems thinking | |
| Developing food system thinking is a core element of this module. All the exercises, such as, the “Journey of my breakfast” and preparing shared conceptual maps of the food system target the development of this competence. | |
| Other competences | |
| <i>Competence</i> | <i>Addressed through</i> |
| Sense making | Addressed through each step that leads up to the concept map creation, as well as, the reflection questions |
| Oral presentation | Each team needs to present their concept map to the whole class |
| Potential of bringing the arts, socio-economic science and humanities creatively or trans-disciplinarily with the module? | |
| It is possible to make the co-creation of conceptual maps into an even more open and artistic process by introducing other materials, such as, clay, paint and material that they can use to create the collage. | |

| TARGET AUDIENCE | |
|---|---|
| Audience category | university-level students general public could also be used with secondary school students |
| Recommended number of participants | 10-20 |
| Recommended age | 16+ |
| Prerequisites | There are no prerequisites – it is possible to join from any disciplines and fields. The quality of the workshop is enhanced by bringing together different perspectives. |

| OPTIONS FOR MULTI-STAKEHOLDER ENGAGEMENT | |
|---|--|
| <i>Stakeholder</i> | <i>Role envisaged in the activity</i> |
| Local business owners or CSOs - preferably active in food system transformation | <ul style="list-style-type: none"> After the workshop, stakeholders can present their activity to students, opening up the space for discussion and inquiry As an optional second round, students can be asked to reflect upon and revise their original map/drawing of the food system based on what they have learned from the short presentation and the following discussion |
| Various stakeholders from the supply chain | If the conditions allow, students can be asked – either in preparation for the lesson or after the workshop as a take home assignment – to go out and trace back where certain foods that they eat come from and reconstruct the journey that these food items have done in order to land on their plate by interacting with various stakeholders from the supply chain. |




SETTING UP THE MODULE

FACILITATION/DELIVERY

The module requires one main facilitator, her/his role is crucial in guiding the process and continuously encouraging participants to go deeper in self-reflection by using the adequate guiding questions. Besides facilitation skills and group management, the facilitator also needs to have at least a general knowledge of the main dynamics, challenges and opportunities of the food system.

RESOURCES

Physical materials

| <i>Resource name</i> | <i>Picture</i> | <i>Number</i> |
|--|---|---|
| Sticky notes |  | 4 per participant + additional ones to allow participants to use them during concept map creation if they wish to |
| Pens, pencils – preferably in different colors | | 15 (3 per group minimum) |
| Flipchart paper | | 3-5 (1 per group) |
| Pictures of the food system printed out. The more varied the better, including various parts, relationships and challenges/opportunities of the system |  | At least 30 different ones, you can find a prepared picture set in <i>Annex1 (separate document)</i> , but feel free to customize and adapt this. |
| Trend cards printed out |  | The whole series (if the group is around 25 two series). You can find the prepared set in <i>Annex2 (separate document)</i> . |

Useful links, videos, articles

For a holistic overview on food systems and systems thinking: the online part of [the System Thinking for Food System Sustainability blended learning course](#) developed by the Environmental Social Science Research Group, in the framework of the FIT4FOOD2030 project.

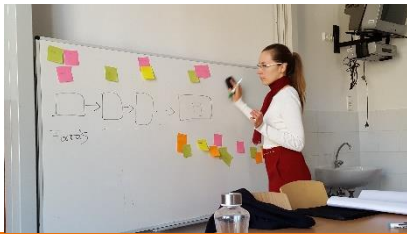
PREPARING THE SETTING


If possible, the best is to have a flexible setting. Starting the workshop with the chairs in a circle to encourage sharing and dialogue and then creating separate workspaces for each team, as well as, a space for the additional material, such as, pictures and trend cards, etc. that they can use for concept map creation.

DETAILED DESCRIPTION OF THE MODULE SCRIPT

| <i>Activity step</i> | <i>Time requirement</i> | <i>Description of activity</i> | <i>Competences</i> |
|---|-------------------------|--|---|
| Bridge – in | 5 min | The facilitator introduces her/himself and briefly introduces the aim of the session. | |
| Setting Expectations Optional part, recommended when the participants are not familiar with each other/with general audience/outside of a formal institutional context | 25 – 30 min | Participants are sitting in a circle. The facilitator asks them to briefly share about: <ul style="list-style-type: none"> • Why did they choose to attend the workshop? • What is their connection to the topic of the workshop? If there are more than 12 participants -choose one of the questions for being able to stay in the timeframe. | |
| Pre-assessment | 5 min | Associations about the food system The participants receive 3 post-its each. Facilitator asks them to write down one association per post-it that they have when they hear the phrase “food system”. | Self-awareness |
| | 10 – 15 min | Start to create shared understanding about what associations participants have about the food system by asking several students to share. After each sharing put up post its on the board/flipchart already starting to cluster them. Ask whether anybody has a same or similar idea that was mentioned before. | Participatory ability Sense making |

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| | | | |
|--|-------------|---|--|
| | | <p>Potential ways to group based on the incoming answers: various actors, elements of the system, creating a visual of the processes & making up the value chain, values, etc.</p>  | |
| The Doughnut Can be left out/substituted depending on the needs of the target group | 5 min | <p>Introduce the Doughnut model for creating context and establishing the base for how the food system is connected to the ecosystem and the need for change.</p> | Responsible long-term thinking |
| “The journey of my breakfast” | 10 min | <p>Each participant writes down what they ate for their most recent meal (e.g.: breakfast), detailing the components.</p> <p>Then the facilitator asks them to choose one component of their meal. This can be a relatively simple ingredient, such as, lettuce, milk, an egg, an apple, etc. However, it can become more complex in the case of processed foods (e.g.: fish sticks, candy bar...)</p> <p>Participants are asked to track back the steps that the food item needed to go through from its source.</p> | <p>Self - awareness</p> <p>Food system thinking</p> <p>Analytical thinking</p> |
| | 10 – 15 min | <p>Initiate plenary discussion by asking some of the participants to share their journey. This step of the workshop is really important for establishing links: ask participants to explain how each step of the previously mentioned journey might have impacted the environment and communities.</p> <p>You can ask in plenary how many steps each person has in their journey. (E.g. Who has more than 10? Who has less than 3? Etc.)</p> <p>Here you can introduce the concept of short supply chains and reflect together with</p> | <p>Participatory ability</p> <p>Critical thinking</p> <p>Ethical thinking</p> <p>Food systems thinking</p> |

| | | | |
|-----------------------------|--------|---|---|
| | | participants on how short chains might impact: communities, human health, environment. E.g: What can be the benefit of buying food from these sources? | |
| Creating shared concept map | 35 min | <ol style="list-style-type: none"> 1. In advance prepare the trend cards and pictures, additional materials. 2. Divide participants into small groups of 3 – 5 people 3. Ask participants to draw/create a representation of the food system on the flipchart before them. Tell them that they are free to draw, write, use the post-its, trend cards and pictures and any additional material that they would like. 4. Tell them how much time they have. 5. During the exercise, go around. When  <p>you see that participants are getting close to finishing their maps present them with the following two tasks (Besides telling them, also write them out on the flipchart/board):</p> <ol style="list-style-type: none"> a. What they think is the most import to be changed in the system? (crucial leverage point for positive change) Each participant writes this down individually. Then the group needs to agree on what they think is the most important. b. Ask them to draw themselves (individually) on the map after thinking about their own role within the system. | <p>Food systems thinking</p> <p>Sense making</p> <p>Analytical thinking</p> <p>(Transdisciplinary) collaboration</p> <p>Communication</p> |
| Presenting Concept maps | 20 min | <ol style="list-style-type: none"> 1. After the concept maps are ready ask each group to present their maps to the whole class. | Oral presentation |

| | | | |
|-----------------------|--------|---|---|
| | | <ol style="list-style-type: none"> 2. After the presentation ask participants from other groups to pose their questions, comments. 3. Pose questions to the group that presented. While they are presenting their concepts, most important aspect to change and individual role and place within the system think about guiding questions that can support participants in discovering new relationships and system dynamics, as well as, increase the depth of their reflection. 4. Go to the next group and repeat. (It worked well to ask participants to come and gather around the table of the presenting group – movement increased attention and facilitates discussion if participants are not so confident in speaking up) | <p>Food system thinking</p> <p>Sense making</p> <p>Ethical and long-term thinking</p> |
| Closing circle | 10 min | <p>If possible, bring back participants into a circle.</p> <ol style="list-style-type: none"> 1. Ask them to share what they learnt and what they are bringing with them from the workshop. 2. Name one action that they would like to do differently based on the workshop. | <p>Reinforcing learning points</p> <p>Self-awareness</p> <p>Opportunities for behavioral change</p> |

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ANNEXES

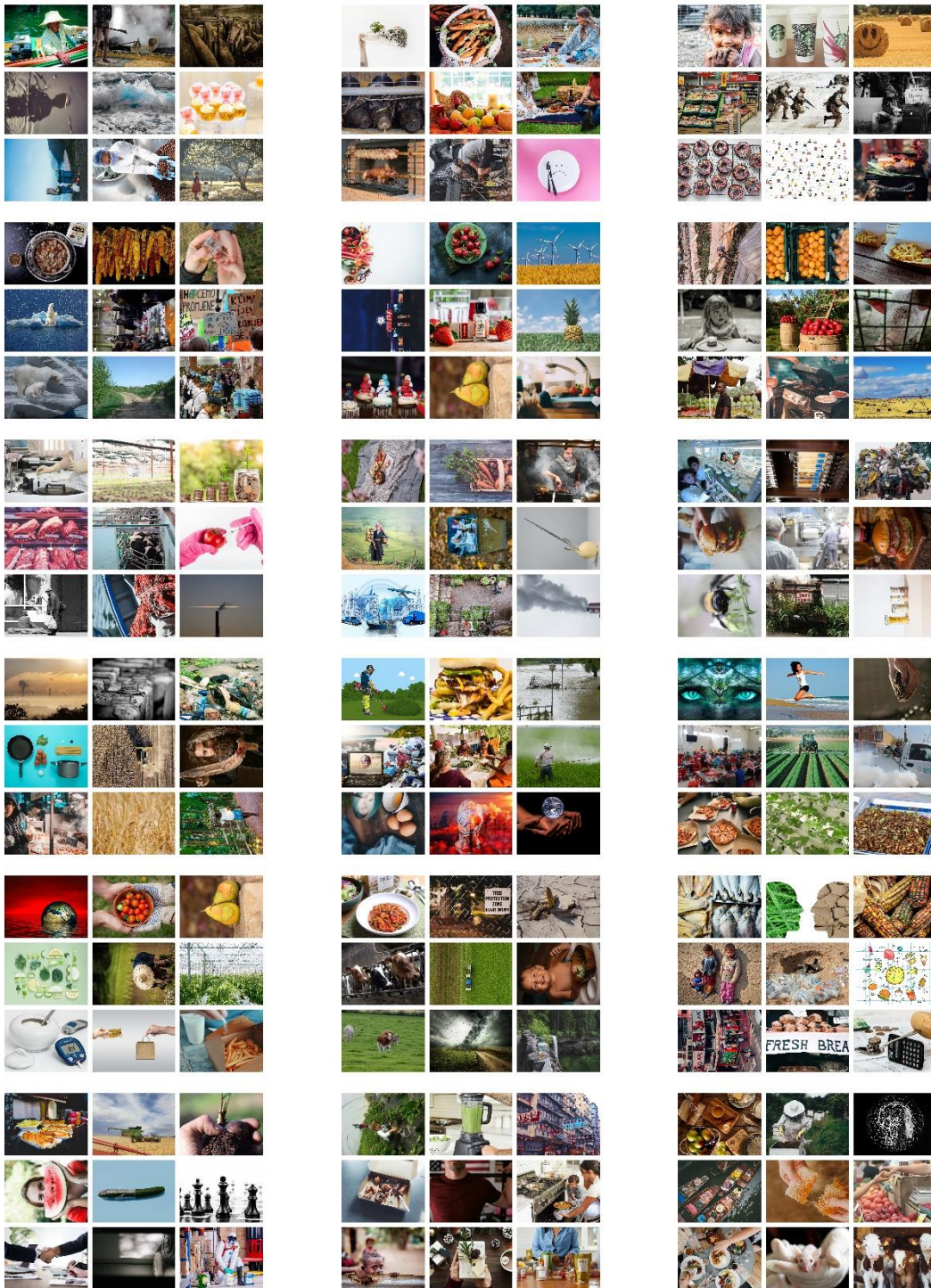
ANNEX 1 Pictures of the food system (available online in higher resolution)

ANNEX 2 [FIT4FOOD2030 TREND CARDS](#) (landscape orientation)

ANNEX 3 Pictures illustrating the workshop

City Lab Budapest: Our Food System – annexes

ANNEX 1 Pictures of the food system (available online in higher resolution)



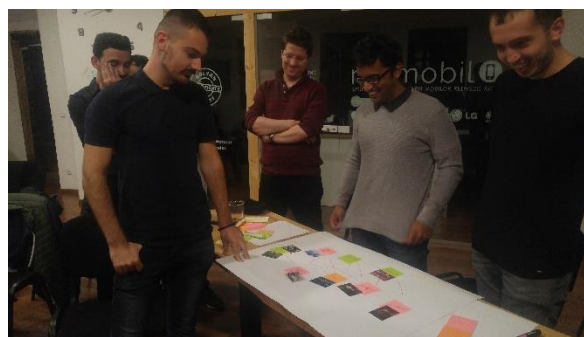
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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No774088

ANNEX 3 Pictures illustrating the workshop

Pictures from the piloting session with a general audience:



Examples of concept maps made by participants during the piloting session with university students:



"The two worlds"



fit4food2030.eu - #FOOD2030EU

Valuable Market

*The activity has been developed by the educational staff of the **National Museum of Science and Technology Leonardo da Vinci in Milan, Italy**. It is based on the experimental and interactive methodologies applied in the educational activities of the Food and Nutrition Interactive Lab of the Museum, which rely on the principles of non-formal learning. The Museum collaborated with the association Recup (which fights food waste with volunteer work to recover surpluses in public markets, donating it to persons in need) to embed in the activity an outreach part in public markets, that provides the starting point for the involvement and for the open reflection which is then further explored with the experimental activity.*

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DA VINCI**

AT A GLANCE

| | |
|-------------------------------|--|
| Thematic Areas | <ul style="list-style-type: none"> - Food waste; - Ethic and social value of food; - Social inclusion; - Food education; - Active participation of different citizens groups. |
| Format | <p>Interactive activities:</p> <ul style="list-style-type: none"> - Activity 1: activity of food surpluses recovered in a neighborhood market, with the support of the volunteer association (A1) - Activity 2: experimental activity on collected food in the museum lab (A2) |
| Duration | <ul style="list-style-type: none"> - A1: 2 hours - A2: 1 hour |
| Type of audience | Citizens/General Public |
| Age group | <ul style="list-style-type: none"> - A1: Adults, students (+16 years old) - A2: Families with children (+8 years old) |
| Number of participants | <ul style="list-style-type: none"> - A1: 10 |

| | |
|--|---|
| | - A2: 10-20 |
| Prerequisites for participation | No prerequisite is needed for both the activities. |
| Number of facilitators | <ul style="list-style-type: none"> - A1: 2 facilitators needed + 1 volunteer - A2: 1 facilitator needed |
| Overall difficulty | <p>Topic: Basic</p> <p>Preparation: Intermediate</p> <p>Facilitation: Intermediate</p> |

OVERVIEW

The module engages groups of citizens in two different activities: the first one concerns collection and recovery of fruit and vegetables remained unsold or that risk to be thrown away at the end of the day in a neighbourhood market; then, an experimental activity with the recovered food aims to increase the knowledge about the nutritional values still present in the recovered food (presence of vitamins).

OVERALL AIM

Citizens become an active community in the recovering and redistributing process and, through the experimental activity in lab, they become aware on the still-present nutritional value in recovered food and how to concretize an action to combat food wastage.

SPECIFIC (LEARNING) OBJECTIVES

After the successful completion of this module, participants are expected to be able to:

- Understand the process of food wastage in a neighbourhood market and possible solutions
- Value and prioritise the ethical, social and cultural features of food
- Become aware of the concrete actions they can undertake in order to contribute to social needs (such as self-organized groups against food waste)
- Recognize the nutritional properties of food which risks to be wasted

SUGGESTED SCENARIO FOR IMPLEMENTATION

- A1: Neighbourhood market with fruits and vegetables stands;
- A2: Museum lab, classroom or any other space that can be arranged with tables, chairs and kitchen utensils.

| TOPICS & COMPETENCES COVERED BY THE ACTIVITY | | |
|--|--|---|
| Thematic area(s) | <ul style="list-style-type: none">- Food waste;- Ethic and social value of food;- Social inclusion;- Food education;- Active participation of different citizens groups. | |
| FOOD2030 Research & Innovation priorities | | |
| Priority | Indicate whether main or secondary | Addressed through |
| Circularity & Resource Efficiency | Main | <ul style="list-style-type: none">- Collection of food surpluses (A1) |
| Innovation & Empowerment of Communities | Main | <ul style="list-style-type: none">- Engagement of different social groups of citizens (A1);- Redistribution of food to disadvantaged categories. |
| Nutrition & Health | Secondary | <ul style="list-style-type: none">- Demonstration of the still-present nutritional values in food surpluses (A2) |
| Climate & Sustainability | Main | <ul style="list-style-type: none">- Limitation of the food wastage (A1) |
| Responsible Research and Innovation (RRI) | | |
| Related concept | Addressed through | |
| Scientific Education | <ul style="list-style-type: none">- Experimental activity on properties and nutritional value of recovered food, through an inquiry-based approach for learning- Reflection on food origin | |
| Public Engagement | <ul style="list-style-type: none">- Engagement of different social groups of citizens to reflect on food waste (A1); | |






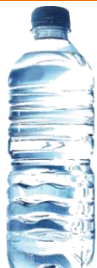
| | |
|---|--|
| Ethics | <ul style="list-style-type: none"> - Improvement of the awareness of the importance of a responsible and sustainable consumption (A1; A2) |
| Research & Innovation (R&I) | |
| <i>Related concept</i> | <i>Addressed through</i> |
| Food analysis and food nutritional properties | Experimental activity on properties and nutritional value of recovered food |
| (Food) Systems thinking | |
| <p>The module aims to integrate and potentiate the Food System-declined RRI competences, through some specific actions:</p> <p>ANTICIPATION</p> <ul style="list-style-type: none"> - <i>Food-related abilities</i>: knowledge on food properties - <i>Future-oriented ethical abilities</i>: giving importance to the sustainability implications of preventing and avoiding food waste <p>REFLEXIVITY</p> <ul style="list-style-type: none"> - <i>Social awareness and empathy</i>: understanding the dynamics of food wastage <p>RESPONSIVENESS</p> <ul style="list-style-type: none"> - <i>Navigating Complexity</i>: approaching the food system in a systemic way <p>INCLUSIVENESS</p> <ul style="list-style-type: none"> - <i>Multi-perspective and intercultural communication</i>: embracing the comprehension of the system through social collaboration - <i>Participatory ability</i>: collaborating in groups | |
| Potential of bringing the arts, socio-economic science and humanities creatively or trans-disciplinarily with the module? | |
| <p>Social sciences approaches:</p> <p>Part of the module is settled in a public market, and address a social innovation practice, involving the participants in a multicultural space and in a possible way to improve the local food supply chain through volunteering.</p> | |

| TARGET AUDIENCE | |
|---|--|
| Audience category | Citizens/General Public |
| Recommended number of participants | From 10 to 20 |
| Recommended age | Adult |
| Prerequisites | No prerequisite is needed for either activity. |






| OPTIONS FOR MULTI-STAKEHOLDER ENGAGEMENT | |
|--|---|
| <i>Stakeholder</i> | <i>Role envisaged in the activity</i> |
| Ethical purchasing groups (GASes) | Possible participants of the activities. |
| Supermarket chains | Possible alternative to the market, as a setting of the A1. |

| SETTING UP THE MODULE |
|--|
| FACILITATION/DELIVERY |
| <p>For A1: 2 facilitators</p> <p>For A2: 1 facilitator</p> <p>Suggestions for the facilitator in the different phases:</p> <ul style="list-style-type: none"> - PREPARATION First, the preparation of the setting and the context of the activities is crucial to create a positive habit in which participants can work. It can be referred to the physical space where the activity takes places or to a proper and efficient stakeholder engagement. - EXPERIMENTAL ACTIVITY It's important to stimulate the direct participation of each participant, trying to avoid demonstrations. For a succeeding activity, the facilitator encourages hypothesis, descriptions of the phenomena or any other comment before and during the practice. Trying to engage the participants, it is suggested to alternate moment of practical activity with a dynamic interaction using questions and debates. As regards the scientific aspects of the experimental activity (A2) proposed, it can be useful for the facilitator to take in account the content of <i>Annex 1</i> and <i>Annex 2</i>. - DISCUSSION |

During the collective moment it is better to stimulate and boost the horizontal interaction, asking a lot of questions and enhancing the debate among participants. For a successful debate, it is better to let the participants start the discussion in small group first: the facilitator limits their intervention, just checking up on each group. Then, the facilitator invites the participants to share in plenary their thoughts about the theme.

| RESOURCES | | |
|--|---|--|
| <i>Physical materials</i> | | |
| <i>Resource name</i> | <i>Picture</i> | <i>Number/quantity</i> |
| Activity 1 – Collection at the market | | |
| Recovered boxes or containers |  | From 10 to 20 (one for each participant) |
| Weight Scale |  | 1 |
| Activity 2 – Experimental activity | | |
| Little pot or any other containers to heat the water |  | 1 |
| Microwaves oven or hotplate |  | 1 |
| Water |  | 850 ml |
| 1lt bottles with stoppers |  | 2 |

| | | |
|-----------------------------|---|---------------|
| Dropper |  | 1 |
| Corn-starch or wheat powder |  | 2 tablespoons |
| Iodine tincture |  | 5 drops |
| Mortars with pestles |  | 4 |
| Juicers |  | 4 |
| Knives |  | 4 |
| Cutting boards |  | 4 |
| Plastic dishes |  | 20 circa |

| | | |
|-------------------------------------|---|----------|
| Small glasses or 50 ml/100ml beaker |  | 20 circa |
| Droppers |  | 4 |
| Recovered fruit and vegetables |  | 8 |
| Effervescent vitamin C tablets |  | 2 |
| Water |  | 100 ml |
| Lugol's iodine | | 60 drops |
| Reagent (starch in solution) | | 300 ml |

PREPARING THE SETTING

A1- Collection of food at the market:

Before the activity starts, it is suggested to create *an easy-identifiable area* (a welcome station, table or stand) as the meeting point for the participants. The station is arranged with boxes or recovered containers, available for the collection.

Note: it is better than no more than two days pass between the two activities, to prevent fruit and vegetables from rotting.

A2 – Experimental activity

The activity can take place in a room, in a classroom or in the school science lab; tables and chairs are gathered to create 4 workstations, in each of which 5 people work together. A table for each workstation is needed to place the material for the activity.

| | DETAILED DESCRIPTION OF THE MODULE SCRIPT | |
|---|--|-------------------------------------|
| | <i>Step</i> | <i>Competences of participants</i> |
| Activity 1: <i>Collection at the market</i> | Preliminary preparation Before the activity it is suggested to visit the chosen market, in order to sensitize and engage the vendors about the aims and the different phases of the collection. It is better to set the beginning of the activity at least 1 hour before the market closes, when vendors start to count the products unsold and dispose of the waste. | // |
| | Group management: 10 minutes Welcome the participants in a predefined area, identifiable with a station (table or stand) arranged with boxes or recovered containers and provide them with some explanation about the activity and the materials needed. | - Participatory ability |
| | Introduction: 10 minutes Agree with participants: <ul style="list-style-type: none"> - The organisation of the collection (in groups or pairs) - Where each group or pair is going to do the activity (which stand?) - Some questions to address to the vendors, to know why some types of fruit and vegetables remain unsold (How much fruit is left? Why? What do people prefer to buy? How many products do you buy from your wholesaler? Where does this type of vegetable come from? Have you any recipe to suggest?) | |
| | Development: 40 minutes <i>Collection of the food</i> The participants, in groups or pairs, collect fruit and vegetables donated by the vendors and bring the food at the welcome station where the redistribution will | - Future-oriented ethical abilities |

| | | |
|------------------------------|---|-----------------------------------|
| | <p>take place.</p> <p>It is better to throw away fruit and vegetables which are clearly rotten and no more edible.</p> <p>Then, the participants proceed in weighing the food, in order to know the quantity of what has been collected.</p> <p>Conclusion: 1 hour</p> <p><i>Redistribution</i></p> <p>Place the food in boxes or other containers.</p> <p>Organise the distribution to:</p> <ul style="list-style-type: none"> - Associations which operate and help in matter of food poverty. - People who spontaneously show up at the distribution point, until all fruit and vegetables are used up. <p>Save about 20 products, among fruit and vegetables for the experimental activity.</p> | |
| | | - Social awareness and empathy |
| Activity 2: | Preliminary preparation | // |
| Experimental Activity | <p>Before the activity starts, the facilitator prepares the Lugol's iodine, following the instructions below:</p> <ul style="list-style-type: none"> - Prepare the reagent: pour 500 ml of water in a pot and add 2 tablespoons of corn-starch. - Bring the mixture to the boil for few minutes (it's possible to use microwave oven) and let it cool. In this way the quantity of the reagent prepared is greater than the one needed for the activity. Anyway, it is better to have a stock available. Store the liquid in 1 l bottle and close it with a stopper. - Prepare Lugol's iodine: pour 250 ml of water in a bottle with stopper and add with the dropper 5 drops of iodine tincture. Close the bottle and shake. In this way the quantity of Lugol's iodine prepared is greater than the one needed for the activity (about 60 drops); anyway, it's difficult to foresee the exact quantity to be use. It's better to have a stock available. | |
| | Group Management | // |
| | <p>The facilitator welcomes the participants (20), divides them in groups (4), clarifies the aims of the activity.</p> | |
| | Introduction: 15 minutes | - Multi-perspective communication |

| | | |
|--|---|---|
| | <p>The facilitator clarifies to the participants the aims of the activity:</p> <ul style="list-style-type: none"> - to share, to discuss and to compare the information given them by the vendors. - to investigate the nutritional properties (presence of vitamins) of the collected food. <p>Then, the participants are asked to report the results of the inquiry done with vendors They share the answers given by the vendors regarding the reasons of food surplus. Comparison and discussion about the answers are helpful to identify the crucial factors involved.</p> | |
| | <p>Development: 30 minutes</p> <p><i>Searching for vitamins in recovered fruit and vegetables</i></p> <p>To introduce the experimental activity, the facilitator can ask some questions to the participants, such as:</p> <ul style="list-style-type: none"> - Where do you think that this food comes from? - Would you eat it? Why? - Do you already know these fruits/vegetables? <p>And once the participants are ready to manipulate the food with the tools:</p> <ul style="list-style-type: none"> - What do you think these fruits/vegetables contains? - Why do we eat fruits and vegetables? - Can the food about to be wasted still be good? <p>Each group works with two fruits or vegetables, following the instructions below:</p> <ul style="list-style-type: none"> - Cut, squeeze, crush with mortar and pestle fruit and vegetables to extract the juices. Extract 25 ml of juice for every fruit and pour it in a glass or in a beaker. - Add 25 ml of reagent in each beaker with extracted juice. - Add 4 or 5 drops of Lugol's iodine and observe the reaction (if the colour of the reagent changes once it touches the liquid). - Prepare the comparison: dissolve half a tablet of vitamin C in a beaker with 25 ml of water. | <ul style="list-style-type: none"> - Participatory ability |

| | | |
|--|---|---|
| | <ul style="list-style-type: none"> - Add 25 ml of reagent and 4 or 5 drops of Lugol's iodine and observe if the colour of the reagent (purple) changes once it touches the juice. <p>Results: the purple colour disappears = the juice contains vitamin C the purple colour doesn't disappear = the juice doesn't contain vitamin C</p> <p>In most cases, if it hasn't been too long since the collection, vitamins are still present in the products. The solution with vitamin C (the purple colour of the reagent disappears) helps to understand how to interpret the result. Share the experimental results of each group and discuss about the quality of the recovered food.</p> | |
| | <p>Conclusion: 15 minutes</p> <p>In the final part of the activity, the facilitator focuses on what comes out from the activity, in order to point the attention on:</p> <ul style="list-style-type: none"> - the reason why we waste food; - nutritional properties, which are still present in the food we waste; <p>which are the key messages of the educational module.</p> <p>Some guiding questions could be:</p> <ul style="list-style-type: none"> - Which kind of food do you waste at your home? - Where does the wasted food go? - Do you know any food waste recover practice? <p>In this process, the facilitator doesn't give an explanation directly to the participants but engages them with questions on their perception of waste and on what emerges from the experimentation.</p> | <ul style="list-style-type: none"> - Navigating complexity |

DEVELOPERS

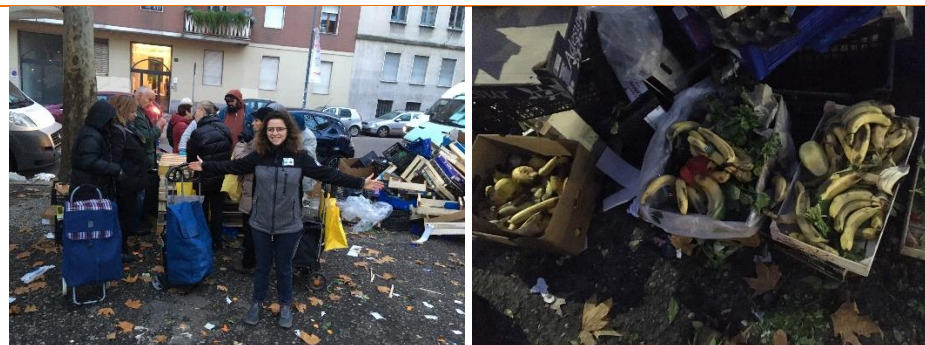
The module is designed and implemented by the educational staff of the National Museum of Science and Technology Leonardo da Vinci in Milan, Italy, together with RECUP, an association of social promotion which operates on a local scale, in social inclusion through the recovery of food. From several years, RECUP has strengthened a mutual relationship with

street vendors and has experimented recovering activities in different neighbourhood markets.

Recup association: <https://assoziazionerecup.org/>

A check for scientific accuracy was done by Valeria Chiodini, Responsible for Food and Nutrition Interactive Lab of the National Museum of Science and Technology

IMAGES ILLUSTRATING THE ACTIVITY



At the market



Experimental activity

ANNEXES

- Annex 1: Preparation of the Lugol's iodine
- Annex 2: Explanation of the reaction

Annex 1

PREPARATION OF THE LUGOL'S IODINE

MATERIALS

1 bottle of amber glass with stopper or a beaker (600 ml capacity)
15 ml test tubes with stoppers
1 graduated pipette
1 funnel
iodine tincture (available in pharmacy)

HOW TO

Bring the iodine tincture, the plastic pipette, the bottle or the beaker.

Aspire with a pipette some iodine tincture.

Pour 5 drops of iodine tincture in the bottle or in the beaker and add water up to reach 250 ml. Mix the solution.

At the end of the procedure, the Lugol's iodine appears limpid and brownish.

SAFETY AND DISPOSAL

Read the iodine tincture safety sheet carefully to use it safely and dispose of it properly.

Annex 2

EXPLANATION OF THE REACTION

(This information can be useful to the facilitator while he addresses to the participants, to stimulate the reflection on the key items of the experience)

The reagent (water and corn-starch, as known as starch solution) is a turbid liquid which assumes an intense purple colour when in contact with Lugol's iodine.

Lugol's iodine (or Lugol solution) is an hydroalcoholic yellow-brown iodine solution.

Starch consists in a long molecule formed by numerous glucose units. Its helical shape is responsible for the intense purple colouring assumed by Lugol's solution. The molecule of iodine can fit perfectly into the starch helix and this interaction causes an immediate change in colour, from yellow-brown to dark purple.

The reaction described is reversible in presence of vitamin C. The foods containing vitamin C break up the starch-iodine complex and bring the reagents back to their initial colour. The greater the amount of vitamin C present, the greater the change.

In the absence of vitamin C the reagent maintains its dark purple colour.

Visions of Future Food

The activity has been developed by the educational staff of the National Museum of Science and Technology Leonardo da Vinci in Milan, Italy. It is based on the experimental and interactive methodologies applied in the educational activities of the Food and Nutrition Interactive Lab of the Museum, which rely on the principles of non-formal learning.

The activity also incorporates approaches deriving from social research (concept mapping) and from the system understanding methodologies adopted in FIT4FOOD2030 (visioning).

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AT A GLANCE

| | |
|--|--|
| Thematic Area | <ul style="list-style-type: none"> - Systemic approach - Scientific citizenship - Innovation and transformation of the systems - Future studies - Food and research |
| Format | Visioning process developed through an experimental activity with the optional intervention of an expert/researcher, and a creative expression of a future scenario with artistic tools. |
| Duration | 1 hour and a half |
| Type of audience | <ul style="list-style-type: none"> - High school students - University-level students |
| Age group | From 16 years old students to 20 years old students |
| Number of participants | 20 |
| Prerequisites for participation | No prerequisite is needed for the activity |
| Number of facilitators | 1 facilitator + 1 researcher (optional) |
| Overall difficulty | <p>Topic: Intermediate</p> <p>Preparation: Intermediate</p> |

| | |
|--|-----------------------------------|
| | Facilitation: Intermediate |
|--|-----------------------------------|

OVERVIEW

The activity is structured into different phases, interconnected:

- The creation of a concept map
- An experimental activity
- An activity of visioning

The visioning exercise starts from a crucial question, concerning one of the main aspects of the food system: “what will be the future of food?”, explored in three possible contexts: food consumption, food production and food purchase.

The experimental activity (about proteins in insects-based food) and the participation of an external expert can help in the exploration of these themes with alternative tools and help students in formulating hypothesis and drawing a vision of the future.

OVERALL AIM

The module purpose is to reflect about the links among different areas of the food system, to involve students’ abilities and competences in reading and interpreting the systemic dimension of food and its development in the future.

SPECIFIC (LEARNING) OBJECTIVES

After the participation to this module the participants should be able to:

- Understand the concept of “systemic perspective” referring to the food supply chain, in order to read and interpret the food system as:
 - A complex of relations and connections between parts, in order to improve an interdisciplinary approach to the comprehension of researches and developments in this field.
 - A dynamic and growing network, as the comprehension of the development process can foster a responsible and sustainable transformation
- Visualize future scenarios with novel foods
- Experiment a stronger emotional engagement linked to the topic of food system

SUGGESTED SCENARIO FOR IMPLEMENTATION

The activity can be proposed during school hours, in events of orientation to STEM careers, during university and research centres open days.

TOPICS & COMPETENCES COVERED BY THE ACTIVITY

| | |
|-------------------------|---|
| Thematic area(s) | - Systemic approach for the understanding of the elements of the food system; |
|-------------------------|---|

| | |
|--|---|
| | <ul style="list-style-type: none"> - Interdisciplinary vision of research and development process in the agri-food field; - Scientific citizenship and innovative competences; - Connections between research and civil society. |
|--|---|

FOOD2030 Research & Innovation priorities

| <i>Priority</i> | <i>Indicate whether main or secondary</i> | <i>Addressed through</i> |
|---|---|---|
| Circularity & Resource Efficiency | Secondary | <ul style="list-style-type: none"> - Experimental activity, to increase awareness on novel food properties and possibilities |
| Innovation & Empowerment of Communities | Main | <ul style="list-style-type: none"> - Activity of visioning to foster the reflections on hypothesis and visions for future food scenarios |
| Nutrition & Health | Main | <ul style="list-style-type: none"> - Experimental activity, to explore novel foods properties and nutritional value. |
| Climate & Sustainability | Main | <ul style="list-style-type: none"> - Experimental activity, to increase awareness on novel food properties and possibilities |

Responsible Research and Innovation (RRI)

| <i>Related concept</i> | <i>Addressed through</i> |
|------------------------|---|
| Public Engagement | <p>Exploring research aspects of the food system</p> <p>Active involvement of the students as citizens and stakeholder of the food system</p> |

| | |
|---|--|
| Scientific Education | <p>Experimental activity on properties and nutritional value of novel food, through an inquiry-based approach for learning</p> <p>Multidisciplinary approach to science</p> <p>(Interaction with an expert in an informal setting)</p> |
| Research & Innovation (R&I) | |
| <i>Related concept</i> | <i>Addressed through</i> |
| <p>Food analysis and food nutritional properties</p> <p>Awareness that R&I address different aspects of the food system</p> | Experimental activity |
| (Food) Systems thinking | |
| <p>The module aims to integrate and potentiate the Food System-declined RRI competences, through some specific actions:</p> <p>ANTICIPATION</p> <ul style="list-style-type: none"> - <i>Food-related future studies abilities</i>: inquiry on novel food, visioning the possible development of food systems <p>REFLEXIVITY</p> <ul style="list-style-type: none"> - <i>Situational awareness</i>: understanding the complexity of Food System and reflecting on its several implications in different fields. <p>RESPONSIVENESS</p> <ul style="list-style-type: none"> - <i>Navigating Complexity</i>: reflecting on an articulated vision of the Food System and the ability to explore it. <p>INCLUSIVENESS</p> <ul style="list-style-type: none"> - <i>Multi-perspective communication</i>: understanding the system through dialogue embracing others' opinions. - <i>Participatory ability</i>: collaborating in groups and comparing different standpoints. - <i>Transdisciplinary collaboration</i>: mixing different competences and field of actions, avoiding sectorial separations. | |

Potential of bringing the arts, socio-economic science and humanities creatively or trans-disciplinarily with the module?

Social sciences approaches:

The module includes a methodology for concept mapping that comes from social research, and serves to explore people's conceptions about a topic.

Creative and artistic approaches:

The module exploits artistic tools, such as drawing tools and mouldable paste, in order to foster imagination in the process of visioning of future scenarios about food.

TARGET AUDIENCE

| | |
|---|---|
| Audience category | <ul style="list-style-type: none"> - High school students - University-level students |
| Recommended number of participants | 20 |
| Recommended age | From 16 years old to 20 years old |
| Prerequisites | No prerequisite is needed for the activity |

OPTIONS FOR MULTI-STAKEHOLDER ENGAGEMENT

| <i>Stakeholder</i> | <i>Role envisaged in the activity</i> |
|---------------------|---|
| Food system experts | Dialogue with participants moderated by the facilitator, on the Personal Meaning Map and on the Food System scenarios, to reflect on future perspectives of research, and on challenges and opportunities of the science of food. |

SETTING UP THE MODULE

FACILITATION/DELIVERY

Needed for the implementation of the activity:

1 facilitator (optional: 1 researcher or expert of the food system)

Suggestions for the facilitators in the different phases:

- PREPARATION

First, the preparation of the setting and the context of the activities is crucial to create a positive habit in which participants can work. It can be referred to the physical space where the activity takes place or to a proper and efficient stakeholder engagement.

- CREATION OF A PERSONAL MEANING MAP (part 1 and 2)

See the link in Resources:

Personal Meaning Map:

<https://www.raeng.org.uk/publications/other/ingenious-personal-meaning-mapping>







- OPTIONAL CONTRIBUTION OF AN EXTERNAL EXPERT
(RESEARCHER OR FOOD SYSTEM PROFESSIONAL)


It might be useful to suggest to the expert to alternate his intervention with some questions, to stimulate the participation of the public.

Before the facilitator introduces the expert, ask the participants about their perception on his profession can be interesting and can stimulate the debate with the expert himself. When students have the possibility to spontaneously ask questions, they are often interested to personal aspect of the researcher's life, on his professional career and his academic experience. These elements can stimulate students' attention during the dialogue.

- EXPERIMENTAL ACTIVITY

It's important to stimulate the direct participation of each participant, trying to avoid demonstrations. For a succeeding activity, the facilitator has to encourage hypothesis, descriptions of the phenomena or any other comment before and during the practice. Trying to engage the participants, it is suggested to alternate moment of practical activity with a dynamic interaction using questions and debates. The facilitator has to avoid unveiling the results of the experiment before all the participants have made their considerations and comments. Referring the main scientific features of the experimental activity proposed, it can be useful for the facilitator to take in account the content of *Annex 2* and *Annex 3*.

| RESOURCES | | |
|---|---|--|
| <i>Physical materials</i> | | |
| <i>Resource name</i> | <i>Picture</i> | <i>Number</i> |
| Chopped meat (bovine, swine or poultry) |  | 10 gr |
| Dried insects (i.g. flour worms) |  | 10 gr |
| Fruit (or any other food without proteins) |  | 10 gr |
| Pipettes |  | 2 |
| Copper sulphate solution (see attachment for the preparation of the solution) |  | 1 test tube with stopper (minimum capacity 10 ml) |
| Sodium hydroxide solution (see attachment for the preparation of the solution) |  | 1 test tube with stopper (minimum capacity 25 ml) |

| | | |
|--------------------------------|---|----------------------------|
| Becher (100 ml capacity each) |  | 12 |
| Post-it of 2 different colours |  | 60 post-it for each colour |
| A3 sheets |  | 25 |
| Moldable paste (or clay) |  | 100 g for person |
| Felt pens of different colours |  | At least 20 |

Useful links, videos, articles

Personal Meaning Map:

<https://www.raeng.org.uk/publications/other/ingenious-personal-meaning-mapping>

Food Systems

<https://foodsource.org.uk/building-blocks/what-are-food-systems>

PREPARING THE SETTING

The activity can take place in a room, in a classroom or in the school science lab; tables and chairs are grouped to create 4 workstations, in each of which 5 people work together. A table for each workstation is needed to place the material for the activity.

A free wall might be useful to hang the conceptual map to make it visible to everyone. The activity alternates individual work to group work and plenary sessions with the mediation of a facilitator.

Before the activity starts:

- Place the materials for the experimental activity
- Prepare the copper sulphate solution and the sodium hydroxide solution.

DETAILED DESCRIPTION OF THE MODULE SCRIPT

| Step | Competences of the participants |
|--|---------------------------------|
| Preliminary preparation The facilitator prepares the copper sulphate solution and the sodium hydroxide solution following the instruction in Annex 2 and Annex 3. | // |
| Group management Divide the participants in 4 groups and let them take sit around the workstations. | - Situational awareness |
| Introduction: 10 minutes <i>Creation of a map - Personal Meaning Map on the theme: “Food System” – part 1</i> The first part of the activity is focused on exploring all the key areas of the complexity of the food network, starting from participants’ experiences and knowledge. The Personal Meaning Map is the tool used to create the very first scenario of participants’ ideas on food system (to deepen the methodology of the map, see the link in Resources). To introduce the theme “Food System”, the facilitator prepares a poster-dimension sheet writing on it: “FOOD SYSTEM”. He explains the purpose of the activity that is the creation of a cognitive map to stimulate the discussion. He asks the participants to write on a post-it a key word (associated with a certain experience) which is related to the idea of food system. It’s important to use post-it of all the same colour in this first phase. Each participant individually writes 2 or 3 key words then, starting from a volunteer, participants share and shortly explain the chosen words and, at the same time, attach the post-it on the map. In case of similar words or experiences, participants can join other explanations. | |

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| <p>It's possible to gather and to cluster words and concepts, naming each group of words after a short plenary negotiation on the possible choices. The next phase is dedicated to expanding and deepening the knowledge about the elements which the map is composed by, through the experimental activity. The map is now left in the background and will be reconsidered after the hands-on phase.</p> | |
| <p>Development part 1: 15 minutes</p> <p><i>Experimental activity</i></p> <p>The facilitator introduces the activity as a tool to stimulate new ideas or new questions on the food system.</p> <p>He starts making questions such as: "What do insects contain? Why, in your opinion, insects are considered as one of the novel foods of the future?"</p> <p>Meanwhile, he takes note of the hypothesis and proposes to find the answer through experimentation. He proceeds giving each group the following instructions to work with:</p> <p><i>Experimental protocols for groups</i></p> <p>Put the chopped meat, the insects and the fruit in three different bechers (one for each substance).</p> <p>Add the reagents to each becher, in the following ways: 3 parts of sodium hydroxide and 1 part of copper sulphate. i.g.: 7,5 ml of sodium hydroxide and 2,5 ml of copper sulphate.</p> <p>Leave for few minutes and observe the change in the colour of the reagent when in contact with foods and insects.</p> <p>Results:</p> <p>Meat: the reagent turns purple Insects: the reagent turns purple Fruit: the reagent doesn't turn purple (it remains light blue)</p> <p>The explanation of the phenomena is the following: In presence of proteins the reagent turns purple. In absence of proteins the reagent maintains its original colour (light blue). Copper ions (copper sulphate) react with the protein peptide bond, giving an intense purple colour in a basic solution (sodium hydroxide). Insects and meat, therefore, contain proteins. Fruit does not contain proteins (negative control).</p> <p>Once the experiment is finished, the facilitator stimulates the reflection on protein content of foods, without directly giving explanation but making questions to the participants. He shares in plenary the observations of the public, going back to the initial issue (What do insects contain? Why they are considered as one of the foods of the future?)</p> | <p>- Future studies abilities</p> |

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| <p>Questions help the reflection and the comparison between usual foods (meat, fruit) and novel foods (insects). They can be, e.g.:</p> <ul style="list-style-type: none"> - Which colour do you observe? - Why did the food change its colour? - What these foods have in common? | |
| <p>Development part 2: 15 minutes</p> <p><i>Expansion of a map - Personal Meaning Map on the theme: “Food System” – part 2</i></p> <p><i>Contribution of the researcher</i> The researcher asks the participants if the experimental context has aroused some other impression or reflection and if they need to enrich the map, by adding other words;</p> <p>To do that, participants use the second-colour post-it. The researcher comments and discusses about the map together with students, aiming to:</p> <ul style="list-style-type: none"> - Establish connections between the emerged themes and the world of the Research (present scenarios, boundaries, critical issues); - Let the interdisciplinarity of themes and interconnections emerges; - Expand the map, if needed, by adding the missing themes. <p>In order to facilitate the discussion, the researcher can propose to cluster the words and to associate to each cluster a different key word. He can also present to the students an object related to his research, to stimulate their imagination and project them in a new scenario.</p> | |
| <p>Development part 3: 30 minutes</p> <p><i>Creation of a vision</i> The arrangement of each workstation changes: on each table, students have now clay or mouldable paste, felt pens and sheets. To present the next step, the facilitator and the researcher briefly introduce these key aspects:</p> <ul style="list-style-type: none"> - System are dynamic networks, rather than static ones, so they continuously evolve and change. The upcoming challenges have to consider the best ways in which the system should grow: in a regular and harmonic way. In this way the system could remain sustainable. - Beside analysis and comprehension of the themes, “visioning” can be considered as one of the main tools that helps the positive change and the design of future scenarios. The visioning exercise is | <ul style="list-style-type: none"> - transdisciplinary collaboration |

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| <p>a form of free-imagination practice.</p> <p>The facilitator should prompt the discussion by asking: what will the food of the future look like? What will contain your typical meal in the future?</p> <p>In order to answer these questions, students have to:</p> <ul style="list-style-type: none"> - Imaging situations that reflect expectations, ideals, values connected to the questions. - Representing the vision using different materials (colours, paper, written words, mouldable paste), choosing the medium that suits the most their expressive style, in order to unlock any creative input. <p>To answer the questions, participants have the possibility to represent their vision.</p> <p>Once the concept of “vision” is clear to the students, they are invited to use the time left (30 minutes) to sum up their ideas, to imaging a future scenario and concretely represent it using the materials available.</p> | <ul style="list-style-type: none"> - multi-perspective communication |
| <p>Conclusion: 20 minutes</p> <p>The facilitator invites each participant to present and to share his personal vision.</p> <p>Together with the researcher and the public, he discusses the emerged inputs, to identify the coherent elements part of the systemic vision of the food system.</p> | <ul style="list-style-type: none"> - participatory ability - navigating complexity |

DEVELOPERS

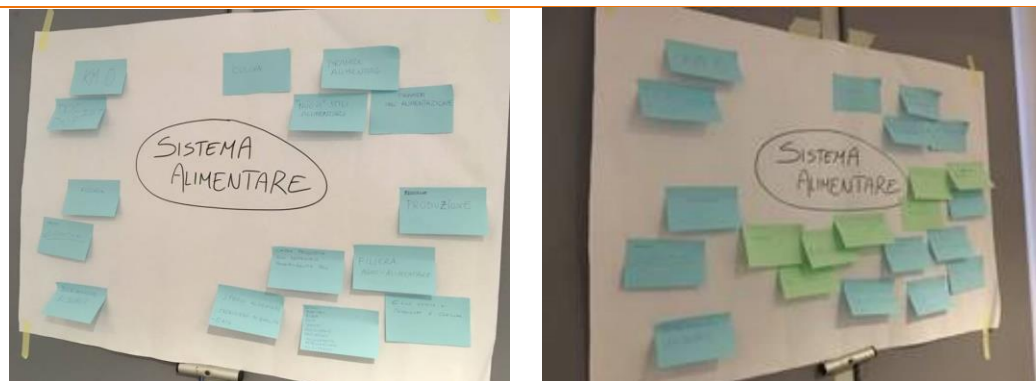
This module was created by the National Museum of Science and Technology Leonardo da Vinci. The perspectives of other stakeholders from the Milan City Lab were considered, namely those of:

- Milano Urban Food Policy Pact Office (Municipality of Milan);
- AGER (Network of foundation for the development of Agrifood Research)
- High school teachers whom participated to the Open Day for teachers held at the Museum on October 2018, 6th.
- Dott. Cristiano Sandels Navarro, founder of Food Education Italy and General Secretary of the foundation since 2011. He is counsellor and trainer in organizing development, management and communication in projects and multidisciplinary innovative activities. He was professor of Environmental and Economic Sustainability of Agrifood Systems at Università Statale di Milano. Sandels significantly contributed to the candidacy of Milan for Expo 2015 and actively collaborates with MIUR (Italian Ministry of Education, University and Research) to the drafting of Guidelines for Food Education in Italian School.

The module was partially based on: Facilitation script visioning City Labs- Extension to module 4 of 'Deliverable 1.1 Tools and training for setting up a transformative network'

A check for scientific accuracy was done by Valeria Chiodini, Responsible for the Nutrition and Food Interactive Lab of the Museum and Cristiano Sandels Navarro, founder of FEI in Italian.

IMAGES ILLUSTRATING THE ACTIVITY

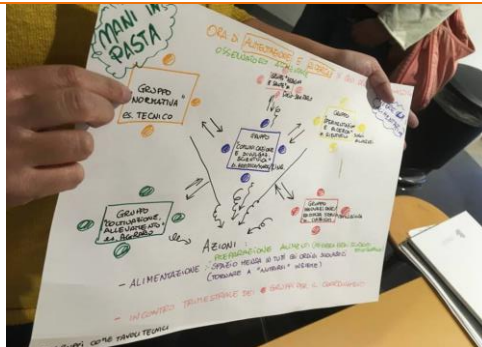


Examples of a Personal Meaning Map



Experimental activity





Activity of visioning

ANNEXES

- Annex 1: In-depth sheet: Visioning
- Annex 2: Preparation of the copper sulphate solution
- Annex 3: Preparation of the sodium hydroxide solution

Annex 1: Visioning

Visioning about a desired future can be an important stimulus for change. It can be the first step in creating a powerful strategy to achieve a desirable future or a particular purpose. In a visioning process, various stakeholders are brought together, that are involved in the environment of the addressed topic, thus visioning is a participatory tool to develop a shared vision of the future. Two central questions in a visioning process include: “Where are you now”? and “Where do you want to be in the future”? The aim of a visioning process is to develop written and visualized statements of long-term goals and strategic objectives in the interested field.

Regarding outputs, visioning is a method for generating a compelling vision of a preferred future. Thus, the outcome of a visioning process includes some pictures that communicate in a very powerful way the preferred future and benefits of the future. A visioning process can also help to show the interdependencies between different factors that shape the future. Ultimately, visioning can lead to recommendations and even transformations of for instance policies, priorities, strategies, investments, socio-economic and research and innovation systems, behaviours and attitudes, education, products and services.

Visioning is typically used after a problem and situation analysis has been completed (although this is not a necessity for your workshop) and before the detailed planning and decision-making process with the involved stakeholders has started. Whereas the results of the problem and situation analysis serve as the definition of State A (Where are we now?), the outcomes of a visioning workshop describe a future State B (Where do we want to be?). Visioning is a process and visioning activities can be organized at any stage of the pathway. In any case, the visioning process should be implemented before decisions on e.g. Lab activities are made. It can last one or several days, even months, depending on the complexity of issues faced.

[from: Facilitation script visioning City Labs- Extension to module 4 of ‘Deliverable 1.1 Tools and training for setting up a transformative network’]