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IO 1 THE FRAMEWORK

TRAINING FOR
SUSTAINABLE
FOOD SYSTEMS
DEVELOPMENT





redacted by Anastasia Costantini & Alessia Sebillo

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1. The Context

A convergence of factors makes the food system one of the most important global issues. Food represents our cultural identity and tries to remind us every day that we are part of Nature. The dominant trend is an increasing separation between the land and the food products, as well as the extension of the food chain: the increasing distance between places of production and places of its consumption breaks the links with nature and culture.

Approximately 795 million people across the world suffer from chronic undernourishment, while two billion are overweight or obese. One in three people suffers at least from malnutrition. No country is immune. World demand for food will increase substantially in coming decades, owing to demographic growth: the world's population is expected to increase from 7.1 billion in 2013 to 9.6 billion by 2050. Meanwhile we face a constant decrease in agricultural soil area. Food production causes significant pressures on the environment. According to the FAO (2014), agriculture uses 70% of global freshwater and the food sector accounts for around 30% of world energy consumption. It is essential to reconsider our food system from the perspective sustainability.

The Europe 2020 strategy stresses the need for smart, sustainable and inclusive growth and highlights that a resource-efficient Europe needs to *“find new ways to reduce inputs, minimise waste, improve management of resource stocks, change consumption patterns, optimise production processes, management and business methods, and improve logistics.”*

The transition towards EU sustainable food system involves many challenges and opportunities. It is needed to support our growing population and to preserve our environment. At the same time it is a great opportunity to foster the economic development, job creation and the preservation of rural areas.

Life programme has demonstrated how it is possible to create new jobs and to develop green skills as well as can help in the further greening of the workforce all over the EU. We have different examples that developing green skills for sustainable food systems not only encourages environmentally friendly management but also create sustainable jobs.

Greater awareness-raising and knowledge sharing for all parts of the agro-food chain should be encouraged, particularly including training and social goals to reskill workers of food sectors and create new green jobs.

2. T4F: the project

While the population is growing, the spending power of numerous citizens is reduced by the economic and social crisis, and in a context of climatic emergency implying a successful ecological transition and a smart, sustainable and inclusive growth, sustainable food system wants to participate and support the transition towards the sustainability.

The European project T4F “Training for Sustainable Food System Development” aims to respond to this issue through a training addressed to professional of the food sector and its new generation of workers, in order to develop their “green skills” and drive the green growth. The professionals of food sector are linked to the environment and it's vital to encourage them to make their methods more environmentally friendly and healthy.

The project duration is 24 months and the partner countries are Belgium, Italy and Spain.

Objectives

- ✓ Implement a replicable European training program, which would provide high and relevant green skills in the food sector.
- ✓ Increase employability and qualification of vocational training in the food sector.
- ✓ Increase the link between ecological transition and the food sector.

Target

- ✓ Student from different study levels (taking into account the last year of vocational training and diploma). The training will be addressed especially to hospitality training institute and VET providers linked to the sector.
- ✓ Professional in the field (e.g. entrepreneurs, managers, chefs, teachers). The training will be open to professionals of the food sector system and who want re-think their workplace and re-skills themselves with green approach.

3. The Framework

3.1 Evaluating the lack of skills and competences identified in training needs research

There is evidence suggesting that a successful green transformation of the agricultural sector could meet global food needs while also contributing to the mitigation of GHG, improving the conservation of biodiversity, water and land resources, slowing the pace of rural to urban migration and improving farmers' adaptation to climate change impacts (Pretty et al., 2006). The transition to more sustainable food practices is needed to support our growing population and should also serve as an economic development engine to create jobs and prosperity in the now impoverished and depopulating rural areas.

We have realised a brief research for identifying the training needs in the field of sustainability for workers of food sectors in each country involved in the project.

In Spain we have observed the presence of different training on sustainability dedicated to food sectors. The results can be divided into 2 main groups:

- ✓ Various Master Degrees based mainly on culinary tourism, gastronomy, agro-ecology and health nutrition.
- ✓ Few vocational trainings about sustainable food, lower level, short training (1/2 day). Also in these cases the main topics are about proper food choices or local markets.

In Belgium there are many vocational training on sustainable food and techniques to be more sustainable in the food sectors. Some competences developed by the trainings are

- ✓ Sustainable Cooking
- ✓ Critical consumers
- ✓ Technical course: composting , food preservation, urban gardening and permaculture
- ✓ Sustainable approach on catering
- ✓ Trust, Traceability and Transparency

In Italy, we can find a large number of trainings about sustainability and food at different level of education (from secondary schools to vocational training as well as advanced training courses and master degree)

The training courses cover from general issues about sustainable food concept to specific area (Circular economy and LCA Tools, Organic garden and biotechnology| organic Cooking). Different training courses focus on food and wine tradition, promotion of culinary excellence, promotion of local products, wine and gastronomy tourism. The training courses targeted to

farmers to improve their farms (digitalisation, marketing, etc) and / or to re-skilled about specific issues (packaging management, HACCP, Food safety).

Although there are different training programs on sustainability related on food sector, a good level of knowledge, skills and competences in this direction are still missing. All training programs observed covered specific issue related to the transition towards sustainable food systems as well as they were addresses at very specific targets (chefs or farmers or students, etc).

It is important to ensure basic understanding of the sustainability issues surrounding food the following step is to provide with the knowledge and the skills to manage and implement a smart and sustainable growth in the field of food system. Life programme has demonstrated how it is possible to create green jobs and to develop green skills as well as can help in the further greening of the workforce all over the EU. Knowing this, it is essential developed a new professional training in order to re-skilling towards more "green thinking» the professionals of the food sector.

Our education systems need to prepare students/professionals with the skills required by alternative emerging markets.

Green skills are the abilities, values and attitudes people need to build and support a sustainable and resources efficient society. Green skills are not just technical but also include other abilities like sustainable management and consumption practices.

We have different example that developing a green skills for sustainable food system not only encourages environmentally friendly management but also create sustainable jobs.

3.2 Defining a new training programme for sustainable food system development

"...We need to find new ways to reduce inputs, minimise waste, improve management of resource stocks, change consumption patterns, optimise production processes, management and business methods, improve logistics..."

T4F is a new professional training on development of green skills in order to re-skilling towards more "green thinking" the students and the professionals of the food sector.

The Green Skills Agreement defines skills for sustainability as " Skills for sustainability, also known as green skills, are the technical skills, knowledge, values and attitudes needed in the workforce to develop and support sustainable social, economic and environmental outcomes in business, industry and the community."

The T4F training aims to:

- ✓ fulfil the lack of competences and training needs in the field of sustainability for workers of the agri- food sectors;
- ✓ stimulate the development of green professionals and to improve the professional competence, cooperation and competitiveness in alternative food systems;
- ✓ offer specialized training contents on sustainable practices in food sector;
- ✓ promote the green social entrepreneur as a new professional figure.

The T4F Framework provides a comprehensive and coherent description of attitudes, skills and competences needed to create professionals of food sectors towards more sustainable food system. It will be also useful to the institutes in order to assess their training offer and evaluate what are the attitude, approach and key skills that they should enhance in their country in order to provide and implement specific training courses.

The T4F training is been thought as integrated modules for standard vocational training on food sector. It offers specialized training content on practices towards the sustainability that can be applied into their work as additional training. The training envisages to work transversely with competencies that covered all dimensions of the concept of sustainability.

To ensure that the educational path can be replicated without additional assistance from development partners it is previewed a **Toolkit guide** (output 4). It provides step-by-step guidance to replicate the training programme. The guide contains the explanation of methodology for development of the training program and the training strategies in terms of learning activities, assessment learning and additional activities (actuations of workshops ect). It describes also the use of training materials that can be used separately for tailor-made training in order to be integrated in existent training programs.

T4F Framework is also useful to

- ✓ Clearly understood program goals and measurable, long-term, short-term, and intermediate objectives.
- ✓ Clearly defined relationships between inputs, processes, outputs, and outcomes, and between activities and the external context.
- ✓ Support the movement between different countries and different learning environments.

T4F

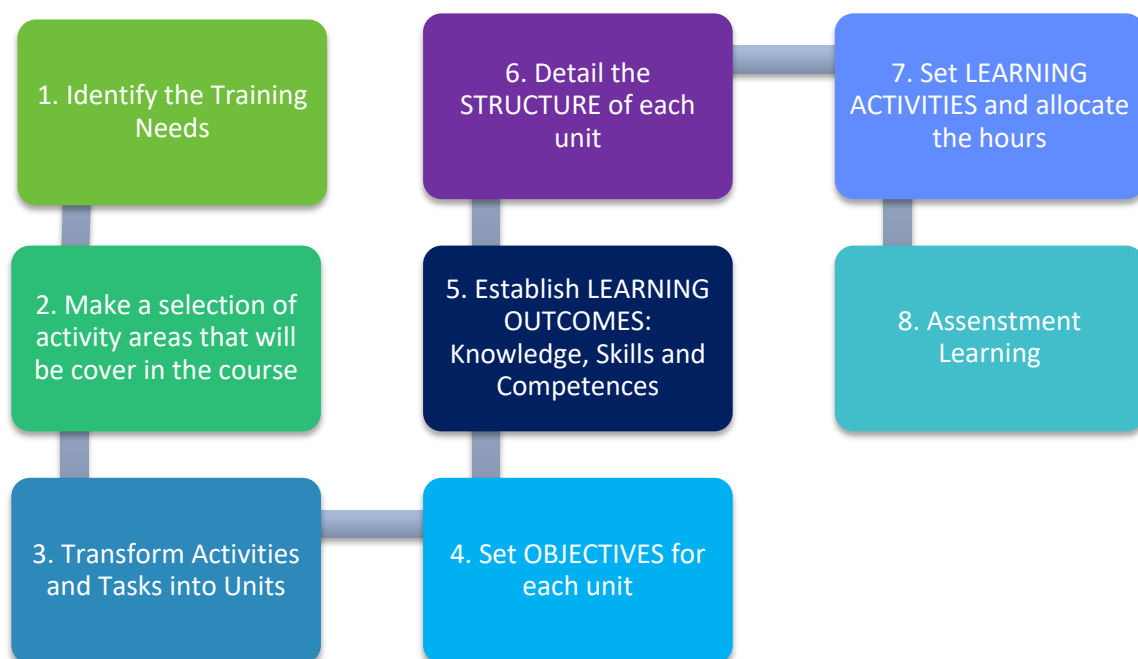
TRAINING FOR SUSTAINABLE
FOOD SYSTEM DEVELOPMENT

THE FRAMEWORK



3.3 Methodology for development of T4F training program

The T4F training programme is designed taking in consideration the existing ECVET guides and recommendations, in particular the set more related with the learning outcomes, units of learning outcomes and assessment of learning outcomes. The training programme has been incrementally developed for creating a structured description of its content. The steps of the developing process are presented in the following chart.



The evaluating the lack of skills and competencies identified in training needs research conducted for each country by the partners, has determined the activities and the tasks selected. Then activities and tasks selected have been transformed into following 4 area of activities and 8 units of training programme:

- ✓ **Nutritional area**
Healthy and sustainable diets

- ✓ **Ecological area**

Biodiversity, seasonality and organic food
Water and land management, food footprints
Food loss and food waste

✓ **Economic area**

Circular economy and resilience
Local economy and alternative systems

✓ **Social area**

Ethic and inclusive food business model
Slow food and cultural heritage

Each unit has composed of various **learning objectives** and the **learning outcomes** were established by the **knowledge, skills and competences** (KSC). In order to comply with the learning outcomes (KSC), the structure of each unit was established and **learning activities** have been set.

The 2008 European Qualification Framework recommendation defines **learning outcomes** as ‘...statements of what an individual should know, understand and/or be able to do at the end of a learning process’ (Cedefop). Learning outcomes are statements that describe the knowledge or skills students should acquire by the end of a particular assignment, class, course, or program, and help students understand why that knowledge and those skills will be useful to them. They focus on the context and potential applications of knowledge and skills, help students connect learning in various contexts, and help guide assessment and evaluation. Good learning outcomes emphasize the application and integration of knowledge. Instead of focusing on coverage of material, learning outcomes articulate how students will be able to employ the material, both in the context of the class and more broadly.

Learning outcomes are specified in three categories – as knowledge, skills and competence.

The three categories are defined as follows:

Knowledge includes theory and concepts, as well as tacit knowledge gained as a result of the experience of performing certain tasks. It means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual.

Skills are something learned in order to be able to carry out one or more job functions. "Skills" means the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the EQF, skills are cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).

Competences specify the "how" (as opposed to the what of the skills) of performing job tasks, or what the person needs to do the job successfully. It means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the EQF competence is described in terms of responsibility and autonomy.

Learning objectives and learning activities are two crucial pieces of the development of training program.

Learning objectives describe the goal of the learning program and define what competencies the learners have to achieve after completing the program. Learning activities are the resources that help in achieving the learning objectives of a training program.

Learning activities are defined as 'any activities of an individual organised with the intention to improve his/her knowledge, skills and competences'. The two fundamental criteria that distinguish learning activities from non-learning activities are as follows:

- ✓ the learning activity must be intentional (as opposed to random learning), so the act has a predetermined purpose;
- ✓ the learning activity is organised in some way, including by the learner him-/herself; it typically involves the transfer of information in a broader sense (messages, ideas, knowledge, strategies).

The structure of each unit and the related learning activities and outcomes are presented as appendix in this document.

The **assessment of learning** is designed in the assessment tool (Output 5) in order to ensure a systematic collection and analysis of information to improve student learning. In addition the assessment tool is thought as practical guidance to drive the users through the training package proposed. It consists of a pre-assessment tool to evaluate a level of sustainability awareness and green skills. The results of the assessment can be useful not only for evaluate the level of awareness of the user, but also to understand what part of the training package can be more suitable for them. It creates a matrix, which matches the pre-assessment results with the

professional profile of the users and develops a tailored path through the units of the training programme. Moreover, there are assessment tools dedicated to each unit of the training programme as well as a final assessment.

4. Area of activities

When we talk about the **food system**, we are referring at all activities, actors and interactions that embrace all the elements (environment, people, inputs, processes, infrastructure, institutions, markets and trade) related to the food chain and the outputs of these activities, including socio-environmental economic and outcomes.



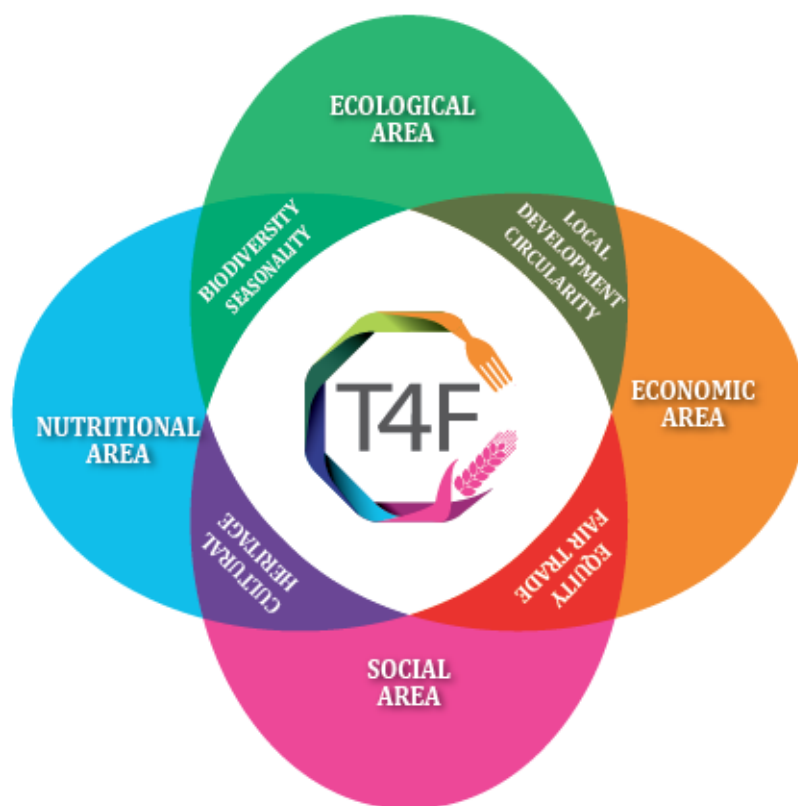
The food system. Source: Combs et al., 1996

According to the FAO, "A Sustainable Food System is a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised".

Sustainability means ensuring human rights and well-being without depleting or diminishing the capacity of the earth's ecosystems to support life, or at the expense of others' well-being. The FAO's vision for sustainable food and agriculture is that of *"a world in which food is nutritious and accessible for everyone and natural resources are managed in a way that maintains ecosystem functions to support current as well as future human needs. In this vision, farmers, pastoralists, fisher-folk, foresters and other rural dwellers have the opportunity to actively participate in, and benefit from, economic development, have decent employment conditions and work in a fair price environment. Rural women, men and communities live in security, and have control over their livelihoods and equitable access to resources which they use in an efficient way"* (FAO, 2014).

The sustainable food systems consist of dimensions related to environmental social and health impact, nutritional adequacy, cultural acceptance, affordability, and economic development. Achieving sustainability in professional food sector implies a long-term a long-term commitment to continuous improvement.

T4F - Training for sustainable food system development cover the following aspects in four areas of activities: nutritional area, ecological area, economic area and social area.



Training for sustainable food development . Area of activities.

NUTRITIONAL AREA

Nutrition is how food affects the health of the body. The nutritional area of sustainable food systems takes into account the implication that different foods have for our health in a long – term period. Proper food choices can be a value tool for our health prevention and can contribute to reduce the economic impact in public health expenditure for chronic- metabolic diseases. Usually, two macro-indicators are used to assess the nutritional sustainability of products. The first takes into account the application of different regulations and standards regarding quality, safety and traceability as well as the origin of raw materials. The second one assesses the product nutritional quality taking into account the contents of key compounds including micronutrients and bioactive phytochemicals. (Azzini et al, 2018)

The main aim of this area is to explore the concept of sustainable diets and the risk, challenges and opportunity for novel ingredients. This area explores also the implication of the lifestyle,

ethic (and/or religious) choices and improper behaviour, which can have on our nutritional status.

Training Unit

1. Healthy and Sustainable Diets

This unit explores the concept of sustainable diets and the implication that our food behaviour can have for our health. The concept of traditional food is changing under the influence of different cultures and novel food productions and the professional of the food sector should be aware about. This unit would be a tool to recognise proper information about health and nutritional food. The main aspects covered will be:

- ✓ Macronutrients, micronutrients and energy intake; proper « quantity and quality» for balanced diets.
- ✓ Influences on nutritional status including lifestyle, improper knowledge and beliefs, ethic (and/or religious) choices like vegan/vegetarian and their possible implications.
- ✓ The main scientific sources for healthy nutrition and to know the health and nutritional claims and their impact on our health.
- ✓ The risk, challenges and opportunity for novel ingredients: exploring new tendency of food from the insects as sustainable protein sources to functional food or novel ingredients.
- ✓ The Mediterranean diet as an example of a sustainable diet approach, in which nutrition, biodiversity, local food production, culture and sustainability are strongly interconnected.

ECOLOGICAL AREA

Food system activities, including producing food, transporting and storing, produce greenhouse gas (GHG) emissions that contribute to climate change and a huge use of natural resources. Agriculture, including fisheries, is the single largest driver of biodiversity loss. Many of current food production systems compromise the capacity of Earth to produce food in the future. The ecological area includes the strategies for the management of land, water, food loss and food waste and living resources that promotes preservation and climate-smart production and consumption of foods with lower water and carbon footprints. Food used should enhance terrestrial and marine ecosystems. The food should be fresh, seasonal and produced, processed, distributed and disposed in a way that minimise both its local and ecological footprint on biodiversity. This approach can contribute in the capturing efficiencies through the ecosystem approach throughout the food chain and towards the reduction of food loss and food waste.

The main goal of this area is to share smart management practices within the food supply chain to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of the impact that the food system has on our environment.

The main aspects regarding the ecological area of sustainable food systems are:

- ✓ Better technical knowledge on the environmental impacts of food.
- ✓ Preserving biodiversity.
- ✓ Reducing food waste and losses.
- ✓ Resource efficiency.
- ✓ Clean water, air and land emissions.

Training Units

2. Biodiversity, seasonality and organic food

This unit takes into account three main issues closely related each other: biodiversity, seasonality and organic food. Biodiversity is vital to several important ecosystem services that ensure sustainability of food production and guarantee food security. Seasonality is a great way to contributing to a sustainable food system, including supporting local producers, lowering the environmental impact and protecting biodiversity and food heritage. Organic food productions not only preserve the environment but also improve public health, bringing significant benefits both to the economy as well as to the social cohesion of rural areas. The main aspects covered will be:

- ✓ Underline the importance of biodiversity at multiple levels.
- ✓ The importance of the seasonality not only at environmental level but also at nutritional level: typically fresher, more nutritious and cheaper to buy compared with food grown out of season.
- ✓ Food preservation technique to avoid food loss, preserve food heritage and artisanal technique.
- ✓ Organic food production and how it is sustainable at local and global dimensions (small organic productions vs large organic productions): opportunities and challenges.

3. Water and land management and food footprints

This unit gives basic knowledge on resource management within food systems (water and land management) and their linkage with climate change. Moreover, it focuses on food footprints,

good tools to understand concretely the impact, which the food system has on the planet. Given the complexity of the notions it can be better to develop the subjects in a practical way. The main aspects covered will be:

- ✓ Overview on food system, which depends on natural environment and at the same it is causing significant environmental impacts: water demand, land usage and their implications on climate change.
- ✓ Food footprints (water and carbon) and some example of resource efficiency usage (e.g. water usage and cooking techniques as examples for energy savings)
- ✓ The intensive production as intensive farming and its footprints.
- ✓ Innovative sustainable land use to know practices and technologies that aim to integrate the management of land, water, biodiversity, and other environmental resources to meet human needs while ensuring the long-term sustainability of ecosystem services and livelihoods.

4. Food loss and food waste

Food waste is bad for the environment, but it is also extremely expensive and becoming socially unacceptable. This unit gives general knowledge on food loss and food waste and highlight the importance and the benefits to reduce wasted food and packaging. Moreover the unit would propose strategies and tools to identify the preferred options for handling excess food (reduction and preventions, reuse, recycling). To tackle this issue across the entire supply chain, it is also essential to know the regulation and the new policies aimed at reducing food waste. The main aspects covered will be:

- ✓ Food loss and food waste: definitions and implications.
- ✓ How reducing your waste: tracking and assessing tools.
- ✓ Turn source reduction strategies into action: education, food reuse/repurposing (vegetables soup, fruit smoothies), preservation, disposal strategy and composting.
- ✓ Definition and benefits of packaging reduction strategies: use environmentally friendly packaging.

ECONOMIC AREA

To be considered economically sustainable, an enterprise should be capable of paying all its debts, generating a positive cash flow, compensating for the negative externalities it may generate, and adequately remunerating workers and shareholders. In addition, it should have buffer mechanisms (savings, assets) to cope with changes and shocks out of its control, for example, economic downturns, damaging weather, or catastrophic accidents. In essence, it must be economically resilient. Steady and adequate economic growth is a common proxy for positive socio-economic development. The possibility of endless economic growth in a limited ecosphere has been contested by many, and even dismissed as an oxymoron (Daly, 1990). Increasingly, the goal of decoupling economic growth from the use of limited natural resources is becoming popular (UNEP, 2011). The main aim of this area of activity is to highlight through best practices that adopting sustainable approach like circular economy and local development is a value business opportunity for the food sector.

The main aspects regarding the economic dimension of sustainable food systems are:

- ✓ Green economy.
- ✓ Circular economy.
- ✓ Micro-economic approach that focuses on the enterprise and local development.
- ✓ Vulnerability and the local community resilience.

Training Units

5. Circular economy and resilience

A circular economy is to use natural resources for longer and as far as possible avoid waste and environmental pollution. This means that all resources are still used in a way, which adds the most value to the economy and causes the least damage to the environment. The aim of this unit is to give base knowledge of circular economy and some interesting case studies in the food sector to show that circular economy can be a strategic model to develop innovative solutions/business in the food sector. The main aspects covered will be:

- ✓ Definition of circular economy in the food sector not only related to food waste.
- ✓ Resilience as tool for coping with change: some practical experiences in the food sector to understand the concept.
- ✓ Underline the economic value and the potential benefit of circular economy as business that create employment and innovative solution.

- ✓ Turn knowledge into action: funding program and practical example of circular economy in the food sector at local level.
- ✓ Cooperation, collaboration and networking: circular economy as a model to realise business relationship within value chain in win-win terms and constructed on collaborative principles.

6. Local economy and alternative systems

The increasing consumer demands for fresh local produce and other farm products are driven by the beliefs that local food production systems are more sustainable, healthy, and supportive of local economies. This unit gives general knowledge to understand the notion of “local sourcing” and advantages of buying locally. It focus not only on positive ecological and health aspects to produce and eat local but also to underline the economic advantage to create short value food supply chain with local or regional producers and artisanal manufactures. The main aspects covered will be:

- ✓ The concept of local food economies and their economic impact on the community.
- ✓ Proposing the concept of food sovereignty, as a critical alternative to the concept of food security is broadly defined as the right of local peoples to control their own food systems, including markets, ecological resources, food cultures, and production modes.
- ✓ Giving practical examples of alternatives business based on local and short supply chain: the economic development strategies are integrated with community development principles and focus on using local resources to build wealth and improve social conditions throughout the community.

SOCIAL AREA

Social sustainability is about the satisfaction of basic human needs and the provision of the right and the freedom to satisfy one's aspirations for a better life (WCED, 1987). This applies as long as the fulfilment of one's needs does not compromise the ability of others or of future generations to do the same (sustainable). Based on the principles of participation, empowerment and individual and collective responsibility, all of us are involved in fixing our food system. The social dimension on sustainable food systems takes into account of ethic and decent job as well as the community and its cultural identity. The area aims to explore ethic and inclusive business models and how the relationship between food, conviviality and culinary traditions has a role in influencing lifestyles and production and economic factors.

The main aspects regarding the social dimension of sustainable food systems are:

- ✓ Decent Livelihood.
- ✓ Fair Trading Practices.
- ✓ Labour Rights.
- ✓ Equity.
- ✓ Preservation of tradition.
- ✓ Cultural Development.

Training Units

7. Ethic and inclusive business model

The aim of this unit is to explore the social dimension of food sector: from fair trade to social economy enterprise models. Fair trade has been shown to increase standards of living and reduce risk and vulnerability for farmers and workers. Social enterprises are a point of reference of the territory, which with the involvement of the community, are making people aware of a more sustainable approach to food and address various issues through an integrated approach. The key elements of this unit are: inclusion, equity, respect, responsibility and opportunity. These elements can be seen as keywords and important aspects for a transition towards more sustainable food systems. The main aspects covered will be:

- ✓ Decent work, fair prices for producers, equitable trade: the values- based food supply chain.
- ✓ Social economy enterprises as model business to develop sustainable food activities: different social economy enterprises have proven the potential to contribute to economic growth and local development and address social issues.
- ✓ Developing the concept as green social entrepreneur in a practical way (for example: create a business model for enterprise with social and green aims).

8. Slow food and cultural heritage

The relationship between food, conviviality and the identity of people within the great culinary traditions has a role in influencing lifestyles and production and economic factors. The culture can codifies the rules for a wise diet with a complex series of rituals, recipes, regulations and traditions. The unit travels along the path that has transformed eating into culture and communication, looking into the food tradition and to explore the business opportunity of culinary tourism.

- ✓ The food-culture relationship in the practice, spiritual and social life and the influence of social cultural trend on contemporary nutrition.
- ✓ Sustainable food and the importance of the "time" (from the producer to the consumer, through processing and distribution logistics and consumers).
- ✓ Geographical indication for each country involved: safeguarding, valuing and transmitting the know-how of the productions (whether they come from production or / and distribution).
- ✓ Culinary tourism is an opportunity to develop a sustainable business activity.