Project No: 862681
Project acronym: ROSEWOOD4.0

Project title:
EU Network of Regions On Sustainable WOOD mobilisation ready for digitalisation

Programme: H2020-RUR-2018-2020 (Rural Renaissance)

Topic: RUR-15-2018-2019-2020 Thematic networks compiling knowledge ready for practice

Start date of project: 01.01.2020

Duration: 30 months

Deliverable D1.6
Final Report on Best practices and Innovations

Author: Eduard Mauri

Due date of deliverable: 30.06.2022   **Actual submission date:** 27.06.2022

Work Package	WP1 Assessing/ Enabling the potential of best practices in EU-region
Associated Task	T1.1, T1.2 and T1.3
Covered Period	M1 – M30
Deliverable Lead Partner	European Forest Institute (EFI)
Version	1

Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

CHANGE CONTROL

DOCUMENT HISTORY

Version	Date	Change History	Author(s)	Organisation
0.1	21.06.2022	First version created	Eduard Mauri	EFI
0.2	22.06.2022	Revision	Francisco Javier Casado Hebrard	SIG
1.0	27.06.2022	Final editing and submission	Francisco Javier Casado Hebrard	SIG

DISTRIBUTION LIST

Date	Issue	Group
24.06.2022	Document submitted and available for the whole consortium	ROSEWOOD4.0 partners

Table of contents

Abstract

The main aim of D1.6 is the update of several deliverables from WP1 related to the collected best practices and innovations (BP&I):

- D1.2 *Progress Report on selected best practices and Innovations*
- D1.3 *Digital innovations and best practices for sustainable wood mobilisation - First batch*
- D1.4 *Digital innovations and best practices for sustainable wood mobilisation - Videos*
- D1.5 *Digital innovations and best practices for sustainable wood mobilisation - Second batch*

The current D1.6 focuses on the results, rather than in the processes, which are already described in these previous deliverables and have not been modified: it summarises the achievements of the whole WP1 *Assessing/Enabling the potential of best practices in EU-region*. It comprises the three main elements: the BP&I (including their collection, the elaboration of the factsheets and the sustainability of the platform hosing them), the produced related videos and the virtual visits, both to disseminate selected BP&I.

Deviations

No deviations.

1. Best practices and Innovations

1.1 Screening, documentation, and clustering & validation of solutions

These steps were already completed when D1.2 *Progress Report on selected best practices and Innovations including full list of identified BP&I, first dissemination material booklet and results of first validation meetings, virtual visits, video productions and beta version of the knowledge platform* was submitted in M12 and, therefore, they are fully described there, with no updated since then. The reader is invited to consult D1.2 (section 2 *Screening of solutions and BP&I in EU regions* and section 4 *Clustering and Validation of BP&I between regions*) to understand the background of the data described in the following sections.

1.2 Factsheets in the *Knowledge platform for regional forest innovation*

To learn about the development and functionalities of the *Knowledge platform for regional forest innovation,* the reader is invited to consult D1.2 (section 3 *Selection of BP&I and Preparation of Dissemination Material*).

Of the **307 BP&I** collected by ROSEWOOD4.0 in the screening, documentation, and clustering & validation of solutions steps (see D1.2 section 4 Clustering and Validation of BP&I between regions for the methodology), 171 BP&I were shortlisted by the Hubs as potentially relevant for their needs, of which 79 BP&I originate from within the own Hub, and a total of 92 BP&I from other Hubs. Of these 171 BP&I, **145** were converted into a factsheet and uploaded on the Knowledge platform for regional forest innovation by 11 May 2022. On that date, the Knowledge platform for regional forest innovation had a total of **275 published factsheets**, including **130 factsheets** elaborated from BP&I collected in the scope of the **ROSEWOOD project** (2018-2020). Between 11 May and the publication of this document, other factsheets may have been added.

In order to simplify the charts, multinational BP&I with countries from different Hubs have been assigned to the Hub of the main country. These **145 factsheets** are distributed as follows, according to selected descriptive fields.

1.2.1 Distribution across Hubs and countries

The 145 factsheets are more or less evenly distributed by Hub, with a surplus of factsheets coming from Central-West Hub (32%) and a deficit from Central-East Hub (11%; Figure 1). When we inspect this distribution per country, we realise that the size of the country is not relevant (Figure 2). Although the country of origin of most of the factsheets is Germany (17 factsheets, 12% of the total), small countries in land area follow as major contributors: Slovenia, Switzerland and Portugal.
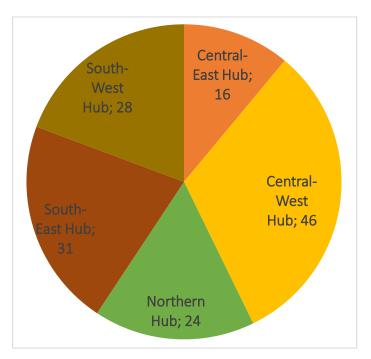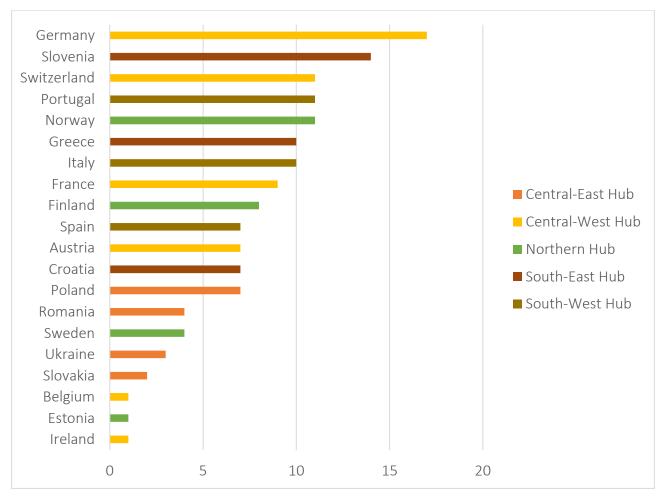
Figure 1. Number of BP&I per Hub (n=145).

Figure 2. Number of BP&I per country (n=145).

1.2.2 Distribution according to domains

A classification by domains corresponds to main parts or activities along the forest-wood value chain from management of the forest ecosystem to final products and markets. Note that one BP&I can be linked to more than one domain, and therefore the total amount is not 145, but 246.

The focus of ROSEWOOD 4.0 lies on the forestry and raw material supply side, but BP&I of end uses are also considered in the sense that they can create higher demand for mobilisation of wood. Following this logic, most of the factsheets belong to a domain related to activities in the upstream end of the forest-wood value chain: 48 belong to forest management, ecosystem (management), (forest) resilience; 42 belong to (forest) inventory and monitoring; and 28 belong to (timber) harvesting, (forest) infrastructure and logistics (Figure 3). The less abundant factsheets are linked to more transversal domains, such as (new) products, markets and trade; and education and training (related to forest and wood activities). At the end of this list, we find domains belonging to the downstream activities of the forest-wood value chain: BP&I from wood energy industry and wood construction industry.
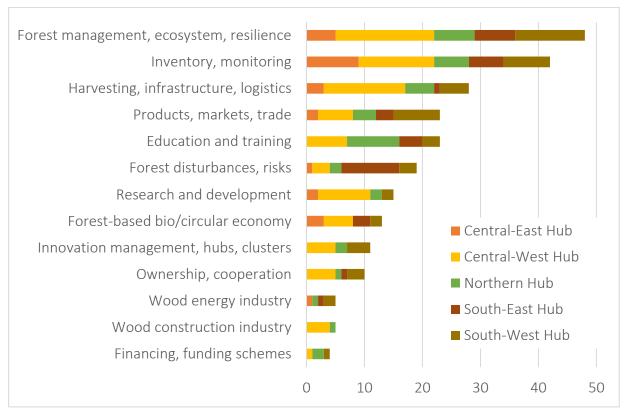

Figure 3. Number of BP&I per domain (n=246, some factsheets cover more than one domain).

Per Hub, all Hubs contributed with BP&I of the three main domains. Central-West Hub is overrepresented in the domains of harvesting, infrastructure and logistics, as well as in research and development, whereas Central-East Hub is overrepresented in the domain of (forest) inventory and monitoring. The Northern Hub stands out as being the Hub with the higher number of BP&I related to education and training (related to forest and wood activities): 39% of the BP&I on this domain (9 out of 23) come from this region of Europe.

1.2.3 Distribution according to types of solution

The types of solution group together similar technological concepts and systems. In opposition to the domain, the BP&I can only be described with one type of solution. The most abundant types of solutions are data platforms and data hubs; modelling, simulation and optimisation tools; and advice and services for forest

owners, with 21, 19 and 17 factsheets each, respectively (Figure 4). On the other hand, urban planning; smart materials; design software; and land reform (policies) are only represented by one factsheet.
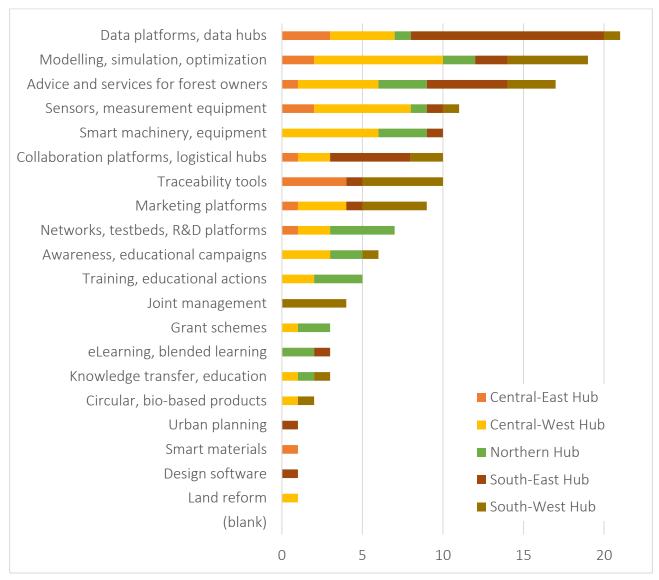

Figure 4. Number of BP&I per type of solution (n=145).

Per Hub, South-East Hub clearly dominates in the data platforms and data hubs solutions, with 57% of the factsheets on this type of solution (12 out of 21) and in the collaboration platforms and logistical hubs, with 50% of the factsheets (5 out of 10), while traceability tools are dominate by South-East Hub (also 5 out of 10). The rest of major types of solutions are more balanced across Hubs, except solution on smart machinery and equipment, which are dominated by the Central-West Hub (6 out of 10) and no solution on this technology from the Central-East and South-West Hubs.

1.2.4 Distribution according to challenges for wood mobilisation

There are two challenges that stand out by number of factsheets: (1) Enhance economic and environmental performance of forestry supply chains and (2) Improve forest resilience and adaptation to climate change. The rest of the challenges are more or less evenly represented (Figure 5). This reflects that fact, as mentioned above, that ROSEWOOD 4.0 focussed primarily on the upstream part of the forest-wood value chain. For the

same reason, the less addressed challenge is Grow the forest-based bioeconomy through circular use and value-added products.
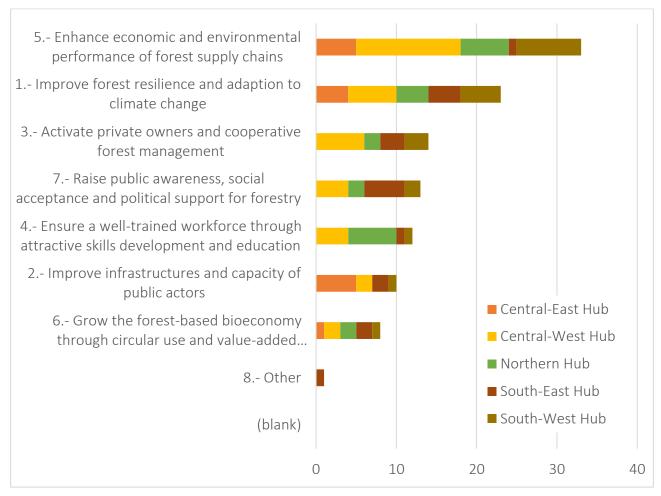

Figure 5. Number of BP&I per challenge addressed (n=145).

Per Hub, the distribution of factsheets for each challenge is balanced, but notice the low number of factsheets from South-East Hub addressing the challenge Enhance economic and environmental performance of forestry supply chains. Notice also the absence of factsheets from the Central-East Hub, and the very low number from South-West Hub, addressing these three challenges: (1) Activate private owners and cooperative forest management, (2) Raise public awareness, social acceptance and political support for forestry and (3) Ensure a well-trained workforce through attractive skills development and education. In this last challenge, Northern Hub is dominant.

1.2.5 Distribution according to the scale of application

For most of the BP&I collected by ROSEWOOD 4.0 (50% of them) the ideal scale of application is the whole country. At the other end, only six BP&I (4%) are meant to be applied at a local scale (Figure 6). Central-East Hub is lacking cross-border or multilateral and local BP&I, while South-East Hub is the major contributor of BP&I applicable at an international scale (54% of them).

Figure 6. Number of BP&I per scale of application (n=145).

When examining the scale of application per challenge addressed, national and cross-border or multilateral scales of application are dominate by BP&I addressing the challenge Enhance economic and environmental performance of forestry supply chains. However, this challenge is rarely addresses in BP&I of regional/sub-national and of local application (Figure 7). The rest of challenges are more or less evenly distributed across the different scales of application.

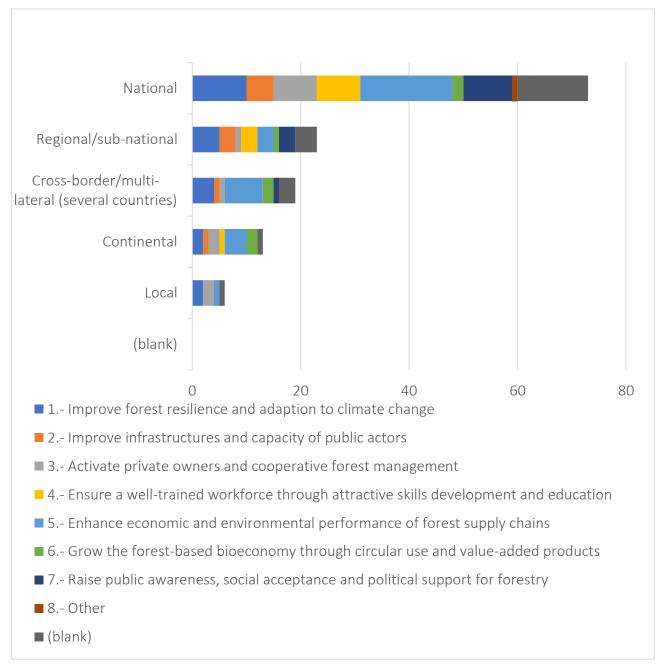Figure 7. Number of BP&I per scale of application and challenge addressed (n=145).

1.2.6 Language diversity

The *Knowledge platform for regional forest innovation* contains BP&I in 15 languages: Croatian, English, French, German, Greek, Italian, Norwegian, Polish, Portuguese, Romanian, Slovak, Slovenian, Spanish, Swedish, and Ukrainian. The master language is English, meaning that all the factsheets must be at least in this language. Of the 145 factsheets, there are 163 translations, meaning that each BP&I exists, in average, in English and in 1,12 other languages. 79 factsheets are available in two languages (English and another one), 14 are available in three languages (English and two other), 9 are available in four languages (English and three other) and 5 are available in five languages (English and four other). The translation of factsheets was agreed by the partners according to the interest of each BP&I for the end-users in their respective countries.

The languages, other than English, in which the factsheets are mostly available are Ukrainian, German, Polish and Slovenian, all four with more than 15 factsheets (Figure 8). However, translation efforts are unequal. Some factsheets have been written in English and not translated to the mother tongue of the reporter. This is the case for German, Greek, Italian, Norwegian, Portuguese, Romanian and Swedish. E.g., German-speaking reporters have written 35 factsheets, but only 20 are in German (and English), meaning that 15 are exclusively in English (when they could have been easily also written in the mother tongue of the reporter). On the other hand, French, Polish, Slovak, Slovenian, Spanish and Ukrainian reporters did an effort to translate factsheets that were not written in by a reporter speaking their language, as it is demonstrated by the fact that these number of factsheets in these languages are higher than the number of factsheets written by reporters having these languages as mother tongue. Two outstanding cases are the Slovak and the Ukrainian languages. Only two and three factsheets come from these countries (respectively), but there are 13 and 27 factsheets available in Slovak and Ukrainian. Finally, notice that no factsheet has been written in or translated to Finnish, arguing that most of the Finnish end-users are fluent enough in English.
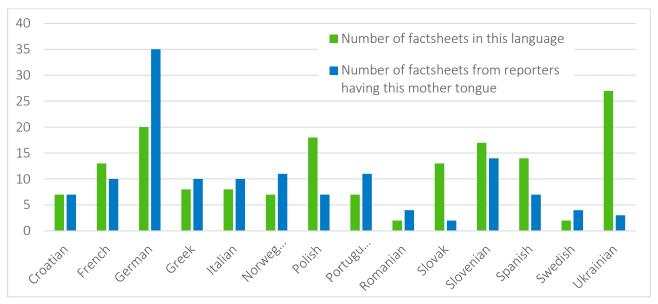

Figure 8. Number of factsheets available in other languages than English (n=163).

1.2.7 Conclusions from the distribution of the factsheets

When collecting new BP&I, ROSEWOOD 4.0 Network partners should put emphasis on:

- Colleting BP&I coming from Central-East European countries, and if possible engaging missing countries such as Hungary, which is not in the ROSEWOOD 4.0 consortium.
- Capturing BP&I from the demand side: best practices and innovations that could be adopted or used by the industry or by the consumers to stimulate the consumption and use of wood, especially for energy and for construction, but also for the chemical industry (this last domain having no BP&I collected) and any forest-based bio/circular economy initiatives.
- Capturing BP&I on grant schemes, eLearning and blended learning, knowledge transfer and education, new circular bio-based products and smart materials, urban planning and land reform, and design software, which are poorly represented in the collection.
- Collecting more BP&I addressing the "social" challenges (in opposition to more "technical" challenges): (1) Activate private owners and cooperative forest management, (2) Raise public awareness, social acceptance and political support for forestry and (3) Ensure a well-trained workforce through attractive skills development and education in Central-East and South-West Hubs.
- Detecting and capturing more BP&I adapted for a local scale of application.

- Translating existing factsheets into Croatian, German, Greek, Italian, Norwegian, Portuguese, Romanian and Swedish.

1.3 Sustainability of the *Knowledge platform for regional forest innovation* and its database

As agreed in the ROSEWOOD 4.0 memorandum of collaboration (MOC) signed by all ROSEWOOD 4.0 consortium members and establishing the ROSEWOOD 4.0 Network, from 1st July 2022 the *Knowledge platform for regional forest innovation* and its database will be transferred, managed and maintained by the European Forest Institute, and more precisely by the Bioregions Facility. The management of the *Knowledge platform for regional forest innovation* and its database will be supervised by the ROSEWOOD 4.0 Network.

As agreed in the MOC, partners will contribute to the *Knowledge platform* uploading at least two new BP&I per country and per year. All the partners should stimulate other projects related to innovation in wood mobilisation to contribute to the database by reporting new BP&I. The *Knowledge platform* is already prepared to accept contributions from non-ROSEWOOD 4.0 consortium members. The only current limitation are the languages. Factsheets can be uploaded in 15 languages: Croatian, English, French, German, Greek, Italian, Norwegian, Polish, Portuguese, Romanian, Slovak, Slovenian, Spanish, Swedish, and Ukrainian, preferring at least English.

All new factsheets created from 1st July 2022 onwards will be identified as "ROSEWOOD 4.0 Network" in the field "Project under which this factsheet has been created", to the distinguish them from those collected during the 30 months of the ROSEWOOD 4.0 project (identified as "ROSEWOOD 4.0" in this same field; the 130 factsheets collected during the ROSEWOOD project are identified as "ROSEWOOD").

The platform could be opened to other topics related to forest bioeconomy beyond wood mobilisation. If this happens, ROSEWOOD, ROSEWOOD 4.0 and ROSEWOOD 4.0 Network contributions will continue to be recognisable and linked to the topic of wood mobilisation.

The partners will continue exploiting the *Knowledge platform* in their own communication and dissemination campaigns related to wood mobilisation. In particular, European Forest Institute intends to exploit the database as a source of potential innovators to be invited to the Bioregions Facility's Forestry Speed Dating and as a source of potential candidates for the Bioregions Facility's Open Innovation Challenge.

2. Videos

This section updates the *Results* section of D1.4 *Digital innovations and best practices in sustainable wood mobilisation – Videos*. Since the publication of this deliverable two new videos have been produced: one of them is already publishe and the other is still under production. Dissemination efforts have not changed (see D1.4). In total, the 5 regional Hubs have produced 28 dedicated videos on selected BP&I.

Due to the efforts required to produce high quality videos, the ROSEWOOD 4.0 Network is not expected to release new videos.

2.1 Summary of BP&I videos

Table 1. Number of videos per hub of origin.

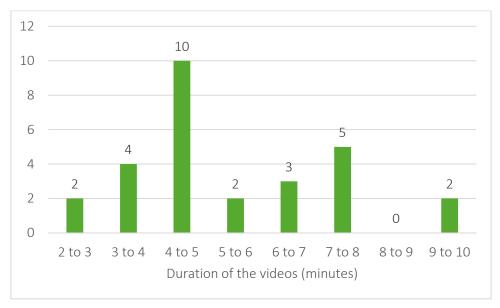| Hub	Count
Central-East Hub	4
Central-West Hub	5
North Hub	7
South-East Hub	6
South-West Hub	6
Total	28

Figure 9. Number of videos by duration.

Table 2. Number of domains of the best practices and innovations presented in the videos.

Domains [a]	Count
Education and training	4
Forest disturbances, risks	3
Forest management, ecosystem, resilience	8
Forest-based bio/circular economy	2
Harvesting, infrastructure, logistics	7
Innovation management, hubs, clusters	2
Inventory, monitoring	10
Ownership, cooperation	4
Products, markets, trade	3
Research and development	2
Wood construction industry	1
Wood energy industry	1
Total	47

[a] One BP&I in a video may be related to more than one domain.

Table 3. Number of types of solution of the best practices and innovations presented in the videos.

Type of solution [a]	Count
Advice and services for forest owners	3
Circular, bio-based products	2
Collaboration platforms, logistical hubs	1
Data platforms, data hubs	4
Design software	1
eLearning, blended learning	3
Joint management	1
Modelling, simulation, optimization	7
Networks, testbeds, R&D platforms	1
Sensors, measurement equipment	2
Smart machinery, equipment	2
Traceability tools	2
Total	29

[a] Each BP&I is related to only one type of solution, but one video featured one best practice and one innovation, each one with a different type of solution.

Table 4. Number of challenges of the best practices and innovations presented in the videos.

Challenge addressed [a]	Count
1.- Improve forest resilience and adaption to climate change	5
2.- Improve infrastructures and capacity of public actors	6
3.- Activate private owners and cooperative forest management	3
4.- Ensure a well-trained workforce through attractive skills development and education	4
5.- Enhance economic and environmental performance of forest supply chains	9
6.- Grow the forest-based bioeconomy through circular use and value-added products	1
7.- Raise public awareness, social acceptance and political support for forestry	1
Total	29

[a] Each BP&I is related to only one challenge, but one video featured one best practice and one innovation, each one with a different challenge addressed.

Table 5. Number best practices and innovations presented in the videos that are digital solutions.

Are digital solutions?	Count
No	4
Yes	25

Table 6. Number best practices and innovations presented in the videos that are innovative solutions.

Are innovative solutions?	Count
No	7
Yes	22

2.2   List of newly published videos

For the list of published videos between M1 and M24, please consult D1.4 *Digital innovations and best practices in sustainable wood mobilisation – Videos*.

Title	Juma Biomassa
Summary	The Italian company Juma Biomassa, located in the South Tyrol region, processes wood and forest residues into wood chips for the production of bioenergy to supply district and small village heating.
Publication link	https://www.youtube.com/watch?v=TExSD24aYlg
Duration	4'05'' minutes
Date of publication	14 January 2022
Domains	Wood energy industry
Type of solution	Circular, bio-based products
Challenge addressed	5.- Enhance economic and environmental performance of forest supply chains
Digital solution	No
Innovation	No
County and hub	Italy (South-West Hub)
Factsheet	None

Title	Soil Protection: Root depth measurement with a terrestrial laser scanner
Summary	Not available yet
Publication link	Not published yet
Duration	2'52'' minutes (tentative)
Date of publication	Under production
Domains	Inventory, monitoring

Type of solution	Sensors, measurement equipment
Challenge addressed	5.- Enhance economic and environmental performance of forest supply chains
Digital solution	Yes
Innovation	Yes
County and hub	Switzerland (Central-West Hub)
Factsheet	None

3. Virtual visits

The videos summarised above, the factsheets in the *Knowledge platform*, along with the 3 MOOCs (D3.3 and D3.4 from T3.2), allowed stakeholders who could not participate in in-person ROSEWOOD 4.0 activities to engage in virtual visits of the BP&I collected in WP1.

Of the 28 videos, 25 had an associated factsheet and are accessible from there. In the 16 study visits (T2.3), 34 BP&I were presented, of which 22 had an associated factsheet. Concerning the 3 MOOCs developed by the project, 4 BP&I are featuring there. In addition, ROSEWOOD 4.0 collaborated with the Forestry Speed Dating series on *Digitalisation of forest management, inventory and monitoring* (organised by the Bioregions Facility of the European Forest Institute from October 2021 to March 2022, https://network.bioregions.efi.int/forestryspeeddating): 8 BP&I from the *Knowledge platform* were presented there. Figure 10 summarises how these materials are interlinked to offer a full virtual multichannel experience.
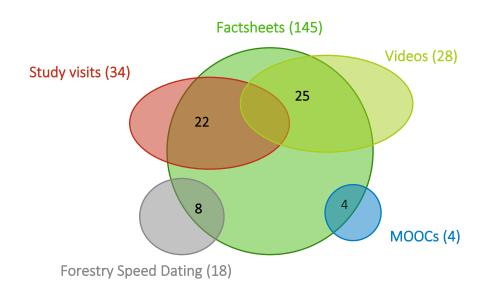

Figure 10. Interlinked material on BP&I, with number of BP&I presented in parenthesis.