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Addressing the current and Future skIll needs for sustainability, digitalization and the bio-Economy in agricuLture: European skills agenDa and Strategy

D2.1: Detailed baseline of occupational profiles	
Document description	Report on the process and deliverables. Target of this task: creation of at least 10 new occupational profiles in the sectors of agriculture, food industry and forestry.
Work package title	Priorities and strategy design
Task title	Task 2.1: Analysis of skill gaps and new profiles creation
Status*	F
Partner responsible	AC3A
Author(s)	Alexandre Morin (AC3A), Francesca Sanna (UNITO), Camilla Tomao (CONFAGRI)
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F: final; D: draft; RD: revised draft

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1. Glossary

EQF: European Qualifications Framework

ESCO: European Skills, Competences and Occupations

FIS: Farm Information System

FMIS: Farm Management Information System

GHG: Greenhouse Gases

GIS: Geographic Information System

GPS: Global positioning system

ICT: Information and communications technology

KPI: Key Performance Indicator

LCA: Life cycle assessment

OP: Occupational profile

WP: Work Packages

2. Task Objectives

Based on previous activities in the project (including WP1), the objective of task 2.1 is to identify future skill and knowledge needs, the existing training in response to those needs, and to identify gaps. The task will focus on 3 main areas: Sustainability, Bioeconomy and Digitalisation. Beside the technical aspects, the soft skills will be included in this analysis (ex: social and communication skills, business and entrepreneurship skills, staff building skills, some marketing and commercial skills.)

A detailed baseline of occupational profiles and skills needed in the bio-economy, agriculture and forestry sectors will be established in cooperation with partners. This establishment of a pool of skills will follow skills definition norms in order to be compliant with the EU platform (ESCO).

3. Methodology

The first step was to create working groups with specialists in each skill category (Sustainability, Digitalisation, Bioeconomy, Forestry and Soft Skills/Business Entrepreneurship)), as in Table 1.

Table 1: List of experts for each category

Sectors	Bioeconomy	Digitalisation	Sustainability	Soft Skills / Entrepreneurship
Partners in charge	**UHOH - CEPI**	**FJ-BLT**	**SCOOP & CONFAGRI**	**CONFAGRI**
Participants	ISEKI	UNITO	CONFAGRI_PT	EFVET
	UNITO	CONFAGRI	UNITO	LLLP
	CONFAGRI	CERTH (IBO)	GAIA	INFOR
	GAIA	AERES	LVA	UNITO
	AERES	EFB	AERES	
		UHOH	AP	
		INFOR	FENACORE	
		PA	ISEKI	

These groups worked on the material (skill gaps, knowledge gaps) identified by the previous tasks of the project (WP 1 activities) with the objective to define and select the most important (missing) skills in order to create Occupational Profiles (OP) in the areas of sustainability, bioeconomy, digitalization, forestry as well as soft skills/business entrepreneurship.

The working groups decided on using the online tool MiroBoard to share the common reflections in a mind-mapping format. The content was gathered from the previous tasks in WP1 (task 1.3 -Focus Groups, task 1.4 - Bottom-up survey; task 1.5 Trends and scenarios analysis) and enhanced by the collective reflection of the Working Groups.

Based on the first exchanges during the initial project phases, the original approach was to create 10 OP divided as follows:

Table 2: initial repartition of 10 OP

Bioeconomy	Digitalisation	Sustainability	Soft Skills / Entrepreneurship
3 Food-Industry OP			1 Soft Skills / Entrepreneurship OP
3 Agriculture OP			
3 Forestry OP			

However, during the first session of the Working Groups, it was identified that the Soft Skills and Business & Entrepreneurship skills were common to all OP and necessary to all profiles, and should therefore form a Core Curriculum applied to all profiles, rather than a separate Occupational Profile.

Furthermore, considering the identified skill and knowledge gaps and sectorial requirements, it was decided to create one EQF level 5 profile on forestry, combining skills in the areas of sustainability, bioeconomy and digitalization; and three separate profiles for each area for the agri-food and the agriculture sectors respectively.

The new repartition of the OP to be created was then amended as follows:

Table 3: new repartition of 10 OP and additional content

	Area : Bioeconomy	Area : Digitalisation	Area : Sustainability
Sector: Food-industry	EQF level 5 profile	EQF level 5 profile	EQF level 5 profile
Sector : Agriculture	EQF level 5 profile	EQF level 5 profile	EQF level 5 profile
Sector : Forestry	1 EQF level 5 profile for all 3 areas		
All sectors	EQF level 4 profile on Bioeconomy	EQF level 4 profile on Digitalisation	EQF level 4 profile on Sustainability
Core Curriculum for all profiles: Soft Skills/ Business & Entrepreneurship skills			

Each Working Group attended several meetings over the course of the spring and summer 2021 to create the EQF level 5 profiles (see table 2 for EQF level 5 profiles. Dates of meetings: see table 3).

The approach for each group was:

- to use mind-mapping tools for each OP's potential content, to sort the content into the relevant profile(s) according to the table above
- to transfer the content into the Occupational Profile templates
- to classify the Content of each occupational profile into "essential skills" vs "optional skills"; and "essential knowledge" vs "optional knowledge", identifying and merging duplicate content coming from different WP1 sources. At this stage the distinction between "essential" and "optional" was not

done following ESCO methodology, although coherence with the ESCO content will be checked later on in the project.

Table 4: dates of meetings of working groups

Digitalisation	Bioeconomy	Sustainability	Forestry	Soft Skills / BE
27.04.21 - WG 1	28.04.21 - WG1	3.05.21 – WG 1		5.05.21 – WG 1
10.05.21 – WG 2	11.05.21 – WG 2	18.05.21 – WG 2		26.05.21 – WG2
28.06.21 – WG 3	25.05.21 – WG 3	27.05.21 - WG 3	05.07.21 – WG 3	
12.07.21 – WG 4	06.07.21 – WG 4	13.07.21 – WG 4		

4. Final Deliverables

The first deliverable is a set of 7 OP at EQF level 5 (see table 2). These profiles have been proof-read by the partners and are attached as Annexes to this report. These profiles are ready to be matched with ESCO criteria in order to identify existing curricula and target the further teaching materials to be created.

These profiles will also serve as a basis for task 2.2 Profiles Prioritization.

The 3 remaining profiles (EQF level 4, see table 2) will be created based on the EQF level 5 profiles, by selecting and merging content relevant for this lower EQF level.

5. Annexes

Annex 1 - EQF Level 5 Occupational Profiles: the 7 profiles first created during task 2.1 (see page 5, table 2)

Annex 2 - EQF Level 4 Occupational Profiles: the additional 3 profiles created later on during this task

Annex 3 - Basic module on Soft-skills and Entrepreneurship: a core module of soft skills that will be part of all EQF level 4 and 5 profiles

ANNEX 4 – Mind-Mapping approach for the Occupational Profiles: screen captures of the mind mapping tool used to identify the knowledge and skills gaps (see part 3 on Methodology)

ANNEX 1 – EQF Level 5 Occupational Profiles

1. Area: Digitalisation

Technician for agricultural digitalisation

Code	Later defined by ESCO
Description	The **Technician for agricultural Digitalisation** performs technical tasks related to the programming, management and supervision of industrial machines, plants and automatic systems, integrating and connecting them according to the new needs of the Smart Farm. Tasks performed usually include: - Programming, robotics and advanced industrial automation - Pushed connectivity (IOT; IIOT) - Assembly, hardware and software configuration - Testing and maintenance of individual automatic machines, intelligent plants and production lines, artificial vision systems, which make widespread use of local and remotely managed software systems. - Selection and management of production systems and the definition of maintenance policies for production systems and after-sales - Integration of different technologies to make machines, anthropomorphic and collaborative robots, virtualization tools of the production process and rapid prototyping communicate with each other.
Alternative label	Later defined by ESCO
Regulatory Framework	
Hierarchy	Later defined by ESCO
More specific professions	Technician for analysis of agricultural data agricultural drones, robotics operator and/or engineer
Essential skills	Core curriculum - Module Soft-skills and Entrepreneurship (see Annex 3) <u>Farming activities</u>: - Communication tools: peer groups for innovative farmers - Logistics management - Traceability, quality signs and labels - Weather forecast knowledge and/or tools - Digital entrepreneurship <u>Arable crops</u>: - Precision farming: remote sensing, GPS, GIS, Automated farming,

	- Pest control: Pest and disease models and recognition from sensors, imagery, etc. - Implementation of crop-specific FMIS + Implementation of a data-transfer system - Use of Field operation management systems <u>Livestock</u> - Implementation of livestock-specific FMIS + Implementation of a data-transfer system - Precision animal health system <u>Mixed farming</u> - Farmhouse platforms, local product online markets
Essential knowledge	- Knowledge about general agriculture principles (whole production chain) - General technical principles and options for digital agriculture - Legal framework for operating a farm - Legal framework when using autonomous machinery - Introduction to machinery with digitalisation tools; advantages and disadvantages of each available technology (assessment criteria) - Basic knowledge on GPS and GIS - Basic knowledge on FIS
Optional skills	- Use of robots & drones - Arable crops: practical training with specific machinery (weeding machine, combined harvester) - Livestock farming: feeding optimisation, traceability, FMIS, specific machinery (e.g. milking robot, autonomous feeding machine)
Optional knowledge	- Use of LCA tools (examples of commercial software tools) - Basic programming knowledge - Data analysis, data exchange - E-Commerce
State	
Concept URI	

Technician for food-industry digitalisation

Code	Later defined by ESCO
Description	The Technician for Food Industry digitalisation performs technical tasks to support the implementation of digital technologies according to the needs of the new Smart Factory; dealing mainly with programming, management and supervision of industrial machines, plants and automatic systems, their integration and connection. Tasks performed usually include: - -sensor programming, robotics, and advanced industrial automation - pushed connectivity (IOT, IIOT) - -assembly, hardware and software configuration, testing and maintenance of individual automatic machines, intelligent plants and production lines, artificial vision systems, which make widespread use of local and remotely managed software systems - selection and management of production systems and the definition of maintenance policies for production systems and after-sales - -integration of different technologies to make machines, anthropomorphic and collaborative robots, virtualization tools of the production process and rapid prototyping communicate with each other
Alternative label	Later defined by ESCO
Regulatory Framework	
Hierarchy	Later defined by ESCO
More specific professions	Later defined by ESCO
Essential skills	Core curriculum - Module Soft-skills and Entrepreneurship (see Annex 3) - Integration of information from FMIS - Data handling and analysis, data exchange - E-commerce and e-marketing - Logistics, warehousing, transportation - Decision Support Systems - Sourcing of raw materials and agricultural products - Circular manufacturing aspects / food Industry 4.0

Essential knowledge	- Food processing; automated food processing - Packaging, automated packaging - Quality management
Optional skills	- Big data handling and processing - Traceability/blockchain - Automated warehousing/robots - High-Tech logistics & transportation: robots, drones - Controlled environment for storage, heat/cold management - Digital entrepreneurship
Optional knowledge	- Food processing, reducing waste - Sustainable packaging - Sourcing of sustainable agricultural products
State	
Concept URI	

2. Area: Bioeconomy

Technician for agricultural bioeconomy

Code	Later defined by ESCO
Description	The **Technician for Agricultural Bioeconomy** manages and controls the production processes by identifying and coordinating procedures useful for saving resources and developing the company according to the reference territorial context. Tasks performed usually include: - Manage the operational organization, the implementation of continuous improvement procedures - Monitoring and evaluation of the results using digital methodologies and technologies - Oversight of executive activities carried out by others - Technical training in the use of methodologies, tools and information specialized in the bioeconomy - Management of production addressing areas such as investments, marketing chains, etc. - Design and Implementation of sustainability processes and products.
Alternative label	Later defined by ESCO
Regulatory Framework	
Hierarchy	Later defined by ESCO
More specific professions	Later defined by ESCO
Essential skills	Core curriculum - Module Soft-skills and Entrepreneurship (see Annex 3) - Planning and coordinating production, - Performing farming operations in line with bioeconomy principles - Production techniques for non-food products (biobased products) - Industrial crops - Crop diversification and crop rotation - Production and Management of renewable energy - Organic production techniques - Treatment and reuse of reclaimed water - Inorganic waste management practices - Agricultural valorisation of organic fertilizers - Management of slurry in livestock farms

Essential knowledge	- Bio-economy and circular economy principles - Basic environmental and climate change introduction - Biomass production - Biodegradable compostable materials - Reuse and recycling and valorisation of raw materials - Biodiversity
Optional skills	- Direct distribution and marketing skills - Controlled Environment Agriculture, horticulture, urban farming - Plant/animal breeding resilience
Optional knowledge	- Product traceability - Information & adoption about climate changes - Labelling of products/packaging - Food ethics
State	
Concept URI	

Technician for food-industry bioeconomy

Code	Later defined by ESCO
Description	The **Technician for Food industry bioeconomy** performs technical tasks to support the development of the company from a bioeconomy perspective in aspects related to production, management and business. Tasks performed usually include: - Monitoring the efficient and sustainable use of resources (including energy), - Implementation and monitoring bio-economy principles applied to food processing, sustainable packaging, waste management and valorisation, - Implementation and monitoring of continuous improvement procedures, - Identification of new marketing chains, - administrative tasks and supervision of activities carried out by others.
Alternative label	Later defined by ESCO
Regulatory Framework	Later defined by ESCO
Hierarchy	Later defined by ESCO
More specific professions	
Essential skills	Core curriculum - Module Soft-skills and Entrepreneurship (see Annex 3) - Quality management assurance control, - Food safety management, hygiene and control - Continuous improvement - Production operations and management - Traceability - Food waste reduction - Product development
Essential knowledge	- Sustainability: food ethics, water reuse, side stream valorisation (from food industry, from farm) and co-products - Bio-economy and circular economy principles, - Energy efficient production methods - Food security, labelling and Ingredients, bioeconomy regulation framework

	- Health & safety management (specific risks on top of the main curriculum) - Emerging technologies - Plant based food, bio-based products - Biomass transformation - Packaging, bio-based food packaging - Renewable energy production and use
Optional skills	- Development of new proteins and new protein fractions - Sustainable Transportation & logistics management
Optional knowledge	- Energy efficiency - Carbon sequestration and carbon balance
State	
Concept URI	

3. Area: Sustainability

Technician for Sustainable Agriculture

Code	Later defined by ESCO
Description	The **Technician for sustainable agriculture** performs technical tasks related to production, resources preservation and company development according to sustainability requirements and the local context. Tasks performed usually include: - The supervision and control of production processes - The implementation of continuous improvement procedures - Monitoring and evaluation - Identifying and coordinating procedures useful for resource preservation and developing the company according to the local context - Operational organization - The implementation of regulations of continuous improvement procedures - The monitoring and evaluation of the results using digital methodologies and technologies. the supervision of activities carried out by others - Management of production addressing areas such as investments, marketing chains, etc. - Design and Implementation of good agricultural practices, sustainability processes and products.
Alternative label	Later defined by ESCO
Regulatory Framework	
Hierarchy	Later defined by ESCO
More specific professions	Agriculture Management and Sustainability Water Management and Sustainability
Essential skills	Core curriculum - Module Soft-skills and Entrepreneurship (see Annex 3) - Soil health management - Crop rotation and new crop techniques - Water/groundwater management - Adaptation and mitigation to climate change - Efficient use of resources, waste prevention and valorisation of by-products

	- Agro environmental practices - Low emission spreading/spraying equipment and practices - Integrated pest and disease management - Sustainable feed sources and animal nutrition (sustainable sourcing, reducing emissions) - Energy management: energy efficiency and renewable energy
Essential knowledge	- Good agricultural practices: crop diversification, conservation farming, agroforestry, biodiversity, crop protection, grassland management - Circular economy: Traceability and LCA aspects - Environmental management aspects, GHGs emission reduction; climate change - Legislation regarding the issue of water, protected areas, sustainable land, use measures and regulatory framework and environmental licensing - Smart farming introductory aspects - Soil nutrients and fertility - Work/life Balance
Optional skills	- Minerals and emission accounting - Zero waste management practices - Corporate social responsibility - Renewable energy production: generation, storage and use of renewable energies - Precision animal health - Slurry management and valorisation - Ecommerce and short supply chains
Optional knowledge	- Indoor vertical farming (horticulture) - Animal welfare, well-being and health - New grasslands such as mixed-species swards - Weather forecast knowledge and/or tools - Generational renewal
State	
Concept URI	

Technician for Sustainable Food Industry

Code	Later defined by ESCO
Description	The **Technician for Sustainable Food industry** performs technical tasks to support the implementation and supervision of sustainability requirements in the production, management and business activities of a food company. These tasks usually include: - Purchase of sustainable raw materials, monitoring the efficient use or resources, - Implementation and monitoring of sustainable processing technologies, - Sustainable product development and packaging, waste management, - Implementation and monitoring of continuous improvement procedures, - Sustainable marketing chains, administrative tasks and supervision of activities carried out by others.
Alternative label	Later defined by ESCO
Regulatory Framework	Later defined by ESCO
Hierarchy	Later defined by ESCO
More specific professions	Technician for agri-food industry and digitalization
Essential skills	Core curriculum - Module Soft-skills and Entrepreneurship (see Annex 3) <u>Efficient use of resources</u> - water treatment and reuse - waste prevention and valorisation of by-products - energy efficiency (generation, storage and use of renewable energies) <u>Sustainable Packaging</u> - sourcing and efficient use of materials - reusability/recyclability - eco-design - life cycle <u>Manufacturing technologies</u> - energetic optimisation of production plants - optimisation of manufacturing processes - industry 4.0 - lean manufacturing - preventive maintenance

	- Sustainable origin of raw material (sustainable sourcing / efficient use of resources)
Essential knowledge	Sustainability: - Climate change - GHGs - water management Circular economy: - Circular manufacturing / Industry 4.0 aspects - Traceability & food Production, food waste reduction - Improved agri-food production (energetic optimisation of production plants - optimisation of manufacturing processes), logistics, sustainable metrics (KPIs), labelling - Consumer trends / demands - General legal framework for industry, environmental Licensing
Optional skills	- LCA digital tools - Environmental Management Systems
Optional knowledge	- Corporate social responsibility - Sustainable value chains
State	
Concept URI	

4. Area: Forestry

Technician for sustainability, digitalisation and bioeconomy in forestry

Code	Later defined by ESCO
Description	The Technician for sustainability, digitalization and bioeconomy in Forestry performs technical tasks to support the implementation and supervision of sustainability and bioeconomy requirements and to implement digital technologies in all aspects related to the production and management of a forestry related business. These tasks usually include (in a forestry related business): - Monitoring and improving the efficient and sustainable use of resources (including energy) and their circularity - Implementing and monitoring sustainable processing technologies and the transformation of primary products - Implementing and monitoring of the application of bio-economy principles to all production processes, including sustainable packaging, waste management and valorisation - Implementing and improving digitization- and digital techniques, methodologies and procedures, including the use of drones and robots for sustainable forestry - Managing operations, including sustainable product development, raw materials purchasing, identification of new marketing chains etc., with particular attention to the sustainability of processes and products and the principles of circular economy
Alternative label	Later defined by ESCO
Regulatory Framework	
Hierarchy	Later defined by ESCO
More specific professions	Later Defined by ESCO
Essential skills	Core curriculum - Module Soft-skills and Entrepreneurship (see Annex 3) Sustainable and multifunctional forest management: - Ecosystem services - Biodiversity - Prevention and management of natural disturbances - Mitigation to climate change - Water management - Management of natural resources Efficient use of resources and logistics: - Production and extraction of products of forestry - By-products and co-products valorisation

	- Soil nutrient health management - Reforestation, afforestation & restoration of forest ecosystems - New markets for bio-based products/construction/biomaterials - Protection against fires/fire detention - Forest disease control and prevention - Forest equipment/machinery and maintenance
Essential knowledge	- Knowledge of general forestry principles - Knowledge of technical principles for digital forestry, forestry smart systems and technologies introductory aspects, - Basic GIS knowledge, precision forestry knowledge - Basic forestry legislation (national and EU) - Process operations - Weather forecast knowledge and/or tools - Wood technology - Renewable energy - Sustainable forest management practices and planning - Climate change-resilient and stress-tolerant forests - Biomass production and transformation - Biobased products and ecosystem services, re-use, recycling and valorisation of raw materials, by-products and waste, nutrients circulation vs nutrients removal - Knowledge of Forest Management Information Systems
Optional skills	- ICT: participation in peer groups / groups of same job area - Implementation of Forest Management Information Systems - Use of robots/drones - Wood processing, heat generation & services - Practical training with specific machinery
Optional knowledge	- European environmental legislation/regulation - Environmental policies, regulation, subsidy and support programmes - LCA aspects - New technologies in pulp and paper manufacturing, - Knowledge of circular economy, application to circular economy and recycling in the pulp and paper industry - Residues and industrial side new technologies in pulp and paper manufacturing - Use data analytics - Knowledge of Decision Support Systems - Urban green spaces/forests
State	
Concept URI	

ANNEX 2 – EQF Level 4 Occupational Profiles

Operator for Digitalisation in agriculture, food industry and forestry

Code	Later defined by ESCO
Description	The **Operator for Digitalisation in agriculture, food industry and forestry** operates at executive level in the field of sustainable agricultural, forestry, or agri-food production, focusing at maintaining digitized processes or digitalisation of sustainable production processes. The operator applies relevant methodologies, software and hardware tools and information to collaborate in the production, management and business activities of agricultural, forestry or agri-food companies. He/she operates autonomously and responsibly within the limits as provided by the procedures and methods of its operation. Tasks performed usually include: - Carrying out applicable techniques, methodologies and procedures to run and improve digitized production processes within the field of sustainable production in agriculture, food industry and forestry sectors - Using drones and robots in different activities of the agriculture -, forestry -, and food industry. - Analysing and handling data. - Providing support in the different phases of the agriculture, forestry and agri-food production processes, using digitized machines and digital tools geared at processing cycles with particular regard to sustainable and quality processes.
Alternative label	Later defined by ESCO
Regulatory Framework	
Hierarchy	Later defined by ESCO
More specific professions	Later Defined by ESCO
Essential skills	From the core curriculum (Module Soft-skills and Entrepreneurship - See Annex 3): - Practical training with job-specific machinery/equipment and their maintenance - Use of robots/drones - Data handling and analysis, data exchange - Traceability - Weather forecast knowledge and tools

Essential knowledge	- Knowledge of technical principles for digital agriculture, industry and forestry, smart systems and technologies introductory aspects; - Basic remote sensing, GPS, GIS knowledge - Knowledge of Management Information Systems - Knowledge about the forestry and agrifood production chain - Legal framework when using autonomous machinery - Industry 4.0 - Circular manufacturing aspects
Optional skills	- ICT: participation in peer groups / groups of same job area - E-commerce and e-marketing - Controlled environment for storage, heat/cold management
Optional knowledge	- Knowledge of Decision Support Systems - Digital entrepreneurship
State	
Concept URI	

Operator for Bioeconomy in agriculture, food industry and forestry

Code	Later defined by ESCO
Description	The **Operator for Bioeconomy in agriculture, food industry and forestry** operates at executive level in the field of agricultural -, forestry -, or agri-food production, focusing at implementation of bio- and circular economy principles. The operator applies relevant methodologies, tools and information to collaborate in the production, management and business activities of companies active in bio-economy and /or circular economy. He/she operates autonomously and responsibly within the limits as provided by the procedures and methods of its operation. Tasks performed usually include: - Carrying out applicable techniques, methodologies and procedures to run and improve a production system based on the circular economy principles. - Carrying out fundamental operations for sustainable (e.g. circular) use of resources and transformation of primary products, within the production processes of agricultural, forestry, or agri-food sectors. - Providing support in the different phases of the agriculture, forestry and agri-food production processes, using machines and digital tools geared at processing cycles with particular regard to sustainable and quality processes.
Alternative label	Later defined by ESCO
Regulatory Framework	
Hierarchy	Later defined by ESCO
More specific professions	Later Defined by ESCO
Essential skills	From the core curriculum (Module Soft-skills and Entrepreneurship - See Annex 3): - Management of natural resources, - Biomass production and transformation - Planning and coordinating production - Traceability - Efficient use of resources and logistics - Production, management of renewable energy and its use, - By-products and co-products valorisation

Essential knowledge	- Bio-economy and circular economy principles - Biobased products and ecosystem services, re-use, recycling, nutrients circulation vs nutrients removal - Food waste reduction - Energy efficient production methods - Knowledge about the forestry and agri-food production chain
Optional skills	- Transportation & logistics implementation management - Application of circular economy and recycling practices
Optional knowledge	- Quality certification - New markets for bio-based products/construction/biomaterials
State	
Concept URI	

Operator for Sustainability in agriculture, food industry and forestry

Code	Later defined by ESCO
Description	The **Operator for Sustainability in agriculture, food industry and forestry** intervenes at the execution level. The operator applies basic methodologies, tools and information to collaborate in the sustainable production, management and business activities of the company. He/she operates autonomously and responsibly within the limits as provided by the procedures and methods of its operation. Tasks performed usually include: - Carrying out applicable techniques, methodologies and procedures resulting in protection of the environment and biodiversity within the agricultural, forestry and food industry production processes. - Application of practices and procedures to ensure sustainability (e.g. sustainable use of resources, reduced emissions, human rights) in the agricultural, forestry and food industry sectors. - Taking responsibility in the production processes and management systems to ensure the sustainability of the production operations, in the agricultural, forestry and food industry sectors. - Providing support in the different phases of the agriculture, forestry and agri-food production processes, using machines and digital tools geared at processing cycles with particular regard to sustainable and quality processes.
Alternative label	Later defined by ESCO
Regulatory Framework	
Hierarchy	Later defined by ESCO
More specific professions	Later Defined by ESCO
Essential skills	From the core curriculum (Module Soft-skills and Entrepreneurship - See Annex 3) - Sustainable and multifunctional agriculture and forest management - Ecosystem services - Biodiversity, Prevention and management of natural disturbances, adaptation and mitigation to climate change - Water management, management of natural resources - Soil health management - Traceability & food Production; food waste reduction - Animal welfare

Essential knowledge	- Renewable energy - Sustainable forest and agriculture management practices and planning; - Environmental management aspects, GHGs' emissions reduction, climate change - Knowledge about the forestry and agri-food production chain - Standards and regulations
Optional skills	- Crop protection, grassland management - Weather forecast knowledge and/or tools
Optional knowledge	- European environmental legislation/regulation, policies, subsidy and support programmes - Good agricultural practices: Crop diversification; conservation farming; agroforestry; - Generational renewal - Sustainable Value Chains
State	
Concept URI	

ANNEX 3 – Basic module on Soft-skills and Entrepreneurship

Units	Learning outcomes	ESCO TSC framework correspondence
Basic knowledge	1. Definitions (soft skills, food industry, sustainability, bioeconomy)	1. ID6: Life Skills and competences a. ID6.6 Applying general knowledge i. ID6.6.1 Apply Knowledge of Science Technology and Engineering ii. ID6.6.2 Apply knowledge of Social Science and Humanities
	2. Job safety	2. ID4: Social and communication skills and competences a. ID4.5 Following ethical code of conduct i. ID4.5.1 Comply with regulations ID6: Life Skills and competences b. ID6.1 Applying health related skills and competences i. ID 6.1.3 Maintain psychological wellbeing ii. ID 6.1.4 Demonstrate awareness of risks to health iii. ID 6.1.7 Protect the health of others ID5: Physical and manual skills and competences c. ID5.1 Manipulating and controlling objects and equipment i. ID5.1.2 Use equipment, tools or technology with precision d. ID5.2 Responding to physical changes or hazards i. ID5.2.1 Adjust to physical demands ii. ID5.2.2 Reach quickly to physical changes or hazards
	3. Digital learning/tools	3. ID1: Core skills and competences a. ID1.3 Working with digital devices and applications i. ID1.3.1 Operate digital hardware ii. ID1.3.2 Conduct web searches iii. ID1.3.3 Use communication and collaboration software iv. ID1.3.4 Create and edit digital content v. ID1.3.6 Manage digital identity vi. ID1.3.7 Apply digital security measures
	4. Basics of economic and financial issues	4. ID6: Life Skills and competences a. ID6.6 Applying general knowledge i. ID6.6.2 Apply knowledge of Social Science and Humanities

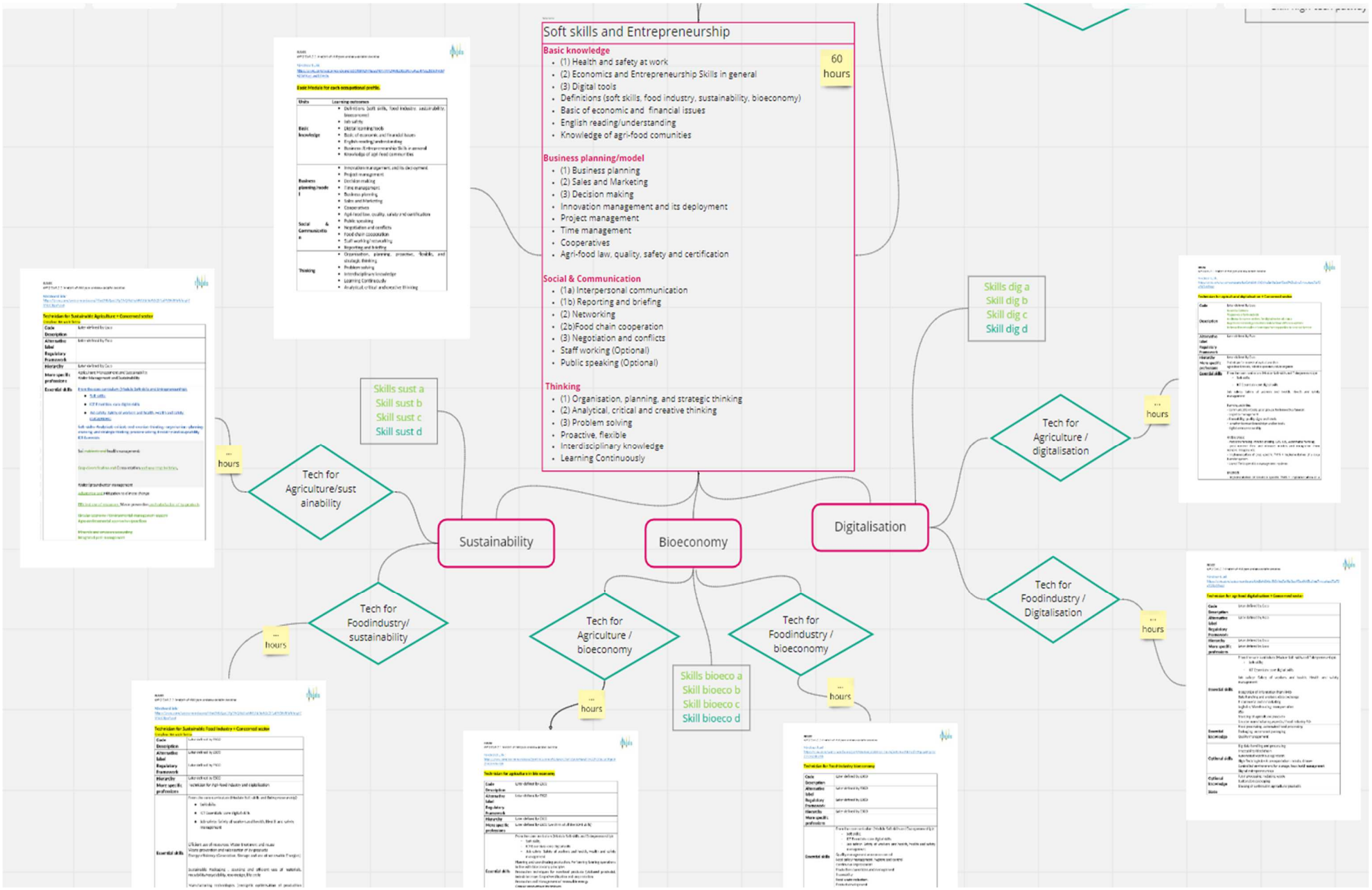
	5. English reading/understanding	5. ID1: Core skills and competences a. ID1.1 Mastering languages
	6. Business-/Entrepreneurship skills in general	6. ID6: Life Skills and competences a. ID6.5 Applying financial and entrepreneurial skills and competences i. ID6.5.1 Manage financial and material resources ii. ID6.5.2 Demonstrate entrepreneurship ID3: Self-management skills and competences (These skills can also be valuable here)
	7. Knowledge of agri-food communities	7. ID6: Life Skills and competences a. ID6.6 Applying general knowledge i. ID6.6.1 Apply Knowledge of Science Technology and Engineering
Business planning/ models	8. Innovation management and its deployment	8. ID2 Thinking skills and competences a. ID2.4 Thinking creatively and innovatively i. ID2.4.2 Thinking innovatively ID3 Self-management skills and competences and ID4 Social and communication skills and competences cluster can also be valuable here.
	9. Project management	9. ID2 Thinking skills and competences ID3 Self-management skills and competences ID4 Social and communication skills and competences
	10. Decision making	10. ID3 Self-management skills and competences a. ID3.2 Taking a proactive approach i. ID3.2.4 Make decisions
	11. Time management	11. ID3 Self-management skills and competences a. ID3.1 Working efficiently i. ID3.1.2 Manage time
	12. Business planning	12. ID6: Life Skills and competences a. ID6.5 Applying financial and entrepreneurial skills and competences i. ID6.5.1 Manage financial and material resources ii. ID6.5.2 Demonstrate entrepreneurship ID2: Thinking skills and competences a. ID2.2 Planning and organising i. ID2.2.1 Plan

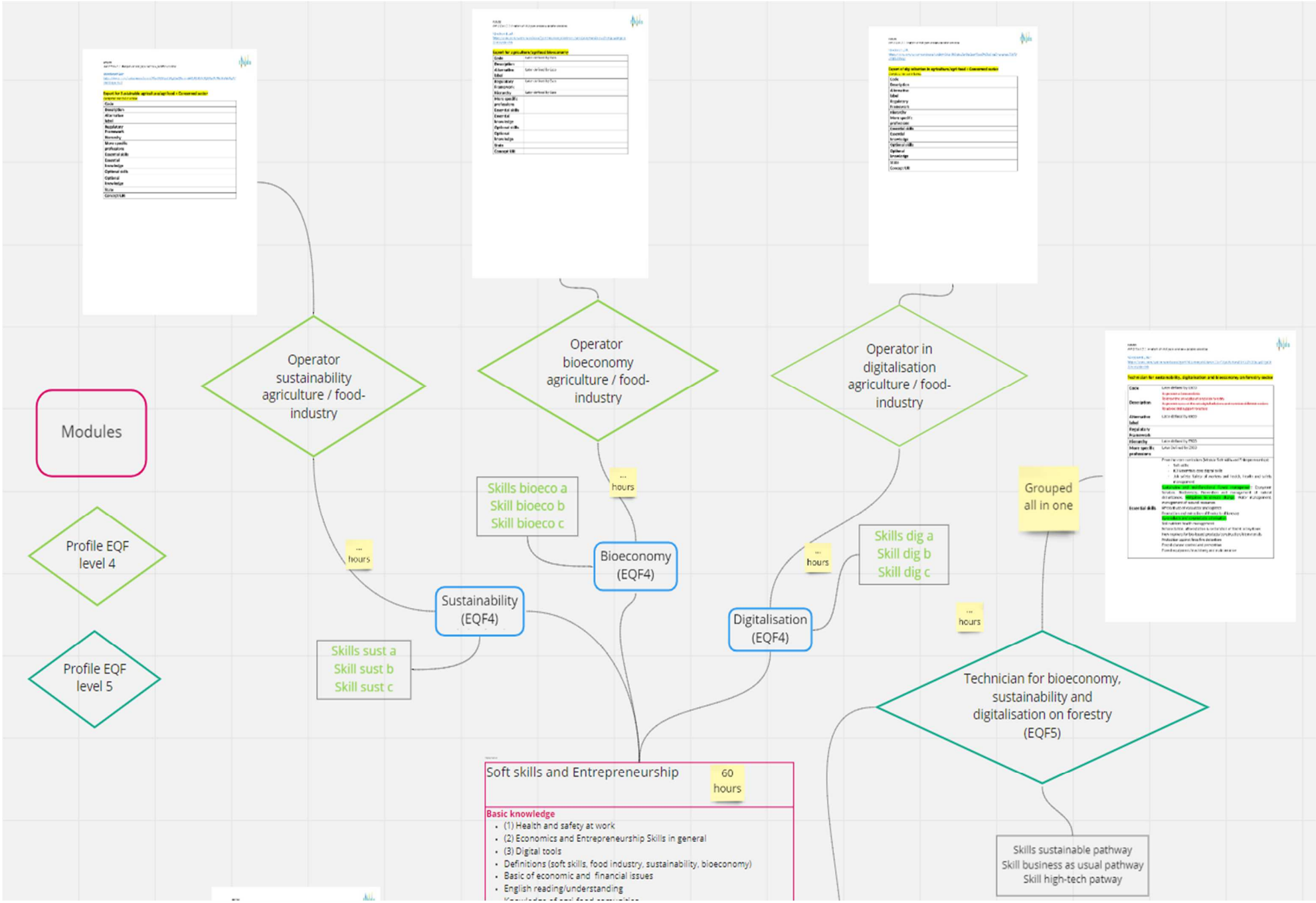
		ii. ID2.2.2 Organise information, objects and resources
	13. Sales and marketing	13. ID6: Life Skills and competences a. ID6.5 Applying financial and entrepreneurial skills and competences i. ID6.5.2 Demonstrate entrepreneurship
	14. Cooperatives	14. ID6: Life Skills and competences a. ID6.6 Applying general knowledge i. ID6.6.1 Apply Knowledge of Science Technology and Engineering ii. ID6.6.2 Apply knowledge of Social Science and Humanities
	15. Agri-food law, quality, safety and certification	15. ID6: Life Skills and competences a. ID6.6 Applying general knowledge i. ID6.6.1 Apply Knowledge of Science Technology and Engineering ii. ID6.6.2 Apply knowledge of Social Science and Humanities ID4: Social and communication skills and competences e. ID4.5 Following ethical code of conduct i. ID4.5.1 Comply with regulations
Social skills & communication	16. Public speaking	16. ID4 Social and Communication skills and competences a. ID4.1 Communicating i. ID4.1.2 Address an audience
	17. Negotiation and conflicts	17. ID4 Social and Communication skills and competences a. ID4.1 Communicating i. ID4.1.5 Negotiate ii. ID4.1.6 Resolve conflict
	18. Food chain cooperation	18. ID4 Social and Communication skills and competences a. ID4.1 Communicating i. ID4.1.3 Promote ideas, products or services ii. ID4.1.4 Moderate discussions b. ID4.2 Supporting others i. ID4.2.1 Show empathy ii. ID4.2.2 Ensure customer orientation iii. ID4.2.3 Advise others iv. ID4.2.4 Instruct others c. ID4.3 collaborating in teams and networks i. ID4.3.1 Work in teams ii. ID4.3.2 Build and maintain networks

		iii. ID4.3.3 Demonstrate intercultural competence
	19. Staff working/networking	19. ID4 Social and Communication skills and competences a. ID4.1 Communicating i. ID4.1.3 Promote ideas, products or services b. ID4.3 Collaborating in teams and networks i. ID4.3.1 Work in teams ii. ID4.3.2 Build and maintain networks iii. ID4.3.3 Demonstrate intercultural competence
	20. Reporting and briefing	20. ID4 Social and Communication skills and competences a. ID4.1 Communicating i. ID4.1.1 Report
Thinking	21. Organisation, planning, proactive, flexible, and strategic thinking	21. Organisation and planning ID2 Thinking skills and competences a. ID2.2 Planning and organising i. ID2.2.1 Plan ii. ID2.2.2 Organise information, objects and resources Proactive and flexible ID3 Self-management skills and competences b. ID3.2 Taking a proactive approach i. ID3.2.2 Show determination ii. ID3.2.3 Show initiative iii. ID3.2.4 Manage personal progression c. ID3.4 Demonstrate willingness to learn i. ID3.4.1 Keep an open mind ii. ID3.4.3 Adapt to change Strategic Thinking ID2 Thinking skills and competences a. ID2.1 Processing information b. ID2.3 Dealing with problems c. ID2.4 Thinking creatively and innovatively
	22. Problem solving	22. ID2 Thinking skills and competences a. ID2.3 Dealing with problems i. ID2.3.1 Identify problems ii. ID2.3.2 Solve problems

	23. Interdisciplinary knowledge	23. ID2 Thinking skills and competences a. ID2.1 Processing information, ideas and concepts i. ID2.1.3 Thinking holistically ID6: Life Skills and competences b. ID6.6 Applying general knowledge i. ID6.6.1 Apply Knowledge of Science Technology and Engineering ii. ID6.6.2 Apply knowledge of Social Science and Humanities iii. ID6.6.3 Apply knowledge of Philosophy, Ethics and Religion
	24. Continuous learning	24. ID3 Self-management skills and competences a. ID3.4 Demonstrating willingness to learn i. ID3.4.5 Demonstrate willingness to learn
	25. Analytical, critical and creative thinking	25. ID2 Thinking skills and competences a. ID2.1 Processing information, ideas and concepts i. ID2.1.1 Critically evaluate information and its sources ii. ID2.1.2 Think analytically b. ID2.4 Thinking creatively and innovatively i. ID2.4.1 Thinking creatively

ANNEX 4 – Mind-Mapping approach for the Occupational Profiles




Modules
Profile EQF level 4
Profile EQF level 5
Operator sustainability agriculture / food-industry
Operator bioeconomy agriculture / food-industry
Operator in digitalisation agriculture / food-industry
Grouped all in one
... hours
Skills bioeco a
Skill bioeco b
Skill bioeco c
Bioeconomy (EQF4)
Skills dig a
Skill dig b
Skill dig c
Digitalisation (EQF4)
Skills sust a
Skill sust b
Skill sust c
Sustainability (EQF4)
Technician for bioeconomy, sustainability and digitalisation on forestry (EQF5)
Skills sustainable pathway
Skill business as usual pathway
Skill high-tech patway
Soft skills and Entrepreneurship
60 hours
Basic knowledge
(1) Health and safety at work
(2) Economics and Entrepreneurship Skills in general
(3) Digital tools
Definitions (soft skills, food industry, sustainability, bioeconomy)
Basic of economic and financial issues
English reading/understanding