D4.4 - Report on New instruments' design and implementation options

WP4 – Policy assessment and recommendation

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List of abbreviations

AFF: Agrifood and Forestry

AKIS: Agricultural Knowledge and Innovation System

CAP: Common Agricultural Policy

CEDEFOP: European Centre for the Development of Vocational Training

https://www.cedefop.europa.eu/**EAPA**: European alliance professional accreditation

ECTS: European Credit Transfer and Accumulation System

EEA: European Education Area

ERA: European Research Area

ESA: European Skills Agenda

ET: Education and Training

FtF: Farm to Fork

ICT: Information and Communication Technologies

ISCED: International Standard Classification of Education,

LLL: Lifelong learning

NEETs: Not in Education, Employment, or Training people

PPPs: Public-Private Partnerships

RTDI: Research, Technological Development and Innovation

SDGs: Sustainable Development Goals

https://www.cedefop.europa.eu/**VET**: Vocational Education and Training

Executive summary

The current European agri-food and forestry system is perceived to be too slow to innovate towards more sustainable agriculture, forestry, food and bio-based value chains. Furthermore, to date, the Education and Training system is perceived as being ineffective to improve human resources able to better face the challenges of the future. The fulfilment of current gaps plays a key role towards setting global standards that can allow and support innovation and transition processes toward new Education and Training pathways.

Deliverable 4.4 presents the final output of NextFOOD Task 4.3 and, more in general, the final output of WP4. The objective of WP4 is to assess the existing policies related to the education in the agri-food and forestry systems by considering the interactions among different actors in the innovation process, hence having as a reference the composition and functioning of AKIS. This Deliverable aims to bring together all findings obtained in the previous Tasks (Task 4.1 and Task 4.2) and use them to propose new instruments design and implementation options for policy-makers that take part in the policy contexts of education and training of the AFF sectors, as well as other main actors that have a role in and contribute to the process.

Conducted mainly through a desk-based activity, Task 4.3 consisted in a collection of results from previous Tasks (i.e., gaps in Education and Training policy within Task 4.1, and strategies for the improvement of current policies within Task 4.2), characterised by strong empirical input, and their enrichment through desk-research and with a workshop held among NextFOOD partners. Finally, the collected results were formalized into a conceptual framework which allowed to visualise and discuss policy objectives, policy instruments (tools), roles of actors and good practices, according to each of the educational level that have been selected to be discussed as part of this report, namely: (1) Pre-University, (2) University, (3) Vocational Education, and (4) Lifelong learning. In addition, a fifth section was denoted as Overarching Issues, which elaborates on the issues that are cutting across all levels of the educational system.

These levels were explored in their needs, current gaps, issues and concerns. The systemic approach adopted for WP4 allowed to understand the problems of dialogue and connection among different levels, in terms of competencies, curriculum-making, subjects, and innovation.

Under the Overarching Issues, the themes emphasized were as follows: skills and competencies needed in the sector, the need to improve and update the curricula in the educational institutions, the importance of life-long learning, and the necessity to enhance collaboration and dialogue among the actors of the sector. Besides, the need to achieve gender equality was underlined in the majority of the workshops. In this regard, the policy priorities that came forward were: a) the integration of the notion of sustainability into the whole education system; b) enhancing gender equality across the AFF sectors; c) increasing collaboration among actors and entrepreneurs, local communities and farmers in decision-making; d) enhancing both hard and soft skills and competencies that are crucial in the sector, and e) adopting simplified administrative procedures to speed-up innovation.

With regard to the different educational levels explored, a crucial role has been identified within the Pre-University education for equipping students with skills and basic knowledge, especially on issues fundamental to face today's challenges of sustainability and gender. The results revealed that Pre-University is "not effective to improve learners' skills and knowledge". Hence, policy objectives targeted at Pre-University were: a) increasing financial support and investments; b) enhancing hard and soft skills; and c) updating the curricula to meet the needs of the sector. The policy tools proposed to enhance competencies and skills included integrating soft skills into the curricula starting from

early ages and enabling continuous learning of trainees. The tools identified to update the curricula focused on establishing a connection between education and real life, adopting new learning approaches, and integrating sustainability and related good practices into the curricula.

University education takes a pivotal role in combatting the challenges faced by the AFF sectors. In this vein, one of the key policy objectives identified was to enhance students' and teachers' skills. To do so, introducing and improving courses on soft skills and digital skills and improving teachers' skills on new educational techniques, increasing experience-sharing with other educational levels, and establishing closer collaboration between faculties and education experts were suggested. Moreover, the critical importance to update curricula was stressed, by: i) incorporating formal, non-formal and informal education; ii) integrating the notion of sustainability into education; iii) establishing an integrated qualification framework; and iv) providing internships and field trips utilising the NextFOOD approach. Furthermore, these processes need to be accompanied by international cooperation, achievable through financing international exchanges and incentivizing joint classes with different countries. Finally, the importance of collaborative policy-making was underlined, to be achieved through enhancing Public-Private Partnerships and enhancing multi-stakeholder approaches by establishing a permanent platform with diverse representatives.

With regard to VET, the flexibility offered by this educational level makes it a strategical element to include citizens, especially young people that are not in education, employment or training (NEETs) in the countries' development. A policy objective, perceived as urgent, is to enable recognition of diplomas, which can be achieved through a unified certification scheme valid throughout the EU. Another important objective is to integrate new learning approaches and introduce new programs in VET stimulating integration of new approaches of education (e.g. action learning) and new contents in programs (e.g. multidisciplinary). Meanwhile, continuous ensuring of financial support to VET is critical to address these objectives. Finally, Member States are encouraged to improve coordination and harmonization of policies about VET, allowing a better integration of human resources throughout Europe.

With regard to LLL, which is regarded fundamental to strengthen sustainable competitiveness in the sector, several gaps exist including limited coordination between LLL and education in the AFF sectors. A policy objective that needs urgent action is designing LLL courses that are accessible and inclusive for all. To do so, prioritising (and introducing new) LLL courses at educational institutions, designing an LLL approach that is flexible, short, digital and affordable (or free) and establishing multi-actor instruments are of critical importance. Also enabling training of teachers and educators is key and can be achieved through designing LLL modules that keep teachers' and educators' skills continuously up-to-date, supporting education of agricultural advisors, and implementing tailor-made solutions on the national/local levels. Finally, the importance of supporting the continuous education of workers/farmers in the AFF sectors throughout their career (regardless of age, gender and location) was put forth.

In the light of these results, one of the major points raised was the crucial role of development of soft skills' as well as the prioritisation of topics that are now missing from the fundamental education, such as sustainability and gender equality, which have been pointed out as critical aspects that need to be incorporated into the curricula. Another key point was with regard to the general fragmentation in the overall education system that lacks a full and functional harmoninsation. Thus, a shared view of curriculum making, from the early ages (*i.e* pre-university) until Lifelong learning should be encompassed. In this perspective, an important role is played by educators, that are enrolled for teaching and training, always keeping pace with the evolving environment. Hence, the continuing

education of educators are of utmost importance within all educational levels. In addition, when developing the curricula, a deep analysis of the needs of the agriculture of the future should be undertaken. Indeed, there are also other key actors that need to be included in the process of curriculum design, who are crucial in providing not only knowledge, but also transmitting enthusiasm and real-life experiences on the field. Indeed, the presence of farmers in the educational landscape has been suggested to constitute the missing link between theory and practice. In this perspective, a wider involvement and better collaboration of figures and entities is desirable, where formal, non-formal and informal education are applied, and where public, private and NGOs strive for the same objective. Importantly, the process must not be intended to be divided within each educational sector, but as highlighted during the workshops, the coordination of the different levels is pivotal and advantageous for each. Last but not least, the reduction of bureaucratic burden plays an important role not only in general, but specifically in ensuring the feasibility of the actions above, in allowing an effective interaction among entities and in ensuring flexible and timely adaptation to a very complex and dynamic environment.

1. Introduction

1.1 Why is it important to develop education and training policies in agri-food and forestry sector?

The importance of enhancing people's skills and education is one of the priorities of the European Commission (New Strategic Agenda for the EU for 2019-2024). Towards this direction, the Communication on the European Education Area, which sets out a vision to be achieved by 2025, is also targeted mainly towards enabling all young people to benefit from the best education and training, and to find employment across Europe. This vision is underpinned by six dimensions: quality; inclusion and gender equality; green and digital transitions; teachers; higher education; a stronger Europe in the world. The aim is that efforts to establish the European Education Area will work in synergy with other critical strategies, including and not limited to the Skills Agenda and the renewed Vocational Education and Training (VET) policy, to put forward inclusion, mobility and innovation in education; the EU Gender Equality Strategy (2020-2025) to promote gender equal workspace culture, to name a few.

The current European agri-food and forestry system is perceived to be too slow to innovate towards more sustainable agriculture, forestry, food and bio-based value chains. Farmers need to develop their capacities in order to: Co-create and implement new practices; adapt to legislative, policy, market and environmental changes; develop contemporary skills in order to market their products; and to take part in interactive innovation-based networks. Various education systems and methods can enhance farmers' capacity to innovate and thus increase the viability of a rural livelihood in a time when there is an increasing shortage of skilled AFF system workforce, especially in rural areas. Meanwhile, integrated legal frameworks, policies and governance systems that are able to address the main gaps in the sector may provide an enabling environment supporting the transition towards more resilient and sustainable food systems, which requires urgent measures by all stakeholders of the sector (FAO, 2018).

According to the Agricultural Knowledge and Innovation System (AKIS) (SCAR, 2017), it is necessary to share knowledge and innovation for agriculture and rural areas development and to promote mutual learning through the involvement of farmers, advisors, trainers, researchers, media and other agricultural experts operating at EU, national, regional and local levels. In this regard, the linear, passive and teacher-centred approaches to learning and sharing of knowledge, which dominated the traditional views, are no longer sufficient to address the challenges of our day. Instead, student-centred, collaborative and social learning approaches need to be adopted. Hence, in order to facilitate the transition from conventional, lecture-based education focused on knowledge accumulation, towards an educational approach that is phenomenon-based and action oriented, it is necessary to cultivate the competences required for this transformation.

One of the most important goals of the NextFOOD project has been the establishment of a specific and innovative "NextFOOD education approach" applying a case-based and action-oriented approach for the development and generation of generic knowledge that can be further used by others.

In this context, the EU can play a key role in setting global standards that allow and support innovation and transition processes toward new Education and Training pathways. These new pathways will

permit a shift towards a more sustainable and innovative sector and to face the new challenges of an evolving sector – and world – that requires new and different learning approaches, starting from knowledge and information sharing, education, and training of future professionals.

1.2   WP4 aim

The WP4 of the NextFOOD project aims to assess the existing policies related to the education in the agri-food and forestry systems by considering the interactions among different actors in the innovation process, hence having as a reference the composition and functioning of AKIS.

WP4 targeted all the Education and Training levels in AFF sectors, namely: (1) Pre-University, (2) University, (3) Vocational Education, and (4) Lifelong learning.

These levels were explored in terms of their needs, current gaps, key issues and concerns. Moreover, the systemic approach adopted for WP4 allowed to understand the problems of dialogue and connection among different levels, in terms of competencies, curriculum-making, subjects, and innovation.

The analysis of existing policies in the scope of Task 4.1 was carried out on multiple scales and levels, from EU to local and non-EU countries, considering different roles in education policy (Viaggi et al., 2019). Relevant education policies and their interaction with sector innovation and training programmes (e.g. those included in the CAP) are covered. Several levels of education, from high school to PhD and life-long learning are considered.

Following this assessment, policy recommendations are delivered based on research activities through which the aim has been to explore what impact the present education and training systems have on the learners' knowledge on sustainability and related subjects, and skills needed to solve problems in an action-oriented and collaborative manner. In this direction, policy recommendations are developed for key stakeholders affected by education and life-long learning programmes for sustainable AFF systems. Specific attention has been devoted to take into account the policy objectives set out by the recent EU strategies and policy, namely the Green Deal, the Farm to Fork strategy and the new CAP.

Moreover, policy recommendations are designed to promote gender equality in research and education, which ties into the implementation of the gender equality dimension in the Europe 2020 strategy. The policy development is, hence, related to the EU objectives to address challenges in education and training systems by 2020 with particular focus on:

• making life-long learning and mobility a reality;

• improving the quality and efficiency of education and training;

• promoting equity, social cohesion, and active citizenship;

• enhancing creativity and innovation, including entrepreneurship, at all levels of education and training.

1.3 Deliverable 4.4 aim

Deliverable 4.4, Report on New instruments' design and implementation options, represents the final output of Task 4.3, which aims to develop guidelines for policy-makers and education managers at regional/national/EU level for improvements of policies in research and education in the field of agrifood and forestry, mainly by bringing together all findings obtained in the scope of WP4, as well as relevant insights from other parts of the project. More in detail, the main objectives of this Deliverable are:

- building on the existing policy gaps identified as part of Task 4.1;

- building on strategies identified as part of Task 4.2 to formalise a conceptual framework and specific policy design options, establishing links to best practices (while best practices are introduced throughout the relevant sections of this report, a comprehensive catalogue of these best practices can be found in the Annex section of this report);

- further developing concrete guidelines for Policymakers and Education managers, towards improvement of policies in the sector;

- developing and specifying new policy instruments and tools that match the needs of the sector and strengthen EU Education and Training system.

Hence, as part of this Deliverable, the guidelines and policy instruments mentioned above are being presented, targeting four levels of the Educational and Training system of the AFF sectors, namely: (1) Pre-University, (2) University, (3) Vocational Education, and (4) Lifelong Learning.

1.4 Structure of the Deliverable

This Deliverable is structured as follows. In Chapter 2 the background that underpins this report is presented. Under Chapter 2, section 2.1 provides a brief summary of Task 4.1, while section 2.2 introduces a summary of Task4.2. Chapter 2 ends with an explanation of the aim and the objectives of Task 4.3, which constitutes the subject of this report. Chapter 3 puts forth a description of terms and framework adopted as part of this report, including the definitions of educational levels used (**Pre-University, University, Vocational Education**, and **Lifelong Learning**) and the main actors involved in education policies, mainly: Policymakers, and Education managers. In Chapter 4 the methodology followed in this study is presented. In Chapter 5 the results of Task 4.3 are presented. More in detail, this chapter illustrates the results of this study in five main parts, which present the educational levels that this study focuses on. In addition, a fifth part aims to present the overarching issues, which are regarded as those issues that are crosscutting across all educational levels that are discussed as part of this report. All of these five parts of this chapter follow the same scheme. Each of them, after the presentation of current situation and the needs, proposes one or more policy tools (that are listed under the associated policy objectives) and explores the role of the main actors involved. Finally, one or more examples of best practices are presented to better frame the suggested tool, if and when applicable (please refer to Chapter 3 for the definition used for "best practices" in the context of this Deliverable). Besides, in the Annex section of this report, these best practices are gathered together in the form of a catalogue, in the context of which the connections between the best practices and identified policy objectives are made.

2. Background

2.1 Summary of Task 4.1: Diagnostics of existing policies in the Agrifood and Forestry Education

Task 4.1 analysed the gaps in the actual educational policy framework. The task was based on a pan-EU survey of actors in the research and education system, involving judgments about the effectiveness of existing policies and their interaction as well as gaps, which has paved the way for providing diagnostics of existing policies, and contributed further to the proposition of effective strategies. In this context, an online survey was conducted on national and EU-level decision-makers and experts, considering also non-EU countries, and the legal framework in force. A special focus was given to the role of policies in the context of information transmission among different actors in the research and education system and the role of education policies in this context.

The main policy gaps highlighted by the survey in Task 4.1 were:

- none or insufficient coordination among the four policy fields addressed (Pre-university, University, Adult learning and Vocational Education, and Training measures in agri-food), which are planned mostly on a country level;
- poor awareness of the existence of strategy documents on educational policy in the AFF field;
- lack of or insufficient financial support (especially for young agri-food and forestry professionals to access adult training and vocational education);
- lack of sufficient innovation in education tools and innovative ways of learning (student-centred learning, participatory and practice-oriented learning, interdisciplinarity, internationalization, mobility, networking);
- low efficiency of educational policies in promoting sustainability, entrepreneurship and innovation, and to be adherent to the practice and real needs of the sector.

These results were also consistent with those obtained in the scope of WP1 about the current gaps in skills, as well as with the findings of the case studies under WP2 and WP3 and were considered during the design of Task 4.2.

These results showed that the quality of the current educational policy in the agricultural, food and forestry sectors is still perceived as poor and largely unable to support the sustainability transition challenge of the Agrifood and forestry sector.

2.2 Summary of Task 4.2: Identifying strategies for improvement

The work done in Task 4.1 with the survey on diagnostics of education policies related to agriculture, food and forestry provided a background for Task 4.2 "Identification of strategies for improvements" by identifying the gaps that are perceived in the current educational policy framework. Task 4.2 aimed to propose strategies for policy improvement of research and education in the field of agri-food and forestry, by identifying options for improved policy instruments in different context scenarios.

The task was performed through two rounds of workshops that were conducted by the NextFOOD Consortium partners between August and December 2020, in connection to the NextFOOD case studies or particular country contexts. The first round of workshops was held on the country level and

aimed to gather different perspectives of stakeholders, including local, regional and national academics, experts, advisors, farmers, education and training managers and policymakers, on new strategies and policy recommendations towards improving education and training policies in the AFF sectors. The EU-level workshop, on the other hand, aimed to discuss the strategies that come out of the first round of workshops, on the EU-level, to bring an overall perspective.

As a result of these two rounds of workshops, strategies proposed by stakeholders were categorized according to each of the Farm to Fork (FtF) Strategy Objectives, namely:

- sustainable food production;
- ensuring food security;
- stimulating sustainable food processing, wholesale, retail, hospitality and food services practices;
- promoting sustainable food consumption and facilitating the shift to healthy, sustainable diets;
- reducing food loss;
- combatting food fraud.

Besides, main cross-cutting issues across all FtF objectives were identified, and presented, as part of Deliverable 4.2. The cross-cutting issues and main themes arising from the workshops were, hence, presented under six main headings, namely: i) the lacking skills and competencies in the sector that needs to be filled by Education and Training (ET) policies; ii) the need to update and improve curricula; iii) the need to enhance collaboration; iv) the changes needed in the approach and content of the ET system; (v) the need to adopt new approaches in educational policy-making; and finally, (vi) gender as a cross-cutting issue in policy-making.

3. Description of terms and framework adopted

The present Chapter aims to clarify to the reader, how certain terms and definitions have been used throughout this document.

3.1. Terms used

Because of differing terminology among the various documents and countries, as well educational levels, we clarify here the definitions adopted in this document, in order to avoid misunderstandings and to make the reading of this document easier.

Formal, non-formal and **informal education** are complementary and mutually reinforcing elements of a lifelong learning process. Specifically:

- non-formal education refers to planned, structured programmes and processes of personal and social education for young people designed to improve a range of skills and competences, outside the formal educational curriculum.
- informal education refers to a lifelong learning process, whereby each individual acquires attitudes, values, skills and knowledge from the educational influences and resources in his or her own environment and from daily experience.
- formal education refers to the structured education system that runs from primary (and in some countries from nursery) school to university, and includes specialised programmes for vocational, technical and professional training.

Good/best practice has been used in this document to refer to policy measures, practices or cases that have been implemented using an approach that leads to success in improving the education and training systems. For the purposes of this Deliverable, the good practices presented aimed to focus on practices of policy implementations that can be replicated throughout Europe on different scales (i.e. EU, National, Regional), leading to an improvement of the education system in the AFF sectors. For the scope of this Deliverable, whenever possible, best practices aim at developing 'evidence-based' policy-making. In other cases, best practices refer more to education approaches/experiences that would benefit of policy support, so being the object of policy action.

3.2. Education levels explored in WP4

Below, a brief overview of each education level is presented.

3.2.1. Pre-University

The Pre-University level consists of training from elementary school to high school or, according to the latest *International Standard Classification of Education*, ISCED2011, we refer to ISCED1, ISCED2, and ISCED3 (UNESCO, 2011). The target ranges from students of 4-6 years old to 17-19 years old, depending on different Countries (UNESCO, website).

This level of education is, for some aspects, the most important level of education for setting the competencies and the basic knowledge of students. This is true especially for general issues like sustainability or gender equality, which are perceived on one hand fundamental for the future challenges of humanity and, on the other hand, are felt so important that they are independent of the students' future profession.

3.2.2. University

The University level represents the tertiary level of education (ISCED from Level 6 to Level 8). In particular, in the first two ISCED Levels, Level 6 and Level 7, the University aims to provide students with academic and/or professional knowledge, skills and competences, generally with a final degree (Bachelor's, Master's) or equivalent qualification. Instead, at Level 8, or doctoral or equivalent level, the programmes are designed to lead to an advanced research qualification.

The University level has an average target of young people aged 18 to 28. Nevertheless, there is greater flexibility than lower ISCED Levels in terms of students' age, being opened to all ages (with rules that change quite a lot from country to country). From an educational point of view, University is the place where sectorial knowledge and competences of tomorrow's professionals are developed. Instead, from a teaching point of view, the strong connection of didactics, research and innovation, that is part of a university education, provides a unique opportunity, where new teaching approaches and tools are utilised. In fact, the relative greater flexibility of programmes and courses compared to other levels of education (especially pre-university) allows university to be an experimental lab of innovative educational techniques and tools.

3.2.3. Vocational Education and Training

Vocational Education and Training (VET) equips learners with practical skills for specific jobs and transversal competences needed for both personal development and the labour market. It is "usually carried out at upper secondary level and post-secondary level before students begin working life. It takes place either in a school-based environment (mainly in the classroom) or in a work-based setting, such as training centres and companies. Although, this varies from country to country, depending on national education and training systems and economic structures." (EC, website).

According to this definition, Vocational Education addresses all people of working age, and it can be complementary or alternative to university education. This alternativity makes Vocational Education not only a way to foster the AFF sectors, but also a strategical element to include citizens, especially young, that are not involved in Education, Employment, or Training (called NEETs).

Furthermore, the flexibility of Vocational Education is seen as the right tool to respond to the rapid changes of our society and the business environment, allowing the training of human resources that are skilled and qualified.

From a policy point of view, Vocational Education has some peculiarities that make it unique. In fact, as we have seen, it has contemporary a societal – involvement of NEETs – and a sectorial role – to educate qualified and skilled workforces; for this reason, it involves generally different ministries (Ministry of Agriculture, Ministry of Labour, Ministry of Education) and, often, different administrative levels (States, Regions, Cities, etc.).

3.2.4. Lifelong Learning

Lifelong learning is the continuous building of skills and knowledge during one's life, hence, it is identified as an ongoing process of learning and adapting (Charatsari et al., 2017).

Lifelong learning responds, in our day, to the necessity that only an individual who has learnt how to learn, and who is willing to learn throughout his or her life, will be able to survive in the labour market, or be able to maintain and pursue agricultural production (Šimenc and Kodelia, 2016).

This argument is in line with the fact that lifelong learning is no longer regarded as a voluntary choice in many sectors, including the AFF; therefore, Lifelong Learning is no longer a matter of free choice, luxury and voluntary decision but is considered as a necessity both for freelancers and employees.

Indeed, in the Communication - European Skills Agenda (ESA) for sustainable competitiveness, social fairness and resilience (EC, 2020), lifelong learning is seen as fundamental to succeed in strengthening sustainable competitiveness, ensuring social fairness and building a resilient system.

Moreover, the ESA is strongly inter-linked with other European policy initiatives in the field of education, mainly European Education Area (EEA) and European Research Area (ERA), showing how education starting at early ages, and that continues throughout the lifetime, is critical (i.e., schools, universities, vocational education and training, adult learning, lifelong learning).

4. Methodology adopted for new instrument design and implementation options

The methodology of Task 4.3 has mainly relied on a desk-based activity, in order to propose new instruments design and implementation options for policy-makers that take part in the policy contexts of education and training of the AFF sectors, as well as other main actors that take role in and contribute to the process. The desk-based activity has been composed of the following main steps (which we also elaborate further below):

- Bringing together the main findings obtained from already completed tasks as part of WP4, namely, Task 4.1 that aimed at making a diagnostic of current education and training policies in the AFF sectors, through the use of an online survey (Viaggi et al., 2019); and Task 4.2 that collected qualitative data through a round of workshops in the participation of stakeholders that are informed about the education and training policy ecosystem of the AFF sectors (Viaggi et al., 2021).

- Enriching these findings with extensive desk-research to develop guidelines for policy makers, and other main actors, including education managers, towards improvement of policies in the AFF sectors. The desk research was guided by the main questions below:

    - How can the policies match the needs of the food and agriculture sector?
    - How can the policies strengthen the role of science/technological innovation in EU education and training system?

    and included the following steps:

    o Collection of associated studies and deliverables prepared by the NextFOOD Consortium to date.
    o Conducting a non-systematic research using key words including "University", "Lifelong learning (LLL)", "Vocational Education and Training (VET)", "education" as well as "policy". This activity has allowed the identification of the main critical points as well as suggestions that emerged and were discussed.
    o Conducting a further literature research using the latest policy reports and empirical studies to contribute to our discussions, in order to enhance the study.

- Enriching our research and findings further during a workshop conducted on "Development of policy instruments in Agrifood and forestry education, recent results and next steps", as part of "NextFOOD Seminars 2021" conducted during the month of May 2021.

    o As part of the workshop, after briefly introducing the findings of previous tasks completed, namely Tasks 4.1 and 4.2, the next steps on how to turn the identified needs in policies as part of Task 4.3 were introduced.

    o The participants were then asked to collaborate during a group work session, where participants' suggestions regarding the needs, actors and policy suggestions according to different educational levels (Pre-University, University, Vocational Education, Lifelong Learning), could be entered in an online platform, by means of an online tool

called the Padlet. In order to fill in the Padlet tool, participants were first asked to reflect on a question that was asked during the plenary session: "Which practical policy instruments do you suggest in order to improve the current Education & Training System, according to the results obtained within your WP and Tasks?". Then, the participants were distributed in small groups moderated by the WP4 team, in order to make a discussion, following specific instructions (and follow-up questions). The main question and follow-up questions asked to the participants were as follows:

"Choose at least one suggestion/idea from each column and comment. Based on your personal experience and/or on the activities developed within your WP:
- i) "What is the feasibility of the suggestion?"
- ii) "What are its main limits?"
- iii) "Do you think it is (un)relevant in your country or in Europe?" and
- iv) "Is there any connection between your suggestion and the others'?".

- Formalising the collected results into a conceptual framework. This step has consisted of re-organization of all collected information focusing on strategic lines, specific policy design options, and establishing links to best practices.

  - o Firstly, major needs, challenges and expectations were brought together, considering the main topics that were discussed as part of previous Tasks (4.1 and 4.2) in addition to key points emphasized in the context of project meetings, workshops and interviews, in order to evaluate how to better approach the identified topics.

  - o As a second stage, a matrix was prepared and used as a schematic guiding tool (see below), which allowed to visualise and discuss policy objectives, policy instruments (tools), roles of actors and good practices, according to each of the educational levels, that have been selected to be discussed as part of this report, namely Pre-University, University, Vocational Education and Lifelong Learning. Furthermore, the same scheme has been applied to the current report, where all the sections of the matrix have reflected in the associated sections.

Table1: Scheme used as a guiding tool for the collection of results

		Policy Objectives	Policy tools to reach the policy objectives	Role of actors	Best practices
Overarching Issues					
Educational Levels	**Pre-University**				
	University				
	Vocational Education				
	Lifelong Learning				

- Developing and specifying of guidelines that include new policy instruments and tools that match the needs of the sector and strengthen EU education and training system.

As part of this step, each of the issues identified and studied in detail have been brought together in the results section of this report, under the sub-chapters that refers to the different educational levels, namely, Pre-University, University, Vocational Education and Lifelong Learning. Furthermore, in addition to the separate educational levels, the overarching policy objectives were also evaluated, which meant that some overarching topics that are relevant and significant across all levels of the education and training system, and needed to be focused on in a separate sub-chapter called "the overarching issues" were brought together.

- As a final step, following the finalisation of the draft report, the document has been circulated across all project partners during the month of November 2021, to collect input and feedback. During this stage, project partners have been asked to provide any comments, as well as to provide contributions especially to the best practices' sections of this report. This step allowed to establish linkages to other WPs and case studies of the NF Project.

- Finally, after having circulated the report, and collected feedback and input from the project partners, the Deliverable will be revised accordingly, and finalised.

5. Results: Policy objectives, policy tools, actors and best practices

The Results Section puts forth policy objectives, under 5 main sub-headings, namely: Overarching issues, Pre-University, University, Vocational Education and Lifelong Learning. In other words, this section aims to bring together all the aforementioned educational levels, and to point to the policy objectives that are wished to be reached within these educational levels. This choice is mainly driven by the idea of having a document immediately readable by a wide variety of actors, approaching the topic from their respective point of view depending on their field of activity. However, in addition to these educational levels, the section of Overarching Issues is where policy objectives that target the whole education system in a crosscutting way are included. In this section, the policies are illustrated without making a distinction about which level of education is in question, as such policies concern and cut across all levels of education. Under each policy objective that is presented throughout this section, sub-headings are used to discuss in detail, how these policy objectives can be reached, namely:

- policy tools, that aim to provide concrete tools towards realizing these objectives;
- actors, that aim to provide information on which actors will need to be in charge of (or be part of) implementing these tools; and finally
- best practices, that will put forward examples of cases, where policy tools have been implemented towards achieving these policy objectives.

5.1. Overarching issues

In this section, based on the findings of Tasks 4.1 and 4.2, an overall explanation of the most important overarching issues is provided, which have relevance to all of the four educational levels, and also throughout the AFF sector as a whole. Indeed, the main request by stakeholders, as part of Task 4.2, was towards development of a coherent European Education System (from primary school to the high school/university level). This System will allow harmonic action throughout all the students' lifelong training. For this reason, these are also topics that carry importance for both policy-makers, and education managers. Hence, these overarching issues are further discussed in detail concerning each of the educational levels, if and when relevant, in the next sections.

5.1.1. Policy objective: Integrating the notion of sustainability into the education system

Sustainability in agricultural and forestry systems is viewed as a prerequisite for the transition to sustainable development at the global level. Given its scale and scope, the sustainability transition is a significant challenge to the entire AFF sector; the main question remains on how to support this transition process (COM, 2019).

i. Policy tools

- **5.1.1.1 Policy tool:** Promoting information and a common language regarding sustainability

While achieving sustainability is of utmost importance and currently it is set as a target to be achieved in the sector, it is widely agreed that the concept is not effectively integrated into the education and training system. A common understanding and common language (not necessarily scientific), that provides a similar visioning of sustainable development, is needed for explanation of existing problems and to be able to address them.

In this regard, one of the most important need for policy action lies in information and communication actions developing a common understanding of the term and what it requires across the sector. In this perspective, shared way of thinking and operating, as well as shared goals should be promoted and disseminated. Setting shared indicators suitable at local and European level might help identifying not only problems, but also the progress towards solutions. In this scope, also a common language for an efficient dialogue with farmers should be promoted. This action would strongly rely on interplays with policy areas different from education (see 5.1.1.3 below). For example, defining and improving sustainability indicators, and disseminating their use, may be an important step towards achieving sustainability objectives.

- **5.1.1.2 Policy tool:** Updating curricula on all educational levels regarding sustainability

This is an action that involves all levels of the educational system, and concerns both policy-makers and educational managers on regional, national and European levels. The workshops conducted in Task 4.2 highlighted that in order to integrate sustainability into the education and training system, there is a need to change the curricula to include sustainability and sustainable food production, which is the way to achieve a society-wide and long-term effect. Indeed, education from early ages can lead to empowering of consumers/citizens to be aware of, and demand healthy and nutritious food and to drive the change to sustainable food consumption, and hence production. Also, in terms of vocational education, it was noted that sustainability is not currently a large part of vocational education, and that it could be more strongly emphasized in the educational provisions by the competent authorities (e.g. education ministry).

The inseparable link between healthy eating and sustainable production is to date not considered enough in education context, as strongly underlined by Task 4.2 workshops' participants. Additional missing (or insufficiently addressed) topics are circular economy, resource exploitation, waste management, packaging options, new agroecological methods of production, short value chains and local markets, and the possible impact of lifestyle changes across the value chain, in the transition to a sustainable AFF sector. These are also part of the sustainability education that needs to be integrated into the curricula. In this direction, some of the actions proposed were as follows:

- education should give the right instruments to understand the importance of a new sustainable way of consumption as well as healthy eating, and in a wider perspective, to educate in adopting sustainable lifestyles, starting already in primary school and throughout the Pre-University level;

- at the University level, it is necessary to provide information about the negative impacts of current farming methods, and to promote the change from conventional to sustainable production;
- regarding lifelong learning, all actors working with food should be strongly recommended/facilitated to have a profession-specific sustainability course or certificate to be renewed within given intervals;
- sustainability competencies should also be promoted as items that employers demand to candidates which will also drive the change and transition of skills acquired in the sector.

- **5.1.1.3 Policy tool:** Supporting integration of sustainability in education through collaboration with other policies (e.g. right to healthy and nutritious eating, practices of the private sector)

Promoting sustainability in education is a key topic and may build on strong synergies with other (non-education) policies. The outcome of Task 4.2 argued that this could also support local economies, and could generate a major change by making only a small modification.

Funding of initiatives should be provided by the government in order to develop and sustain different projects that design, demonstrate, and/or disseminate environmental education practices. Projects may be developed in order to achieve one or more of the following outcomes, with an integrative perspective: buy sustainable and healthy food at schools, reduce waste and/or increase recycling, projects that have a positive environmental impact. Initiatives should also address the right to know what food actually contains and its traceability (*e.g.* transgenic products). The use of food guides could also be promoted, including information on sustainable diets, local production, maintaining and providing biodiversity in countries. An important part of this activities relates to establish links to the local context. Policies can also promote activities to restrict businesses with unsuitably processed products and limitations of aggressive advertising and offers, especially for children.

ii.　　Actors

The integration of sustainability into the education and training system calls for the attention and action of a variety of actors. In this regard:

- **policymakers** play a critical role in supporting other actors involved in the education sector since they can provide regulation, resources and support for large-scale changes to existing processes in shaping the future of education;
- **international organisations** and **networks** have an important role to play in mobilizing resources to conduct research and set the standards in terms of integrating sustainability in education and training.
- **education managers** are another group of actors identified as influential in advancing sustainability in education and training, as not only they can influence decisions taken at the educational institutions, they can also act as role models for students. The literature shows that students consider exemplary education managers to play an important role in their decision to become involved in sustainability initiatives (Emanuel & Adams, 2011). Visible activities among education institutions such as biking to school, recycling, or buying fair trade goods motivate students to take similar actions (Emanuel & Adams, 2011; Kagawa, 2007;

Leal Filho & Schwarz, 2008). In a similar way, implementation of sustainable school canteens at educational institutions can facilitate, starting from childhood, the adoption of correct eating habits for the promotion of health and the prevention of chronic-degenerative diseases. Teachers, in this sense can make use of the educational role of tools, such as school canteens, explaining the value of food, the methods of cultivation and production, healthy eating habits and the principles of healthy and nutritious eating;

- **regional centres of expertise** are another group of actors that can be involved in supporting educational institutions in developing and implementing sustainability initiatives. These centres can act as hubs where education that integrates sustainability in learning practices can be disseminated to different audiences in formal and informal settings.

iii.   Best practices

Best practices
The NextFOOD Sustainability Impact Framework - EU- **Description:** The NextFOOD project has, as one of its objectives, to develop an impact framework which assesses: 1) the various effects of practice-oriented research in the agri-food and forestry sectors; 2) the processes of interactive innovation in this context; and 3) their positioning in relation to use and impact. The framework generates a sustainability impact index relating to impact aspects on multiple levels. **Good practice:** The framework resonates with NextFOOD's "action learning strategy" (Lenaerts et al 2019), in considering multi-actor involvement and action-oriented features, as well as including practice abstracts as a component of the impact work itself. **For more information:** https://www.nextfood-project.eu/wp-content/uploads/2020/01/lw3n-ku0px678bpshlm.pdf
CASI Public Participation in Developing a Common Framework for Assessment and Management of Sustainable Innovation **Description**: The project's main objective is to develop a methodological framework for assessing sustainable innovation and managing multi-disciplinary solutions through public engagement in the Research, Technological Development and Innovation (RTDI) system by ensuring the commitment of a broad spectrum of societal stakeholders into its implementation. **Good practice**: The project enables the elaboration of an assessment framework of sustainable innovation practices, providing opportunities and various venues for stakeholders to engage in focused debates on sustainable innovation. Finally, EU-wide policy recommendations are elaborated. **For more information:** https://cordis.europa.eu/project/id/612113/it
Increasing Organic Food in Schools - Italy- **Description**: The project started off with the main objective to educate kids about the importance of healthy lifestyle and nutrition and the need to improve the relation that children have towards food, especially in the school context. In addition, the project also aims at strengthening the link between the environmental and education perspectives.

Good practice: raising educated citizens and consumers of tomorrow, who understand the importance of organic food with the cooperation of parents, involving them in this educational process; economic objective: creating the conditions for a local supply chain founded on the needs of local producers, designing procurements; social objective: improving local community support, above all for farmers and organic food producers; environmental objective: reducing environmental impacts, using less pesticides and reducing food transport.

For more information: https://www.provincia.re.it/wp-content/uploads/2020/07/Increasing-organic-food-in-schools_Brochure.pdf

Fruits and Vegetables in Schools- Italy-

Description: The policy is targeted at substitution of traditional snacks by fruits and vegetable. Thanks to the close collaboration between the 8 selected agricultural companies, Ministry of Agricultural Policies, CREA and ISMEA, a Program was created with the central objective of providing food education that aims to increase awareness of children and their families about importance of a greater consumption of fruits and vegetables in daily meals.

Good practice: Notwithstanding the numerous hindering forces, pupils of elementary schools received at least 10 different species of fruits and 2 different species of vegetables. The majority of fruits and vegetables was produced in Italy and had certifications of PDO, PGI and Organic; and some of these products were produced in Europe. This allowed to make daily meals healthier, to sustain local food supply chains and to prepare a future generation of consumers.

For more information: https://www.unitedfresh.co.nz/our-work/fruit-and-vegetables-in-schools

The European Sustainability Competence Framework (GreenComp)

Description: This is a reference framework for sustainability competences created in 2022 by a network of people, including experts on sustainability education and lifelong learning from academia and research institutions, youth representatives, educators, policy representatives from EU members states and NGOs.

Good practice: The framework provides a common ground to learners and guidance to educators.

For more information: https://op.europa.eu/en/publication-detail/-/publication/bc83061d-74ec-11ec-9136-01aa75ed71a1/language-en

UNECE's Competences in Education for Sustainable Development Framework

Description: The Competences in Education for Sustainable Development ("Learning for the future: Competences in Education for Sustainable Development"; ECE/CEP/ AC.13/2011/6) were adopted at the sixth meeting of the United Nations Economic Commission for Europe (UNECE) Steering Committee on Education for Sustainable Development on 7 April 2011. The framework has been followed-up with and developed further by various documents and frameworks, one example being Framework of Education for Sustainable Development Goals (2017),

Good practice: The framework sets out key competences for educators in education for sustainable development, with an aim to identify shared principles and beliefs that can unite educational staff and guide personnel in their actions, regardless of their grade, function or location.

5.1.2. Policy objective: Enhancing gender equality across the AFF sectors

Another key overarching issue across the AFF value chain and across all educational levels is the topic of gender, and how to bring gender-neutrality to the whole sector, starting by introducing it from early ages of education. Currently, the issue of gender-neutrality is being treated as a separate topic that needs to be implemented in the AFF sector. While this is not the case only in the AFF sector, and is a common challenge in all sectors, AFF sector also constitutes a sector where there is a significant gender gap.

In order to change this trend, and to make gender-neutrality an integral part of the whole value chain - and not only a topic to consider separately - the whole approach of the sector needs to be changed as a system, starting from primary education onwards including all the levels of education and training.

i. Policy tools

- **5.1.2.1 Policy tool:** Integrating gender studies into agricultural education from early ages

The outcomes of Task 4.2 suggested that gender angle in agricultural and forestry education is missing, and there is a need to bring it from scratch. The results suggested that this transformation is needed both in the education and training system and in research. Currently, while on the policy-level, the educational policies are lacking to make gender an integral part of the education system; while on the level of educational institutions, incorporating gender in the syllabus is a matter of individual initiative and enthusiasm and not an institutional strategy (Trbovc and Hofman, 2015). In this regard, it is of utmost importance to integrate the gender angle into study curricula throughout all levels of the ET, starting from early ages, so that the curricula not only provide a more balanced vision of the world in terms of gender but also help students build cognitive structures that would allow them to understand the concepts and themes that gender studies cover at more advanced educational levels.

Moreover, gender mainstreaming in the ET system is a part of a larger call for transitioning research policies and practices. It is seen that currently the issue of gender is usually studied as an "isolated topic" by (usually female) researchers who specialised in this specific subject. In most cases, incorporating gender into research plan or syllabus is a matter of individual initiative and enthusiasm, not an institutional strategy (Trbovc and Hofman, 2015).

- **5.1.2.2 Policy tool: Enabling gender equality (or neutrality) in the ET system**

It is a necessity to have gender equality as a horizontal priority when designing programmes, and to integrate it to all parts of the ET system. In this regard, it is important to enable equal representation of men and women in the admittance of programmes, indeed after Pre-University level throughout the lifelong learning stages, equal admittance of men and women can be challenging, due to lack of equal rights throughout the whole sector. To provide an example, the overrepresentation of men in professional courses can partly be explained by long and weekend-based workhours incompatible with current social division of work at home, that puts more burden on the women.

Towards this direction, some strategies were proposed as part of workshops conducted in the scope of Task 4.2, that can be implemented across the four levels of education. These include:

- enhancing digital skills to close the gender gap, by empowering women entrepreneurs;
- adopting distance learning approaches, and introducing distance learning programmes at formal institutions;
- introducing more flexible learning approaches, rather than rigid programmes with prerequisites, fixed semesters, limited or no work placement during the programmes as a way forward, in order to be able to include more students from various specialisation or demographic backgrounds.

As part of Task 4.4, on the other hand, some tools and instruments for integrating gender into organizations and educational institutions were proposed, which can also constitute an example for the AFF sector. These include:

- designing a gender equality plan;
- implementing gender mainstreaming in project cycles;
- allowing various levels of gender integration in a program or policy;
- mainstreaming gender into research and education contents;
- introducing gender equality training resources;
- and introducing and applying various checklists to implement these steps.

ii. Actors

A variety of actors have a role to play in enhancing gender equality across the AFF sectors:

- **governments**, which act as key actors in decision-making, have the role of promoting gender equality since their role can be identified in terms of ensuring enforcement of the right to education and non-discrimination. Besides, it is of utmost importance that governments consider the following issues: gender implications of how resources are allocated, gender equality on how teachers are paid, how school leadership appointments are made, how curricula can be made gender-bias free, how teachers and trainers can be educated continuously to adopt gender-sensitive and gender-neutral approaches, how gender parity in school participation rates can be ensured, and how financial and human resources can be prioritised to support the implementation of good-quality adult basic education and literacy that transforms gender relations. To give an example, the Finnish Equality Act requires educational institutions to draft a gender equality plan that includes the institutions' most

significant measures for promoting gender equality, and sanctions exist for neglecting this duty;

- **educational institutions** and education managers on the other hand are responsible for ensuring safe and inclusive learning environments free from school-related gender-bias. The approach the schools take in addressing this topic, not as an external topic "to be mentioned in class", but rather as an integral part of education that needs to be integrated into the whole school approach and curricula can make a significant difference (especially from early ages onwards). Education and training organisations must also take steps to ensure women and men's equal opportunities for education and professional development are met;
- in a similar way **teachers and trainers** are responsible for using inclusive instructional practices and promoting active discussions on gender issues, making classrooms to be free spaces of expression of ideas;
- **non-governmental organisations** and **civil society**, on the hand have a role to support the leadership capacity of all actors associated with an education system.

iii.   Best practices

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The genderNEXT Toolbox

Description: As part of the NextFOOD project, a gender toolbox has been prepared, in the context of which various tools and instruments are presented that are useful for starting or enhancing the integration of a gender perspective in research producing entities and educational institutions. The purpose of the toolbox was to offer practical instruments to be applied in various contexts and for various tasks. The toolbox includes the following instruments and guidelines:
1. Designing up a Gender Equality Plan (GEP)
2. Gender mainstreaming in project cycles
3. Various levels of gender integration in a program or policy
4. Conducting a gender analysis
5. Including and measuring intersectionality
6. Integrating gender-sensitive approach into education curricula, research and teaching
7. References for gender training resources
8. Checklist(s) for rapid gender audit

Good practice: The toolbox can be a critical tool to be used as part of AFF educational institutions in order to make sure that the necessary steps are taken towards a gender-equal or gender-neutral ET system.

For more information: https://platform.nextfood-project.eu/#/categories/-M3PtoElFOporslH9aiW

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Minimum Standards for Gender Mainstreaming

Description: The Policy for applying minimum standards for gender mainstreaming (FAO, 2020) recognizes that a gender-responsive organizational environment is necessary to achieve progress towards its four gender-equality objectives and to implement its twin-tracked strategy.

Good practice: The Policy identifies 17 minimum standards that aim at ensuring that the gender dimensions are adequately integrated in all institutional processes and functions through specific

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requirements for accountable offices and divisions. The implementation of the minimum standards, which are aligned to the performance indicators of the UN-SWAP 2.0, will be annually monitored and reported to Members as part of the corporate reporting efforts.

For more information: https://www.fao.org/3/cb1583en/cb1583en.pdf

Diversi si, ma tutti uguali (Different but all the same) Awareness and education to equal opportunities in primary schools - Italy-

Description: Working on a cultural level to deconstruct stereotypes in gender identity and gender roles. By means of an interactive methodology based on a concept whereby girls and boys will be stimulated, by interacting among them, to have emotional responses.

Good Practice: The project foresees a set of activities to be developed in the class, involving pupils, teachers, and parents aimed at deconstructing stereotypes and prejudices that condition individual and relational growth.

For more information: https://www.icmonteforteirpino.edu.it/archivio/wp-content/uploads/2019/01/progetto-DIVERSI-SI-MA-TUTTI-UGUALI-percorso-alunni.pdf

5.1.3. Policy objective: Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system

Another overarching topic that has been identified in Task 4.2 as a gap and, consequently, as a need of the AFF sectors, was to put emphasis on and integrating certain skills and competencies which are lacking in the sector, and which are necessary to enhance innovativeness.

To fill the gap, the actions required and proposed involve approaching the AFF system as a whole, which should also be reflected to the curricula that today's education and training system offers.

i.   Policy tools

- **5.1.3.1 Policy tool:** Promote the integration of soft skills into the curricula and allow them to be an integral part of the EF system across all education levels

As part of Tasks 4.1 and 4.2, the importance of the need to integrate soft skills into the educational and training programmes was stressed, including:

- entrepreneurship;
- strategic development;
- critical thinking;
- systems thinking;
- marketing;
- leadership;
- teamwork;
- communication;
- interpersonal skills;
- goal setting visionary thinking.

Besides, the importance to implement new and innovative learning approaches, such as action learning and student-centered learning, into the ET system were emphasized. In this way it would be possible to enhance higher order learning skills, through which, students can absorb the skills to synthesize, analyse, reason, comprehend, apply and evaluate the knowledge they acquire, and to put them critically in practice. These skills, if provided from early ages onwards, can make it possible to raise students (and future farmers) that can innovate and co-create.

- **5.1.3.2 Policy tool:** Introducing and extending courses to improve digital skills and digital literacy of students of all levels

In addition, other critical skills that are needed across the whole sector and that must be integrated into the whole education and training system are digital skills and digital literacy (intended as the skills required to achieve digital competence). Digital skills are not only important for farmers (or future farmers) to learn new and advanced technologies in order to improve food production by being able to make more informed decisions, it also can facilitate the use of digital learning platforms.

In this regard, policy actions need to be put forth to enable more students (also those in more disadvantaged or remote areas) to reach learning activities, and also contribute to closing the gender gap. It is also required to involve students with their local environment and field reality during their early years of studies to acquire skills related to knowledge integration, interdisciplinary work, and communication. This is also closely linked to acquiring practical training (experiential knowledge and ability to relate), familiarization with all the levels of production and familiarity with the experience of previous generations.

However, it is important to underline some controversial factors about digitalization. Indeed, the pandemic forced many education institutions to use digital tools (university digital platform, some tools for group activities such as Mentimeter etc). These remote activities allowed to improve digital skills of students as well as teachers and facilitators. On the other hand, the increased use of digital devices exposed too much young generation to digital gadgets and virtual reality. In this vein, a general demand on how to help young people to have a real-life activity and to interact among each other, to develop language skills, empathy and critical thinking was raised worldwide.

ii.   Actors

To enhance the soft and hard skills and competences, the actors involved are as follows:

- **ministries** have an important role to play in enhancing soft and hard skills and competencies in the AFF sectors. To give an example, **Ministry of Education,** depending on the Member State, has the role of decreeing the schools and universities' programs. Indeed, to modernise the education and training systems on the recognition and validation of hard and soft skills and competences in formal, non-formal and informal learning settings the Ministry can provide new techniques and approaches, involving the technical offices and the ministry officers. **Ministry of economy and finance**, on the other hand, can take on the role of allocating resources in order to increase digital skills and digital equipment;
- **educational institutions** can take on a role of actively promoting and inspiring students, by providing them with the awareness of the importance and opportunities regarding hard and

soft skills and competencies. Hence, the education managers and teachers must be equipped with the right knowledge and tools, and be open minded to learn new approaches and new educational techniques, to be able to transfer the knowledge to the professionals of the future;

- **external stakeholders and private sector (**the industry and the labour market) can take on a critical role in guiding the educational institutions towards introducing practical tools to equip the students with relevant qualifications;
- **education researchers and experts**, thanks to their knowledge, can strongly contribute to the setting up of new educational pathways coherent throughout the whole educational process (from primary school to VET);
- **youth organisations** can play an important role as providers of non-formal education for young people across Europe. In this regard, recognition and validation of non-formal education becomes critical, and youth organisations can collaborate with educational institutions to participate in projects and initiatives that support recognition and validation of non-formal and informal learning, that can support the provision of hard and soft skills to meet the needs of the sector.

iii. **Best practices**

Best practices
CRISS – Europe- **Description**: The purpose of the project is to develop and pilot, on a very large-scale way, an educational platform in the cloud for the acquisition, evaluation, and certification of students' digital competence in primary and secondary schools. **Good practice**: The project consortium developed a new cloud-based digital learning ecosystem and tested it in over 535 European schools. Its outcomes have potential to impact all actors, with more qualified **students**, **schools** that can better describe what they want in their procurements, and **regional education directorates** having a clear picture of which **policy actions** are needed **For more information:** https://www.crissh2020.eu/
NextFOOD Toolbox for teaching practitioners **Description:** As part of the NextFOOD project, an online Toolbox has been created to support teaching practitioners in implementing the NextFOOD approach to education. The approach is based on action learning, and reflects the need to move away from a linear education system to an education that is experience-based and focused on developing key competences for sustainability. **Good practice**: The Toolbox reflects the design of the NextFOOD approach, which implies a focus on developing these competences, which are dialogue, observation, reflection, participation, visionary thinking, facilitation, and systems thinking. **For more information**: https://platform.nextfood-project.eu/#/categories/-M3PtoElFOporslH9aiW
NextFOOD audit tool

Description: The tool is designed to assess an educational programme's capacity to equip students with the inventory of seven skilling pathways identified originally in the NextFOOD Inventory for future practices in the agrifood and forestry sectors. The audit tool uses a self-assessing methodology with the aim of generating awareness and reflection.

Good practice: The audit tool will help the user(s) discover how the audited education performs in relation to each of the seven skilling pathways identified originally in the NextFOOD Inventory of Skills (Rosenlund et al., 2019), as well as be encouraged to reflect on ways to develop the educational activities further, along these pathways

For more information: https://www.nextfood-project.eu/wp-content/uploads/2021/04/d1.2-audit-tool-for-education-and-research1.pdf

5.1.4. Policy objective: Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making

One of the most significant findings of Task 4.1 and Task 4.2 has pointed out how the insufficient networking between academic and non-academic educational policies in AFF sector is resulting in an education system that is theory-oriented and failing to deliver practical abilities and tools.

Hence, collaboration should be adopted by a wide range of actors and institutions, for example between universities and market actors, between ministries and between all the AKIS actors with a network mindset, but also to learn from the experience and good practices. As also mentioned during the workshops conducted in Task 4.2, a greater collaboration should be established in several ways: a) closer collaboration between educational bodies and industry to balance theory and practice; b) joint efforts to develop work placement and applied projects; c) engage and interact with the outside world; d) broader competence through collaboration and mixing competencies, also with an international outlook.

In addition, steps need to be taken to link education with the field and local realities starting from early years of education. It was argued that education should not only focus on knowledge transfer, but also to convey local cultures and stories behind food, taking the local context into account. This would require a better integration of farmers and farming and food system entrepreneurs in the development of courses that could provide students with all the necessary tools for getting acquainted with the farming systems, not only on paper, but in real life. Towards this end, a methodological proposal was also made to shift the current understanding of the "knowledge triangle", based on "education, research, business", to a rectangle, incorporating "education, research, business, and local society", where the local society is regarded as a new dimension, fundamental for new projects, to prosper the sector.

i.   Policy tools

- **5.1.4.1 Policy tool:** Promote the inclusion of farmers/practitioners as facilitators/teachers in courses

Education provided directly from farmers can inspire, engage and educate young people and give practical understanding of the crucial role that agriculture plays. This would then lead to preparing and equipping the students with necessary skills to tackle the sustainability challenges and to improve the production systems from early ages.

ii.   Actors

The integration among different actors and levels in the educational pathways requires a significant effort, especially from coordinators. Indeed, the role of the main actors can be as follows:

- **policymakers** can take the necessary steps to increase the number of institutional initiatives (i.e. funded projects), and promote the multi-actor and interdisciplinary approaches;
- **educational managers** can take on the role of coordination of different actors, realities and contexts;
- **industry** can act as a catalyst of human resources from the job's world to the education context;
- **private sector** can allow the allocation of company resources, both human and financial, in courses' development.

iii.   Best practices

Best practices
The NextFOOD cases   **Description:** The NextFOOD project has adopted a case-oriented approach because in real-life cases the complex topic of learning in agrifood and forestry systems come into full play and, thus, can be studied under realistic conditions. These cases refer to a wide range of agrifood and forestry systems in different geographical locations (Europe, Africa and Asia).   **Good practice:** The cases are continuously exploring theory and methods for fostering the key skill in a participatory manner involving students, stakeholders and faculties. All NextFOOD cases are working to increase collaboration with farmers and other stakeholders in the food system, and integrate this in their education and training programs.   **For more information:** https://www.nextfood-project.eu/case-studies/
NextFood Sustainability Impact Framework   **Description:** The NextFOOD framework aims to measure impact in ways which provide for networking and interactive innovation towards sustainability in the agri-food and forestry sectors. The NextFOOD framework does not standardize sustainability impact. Instead, it acts as a tool for organizing stakeholder interactions around potential and actual impacts

> **Good practice:** A potential way of using the framework is as a tool for evaluating the impact of education programmes in the agriFood sector.
>
> **For more information:** https://www.nextfood-project.eu/wp-content/uploads/2020/01/lw3n-ku0px678bpshlm.pdf

Farmer time

Description: The initiative pairs farmers with classes for a series of video calls throughout the year. The students have the opportunity to ask questions, and see what happens on the other side of the farm gate, reinforcing curricular learning with real life examples

Best practice: The project allows to connect the younger generations with the countryside, highlighting the role of agriculture sector in society, improving the respect and social perception of farmers.

For more information: https://leaf.eco/farmertime/home

5.1.5. Policy objective: Simplify administrative procedures and allow a better coordination of policies

All policies should be designed in ways that produce synergy, or at a minimum reduce conflicts. Indeed, difficult problems cannot readily be solved through the actions of an individual public sector organization, but a collaborative approach is required.

Indeed, it was noted as part of both Task 4.1 and Task 4.2 that there is a need of a simplification of bureaucracy in the ET system, which is currently standing in the way of adapting quickly to the needs of the sector for trained professionals and making the necessary changes in a timely manner, towards integrating more innovative ways of learning. Besides, the poor communication between actors and legal entities (e.g., ministries, academia, chambers of commerce, districts, municipalities, educational institutions etc.) does not help improve the situation. In addition, it was noted that there is a problem in the abundance of documents and regulations, both at EU and national level, which leads to the necessity to enable policy harmonization, in order to obtain a more systematic and integrated policy.

i.   Policy tools

- **5.1.5.1 Policy tool:** Simplify the bureaucratic process to allow for a better interaction between educational institutes and experts

Enabling interaction of schools and experts is of critical importance, and towards this goal simplification of bureaucratical processes is required: very often this kind of interaction is provided by external instruments, like targeted funding; but this is not sufficient.

To achieve the simplification of administrative procedures and improve the coordination policies, two actions are proposed:

- the simplification process might start from the top with a better coordination amongst General Directorates (agriculture, health, education and training), leading to quick response mechanisms and procedures;

- in order to effectively minimize the bureaucratic burden at educational level, institutionalization in the normal programming of interaction among schools and experts, needs to be introduced.

- **5.1.5.2 Policy tool:** Setting a periodic debate session among stakeholders and policymakers

During the workshops conducted in Task 4.2 the need to set periodic (for example annual) debates has been highlighted. Indeed, discussion among stakeholders and policymakers would also be an opportunity to voice different perspectives, exchange ideas and opinions, have a register of sectorial hot topics, developments and approaches in terms of human resources and their education and training, and to pave the way for future collaboration

ii. Actors

The simplification of administrative procedures and the coordination among stakeholders and policy-makers requires an effort from several actors:

- **policy-makers** have the responsibility to create trust regarding policies and regulations by favouring not only transparency but also easiness of use of the policies and bureaucracy;
- **educational institutions** have the responsibility to coordinate with policy-makers and to put in place effective internal governance mechanisms to implement the necessary changes;
- **local stakeholders** play a relevant role in providing information for the identification of key problematic areas;
- **citizens** must be part of the changing since their participation helps to deliver a better service through the identification and understanding of citizens' needs, enhancing rational decision-making and inclusive development.

iii. Best practices

Best practices
The SCAR AE Platform
Description: SCAR Strategic Working Group (SWG) on Agroecology (SCAR-AE) will offer a platform for continuous strategic discussion between the members states/associated countries and the European Commission. SCAR-AE will, in particular, centralise and integrate the efforts for the process of preparing a candidate partnership (the "Partnership") related to Agroecology (AE), Living Labs (LLs) and Research Infrastructures (RIs) proposed under Horizon Europe (HE) (provisional title ''Accelerating farming systems transition: agroecology living labs and research infrastructures''). As a first target, SCAR-AE will write the "Partnership proposal", which will be the basis of the Partnership call that will be included in the Work Programme 2023-2024. The SCAR-AE aims at supporting research policy development for Agroecology at national, EU and international levels, and fostering debate and providing conceptual, methodological and practical frameworks on AE, AE Living Labs (LLs) and corresponding Research Infrastructures (RIs).

Good practice: SCAR is considered as a suitable platform for Member States (MS) and Associated Countries (AC) to share views, create common visions together with the European Commission (EC) with a unified voice on agricultural, food and bioeconomy R&I matters. To ensure these aims, it favours the alignment of activities from the relevant entities by gathering and analysing their potential inputs and providing advice to promote synergies and avoid duplication. SCAR-AE reinforces SCAR's advisory role for MS, AC, and the EC by catalysing a common and inclusive debate on AE and AE LL-related Research and Innovation (R&I) needs.

For more information: https://scar-europe.org/index.php/agroecology

Zero bureaucracy project -Estonia-

Description: A taskforce composed of high-level civil servants of public institutions and representatives of the main stakeholders was set in order to coordinate and monitor the activities aimed at reducing the administrative burden on businesses, deregulating the economic activity by addressing unnecessary requirements, reducing the bureaucracy within the public sector.

Good practice: The Minister of Economic Affairs and Infrastructure initiated together with the Minister of Entrepreneurship, the Minister of Finance and the Minister of Public Administration. Stakeholders have been identified in: Chamber of Commerce and Industry, Employers' Association and Estonian Service Industry Association.

For more information: https://projects2014-2020.interregeurope.eu/purecosmos/news/news-article/3728/zero-bureaucracy-project/

5.2. Pre-University

According to the findings of Task 4.1, the policy field where the highest percentage of respondents think that the policies are "not at all effective" to improve learners' skills and knowledge was the Pre-University level. It was noted that education should be improved from primary school if we want to see a substantial change and that a policy action is required to develop early childhood education programmes. Indeed, Pre-University level is, for some aspects, the most important level of education for setting the competencies and the basic knowledge of students. For this reason, the need for many topics to be introduced starting from the early ages (elementary schools) was a key message that came out in the workshops.

This is true especially for key issues like sustainability and gender equality, which are perceived on one hand fundamental for the future challenges and, on the other hand, are felt so important that they are independent from the students' future profession. However, one of the critical points of both these issues is their correct definition and the identification of what is meant for introducing them into the curricula. Indeed, these two general issues have a common element: they can be perceived by students not only by adopting an approach, but also by adopting a lifestyle. In this sense, it is important to find the right balance between these two dimensions in education. For instance, in sustainability finding the balance between integrating the three pillars (economic, social, environmental) into education and training as an approach, and providing the right instruments to understand the importance of a new sustainable way of consumption as a change of lifestyle are critical. Hence, these practices can be applied on the school level to equip students with the necessary knowledge and awareness, but also to adopt the lifestyle changes, from early ages, which can drive the change and transition of the AFF sectors. More in general, it is a matter of building on human capital. In 1988 the National Research Council stated that agriculture is too important to be taught to only students in vocational education and that "agricultural literacy" must be a part of the regular curriculum. Nevertheless, to date pre-university education fails to provide students with sufficient skills needed in the real world. Policies aiming at building human capital for the rural sector must implement not only the skills of the workforce, but more in general the education. Importantly, policies should act to provide education to the farmers' present and future needs.

AFF systems are largely influenced by governments, that can affect the system by acting not only on legislation and regulation, but also through financial instruments, as well as support for innovation and education. The range of potential control instruments that governments can consider using is wide, including regulations, controls and bans. Importantly, the education ecosystem involves now a wide range of stakeholders inside school such as teachers, principals, students, and other staff, but also the population outside the school, comprising entrepreneurs, associations, institutions, parents, families, friends and private persons etc.

In this section, the policy objectives that are wished to be achieved, and the relating policy tools that can be used towards achieving these objectives are listed for the pre-university level.

5.2.1. Policy objective: Increasing financial support and investments

Unsatisfactory levels of financing are one of the main issues that negatively affect the output of the education sector, giving to students an insufficient level of resource availability. Hence, financial instruments are necessary to fund school programs and staff, guaranteeing the correct human and professional development of pupils and teachers.

i. Policy tools

- **5.2.1.1 Policy tool**: Investing in new technologies and instruments in schools

Technology has the potential to democratise and make education more accessible on a global scale, but the lack of technical innovation across the schools creates a gap that will be more difficult to fill over time. Besides, the use of advanced devices constitutes a step forward enabling new ways for people to learn and work together as well as acquiring new skills. Technology investments play an important role in raising educational standards, hence ICT should be widely used across the whole school curriculum in order to transform education. Acquisition of technological material implies that more laboratory time is included in normal courses. In this regard, laboratory time might be evaluated also by means for example, of a mandatory minimum hours per year or specific evaluations for students in a given technology sector.

- **5.2.1.2 Policy tool**: Improving ICT education level by means of skilled educators

It is teachers/learners' responsibility to ensure that most of the opportunities provided by technology is utilised, so that effective and efficient education is available to everyone everywhere. Importantly, researchers have identified that the most important factor in teachers' use of technology is confidence (Inan & Lowther, 2010). Teachers need to be better prepared, supported and resourced and this will also have implications for budget and resource allocations to school. In this regard, ensuring that all teachers are equipped with digital literacy will allow to deliver more personalised and effective learning experiences.

ii. Actors

Several key actors need to join forces to increase financial support and investments in the pre-university education:

- **governments** have an important role in the funding of school technology plan, that must be supported by overseeing and implementing efforts to introduce digital educational content;
- **school principals** must attend training and commit to using technology in their own jobs. In addition, how a principal prioritizes digital technologies contributes to teachers' use and related student-centred pedagogy;
- **teachers** can decide to use technology for instruction. Importantly it would be necessary to practically demonstrate how it makes it easier to create instructional materials;

· **academic research community** have the potential to customize and influence new technologies/teaching methods by findings from educational research projects.

iii. Best practices

Best practices
Piano Nazionale Scuola Digitale The National Digital School Plan (PNSDhttps://www.tes.com/lessons/QCQ3lC8-B9Ua7g/piano-nazionale-scuola-digitale is the guiding document of the Ministry of Education, Universities and Research for the launch of an overall strategy that helps to "catalyse" the use of multiple sources of resources in favour of digital innovation in the Italian school. Considered a fundamental pillar of "The Good School" the planned actions are divided into four fundamental areas: tools, skills and contents, training, accompaniment **For more information:** https://www.miur.gov.it/scuola-digitale

5.2.2. Policy objective: Enhancing competencies and skills

The need of improving competencies and skills is transversal to the whole training system. However, the higher expectations are placed in the Pre-University level, due to its importance from a pedagogical point of view.

i. Policy tools

- **5.2.2.1 Policy tool: Integrating soft skills into the curricula starting from early ages**

Soft skills, such as critical and system thinking, communication, entrepreneurship, marketing, foreign languages (mainly English) are critical skills and competencies that need to be acquired by the students. Students, when they become graduates, often do not have or do not know how to use these skills and hence are only able to develop them during the working life. However, to match the needs of the sector, it is crucial to provide these soft skills starting from early ages, and starting from Pre-University education, so that students can build these skills throughout their education lives, and be ready to use them when needed as part of their roles in the AFF sectors. In this framework, the Pre-university education managers must set both a vertical and a transversal dialogue. The vertical one with upper levels of education, should aim to develop a coherent education system from primary school to university. Both Tasks 4.1 and 4.2 revealed that many crucial soft skills that are necessary in the AFF sectors (and also throughout life) are missing. Experts in teaching methodologies, approaches, and tools should collaborate in order to discover the best solutions to educate students in acquiring and becoming aware of the acquisition of competencies and skills, such as:

- holistic knowledge (too specialized knowledge);

- digital and technological skills;
- motivation and consciousness;
- teamworking, interpersonal skills, and communication;
- networking;

- **5.2.2.2 Policy tool:** Promote and enhance continuous training of trainers

The success of an education system is strictly linked to the quality of the teachers themselves. The training of trainers' modules is intended to involve more experienced personnel for training those that are less experienced. The training can include the topic/skill but also the teaching methods. In both cases, a more practical application of the training can be done by means of interactive lessons or by simulation. In addition, a "cascade model" can be applied, where one or two teachers from a school receive standardized training and replicate it in their schools. This approach can be extended if networks of researchers and teachers from different education levels can learn and/or teach together.

ii.   Actors

Enhancing soft and hard skills and competences as part of the Pre-University education requires efforts by numerous key actors:

- **policy-makers** should put efforts in removing all the barriers to collaborations among different levels, especially administrative and financial ones;
- **companies** can invest in high-quality training targeted to the development of labour market relevant skills. The education sector as a whole can collaborate and dynamically work in order to encounter the needs of the market. In the case of academics, this sector can increase educational research to better adapt curricula for skills' development;
- **regions, ministries** can collect information and sources and homogenize them in order to link to one another;
- **education sector as a whole,** namely universities and schools can collaborate and dynamically work in order to promote soft skills linked to labour market and orient students.

iii.   Best practices

Best practices
PCTO Percorsi per le competenze trasversali e l'orientamento (Paths for transversal skills and orientation) - Italy
Description: The transversal skills and orientation programme - is an educational methodology that, through practical experience, helps high school students consolidate their educational expertise and test their skills on the job while enriching their training and guiding their studies. These paths are part of all secondary schools' curricula in Italy and can be organized in collaboration with university or with the labour market.

Good practice: The programme provides an experience connecting the theory learned in school with a real context and reflect on future expectations and individual interests.

For more information: https://www.istruzione.it/alternanza//

Recognise and certify skills acquired during secondary school

Description: In 2004 the Flemish Government approved a Decree concerning formal recognition of non-formal and informal learning related to work experience. This Decree focuses on validating meaningful, profession-related competencies obtained in daily experience inside and/or outside the workplace. Individuals can step into a recognition procedure and can obtain a 'certificate for work experience' ('Title for Vocational Competence'). The Decree grants formal recognition to people who can prove they have the skills and knowledge needed for a particular profession. Following the European developments on the structure of Bachelor and Master Degrees for Higher Education, the Flemish Government installed the Decree on Flexible Learning (April 2004). This means that Higher Education institutions can grant exemptions within certain study programme units and can even grant a degree if the outcome of assessment concludes that the competencies are indeed held by the applicant. In Finland there is an Act on Vocational Adult Education (631/1998). The Act lays down the legal framework for skills tests, which are open to all adults, regardless of how (in educational institutions, at work, by self-study or by some other form of activity) they have acquired their occupational skills. By passing these tests they can achieve an officially recognised qualification

Good practice: A number of countries have specific statutes in law that give citizens rights to have their skills, knowledge and competencies recognised, regardless of the manner in which they have been obtained.

For more information: https://www.oecd.org/education/skills-beyond-school/34376318.pdf

5.2.3. Policy objective: Updating the Pre-University curricula to meet the needs of the sector, curricula implementation and development

The needs of the sector are developing at unprecedented speeds. Furthermore, not only the AFF sectors are facing new scenarios but also other productive sectors. In this changing context, the implementation of curricula requires serious analysis and strong collaboration among educational managers and stakeholders, especially from a socio-environmental point of view.

i. Policy tools

- **5.2.3.1 Policy tool:** Promoting initiatives to strengthen a connection between education and everyday life starting from early ages

Curriculum development should be viewed as a process of meeting the social needs, improving the student learning outcomes and promoting the knowledge at a larger scale. Indeed, knowledge transfer should not be the only part of the education program, as we need to also transfer values to kids/scholars and convey local cultures and stories behind food, while increasing parent's connection

to schools. In this regard, the inadequacy of current Pre-University curricula has been strongly underlined in Task 4.2, where the education that establishes a connection to real life, and the real experiences on the ground, hence to the land, is rare among today's children and youth. Policy-makers should consider how to promote education policies that contribute to effectively reinforce this educational dimension. To give an example, kids can have their small garden to get familiar with plants and soil starting from an early age. This necessity was also exacerbated further during the pandemic, which proved even more the importance of building this connection. Towards this direction, the following actions can be taken:

- ensuring that children learn about the benefits of healthy eating and reconnect to agriculture;
- increasing the awareness of the entire farm to fork process implementing students' good and healthy eating practices;
- disseminating information on food nutrition and its cultural aspect.

• 5.2.3.2 Policy tool: Adopting new learning approaches in Pre-University education

As already mentioned, connection to the territory is usually missing among pupils of modern society. Schools should act in order to bring students closer to the Agrifood and forestry topics. In doing so, new innovative pedagogic methods and remote learning methodologies must be included in everyday education. Some examples are: blended learning (integrating offline (in-person) and virtual methodologies), mobile learning (when students work from different devices like tablets, notebooks and smart mobiles), flipped classrooms (when students develop videos for fellow students to gain better comprehension on a certain topic), but also gamification is an interesting tool that can help in getting students, especially younger and less self-conscious ones, more involved in learning. In this context, policies encouraging the use of devices, by means of initiatives such as a Bring-Your-Own-Device (BYOD) at school, as well as policies funding purchase of devices at schools might encourage modernization of teaching methods.

Another suggestion is to implement reflexive transdisciplinary practices in educational settings. A greater connection between theory and practice helps engaging students in lessons and real world. SMEs and local farmer communities could get in touch with education realities where student can interact with professionals of the sector. The further added value consists of the possibility to teach traditional agriculture, maintaining and providing biodiversity in countries.

• 5.2.3.3 Policy tool: Integrating the notion of sustainability into pre-University

Building human capital for sustainability is likely to require substantial government investments in education and training. The pathway to sustainability depends on how societies educate the next generation, hence schools can have a huge impact acting on different levels. One aspect of sustainability is acquiring life and lifestyle skills such as consumer awareness and citizen skills. Indeed, one thing is to have a course, while another is getting people to act -and this requires engagement. In this context, different educational initiatives can be applied in a school context:

- school canteen system for education on healthy eating and lifestyle: a key tool for the sustainable production (processing) of food could be the use of the potential of a developed school canteen system for education on healthy eating and lifestyle;

- reinforcing short value chains, and production for self-consumption;
- teaching to use more parts of food in the context of students' education;
- education providing information about the possibilities and conditions of donating unused food.

ii. Actors

Updating the Pre-University curricula to meet the needs of the sector requires the action and collaboration of a variety of actors:

- on a wider perspective, the curriculum development as well as its implementation in the classrooms is influenced by **legislation, national reports, educational research** and **external stakeholders** such as **consumers, financial** and **economic entities, technology developers** and **media;**
- **local and regional governments** have the power to make interaction among different levels of education;
- **families** can either support, be involved or involve kids in the development of activities that can be suggested by the schools or by themselves;
- **industry partners** play a crucial role in connecting with local schools to share their experience and enthusiasm;
- **schools/teachers** are pivotal in educating young people by:
  - influencing curriculum development by choosing subjects;
  - disseminating teaching material to the students;
  - integrating food and agri-food system themes and examples into social studies, science, mathematics, and health curricula;
  - connecting the agri-food system to environmental and social issues;
  - involving students in real-world experiences in the agri-food system;
  - using media to enhance instruction about food and the agri-food system;
  - and enhancing critical thinking skills by analysing food choices and the inter-relationships within the agri-food system.

iii. Best practices

Best practices
Farm to Fork Game – Australia -   **Description**: The 'Farm to Fork' game creates a virtual world in which the player manages the potato supply chain, starting with on-farm production, through processing to create different products, marketing and advertising to increase distribution and sales, and methods of preparing potatoes for consumption.   **Good practice**: Throughout this game, the player is provided with key information and is challenged to make decisions which will affect the health of consumers, amount of waste generated and profitability of the potato industry. In addition, players can see the consequences of their decisions.

For more information: https://www.ecu.edu.au/__data/assets/pdf_file/0004/874885/Farm-to-Fork-Game-in-the-Classroom-Teacher-Reference-Guide.pdf

National farm to school network – USA-

Description: National Farm to School Network is an information, advocacy and networking hub for communities working to bring local food sourcing and food and agriculture education into school systems and early care and education environments.

Good practice: Farm to school enriches the connection communities have with fresh, healthy food and local food producers by changing food purchasing and education practices at schools and early care and education settings.

For more information: https://www.farmtoschool.org/

Digital Education Action Plan (2021-2027)- EU-

Description: The Digital Education Action Plan (2021-2027) is a renewed European Union (EU) policy initiative to support the sustainable and effective adaptation of the education and training systems of EU Member States to the digital age.

Good practice: The Action Plan sets out two priority areas: 1) fostering the development of a high-performing digital education ecosystem, 2) enhancing digital skills and competences for the digital transformation.

For more information: https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_en

American farm bureau foundation for Agriculture – USA-

Description: The site is dedicated to helping learners of all ages to understand the importance of agriculture in our everyday lives.

Good practice: Awareness and understanding of agriculture is grown through education. The site encourages understanding the importance of agriculture and sustainability.

For more information: https://www.agfoundation.org/

CarboSchools -

Description: CarboSchools aim to link researchers from several leading carbon science laboratories in Europe with secondary schools. In these partnerships, young Europeans conduct experiments on the impact of greenhouse gases and learn about climate research and the reduction of emissions.

Good practice: Scientists and teachers co-operate over several months to give young people practical experience of research through true investigations, interactions with real scientists and public presentations.

For more information: http://www.carboeurope.org/education/index.php?lang=en

5.3.   University

The strong connection between research and teaching that characterizes the universities allows them to identify the gaps and needs before the other levels of Education and Training. Indeed, the research helps universities to assess gaps in teaching methods, curriculum-making and skills and competencies needed. On the other hand, this connection brings universities to a privileged position to experiment with new forms of teaching and new approaches.

5.3.1. Policy objective: Enhancing students' skills and competences

The sectorial competencies and skills are not sufficient anymore. University students are required to develop new transversal skills (both hard and soft skills), that might help the sector face the grand global challenges of today.

i. Policy tools

- **5.3.1.1 Policy tool:** Introduce and improve courses that provide soft skills to students

The presence of several gaps in students' skills and competencies was deeply underlined as part of Tasks 4.1, 4.2 and 4.4. In this sense, the main problem is the lack of right instruments to be utilised during University education. Moreover, often these gaps do not allow degree courses to express their full potential. However, even if there may be different means to reach the fulfilment of the aforementioned gaps, the final aim of university education must be shared across the EU Member States.

- **5.3.1.2 Policy tool:** Increase and finance experience-sharing and collaboration with other educational levels (Pre-University, Vocational Education and Lifelong Learning) to create bridges

In a globalized world, all the actors involved in AFF sectors are connected in some way. This is true especially for innovations and information that flow from country to country and from professional to professional. In this sense, it is not possible anymore to consider educational levels separately. Moreover, this is especially true for universities, which are hubs of knowledge and innovation: if these are not shared across the whole ET system, they cannot be of sufficient value for society. In fact, to be successful in the job market and, more in general, in grand challenges that affect humanity, the University's achievements should reconnect with the overall educational system that, from its side, should move as a unique system with more dialogue and collaborations among different levels.

In fact, establishing this would lead to many positive outcomes, especially for students who would have greater awareness of the requirements and objectives of the different educational levels. Furthermore, it would help teachers, too, allowing them to have an exchange of information among different levels on students' skills and competencies needed (e.g. University teachers could ask to

enhance a specific skill or competence to Pre-University teachers). To do so, more than one pathway is possible, ranging from targeted projects to more stable and permanent programs of exchange.

However, whatever is the path, some elements are fundamental for the success of this policy tool, namely: a central entity (*e.g.* Ministry) that promotes and incentivises – also financially – these experiences; an authority (*e.g.* a Public Agency) that collects good practices and helps actors to overcome obstacles, especially administrative ones; and educational entities (e.g. schools and universities, or schools and training centres) that are proactive and inclined to cooperate. Finally, the greater is the degree of interconnection between the different levels, the greater must be the degree of common understanding, especially at the level of "shared ways of operating."

ii. Actors

The suggested tools require a response from the overall education system, especially university institutions. In detail, the main stakeholders involved are as follows:

· **member States** have a crucial role in setting up a coherent European Education System that matches the Education with the Sustainable Development Goals and the European policies (New Green Deal and Farm to Fork);
· **policy-makers** have to remove all barriers to collaborations among different levels, especially administrative and financial ones;
· **education managers** must coordinate the creation of new courses and incentivize collaboration with other educational levels;
· **private sector** and **companies** should adopt a proactive approach, taking active part in the education and training of future generations of professionals;
· **independent and non-profit organizations** can collaborate in University courses to provide a different perspective on students' skills and competencies that usually are not provided in the University courses.

iii. Best practices

Best Practices
NMBU – Norwegian University of Life Science MSc in Agroecology - Norway   **Description**: The NMBU MSc in Agroecology tries to reach the right balance between action-oriented learning and theoretical knowledge of the subject "agroecology". Indeed, the course stimulates participation, observation, dialogue, visioning and reflection of students in a coherent epistemic approach which aims to develop, at the same time, both hard and soft skills. This approach helps create bridges between university and local stakeholders thanks to the involvement of the latter in the students' "on-the-field" activities.   **Good practice**: The NMBU MSc in Agroecology highlights two main aspects. Firstly, it underlines the importance of education managers in developing a coherent education path that balances the high number of needs and requests to AFF courses (e.g. balance between theory and practice, development and training of soft skills, etc.). On the other hand, it emphasizes the importance of having a flexible legislation on setting university courses, which is not guaranteed in all EU Member States. In other words, the efforts of national policymakers should be geared towards simplifying the steps to modify a university course in terms of approach and hours per activity.

5.3.2. Policy objective: Enhancing teachers' skills and competences

The issue of "teaching teachers" was largely highlighted by different stakeholders (Task 4.2). The importance of being updated with new and alternative teaching methods is felt very important both by professors and learners.

i. Policy tools

- **5.3.2.1 Policy tool:** Set experimental courses to promote closer collaboration between AFF faculties and Education experts

The AFF faculties cover a wide range of subjects and scientific areas. However, to be effective, all of these subjects should be taught in the best way possible to fully unlock their potential. To do so, a closer collaboration between AFF faculties and Education experts is strongly recommended. Indeed, according to the rapidly changing scenario, new techniques and new approaches in education are growing. In particular, the request of balancing knowledge and competencies requires a dialogue with education experts that can help the faculties in developing harmonic and balanced courses.

In this vein, experimental courses can be set to apply new approaches (e.g., the action learning approach) in order to develop students' skills and competencies, satisfying the requests from the job world. Coherently, the courses should be designed in accordance with the degree course (Bachelor's or Master's) and with the professional figures that the courses are intended to provide.

- **5.3.2.2 Policy tool:** Setting mandatory courses for professors in Education techniques and methods (mandatory lifelong learning)

One of the most important activities of the University in the near future will be training teachers to teach. In this perspective, setting mandatory courses for professors is deemed necessary. While, on one hand, this aspect can burden professors, on the other hand it will benefit both teachers and students. In this sense, the main challenge is to find the right balance in providing courses as much as possible, in a short, effective and stimulating way (Please also refer to sub-heading 5.5.2 under the Lifelong Learning section).

The courses should provide elements to improve skills and competencies in terms of ability to explain in class, in students' engagement, in the management of the activities on the field or in the laboratory. Furthermore, the Covid-19 pandemic brought out the need of improving distance learning tools. In this sense, it will be necessary to provide teachers with the tools and the skills to manage a virtual class.

ii. Actors

For establishing closer collaboration between AFF faculties and education experts, actors involved are:

· **education Researchers** because they are the expression of the scientific knowledge in this field and can contribute both in theory and practice;
· **professionals in Education** (**other Teachers**), as sources of know-how, and practical knowledge in Education.

For setting mandatory courses of professors in education techniques and methods:

· **member states** can set up modalities, programs, and targets for compulsory courses at national levels;
· **university Education managers** have the task of coordinating activities for teachers and making courses lighter in terms of administrative burden and timing, while increasing their effectiveness;
· **AFF Faculties** have the task to set the right conditions to start the courses by providing spaces, tools, and technologies.

iii. Best practices

Best practices
University of Bologna Center for learning and teaching innovation- Italy-   **Description**: The teaching innovation model of the University of Bologna is based on research activities inspired by the Formative Educational Evaluation model with specific Degree Programmes that can participate in activities such as systematic data collection and analysis, collective discussions, identification of teachers' training needs, experimentation with teaching innovations, and the implementation of resulting training activities that are useful for redesigning teaching in the future.   **Good practice:** When applied to the Degree Programmes for Teaching Innovation, the Formative Educational Evaluation approach includes three phases: 1. collecting and analysing data: a session during which different types of information are collected, through valid indicators and rigorous procedures, in order to study the context and processes currently underway;   2. data return and resulting identification of university teachers' training needs: a session focusing on sharing, self-evaluation and reflection for the players involved;   3. formulating proposals for redesigning and improving teaching: an operational decision-making session whereby players in a university context collectively propose possible actions and directions for change.   **For more information:** https://centri.unibo.it/centroinnovazionedidattica/en

5.3.3. Policy objective: Spread and improve University collaborations for educational purposes

The need to move from a linear and mainly top-down approach to a systemic and collaborative approach concerns not only pedagogy but also policymaking, called to find solutions in new and innovative ways. This objective should be pursued by all the actors involved, especially the University, which has the dual role of user and proponent of new strategies and new policies.

Important actions to be taken to pursue this objective are the removal of obstacles and the construction of bridges that connect all the stakeholders involved.

i.   Policy tools

- **5.3.3.1 Policy tool:** Enhancing Public-Private Partnerships (PPPs), reducing administrative burden, and creating tax incentives

According to the general belief, there is an under-representation of practical knowledge and experiences in university curricula in AFF. Indeed, the request of enhancing practical learning is widespread throughout Europe (Task 4.2). One important way to achieve this is through incentivizing the collaboration among different partners, in particular with industry and local society.

- **5.3.3.2 Policy tool:** Enhancing multi-stakeholder approaches by a permanent panel with diverse representatives

Creating in each AFF faculty a permanent panel with representative members of University, Industry, Public institutions and local society is critical, in which local/national stakeholders can express their requests and critiques to the curriculum-making process. In this way, a continuous exchange of information across different stakeholders (University, Industry and local society) can be established, to understand the socio-economic needs and which professional actors are required.

ii.   Actors

The different actors that can be involved are as follows:

- **AFF Faculties** can be regarded as hubs where different stakeholders in AFF can meet and exchange opinions for curriculum-making process and job market requests;
- **local stakeholders** should be involved to co-create curricula and to point out local needs and expectations;
- **AFF Professionals**, with their know-how and their knowledge of the sectors, can be fundamental sources of hints and tips;
- **public officers** and **public institutions** are fundamental for PPPs and for helping the curriculum-making process. Indeed, about the latter, public institutions constitute the link between citizens and policy-makers. In this sense, they can help point the way decided at the policy level.

iii. Best practices

Best practices
TU Delft - #cocreateMYCITY   **Description**: #cocreateMYCITY is an example of the international collaborative program that TU Delft, a Dutch public technical university, set up in the cross-faculty TU Delft | Global Initiative. The program was hold in collaboration with the city of Durban, and the aim was to find solutions to urban challenges in the sectors of Water, Transport & Logistics, Energy, Agriculture and Healthcare. Closely related to several UN SDG's, the main objective of the course was to stimulate the students to find innovative and sustainable solutions. The activity was conducted through multidisciplinary and multicultural teams. In detail, twenty Dutch and twenty South African students teaming up for 10 days, worked together in small groups on challenges identified by the city of Durban under the guidance of a selected group of experts and mentors. All groups came up with concrete solutions to these challenges. On the last day, they presented these solutions in the form of business cases to local business, start-ups and government.   **Good practice**: The #cocreateMYCITY program is an example of the involvement of different stakeholders in a University program. Indeed, the local stakeholders are involved both indirectly and directly. Indirectly, because the program aims to find solutions for them, stimulating students to identify their needs. And directly, by presenting them their identified solutions in the final event. Furthermore, it is important to underline how this program adopted the triple helix, involving students (university), local business (industry) and government (state). On the side of AFF faculties and education managers, the #cocreateMYCITY suggests how a program can be multidisciplinary and, thanks to the involvement of students from different contexts – Netherlands and South Africa –, multicultural. Furthermore, last but not least, the pedagogy is based on practical learning, improving students' practical skills and competences.   **For more information:** https://www.tudelft.nl/2018/global/cocreatemycity-delft

5.3.4. Policy objective: Enhancing and updating the programs and curricula to match the needs of the AFF sectors

The 5.3.1 policy objective can be further elaborated with reference to the AFF sectors, which have their own needs and requirements. Indeed, programs and curricula must be improved according to the needs of the sectors, which are moving toward sustainability, digital transition, and virtuous management of resources.

i. Policy tools

- **5.3.4.1 Policy tool:** Better integration of formal, non-formal and informal education into the curricula

It is of critical importance to allow for a better integration of *formal*, *non-formal*, and *informal* education, allowing students to put into practice the knowledge acquired with the formal University education.

Specifically, complementing formal with non-formal education in schools could allow students to gain practical skills on the field. For this purpose, educational entities such as NGOs, associations, industry, enterprises and the third sector entities should be involved in curriculum-making in order to support the regular studying courses. Besides, the collaboration between school and business, and more in general between educational bodies and industry, is necessary to initiate a virtuous circle that will improve education. This will also improve the service/expertise provision to enterprises and, through their needs' identification would continue to foster programme design with the requirements for skills update. Hence, it is necessary to:

- increase the interaction among work realities and school
- and implement lessons with more practical activities in order to exploit the theoretical knowledge acquired "on the desk" balancing theory and practice.

Indeed, students appreciate the relationship with the real world and this should be a driver not only because it allows designing new educational programmes, but also because it responds to the stakeholders' needs. To do so, incentivizing private businesses to cooperate with schools should provide a normative framework, where bureaucratic and financial burden must not penalize who accept trainees.

This strictly relates to another important topic that was often highlighted as part of Task 4.2: education in school is too static and does not consider a changing world. In this direction, lack of sufficient innovation in education tools and innovative ways of learning (student-centred learning, participatory and practice-oriented learning, interdisciplinarity, internationalization, mobility, networking) has been underlined. Hence, a more dynamic system should be applied to teaching programs. Such system should allow:

- higher educational institutions to modify their educational offer to match the skills needed in the future;
- education to be supported by farmers who are directly working on the territory;
- putting more emphasis on the role of future consumers;
- acquisition of work-related generic skills for creating a more "flexible" and multi-skilled workforce.

- **5.3.4.2 Policy tool:** Integration of the notion of sustainability into the curricula

Sustainability is one of the most important topics that has to be addressed not as a subject that needs to be followed in school, but has to be considered as a fundamental pillar for education. In this regard, it is crucial to make sure that education must consider the inseparable link between healthy eating and sustainable production: Consumers play a key role on what they demand. If subjects such as nutrition, sustainability and environmental awareness are to be introduced in the curricula, it is crucial that schools also adopt consistent practices that would serve this goal.

- **5.3.4.3 Policy tool:** Putting in place an integrated qualification framework

An integrated qualification framework is currently missing, and putting it in place would be of critical importance for allowing students to have experiences outside the University with Associations, Foundations, NGOs and so on. Currently, there are now two or three separate systems: Bologna, Copenhagen, EAPA (European alliance professional accreditation) – which means that an effort should be made by policy-makers to set a unified accreditation system to evaluate the experiences made by students.

- **5.3.4.5 Policy tool:** Incentivizing internships and field trips using the NextFOOD approach

On the same line, incentivizing internships and field trips that allow interactions between students and workers is a task for policy-makers, education managers and companies. Moreover, something that came up from the NextFOOD project is the importance of the action learning approach to reach the best results in this type of experience.

- **5.3.4.6 Policy tool:** Establishing (a network of) national centers for curriculum design and personnel development

An important aspect in the AFF education is the necessity to review the curricula; and for this reason, enhancing skills and competences should no longer be an occasional activity, but a permanent one. Indeed, establishing a national center for curriculum design and personnel development would allow a national coordination of different practices among national universities. Furthermore, this national think thank could be a way to coordinate actions and requests from policy-makers.

ii. Actors

Actors involved in enhancing and updating programs and curricula, integrating the concepts of formal, non-formal and informal education, and the concept of sustainability, are as follows:

- **education managers** are the most involved in this process because of their role. It means that they should coordinate, enhance dialogue and collaborations with external actors, help teachers to rethink courses, integrating new concepts and approaches;
- **teachers and education professionals** can be part of the change of pace with a proactive role, targeting new collaborations (multi/trans/interdisciplinarity) and new teaching methods;
- **AFF Professionals** may have an "adviser" role, giving suggestions and hints from job's world;

- **students** can enter in the process by expressing their point of view, the strengths and weaknesses of University courses by means of surveys or interviews;
- **EU/national Policymakers** have to update regulations and laws in order to simplify the action of universities and education managers in terms of bureaucratical pressure and administrative costs.

Instead, for the creation of an integrated qualification framework, the main actors are:

- **certification experts,** with a role of coordinators and advisors;
- **EU Policymakers**, with the task of unifying the actual qualification frameworks in Europe that are perceived unsuitable by different actors involved in AFF Education (University and, especially external actors like NGOs, Foundations and Associations);
- **researchers** bringing their knowledge into the process.

Incentivizing internships and field trips with the NextFOOD approach requires the involvement of:

- **national Policymakers**, with clear regulation and appropriate funds for these activities. It is fundamental to understand how this measure can suit the national context and which are the elements that decree the success or failure of these initiatives according to the state of the art of research in this topic;
- **education managers** should promote the students' experiences keeping a wide network of relationships with companies. Furthermore, they can incentivize professors to adopt Action Learning as a basic approach for their courses;
- **private sector** should implement a gradual insertion of students into the world of work. This implies ethics requirements for the firms in this kind of collaboration with universities.
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iii. Best practices

Best practices
Rural4University – Rete Rurale Nazionale (Italy) **Description**: Rural4University is a project in the scope of Rete Rurale Nazionale 2014-2020, powered by Italian Ministry of Agriculture (Mipaaf). Its goal is transferring knowledge, and experiences from farmers to university students about RDPs, Good Agricultural Practices (GAPs), Innovation and Sustainability on farms. The course is taught in an innovative format, consisting of three phases: face-to-face and online training (called RuralLEARN), field experience (called RuralCAMP) and business laboratory (called RuralLAB). In 2020 the project involved a Public Entity (Rete Rurale Nazionale, RRN), eleven Italian Regions and their Rural Development Plans (RDPs), two Public Research Institutes (namely, CREA, and ISMEA), and a private association (called Vazapp). Meanwhile, the students came from seventeen universities scattered throughout the national territory. **Good practice**: In addition to being an example of an innovative format of education path (theory mixed with on-the-field experiences and action learning), the Rural4University project highlights the importance of a good coordination process among different partners. Indeed, the RRN has the double role of coordinator of activities and expense manager. In the former, the activities are set up with the Public Research Institutes, CREA and ISMEA, and with the private association

Vazapp (multi-actor approach). While for the latter, the RRN manages public spending funded by the Ministry and the Regional RDPs.

Finally, this experience emphasizes the importance of complementary paths to the university ones for students in their training and the fundamental dialogue between university and external bodies, whether they are private or public.

For more information: http://www.rural4learning.eu/

C-Lab – Master Thesis Lab

Description: Challenge Lab (C-Lab) at Chalmers University of Technology (Sweden) is a "co-creation arena" founded with the idea of supporting students in thinking how to change the pace towards a more sustainable society. The C-Lab targets students from any Masters programme at Chalmers and Gothenburg School of Business, Economics and Law and it gives a space for students to set collaborations with stakeholders from organisations within academia, industry, the public sector and civil society.

The C-Lab offers courses and a Master Thesis Lab. In this latter, students "work in a dynamic environment where they are in charge to connect projects, companies and public sector initiatives together with academia to find leverage points in the system to then suggest and initiate solutions to take all sectors in the society forward." The students' projects address challenges in the local and regional contexts.

Good practice: The C-Lab is an enabling environment for students that are involved in the process of thesis project, educated in sustainable-thinking, and stimulated to collaborate among them and among stakeholders. On the other hand, the stakeholders themselves are actively involved in this multi-actor approach, aiming to find solutions to societal challenges and sustainability issues. Finally, the education managers become "learning facilitators" rather than teachers, moving from the simple delivery of information (*linear learning*) to the offer of information, resources and support (action learning) facilitating student to complete their thesis.

For more information: https://challengelab.chalmers.se/

5.3.5. Policy objective: Enhancing international cooperation

The increasing interest in finding common solutions to common issues in AFF leads universities to enter local and international networks. This important cooperation approach is also critical in research projects, publications and could have a twofold outcome:

    i.   a way to improve the knowledge and the values of each University;

    ii.   to allow the growth of their student with specific practice-oriented experiences.

In other words, international cooperation should be a way to benefit teachers and students simultaneously.

i.   Policy tools

- **5.3.5.1 Policy tool:** Financing international exchanges between Universities

Financing international exchanges between Universities, both for professors and students is critical. This type of experience, which is provided widely in the EU, thanks to the Erasmus project, is becoming even more important in our globalized world. Indeed, experimenting different approaches and contexts allows students to develop themselves both in terms of knowledge and in social capital. This is true also for professors and researchers, who, thanks to their abroad periods, can enrich their networks, experience and educational approaches and tools.

- **5.3.5.2 Policy tool:** Incentivizing joint lessons of classes from different countries

It is of critical importance to incentivize the joint lessons of classes from different countries, making use of "distance learning" and all the IT technologies. This experience is a sort of "low cost" exchange that requires little financial resources but that can be highly efficient and effective in terms of education and training achievements.

ii.   Actors

The actors involved in these policy tools have different roles:

- **EU/National Policymakers** should finance international exchanges between universities. These exchanges can respond to European or national or local needs, for this reason, it is important to guarantee them with financial incentives and/or tax reliefs;
- **education managers** must have the ability to seize the opportunities offered by policies (*e.g.* tenders, financing, incentives, etc.), and to be proactive in education pathways building;
- **researchers and students** must get involved in these experiences and report the problems and successes of these initiatives to allow effective use of the resources;
- **public officers,** helping students in finding the opportunities and guiding them through the bureaucratic procedures.

iii.   Best practices

Best practices
DAMR Project – UNA EUROPA **Description**: In the scope of seed funding UNA EUROPA - European University Alliance, the DAMR project (*Disseminate Anti-Microbial Resistance knowledge and the use of whole-genome sequencing on relevant bacterial pathogens during COVID-19 world emergency*) aims to promote virtual mobility of students and researchers and dissemination of knowledge on *antimicrobial resistance* (AMR) and *bacterial whole genome sequencing* (WGS). The project is divided into two parts: The first one is a series of classical frontal lessons hold by expert researchers and teachers from the University Alliance; the second part consisting of *live sessions* of Q&A between students and teachers. Furthermore, the project promotes the peer-to-peer exchange of experiences and knowledge with regard to their research activities.

Good practice: DAMR project is a good example of joint lessons of students from different countries using "distance learning"; it reveals good coordination among different consortium universities' education managers and, at the same time, their ability to build new educational pathways exploiting the UNA EUROPA - European University Alliance opportunity. Hence, this Alliance demonstrates the possibility for policymakers to incentivize these low-cost experiences (compared with other exchange experiences like Erasmus+). Furthermore, researchers and students have the opportunity to be actively involved in the process thanks to both the *live sessions* and the final survey, which evaluates their preparation and willingness on the topics faced in the project. The survey is a way to understand how to improve future courses.

For more information: https://www.fu-berlin.de/en/international/network/partnership-networks/unaeuropa/news/2021-antimicrobial-resistance.html

5.3.6. Policy objective: Enhancing digitalization in universities

The demand for new skills and competencies depicted in the policy objectives 5.3.1 and 5.3.4 cannot be detached from digitalization. In fact, digitalization represents the main challenge for AFF education and training and, *lato sensu,* for the whole AFF sector.

The need to equip universities with digital devices and trained staff is becoming one of the most pressing policy objectives in terms of education and training, requiring necessary and timely response actions.

i. Policy tools

- **5.3.6.1 Policy tool:** Promote design of courses that will provide students with the necessary digitalization skills

The grand challenges of the future and the digitalization of both economic and non-economic sectors force the development of digital skills and necessitates the provision of right tools and competences to students to answer the needs of the world and the job market. The aim is to raise future-professionals that can manage modern technologies and techniques that will lead them to critically contextualize results, numeric data, or laboratory data in the real context of a farm or a company. Besides, to deal with the challenges of our day, which is making it more and more difficult for farmers to survive and maintain their businesses or production, it is important to be informed and skilled about using precision farming instruments. In this way, it would be possible to improve agricultural yield and reduce potential environmental risks, by monitoring digitally the soil and physicochemical parameters.

Although this is part of the wider debate on the digitization of the profession and how to prepare the sector to this transition (that is beyond the scope of this publication), one solution to design these courses could be through establishing (or increasing) connection with enterprises, who have the financial means, the necessary skills, and potential and limits of these technologies. Hence, motivating the enterprises to be part of such collaboration would be critical.

- **5.3.6.2 Policy tool:** Promote actions to increase the total number of hours of lessons that use digital instruments and technologies

Providing courses on digital means as teaching tools in universities is critical. In this regard, guaranteeing certain number of hours of lessons that use digital instruments and technologies (mandatory minimum amount per year) can be a way to make this possible. Hence, updating the curricula toward integrating more digital teaching tools will also need to go hand in hand with infrastructure investments in schools.

- **5.3.6.3 Policy tool:** Put in place courses for training of trainers, which will be equipped to provide digital skills to students

The ability to use digital instruments as teaching means, requires the right competence from professors and facilitators. Especially the Covid-19 pandemic pushed trainers to adopt e-learning solutions. This meant a shift from in presence lessons to virtual ones, opening the door to new skills and competences for teachers: to manage virtual classes, to produce materials more interactive for lessons, to manage online exams and so on. The topic of training of trainers are further discussed in the Lifelong Learning section.

- **5.3.6.4 Policy tool:** Investing on schools' infrastructure to provide technological instruments and digital technologies

In order to equip students with digital skills and to enhance digitalization in the sector, we need higher availability of modern technologies during practical education activities. All these issues, that cross the borders of the digitalization in the universities and will have to be the subject of discussion in Academia in the next years, are not only problems of knowledge and competence but also infrastructural problems. Indeed, it will be always more important for policymakers and public institutions to guarantee the correct supply of IT material, software for teaching, stable and fast internet connections. Besides, the lack of technical innovation in the schools creates a gap that will be always more difficult to fill over time. To fulfil this gap, an integrated system of financial evaluation and use of technologies purchased should be developed in collaboration between education managers and policymakers.

Moreover, to provide more technological instruments and digital technologies, public investment in digital technologies at schools can be justified by putting in place a "using scheme of these technologies". Measuring the impact (economic and social impact) of putting in place digital technologies, can also be a way to provide numerical evidence to the investors to show the impact of their investment, and its impact on the society.

ii. Actors

In order to develop policies for digitalisation and technological update, some actors are crucial:

· **policymakers** have the role to provide fundamental support to allow a digital transition. Massive investments are needed and only with the joint efforts of policymakers at different levels (EU, national, regional), Europe can upgrade its technological assets. However, careful managing of funds is necessary, because in order to increase digital skills of students, the

purchase of technologies is only part of the solution, which also requires investment in digital training for university teaching staff, increasing the hours of lessons that use digital instruments, and increasing the number of technicians and experts per university. All these actions must be coordinated within universities themselves;

- **education managers** have to interface with policymakers and other teachers. Their coordinator role assumes a strategic importance to guarantee the correct application of policies and the right management of the resources;
- **IT experts** are needed for their competences. Moreover, their know-how and knowledge of the sector can be fundamental sources of hints and tips;
- **IT technicians** are essential for the correct operation of the lessons and to help professors and teachers in case of need;
- **public officers** are a link between policymakers and universities;
- **digital learning experts** have a profession that is getting always more attention coherently with the growth of *remote learning* and new digital tools for education and training. Their involvement will be part of the University of the future;
- **finance Experts** are essential to guarantee the financial strength of universities and to avoid the waste of resources.

iii.   Best practices

Best practices
Restart for Education in a Digital Era through Project-based E-learning- EU- **Description:** The Project stands for innovating teaching and learning methods at academic level by integrating the digital technology in the educational process. **Good practice:** The main innovation consists in the development of methodology of teaching that integrates Project-Based Learning (PBL) with digital technologies. This innovation will lead to a better correlation between the higher education and employers' expectations, by creating the framework of cooperation between students and specialists from different fields of activity. **For more information:** https://ec.europa.eu/programmes/erasmus-plus/projects/eplus-project-details/#project/2020-1-RO01-KA226-HE-095772

5.4. Vocational Education

The goal of vocational education and training is to enable students to move into working life with solid vocational knowledge and skills. The Vocational Education is "usually carried out at upper secondary level and post-secondary level before students begin working life. It takes place either in a school-based environment (mainly in the classroom) or in a work-based setting, such as training centres and companies, although, this varies from country to country, depending on national education and training systems and economic structures" (EC, 2020). It is perceived by the European Institutions as a key element for "sustainable competitiveness, social fairness and resilience" (EC, 2020). The importance of this level of Education for EU is testified by the official documents (European Council, 2020; Osnabrück Declaration 2020), the financial instruments (Erasmus+ programme, European Social Fund – ESF) and specific agencies (European Centre for the Development of Vocational Training – CEDEFOP, European Training Foundation – ETF) https://www.cedefop.europa.eu/https://www.etf.europa.eu/enthat support the Vocational Education in Europe.

Indeed, the flexibility of Vocational Education is seen as the right tool to respond to the rapid changes of our society and the business environment. In this regard, policymakers and, in general, AFF actors pay a great attention to knowledge, skills and competences that Vocational Courses give to their students. Furthermore, the Vocational Education is not only a way to foster the AFF sectors, but is regarded as a fundamental element to include the citizens, especially young, that do not intend to attend university courses or even the graduate students that cannot find a job. In other words, it can be a solution to minimize the number of NEETs (Not in Education, Employment, or Training people) in Europe.

5.4.1. Policy Objective: To enable recognition of diplomas

This policy objective arises according to the request made by Vocational Education and Training stakeholders, who find it difficult to get recognition for their work in a uniform way throughout Europe.

i.   Policy tools

- **5.4.1.1 Policy tool:** Set up a unified certification scheme valid through the EU

To date, a general lack of recognition of Vocational Education diplomas and of learning experiences have been underlined. This gap points to the disconnection between *formal* and *non-formal* education and training. To overcome this challenge, it is fundamental to set a unified certification scheme that allows the alignment of the *non-formal* education with the formal one.

ii.   Actors

The actors involved are as follows:

- **EU/National Policymakers** can set up a regulation of the several certification scheme still in force (Bologna, Copenhagen, EAPA – European Alliance Professional Accreditation, etc.);

- **certification experts,** with their knowledge, can help to find a certification scheme suitable for all Member States. Furthermore, when the difference of education and training system is too wide from country to country, it is possible to put in force a national certification that overcomes this obstacle;
- **education managers of other Educational Levels** must be involved in the co-creation of the scheme. In this way they can contribute to expressing their priorities, objective and aims according to their respective educational level (mainly Pre-University and University).

iii. Best practices

Best practices
Spotlight on recognition   **Description:** The Academic Recognition Hub is a database of resources in the field of recognition of qualifications and study periods abroad.   **Good practice:** The project aims to support staff at higher education institutions who are responsible for recognition processes and decisions by enhancing their capacities in terms of recognition procedures in compliance with the Lisbon Recognition Convention.   **For more information:** https://academicrecognition.eu/

5.4.2. Policy objective: To integrate new learning approaches and introduce new programs

The NextFOOD project underlined how important it is to switch from old paradigms to new ones. The need is compliant with the request of integrating sustainability (economics, social and environmental) in education (Policy objective 5.1.1). Furthermore, the complexity of today's relationships among different disciplines and the rising interest in inter and multidisciplinary requires responses that can be achieved through approaches that overcome the limits of the old ones (monodisciplinary, top-down approaches, etc.), especially in Vocational Education.

i. Policy tools

- **5.4.2.1 Policy tool:** To promote integration of new approaches of education (e.g. action learning) and new contents in programs (e.g. multidisciplinary)

There is a need to integrate different competences to educate a new generation of sustainable agricultural operators and this necessitates the designing of multi-disciplinary programs. In this sense, education managers take on important roles, as they must be not only good coordinators among different disciplines, but also good facilitators for students.

About the approaches, the request of a practice-oriented approach both to achieve hard and soft skills is widespread. However, technical and technological update is also necessary, because without the

right tools, students cannot be taught as needed. This aspect underlines the importance of technological know-how in AFF sectors, and it is expected to be always more important in the future.

In this regard, enabling and increasing practical experiences, such as training on-site (perceived as more effective), and to enhance learning experiences such as peer-to-peer learning are regarded to be crucial.

ii.   Actors

This policy tool requires that:

· **education managers** must be not only good coordinators among different disciplines, but also promoters of new approaches in education;
· **education researchers and experts**, thanks to their knowledge in this field, can strongly contribute to set up new educational pathways both from a theoretical and a practical point of view;
· **private sector,** represented by AFF companies should adopt a proactive approach, taking an important role in the education and training of future generations of professionals. SMEs, on the other hand, can be involved in peer-to-peer learning, allowing on-site experiences, which are felt as necessary by stakeholders around Europe;
· **students** have to be proactive in these new educational pathways, suggesting pros and cons of experimental techniques or approaches.

iii.   Best practices

Best practices
The action learning kit for vocational education and training - Australia **Description**: The National Staff Development Committee (NSDC) is a committee of the Australian National Training Authority (ANTA) and is responsible for the development of national policy and managing national projects in relation to staff development within the National, Vocational Education and Training System (NVETS). The action learning kit is designed to help facilitate a range of staff development sessions about action learning. Each volume in the kit presents case studies around a theme and focuses on staff development experience within a range of organisations. This kit contains four volumes, a workbook and a video: An introduction to action learning ; an introduction to action learning workbook: a guide to staff development activities; case studies of action learning groups: volume one: assessment, recognition, evaluation; volume two: curriculum and learning resources development; volume three: flexible delivery; volume four: workplace competencies and competency-based training (CBT) implementation. **Good practice**: Application of learner-centered techniques in the scope of vocational education programmes is of utmost importance. Student-centered learning and action learning methods involve the full engagement of participants in developing, delivering and ensuring the flexibility and relevance of the curriculum. Adopting these learning approaches in vocational learning can facilitate flexible and negotiated assessment having the learner generate contextually relevant content; true collaboration regarding content and process between teacher and learner; the involvement of the environment in the learning; spontaneous and organic learning experiences and, flexible curricula. As most of these issues can be challenging to adopt in formal education contexts,

contributing to the learners' reflection and critical thinking skills as part of vocational education could have important implications to meet the needs of the sector.

For more information: https://www.voced.edu.au/content/ngv%3A3594

5.4.3. Policy objective: Enhancing skills of teachers and trainers

A general lack of specific competencies for teachers and trainers in VET has been found during the workshops held in the scope of Task 4.2. This gap does not reconcile with the request for Vocational courses, and, broadly speaking, it blocks the growth of this educational level.

i.   Policy tools

- **5.4.3.1 Policy tool:** To set mandatory credit acquisition for Vocational teachers (or trainers)

Teachers need to be continuously updated so that they can better identify and better meet students' needs. This, combined with a better integration of farmers and farming and food system entrepreneurs in the development of courses could provide students with all the necessary tools for employment. Importantly, it has been suggested as part of Task 4.2 that training and education are valued more when it is supported with on-site experience gained in a company/organization.

ii.   Actors

Different actors have different tasks:

· **education researchers** are crucial, because they are the expression of the scientific knowledge in this field and can contribute both in theory and practice in "teaching to teachers";
· **professionals in education** are sources of know-how, and practical knowledge in education;
· **private sector** has a fundamental role, especially with the involvement of SMEs, which can be involved in a peer-to-peer prospective, allowing on-site experiences.

iii.   Best practices

Best practices
Teachers continuing professional development – Japan **Description**: The Japanese Ministry of Education, Culture, Sports, Science, and Technology (MEXT) implemented in 2009 a system of *continuing professional development* for teaching profession. The system requires that teachers must spend a minimum number of hours on professional development each year, and the amount is decided by municipal boards. Furthermore, teachers must renew every 10 years their teaching certificates. In addition to this formal training, a complementary practice is to use "lesson study" to learn informally from other colleagues. In detail, these lessons are structured as follow: principals organize meetings during which teachers with varying levels of experience identify an area of need

in the classroom, research intervention options, and create a lesson plan targeting the need. One teacher then uses this sample lesson in the classroom, with the other teachers observing. Teachers from other schools may also attend to observe and learn from the lesson. Finally, the group of teachers meets again to discuss, reflect, and make adjustments to refine the lesson plan. The process may also include an outside expert, such as a university representative. However, all feedback is non-evaluative and focused on lesson design.

Good practice: Although this best practice is implemented by Basic Education Schools, it highlights some elements that can also be applied to the VET Centers. Indeed, in addition to mandatory courses for trainers – that can be called formal training – the *continuing professional development* is completed by complementary informal training (peer-to-peer). Moreover, opening this informal training to other schools' teachers and to outside experts such as a university representative, allows in the first case to create a Community of Practice (CoP) and in the second case to better integrate know what and know how. Finally, this pedagogy is on the same line of the NextFOOD approach, proposing all the key elements of *action learning*: Observation, Participation, Reflection, and Dialogue.

For more information: https://ncee.org/country/japan/https://ncee.org/country/japan/

LIFE Foster Project

Description: This LIFE project is co-financed by the EU Commission LIFE Programme, and aims at educating, communicating, and, in the final instance, reducing food waste in the restaurant industry. To do so, a consortium of subjects active in the research sector, vocational education and training, and in the restaurant industry was held, involving partners from France, Italy, Malta and Spain.

The project targets various groups: Students following a chef programme, in various training centres; 527 Trainers, that are spread over the four European Countries; Policymakers, representative of the national or regional governments or of large municipalities; and other European Training Centres, both directly and indirectly with the aim of spreading the good practices.

Good practice: The LIFE Foster Project matches research, VET and restaurant industry with a common goal, namely raise awareness about food waste and try to prevent and reduce it. This fruitful collaboration is the starting point for a systemic approach that involves students, trainers and trainers of trainers (VET Centres). This approach should guarantee an effective application of good practices in terms of food waste both now and in the future. In particular, trainers are well-prepared to apply precautions in food management and to adopt more sustainable practices, teaching them to their students. In turn, **students "**will pass down their knowledge in the restaurant industry."

For more information: https://www.lifefoster.eu/

5.4.4. Policy Objective: To guarantee the activation of policy-driven rather than market-driven courses

It was underlined during one of the workshops held in the scope of Task 4.2 that the market-driven approach does not always satisfy the needs of the sector or, for example, the environmental or social needs. It means that an effort should be put in place by policy-makers to move from the market-driven approach – which failed in the past in reaching the objectives of a sustainable transition– to policy-driven approach, where the courses are proposed in compliance with the national or international strategy of growth.

i. Policy tools

- **5.4.4.1. Policy tool:** To improve financial support to courses

The education system can be argued to be a market driven sector, meaning that without strong demand for courses in sustainable practices, classes are neither filled nor courses are held. This is strictly related to the lack or insufficient amount of financial support for young AFF professionals to access adult training and Vocational Education. In this light, incentives program for recruiting new groups of students to AFF subjects are deemed necessary.

ii. Actors

The actors involved in this policy tool have different tasks:

- **policymakers** have to be ambitious in proposing financial support or incentives to courses that are not market-driven but that provide a perspective of sustainability and inclusivity;
- **education managers** should be creative to propose courses that attract new groups of students to add new perspectives on the AFF issues.

iii. Best practices

Best practices
VIVEA – Training insurance fund- France-   **Description**: VIVEA is a French Training Insurance Fund, created in 2001 by decree of the Minister of Agriculture and Fisheries and the Secretary of State for Women's Rights and Vocational Training. The fund is supported by agricultural unions (Confédération paysanne, Coordination Rurale, FNSEA and Jeunes Agriculteurs) and agricultural organizations (Chamber of Agriculture and CNMCCA). It offers the opportunity to agricultural entrepreneurs in developing their skills by financing VET. It finances the training actions towards its contributors and defines a training development policy to meet the skills needs of the latter.   **Good practice**: VIVEA represents an example of dialogue and coordination among different partners (unions and organizations) with the support of policy-makers.   **For more information:** https://vivea.fr/

5.4.5. Policy Objective: Increasing financial support for young professionals

The access to credit is one of the most challenging obstacles for young professionals. It is true also for education and training, especially when combined with other costs that young professionals must face (e.g., business start-up costs, mortgages, loans, etc.). In this framework, the need for increasing financial support for young professionals assumes a crucial role for the development not only of the young professional per se but also for the nation as a whole.

i.   Policy tools

- **5.4.5.1 Policy tool:** Increasing financial support and technological equipment for young professionals to achieve strategic objectives

It is critical to improve financial support for young professionals and to enhance the technological equipment of training institutions. Indeed, the increasing importance of IT in AFF sectors will require increased workforce expertise in technologies applied to agriculture, food and forestry. However, in this regard, it is important not to waste financial support with useless purchases or promoting projects too ambitious to be feasible. In this vein, setting up an evaluation system to analyse the effectiveness of financial support and the usage of technologies would help allocate effectively public funds avoiding the waste of resources. Furthermore, policymakers need to identify strategic objectives – such as the six Farm to Fork objectives – in order to define the amount of resources per objective and the evaluation of their effectiveness and efficiency.

ii.   Actors

The actors involved are as follows:

- **policymakers'** support is fundamental to allow this policy tool to be implemented. Careful managing of funds is necessary, because to increase digital skills of students, the purchase of technologies is only part of a system that also requires: investment in digital training for teaching staff, increasing the hours of lessons that use digital instruments, and increasing the number of IT technicians and experts. On one hand, all these actions must be coordinated with Vocational Education Centers, on the other hand it is important to set an evaluation system to analyse the effectiveness of financial support together with Financial Experts and Education Managers;
- **education managers,** as coordinators, play a strategic role to guarantee the correct application of policies and the right management of resources;
- **IT experts** are needed for their competences. Moreover, with their know-how and their knowledge of the sector can be fundamental sources of hints and tips;
- **public officers,** act as a link between policymakers and Vocational Education Centers;
- **finance experts** are essential to guarantee the financial position of Vocational Education Centers and to avoid abuses of resources.

iii. Best practices

Best practices
Measure 1 RDPs – EU   **Description**: Measure 1 of Rural Development Programs (RDPs) aims to boost knowledge transfer, information actions and innovation. It promotes vocational training and skills acquisition actions (Sub-Measure 1.1), finances demonstration activities and information actions (Sub-Measure 1.2), and helps to implement short-term farm and forest management exchange as well as farm and forest visits (Sub-Measure 1.3).   **Good Practice**: Measure 1 gives an example of policy tool that helps the spread of knowledge and positive interactions among different actors. It encourages the farmers to be active in VET and Lifelong Learning. The Measure 1 finances not only the farmers but the AKIS as a whole, giving the opportunity to all the stakeholders involved to have a professional growth.   **For more information:** https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/rural-development/measures_en

5.4.6. Policy objective: To Increase coordination and harmonization of policies

The process of coordination and harmonization of policies is a fundamental step to developing VET throughout Europe. The need is to harmonize within the Member States (e.g., national and regional laws) and among the Member States. Especially the latter is felt crucial to unlock the full potential of VET in the common market of job.

i. Policy tools

- **5.4.6.1. Policy tool:** To strengthen the coordination among the Member States to harmonize policies in Vocational Education through regulations

The aim should be the harmonization of national laws with European guidelines in terms of Vocational Education. Currently, comprehensive policies and validation strategies are lacking in some EU countries within the Vocational Education. In a more practical view, Vocational Education has been defined as insufficient. This leads to the failure of not being able to raise technicians ready to face real context requirements in agriculture.

ii. Actors

The actors involved are as follows:

- **EU/National Policymakers** are the main actors of this harmonization process. Indeed, the success or the failure of this educational level in the next years depend on their ability to coordinate the different European and national policies in the field of Vocational Education;
- **education managers** have a role of support and advice, helping policymakers to define priorities, objectives and tools to make Vocational Education smarter and more effective.

iii. Best practices

Best practices
Osnabrück Declaration
Description: The Osnabrück Declaration (2020) on "*vocational education and training as an enabler of recovery and just transitions to digital and green economies*" sets out the policy actions that would be performed in the EU countries in the period 2021-2025. It focuses on four main areas, namely: 1. Resilience and excellence through quality, inclusive and flexible VET; 2. Establishing a new lifelong learning culture – relevance of continuing VET and digitalisation; 3. Sustainability – a green link in VET; 4. European education and training area and international VET. The Declaration represents an update of the previous Riga Declaration (2015) and it takes in consideration the also updated European Skills Agenda.
Good practice: The involvement of the Ministers responsible for Vocational Education and Training of countries participating in the Copenhagen process (i.e. EU Member States, EU, Candidate Countries, and EEA countries) sets the conditions for a dialogue in the harmonization of policies and in the coordination of collective objectives.
For more information: https://www.cedefop.europa.eu/files/osnabrueck_declaration_eu2020.pdf

5.4.7. Policy objective: To enable stakeholders' inclusion

The development of VET in AFF cannot be achieved without inclusion of the main stakeholders of the sector, an aspect that today seems to be underestimated.

i. Policy tools

- **5.4.7.1. Policy tool:** Promote periodical meetings (e.g. every two years) with selected stakeholders (e.g. trade associations, professionals, other educational institutions, etc.) or to set permanent platforms for discussions

Integrating stakeholders in Education and Training courses is regarded as a good practice to know the needs of the AFF sectors and to be aware of the problems of professionals. For this aim, the European AKIS framework can be a practical guide for education managers to understand which actors can be involved in the curriculum-making and programs-making processes. Setting periodical meetings with selected stakeholders or creating permanent platforms for discussion could be two examples of AKIS actors' involvement. These examples can be adapted to local contexts, according to the peculiarities of the AKIS.

ii.   Actors

Some actors that are involved in this policy tool are found below:

- education managers have a role of coordination and curriculum-making;
- trade associations, professionals, other Educational Institutions have the role of providing their support to the curriculum-making process, helping education managers to focus on the sectorial requests or on the specific demands of skills and competences.

iii.   Best practices

Best practices
The Alliance for Initial and Continuing Training - Germany **Description**: The Alliance for Initial and Continuing Training acts as a policy platform with the aims of bringing together all relevant VET stakeholders at a federal level and of developing possible joint solutions to the main challenges that VET policy is facing. The Alliance tries to improve the situation in the vocational training market, gathering the partners in order to work together both to attract more high-achieving young people into vocational training and to make it possible for more young people with worse initial prospects, young people with migration-related problems, and people with disabilities to enter vocational training. The new instrument of assisted training particularly aims to support small and medium-sized enterprises which offer training to lower-achieving young people. **Good practice**: The Alliance brings together several stakeholders, allowing good communication among different levels, i.e. business, trade unions, and Länder representatives, in order to find policy solutions. Furthermore, the Alliance stands out the socio-economic dimension of the VET. **For more information**: https://www.aus-und-weiterbildungsallianz.de/AAW/Navigation/EN/Home/home.html; and https://www.econstor.eu/bitstream/10419/242110/1/1770110453.pdf

5.5. Lifelong Learning

Lifelong learning is identified as an ongoing process of learning and adapting on both local and global levels (Charatsari, 2019). Lifelong learning means that learning should take place at all stages of life cycle (from the cradle to the grave) and, is embedded in all life contexts from the school to the workplace, the home and the community (Laal, 2011). It is also the continuous building of skills and knowledge during one's life. Besides, lifelong learning is also regarded as providing second chances to update basic skills and also offering learning opportunities at more advanced levels (Laal, 2011), and also refers to the activities people perform throughout their lifetime to improve their knowledge, skills and competence in a particular field. While, education is a human right, many actors and institutions argue that learning throughout life should also be regarded as a human right (Lifelong Learning Platform, 2020). However, currently it appears that neither lifelong education nor lifelong learning is recognised as one of the fundamental human rights (Šimenc and Kodelia, 2016).

This argument is in line with the fact that lifelong learning is no longer regarded as a voluntary choice in many sectors, including the AFF sectors; in contrary, it is argued that in our day, only an individual who has learnt how to learn, and who is willing to learn throughout his or her life, will be able survive in the labour market, or be able to maintain and pursue agricultural production (Šimenc and Kodelia, 2016). Meanwhile, those who are unable to adapt to rapid social changes and frequent employment changes, and incapable of assuring their own employment, will be existentially endangered. Therefore, it is crucial to take the necessary steps in order to make lifelong learning a fundamental human right, and to provide to all individuals who would like to pursue it; and provide more opportunities and options to lifelong learners, in order to make it accessible to all, and to meet the needs of the sector.

Indeed, in the Communication for European Skills Agenda (ESA) for sustainable competitiveness, social fairness and resilience (EC, 2020), life-long learning is seen as fundamental to succeed in strengthening sustainable competitiveness, ensuring social fairness and building a resilient system. Moreover, the ESA is strongly inter-linked with other European policy initiatives in the field of education, mainly European Education Area (EEA) and European Research Area (ERA), showing how education starting at early ages, and that continues throughout the lifetime, is fundamental (i.e., schools, universities, vocational education and training, adult learning, lifelong learning). Hence, in the scope of the EEA, the Commission has presented a first package of measures addressing three main issues: a) key competencies for lifelong learning; b) digital skills; and c) common values and inclusive education. In this regard, the "key competencies for lifelong learning" adopted by the Council are as follows: literacy; multilingualism; numerical, scientific and engineering skills; digital and technology-based competencies; interpersonal skills, and the ability to adopt new competencies; active citizenship; entrepreneurship; cultural awareness and expression.

In fact, lifelong learning is perceived as one of the most important levels of education and training for facing the grand challenges of the future. Indeed, as pointed out by a participant during one of the local workshops in Task 4.2: "How are we to change a society if the majority of people occupying positions are not trained to combat new types of challenges during the next 40 years of their remaining time on the job market?"

5.5.1. Policy objective: Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all

i. Policy tools

- **5.5.1.1. Policy tool:** Prioritizing (and introducing new) lifelong learning courses at educational institutions

In order to promote sustainability in the AFF sectors, it is important that learners can acquire knowledge and skills needed, at all ages and at any time in their life, and that all citizens should be provided with learning opportunities for both personal and professional development (Lifelong Learning Platform, 2020).

Towards this goal, a policy action that needs to be taken among educational institutions, is to give lifelong learning courses more emphasis, to make them more accessible and allocate larger funds for their development. The workshops conducted in Task 4.2 highlighted that generally until now, campus-based learning has been the main focus in most of the educational institutions, while free standing courses (courses that can be taken without being enrolled in a programme) and lifelong learning modules have been given lower priority or seen as compensatory activities when there have been few students on the regular programmes. Hence, in order to make lifelong learning accessible to a larger number of learners, and to widen its reach, it needs to be prioritized among educational institutions.

- **5.5.1.2. Policy tool:** Promoting approaches to Lifelong Learning that are flexible, short, digital, and free (policy decision to strengthen lifelong learning modules in teaching institutes)

It is of crucial importance to design a lifelong learning approach that is accessible to all, including: students that would like to change path, professionals working in the AFF sectors, adults that would like to keep updated with the sector or those that would like to change careers and occupation in midlife and teachers or educators who would like to be equipped to teach new skills and competencies. The workshops conducted in Task 4.2 underlined that in order to increase the accessibility and reach of lifelong learning courses or modules, an important step to be taken is to make them "short, flexible, tailor-made, digital". In this regard, creating courses or modules that are flexible both in terms of scheduling and contents provided is particularly important in the case of adult learning, as adults typically need options allowing them to progress at an individually determined pace, schedules that consider such factors such as work hours and/or children's school hours, easy access to transport facilities, and the availability of day-care facilities for children (OECD, 2001). Besides, providing courses in a flexible manner would also work towards **diminishing the gender gap** in lifelong learning, by increasing the inclusion of women who are otherwise mostly eliminated from learning activities due to the unpaid care-taking tasks they take at home (e.g. looking after the children, or elderly at home).

In order to design flexible courses, the use of ICT and the creating of distance learning opportunities are of utmost importance, which can both work towards providing education to people who would not otherwise have the chance. While the importance of **distance learning** became much more prominent following the pandemic, an example was given in the case of the forestry sector (Task 4.2), such that the geographical profile of forestry education (schools and campuses are mostly based in small cities in remote areas) is a major impediment to attract groups outside the traditional base for forestry work. To increase diversity in terms of socio economics, ethnicity, age and gender balance, some measures should be taken, and distance learning approaches have been promising for broadened recruitment.

For this reason, the necessary steps need to be taken by education providers (e.g., universities, schools, NGOs, community learning centers) to design flexible and tailor-made programmes and modules, which will attract lifelong learners, and make sure that these are beneficial to an increasing number of adults.

- **5.5.1.3. Policy tool:** Establishing multi-actor instruments to enhance lifelong learning

The workshops conducted as part of Task 4.2 emphasized the importance of multi-actor networks and Public-Private Partnerships (PPPs) in order to achieve lifelong learning objectives. According to UNESCO (2018), lifelong learning policy development and implementation activities do not fall exclusively within the domain of Ministries of Education; rather, all sectors of society have key roles to play in developing lifelong learning systems.

In order to establish multi-actor networks in lifelong learning, policy actions are required towards establishing inter-sectoral coordination mechanisms to involve governmental and non-governmental organisations and the private sector, and universities to develop bilateral or multilateral partnerships between sectors and stakeholders in order to share resources and increase the availability of learning opportunities. Moreover, providing diverse and accessible learning opportunities and to make their own unique contribution to lifelong learning for all is of utmost importance. In this regard, managers of educational institutions have an important role to enable these networks, to form alliances and partnerships with a multitude of actors and organisations, and to design lifelong learning programmes in a collaborative and a multi-stakeholder way.

ii. Actors

Different actors have different tasks towards making lifelong learning accessible:

- **Member States** can put in place lifelong learning opportunities for all, **regardless of age, education level, gender,** or **financial opportunities;**
- **ministries** can mobilize public funds to increase the number of courses that are available at educational institutions (which can be offered free of charge to anyone who is interested).
- **policy-makers** should introduce rules and regulations to make these courses less rigid (in terms of pre-requisites), and to harmonize them with credit schemes;
- **education managers** can take on important roles to attract students, professionals or adults into these courses, by making their content tailor-made and interesting to all;

- **private sector** can offer more lifelong learning courses (free of charge) in their area of specialisation;
- **independent organizations** and **non-profit organizations** on the other hand can join forces to create community spaces (both offline and online), or platforms, where lifelong learning and continuous learning opportunities are provided and supported.

iii. Best practices

Best practices
Introductory courses without credits – Norway and Sweden **Description**: A "soft entrance" into learning through introductory or orientation courses on how to learn, or short seminar courses without grades, can ease the entrance into the adult learning process. This approach is used by the Nordic Study Circles (in Sweden and Norway), the School-clubs Migros in Switzerland, and the EDAP programme in the United Kingdom (OECD, 2001). **Good practice:** Courses without credits can provide students or adults with the possibility to experiment with topics and subjects towards identifying their education (or career) path, or simply help them gain experience in topics that are useful for them. In this regard, it would be important for educational institutions to allow this option. At the same time, possible collaborations among educational institutions to fill this gap collectively, offering a variety of different topics complementing each other, would also be useful from a perspective of sharing of costs and responsibilities. **For more information:** https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DEELSA/ED/CERI/CD(2000)12/PART1/REV2&docLanguage=En
Free-standing Open Universities – UK **Description**: Open universities are educational institutions offering degrees with low or no entry requirements, where "open" refers to their open-door academic policy; hence, they offer study options also for those who graduated previous studies with low grades but want to continue their higher education. Open universities also offer distance learning opportunities (which has been a long tradition even way before the Covid-19 pandemic pushed for online solutions), making education accessible across geographical distances. The first European university to give the option of open and online education to students was the Open University UK, which was created in 1970. Apart from the UK, other countries have also joined this tradition, including the Netherlands, Germany and Japan, which all serve clientele not easily reached by residential study options, including adults whose work or family responsibilities make attendance difficult or impossible (OECD, 2001). https://www.distancelearningportal.com/universities/1865/the-open-university-uk.html**Good practice**: The aim behind open universities was to make higher education accessible for everyone, regardless of location, age, gender, but also academic achievements at school. In other words, the goal of open universities is to offer everyone equal opportunities to develop their abilities to improve their level of education and to have a greater chance at their career achievements. For these reasons, open universities offer an important lifelong learning opportunity, offering adult and social education in large scale, and with minimum expenditure. Especially in our day, where online

studying possibilities are increasing at an unprecedented rate, offering open university options around Europe would provide many benefits not only for those who would like to get an education, but also for the sector as a whole to increase the skill level of its current and future professionals.

For more information:
https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DEELSA/ED/CERI/CD(2000)12/PART1/REV2&docLanguage=En

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Forestry Project Initiative - Sweden

Description: The aim of this initiative is to provide shift workers in the forestry industry with upper secondary level education in the core subjects of mathematics, chemistry, physics, Swedish and English. Tuition is carried out mainly through distance education and with the support of supervisors and new technology such as computers and interactive video. Education takes place mainly outside working hours.

Good practice:
This initiative has been designed to address employers' needs for a more highly educated workforce, provides an example of how ICT is being used to increase cost-effectiveness in the adult education sector (OECD, 2001).

For more information:
https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DEELSA/ED/CERI/CD(2000)12/PART1/REV2&docLanguage=En

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Recognition of Lifelong Learning - Norway

Description: In 1999, Norway began establishing a national system to document and recognise adults' informal learning both in the workplace and in an educational setting. Pilot projects have been implemented to integrate informal learning both to upper secondary education and to higher education using a mix of written and oral tests. A May 2000 bill was proposed allowing universities and colleges to admit students without formal entrance qualifications on the basis of age (25 years or more) and informal learning, and also giving them credit in their studies for non-formal learning.

Good practice: This initiative implemented by Norway provides an important example of wider mechanisms for recognising informal learning. Recognition of informal learning in education has also been a topic stressed with importance in the AFF sectors, where applications and relationships on the ground and informal learning opportunities that provide practical experience to students, carry significant importance. In this vein, range of projects need to be initiated to investigate how informal learning acquired through work and field experience, can be identified, assessed and recognised in order to provide access to occupations, to provide credit or exemptions within formal education, and to provide certification in the AFF sectors.

For more information:
https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DEELSA/ED/CERI/CD(2000)12/PART1/REV2&docLanguage=En

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Adult-friendly non-university-level tertiary education system - Australia

Description: Australia has a large "adult-friendly" non-university-level tertiary education system. The largest element of the system is a network of 74 government-funded Technical and Further Education (TAFE) colleges at more than 100 campuses. These have much in common with the Community Colleges in Canada and the United States. The public system also includes some community-based providers in private organisations, enterprises and some provision within university-level tertiary institutions. Courses are provided in a wide range of vocational fields, and

at a wide variety of levels. Provision includes both programmes that lead to formal qualifications within a national qualifications framework and programmes that do not.

Good practice: Non-university level tertiary programmes can meet a wide range of educational purposes, ranging from the provision of complete recognised vocational qualifications, to the updating of specific vocational skills, to remedying deficiencies in basic education, to preparation for university-level studies as well as to fulfil hobby and recreational purposes.

For more information:
http://200.6.99.248/~bru487cl/files/libros/Tendencias/pdf/9601031e.pdf

Massive Open Online Courses (MOOCs) and micro-credentials

Description: MOOCs are online courses (mostly free) in which anyone can enrol. MOOCs provide an affordable and free way to learn new topics and skills, to advance careers and to deliver an educational experience at a large scale. While traditional classrooms can serve only a limited number of people, MOOCs lift off this barrier to educate all who are interested in learning.

Good practice: MOOCs can act as stand-alone courses in informal and non-formal learning and can complement formal education, as integrated modules. They can also provide collaborative experiences, as it allows peer learning and the content to be continuously generated by the large online community. A few examples of top-rated courses offered on the Coursera platform in the AFF sectors are as follows: Best practice farming for a sustainable 2050 (University of Western Australia), Sustainable agriculture and land management (University of Florida), Sustainable food production through livestock health management (University of Illinois at Urbana Champaign), Challenges of agribusiness management (Bocconi University), The economics of agri-food value chains (Technical University of Munich), Transformation of the Global Food System (University of Copenhagen).

For more information: mooc.org; https://www.intechopen.com/online-first/78156

5.5.2. Policy objective: Enable and enhance training of teachers and educators

i.   Policy tools

- **5.5.2.1. Policy tool:** Promoting lifelong learning initiatives to keep teachers' and educators' skills and competencies continuously up to date

Linear, passive and teacher-centred approaches to learning and sharing of knowledge, which dominated the traditional views, are no longer sufficient to address the challenges of our day. The workshops conducted in Task 4.2 highlighted that teachers and educators are still in some cases very traditional and resistant to change. In other cases, teachers are argued to not know about the farmers' world, and for this reason, they fall short of introducing the sector to the students. It was, hence, argued that this needs to be treated as a critical problem and it is necessary to have instruments to address this issue, and to train the trainees, in the best way possible.

In this regard, acquiring and teaching skills and competencies is pivotal for teachers and requires an approach of learning that continues throughout life (Polz, 2020). Teachers need to not only be proficient in their specific domain, but also able to develop professional awareness and the core competencies in their students. Hence, the core competencies of teachers are regarded to be pedagogical knowledge, content knowledge´, and technological knowledge. In addition, the necessity of transformative learning, which requires the development and cultivation of higher order thinking skills such as perceiving, abstracting, patterning, embodied thinking, modelling, and synthesizing, are critical (Mishra, Koehler & Henriksen, 2011). Meanwhile, the European Commission (2010) states that the skills of a sound teacher are to be considered with respect to lifelong learning; and hence being ready to cooperate and collaborate, applying knowledge and using technology effectively, and working with multiple stakeholders are considered to be key competencies of teachers (Polz, 2020; European Commission, 2010).

- Therefore, measures to be taken include equipping the teachers continuously with certain capabilities, including but not limited to: better identifying their own knowledge gaps, as well as students' needs;
- having the necessary practical experience and knowledge of the local agricultural political context;
- having skills of critical thinking, co-creating knowledge and addressing mutual objectives;
- being able to choose the right ways of informing people (individual approach to individual groups of people and their ability to understand the topic) and to provide truthful information, advice and help.

For all these reasons, it is evident and urgent to provide teachers and educators in the AFF sectors, with the necessary lifelong learning, to continuously update their knowledge. Without up-to-date teachers, equipping future professionals that are ready to face the real-life challenges of the AFF sectors will not be possible. Towards this goal, some proposals raised by the Eurydice platform (2021) include:

- involving pedagogical professionals in qualification courses to master teaching techniques for youth and adults in formal and non-formal education and training, with priority given to the acquisition of digital skills and digital learning methods;
- creation of professional communities of teachers/trainers for exchange of good practices in adult learning, mutual learning through open educational resources, content creation and sharing.

ii.   Actors

A variety of actors take on important roles to address this policy objective:

- **Member States** have a crucial role in setting up an education system that keeps the skills of teachers and trainers up-to-date, so that they are equipped to provide this knowledge to the students;
- **policy-makers** shall take the necessary steps in order to make training of teachers not a luxury, but a continuous education that is provided throughout life;

- **private sector** and **companies** should take on roles to collaborate with other organisations to provide continuous learning opportunities to trainers and teachers.

iii. Best practices

Best practices
Regional expertise networks for trainers - Belgium **Description:** The government of the Flemish Community of Belgium has commissioned Regionale Expertisenetwerken (REN, or Regional Expertise Networks) to provide supply and demand driven in-service training. Each REN consists of at least one department for teacher training at an officially recognised university or school for higher education. These networks have a twofold responsibility to offer a wide range of in-service training, as well as a technical assistance helpdesk (CEDEFOP, 2001). **Good practice**: The core tasks of the RENs are offering further training and using their expertise to provide technical and organisational support. The networks promote cooperation and optimize all the available ICT-expertise and see to it that ICT is integrated into teacher training. These kinds of expertise networks for teachers and trainers are of critical importance, as teachers are required to grow their skills continuously; and without the support of such networks, it would be difficult for teachers to update their skills on their own in a continuous manner, while the diverse need of skills in the sector is more demanding and as ever. Especially, core skills such as critical-thinking, problem-solving, leadership and communication need to be possessed by teachers in a confident way, so that they can transfer these skills to their students. Hence, teaching these core skills requires access to the right information and tools, by the teachers, which further highlights the benefits of teacher training and development. **For more information:** http://www.renvlaanderen.be
A register for continuing vocational training for trainers - Greece **Description:** The Greek Ministry of Labour and Social Security has issued a ministerial decision that regulates the procedures for the development of a register of continuing vocational training for trainers. **Good practice**: The register is of importance to keep the skill level of trainers up-to-date, and also to promote digital literacy and the use of ICT by teachers and trainers, since registered trainers will need to have a European Computer Driving Licence (ECDL) that will certify their computer competence (CEDEFOP, 2009). **For more information:** https://www.cedefop.europa.eu/en/country-reports/greece-vet-europe-country-report-2016
Special actions for improving the in-service training for teachers - Italy **Description:** In Italy, the national adult education programme includes special actions for improving the in-service training of teachers and trainers. Such actions are defined in the national agreement for each professional category, in accordance with the financial resources available. A top priority is the joint training of teachers and trainers with professionals working in the different training systems, in order to improve skills in areas relating, for example, to the training contract,

tutorial help, modular teaching, integrated planning, networking and literacy and so on. In a similar way, in order to prepare teachers in Sweden for their work with new kinds of learners, a government Commission has put forward proposals for the reform of teaching in higher education. The proposals relate to the in-service training of university teachers, and ways of adjusting to the educational requirements of new groups of students who enter higher education from different backgrounds.

Good practice: In-service teacher training programs mostly refer to the short-term education modules that have been specially designed for professionals already working as teachers. In-service training is regarded as an important way of updating teachers' skills and knowledge for improving teaching and learning which lead to better job performance. In-service training is important for teachers to face new challenges and changes in the education world. The effectiveness of in-service training is important so that teachers can apply the knowledge acquired in teaching and learning.

For more information: https://www.cedefop.europa.eu/en/countries/italy

Policy initiative to boost teacher employability – The Netherlands

Description: In the Netherlands, the need to provide for the ongoing career development of teachers (to ensure implementation of innovative teaching concepts) prompted the government policy document, Lifelong Learning: The Dutch Initiative, to boost teacher employability.

Good practice: Measures proposed included raising the numbers of people entering teacher training, opening up the labour market in education, new ways of recruiting teachers, reform of teacher training, quality systems, and improving personnel policies and the conditions of employment. A relatively successful strategy has been the national campaign to encourage ex-teachers – especially married women – to return to teaching following a course of retraining work experience (a similar campaign is now under way in the United Kingdom). Also proving successful is the new temporary law on horizontal transition (Interim Wet zij-instroom), which encourages people to (partly) leave jobs in other sectors and to train as teachers (in later life) (CEDEFOP, 2001).

For more information: https://www.cedefop.europa.eu/en/countries/

Financially supporting skills centers to act as teacher training centers in ICT - Portugal

Description: The aim of the Nónio – 21st Century Programme launched by the Portuguese government is to support the development of projects to bring ICT into education, as well as the promotion of teacher training and international cooperation in ICT, particularly by incorporating the national school network into the network of European schools.

Good practice: Many provisions of the programme are in the form of calls for tender aimed at accrediting and financially supporting Nónio skills centres and school projects. In order to improve the skills of those actively involved in education and training and ensure that their qualifications are appropriate to a learning society, the Inofor (Instituto para Inovação na Formacão) has set up a learning resource centre. Its aim is to provide an area for consultation and experimentation with new training methods, as well as for the exchange of experience and practical support to professionals in the field of training. The centre is thus, in effect, a distribution channel for the development of individual and/or collective skills (CEDEFOP, 2001).

For more information: https://www.oecd.org/education/research/2740323.pdf

5.5.3. Policy objective: Supporting education of agricultural advisors, and improving extension services to make them more accessible and to promote lifelong learning of farmers

i. Policy tools

- **5.5.3.1. Policy tool:** Promoting the establishment of a platform of advisors, and tailor-made implementation solutions on the national level

Advisory services have a crucial role in bridging the gap between research and innovation. However, it is argued that technical advisors are lacking in the sector, and advisory services are not sufficient in reaching all farmers or providing them with the necessary up-to-date knowledge and information. In Task 4.2, the importance of the advisory system, and the necessity to improve it, were underlined. Hence, the need to establish a system, where both public and private advisory services are presented, and that can collaborate was also put forth. In this context, some scholars point out that small-scale farmers are under-serviced by formal advisory services, with a consequential barrier to knowledge and innovation flows. Dunne et al. (2019), explore public and private agricultural advisory services in Ireland, examining the reach, the content, and the quality of advisory services. The authors state that they "have limited reach and their operations may not be sufficient to meet the nuanced and complex requirements of the farming community and wider rural society" (Dunne et al., 2019, p. 411).

Policies should thereby **reinforce the role of advisory services** in the AKIS system and, particularly, in Rural Development (EAFRD), thus "**rethink the role of advisors, make them more central in AKIS, support their training and reconnect them to tackle current challenges**" (Djelveh and Bisevac, 2016). In this regard, it is important to take policy actions towards establishing harmonization across the EU with regard to tackle issues with fragmentation of advisory services. In addition, increasing the interest and trust of farmers in advisory services calls for attention. While some services are clearly co-funded and co-managed by the sector (e.g. the Danish Agricultural Advisory Service and French and German agricultural chambers), there is a clear lack of interest and trust in other countries (e.g. in Latvia and Hungary) (EU SCAR, 2012). Such complexity, fragmentation and diversity show that, **one-size-fits-all solutions cannot effectively work** and **tailor alternatives need to be put in practice** that are adaptable to different situations to be evaluated on an ad-hoc basis (Djelveh and Bisevac, 2016).

ii. Actors

Supporting the education of agricultural advisors and improving extension services to promote lifelong learning of farmers requires the attention of a variety of key actors:

- **policy-makers** have an important role to play in the institutionalization of an agricultural extension service with a sound, legal framework, clear scope of responsibility and adequate operational resources (personnel, funding, facilities, etc.). Besides, harmonization of these

policies and standardization across Europe is key. In this regard, setting specific and clear policy directives is critical, in identifying the needs and gaps in providing extension services to farmers, and the adequate training to be provided to the extension personnel. Moreover, setting the role and responsibilities of agricultural universities in research, teaching and extension, as well as the contribution of lifelong learning to rural development also require policy directives;

- **the extension workers** also have an important role to play, who act as the bridge between the farmer and all other stakeholders (i.e. planners, researchers, policy-makers and the private sector). Hence, it is their role to support farmers and engage with researchers and other stakeholders to foster innovation along the value chains, facilitate interaction among value chain and other stakeholders to collaborate on developing innovative responses to problems and opportunities on the farm;

- besides, **membership organisations, commodity boards, government departments, centres for knowledge transfer and associations** as well as other private actors have a role to provide support to farmers;

- **suppliers** are also very active in this field and combine product sales (e.g. animal feed, seeds, fertilizer and pesticides) with knowledge transfer;

- **private actors,** meanwhile, provide advice and accounting services.

iii.   Best practices

Best practices
Agricultural Advisory Service (DAAS) - Denmark **Description:** The Danish Agricultural Advisory Service (DAAS) is owned and managed by farmers, via their membership of farming organizations. Organizationally, DAAS consists of 31 independent local advisory centres throughout the country and one national knowledge center, which provides the local centres with the latest information from both Danish and foreign research (OECD AKS Response Denmark; EU SCAR, 2012) **Good practice**: The DAAS' main responsibility is to supply Danish farmers with management tools and advice relating to all aspects of farming, including farm accounting, production and farm management. Its principal tasks are: • to offer farmers the best possible technical know-how and support with regard to production methods and economy; • to provide guidance in specific situations for the planning and implementation of production; • to organize courses for the further education of farmers; • to act as a link between farmer and the research and experimental institutions; • to prepare accounts and tax returns for the farmer and to provide farm management advice including finance. **For more information:** https://www.fao.org/documents/card/en/c/18a4835f-0dff-4b43-838e-bf5c94ecb99b/
ProAgria - Finland

Description: The Finnish ProAgria is a member-owned organisation that was founded in 1797. The organization has 16 regional advisory centres nationwide, a staff of 685 people (out of which 660 in the field) and a membership base of 113 000. Funding is provided by the state (16%), clients (65%), projects (18%) and others (1%). Together, these account for an annual turnover of 49 million € (2011) and around 30 000 clients annually.

Good practice: Around 80% of Finnish farms utilize ProAgria services. Advisory services are based on face-to-face advice at the farm, but also a rapidly increasing number of e-services. An on-line advisor registry is established, where the client can search for an advisor and make an appointment (ProAgria public presentation; EU SCAR, 2012).

For more information: https://www.proagria.fi/en/home

EU-Platform of Chambers of Agriculture – EU-

Description: Working in 14 European countries (Austria, Croatia, Czech Republic, Estonia, Flanders, France, Germany, Hungary, Latvia, Lithuania, Luxembourg, Poland, Slovakia and Slovenia) with about 15.000 employees in more than 150 independent Chambers of Agriculture, the chambers provide extension and advisory services for more than 5 million farmers, as well as for local authorities, applied research agencies and rural enterprises.

Good practice: Chambers manage numerous experimental stations, test areas and research laboratories for applied life science. Knowledge transfer from research to farm level takes place. On EU-level there is an informal network of Chambers of Agriculture, handling, translating and promoting EU-policies with a focus in agriculture, environment, applied life science and regional development (EU Chambers of agriculture, 2011).

For more information: https://enrd.ec.europa.eu/sites/default/files/uploaded-files/3.eufras_in_enrd_empowerment_of_extension_services.pdf

Two-level advisory system -Switzerland-

Description: The advisory system in Switzerland is organized on two different levels. Information and advice to farmers is offered by extension services at the cantonal level. They cover activities in farmers' own private interests (in the sense of advisory services: information, technical advice in crop and animal production, socio-economic expertise in farm management) as well as providing services in public interests (in the sense of extension services like soil and water conservation or landscape protection). Hence, farmers partly finance these services.

Good practice: At the national level, the Agridea extension service, an association of the cantons and several farmers' organizations, but mainly funded by the federal administration, is carrying out second-line support: training cantonal extension service staff, providing practical information in manuals and guidelines, supporting regional and national networks. Agridea therefore is a link between scientific research and farmers' own experience as well as between national and cantonal institutions (Agricultural Report, Swiss Federal Office for Agriculture).

For more information: https://www.agridea.ch/en/agridea/

5.5.4. Policy objective: Supporting the continuous education of workers/farmers in the AFF sectors

i.   Policy tools

- **5.5.4.1. Policy tool:** Designing programmes and modules which will allow the continuous education of AFF professionals throughout their career regardless of their age and gender

The workshops conducted in Task 4.2 highlighted that many primary producers and agricultural professionals are educated with the start of their twenties and rely on this knowledge throughout the rest of their careers. In this regard, the need to focus on supporting the education of workers in the AFF sectors was stressed. It was noted that especially small-scale farmers need to learn about how to add value to their products in order to be competitive with large companies, which are more profitable because of the large volumes they produce.

This needs point to the importance of continuous education of farmers throughout their lives. In this regard, non-formal and informal learning opportunities carry significant importance. The study conducted by Lans et al. (2004) revealed that the top 10 learning preferences for workers in the agri-food sector did not include any formal learning possibilities, which was due to lack of time. Meanwhile, non-formal and informal learning activities prevailed. The findings revealed that business visits, conferences, study groups, extension services and R&D centres are the most mentioned ways to learn as part of non-formal learning. In terms of informal learning, however, many other tools and instruments were put forth by the interviewers. These include the following (in descending order, in terms of importance given to each): colleagues, pre-entry experience, professional journals, on the job training, self-analysis and reflection, customers, use of a role model, suppliers, producers, knowledge databases, book-keepers, management games, bank and radio and television. One reason why informal and non-formal ways of learning was valued more by workers can be due to the fact that the current lifelong learning opportunities provided through formal ways, are not sufficient and do not match the needs of the workers.

These findings reveal the importance of aligning the formal lifelong learning opportunities to meet the needs of the sector and designing education possibilities (both formal and non-formal) that can equip them with the necessary skills of our day. Besides, necessary policy actions should be taken to prioritize non-formal learning methods and extend their reach so that non-formal learning ways are integrated into the AFF lifelong learning programs, and systematically be evaluated, updated and improved, which should also go hand-in-hand with training of teachers and educators.

- **5.5.4.2. Policy tool:** Enhancing and systemizing peer-to-peer learning through platforms that connect farmers

During the workshops held in Task 4.2, one of the topics underlined was the importance of peer-to-peer learning as an education mean. While peer-to-peer learning is a traditional and an old and well-

known way to learn for farmers, it is also critical in gaining practical skills needed for the sector. It was also noted that peer-to-peer learning works in an informal way (e.g. when a farmer decides to switch to organic farming, they may need to learn about how to use new machinery). So, the farmer can go to the neighbour farm to achieve practical skills; however, the geographical area may constitute a limit. A farmer in a remote area may find this difficult.

For this reason, platforms connecting farmers would be significantly critical (and this point also links closely to digitalization). Besides, although peer to peer learning is a traditional and well-known way to learn for farmers, now with the advances in technology and the need to use new machinery and have new set of skills, it is gaining a new dimension. On the other hand, while peer-to-peer learning happens informally, and unintentionally on many farms, as farmers engage in social interactions, peer-to-peer learning can be facilitated in a systematic way, and advisors have an important role to play. Farm advisors, hence, need to develop more skills and experience in enhancing peer to peer learning initiatives (e.g. study groups) (SCAR, 2017). Peer-to-peer learning could be further fostered through field schools, on-farm demonstrations, groups exchanging skills and expertise and inter-disciplinary workshops for both conventional and organic farmers. Hence, stimulating peer to peer learning amongst farmers is important in lifelong learning, also with regard to the facilitating role of advisors (SCAR, 2017), especially when resources for advisory services are diminishing.

Meanwhile, in addition to face-to-face exchanges, knowledge-sharing among farmers is also increasing through the use of social media, especially due to obstacles faced by farmers such as geographical remoteness or difficulties faced due to the pandemic. Research suggests that farmers increasingly seek advice and mentoring through social media and try to participate in key annual farming events to update their knowledge (Burbi and Rose, 2016; Phillips et al., 2018). Hence, social media offer new communication tools for rural communities, by enabling them to create rural social networks, and enhancing these modes of communication shall be promoted and further efforts should be put in place to make it widespread among a larger number of farmers.

ii. Actors

Several actors have important roles to address this policy objective:

- **governmental bodies** and **Ministries** have an important role to play in making continuous learning accessible for farmers and professionals in the AFF sectors. To give an example, Ministries of Education and Agriculture can collaborate to provide lifelong learning education systems and opportunities to the farmers or professionals in the AFF sectors, who would like to either update their current knowledge, or to choose this path as a newcomer. Ministries related to Employment and Labour, on the other hand, along with private companies can also collaborate to make sure the level, quality and content of lifelong learning opportunities provided are in line with the needs of the sector and the labour market;
- **educational institutions** play an important role in contributing to the process with their know-how, providing knowledge and skills on learning methods and approaches;
- **independent organizations and NGOs** can take role in facilitation of establishment or promotion of platforms for connection of farmers, to share, and update their knowledge and ideas (e.g. food learning hubs, farmer field schools);

- trainers can apply scientific knowledge to enhance stewardship of the land, water, and ecosystems;
- farmers have a key role for the engagement with their peers and the general public as part of education development strategies.

iii. Best practices

Best practices
Farmer field schools – a global initiative **Description:** Farmer Field Schools (FFS), which is a community-driven, non-formal learning approach to agricultural training and education, constitute a lifelong learning model which emerged in late 1980s as an alternative way to help Indonesian rice farmers understand the principles of integrated pest management and incorporate them into their farm practices. Instead of using linear approaches for knowledge transfer, FFS emphasize group dynamics, hands-on experimentation, interactive learning, and farmer-to-farmer communication in order to facilitate not only the diffusion but also the construction of knowledge tailored to the linguistic, cultural, and social background of trainees and relevant to their real needs. A typical Farmer Field School consists of about 30 people who meet regularly, throughout the season to identify common problems and find solutions for their agricultural production areas. **Good practice:** While FFSs are community-driven organizations, in some parts of the developing countries, some policies are put in place to make the FFS system work. For instance, in the Philippines the FFS approach is included in all national food production programmes, and a yearly budget is set aside for its implementation. This has facilitated the partnership between the Department of Education and the Department of Agriculture for the integration of FFS into elementary and secondary schools (FAO, 2016b). In Burkina Faso, in 2010 the Ministry of Agriculture and all the actors involved in agricultural advisory and extension services (research institutes, universities, producers' organizations, NGOs, etc.) formally registered the FFS approach in the National Agricultural Advisory Support Extension System (SNVACA). The Ministry of Agriculture finances the implementation of more than 2 000 FFS each year (FAO, 2017). While this is an approach used mainly as part of developing countries, it can be adopted also by European countries in order to reach those farmers in remote areas, or those in disadvantaged regions. **For more information:** https://sdgs.un.org/partnerships/farmer-field-schools-ffs
Workplace learning and apprenticeships - Ireland **Description:** The Action Plan to Expand Apprenticeship and Traineeship in Ireland 2016 - 2020, (Department of Education and Skills, 2016) recognizes that there is a need for alternative education and workplace experience routes to develop hands-on capabilities. Traditional education routes may not always deliver these outcomes. The Action Plan seeks a substantial increase in the number of apprenticeship and traineeships with a target of over 120 Apprenticeship and Traineeship Schemes and 50,000 apprenticeship and traineeship registrations to be in place by 2020. The Action Plan calls for new Apprenticeship proposals.

Good practice: The effectiveness of apprenticeship schemes in bringing young people into work is recognised by the EU Commission. The European Framework for Quality and Effective Apprenticeships (EU Commission, 2017) initiative to boost apprenticeships forms part of the EU New Skills Agenda for Europe, adopted by the Commission in 2016. The Commission views apprenticeships as a way to strengthen 'the link between education and the labour market' and to provide the 'combination of technical, transversal and soft skills that employers are looking for.' Towards this direction, in the case of Ireland, the Farm Apprenticeship Board (FAB) filled a major and very well recognized role in farm management training. Following on from recommendations of the report of the Taskforce on Agricultural Education and Training (DAFM, 2000), the Farm apprenticeship Scheme was incorporated into Teagasc education structures (TEAGASC, 2018).

For more information: https://www.cedefop.europa.eu/en/country-reports/apprenticeship-type-schemes-and-structured-work-based-learning-programmes-ireland

Incubator centers for new farmers - EU

Description: Today, the majority of young farmers have a family background in agriculture. However, growing numbers of newcomers to farming are entering the sector. These new entrants are more likely than the average to engage in agro-ecological projects: small-size organic farms, direct sales to consumers, or on-farm processing. Among many obstacles, such as access to land and credit, they can face several knowledge issues: gaining the right technical knowledge, finding networks, and knowing where to find information. Farm incubators are programmes enabling would-be farmers to test their business project at full size before getting started. They make entry into farming easier by addressing barriers to prospective farmers, including access to land, capital and credit, and opportunities to learn and develop skills in farm management and business planning.

Good practice: These farm incubators enable prospective farmers to develop a life-size farming activity in an autonomous way, during a limited period of time (two to three years), in an environment presenting limited risks. They are particularly adapted to newcomers to agriculture, who are provided with land, buildings and equipment, and receive training, support and advice, as well as access to networks. They are assisted by mentors (farmers or former farmers) who show them how to work. At the end of the trial period, the prospective farmers assess their project and their performance, in order to decide whether to carry on, to amend, or to give up the project (European Parliamentary Research Service (EPRS), 2017).

For more information: https://ec.europa.eu/eip/agriculture/sites/default/files/eip-agri_fg_new_entrants_final_report_2016_en.pdf

On-farm demonstrations to boost peer-to-peer learning

Description: Horizon 2020 multi-actor projects AgriDemo-F2F, PLAID and NEFERTITI have joined forces to connect farm demonstration activities across Europe, stimulating knowledge exchange and the uptake of innovation. The project will support more than 700 demonstration events across Europe. It is also setting up 10 networks on selected themes, such as robust organic livestock systems, nutrient efficiency in horticulture, soil quality in arable crops and farm attractiveness for new entrants.

Good practice: Across these networks, 45 regional or national clusters have been established, bringing together farmers, advisers, NGOs, researchers, policy makers and others involved or interested in demonstration activities. The FarmDemo Hub will give platform users access to information on participating farms, events, webinars, videos and

more to connect and share experiences (EIP-AGRI, 2019; Smart AKIS, 2018). Farmer-to-farmer exchanges can be very effective to promote the use of innovative technologies and approaches in the agricultural sector. This is why on-farm demonstrations can play a major part in stimulating peer-to-peer learning and sharing best practices.

For more information: https://ec.europa.eu/eip/agriculture/sites/default/files/eip-agri_agrinnovation_magazine_6_2019_en_web.pdf

5.5.5. Policy objective: Integrating sustainability into lifelong learning programmes

i.   Policy tools

- **5.5.5.1. Policy tool:** Promoting the mobilization of partnerships of actors and organizations to integrate sustainability into education throughout life

The workshops conducted in Task 4.2 stressed the necessity to transform learning and training environments in order to integrate sustainability principles.

In this regard, there are certain regulations and policies that need to be put in practice, and to allow this, a partnership of many actors and organizations need to be mobilized in order to integrate sustainability into all educational levels, and throughout life.

Moreover, the industry has an ethical "conduct code" role to adopt a corporate social responsibility. Another role that organizations, corporations or institutions can take is regarding requiring certain standards of sustainability practice certification prior to buying a service (e.g. catering scheme). Moreover, corporate-driven regulatory frameworks like e.g. Global Gap can be implemented by companies to promote sustainable practices. Besides, in-house training courses provided by Global Gap to trainers, auditors and managers can provide the skills to implement such regulatory frameworks and schemes.

ii.   Actors

In order to integrate sustainability in lifelong learning, numerous key stakeholders need to take part:

- **policy-makers** have a significant role of providing policy coherence and alignment in integrating sustainability in education, and lifelong learning is no exception. In this regard, aligning the lifelong learning programmes to that of European agenda (e.g. European Sustainability Competence Framework) or international agenda (i.e. UNESCO's Competencies in Education and Sustainable Development, or SDGs), and making the linkages between policies and strategies is of critical importance. Policy-makers also have a role to play in ensuring adequate, long-term funding at both European, national, regional and local levels, to unlock the potential of sustainable development education across all learning

sectors. This could include targeted resources from schemes such as the Sustainable Europe Investment Plan;

- **international organisations** and **networks** have an important role to play to mobilize resources to conduct research and set the standards in terms of integrating sustainability in education and training. These can guide educational institutions in setting up their programs that are in line with the needs of the sector;
- **educational institutions**, on the other hand, by using the available tools, are the ones that can transform learning and training environments in order to integrate sustainability principles into lifelong learning programmes and settings. They can also promote cooperation between different educational institutions and different generations of learners in order to foster a long-term holistic view on learner development and lay the ground for more innovative and inclusive approaches to teaching in lifelong learning;
- **experts and practitioners** also have a role to raise awareness about the significance of integrating sustainability in lifelong learning programmes. Teachers and trainers also have an important responsibility in supporting the learning processes of experts and practitioners.
- In the meantime**, non-government organisations and communities** can collaborate in the establishment and provision of lifelong learning;
- **research institutes and educational institutions** can help in creating the content for such initiatives;
- **local initiatives and regional centres of expertise, on the other hand, can act as hubs, where** education that integrates sustainability in learning practices can be disseminated to different audiences in lifelong learning settings.

iii.　　Best practices

Best practices
Initiatives that promote Education for Sustainable Development (ESD) **Description:** ESD covers the full range of human activities in order to equip learners with the relevant knowledge, skills and values for sustainable development (UNESCO, 2012). ESD has its roots in two educational movements that have arisen since the establishment of the United Nations. One is the Education for All (EFA) movement, which aims to expand basic education in order to build strong foundations for lifelong learning. The second is the movement for environmental education which begun in the 1960s, in the scope of which educators aimed to develop innovative approaches in their daily education practices in order to challenge the existing education that contributed to reproducing unsustainable systems and practices. **Good practice**: The United Nations' Decade of Education for Sustainable Development (UNDESD) initiative that put forth an action and policy plan for the period covering 2005-2014, suggested that four main policy support mechanisms were necessary to allow ESD both locally and globally, namely: 1) Providing resources (to especially non-formal education), 2) Provision of partnerships and networking opportunities, 3) Ongoing capacity-building through training, courses and workshops, and 4) Content development (support provided policy to assist organizations to identify the relevant issues or entry points for engagement). In the remaining section of this best practices box, a few of the case studies that implemented the ESD approach into their educational programmes can be found.

For more information: https://unesdoc.unesco.org/ark:/48223/pf0000190898

Phenoclim: measurement by the general public of the impact of climate change on plant life - Centre for Research on High Altitude Ecosystems (CREA) - France

Description: This initiative aims to develop skills of observing everyday natural phenomena among young students. The initiative also reflects the desire to develop research on climate change in order to improve capacities for adaptation, as well as to raise public awareness. Phenoclim volunteer observers comprise schools, individuals, associations, conservation areas and some local governments.

Good practice: The initiative puts emphasis on establishing closer links between "scientific research" and "teaching", and thus "public interest" and "awareness-raising". A full-time network coordinator who also acts as interface between participants and researchers. Support on teaching and social support (online learning materials, meetings, talks in participating schools, newsletter and programme representatives in the more remote areas) are also provided.

For more information: https://www.eocaconservation.org/project-detail.cfm?projectid=2

Earth Hour education WWF Sweden, Sweden

Description: The initiative aims to reach a significant number of preschools and schools to be reducing their ecological footprint and to be active in reducing their emissions of CO_2.

Good practice: The initiative contributes both to the fulfilment of the Swedish curriculum and the Swedish environmental objectives. Moreover, multiple partnerships are established to achieve the objectives of the initiative.

For more information: https://unesdoc.unesco.org/ark:/48223/pf0000220304

Ekospinning – Share your energy - Jesús Obrero Secondary and Vocational Training School & Ingurugela, Spain

Description: The main objectives of the project are: To provide the necessary knowledge, skills and experience about climate change and its consequences; to foster readiness to cooperate and participate with responsibility in their local environment; and to minimize the scholar contribution to greenhouse effect. The specific objective of the project is to develop a system for generating clean energy that promotes sustainable mobility through physical exercise, relaxation, innovation and creativity.

Good practice: The initiative contributes to diversifying the skills of students and improving the education of future students, through the inclusion of technology and methodology of the Eco-spinning project. As a transversal and multidisciplinary project, the involvement of teachers in technical (Electrical-Electronic and Mechanical) and non-technical departments (Science and Environment) and students from Secondary and Vocational Training, allows learning to take place in formal, non-formal and informal settings.

For more information: https://unesdoc.unesco.org/ark:/48223/pf0000220304

ECO-UNESCO's Youth for Sustainable Development Peer Education Programme

Description: The Programme seeks to engage and empower young people between the ages of 15 and 18, encouraging them to think more holistically, critically, both globally and locally about issues relating to sustainable development with a particular focus on developing countries. The

peer education programme also encourages young people to link in with other groups in their local community and to develop links to other groups in the developing world using the UNESCO clubs' network.

Good practice: The programme raises awareness of local and global issues in relation to sustainability (i.e. – Climate Change, Sustainable Development Goals, Global Justice, Understanding Development, Fair Trade, increased environmental awareness etc.). The programme uses peer education methodologies to build the skills of young people in areas such as communication and critical thinking.

For more information: https://ecounesco.ie/10-18-youth-programmes/youth-for-sustainable-development/

5.5.6. Policy objective: Establishing partnerships to provide lifelong learning

i. Policy tools

- **5.5.6.1. Policy tool:** Supporting the mobilisation of community learning centres

If supported by the necessary legal frameworks, the network of community learning centers could become the vehicle for creating lifelong learning opportunities (Ahmed, 2014). In this regard, building effective partnerships among the concerned government agencies, non-governmental organisations, communities, and academic and research institutions is equally important to leveraging community learning centres to serve these goals. The legal and policy framework, therefore, has to support and promote this partnership-building. Only then can community learning centres be the essential building blocks for lifelong learning in the learning society (Ahmed, 2014).

ii. Actors

Establishing collaborations and partnerships is of utmost importance to provide lifelong learning opportunities. Some actors that are responsible are as follows:

- **Member States** can mobilize resources, which can be distributed and utilized on the local level in order to reach individuals, who could not be reached otherwise;
- **city councils and municipalities** can facilitate the establishment of community learning centres. Individuals, who have in some cases no affiliation to formal educational institutions, can be reached by local governments;
- **non-government organisations and communities** can collaborate in the establishment and provision of lifelong learning through community learning centres;
- **Farmers** can actively participate and collaborate in the design of lifelong learning programmes, modules or courses, and provide support in the provision of knowledge to lifelong learners;
- **research institutes and educational institutions** can help in creating the content for such initiatives, in collaboration with the farmers.

iii. Best practices

Best practices
Community learning centres   **Description:** A community learning centre (CLC) is a local educational institution outside the formal education system, usually set up and managed by local people to provide various learning opportunities. The purpose of a CLC is to provide opportunities for lifelong learning to all people in the local community. CLCs support empowerment, social transformation and improvement of the quality of life of the people. The main functions of CLCs are to provide: i) skills through education and training, ii) community information and resource services, iii) community development activities, and iv) co-ordination and networking (UNESCO, 2016).   **Good practice**: Learning Centers are a way to address limitations in the formal school system. The main objective is to provide opportunities for people (and farmers) to develop their knowledge, skills and interests more fully than is possible through the formal education system. While these kinds of learning centers are much more needed and hence common in the developing countries - in a bid to provide opportunities and skills to farmers that could otherwise not be reached - they could still benefit farmers in Europe that are in remote or underprivileged areas.   **For more information:** https://unesdoc.unesco.org/ark:/48223/pf0000246742

5.5.7. Policy objective: Consumer/citizen learning through community practices

i. Policy tools

- **5.5.7.1. Policy tool:** Supporting community agricultural practices where informal learning is triggered among citizens

During the workshops conducted in Task 4.2, the role of consumers was underlined many times. It was noted that **consumers have a key role to drive the demand and motivate suppliers to change**, and also to drive the public policies and political instruments regarding food production and sustainability in agri-food systems.

Hence, there is a need to **empower consumers** regarding the importance of healthy and sustainable diets. While consumer education and awareness are of great importance, and that this should be an important part of education starting from early ages, it can be argued that **efforts on a local and community level** can also have important benefits, in raising the awareness of consumers and in driving lifestyle changes, that is also a critical aim of lifelong learning in the AFF sectors.

In this regard, local community groups and local food initiatives are considered as spaces of important technical and social innovations, insofar as they provide new economic and cultural spaces to learn new ways of "knowing" food and new narratives and discourses around food (Fonte, 2008; Goodman et al., 2012). In fact, it is argued that informal knowledge that is acquired through social mechanisms

in these learning spaces can complement and compensate for the shortcomings of the formal knowledge systems and make a range of positive contributions to the resilience and sustainability of agriculture, including those to farmers' identities, communities and environments (Šūmane et al., 2018). In this regard, facilitating the establishment and existence of these spaces, by regulations would have significant outcomes on a local level towards raising the awareness of citizens and consumers on a local level.

ii.   Actors

Citizen learning through community practices can be enhanced as a result of the efforts of several actors:

- **local authorities** or **organizations** can join forces together with local food initiatives, towards widening the impact of sustainable consumption and production efforts. Establishing appropriate links with local food initiatives on the ground, may provide an opportunity for understanding the most critical knowledge gaps of both consumers and producers on a local level, and which mechanisms are required to fill these gaps through adult or experiential learning mechanisms. Besides, implementing local awareness campaigns, projects or innovative events (e.g. workshops, competitions, collaborative working spaces) can also have an impact to widen the effect of such efforts;
- **local food initiatives**, by collaborating with other local organizations can gain knowledge and experience in the area of organization, management or financing, or widen their impact and reach further;
- consumers have an important role and can take on responsibility towards the transition of the food value chains. In our day, it is becoming increasingly apparent that the preferences of consumers or citizens can have an impact on the production patterns or services provided. In this regard, the self-organization of consumers or citizens are of critical importance, in order to be empowered in deciding what they require from producers and service providers.

iii.   Best practices

Best practices
Consumer-led Solidarity Purchasing Groups - Italy- **Description:** In Italy the Gruppi di Acquisto Solidale (GAS – Solidarity Purchasing Groups) are groups of households that self-organize and collaborate in purchasing food and other goods directly from producers on the basis of ethical and environmental criteria and considerations of solidarity. They present themselves as a movement with a shared critique of the dominant model of consumption, a movement whose aim is to build a more sustainable economy by changing the way they buy their food and other goods (Fonte, 2013). **Good practice**: Solidarity Purchasing Groups (GAS) movement is a bottom-up social innovation that has been spreading over the past 20 years in Italy. It is composed mostly of self-organised groups of citizens who collectively buy from small organic producers in Italy. They promote several practices that sustain the alternative food networks in the country, such as: solidarity and critical consumption, organic and km-0 productions as ways to promote environment protection, respect of labour regulation and fair economic relations (Maestripieri, 2016). Through relationships

established in these groups, linkages are promoted through joint activities, mobility and sharing of resources. Hence, consumers spend time with other consumers and farmers on the field. Besides, the consumers that regularly join solidarity purchasing groups gain knowledge on realities of farming, farmers' perspectives and wider understanding and awareness towards local and global food systems. In these spaces, informal and social learning through experience sharing, and learning-by-doing take place. Besides, exchange of local lay knowledge (or traditional knowledge) – technical knowledge utilized by farmers to grow food in the specific agri-ecological context is also learned. In addition, it is observed that consumers' desire to learn further about food systems are also triggered in these groups: as consumers learn in these groups, they are motivated to learn more by their own means of further research. Last but not least, sustainable practices are learnt, and lifestyle changes are triggered in the scope of these interactions: more consumers are engaged with environmental or social justice issues, after having part of these initiatives. These specificities make these groups an ideal example of how a consumer-organized new practice of enhanced sustainable food consumption can emerge and develop, and how consumers can learn about food and food systems through community of practice (Fonte, 2013).

For more information: https://recyt.fecyt.es/index.php/res/article/view/76381

6. Common Agricultural Policy (CAP), education and training

6.1. Set up of this section and the new CAP

This section provides an analysis of the connection between education and training issues in the Common Agricultural Policy (CAP) post 2020, i.e. post-2020 CAP, now usually termed post-2022 CAP or CAP 2023-2027.

At the time of writing this chapter, the new regulations have been published (Parliament approval on 23/11/2021 and publication on 6/12/2021) and some of the strategic plans have been published as well at the beginning of 2022. Has there has not been time enough for a comprehensive analysis of education and training implementation in the new CAP, this section will build some reasoning based on the matching of the needs highlighted in the previous section with the content of the regulations.

The new regulations related to the CAP 2023-2027 are the following:

- REGULATION (EU) 2021/2115 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013.
- REGULATION (EU) 2021/2116 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 2 December 2021 on the financing, management and monitoring of the common agricultural policy and repealing Regulation (EU) No 1306/2013.
- REGULATION (EU) 2021/2117 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 2 December 2021 amending Regulations (EU) No 1308/2013 establishing a common organisation of the markets in agricultural products, (EU) No 1151/2012 on quality schemes for agricultural products and foodstuffs, (EU) No 251/2014 on the definition, description, presentation, labelling and the protection of geographical indications of aromatised wine products and (EU) No 228/2013 laying down specific measures for agriculture in the outermost regions of the Union.

The objectives of the future CAP are:

- to ensure a fair income to farmers;
- to increase competitiveness;
- to rebalance the power in the food chain;
- climate change action;
- environmental care;
- to preserve landscapes and biodiversity;
- to support generational renewal;
- vibrant rural areas; and
- to protect food and health quality.

The new CAP partly refocuses its objectives with a stronger role of environmental and climate change actions. New instruments are also introduced such as eco-schemes. Others are reshaped such as conditionality and the AKIS.

6.2. Education and training in the new CAP

Education and training appear in different parts of the new CAP:

- Training is mentioned in particular in connection to young farmers in the preamble and definitions; some specific needs are identified here, in particular in connection to entrepreneurial and risk management abilities.
- Article 78 provide for support to "Knowledge exchange and dissemination of information" aimed at addressing the objectives of the new CAP while "specifically targeting the protection of nature, environment and climate, including environmental education and awareness actions and the development of rural businesses and communities."
- Article 99 provide for financing "actions in respect of transnational learning mobility of people in the field of agricultural and rural development with a focus on young farmers and women in rural areas", in accordance with ERASMUS+ regulations.
- One strong focus is the AKIS. In particular in the preamble (50) the regulation states that "Member States should integrate all public and private advisors and advisory networks within the Agricultural Knowledge and Innovation Systems (AKIS), in order to be able to deliver up-to- date technological and scientific information developed by research and innovation." Point 85 recalls that "'The Future of Food and Farming' refers to the exchange of knowledge and focus on innovation as a cross-cutting objective for the new CAP" and mention AKIS as the new instrument for networking and coordination of AKIS. AKIS are then defined: "AKIS' means the combined organisation and knowledge flows between persons, organisations and institutions who use and produce knowledge for agriculture and interrelated fields (Agricultural Knowledge and Innovation System)". Article 15 on farm advisory services provides for the integration of farm advisory services within the AKIS. Article 78 provides support for Knowledge exchange and dissemination of information and requires that is based or being consistent with the description of AKIS. Article 114 refers to modernisation in strategic plans and requires that strategic plans provide a description of the organisational set-up of AKIS and how advisory services are integrated with AKIS. According to article 115 the strategic plans needs to include a description of AKIS in the SWOT analysis. Article 127 on the EIP states that the EIP shall support AKIS.

When looking at Annex I, the following indicators are directly related to knowledge, education and training:

- I.1 Sharing knowledge and innovation: Share of CAP budget for knowledge sharing and innovation
- R.1 Enhancing performance through knowledge and innovation: Number of persons benefitting from advice, training, knowledge exchange or participating in European Innovation Partnership (EIP) operational groups supported by the CAP in order to enhance sustainable economic, social, environmental, climate-related and resource efficiency performance

- R.2 Linking advice and knowledge systems: Number of advisors receiving support to be integrated within the Agricultural Knowledge and Innovation Systems (AKIS)
- R.28 Environmental or climate-related performance through knowledge and innovation: Number of persons benefitting from advice, training, knowledge exchange, or participating in European Innovation Partnership (EIP) operational groups supported by the CAP related to environmental or climate-related performance
- O.33 Number of supported training, advice and awareness actions or units
- C.15 Agricultural training of farm managers.

Among the requirements for social conditionality training is also included:

- Employment: Mandatory training
- Health and safety: General obligation on employers to take measures necessary for safety and health protection, including prevention of risks and provision of information and training
- Employer to ensure that workers receive adequate safety and health training
- Workers to receive adequate training

6.3. First evaluation and implications in light of the study

In this section, we provide a first evaluation and potential implications of the Cap reform in the light of this study.

Overall the CAP reform goes in a direction consistent with identified needs and potential good practices as highlighted above; this applies in particular to education as part of a cross-cutting objective and in promoting coordinating measures with other programs (e.g. the ERASMUS+), environmental objectives, advisory services and research and innovation.

On the other hand, the provisions from the regulation are rather general and much of the practical provisions for implementation, including resources, is delegated to member states; this is consistent with the need of flexibility and adaptation to local contexts, but can also be a drawback of member states do not put enough attention to this topic.

The following more specific points of attention emerge from matching the contents of the CAP reform and the results of this study:

1. A major point concerns sustainability, that has major emphasis in the outcome of the project and in the CAP; having in mind both the need of an ecological transition and the varying context (in particular with recent increase of prices of commodities and the war in Ukraine), attention must be kept to all dimensions of sustainability and in particular on actions that allow to reduce trade-offs between production and environmental sustainability.
2. The needs to address soft and managerial skills is clearly identified; this is consistent with our findings, though in the CAP it is explicitly connected to risk and entrepreneurship, which is a too narrow scope compared to the need; so the scope of these measure could be expanded.
3. Further improvements are possible in the direction of explicitly strengthen the linkage with outside the CAP, either at University and vocational education, in particular in the context of the AKIS and in better connecting with research and innovation activities besides the EIP

operational groups; for example, a better connection could be promoted with Horizon Europe projects and through initiatives allowing interaction of farmers and students.

4. The chapter of social conditionality is a completely new one and opens a potentially important area for the future of training, incorporating it as a cross cutting issue for working quality and in relation to health and safety; in this respect it is important that the topic of continuous education is given enough space in implementation.

5. innovation concerning information, education and training instruments seems to have little space in the CAP (see also the results indicators), while its relevance is highly emphasised in the NextFOOD project. Exploration of innovative education means and connection with digitalisation could have more space in monitoring implementation.

7. Discussion

The Discussion section provides a summary of policy objectives, policy tools and actors discussed in this report and then puts forth the limitations of the study.

7.1. Summary of policy objectives and tools

This section of the report, through the use of the table below, brings together the most important parts and messages from the results presented as part of this Deliverable. While it is possible to see in this table, the policy objectives and policy tools suggested under each of the Educational Levels, in addition to the Overarching issues identified, it is also possible to view (and go directly to) the respective educational levels, or policy objectives in the Results section, by clicking on the topics presented in the table, in order to read them in detail.

Table: Summary of Policy Objectives, Policy Tools and Actors

	Policy Objectives	Policy tools to reach the policy objectives
Overarching issues	Policy objective: Integrating the notion of sustainability into the education system	Promoting information and a common language regarding sustainability
		Updating curricula on all educational levels regarding sustainability
		Supporting integration of sustainability in education through collaboration with other policies
	Policy objective: Enhancing gender equality across the AFF sectors	Integrating gender studies into agricultural education from early ages
		Enabling gender equality (or neutrality) in the ET system
	Policy objective: Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system	Promote the integration of soft skills into the curricula and allow them to be an integral part of the EF system across all education levels
		Introducing and extending courses to improve digital skills and digital literacy of students of all levels
	Policy objective: Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making	Promote the inclusion of farmers/practitioners as facilitators/teachers in courses
	Policy objective: Simplify administrative procedures	Simplify the bureaucratic process to allow for a better interaction between educational institutes and experts

		and allow a **better coordination of policies**	Setting a periodic debate session among stakeholders and policymakers
Educational Levels	**Pre-University**	Policy objective: Increasing financial **support and investments**	Investments in new technologies and instruments in schools
			Improving ICT education level by means of skilled educators
		Policy objective: Enhancing **competencies and skills**	Integrating soft skills into the curricula starting from early ages
			Promote and enhance continuous training of trainers
		Policy objective: Updating the Pre-University curricula to meet the needs of the sector, curricula **implementation and development**	Promoting initiatives to strengthen a connection between education and everyday life starting from early ages
			Adopting new learning approaches in Pre-University education
			Integrating the notion of sustainability into Pre-University
	University	Policy objective: Enhancing students' **skills and competences**	Introduce and improve courses that provide soft skills to students;
			Increase and finance experience-sharing and collaboration with other educational levels (Pre-University, Vocational Education and Lifelong Learning) to create bridges
		Policy objective: Enhancing teachers' **skills and competences**	Set experimental courses to promote closer collaboration between AFF faculties and Education experts
			Setting mandatory courses for professors in Education techniques and methods (mandatory lifelong learning)
		Spread and improve University collaborations for educational purposes	Enhancing Public-Private Partnerships (PPPs), reducing administrative burden, and creating tax incentives
			Enhancing multi-stakeholder approaches by a permanent table with diverse representatives
		Policy objective: Enhancing and updating the programs and curricula to match the needs of **the AFF sectors**	Better integration of formal, non-formal and informal education into the curricula
			Integration of the notion of sustainability into the curricula
			Putting in place an integrated qualification framework
			Incentivizing internships and field trips with the NextFOOD approach;
			Establishing (a network of) national centers for curriculum design and personnel development

		Policy objective: Enhancing international cooperation	Financing international exchanges between Universities
			Incentivizing joint lessons of classes from different countries
		Policy objective: Enhancing digitalization in universities	Promote design of courses that will provide students with the necessary digitalization skills
			Promote actions to increase the total number of hours of lessons that use digital instruments and technologies
			Put in place courses for training of trainings, which will be equipped to provide digital skills to students;
			Investing on schools' infrastructure to provide technological instruments and digital technologies;
	Vocational **Education**	Policy Objective: To enable recognition of diplomas	Set up a unified certification scheme valid through EU;
		Policy objective: To integrate new learning approaches and introduce new programs	To promote integration of new approaches of education (e.g. action learning) and new contents in programs (e.g. multidisciplinary)
		Policy objective: Enhancing skills of teachers and trainers	To set mandatory credit acquisition for Vocational teachers (or trainers)
		To guarantee the activation of policy-driven rather than market-driven courses	To improve financial support to courses
		Policy Objective: Increasing financial support for young professionals	Increasing financial support and technological equipment for young professionals to achieve strategic objectives;
		Policy objective: To Increase coordination and harmonization of policies	To strengthen the coordination among the Member States to harmonize policies in Vocational Education through regulations
		To Policy objective: To enable stakeholders' inclusion	Promote periodical meetings (e.g. every two years) with selected stakeholders (e.g. trade associations, professionals, other educational institutions, etc.) or to set permanent platforms for discussions
	Lifelong Learning	Policy objective: Designing lifelong learning courses that	Prioritizing (and introducing new) lifelong learning courses at educational institutions

		meet the needs of the sector, and making them accessible (and inclusive**)** for all	Promoting approaches to Lifelong Learning that are flexible, short, digital, and free (policy decision to strengthen lifelong learning modules in teaching institutes)
			Establishing multi-actor instruments to enhance lifelong learning
		Policy objective: Enable and enhance training of **teachers and educators**	Promoting lifelong learning initiatives to keep teachers' and educators' skills and competencies continuously up to date
		Policy objective: Supporting education of agricultural advisors, and improving extension services to make them more accessible and to promote lifelong **learning of farmers**	Promoting the establishment of a platform of advisors, and tailor-made implementation solutions on the national level
		Policy objective: Supporting the continuous education of workers/farmers in **the AFF sectors**	Designing programmes and modules which will allow the continuous education of AFF professionals throughout their career regardless of their age and gender
			Enhancing and systemizing peer-to-peer learning
		Policy objective: Integrating sustainability into **lifelong learning programmes**	Promoting the mobilization of partnerships of actors and organizations to integrate sustainability into education throughout life
		Policy objective: Establishing partnerships to **provide lifelong learning**	Supporting the mobilisation of community learning centres
		Policy objective: Consumer/citizen learning **through community practices**	Supporting community agricultural practices where informal learning is triggered among citizens

7.2. Limitations

While this report collects a number of relevant insights about policy needs, objectives, tools and good practices, it is also necessary to acknowledge that it is affected by a number of limitations. The most relevant are listed below.

First of all, the education issues are very much context-specific and linked to the country or even local legal frame: as a result, many of the outcomes, in attempt to generalise, may appear still not enough concrete or at least needing adaptation to local needs.

Second, the policy, market and political context have been changing quite dramatically since the outset of the project. Not only the COVID-19 outbreak has reshaped priorities in recent years, but also the increase in product and input prices, and, finally, the Ukrainian war, have dramatically modified the discourse, especially in the balance between economic, social and environmental sustainability.

Even within the medium-long term policy framework identified by the European Green Deal, most of the work was carried out when only some policy strategies were available, while the implementation, e.g. of the new CAP, was far from being well-defined.

8. Conclusions

The need for a good quality educational policy in this sector and the need to enhance networking, collaboration, sustainability, entrepreneurship and innovative learning methods came out as the most important needs of the sector. These results emphasize that to make a transition of the education and training systems towards achieving the Green Deal, Farm to Fork and new CAP objectives, a development of policies that support initiatives for student-centred and interdisciplinary education, that is flexible, non-traditional and supported by non-formal and life-long learning approaches, is needed. Hence, this work provides a background for proposing new policy instruments and concrete policy tools for the future challenges in the AFF sector, where an urgent change of pace and approach in ET is necessary for all the value chain, from the farm to the fork.

While this report provides a structured approach to the topic, classified in relation to different education levels and with a sectorial focus, the main message is the need to go beyond these distinctions, in order to address education and training in a systemic view, having in mind a vision of innovation in the context of complex transition processes.

Another general thought concerns dynamics. The world and EU context have been continuously changing during the life of the project, challenging the priorities and topics emerging from the NextFOOD work. This has also highlighted attention to resilience, flexibility and adaptation capacity of the education system as key features, potentially much more relevant than sophisticated and forward-looking skill inventory.

These considerations, in turn, bring to the point that methods and contents are finally not separable, as the perceived needs can only be achieved with a consistent society- and person-centered approach.

9. Annex

The below table aims to bring together the best practices introduced as part of this report, and provides a link between these best practices and the policy objectives they address. The final column on the other hand shows the educational level that each of the best practices aim to cover.

Best practice	Brief information	Policy objectives	Education levels
The genderNEXT Toolbox	As part of the NextFOOD project, a gender toolbox has been prepared, in the context of which various tools and instruments are presented that are useful for starting or enhancing the integration of a gender perspective in research producing entities and educational institutions. The purpose of the toolbox is to offer practical instruments to be applied in various contexts and for various tasks. The toolbox can be a critical tool to be used as part of AFF educational institutions in order to make sure that the necessary steps are taken towards a gender-equal or gender-neutral ET system.	• Enhancing gender equality across the AFF sectors • Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making • Enhancing collaborative policymaking • Enhancing and updating the programs and curricula to match the needs of the AFF sectors • To enable stakeholders' inclusion	• Pre-University • University • Vocational Education • Lifelong learning
The NextFOOD Sustainability Impact Framework	The NextFOOD project has, as one of its objectives, to develop an impact framework which assesses: 1) the various effects of practice-oriented research in the agri-food and forestry sectors; 2) the processes of interactive innovation in this context; and 3) their positioning in relation to use and impact. The framework generates a sustainability impact index relating to impact aspects on multiple levels. The framework resonates with NextFOOD's "action	• Integrating the notion of sustainability into the education system • Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making	• Pre-University • University • Vocational Education • Lifelong learning

	learning strategy" (Lenaerts et al 2019), in considering multi-actor involvement and action-oriented features, as well as including practice abstracts as a component of the impact work itself.		
CASI Public Participation in Developing a Common Framework for Assessment and Management of Sustainable Innovation	The project's main objective is to develop a methodological framework for assessing sustainable innovation and managing multi-disciplinary solutions through public engagement in the Research, Technological Development and Innovation (RTDI) system. The project enables the elaboration of an assessment framework of sustainable innovation practices, providing opportunities and various venues for stakeholders to engage in focused debates on sustainable innovation. Finally, EU-wide policy recommendations are elaborated.	• Integrating the notion of sustainability into the education system	• University
The European Sustainability Competence Framework (GreenComp)	This is a reference framework for sustainability competences created in 2022 by a network of people, including experts on sustainability education and lifelong learning from academia and research institutions, youth representatives, educators, policy representatives from EU members states and NGOs. The framework provides a common ground to learners and guidance to educators.	• Integrating the notion of sustainability into the education system	• Pre-University • University • Vocational Education • Lifelong learning
UNECE's Competences in Education for Sustainable Development Framework	The Competences in Education for Sustainable Development were adopted at the sixth meeting of the United Nations Economic Commission for Europe (UNECE) Steering Committee on Education for Sustainable Development in 2011. The framework has been followed-up with and developed further by various documents and frameworks, one example being Framework of Education for Sustainable Development Goals (2017). The framework sets out key competences for educators in education for sustainable development, with an	• Integrating the notion of sustainability into the education system	• Pre-University • University • Vocational Education • Lifelong learning

	aim to identify shared principles and beliefs that can unite educational staff and guide personnel in their actions, regardless of their grade, function or location.		
Minimum Standards for Gender Mainstreaming	The Policy for applying minimum standards for gender mainstreaming (FAO, 2020) recognizes that a gender-responsive organizational environment is necessary to achieve progress towards its four gender-equality objectives and to implement its twin-tracked strategy. The Policy identifies 17 minimum standards that aim at ensuring that the gender dimensions are adequately integrated in all institutional processes and functions through specific requirements for accountable offices and divisions.	• Enhancing gender equality across the AFF sectors • Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making • Enhancing collaborative policymaking • Enhancing and updating the programs and curricula to match the needs of the AFF sectors • To enable stakeholders' inclusion	• Pre-University • University • Vocational Education • Lifelong learning
NextFOOD Toolbox for teaching practitioners	As part of the NextFOOD project, an online Toolbox has been created to support teaching practitioners in implementing the NextFOOD approach to education. The approach is based on action learning, and reflects the need to move away from a linear education system to an education that is experience-based. It is also focused on developing key competences for sustainability, and which depends on dialogue, observation, reflection, participation, visionary thinking, facilitation, and systems thinking.	• Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Enhancing teachers' skills and competences	• Pre-University • University • Vocational Education • Lifelong learning
Increasing Organic Food in Schools	The project aims to educate kids about the importance of healthy lifestyle and nutrition and the need to improve relation that children have towards food, especially in the school context. In addition, the project also aims at strengthening the link between the environmental and education perspectives.	• Enhancing and updating the programs and curricula to match the needs of the AFF sectors	• Pre-University

Fruits and Vegetables in Schools- Italy-	The Program was created with the central objective of providing food education that aims to increase awareness of children and their families about importance of a greater consumption of fruits and vegetables in daily meals. Pupils of elementary schools received at least 10 different species of fruits and 2 different species of vegetables. The majority of fruits and vegetables was produced in Italy and had certifications of PDO, PGI and Organic; and some of these products were produced in Europe. This allowed to make daily meals healthier, to sustain local food supply chains and to prepare a future generation of consumers.	• Enhancing and updating the programs and curricula to match the needs of the AFF sectors • To integrate new learning approaches and introduce new programs	• Pre-University
Diversi si, ma tutti uguali (Different but all the same) Awareness and education to equal opportunities in primary schools - Italy-	The project foresees a set of activities to be developed in the class, involving pupils, teachers, and parents aimed at deconstructing stereotypes and prejudices that condition individual and relational growth.	• Enhancing and updating the programs and curricula to match the needs of the AFF sectors ☐ • To integrate new learning approaches and introduce new programs	• Pre-University
NextFOOD audit tool	The tool is designed to assess an educational programme's capacity to equip students with the inventory of seven skilling pathways identified originally in the NextFOOD Inventory for future practices in the agrifood and forestry sectors. The audit tool uses a self-assessing methodology with the aim of generating awareness and reflection. The tool will help the user(s) discover how the audited education performs in relation to each of the seven skilling pathways identified originally in the NextFOOD Inventory of Skills, as well as be encouraged to reflect on ways to develop the educational activities further, along these pathways.	• Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Enhancing and updating the programs and curricula to match the needs of the AFF sectors	• Pre-University • University • Vocational Education • Lifelong learning

CRISS – Europe-	The purpose of the project is to develop and pilot, on a very large-scale way, an educational platform in the cloud for the acquisition, evaluation, and certification of students' digital competence in primary and secondary schools. The project consortium developed a new cloud-based digital learning ecosystem and tested it in over 535 European schools. Its outcomes have potential to impact all actors, with more qualified students, schools that can better describe what they want in their procurements, and regional education directorates having a clear picture of which policy actions are needed.	• Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Enhancing and updating the programs and curricula to match the needs of the AFF sectors	• Pre-University
The NextFOOD cases	The NextFOOD project has adopted a case-oriented approach because in real-life cases the complex topic of learning in agrifood and forestry systems come into full play and, thus, can be studied under realistic conditions. These cases refer to a wide range of agrifood and forestry systems in different geographical locations (Europe, Africa and Asia). The cases are continuously exploring theory and methods for fostering the key skill in a participatory manner involving students, stakeholders and faculties. All NextFOOD cases are working to increase collaboration with farmers and other stakeholders in the food system, and integrate this in their education and training programs.	• Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Enhancing and updating the programs and curricula to match the needs of the AFF sectors • To enable stakeholders' inclusion • Enhancing and updating the programs and curricula to match the needs of the AFF sectors • To integrate new learning approaches and introduce new programs • Enhancing skills of teachers and trainers	• Pre-University • University • Vocational Education • Lifelong learning

Farmer time	The initiative pairs farmers with classes for a series of video calls throughout the year. The students have the opportunity to ask questions, and see what happens on the other side of the farm gate, reinforcing curricular learning with real life examples. The project, hence, allows to connect the younger generations with the countryside, highlighting the role of agriculture sector in society, improving the respect and social perception of farmers.	• Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system	• Pre-University
The SCAR AE Platform	SCAR Strategic Working Group (SWG) on Agroecology (SCAR-AE) will offer a platform for continuous strategic discussion between the members states/associated countries and the European Commission. As a first target, SCAR-AE will write the "Partnership proposal", which will be the basis of the Partnership call that will be included in the Work Programme 2023-2024. The SCAR-AE aims at supporting research policy development for Agroecology at national, EU and international levels, and fostering debate and providing conceptual, methodological and practical frameworks.	• Simplify administrative procedures and allow a better coordination of policies • Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making	• Pre-University • University • Vocational Education • Lifelong learning
Zero bureaucracy project -Estonia-	A taskforce composed of high-level civil servants of public institutions and representatives of the main stakeholders was set in order to coordinate and monitor the activities aimed at reducing the administrative burden on businesses, deregulating the economic activity by addressing unnecessary requirements, reducing the bureaucracy within the public sector. The Minister of Economic Affairs and Infrastructure initiated together with the Minister of Entrepreneurship, the Minister of Finance and the Minister of Public Administration. Stakeholders have been identified in: Chamber of Commerce and Industry, Employers' Association and Estonian Service Industry Association.	• Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making • Enhancing collaborative policymaking • Simplify administrative procedures and allow a better coordination of policies	• Pre-University • University • Vocational Education • Lifelong learning

Introductory courses without credits – Norway and Sweden	Description: A "soft entrance" into learning through introductory or orientation courses on how to learn, or short seminar courses without grades, can ease the entrance into the adult learning process. This approach is used by the Nordic Study Circles (in Sweden and Norway), the School-clubs Migros in Switzerland, and the EDAP programme in the United Kingdom (OECD, 2001). Courses without credits can provide students or adults with the possibility to experiment with topics and subjects towards identifying their education (or career) path, or simply help them gain experience in topics that are useful for them.	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all • Enhancing competencies and skills • Supporting the continuous education of workers/farmers in the AFF sectors	• University • Vocational Education • Lifelong learning
Free-standing Open Universities- – UK	Open universities are educational institutions offering degrees with low or no entry requirements, where "open" refers to their open-door academic policy; hence, they offer study options also for those who graduated previous studies with low grades but want to continue their higher education. Open universities also offer distance learning opportunities (which has been a long tradition even way before the Covid-19 pandemic pushed for online solutions), making education accessible across geographical distances. The first European university to give the option of open and online education to students was the Open University UK, which was created in 1970.	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all • Enhancing competencies and skills • Supporting the continuous education of workers/farmers in the AFF sectors	• Lifelong learning • University
Forestry Project Initiative - Sweden	The aim of this initiative is to provide shift workers in the forestry industry with upper secondary level education in the core subjects of mathematics, chemistry, physics, Swedish and English. Tuition is carried out mainly through distance education and with the support of supervisors and new technology such as computers and interactive video. Education takes place mainly outside working hours.	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Enhancing competencies and skills	• Lifelong learning

		• Supporting the continuous education of workers/farmers in the AFF sectors	
Adult-friendly non-university-level tertiary education system - Australia	Australia has a large "adult-friendly" non-university-level tertiary education system. The largest element of the system is a network of 74 government-funded Technical and Further Education (TAFE) colleges at more than 100 campuses. The public system also includes some community-based providers in private organisations, enterprises and some provision within university-level tertiary institutions. Courses are provided in a wide range of vocational fields, and at a wide variety of levels. Provision includes both programmes that lead to formal qualifications within a national qualifications framework and programmes that do not.	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • To enable recognition of diplomas	• Lifelong learning • University • Vocational Education
Piano Nazionale Scuola Digitale	The National Digital School Plan (PNSD) is the guiding document of the Ministry of Education, Universities and Research for the launch of an overall strategy that helps to "catalyse" the use of multiple sources of resources in favour of digital innovation in the Italian school. Considered a fundamental pillar of "The Good School (law 107/2015) the planned actions are divided into four fundamental areas: tools, skills and contents, training, accompaniment	• Increasing financial support and investments • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Increasing financial support and investments • Enhancing competencies and skills	• Pre-University
PCTO Percorsi per le competenze trasversali e l'orientamento (Paths for transversal skills and orientation)	The transversal skills and orientation programme - is an educational methodology that, through practical experience, helps high school students consolidate their educational expertise and test their skills on the job while enriching their training and guiding their studies. These paths are part of all secondary schools' curricula in Italy and can be organized in collaboration with university or with the labour market.	• Enhancing competencies and skills • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Enhancing competencies and skills • Updating the Pre-University curricula to meet the needs of the	• Pre-University • University

		sector, curricula implementation and development • Enhancing students' skills and competences • Spread and improve University collaborations for educational purposes • Policy objective: Enhancing and updating the programs and curricula to match the needs of the AFF sectors • To integrate new learning approaches and introduce new programs • To enable stakeholders' inclusion	
National farm to school network	National Farm to School Network is an information, advocacy and networking hub for communities working to bring local food sourcing and food and agriculture education into school systems and early care and education environments.	• Integrating the notion of sustainability into the education system • Enhancing and updating the programs and curricula to match the needs of the AFF sectors • To integrate new learning approaches and introduce new programs • To integrate new learning approaches and introduce new programs • To enable stakeholders' inclusion • Consumer/citizen learning through community practices	• Pre-University • Lifelong Learning
Farm to Fork Game – Australia	The 'Farm to Fork' game creates a virtual world in which the player manages the potato supply chain, starting with on-farm production, through processing to create different products, marketing and	• Integrating the notion of sustainability into the education system	• Pre-University

	advertising to increase distribution and sales, and methods of preparing potatoes for consumption	• Enhancing competencies and skills • Updating the Pre-University curricula to meet the needs of the sector, curricula implementation and development	
Digital Education Action Plan (2021-2027)	The Digital Education Action Plan (2021-2027) is a renewed European Union (EU) policy initiative to support the sustainable and effective adaptation of the education and training systems of EU Member States to the digital age.	• Enhancing and updating the programs and curricula to match the needs of the AFF sectors • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Updating the Pre-University curricula to meet the needs of the sector, curricula implementation and development	• Pre-University
Norwegian University of Life Science MSc in Agroecology	The NMBU MSc in Agroecology tries to reach the right balance between action-oriented learning and theoretical knowledge of the subject "agroecology", stimulating participation, observation, dialogue, visioning and reflection of students in a coherent epistemic approach which aims to develop, at the same time, both hard and soft skills. It represents the application of action learning approach.	• Enhancing students' skills and competences • Enhancing and updating the programs and curricula to match the needs of the AFF sectors • Enhancing teachers' skills and competences	• University
University of Bologna Center for learning and teaching innovation	The teaching innovation model of the University of Bologna is based on research activities inspired by the Formative Educational Evaluation model with specific Degree Programmes that can participate in activities such as systematic data collection and analysis, collective discussions, identification of teachers' training needs, experimentation with teaching innovations, and the implementation of resulting training activities that are useful for redesigning teaching in the future.	• Enhancing teachers' skills and competences • Spread and improve University collaborations for educational purposes • Enhancing and updating the programs and curricula to match the needs of the AFF sectors	• University

		• Enhancing digitalization in universities	
TU Delft - #cocreateMYCITY	#cocreateMYCITY is an example of the international collaborative program that TU Delft, a Dutch public technical university, set up in the cross-faculty TU Delft	Global Initiative. The program was held in collaboration with the city of Durban, and the aim was to find solutions to urban challenges in the sectors of Water, Transport & Logistics, Energy, Agriculture, and Healthcare. The activity was conducted through multidisciplinary and multicultural teams. In detail, twenty Dutch and twenty South African students teaming up for 10 days, worked together in small groups on challenges identified by the city of Durban under the guidance of a selected group of experts and mentors. All groups came up with concrete solutions to these challenges. On the last day, they presented these solutions in the form of business cases to local businesses, start-ups, and the local government.	• Spread and improve University collaborations for educational purposes • Enhancing students' skills and competences • Integrating the notion of sustainability into the education system • Enhancing international cooperation	• University □
Rural4University – Rete Rurale Nazionale (Italy)	Rural4University is a project in the scope of Rete Rurale Nazionale 2014-2020, powered by Italian Ministry of Agriculture (Mipaaf). Its goal is transferring knowledge, and experiences from farmers to university students about RDPs, Good Agricultural Practices (GAPs), Innovation and Sustainability on farms. The course is taught in an innovative format, consisting of three phases: face-to-face and online training (called RuralLEARN), field experience (called RuralCAMP) and business laboratory (called RuralLAB). In 2020 the project involved a Public Entity (Rete Rurale Nazionale, RRN), eleven Italian Regions and their Rural Development Plans (RDPs), two Public Research Institutes (namely, CREA, and ISMEA),	• Enhancing and updating the programs and curricula to match the needs of the AFF sectors • Enhancing students' skills and competences • Integrating the notion of sustainability into the education system • Spread and improve University collaborations for educational purposes	• University

	and a private association (called Vazapp). Meanwhile, the students came from seventeen universities scattered throughout the national territory.		
C-Lab – Master Thesis Lab	Challenge Lab (C-Lab) at Chalmers University of Technology (Sweden) is a "co-creation arena" founded with the idea of supporting students in thinking how to change the pace towards a more sustainable society. The C-Lab targets students from any Masters programme at Chalmers and Gothenburg School of Business, Economics and Law and it gives a space for students to set collaborations with stakeholders from organisations within academia, industry, the public sector and civil society. The C-Lab offers courses and a Master Thesis Lab in a "a dynamic environment where they are in charge to connect projects, companies and public sector initiatives together with academia to find leverage points in the system to then suggest and initiate solutions to take all sectors in the society forward."	• Enhancing and updating the programs and curricula to match the needs of the AFF sectors • Enhancing students' skills and competences • Spread and improve University collaborations for educational purposes	• University
DAMR Project – UNA EUROPA	In the scope of seed funding UNA EUROPA - European University Alliance, the DAMR project (*Disseminate Anti-Microbial Resistance knowledge and the use of whole-genome sequencing on relevant bacterial pathogens during COVID-19 world emergency*) aims to promote virtual mobility of students and researchers and dissemination of knowledge on *antimicrobial resistance* (AMR) and *bacterial whole genome sequencing* (WGS). The project is divided into two parts: The first one is a series of classical frontal lessons hold by expert researchers and teachers from the University Alliance; the second part consisting of *live sessions* of Q&A between students and teachers.	• Enhancing international cooperation • Spread and improve University collaborations for educational purposes • Enhancing students' skills and competences • Enhancing and updating the programs and curricula to match the needs of the AFF sectors	• University

	Furthermore, the project promotes the peer-to-peer exchange of experiences and knowledge with regard to their research activities.		
Restart for Education in a Digital Era through Project-based E-learning	The Project stands for innovating teaching and learning methods at academic level by integrating the digital technology in the educational process.	• Enhancing digitalization in universities • Enhancing students' skills and competences • Enhancing and updating the programs and curricula to match the needs of the AFF sectors	• University
Spotlight on recognition	The Academic Recognition Hub is a database of resources in the field of recognition of qualifications and study periods abroad.	• To enable recognition of diplomas	• Vocational Education
The action learning kit for vocational education and training - Australia	The action learning kit is designed by the Australian National Staff Development Committee (NSDC) to help facilitate a range of staff development sessions about action learning. Each volume in the kit presents case studies around a theme and focuses on staff development experience within a range of organisations. This kit contains four volumes, a workbook and a video, all focused on action learning.	• Integrating new learning approaches and introduce new programs • Enhancing skills of teachers and trainers	• Vocational Education
Teachers continuing professional development – Japan	The Japanese system of *continuing professional development* for teaching profession provides that teachers must spend a minimum number of hours on professional development each year, and the amount is decided by municipal boards. Furthermore, teachers must renew every 10 years their teaching certificates and they can integrate formal training with complementary practices like "lesson study" to learn informally from other colleagues.	• Enhancing skills of teachers and trainers • Integrating new learning approaches and introduce new programs	• Vocational Education
LIFE Foster Project	This LIFE project is co-financed by the EU Commission LIFE Programme, and aims at educating, communicating, and, in the final	• Enhancing skills of teachers and trainers ☐	• Vocational Education

	instance, reducing food waste in the restaurant industry. To do so, a consortium of subjects active in the research sector, vocational education and training, and in the restaurant industry was held, involving partners from France, Italy, Malta and Spain. The project targets various groups: Students following a chef programme, in various training centres; 527 Trainers, that are spread over the four European Countries; Policymakers, representative of the national or regional governments or of large municipalities; and other European Training Centres, both directly and indirectly with the aim of spreading the good practices.	• Integrating new learning approaches and introduce new programs • Integrating the notion of sustainability into the education system	
VIVEA – Training insurance fund-France	VIVEA is a French Training Insurance Fund, created in 2001 by decree of the Minister of Agriculture and Fisheries and the Secretary of State for Women's Rights and Vocational Training. The fund is supported by agricultural unions (Confédération paysanne, Coordination Rurale, FNSEA and Jeunes Agriculteurs) and agricultural organizations (Chamber of Agriculture and CNMCCA). It offers the opportunity to agricultural entrepreneurs in developing their skills by financing VET. It finances the training actions towards its contributors and defines a training development policy to meet the skills needs of the latter.	• To guarantee the activation of policy-driven rather than market-driven courses • Increasing financial support for young professionals	• Vocational Education ◻
Measure 1 RDPs – EU	Measure 1 of Rural Development Programs (RDPs) aims to boost knowledge transfer, information actions and innovation. It promotes vocational training and skills acquisition actions (Sub-Measure 1.1), finances demonstration activities and information actions (Sub-Measure 1.2), and helps to implement short-term farm and forest management exchange as well as farm and forest visits (Sub-Measure 1.3).	• Increasing financial support for young professionals • To guarantee the activation of policy-driven rather than market-driven courses	• Vocational Education

Osnabrück Declaration	The Osnabrück Declaration (2020) on "vocational education and training as an enabler of recovery and just transitions to digital and green economies" sets out the policy actions that would be performed in the EU countries in the period 2021-2025. It focuses on four main areas, namely: 1. Resilience and excellence through quality, inclusive and flexible VET; 2. Establishing a new lifelong learning culture – relevance of continuing VET and digitalisation; 3. Sustainability – a green link in VET; 4. European education and training area and international VET. The Declaration represents an update of the previous Riga Declaration (2015) and it takes in consideration the also updated European Skills Agenda.	• To increase coordination and harmonization of policies • To enable stakeholders' inclusion • To guarantee the activation of policy-driven rather than market-driven courses • Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all	• Vocational Education
The Alliance for Initial and Continuing Training - Germany	The Alliance for Initial and Continuing Training acts as a policy platform with the aims of bringing together all relevant VET stakeholders at a federal level and of developing possible joint solutions to the main challenges that VET policy is facing. The Alliance tries to improve the situation in the vocational training market, gathering the partners in order to work together both to attract more high-achieving young people into vocational training and to make it possible for more young people with worse initial prospects, young people with migration-related problems, and people with disabilities to enter vocational training. The new instrument of assisted training particularly aims to support small and medium-sized enterprises which offer training to lower-achieving young people.	• To enable stakeholders' inclusion • Increasing financial support for young professionals	• Vocational Education
Forestry Project Initiative	The aim of this initiative is to provide shift workers in the forestry industry with upper secondary level education in the core subjects of mathematics, chemistry, physics, Swedish and English. Tuition is carried out mainly through distance education and	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all	• Lifelong Learning

	with the support of supervisors and new technology such as computers and interactive video. Education takes place mainly outside working hours. This initiative has been designed to address employers' needs for a more highly educated workforce, provides an example of how ICT is being used to increase cost-effectiveness in the adult education sector.	• Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system	
Recognition of Lifelong Learning - Norway	In 1999, Norway began establishing a national system to document and recognise adults' informal learning both in the workplace and in an educational setting. Pilot projects have been implemented to integrate informal learning both to upper secondary education and to higher education using a mix of written and oral tests. This initiative implemented by Norway provides an important example– of wider mechanisms for recognising informal learning.	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all • Enhancing and updating the programs and curricula to match the needs of the AFF sectors • To enable recognition of diplomas	• Lifelong Learning
Massive Open Online Courses (MOOCs) and micro-credentials	MOOCs are online courses that provide an affordable and free way to learn new topics and skills, to advance careers and to deliver an educational experience at a large scale. While traditional classrooms can serve only a limited number of people, MOOCs lift off this barrier to educate all who are interested in learning. MOOCs can act as stand-alone courses in informal and non-formal learning and can complement formal education, as integrated modules. They can also provide collaborative experiences, as it allows peer learning and the content to be continuously generated by the large online community.	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system	• Lifelong learning
Regional expertise networks for	The government of the Flemish Community of Belgium has commissioned Regionale Expertisenetwerken (REN, or Regional Expertise Networks) to provide supply and demand driven in-	• Supporting the continuous education of workers/farmers in the AFF sectors	• Lifelong Learning

trainers - Belgium	service training. Each REN consists of at least one department for teacher training at an officially recognised university or school for higher education. These networks have a twofold responsibility to offer a wide range of in-service training, as well as a technical assistance helpdesk	• Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system	
A register for continuing vocational training for trainers - Greece	The Greek Ministry of Labour and Social Security has issued a ministerial decision that regulates the procedures for the development of a register of continuing vocational training for trainers. The register is of importance to keep the skill level of trainers up-to-date, and also to promote digital literacy and the use of ICT by teachers and trainers, since registered trainers will need to have a European Computer Driving Licence (ECDL) that will certify their computer competence (CEDEFOP, 2009).	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all	• Lifelong Learning
Special actions for improving the in-service training for teachers - Italy	In Italy, the national adult education programme includes special actions for improving the in-service training of teachers and trainers. Such actions are defined in the national agreement for each professional category, in accordance with the financial resources available. A top priority is the joint training of teachers and trainers with professionals working in the different training systems, in order to improve skills in areas relating, for example, to the training contract, tutorial help, modular teaching, integrated planning, networking and literacy and so on. In-service teacher training programs mostly refer to the short-term education modules that have been specially designed for professionals already working as teachers.	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all	• Lifelong Learning
Policy initiative to boost teacher employability – The Netherlands	In the Netherlands, the need to provide for the ongoing career development of teachers (to ensure implementation of innovative teaching concepts) prompted the government policy document, Lifelong	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all	• Lifelong Learning

	Learning: The Dutch Initiative, to boost teacher employability. Measures proposed included raising the numbers of people entering teacher training, opening up the labour market in education, new ways of recruiting teachers, reform of teacher training, quality systems, and improving personnel policies and the conditions of employment.	• Enhancing teachers' skills and competences	
Financially supporting skills centers to act as teacher training centers in ICT - Portugal	The aim of the Nónio – 21st Century Programme launched by the Portuguese government is to support the development of projects to bring ICT into education, as well as the promotion of teacher training and international cooperation in ICT, particularly by incorporating the national school network into the network of European schools. Many provisions of the programme are in the form of calls for tender aimed at accrediting and financially supporting Nónio skills centres and school projects.	• Enable and enhance training of teachers and educators • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Enhancing skills of teachers and trainers	• Lifelong Learning
Agricultural Advisory Service (DAAS) - Denmark	The Danish Agricultural Advisory Service (DAAS) is owned and managed by farmers, via their membership of farming organizations. The DAAS' main responsibility is to supply Danish farmers with management tools and advice relating to all aspects of farming, including farm accounting, production and farm management.	• Supporting the continuous education of workers/farmers in the AFF sectors • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system	• Lifelong Learning
ProAgria - Finland	ProAgria has 16 regional advisory centres nationwide, a staff of 685 people (out of which 660 in the field) and a membership base of 113 000. Funding is provided by the state (16%), clients (65%), projects (18%) and others (1%). Together, these account for an annual turnover of 49 million € (2011) and around 30 000 clients annually. Around 80% of Finnish farms utilize ProAgria services. Advisory services are based on face-to-face advice at the farm, but also a rapidly increasing number of e-services. An on-line advisor registry is established,	• Supporting education of agricultural advisors, and improving extension services to make them more accessible and to promote lifelong learning of farmers • Supporting the continuous education of workers/farmers in the AFF sectors • Enhancing both hard and soft skills and competencies that are crucial in	• Lifelong Learning

	where the client can search for an advisor and make an appointment.	the AFF sector, throughout the ET system	
Two-level advisory system - Switzerland	The advisory system in Switzerland is organized on two different levels. Information and advice to farmers is offered by extension services at the cantonal level. They cover activities in farmers' own private interests (in the sense of advisory services: information, technical advice in crop and animal production, socio-economic expertise in farm management) as well as providing services in public interests (in the sense of extension services like soil and water conservation or landscape protection).	• Supporting education of agricultural advisors, and improving extension services to make them more accessible and to promote lifelong learning of farmers • Supporting the continuous education of workers/farmers in the AFF sectors • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system	• Lifelong Learning
EU-Platform of Chambers of Agriculture - EU	Working in 14 European countries (Austria, Croatia, Czech Republic, Estonia, Flanders, France, Germany, Hungary, Latvia, Lithuania, Luxembourg, Poland, Slovakia and Slovenia), the chambers provide extension and advisory services for more than 5 million farmers, as well as for local authorities, applied research agencies and rural enterprises. Chambers manage numerous experimental stations, test areas and research laboratories for applied life science. Knowledge transfer from research to farm level takes place.	• Supporting education of agricultural advisors, and improving extension services to make them more accessible and to promote lifelong learning of farmers • Supporting the continuous education of workers/farmers in the AFF sectors • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system	• Lifelong Learning
Farmer field schools – a global initiative	Farmer Field Schools (FFS), which is a community-driven, non-formal learning approach to agricultural training and education, constitute a lifelong learning model which emerged in late 1980s. Instead of using linear approaches for knowledge transfer, FFS emphasize group dynamics, hands-on experimentation, interactive learning, and farmer-to-farmer communication. While this is an approach	• Supporting the continuous education of workers/farmers in the AFF sectors • Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making	• Lifelong learning

	used mainly as part of developing countries, it can be adopted also by European countries in order to reach those farmers in remote areas, or those in disadvantaged regions.	• Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system	
Incubator centers for new farmers- EU	Today, a growing number of newcomers to farming are entering the sector. Farm incubators are programmes enabling would-be farmers to test their business project at full size before getting started. They make entry into farming easier by addressing barriers to prospective farmers, including access to land, capital and credit, and opportunities to learn and develop skills in farm management and business planning. These farm incubators enable prospective farmers to develop a life-size farming activity in an autonomous way, during a limited period of time (two to three years), in an environment presenting limited risks. At the end of the trial period, the prospective farmers assess their project and their performance, in order to decide whether to carry on, to amend, or to give up the project.	• Supporting the continuous education of workers/farmers in the AFF sectors • Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system	• Lifelong Learning
Workplace learning and apprenticeships - Ireland	Traditional education routes may not always deliver these outcomes. The Action Plan to Expand Apprenticeship and Traineeship in Ireland 2016 - 2020 seeks a substantial increase in the number of apprenticeship and traineeships with a target of over 120 Apprenticeship and Traineeship Schemes and 50,000 apprenticeship and traineeship registrations to be in place by 2020. The Action Plan calls for new Apprenticeship proposals. The effectiveness of apprenticeship schemes in bringing young people into work is recognised by the EU Commission. The Commission views apprenticeships as a way to strengthen 'the link between education and the labour	• Supporting the continuous education of workers/farmers in the AFF sectors • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system	• Lifelong Learning

	market' and to provide the 'combination of technical, transversal and soft skills that employers are looking for.		
On-farm demonstrations to boost peer-to-peer learning	Horizon 2020 multi-actor projects AgriDemo-F2F, PLAID and NEFERTITI have joined forces to connect farm demonstration activities across Europe, stimulating knowledge exchange and the uptake of innovation. Across these networks, 45 regional or national clusters have been established, bringing together farmers, advisers, NGOs, researchers, policy makers and others involved or interested in demonstration activities. Farmer-to-farmer exchanges can be very effective to promote the use of innovative technologies and approaches in the agricultural sector. This is why on-farm demonstrations can play a major part in stimulating peer-to-peer learning and sharing best practices.	• Supporting the continuous education of workers/farmers in the AFF sectors • Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making	• Lifelong Learning
Initiatives that promote Education for Sustainable Development (ESD)	ESD has its roots in two educational movements that have arisen since the establishment of the United Nations. One is the Education for All (EFA) movement, which aims to expand basic education in order to build strong foundations for lifelong learning. The second is the movement for environmental education which begun in the 1960s, in the scope of which educators aimed to develop innovative approaches in their daily education practices in order to challenge the existing education that contributed to reproducing unsustainable systems and practices.	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all • Integrating new learning approaches and introduce new programs • Integration the notion of sustainability into the education	• Lifelong Learning
Phenoclim: measurement by the general public of the impact of climate change on	This initiative aims to develop skills of observing everyday natural phenomena among young students. The initiative also reflects the desire to develop research on climate change in order to improve capacities for adaptation, as well as to raise public awareness. Phenoclim volunteer observers	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all	• Lifelong Learning

plant life - Centre for Research on High Altitude Ecosystems (CREA) - France	comprise schools, individuals, associations, conservation areas and some local governments. The initiative puts emphasis on establishing closer links between "scientific research" and "teaching", and thus "public interest" and "awareness-raising". A full-time network coordinator who also acts as interface between participants and researchers.	• Integrating new learning approaches and introduce new programs • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making • Integration the notion of sustainability into the education	
Earth Hour education WWF Sweden, Sweden	The initiative aims to reach a significant number of preschools and schools to be reducing their ecological footprint and to be active in reducing their emissions of CO2. The initiative contributes both to the fulfilment of the Swedish curriculum and the Swedish environmental objectives. Moreover, multiple partnerships are established to achieve the objectives of the initiative.	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all • Integrating new learning approaches and introduce new programs • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Integration the notion of sustainability into the education	• Lifelong Learning • Pre-University Education
Ekospinning – Share your energy - Jesús Obrero Secondary and Vocational Training School & Ingurugela, Spain	The main objectives of the project are: To provide the necessary knowledge, skills and experience about climate change and its consequences; to foster readiness to cooperate and participate with responsibility in their local environment; and to minimize the scholar contribution to greenhouse effect. The specific objective of the project is to develop a system for generating clean energy that promotes sustainable mobility through physical exercise, relaxation, innovation and creativity. The	• Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all • Integrating new learning approaches and introduce new programs • Enhancing both hard and soft skills and competencies that are crucial in	• Lifelong Learning

	initiative contributes to diversifying the skills of students and improving the education of future students, through the inclusion of technology and methodology of the Eco-spinning project. Training, allows learning to take place in formal, non-formal and informal settings.	- the AFF sector, throughout the ET system - Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making - Integration the notion of sustainability into the education - Establishing partnerships to provide lifelong learning	
ECO-UNESCO's Youth for Sustainable Development Peer Education Programme	The Programme seeks to engage and empower young people between the ages of 15 and 18, encouraging them to think more holistically, critically, both globally and locally about issues relating to sustainable development with a particular focus on developing countries. The peer education programme also encourages young people to link in with other groups in their local community and to develop links to other groups in the developing world using the UNESCO clubs' network. The programme raises awareness of local and global issues in relation to sustainability (i.e. – Climate Change, Sustainable Development Goals, Global Justice, Understanding Development, Fair Trade, increased environmental awareness etc.). The programme uses peer education methodologies to build the skills of young people in areas such as communication and critical thinking.	- Designing lifelong learning courses that meet the needs of the sector, and making them accessible (and inclusive) for all - Integrating new learning approaches and introduce new programs - Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system - Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making - Integration the notion of sustainability into the education - Establishing partnerships to provide lifelong learning	• Lifelong Learning
Community learning centres	A community learning centre (CLC) is a local educational institution outside the formal education system, usually set up and managed by local people to provide various learning opportunities. The purpose of a CLC is to provide opportunities for	- Establishing partnerships to provide lifelong learning - Enhancing both hard and soft skills and competencies that are crucial in	• Lifelong Learning

	lifelong learning to all people in the local community. CLCs support empowerment, social transformation and improvement of the quality of life of the people. The main functions of CLCs are to provide: i) skills through education and training, ii) community information and resource services, iii) community development activities, and iv) co-ordination and networking (UNESCO, 2016).	the AFF sector, throughout the ET system • Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making • Supporting the continuous education of workers/farmers in the AFF sectors	
Consumer-led Solidarity Purchasing Groups - Italy-	Solidarity Purchasing Groups are groups of households that self-organize and collaborate in purchasing food and other goods directly from producers on the basis of ethical and environmental criteria and considerations of solidarity. They present themselves as a movement with a shared critique of the dominant model of consumption, a movement whose aim is to build a more sustainable economy by changing the way they buy their food and other goods. In these spaces, informal and social learning through experience sharing, and learning-by-doing take place. Besides, exchange of local lay knowledge (or traditional knowledge) – technical knowledge utilized by farmers to grow food in the specific agri-ecological context is also learned. In addition, it is observed that consumers' desire to learn further about food systems are also triggered in these groups: as consumers learn in these groups, they are motivated to learn more by their own means of further research. Last but not least, sustainable practices are learnt, and lifestyle changes are triggered in the scope of these interactions.	• Establishing partnerships to provide lifelong learning • Enhancing both hard and soft skills and competencies that are crucial in the AFF sector, throughout the ET system • Increasing collaboration among actors and integrating entrepreneurs, local communities and farmers in decision-making • Supporting the continuous education of workers/farmers in the AFF sectors	• Lifelong Learning

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