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List with Abbreviations

Acronym	Abbreviation
WBL	Work Based Learning
HEI	Higher Education Institute
VET	Vocational Education and Training Centre
PBL	Project Based Learning
F2F	Face-To-Face training
LU	Learning Unit

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Project summary

The general goal of RELIEF “euRopean bio-Economy aLLiance In Farming” is to foster the potential of HE and VET to provide new training approach, innovative learning material and training practices in the field of bio-economy focusing to open up new learning opportunities for the embedding of bio-economy principles and practices in farming.

The project objectives are:

- to design a training approach starting from the skills needed to facilitate the transition of farming sector to bioeconomy;
- to enhance the knowledge, skills and competencies of HE students, agronomists, farmer consultants in bioeconomy and prepare them to support farmers towards the transition process;
- to develop an innovative and multidisciplinary approach for teaching the integration of bioeconomy principles and practices in farming;
- to promote the cooperation and co-creation of knowledge between higher education (HE) and vocational education and training (VET), research, and the business farming sector in order to contribute to innovation in business modelling based on bioeconomy and in education and training;
- to empower multiple stakeholders in agriculture, policy makers, regional governments across Europe to utilize high quality, state-of-the-art learning resources, available through an e-learning repository, for the knowledge in bioeconomy to be developed and spread.

Introduction

Scope of this Report

The purpose of this report is to present the Training Material that has been developed within the framework of the RELIEF project, for both HEI and VET levels. This material is composed of:

- Two curricula, one at HEI level and one at VET level
- Each curriculum is comprised of 20 Learning Units (LUs)
- Each Learning Unit includes
 - ✓ a document containing all the information regarding the topic, the identified Learning objectives, and bibliography;
 - ✓ a set of slides that will support the trainers during the face-to-face lessons;
 - ✓ a practical activity (WBL) that will help the students put into practice some of the knowledge learnt during the LU lessons.

All these documents are written in English and have subsequently been translated into the four native languages of each of the partner countries (Italian, Greek, Portuguese and Swedish).

The HEI and VET curricula is made up of 5 modules, 4 of which are specific in the bioeconomy area:

1. Agricultural Sustainability, of natural resources and climate action,
2. Digital technologies and artificial intelligence,
3. Bio-economy, circular economy and bio-based products,
4. Controlled environment agriculture.

The aim of these modules is to prepare students in the different areas relevant to the bioeconomy. The fifth module concerns Transversal Skills. The aim of this module is to prepare students both in general terms, which can be useful in many areas (Digital Skills, Green Skills, Entrepreneurial Skills) and on a personal and interpersonal level (Soft Skills).

Module 1

Aims to develop the students in the areas of Agricultural Sustainability, of natural resources and climate action (Table 1 and Table 6). This module explores various themes central to agricultural sustainability, focusing on the integration of renewable energy systems and the impact of climate change. It emphasizes sustainable practices in managing agricultural resources, including energy, water, and organic waste, to promote long-term ecological balance and resource conservation.

Module 2

Is designed to prepare students to work in the field of digital technologies and artificial intelligence, related with agriculture (Table 2 and Table 7). In pursuit of this objective, the integration of advanced precision technologies, the utilization of remote sensing capabilities, and the implementation of digital and automated solutions are crucial for propelling agricultural progress. These innovations not only enhance profitability but also promote efficient management of resources, ensuring a sustainable and productive future for the agricultural sector.

Module 3

Aims to introduce the importance of bio-economy, circular economy and bio-based products (Table 3 and Table 8). To achieve this goal, the integration of advanced precision technologies, the employment of remote sensing capabilities, and the implementation of digital and automation technologies are essential to the advancement of agriculture in terms of greater profitability and good resource management.

Module 4

Is designed to educate students on the intricacies of cultivating crops within a regulated setting (Table 4 and Table 9). The curriculum encompasses a range of techniques, from the established methods of greenhouse farming to the innovative practices of vertical agriculture, emphasizing the production of crops in greenhouses utilizing sustainable methods.

Module 5

Is dedicated to horizontal skills that students and agronomists should have when exercising the professions of Bioeconomy specialist in the Agricultural sector (Table 5 and Table 10). More specifically, based on the research conducted under WP2 and the related findings, there are additional skills that are of high importance for professionals in the agricultural sector since they enhance their professional and personal development thus facilitating the cultivation of their sustainable and green mindset. Therefore, this model includes LUs that promote knowledge, skills and competences on soft skills, green skills, digital skills and entrepreneurial skills.

Audience of the Document

The audience of the Training Material Report is a) the RELIEF project partners who will undertake the implementation of the RELIEF training courses both in HEI and VET levels, and therefore will be responsible for testing what has been developed within the framework of the RELIEF project checking whether it works or not, thus identifying any adjustments need to

be done, if necessary, b) HE and VET providers that could provide the full RELIEF training scheme or implement parts of the training courses, c) trainers, educators and professors who could use the RELIEF training material within courses related to the field of Bioeconomy.

The document derives from the Training needs Analysis carried out throughout WP2, the results of which are reflected within the “D2.1- Analysis of Training in Bioeconomy in farming sector” whilst is founded upon “D2.2 – RELIEF Curricula”.

It has a strong linkage with the “D3.2- Training and Assessment Methodology” where the training approach for delivering the courses through various methods (face-to-face, online/ asynchronous e-learning, and work-based learning) is defined and the appropriate methods and tools for monitoring the learners’ progress and assessment of the learning process are determined.

Finally, this deliverable serves as a source for the “D4.1 -E-learning courses with online learning units, gamified resources, videos” as well as the D5.1- Report on implementation of the piloting testing”.

Structure of the RELIEF training material

The RELIEF training material has been developed with the aim to reflect the RELIEF proposed learning approach which is comprised by a number of learning theories that place the learner at the center of the learning process, emphasizing their active engagement, critical thinking, and personal growth. These approaches, such as the constructivist learning theory, experiential learning, transformative learning, problem-based learning, blended learning, collaborative-group learning, and design thinking, recognize that the learner is not a passive recipient of knowledge but an active participant in constructing their understanding, exploring real-world applications, challenging assumptions, and collaborating with others. Moreover, it is anticipated that the RELIEF Training material will support the delivery of the training courses through three different methods (Face-to-face, online/ asynchronous e-learning and work-based learning).

The RELIEF Training Material consists of three parts:

1. The learning material that will be up-loaded on the e-learning platform and will serve the purpose of the asynchronous e-learning and self-directed learning.
2. The learning material that will be used in the face-to-face training or synchronous e-learning for supporting the trainers
3. The learning material that will be used in the Work Based Learning (if WBL is an option)

More specifically:

Training material for the e-learning platform

Each learning unit (LU) regardless the level of the curriculum under which is developed, includes:

- ✓ A small introduction along with the Learning outcomes predetermined for the LU.
- ✓ The theoretical information of the topic which includes text, tables, graph and infographics
- ✓ Reflection Questions that encourage the learners to think about their experience/ knowledge on a specific topic.
- ✓ Presentation of some important information under the “Did you know?” section presenting peculiarities, curiosities, tips, practical examples, good practices, worst case scenarios related to the topic
- ✓ Additional information that encourages learners to search more on the related subtopics, deepening their knowledge on the subtopics with means different that simple texts (such as articles, papers, videos, reports, etc)
- ✓ Self-assessment activities that enable the learners to test their progress on the LU that include quizzes with closed questions (6-8 questions), True/false questions, Multiple choice questions
- ✓ A conclusion about the key parts of the LU that could be either in the form of a Summary text or a Mind map, a Table or a Graph.

Training material for face-to-face training

This material constitutes part of the developed supportive material that has been developed with the aim to support the trainers during the delivery of the LU in the classroom.

More specially, this material includes structured Power Point presentations (PPTs) focused on specific topics of the LU which are enriched with practical activities that promote the interaction between the learners, their peers and the trainers thus helping them to better comprehend the topic. These practical activities include:

- ✓ Case studies
- ✓ Peer activities that concern simple exercises that learners could do with peers
- ✓ Role-playing simulations
- ✓ Group discussions

Training material for Work Based Learning

The training material for Work-based learning developed, aimed to integrate practical work experiences with classroom learning so as to bridge the gap between theory and practice. Within the framework of the RELIEF project, the supportive material developed under WBL regarded:

- ✓ Study visits to specific locations, institutions, or events that provided learners with firsthand experiences related to the topic of the LUs
- ✓ Flexible short projects that encourage learners to apply the knowledge, skills and competences acquired through the different face-to-face training and the online learning the adapted in various agricultural work settings.

And is anticipated to support the trainers during the implementation of the WBL.

The majority of the consortium members who taught the HEI courses (UAZ, MDU and Unifi) decided not to translate the ppts and the WBL, since all the students who attended these courses have a high level of English. Since these students have not had, and will not have, any problem reading the documents.

HEI Curriculum

The term HEI is also commonly used in Europe for the designation of organizations offering higher, post-secondary, tertiary, and even third-level education if required ([1](#)).

Within the framework of the RELIEF project, the HEI curriculum consists of 20 LUs at EQF level 6, each of which has a duration of 60 hours of learning and equals to 3 ECTS. Furthermore, the LUs developed are 100% aligned with the Learning Objectives identified under WP2.

The HEI curriculum is addressed to HEI/VET providers, HEI students, Agronomists and Farm Consultants with the aim to provide key knowledge and cultivate learners' skills and competences to become "Bioeconomy specialists in farming sector".

It is worth mentioning that the Training material is provided in 5 different languages, English, Greek, Italian, Portuguese and Swedish while the translation of the supportive material (Training material developed for Face-To-Face and WBL) in partner languages was not mandatory especially in some countries where the level of knowledge in English of the participants was considered to be very high.

Module	LU Title	Online Training (Hyperlink)	Supportive Material	
			Face to Face Training (F2F) (Hyperlink)	Work Based Learning (WBL) (Hyperlink)
Agricultural Sustainability of natural resources and climate action	A1 Renewable energy and its application as green agricultural energy source	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	A2 Climate change	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	A3 Water, Energy, and Food (WEF) Nexus security, Drip Irrigation, and Desalination	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	A4 Agricultural reuse of organic residuals	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		

Table 1: Learning units of Module 1 for HEI: Agricultural Sustainability, of natural resources and climate action.

Module	LU Title	Online Training (Hyperlink)	Supportive Material	
			Face to Face Training (F2F) (Hyperlink)	Work Based Learning (WBL) (Hyperlink)
Digital technologies and artificial intelligence	B1 Precision technology and Big Data	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	B2 Remote sensing in Farming	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	B3 Integration of digital technologies for effective farm management	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	B4 Automation Technologies	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		

Table 2: Learning units of Module 2 for HEI: Digital technologies and artificial intelligence.

Module	LU Title	Online Training (Hyperlink)	Supportive Material	
			Face to Face Training (F2F) (Hyperlink)	Work Based Learning (WBL) (Hyperlink)
Bioeconomy, Circular economy and bio- based products	C1 Circular Economy	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	C2 The concept of biorefinery	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	C3 Bioenergy and energy crops	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	C4 Innovation, Economics and Strategic Management in the Bioeconomy	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		

Table 3: Learning units of Module 3 for HEI: Bio-economy, Circular economy and bio-based products.

Module	LU Title	Online Training (Hyperlink)	Supportive Material	
			Face to Face Training (F2F) (Hyperlink)	Work Based Learning (WBL) (Hyperlink)
Controlled environment agriculture	D1 Introduction to controlled environmental agriculture: principles, techniques and innovations	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	D2 Advanced techniques in vertical farming: from LED lighting to plant nutrition	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	D3 Entrepreneurship in vertical farming: business models, financial planning and marketing	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	D4 Sustainable agriculture in controlled environments: Challenges, opportunities and solutions	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		

Table 4: Learning units of Module 4 for HEI: Controlled environmental agriculture.

Module	LU Title	Online Training (Hyperlink)	Supportive Material	
			Face to Face Training (F2F) (Hyperlink)	Work Based Learning (WBL) (Hyperlink)
Horizontal	E1 Soft Skills	EN version	EN version ppt and txt	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	E2 Green Skills	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	E3 Entrepreneurial skills	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		
	E4 Digital skills	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version		
		PT version		
		SE version		

Table 5: Learning units of Module 5 for HEI: Horizontal skills.

VET Curriculum

The VET curriculum consists of 20 LUs at EQF level 5, each of which has a duration of 20 hours of learning and equals to 1 ECTS. Furthermore, the LUs developed are 100% aligned with the Learning Objectives identified under WP2.

The VET curriculum is addressed to Farmers, and other related target groups such as VET students in professions related to the agricultural sector, young farmers, future farmers, employees and managers/owners in farming companies, members in farming cooperatives.

The training material at its whole is provided in 5 languages, in English and all partner languages (Greek Italian, Portuguese and Swedish).

Module	LU Title	Online Training (Hyperlink)	Supportive Material	
			Face to Face Training (F2F) (Hyperlink)	Work Based Learning (WBL) (Hyperlink)
Agricultural Sustainability of natural resources and climate action	A1 Renewable energy and its application as green agricultural energy source	EN version	EN version Txt , ppt	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version Txt , ppt	PT version
		SE version	SE version Txt , ppt	SE version
	A2 Climate change	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version
	A3 Water, Energy, and Food (WEF) Nexus security, Drip Irrigation, and Desalination	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version
	A4 Agricultural reuse of organic residuals	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version

Table 6: Learning units of Module 1 for VET: Agricultural Sustainability, of natural resources and climate action.

Module	LU Title	Online Training	Supportive Material	
			Face to Face Training (F2F)	Work Based Learning (WBL)
Digital technologies and artificial intelligence	B1 Precision technology and Big Data	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version
	B2 Remote sensing in Farming	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version
	B3 Integration of digital technologies for effective farm management	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version
	B4 Automation Technologies	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version

Table 7: Learning units of Module 2 for VET: Digital technologies and artificial intelligence.

Module	LU Title	Online Training	Supportive Material	
			Face to Face Training (F2F)	Work Based Learning (WBL)
Bioeconomy, Circular economy and bio-based products	C1 Circular Economy	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version
	C2 The concept of biorefinery	EN version	EN version Ppts and word	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version Ppts and word	PT version
		SE version	SE version Ppts and word	SE version
	C3 Bioenergy and energy crops	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version
	C4 Innovation, Economics and Strategic Management in the Bioeconomy	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version

Table 8: Learning units of Module 3 for VET: Bio-economy, Circular economy and bio-based products.

Module	LU Title	Online Training	Supportive Material	
			Face to Face Training (F2F)	Work Based Learning (WBL)
Controlled environment agriculture	D1 Introduction to controlled environmental agriculture: principles, techniques and innovations	EN version	EN version	EN version Txt , ppt
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version Txt , ppt
		SE version	SE version	SE version Txt , ppt
	D2 Advanced techniques in vertical farming: from LED lighting to plant nutrition	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version
	D3 Entrepreneurship in vertical farming: business models, financial planning and marketing	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version
	D4 Sustainable agriculture in controlled environments: Challenges, opportunities and solutions	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version

Table 9: Learning units of Module 4 for VET: Controlled environmental agriculture.

Module	LU Title	Online Training	Supportive Material	
			Face to Face Training (F2F)	Work Based Learning (WBL)
Horizontal	E1 Soft Skills	EN version	EN version Ppts and word	EN version
		GR version	GR version ppts and word	GR version
		IT version	IT version Ppts and word	IT version
		PT version	PT version Ppts and word	PT version
		SE version	SE version Ppts and word	SE version
	E2 Green Skills	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version
	E3 Entrepreneurial skills	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version
	E4 Digital skills	EN version	EN version	EN version
		GR version	GR version	GR version
		IT version	IT version	IT version
		PT version	PT version	PT version
		SE version	SE version	SE version

Table 10: Learning units of Module 5 for VET: Horizontal skills.

References

- 1 - [HEI - Teachmint Full Form, Meaning and Definition](#)



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