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The assessment of the education needs and gaps for the sustainable development of the EU peripheral rural areas

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Intellectual Output 1 “The assessment of the **education needs** and **gaps** for
the sustainable development of the EU peripheral rural areas”

FINAL REPORT

29/04/2021

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1. INTRODUCTION

Peripheral rural areas have been largely studied in the last decades due to their contributions to biodiversity preservation in the EU, despite the fact that there is no agreed common EU definition for them (Jonard et al. 2009; Féret et al., 2020). Currently, the OECD typology has more statistical importance and not real public policy implications. The OECD typology is mainly based on population densities and it is highly sensitive to the size of the geographic units and the classification thresholds. There were some attempts to improve the OECD typology using peripherality and a land cover index such as to define peripheral rural areas (Jonard et al. 2009). In that approach a peripheral rural area is located “45 minutes’ travel time to reach an urban centre with at least 50 000 inhabitants” and it is “an open space commune if at least 75% of its area is covered by forest, agricultural or natural areas”.

Nevertheless, these definitions remain too broad because they do not integrate the physical natural constraints and limitations that farmers and territories must face in some specific areas like mountains, other areas facing natural or other specific constraints or protected areas like natural parks or Natura 2000 sites. These areas have specific particularities in terms of farming practices and activities that support the conservation of the last biodiversity rich spaces in Europe. Some of them are recognised as being High Nature Value (HNV) areas supported under the second CAP pillar by agri-environment measures. Usually, such areas also achieve the geographical and land cover limits established above. But what is important from the educational perspective, is that graduates and stakeholders working in those areas (mountain, HNVf, natural parks or Natura 2000 sites) must deal with recognised problems (intensification or abandonment) that alter biodiversity. For these reasons, in the present study, a region **was considered to be a peripheral rural area** if it faces structural weakness due to the agri-environmental constraints created by mountains, HNV farming practices, natural park or Natura 2000 sites.

The intellectual output 1 (IO1) is the starting point of the Erasmus+ project RUR’UP on “Innovative education for sustainable development in peripheral rural areas”. It summarises the findings of two tasks implemented between October 2020 and March 2021 in 7 EU Member States (Figure 1).

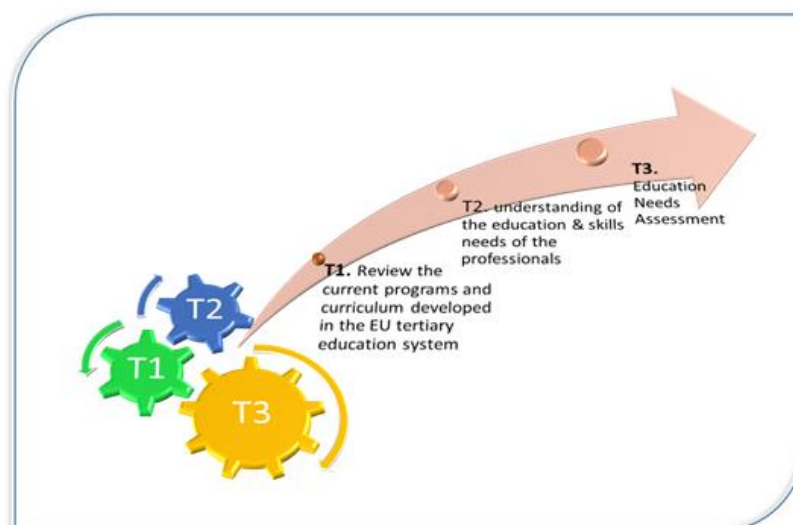


Figure 1. IO1 interconnection

These were:

Task 1.1. Review the current programs and curricula developed in the EU tertiary education systems for the sustainable development of the peripheral rural areas.

1. Objectives:

1. Assess the content of the potential programs in Bulgaria, Croatia, Greece, Finland, France, Ireland, and Romania (curriculum);
2. Identify the tools used in the educational programs/curricula emphasizing any blended learning approaches, transnational exchanges initiatives and direct practical training provision by practitioners;
3. Provided skills and the number and targeted students group.

Task 1.2. Expand the understanding of the education and skills needs of the professionals activating in the peripheral rural areas (farmers, advisory, small industry, NGOs, public sector, etc.)

2. METHODOLOGY

2.1. Review the content of the tertiary education programs

RUR'UP partners used structured internet searches to locate web-based information about **bachelors' and masters' programs** developed in each partner Member State (Bulgaria, Croatia, Greece, Finland, France, Ireland, and Romania) that potentially target the sustainability of peripheral rural areas. Official governmental lists providing the Higher Education Institutions (HEI) accredited to function in each Member State (eg. Romanian Ministry of Education & Research <https://www.edu.ro/institutii-invataman-t-superior>) were used. From such lists, the institutions that potentially target the peripheral rural areas and those that target related rural programs and curricula were selected. These had to **provide education in disciplines relevant to the four High Nature Value (HNV) innovation types - regulatory; technical; social; market - identified in the HNV-Link project (<http://www.hnmlink.eu/>) as important for the sustainability of such areas.** The disciplines were life sciences; agricultural/ agronomic sciences; food sciences; environmental sciences; economic sciences; social & political sciences.

The official websites of the institutions previously identified were reviewed to spot the potential bachelors' & masters' programs that currently address the challenges of the peripheral rural areas. The review investigated two main challenges established by the United Nations as Key Sustainable Development Goals (<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>) using common definitions:

1. **Decent work and economic growth:** graduates learn to improve economic resilience of farm and territory through diversification, technological upgrading and innovation, focusing on high value added and labour-intensive products and sustainable tourism based on local culture and products;
2. **Life on Land:** graduates have classes about sustainable use of resources and halt the biodiversity losses;

The review also used common definitions in identifying the role of the peripheral rural areas in the HEI catchment area and in the identification of the academic degree's levels:

1. **Definition of the catchment area:** the geographical area from which an institution (University or High Education Institution) attracts a population that uses its services. If there

are peripheral rural agricultural areas within 50 km of an institution (peripheral rural agricultural area = mountain, HNVf area, natural park or Natura 2000 site) it is considered that the institution has peripheral rural areas in its catchment area.

2. **Academic degree:** there are important differences between the EU national education systems. To have common grounds of comparison, it was assessed the number of years after the baccalaureate. Eg: Bachelors' -(BAC +3); Masters' - MSc (BAC +5).

The review also aims to identify specific skills using common definitions developed from the Korn Ferry (2017) Competencies development guide:

1. **Self-direction:** graduates solve **case-studies or projects** where they manage goals and time and go beyond basic curriculum requirements such as to explore and to expand their own learning;
2. **Organization:** graduates learn how people and organisations function in agricultural rural areas, focusing mostly on peripheral areas. They have multi-disciplinary knowledge in farm and food technologies, socio-economy and environment.
3. **Co-operation:** build partnerships and work collaboratively with others to meet shared objectives. Graduates work in **group case-studies or projects** that involve **multiple stakeholders** (colleagues; educators; industry partners). There are **transnational exchange initiatives** that will be reported in the review process.
4. **Negotiation:** Handling conflict situations effectively, facilitating consensus between parties. Graduates learn to manage conflict by having conflict and negotiation management courses.
5. **IT&C:** graduates learn Information and Communication Technologie (IT&C) knowledge adapted to the new farming technologies and innovations.
6. **Project management:** graduates learn project management and study entrepreneurial initiatives in order to be able to generate self-sufficient incomes, develop local high-value products or households' diversification in an environmental friendly approach.
7. **Practical knowledge:** graduates solve real-life problems and **receive direct practical training from practitioners;**
8. **Teaching:** graduates develop teaching and guidance skills appropriate for advisory and training activities in the peripheral rural areas. They use **blended learning techniques** which combine online educational materials and opportunities for interaction with traditional place-based classroom methods.
9. **Legislation:** ability to apply legislation changes in environmental requirements, farm management and market regulations, etc.
10. **Acting in a multicultural environment:** ability to interact effectively with people from different cultures and to successfully manage intercultural situations. Graduate courses include international exchange programs dedicated to students; they also feature lectures with teachers coming from abroad; it is a program taught in an international language that attracts students from different countries.

Reporting was done in an on-line shared document using a common reporting guide.

2.2. Methodology used for better understanding the needs of professionals from peripheral rural areas

RUR'UP project used focus groups or/and surveys to expand the understanding of the educational and skills needs of the practitioners. Primarily these targeted the practical ecosystem previously developed at the local level during the course of the HNV-Link H2020 thematic network, such as farmers' associations, local action groups, AgroClusters, advisory services, educators, trainers' providers, etc. It investigated the needs in several cross-education themes: 1. Social and institutional innovation skills; 2. Regulations and policy needs; 3. Products and markets; 4. Farming practices and management; 5. Soft skills; and, 6. Blended learning approaches making use of the IT&C tools.

2.2.1. Focus-groups technique

The focus groups (FG) research is a qualitative technique that aims at engaging discussions with a group of different stakeholders around a topic of interest. Such meetings can involve between 5 and 12 different stakeholders that are not necessarily a representative sample for a specific population (Krueger and Casey, 2014). Bigger groups are criticised because they have the tendency to fragment. The discussions should not be longer than two hours. To implement a focus group such as to expand the understanding about the education and skills needs of the professionals active in the peripheral rural areas, all local teams followed a common protocol (Appendix 1).

2.2.2. Survey methodology

The partners that could not organise focus-groups due to the SARS-COV-2 lockdown sent an on-line survey to at least 11 and up to 20 stakeholders coming from or working in peripheral rural areas (Appendix 2). These came from actor groups of: 1. Farmers and small industry; 2. Local action groups or AgroClusters & farmers' associations representatives; 3. Advisory services, educators, or training providers. 4. Employed or residents in peripheral rural areas; 5. NGO representatives; and, 6. Governmental bodies.

3. RESULTS

3.1. Review the current programs and curricula developed in the EU tertiary education system for the sustainable development of the peripheral rural areas (PRA)

There were identified an important number of HEI in each partner Member State with peripheral rural areas in their catchment territory (Table 1).

Table 1. Descriptive statistics

	Bulgaria	Croatia	Greece	Finland	France	Ireland	Romania
Number of HEI	7	13	11	2	60	17	14
Number of programs	14	24	34	6	150	67	79
bachelor	12	16	7	2	78	39	43
master	2	8	27	4	72	28	36
Programs targeting peripheral areas	0	14	1	0	18	5	12
bachelor	0	9	0	0	5	5	5
master	0	5	1	0	13	0	7

Although there are an important number of bachelor and master programs in the institutions that potentially target peripheral rural areas, only four member states (Croatia, France, Ireland, and Romania) reported the existence of educational programs devoted to the topics of peripheral rural areas.

Table 2. Examples of learning activities targeting PRA

	Bulgaria	Croatia	Greece	Finland
Number of programs	14	24	34	0
Programs with topics targeting PAA (%)	3	24	2	0
Topics	Governance of the territory and development Protected Areas Management	Hunting development Endangered habitats of the Republic of Croatia Management of protected areas Responsible tourism	Spatial planning and development of mountain and disadvantaged areas Monitoring of mountain environment Spatial economic, social, legal dimensions of the development and the environment of the mountain areas Introduction to the Environment and Society of Mountainous Areas Environmental Economics: Applications in Mountain Development Issues Environmental Management with ecosystemic approach and emphasis in mountainous areas Identity and development prospects of mountain areas	No specific topic

The number of learning activities and the European Credit Transfer and Accumulation System (ECTS) dedicated to the peripheral rural areas in the overall educational programs are marginal (below 2 %). They mostly cover subjects related to mountain areas and to a lesser extent to other peripheral rural areas like Natura 2000 or natural parks. High nature value farming is only partially covered mostly in terms of technical knowledge related to the management of natural meadows and pastures. The other areas of sustainability needs like socio-economic and environment are mostly missing from the current curriculum (Table 2).

Table 2. Examples of learning activities targeting PRA (continued)

	France	Ireland	Romania
Number of programs	150	67	79
Programs with topics targeting PRA	26	5	12
Topics	Mountains as challenging areas Human-environment interactions in mountains	Applied Ecology and Environmental Management; sections	Protection of mountain ecosystems Protected natural areas

	Territorial management and local development Governance of mountain areas Risks and environment sustainable management Local development and territorial strategies Biodiversity: threats and conservation Agricultural management of natural and rural areas Short value chains and environmental certifications Ecological management of agrosystems etc	on HNV and management semi-natural veg; AECM design; Natura 2000 Agricultural environmental science module; section on HNV and Upland management Practical field course in Burren; module end issues and policy including HNV	Agricultural politics specific to the mountain area Agricultural systems in the mountain area Management of areas with high nature value farming Monitoring and administration of nature 2000 sites Montanology and mountain tourism
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3.1.1. Programs and curriculum developments to meet the United Nations Sustainable Development Goals

The two United Nations Sustainable Development goals under investigation **SDG8 – Decent work and economic growth** and **SDG 15 - Life of land** are present only marginally in the current curriculum (below 1% from the total ECTS and number of hours). The lectures covered mostly general aspects relating to farming and non-agricultural activities (Figure 2, 3 and 4). There are some specific lectures dedicated to mountain areas that cover both SDGs. HNV farming is almost missing from all partner Member States.



Figure 2. Examples of learning activities targeting SDG8 – Decent work and economic growth

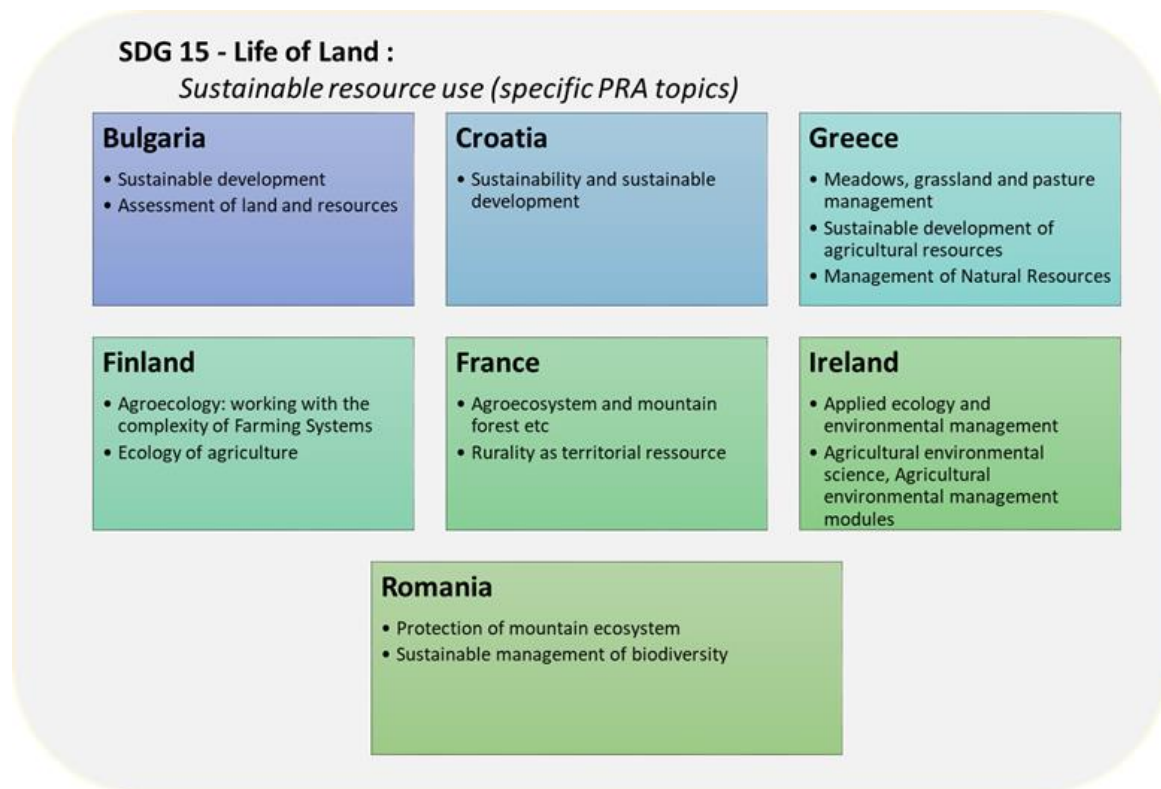


Figure 3. Examples of learning activities targeting SDG15 – Life on land (resource use)

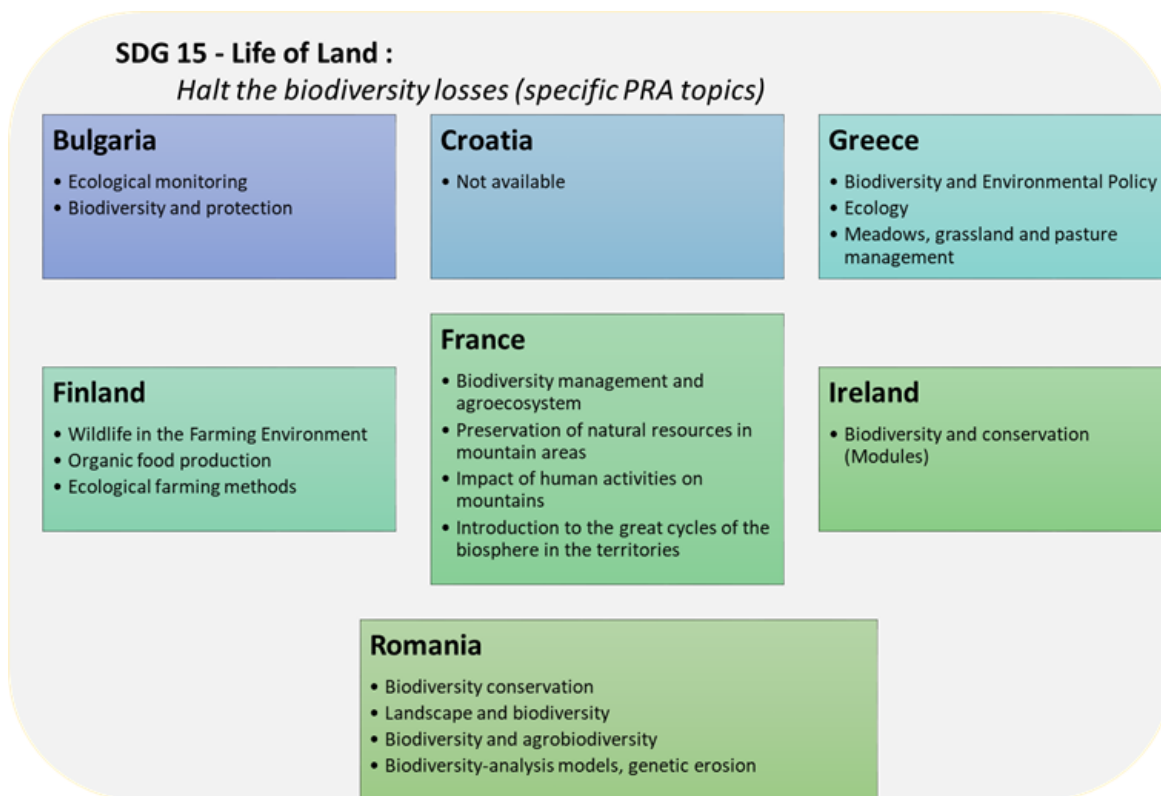


Figure 4. Examples of learning activities targeting SDG15 – Life on land (halt the biodiversity losses)

3.1.2. Curriculum developments to promote specific skills adapted to the sustainable development of peripheral rural areas

The learning activities promoted by the current curriculum only partially sustain the development of the appropriate skills adapted to the peripheral rural area’s needs. Important skills like organisation, cooperation, negotiation, teaching or multiculturalism are missing in the curriculum of some partner Member States. In the others, the current curriculum develops some general practical skills. There are no particular developments targeting peripheral rural areas with the exception of mountain areas (Table 3).

Table 3. Skills development

	Bulgaria	Croatia	Greece
Self-direction	No specific learning activities	Direct sales and processing on the farm	Grassland and meadow management Fauna of natural ecosystems etc
Organisation	No specific learning activities	No specific learning activities	Organizational behaviour and human resource management Biodiversity Conservation and Exploitation etc
Co-operation	Economics of cooperatives	No specific learning activities	Theory and methods of participatory planning Environmental management with ecosystemic approach and emphasis in mountainous areas
Negotiation	Ecological conflicts management	No specific learning activities	No specific learning activities
IT&C	Electronic systems in agricultural machinery IT&C in agribusiness	Biomimicry-solutions inspired by nature	E- entrepreneurship and E-marketing Geographic Information Systems
Project management	Project management	Natural pasture sustainable management Farm management and agricultural products marketing Management and entrepreneurship in agriculture	Project management and investment projects management Management plans etc
Practical knowledge	Mechanisation Introduction to agriculture Principles of agriculture and	Farm management and agricultural products marketing Nutrition of domestic animals	Grassland and meadow management Collective project and field studies

	mechanization Organization and technology in plant-growing	Olive growing and production Traditional products	
Teaching	No specific learning activities	No specific learning activities	Didactic / Agricultural Education
Legislation	Agricultural policy Environmental policy Agricultural legislation	Legislation in agribusiness	Policies in Rural Area Quality systems and product quality Rural Environment Protection Policy
Multiculturalit y	No specific learning activities	No specific learning activities	No specific learning activities

Table 3. Skills development (continued)

	Finland	France	Ireland	Romania
Self-direction	Courses in the program with project work assignments	Group case-study in experimental research Social perception and acceptability of socio-natural risks Researching approach: from concrete to field Role games: supporting project coordinators Professional project and insertion	Research project Agricultural science project	Professional project-case study Designing an eco-innovative food etc
Organisation	Cross disciplinary program	Transversality Survey techniques, field work: participatory tools Institutions Coordination in the firms and agri-food chains Large retailing sector and food supply chains management Integrated and sustainable territorial development: from actors to tools	No specific learning activities	Management, economic engineering and marketing Quality of environment and life in rural areas The multifunctionality of farms in rural areas etc
Co-operation	Courses in the program with group work assignment, not necessarily in connection to stakeholders	Protect and hand over Territorial collectivistic International promotion and cooperation of territories Methodology of multidisciplinary international work	No specific learning activities	Project management Project Planning Community Projects
Negotiation	No specific learning	Multimedia mediation: Consultation and	No specific learning	Communication methods and

	activities	Deliberation Biodiversity and engagement Conflict management Governance, stakeholders strategies and policies	activities	techniques Business Negotiation Techniques Communication, negotiation and business partnership Environmental conflict management
IT&C	Courses in the program with group work assignment, not necessarily a connection to stakeholders	IT&C & Environmental learning Spatial analysis: GIS applications and image processing Geomatics and spatial analysis	No specific learning activities	Informatics and computer programming GIS applications in intelligent territorial development Applied Informatics Information systems in forestry
Project management	Project management and working life skills Summer course, agricultural sciences Other courses in the program with group work assignment	Project management Tools and practices for sustainability Project management Projects of the territories, Territorial project Ecological engineering	Research project Agricultural science project	Project management Development project Environmental programs and project development Methods and techniques for presenting projects
Practical knowledge	Practical training Other courses with working life connection Practical training in organic farming	Field visits Tutored projects in small groups commissioned by partner companies	Work Placement Professional work experience	Field practice Practical activity in rural units Practical training
Teaching	Available as a minor	Currents and Educational and Didactic Approaches in Education for Sustainable Development Scientific and technical culture in Education for Sustainable Development Knowledge, practices, training and learning on environment disciplines Coordination of environmental education projects for sustainable	No specific learning activities	Psychology of education Pedagogy Management of class Teaching practice

		development.		
Legislation	Agricultural policy, environment and rural areas Agricultural and rural policy of European Union	Environmental Law Territorial Rights Environmental and Living Sciences Law Environmental Law and regulatory tools Rights, society and nature: Justice and Sustainability in question	No specific learning activities	Law and legislation Environmental law and legislation Agricultural law and legislation Business law; etc
Multiculturalit y	Exchange program, exchange students, lecturers coming from abroad International program	Global changes and networks of interactions Landscape and regional actors Mobilise collective intelligence: a key resource for international teamwork	International study opportunity	Exchange program, exchange students, lecturers coming from abroad International program; courses held in English, lecturers coming from abroad, exchange students, possibility to include an exchange period in studies

3.2. The needs of professionals from peripheral rural areas

There were a total of 108 answers to the survey implemented at different scales (regional/local) in the partner Member States (Table 4). Professionals (advisory, farming, NGOs, industry and government bodies) represent around 80% from the number of participants.

Table 4. Type of participants in the study in partner Member States

	Advisory	Education	Farming/Primary production	Farming associations	Food & Beverage industry	Government bodies	NGOs	Research	Other
Bulgaria	2	1	0	3	0	2	6	3	1
Croatia	1	5	3	2	1	5	0	0	1
France	1	5	6	1	0	4	0	1	2
Greece	3	1	2	1	0	6	3	0	4
Ireland	4	0	0	0	0	2	1	1	3
Finland	2	1	2	1	1	2	1	1	0
Romania	1	3	2	2	0	0	2	0	0
Total(%)	13.0	14.8	13.9	9.3	1.9	19.4	12.0	5.6	10.2

In terms of knowledge needs, results show that future graduates should master an in-depth understanding of interaction between land use, environment and economy, followed by the

knowledge of specific rules and regulations that target the sustainability of peripheral rural areas (Table 5).

Table 5. Knowledge needs for the sustainability of the peripheral rural areas.

	In-depth understanding of interaction between land use, environment, and economy	Knowledge of rules and regulations	Knowledge of markets requirements and consumer needs	Knowledge of best available new technologies
Bulgaria	4.6	4.4	4.5	4.1
Croatia	4.2	4.3	4.1	4.1
France	4.7	4.2	3.8	3.6
Greece	4.5	4.7	4.8	4.0
Ireland	4.6	4.6	3.7	4.3
Finland	4.8	4.5	4.1	4.3
Romania	4.5	4.0	4.1	4.5
Average	4.6	4.5	4.1	4.0

Table 6. Farming techniques and management knowledge competences expected from future graduates to contribute to the sustainability of the peripheral rural areas

	Environmental protection	Animal & plant breeds management	Halt the biodiversity losses	IT&C knowledges specific for machines & technology use
Bulgaria	4.6	4.7	4.6	4.1
Croatia	4.0	3.9	4.0	3.8
France	4.5	4.1	4.1	3.2
Greece	4.6	4.6	4.2	3.9
Ireland	4.6	4.4	4.6	3.5
Finland	4.7	4.1	4.2	3.4
Romania	4.0	3.8	4.5	3.8
Average	4.5	4.3	4.3	3.7

As it concerns farming techniques and management, a future graduate should have better knowledge competences in areas of environmental protection. Also, knowledge related to farming techniques appropriate to halt the biodiversity losses from farming activities are a must (Table 6).

Table 7. Rules and regulations knowledge competences expected from graduates to contribute to the sustainability of the peripheral rural areas

	Environmental requirements (cross-compliance)	Farm management	Implement rural development intervention measures	Market regulations	International regulations (WTO; etc)
Bulgaria	4.6	4.6	4.2	4.0	3.6
Croatia	3.8	4.2	3.8	4.1	4.0
France	4.4	4.3	4.4	4.0	3.6
Greece	4.7	4.4	4.9	4.6	3.5
Ireland	4.7	4.5	4.5	3.9	3.5
Finland	4.6	4.3	4.4	3.7	3.5
Romania	4.4	3.7	3.5	4.5	3.4
Average	4.5	4.4	4.4	4.0	3.6

Future graduates should master better knowledge about environmental regulations (cross-compliance rules; agri-environmental measures) and to know how to implement specific rural development intervention measures such as to valorise the rich biodiversity resources specific for the peripheral rural areas (Table 7).

Table 8. Products and markets knowledge competences expected from graduates to improve the sustainability of the rural peripheral area.

	Product diversification (on farm activities)	Marketing of farm products	Collective marketing actions	Understanding consumer needs
Bulgaria	4.4	4.6	4.5	4.6
Croatia	3.4	3.9	4.2	3.9
France	4.1	3.8	4.0	4.1
Greece	4.9	4.7	4.6	4.4
Ireland	4.1	3.8	3.8	3.7
Finland	4.1	4.0	3.7	3.7
Romania	4.6	4.1	4.0	3.4
Average	4.2	4.1	4.1	4.1

Although there are differences between Member States in terms of ranking the skills needed by a future graduate for the sustainability of peripheral rural areas (Figure 3) there are common needs in all partner member states like: self-direction; co-operation; negotiation, practical knowledge or project management.



Figure 5. Skills needed by future graduates to improve the sustainability of the peripheral rural area.

4. CONCLUSIONS

The report helped finding answers to the following questions about the effective implementation of the RUR'UP project:

1 What kind of learning activities are needed in order to fulfil the needs of practitioners from PRA?

Significant differences were identified between the knowledge and capacities acquired by graduates and the needs that are regarded as important by local actors and authorities in PRA.

- First and foremost, employers need graduates that can master an in-depth understanding of interaction between land use, environment, and economy-specific for peripheral rural areas. Most of the educational programs specialise graduates in one of the directions. Usually some of them target more technical knowledge (land use and environment) while others more socio-economic areas;
- In the area of farming techniques and management, employers look for graduates that know how to use production techniques with respect towards the environment and biodiversity. Such learning activities targeting the peripheral rural areas are mostly missing from the HEI curricula. Graduates learn general farming techniques. In some countries mountain farming is a specific topic, and to a less extent others, such as Natura 2000 and HNV farming;
- Product diversification and collective marketing actions represent the most important knowledge needed by a future graduate who will work in a peripheral rural area. Current lectures do not integrate the specific needs of peripheral areas;
- In addition, they acquire general knowledge of policies without always being able to specialize them based on the particular needs of the local actor (eg. develop a multifunctional exploitation; develop an agritourism business or handcraft), authority (eg. design and application of a territorial Plan) in a PRA.

The gaps and deficits identified in this report will be filled with the syllabus developed through RUR'UP project.

2. What skills and capacities are needed in PRA?

Practitioners coming from the PRA highlighted the skills and capacities needed for the sustainable development of PRAs. They are: *self-direction; co-operation; negotiation, practical knowledge or project management*. Important practical skills like organisation, cooperation, negotiation, teaching or multiculturalism are missing in the HEI curricula of some partner member states.

The report clarifies the specific training needs of the PRA. Therefore, the development of RUR'UP training materials aims to fill in the identified training gaps.

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APPENDIX 1 - RUR'UP FOCUS GROUPS RESEARCH PROTOCOL

1. Pre-select stakeholders

The group was composed of at least two participants from each stakeholder type: 1. Farmers and small industry; 2. Local action groups or AgroClusters and farmers' associations representatives; 3. Advisory services, educators, or training providers. 4. Employed and/or resident in rural areas; 5. NGO representatives; and, 6. Governmental bodies (at local/regional level). Such stakeholders should work or previously have worked in a **peripheral rural area**.

2. Select date, hour and place for the meetings

Meetings were organised on-line or face-to-face according to the COVID-19 pandemic situation. In the implementation phase, all partner countries were in lockdown due to the SARS-COV-2 virus thus the focus-groups meetings were organised on-line. Before the meetings email invitations have been sent to all identified participants explaining the main purpose of the meeting: to identify **education and skills needs of the professionals active in the peripheral rural areas**.

3. Prepare the meeting

Each local team designated a **moderator** for animating and conducting the meeting. Also, a **supervisor** checked that all topics from the interview guide were covered during the meeting. One team member **recorded** the main answers on a **standardised fiche**. Meetings were recorded such as to use the transcripts afterwards to check and to complete the in-situ notes.

4. Meeting

The moderator used open-ended questions arranged in a logical sequence in a common pre-established discussion guide. At the beginning of the meeting, the moderator presented the main goals of the meeting followed by a presentation of all participants (approx. **10 minutes**).

5. Focus group discussion guide:

a. Introduction into the subject (10 minutes):

Q1. Do you know what peripheral rural areas are?

Q2. Do you know what type of peripheral rural areas exist in your territory?

After collecting the answers to introduction questions (Q1&Q2), the moderator clarifies the meaning of the terms to be used later into discussion in order to avoid the possible insecurity of the participants as suggested by Fischer and Young (2007).

For the purposes of the project we consider as:

Peripheral rural areas = regions affected by structural weakness due to the agri-environmental constraints created by mountains, HNV farming practices supporting biodiversity, natural park or Natura 2000 site.

Mountain area = regions characterized by a considerable limitation of the possibilities for using the land and by an appreciable increase in production costs due to altitude that shorten the growing season or the presence of slopes too steep for the use of machinery or requiring the use of very expensive special equipment; areas north of the 62nd parallel (EU Regulation 1305/2013).

HNV farmland = 1. Farmland with a high proportion of semi-natural vegetation; 2. Farmland with a mosaic of low intensity agriculture and natural and structural elements, such as field margins, hedgerows, stone walls, patches of woodland or scrub, small rivers, etc.; 3. Farmland supporting rare species or a high proportion of European or World populations (Keenleyside et al., 2014).

Skill: the ability to carry out complex activities or job functions involving ideas (cognitive skills), things (technical skills) and/or people (interpersonal skills) (Korn Ferry, 2017).

Education for sustainable development (ESD): empowers graduates to take informed decisions and responsible actions for environmental integrity, economic viability and a just society for present and future generations.

Blended Learning: learning techniques that combine online educational materials and opportunities for interaction with traditional place-based classroom methods.

b. Identify the main education knowledge needs and gaps targeting peripheral rural area (30 minutes):

Table 1. Reporting fiche concerning education needs and gaps targeting peripheral rural area:

Questions provided by the moderator	Education gaps
<p>Q3. What do you expect from a future university graduate active in a peripheral rural area, in terms of farming techniques and farming management knowledge? What is currently missing? Focus on:</p> <ul style="list-style-type: none"> ● Sustainable use of resources and halt the biodiversity losses. ● IT&C needs. ● Existing knowledge about machines & technologies targeting peripheral rural areas. ● Animal & plant breeds. 	
<p>Q4 What do you expect from a future university graduate in terms of knowledge about public policy targeting peripheral rural areas? What is currently missing? Focus on:</p> <ul style="list-style-type: none"> ● Finding the most important type of knowledge that they need (cross-compliance rules; agri-environmental measures; assess specific rural development measures etc); ● Other 	
<p>Q5. What do you expect from a future university graduate active in a peripheral rural area, in terms of products and markets knowledge? What is currently missing? Focus on:</p> <ul style="list-style-type: none"> ● product diversification; ● develop high-value added and labour-intensive products; ● develop tourism services based on local culture and products; ● marketing ● Other 	

After identifying the main educational gaps, the group will be asked to rank them (the most important gap from the three classes above (technical; regulation and market) needed to take informed decisions and responsible actions for environmental integrity, economic viability and a just society for present and future generations.

c. Identify the main skills needs and gaps targeting peripheral rural area (30 minutes):



Table 2. Reporting fiche concerning skills needs and gaps targeting peripheral rural area:

Questions provided by the moderator	Education gaps
<p>Q6. Discuss, based on the main skills listed below, what are the main important five skills that a graduate should have to respond to the problems of peripheral rural areas and that are currently missing. Provide us some examples of good practices developed in your region. Self-direction: graduates solve case-studies or projects where they manage goals and time and go beyond basic curriculum requirements such as to explore and to expand their own learning.</p>	<p>Main skills:</p> <ol style="list-style-type: none"> 1. 2. 3. 4.
<p>Organization: graduates learn how people and organisations function in agricultural rural areas, focusing mostly on peripheral areas. They have multi-disciplinary knowledge in farm and food technologies, socio-economy and environment.</p>	<ol style="list-style-type: none"> 5. <p>Main gaps:</p>
<p>Co-operation: build partnerships and work collaboratively with others to meet shared objectives. Graduates work in group case-studies or projects that involve multiple stakeholders (colleagues; educators; industry partners). There are transnational exchange initiatives that will be reported in the review process.</p>	<ol style="list-style-type: none"> 1. 2. 3. 4.
<p>Negotiation: Handling conflict situations effectively, <i>facilitating consensus between parties</i>. Graduates learn to manage conflict by having conflict and negotiation management courses.</p>	<ol style="list-style-type: none"> 5.
<p>IT&C: graduates learn Information and Communication Technology (IT&C) knowledge adapted to the new farming technologies and innovations.</p>	<p>Examples of good practices developed in your area/region:</p>
<p>Project management: graduates learn project management and study entrepreneurial initiatives in order to be able to generate self-sufficient incomes, develop local high-value products or households' diversification in an environmental friendly approach.</p>	<ol style="list-style-type: none"> 1. 2. 3.
<p>Practical knowledge: graduates solve real-life problems and receive direct practical training from practitioners.</p>	<ol style="list-style-type: none"> 4.
<p>Teaching: graduates develop teaching and guidance skills appropriate for advisory and training activities in the peripheral rural areas. They use blended learning techniques which combine online educational materials and opportunities for interaction with traditional place-based classroom methods..</p>	<ol style="list-style-type: none"> 5.
<p>Legislation: ability to apply legislation changes in environmental requirements, farm management and market regulations, etc.</p>	
<p>Acting in a multicultural environment: ability to interact effectively with people from different cultures and to successfully manage intercultural situations. Graduate courses include international exchange programs dedicated to students; they also feature lectures with teachers coming from abroad; it is a program taught in an international language that attracts students from different countries.</p>	

6. Reporting

Data collection was done in an on-line shared document using a common reporting guide.

APPENDIX 2 - RUR'UP SURVEY RESEARCH PROTOCOL

Introductory questions:

Question 1. What is your home country (open question)?

Question 2. What is your main job role (single choice question)?

- Advisory Services;
- Education;
- Farming/Primary production;
- Farming associations;
- Food & Beverage industry;
- Government bodies;
- NGOs;
- Research;
- Other

Question 3. Are you working in rural areas (closed-ended question)?

- Yes
- No

Question 4. Are you working in an EU agricultural peripheral area (closed-ended question)?

Peripheral rural areas = regions affected by structural weakness due to the agri-environmental constraints created by mountains, HNV farming practices supporting biodiversity, natural park or Natura 2000 site.

- Yes;
- No;

Core questions:

Question 5. Based on the scale below, which of the following knowledge competences do you/your organisation expect from graduates to contribute with to the sustainability of the peripheral rural areas? (single choice question)

Knowledge competences/Importance	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
In depth understanding of interaction between land use, environment and economy					
Knowledge of rules and regulations					
Knowledge of market requirements and consumer needs					
Knowledge of best available new technologies					
Other:.....					

Question 6. Based on the scale below, what are the most important **farming techniques and farming management knowledge** competences do you/your organisation expect from graduates to contribute with to the sustainability of the farming practices in the peripheral rural areas? (single choice question)

Knowledge competences/Importance	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
IT&C knowledge specific for machines & technology use					
Animal & plant breeds management					
Environmental protection					
Halt the biodiversity losses					
Other:.....					

Question 7. Based on the scale below, what are the most important **rules and regulations knowledge** competences do you/your organisation expect of graduates to contribute with to the sustainability of the farming practices in the peripheral rural areas?

Knowledge competences/Importance	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Farm management					
Market regulations					
Environmental requirements (cross-compliance rules; agri-environmental measures);					
Implement rural development intervention measures					
International regulations (WTO; etc.)					
Other:.....					

Question 8. Based on the scale below, what are the most important **products and markets knowledge** competences do you/your organisation expect of graduates to contribute with to the sustainability of the farming practices in the peripheral rural areas?

Knowledge competences/Importance	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Product diversification (develop on farm activities that do not involve agricultural production eg touristic services; small processing capacities;)					
Marketing of farm products					
Collective marketing actions					
Understanding consumer needs					
Other:.....					

Question 9. What are the most important **five skills** you/your organisation expect from graduates to contribute with to the sustainability of the farming practices in the agricultural peripheral areas? (multiple choice question)

- **Self-direction:** to solve **projects** where they manage goals and time and go beyond basic knowledge requirements using multidisciplinary knowledge (social, economic and environment);
- **Organisation:** to organise multidisciplinary groups of stakeholders;
- **Co-operation:** build partnerships and work collaboratively with others to meet shared objectives.
- **Negotiation:** handling conflict situations effectively, with a minimum of noise.
- **IT&C:** use new farming technologies and innovations.
- **Project management:** develop and implement projects;
- **Practical knowledge:** solve real-life problems;
- **Teaching:** advisory and training activities in the peripheral rural areas.
- **Legislation:** ability to apply legislation changes in environmental requirements, farm management and market regulations, etc.
- **Acting in a multicultural environment:** ability to interact effectively with people from different cultures and to successfully manage intercultural situations.
- **Other?**

Socio-economic profile:

Question 10. What is your highest degree in education?

- Vocational school in agricultural related areas;
- High school;
- University, not in agricultural related areas;
- University in agricultural related areas;
- Other?.....

Question 11. How many years since your highest degree in education?

- Less than 5;
- 5 to 10;
- 10 to 20;
- More than 20;

Question 12. Your age?

- 20 years to 30 years;
- 30 years to 50 years;
- More than 50 years;

II.3. Reporting:

Data collection was done in an on-line shared document using a common reporting guide.