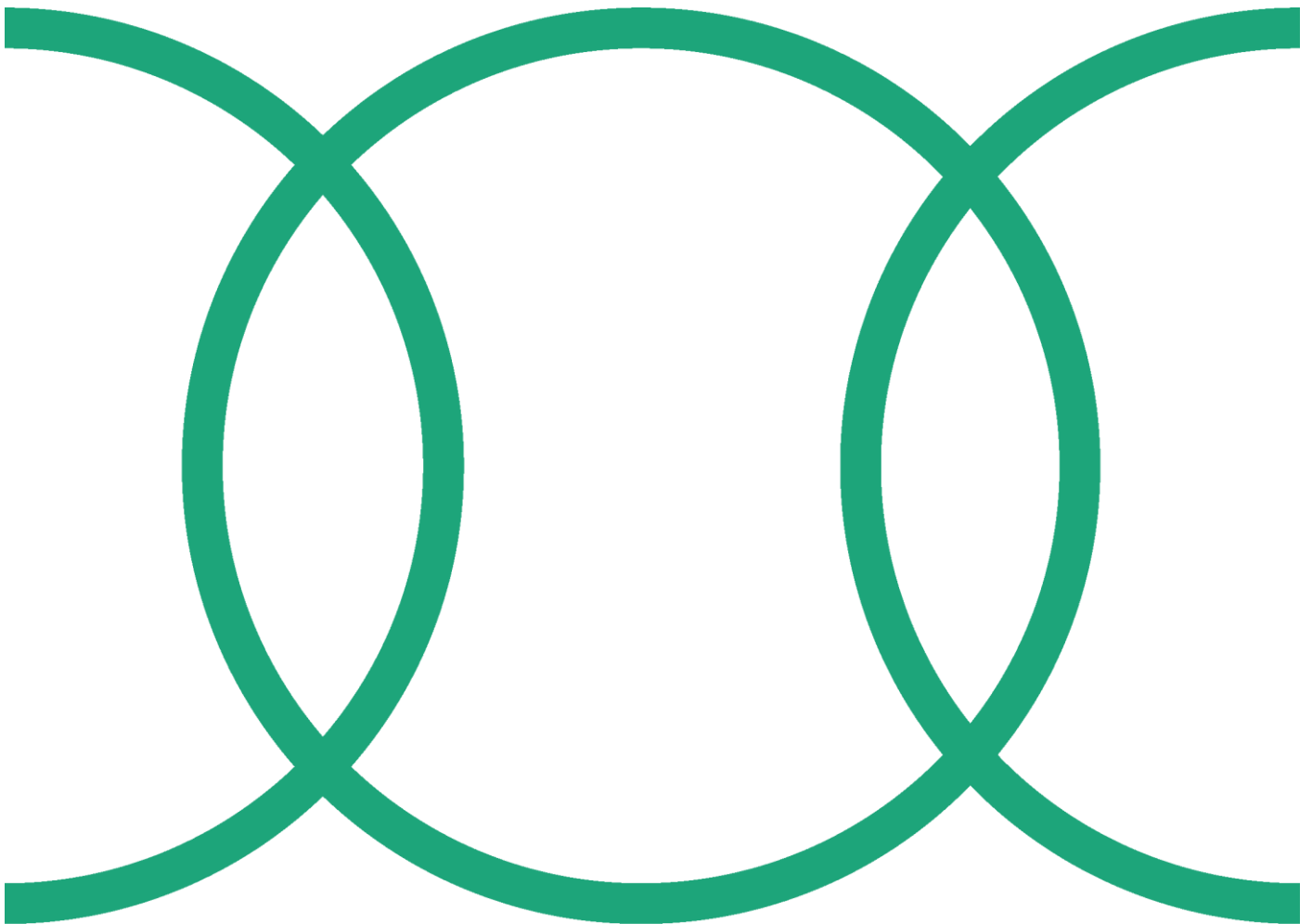


D3.2 Drivers in policies and administrations for innovation in forestry and agroforestry



Document control sheet

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Executive Summary

Forestry and agroforestry hold many benefits but are also faced with a broad range of challenges like forest fragmentation, lack of knowledge and cooperation, climate change, limited policy support for new services and products, and soil health. Innovations can help address these challenges, contribute to rural development and other policy goals. The present report reveals the enabling conditions and provides insights into the constraints for innovation in forestry and agroforestry. The empirical basis is a European-wide survey which targeted OG members, policymakers, interest groups, NGOs, researchers, and practitioners (n=326). The analysis shows that innovations in the forest sector are driven by a broad range of drivers, incl. climate change, changing demands in society on forests, and markets for ecosystem services. Beyond that, actors' behavior is key in driving innovations. It includes openness for new knowledge and the ability to collaborate with different actors. The results for the administration and management of the EIP-Agri funding for OGs are mixed. The performance of the EIP-Agri funding scheme seems to be moderate from the perspective of interviewed OG members. Further analysis of the drivers and constraints for innovation in forestry and agroforestry will be conducted in the follow-up report (D3.3).

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1. Introduction

Forests cover 160 million hectares of the land in the European Union (EU), representing 39% of the EU's land area.¹ They provide a wide range of ecosystem services, including natural habitats and water regulation, carbon storage and sequestration, and provision of wood and non-wood products. Agroforestry is a dynamic system combining trees, crops and/or livestock on the same area of land in some form of spatial arrangement or temporal sequence on the same piece of land. Agroforestry practices provide many environmental benefits, contributing to climate change adaptation and mitigation, soil conservation, biodiversity enhancement and improving the overall condition of the landscapes. That way, they are also beneficial to the local rural economy, as those improved landscapes offer cultural and recreational opportunities. Moreover, agroforestry farmers can diversify their production, reduce some costs, and achieve better productivity. However, agroforestry is usually more complex and knowledge-intensive than conventional agriculture and may involve a greater administrative burden. In Europe, according to the AGFORWARD² project, the total area under agroforestry in the EU-27 including silvo-pasture, silvo-arable and home garden practices are calculated to occupy is around 15.4 million ha, equivalent to almost 9 % of the utilized agricultural area (or 3.6 % of the territorial area) (Augère-Granier et al., 2020).³

Forestry and agroforestry hold many benefits but are also faced with a broad range of challenges like forest fragmentation, lack of knowledge and cooperation, climate change, limited policy support for new services and products, and soil health. Innovations can help address these challenges, contribute to rural development and other policy goals. The present deliverable D3.2 “Drivers in policies and administration for innovation in forestry and agroforestry” (M18) sheds light on enabling conditions and constraints for innovation in forestry and agroforestry. It summarizes the main insights from a literature review and presents findings from a European-wide survey with representatives from government authorities, interest groups, NGOs, research, and practitioners (n=326). Empirically, this report focuses on the enabling conditions. A closer analysis of the data, including country comparisons and identification of barriers for innovation, will be delivered in an updated report in September 2024 (D3.3).

2. Literature review of factors affecting innovation in forestry and agroforestry

Forestry and agroforestry have great potential to facilitate the ambition of a sustainable green transition in Europe yet face significant challenges. The forest sector is often characterized as traditional and mature (see Weiss et al. 2020, 2021). Innovations may be needed to support the implementation of various policy goals. Innovation is understood here as “the process of making changes to something established by introducing something new” (Mann et al. 2022: 283; Weiss et al. 2020). Such processes include making changes in technologies, products, processes, or management approaches that seek to secure and improve the provision of forest ecosystem services (FES) (Hansen et al. 2019; Louda et al. 2023).

Governments support the innovativeness of the forest sector by various means, incl. grant programmes for R&D,

¹ European Parliament: The European Union and forests. See: <https://www.europarl.europa.eu/factsheets/en/sheet/105/the-european-union-and-forests> (accessed 18.06.2024)

² See: <https://www.agforward.eu/> (accessed 19.06.2024)

³ See: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/651982/EPRS_BRI\(2020\)651982_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/651982/EPRS_BRI(2020)651982_EN.pdf) (accessed 18.06.2024)

technology platforms, knowledge transfer from research to practice, or the establishment of forest-based clusters. To be successful, such support needs to consider the range of factors that affect innovation in forestry and agroforestry (Innes 2009; Varela et al. 2022). Accordingly, a literature review of recent research on innovation in forestry and agroforestry was conducted to identify those factors. They are listed in the table below and specified with respect to their facilitating and constraining impact. The list of references is included in the Appendix.

Factors affecting innovation in forestry and agroforestry		
	Facilitating	Constraining
Knowledge and information	Access to new knowledge Information about support programs	New knowledge not available (no accessible) Information about support programs not available/not accessible
Technology	Availability of digital tools ready for practice Shared data standards, interfaces Fairs and platforms for new providers/solutions	
Values and attitudes	Openness Entrepreneurial can-do attitude Positive attitude toward change Regional innovation focus	Skeptical attitude toward change Cost and risk sensitive
Cooperation	Inter-sectoral/Inter-disciplinary cooperation Participation in networks	Small, fragmented forest ownership Closed, homogeneous forestry circle
Resources	Skilled labor Finance schemes, incl. tax/subsidy incentives	
Markets	Competition New narratives (forest and health/wellbeing, forest bioeconomy, ecosystem services etc.) Markets for ecosystem services, incl. payment schemes	Competition Commodity-/production-orientation dominates
Society	Changing demands of people in society	Sustained conflict with civil society actors/ENGOS
Government and policy	Accessible/supportive guidance in applications for public funding Forest-related policies (climate, nature conservation, hunting, RE, rural development, construction, health, other) Financial instruments targeting policy goals to environmental goals	(Perceived) high level of bureaucracy Lack/limited guidance in applications for public funding Command-and control style of public decision-making State forest enterprise/administration dominates sector at national level Commodity-centered forest policy

Table 1: Facilitators and constraints of innovation in forestry and agroforestry

The focus on enablers and barriers of innovations in forestry allows to test most factors with Likert-type survey questions. The issue is different with respect to government and policy as influencing factor(s) in innovation. Whereas governments perceived as accessible, supportive, and collaborative may be more likely to facilitate innovation in forestry, there is less clarity about the goals and means of forest-related policies and how they affect innovation.

Nichiforel et al. (2020) showed that the decision-making power of owners and managers is rather different across Europe, depending strongly on domestic legislation for forestry, while subsidies and incentives can effectively target policy goals to environmental discourse. Mann et al. (2022: 283) suggested that the current revision of the forest policy framework at the EU level under the European Green Deal “poses a window of opportunity for more sustainable FES [Forest Ecosystem Services] provision.” Varela et al. (2022) arrived at a different conclusion for the CAP (2014-2020), which they consider as “inadequate” for maintaining multi-purpose habitats. The influence of government and policy in forestry innovations seems to be far from unequivocal.

3. Research design for analysis of drivers in policies and administrations for innovation in forestry and agroforestry

The innovation factors identified in the literature review have been translated into 44 survey questions and statements, including demographic questions. Previous versions of the survey had been pretested. The FOREST4EU innovation survey targeted OG members, policymakers, interest groups, NGOs, researchers, and interested practitioners to learn about their views on how innovation in the forest sector can be improved. It contained four components. The survey design is included in the Appendix.

	Survey component	No of questions	Target group
I	Your view of general conditions for innovations in the forest sector	14	All
II	OG-specific influencing factors for innovation in the forest sector	15	OG members only
III	Application procedure for OGs	6	OG members only
IV	Demographic questions	7	All

Table 2: Structure of FOREST4EU innovation survey

The survey was conducted in 11 languages and fully answered by 326 people – among them, 73 who are or have been members of Operational Groups (OGs). It was online on the FOREST4EU website from 02.01.2024 until 31.03.2024 and shared via LinkedIn and the national networks of project partners. The goal was to reach +/- 30 responses per partner country in FOREST4EU, which was achieved in most cases (except for ES, LV, FR). Information about the survey response can be found in the Appendix.

The identification of drivers in policies and administrations for innovation in forestry and agroforestry requires empirical analysis. Attention goes to: (1) potential drivers of innovation in forestry and agroforestry, and (2) the role of administration in EIP-Agri funding for innovation in forestry and agroforestry. A distinction is made between two types of drivers. The drivers that are external to what innovative actors in forestry do and the ones that relate to actors’ behavior. In the data set, there are six external drivers and four behavioral drivers of the innovating actors. The external drivers relate to the policy context, market developments and the environment. The behavioral relate to the

knowledge, values & attitudes, and the cooperative behavior of the actors involved.

Moreover, the role of administrations and project management in EIP-Agri funding for innovation in forestry and agroforestry is examined. This section pulls the evidence together that is related to the administration and project management of the OGs in forestry and agroforestry. Here attention goes to the views and perspectives of the 73 OG members who have participated in the survey. This chapter reveals how the administrative support and procedures are perceived, and how cooperation in diverse teams, securing funding and other resources is managed. Table 3 provides an overview of the drivers, and the administrative and project management aspects for innovation in forestry and agroforestry OGs.

Drivers	
External drivers	Behavioral drivers
<ol style="list-style-type: none"> 1. Climate change 2. Loss of biodiversity 3. Bioeconomy 4. Markets for ecosystem services 5. Changing demands of society on forestry 6. Government support for innovation in forest sector 	<ol style="list-style-type: none"> 1. Implementation of new ideas into practice 2. Knowledge transfer from research into practice 3. Trying out something new 4. Activeness
Administration and project management of EIP-Agri funding for innovation	
<ul style="list-style-type: none"> • Authority support in difficult situations • Application procedure • Overall impression project management • Securing funding 	<ul style="list-style-type: none"> • Dealing with de minimis rule in forestry • Managing with limited resources • Learning how to work together • Recommending EIP-Agri funding to peers

Table 3: Drivers in policies and administration for innovation in forestry and agroforestry

The survey data is analyzed with the statistical software R and partly with Excel. For each of the survey questions and statements, descriptive statistics are produced. The evidence on the external drivers is based on the full sample (n=326). The results for the behavioral drivers and the administration and management of the OG projects are largely based on the views of the OG members who participated in the survey (n=73).

The results of the FOREST4EU innovation survey will be further elaborated in the course of the project. They will be discussed with the Policy Focus Group members from Central, South-East and South-West Europe and analyzed in greater depth for D3.3 “Update of drivers in policies and administration for innovation in forestry and agroforestry” (M21). Beyond that, the survey results will be disseminated through scientific publications in the realm of innovation governance and forest and agroforestry policy.

4. Results from Innovation survey in FOREST4EU

External drivers for innovation in forestry and agroforestry

This chapter looks first at the external drivers for innovation and then highlights the results for the behavioral and attitudinal drivers of actors. We asked respondents if they believe that climate change and loss of biodiversity call for innovation in the sector and the result was very clear. Climate change, loss of biodiversity and changing demands in society on forests represent the major challenges faced by forestry to become innovative (Fig. 1, 2, 3).

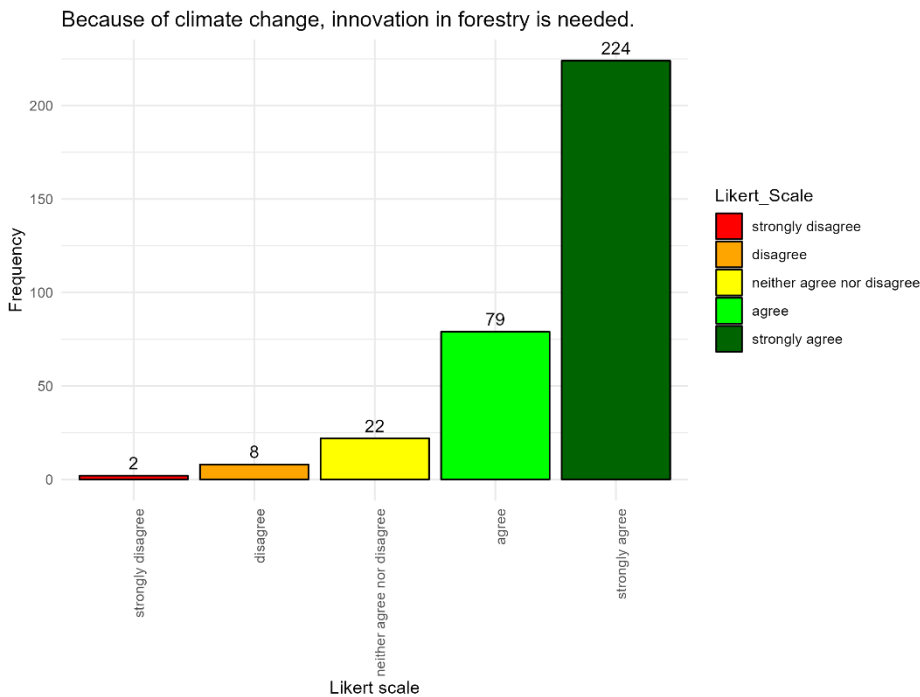


Figure 1: Climate change as driver for innovation

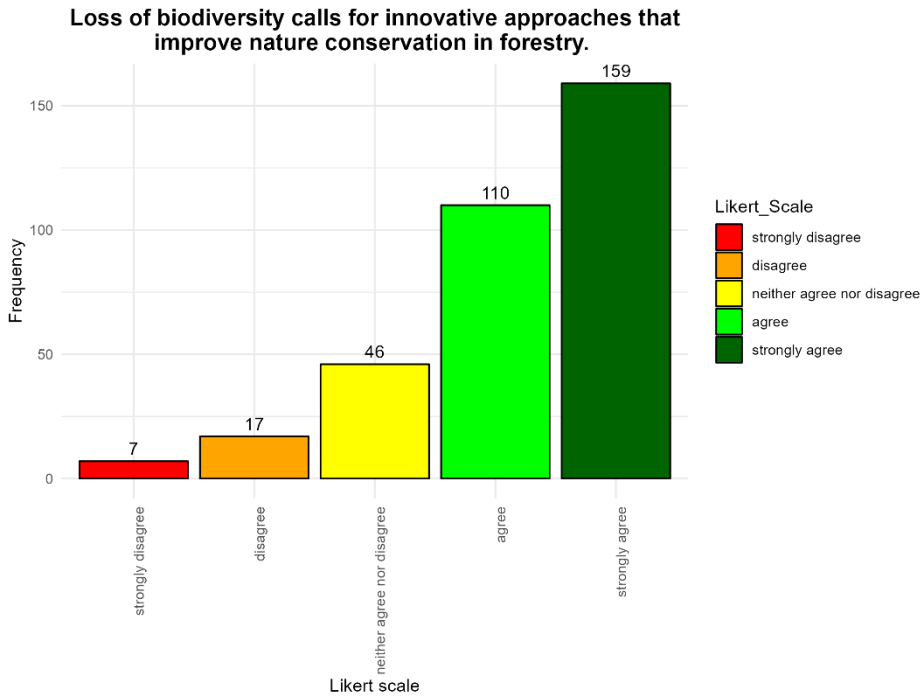


Figure 2: Loss of biodiversity as a driver for innovation

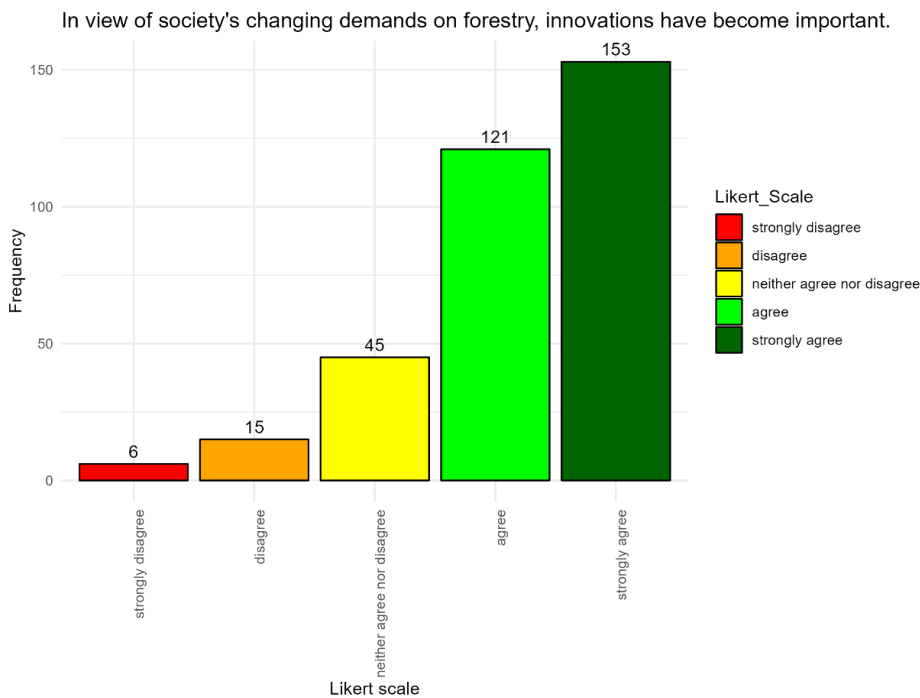


Figure 3: Changing demands of society on forestry as a driver for innovation

The influence of market drivers appears less compelling, though still strong. In our survey, we focused on the bioeconomy and markets for ecosystem services. The notion of bioeconomy covers different narratives: it emphasizes the importance of biotechnology research and application, focuses on the processing and upgrading of raw materials, and highlights ecological processes (Bugge et al. 2016). Because forests are Europe’s biggest renewable natural

resource in terms of energy supply and material supply, strategies to promote the bioeconomy are often well-received in the forest sector (Winkel et al. 2017).

The notion of forest ecosystem services (FES) denotes the essential role that ecosystems play for life on earth and economic systems (Mann et al. 2022). It is based on the Common International Classification of Ecosystem Services (CICES), which distinguishes between regulating, provisioning, and cultural ecosystem services. Markets for FES direct attention to a broader range of products and services than the traditional biomass production and go hand in hand with the development of valuation methods and payment schemes.

Overall, there is broad agreement that both the bioeconomy and emerging markets for FES trigger innovation (Fig. 4, 5). In the case of the bioeconomy, 70% of respondents perceive it as a driver whereas 60% indicated that markets for ES services is a driver for innovation in forestry and agroforestry. In the latter case, there is also a somewhat higher share of respondents who indicated that they would neither agree nor disagree and a substantial share that did not agree with this statement – representing more than one third of the respondents.

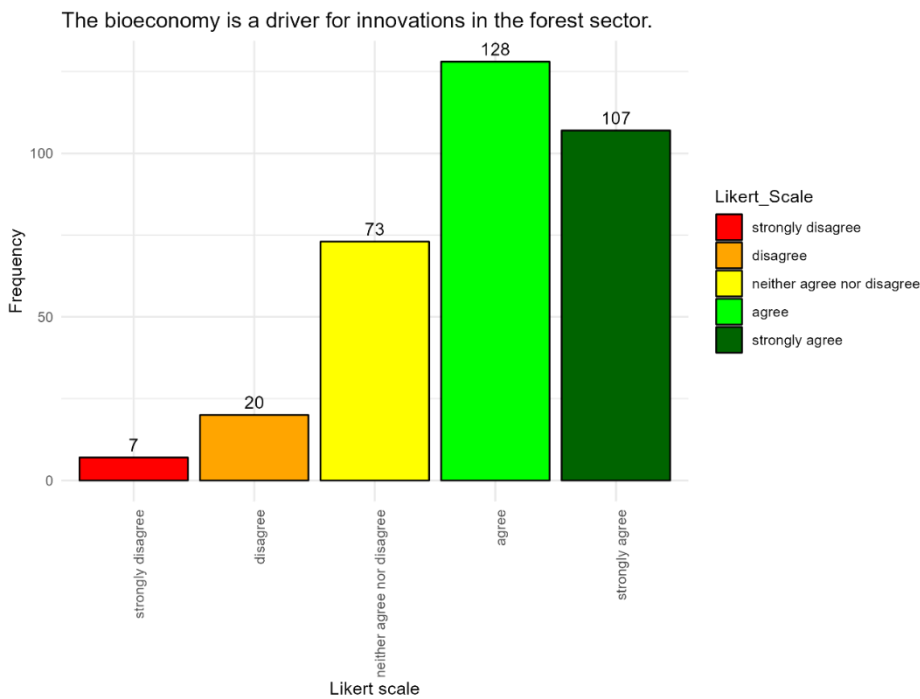


Figure 4: Bioeconomy as a driver for innovation

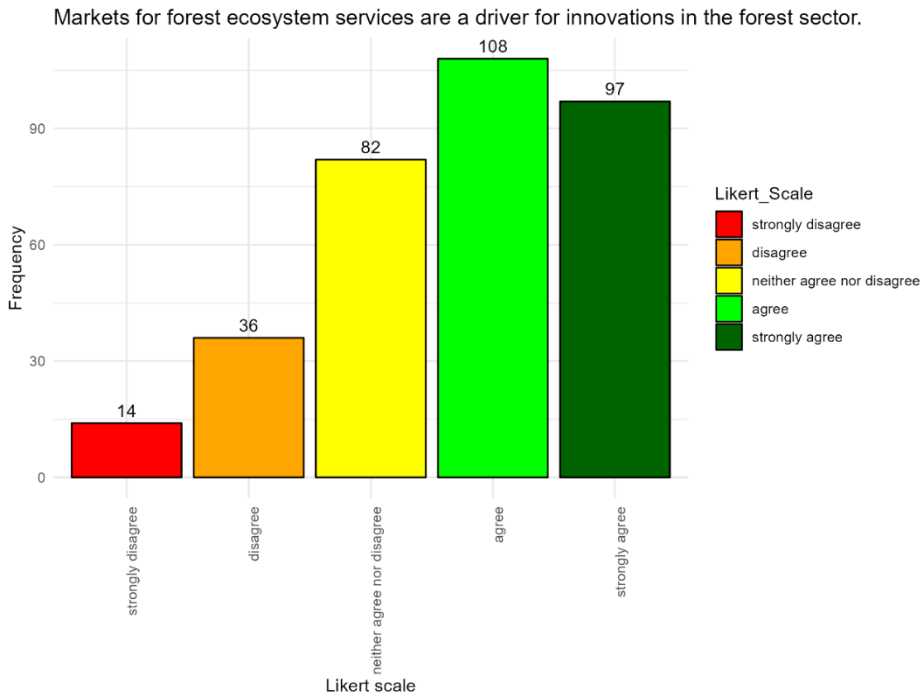


Figure 5: Markets for ES as a driver for innovation

Interestingly, the results suggest that government support programs play a subordinate role as a driver for innovation. Only 40% of the respondents are aware that relevant programs exist, whereas another 40% are unsure and 20% indicated that support programs for innovation in the forest sector do not exist in their country (Fig. 6).

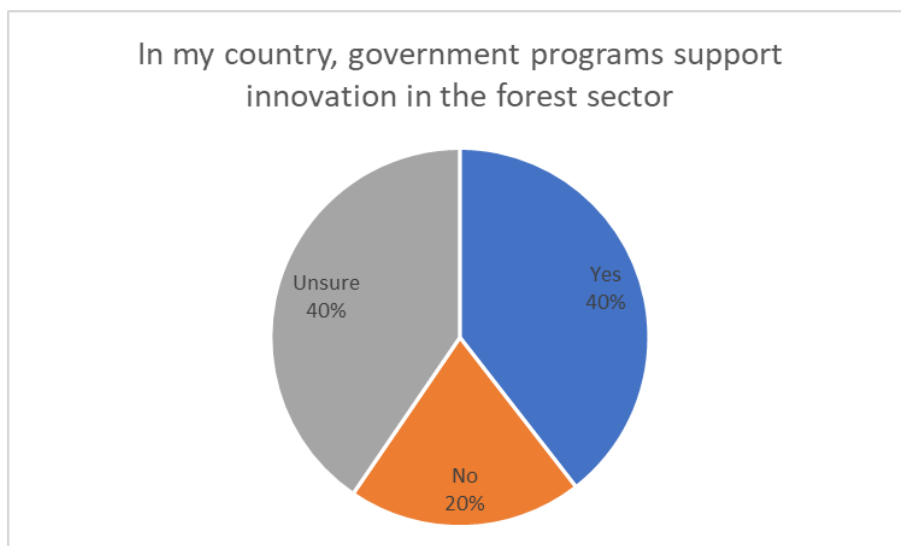


Figure 6: Perceived government support for innovation

Behavioral drivers for innovation in forestry and agroforestry

We have looked at the behavioral drivers mainly at the level of OGs (n=73), except those covering the role of knowledge. Knowledge and its transfer from research into practice plays a key role as can be seen in Figure 7.

Moreover, a large majority of respondents agree with the statement that “innovation is about implementing ideas into practice” (Fig. 8).

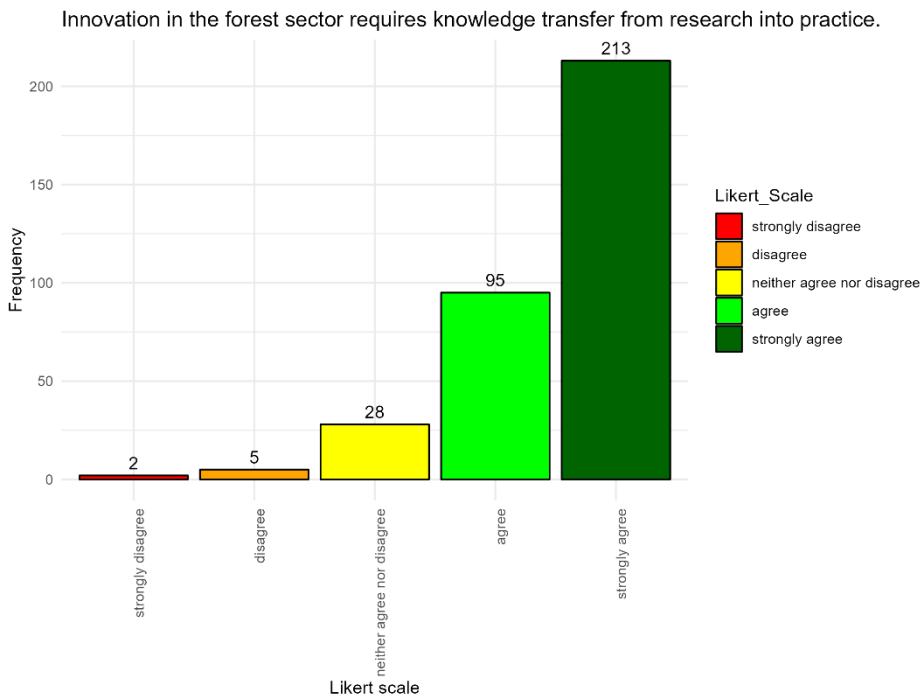


Figure 7: Role of knowledge transfer for innovation

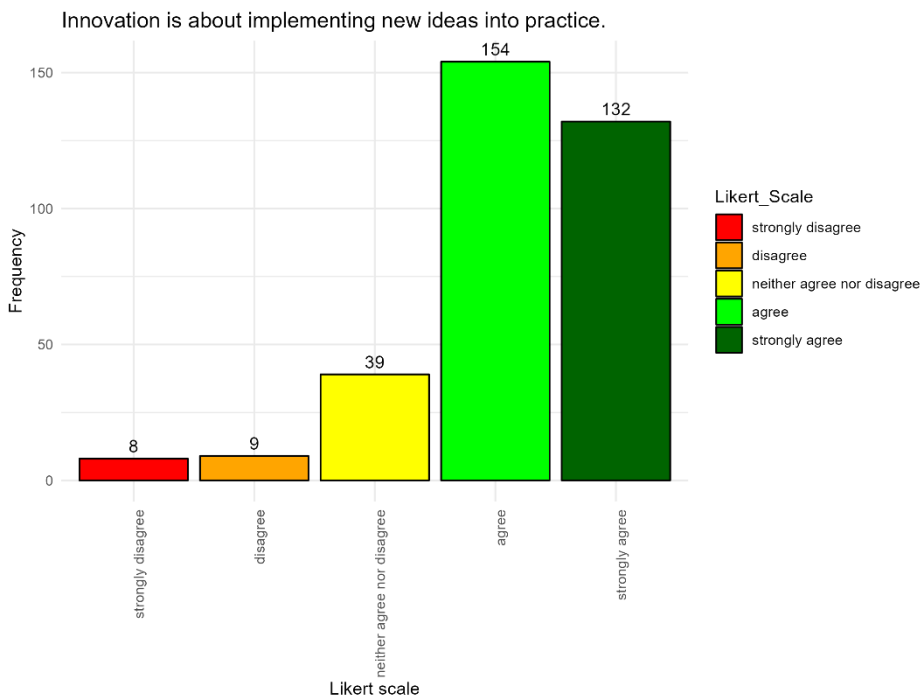


Figure 8: Innovation is about implementation of new ideas

At the level of OGs, there is a strong sentiment of innovations as novelties. Of the 73 OG members who have answered the survey, 61 indicated that they either agree or strongly agree with the statement that they “try out something

new”, i.e. 83% (Fig. 9). Apparently, however, the activeness of OG members is perceived to be varying a lot. Slightly more than half of the respondents (53%) agreed with the statement that all OG members are active whereas a large share either disagreed or were indecisive (Fig. 10).

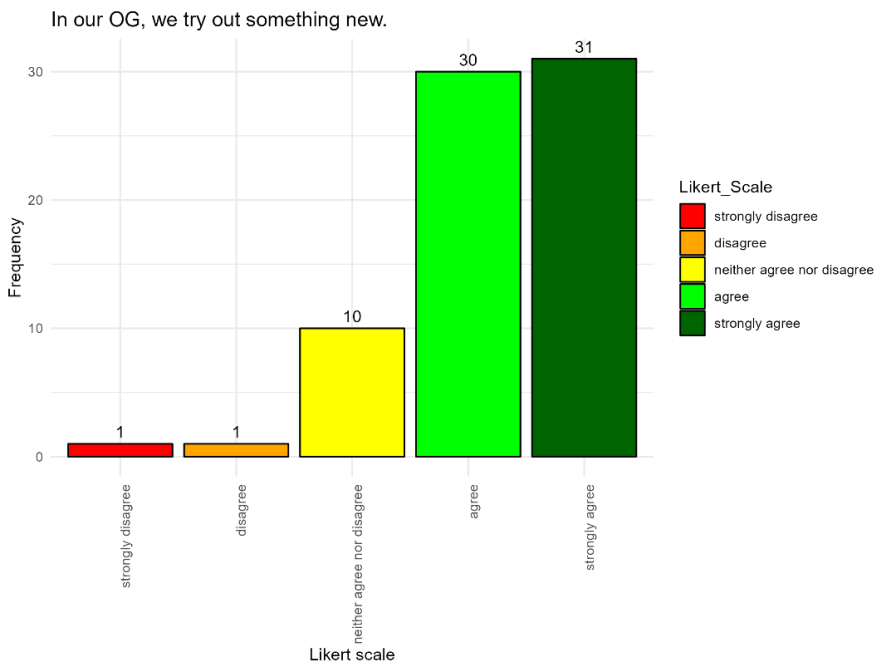


Figure 9: OGs try out something new

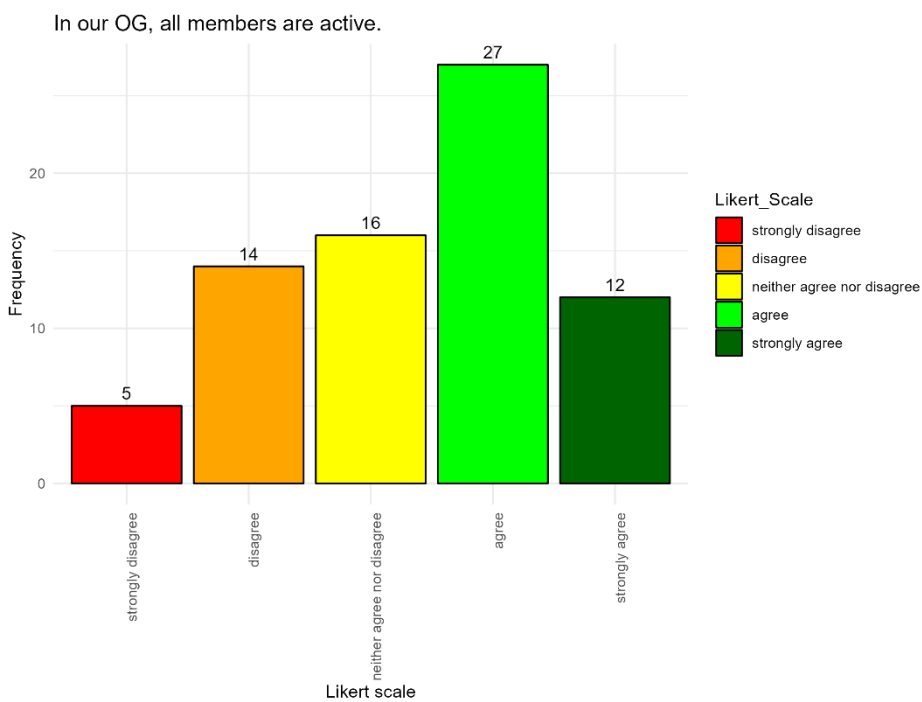


Figure 10: Perceived activeness of OG members

Administration and project management of EIP-Agri funding in forestry and agroforestry

This section directs attention to the administration and management of the EIP-Agri funded OGs. EIP-Agri funding for the practice-based projects is a means to translate novelties into solid solutions. Therefore, their administration and management are conceptualized as a potential driver for innovation in forestry and agroforestry. The analysis is based on the views of the 73 OG members who have participated in the survey. The presentation of the results starts with looking at the role of administrative rules and support, then shifting attention to the practical management of the OG projects. Overall, the results show a mixed picture.

The application procedure is largely perceived as difficult. Here, respondents were asked to rate the procedure on a Likert scale ranging between “complicated and very time consuming” at the one end and “simple” at the other end. One third of the respondents said that the application is either “complicated and very time consuming” or representing a “bad cost-benefit ratio”, whereas two thirds perceived it as “doable”. Only one OG member opted for “simple” (see Fig. 11). The application procedure – from submitting the proposal to obtaining the approval – takes one year on average (mean: 11,79 months) but ranging widely between 1 and 30 months.

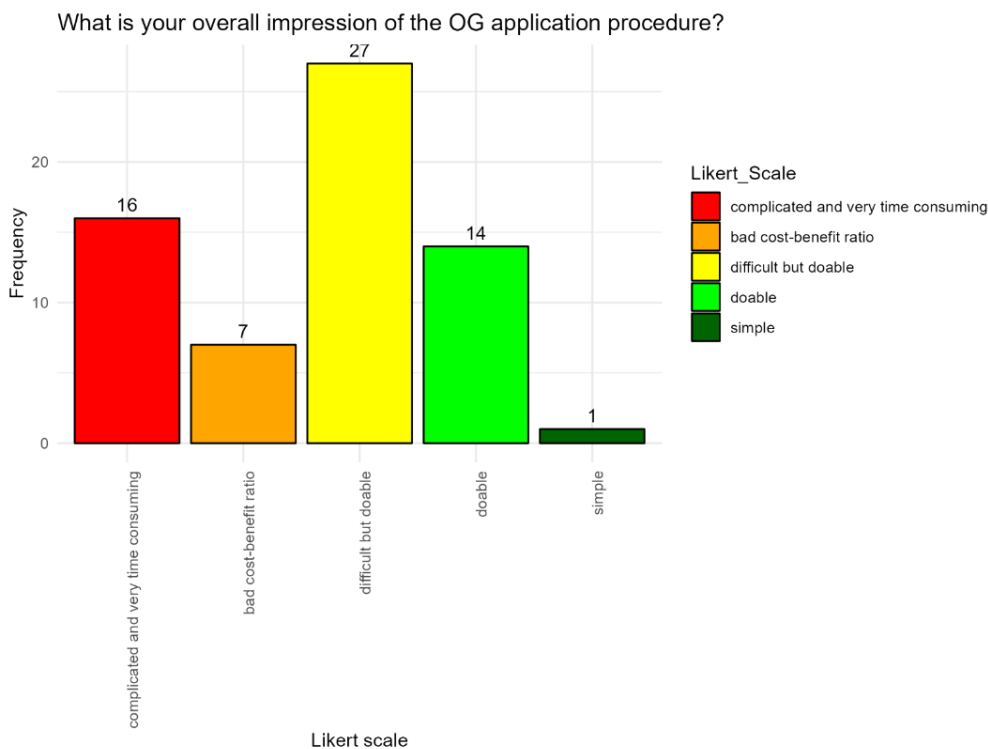


Figure 11: Impression application procedure EIP-Agri OGs

Respondents were indecisive to the statements that government authorities provided them with helpful advice in the event of difficulties. The mean is 3,09: A large share neither agrees nor disagrees. Furthermore, about one third (31%) of the respondents indicated that they do not receive helpful advice from authorities in the event of difficulties (Fig. 12).

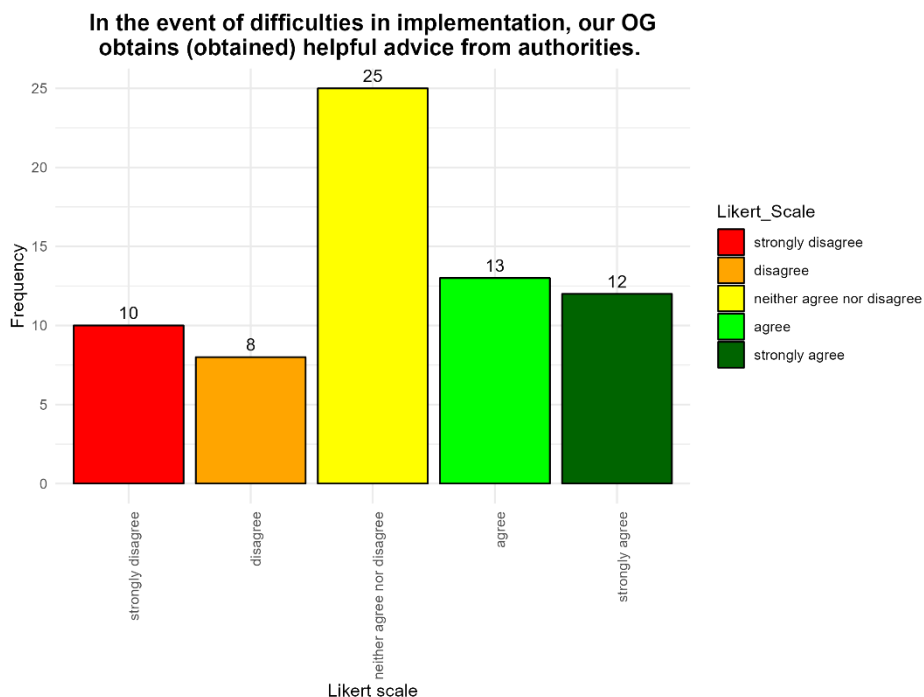


Figure 12: Obtaining helpful advice from authorities in the event of difficulties

Innovation requires the allocation of resources. Securing funding is a major challenge according to the interviewed OG members (Fig. 13). Respondents were also asked about the de minimis rule in forestry. The de minimis rule limits funding for agricultural and forestry measures to a certain ceiling or national cap in order to not distort competition between the Member States in the internal market (Commission Regulation No 1408/2013).⁴ In Bavaria, for instance, this cap is 400.000€ for agricultural measures of three years and 200.000€ for forestry measures. In the sample, almost half of the respondents (47,5%) said that the de minimis rule is too restrictive for innovation funding in forestry and agroforestry (Fig. 14). Three out of five (60%) respondents said that they needed more resources (staff, time, money) than planned (Fig. 15).

⁴ Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by the Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulation (EU) No 1305/2013 and (EU) No 1307/2013

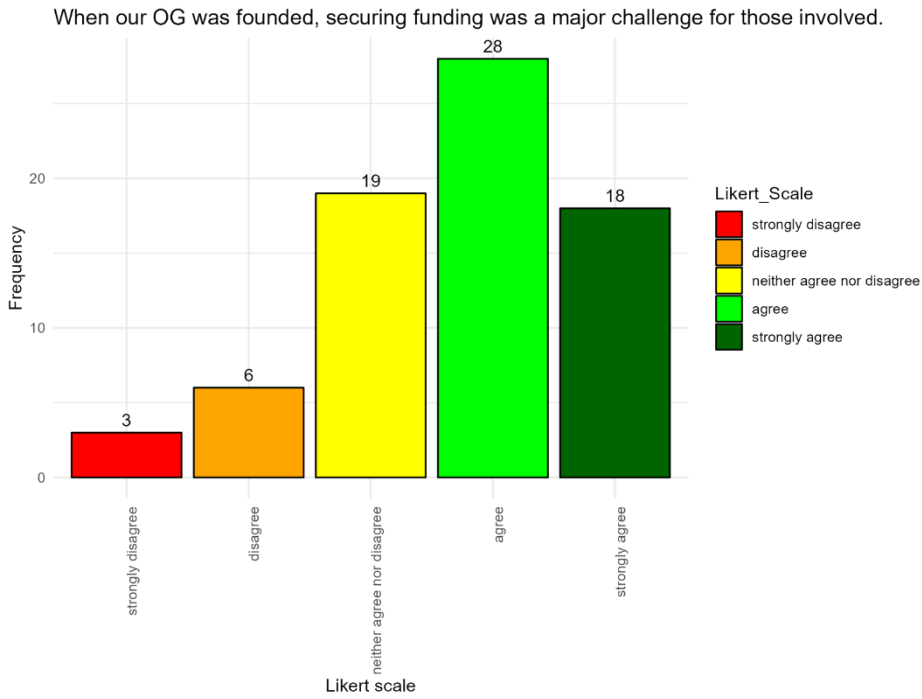


Figure 13: Securing funding for EIP-Agri OGs as a challenge

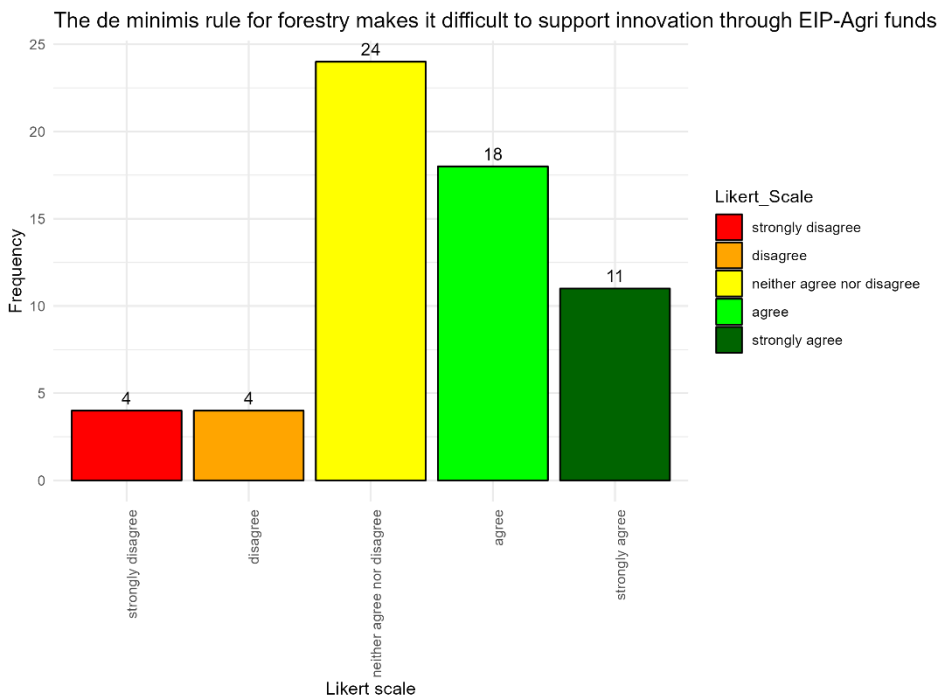


Figure 14: De minimis rule affecting EIP-Agri funding

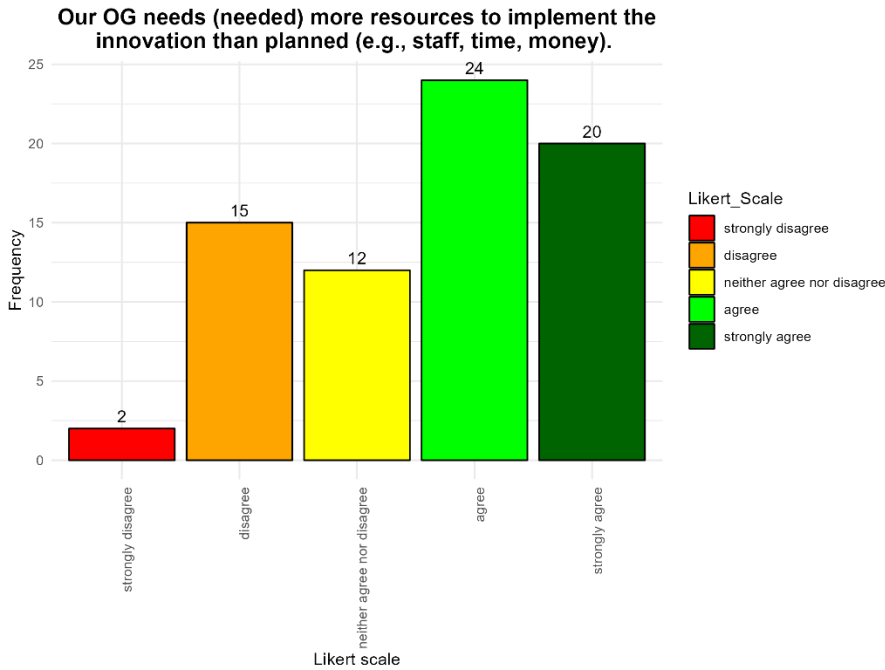


Figure 15: Resource needs in EIP-Agri OGs

Part of the explanation for the perceived resource constraint may have to do with the need to learn how to work together in the OG. One third (33,3%) agreed with the statement that they first had to learn to work together in their multi-actor partnership (Fig. 16).

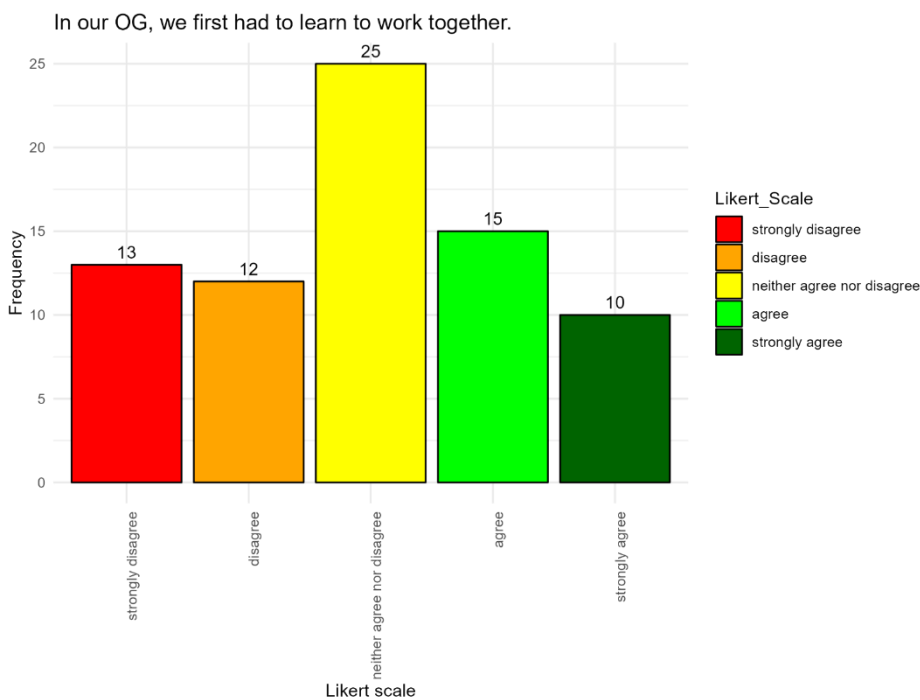


Figure 16: Learning to work together in EIP-Agri OGs

Respondents were quite clear in whether they would recommend the EIP Agri funding to peers. They opted for either “Yes” or “No”. Almost two thirds would recommend this funding measure, yet 38% would not (Fig. 17).

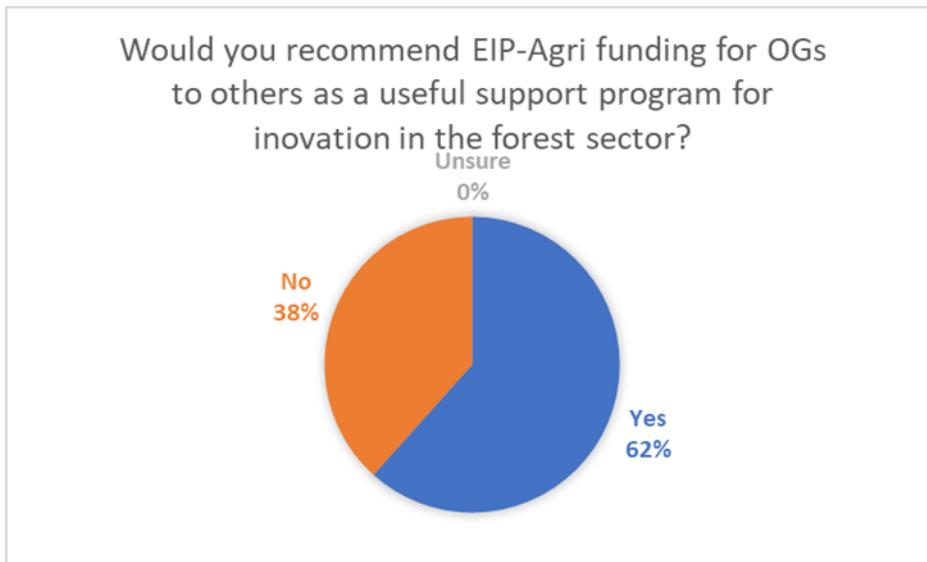


Figure 17: Recommending EIP-Agri funding to peers

5. Conclusions

Forests and agroforestry systems cover approx. 43% of the land in the European Union. They are subject to numerous policy debates because of their many benefits for people and the environment. For example, the ambition of the Green Deal to transform Europe into a “modern, resource efficient and competitive economy” is not feasible without forests and wooden lands.

The contribution of forestry and agroforestry to European policy goals cannot be taken for granted, however. The sector is faced with many challenges, incl. fragmented land ownership and climate change impacts, and is often characterized as traditional and mature. Accordingly, innovation is needed to address the challenges of forestry and agroforestry and contribute to policy goals. The present report presents new insights on enabling conditions for innovation in forestry and agroforestry. It is based on a European-wide survey with representatives from government authorities, interest groups, and practitioners (n=326), incl. 73 OG members.

The study distinguishes between external and behavioral drivers of innovation. External drivers refer to changes and developments external to what actors do. Behavioral drivers relate to specific traits and characteristics of what innovators – here OGs – do in order to be innovative. It is shown that climate change, loss of biodiversity, and changing expectations in society on forestry are major drivers for innovation. Moreover, market developments like a growing bioeconomy and markets for ecosystem services also hold great potential for innovation in forestry and agroforestry. Innovation in forestry and agroforestry is clearly about implementing new ideas into practice. A positive attitude towards knowledge transfer from research into practice and to “try out something new” are major behavioral drivers for innovation.

The role of government, however, seems to be ambivalent. The percentage of respondents who answered that they are aware of government programs for innovation is the same for those who answered that they are unsure, namely 40% each. Looking at the results for the administration and management of the EIP-Agri funded OGs as enabling innovation, some caution about the performance of this funding scheme seems appropriate. More often than not, the application procedure is perceived as very demanding. Furthermore, a large share of survey participants indicated that they did not receive helpful advice in the event of difficulties in implementation of their OG while resources are limited. Nonetheless, two thirds of the interviewed OG members would recommend the EIP-Agri funding as a useful support program for innovation in the forest sector.

The updated report on drivers and barriers in policies and administration (D3.3) will examine the constraints for innovation in forestry and agroforestry in greater depth. Together, both reports are vital for the ongoing dialogue with the policy makers, interest groups and researchers in the policy focus groups meetings in FOREST4EU and at EU level in Brussels, and for scientific publications.

6. Appendix

List of references

- Bennighof, F. K. M. (2022) Beeinflussung digitaler Innovationen in der deutschen Forstwirtschaft, TUM Master Thesis
- Bugge, M. M.; Hansen, T.; Klitkou, A. (2016) What is the bioeconomy? A review of the literature, *Sustainability* 8, 691
- Buttoud, G.; Kouplevatskaya-Buttoud, I.; Slee, B.; Weiss, G. (2011) Barriers to institutional learning and innovations in the forest sector in Europe: Markets, policies and stakeholders, *Forest Policy and Economics*, 13, 124-131
- Callegari, B.; Nybakk, E. (2022) Schumpeterian theory and research on forestry innovation and entrepreneurship: The state of the art, issues and an agenda, *Forest Policy and Economics*, 138
- Damanpour, F. (2017) *Organizational Innovation*, Oxford Research Encyclopedias, Business and Management. <https://doi.org/10.1093/acrefore/9780190224851.013.19>
- Fátima Oliveira, M. de; Gomes da Silva, F.; Ferreira, S.; Teixeira, M.; Damásio, H.; Dinis Ferreira, A.; Gonçalves, J. M. (2019) Innovations in Sustainable Agriculture: Case Study of Lis Valley Irrigation District, Portugal, *Sustainability*
- Gianetti, F.; Laschi, A.; Zorzi, I.; Foderi, C.; Cenni, E.; Guadagnino, C.; Pinzani, G.; Ermini, F.; Bottalico, F.; Milazzo, G.; Massai, L.; Errico, A.; Giambastiani, Y. (2023) Forest Sharing as an Innovative Facility for Sustainable Forest Management of Fragmented Forest Properties: First Results of Ist Implementation, *Land* 12, 521
- Hansen, E.; Nybakk, E.; Guerrero, J. (2019) Service innovation in forestry: The perspective of family forest owners, in: Hujala, T.; Toppinen, A.; Butler, B. J. (Eds.). (2019). *Services in family forestry*. Springer, 121-141
- Hansen, E.; Rasmussen, C. C.; Nybakk, E. (2017) Recessionary period activities in forest sector firms: Impacts on innovativeness, *Journal of Forest Economics*, 28, 80-86
- Innes, J. L. (2009) The promotion of 'innovation' in forestry: a role for government or others? *Journal of Integrative Environmental Sciences* 6, 201-215
- Laier, P. (2022) *Innovation, product and technology management*, TCW Transfer-Centrum für Produktions-Logistik und Technologie-Management GmbH & Co. KG, Munich
- Loft, L.; Schleyer, C.; Klingler, M.; Kister, J.; Zoll, F.; Stegmaier, P.; Aukes, E.; Sorge, S.; Mann, C. (2022) The development of governance innovations for the sustainable provision of forest ecosystem services in Europe: A comparative analysis of four pilot innovation processes, *Ecosystem Services* 58
- Louda, J.; Dubova, L.; Spacek, M.; Brnkalakova, S. Kluvankova, T. (2023) Factors affecting governance innovations for ecosystem services provision: Insights from two self-organized forest Communities in Czechia and Slovakia, *Ecosystem Services* 59
- Ludvig, A.; Sarkki, S.; Weiss, G.; Zivojinovic, I. (2021) Policy impacts on social innovation in forestry and back: Institutional change as a driver and outcome, *Forest Policy and Economics*, 122
- Ludvig, A.; Weiss, G.; Sarkki, S.; Nijnik, M.; Zivojinovic, I. (2018) Mapping European and forest related policies supporting social innovation for rural settings, *Forest Policy and Economics* 97, 146-152
- Mann, C.; Loft, L.; Hernandez-Morcillo, M.; Primmer, E.; Bussola, F.; Falco, E.; Geneletti, D.; Dobrowolska, E.; Grossmann, C. M.; Bottaro, G.; Schleyer, C.; Kluvankova, T.; Garcia, G.; Lovric, M.; Toralba, M.; Plieninger, T.; Winkel, G. (2022) Governance innovations for forest ecosystem service provision - Insights from an EU-wide survey, *Environmental Science and Policy* 132, 282-295
- Nichiforel, L.; Deuffic, P.; Jellesmark Thorsen, B.; Weiss, G.; Hujala, T.; Keary, K.; Lawrence, A.; Avdibegovic, M.; Dobsinska, Z.; Feliciano, D.; Gorriz-Mifsud, E.; Hoogstra-Klein, M.; Hrib, M.; Jarsky, V.; Jodlowski, K.; Lukmine, D.; Pezdevsek Malovrh, S.; Nedeljkovic, J.; Nonic, D.; Krajter Ostoic, S.; Pukall, K.; Rondeux, J.; Samara, T.; Sarvasova, Z.; Scriban, R. E.; Silingiene, R.; Sinko, M.; Stojanovskaja, M.; Stojanovski, V.; Toyonov, T.; Teder, M.; Vennesland, B.; Wilhelmsson, E.; Wilkes-Alemann, J.; Zivojinovic, I. Bouriaud, L. (2020) Two decades of forest-related legislation changes in European countries analysed from a property rights perspective, *Forest Policy and Economics*, 115, 102146
- Quiroga, S.; Suarez, S.; Ficko, A.; Feliciano, D.; Bouriaud, L.; Brahic, E.; Deuffic, P.; Dobsinska, Z.; Jarsky, V.; Lawrence, A.; Nybakk, E. (2019) What influences European private owners' affinity for subsidies? *Forest Policy and Economics*, 99, 136-144

- Rodrigues, C.; Teles, F. (2023) Community-led innovation: facts, rhetoric, and policy challenges, in: Territorial Innovation in Less Developed Regions. Governance, Technologies, and Sustainability, Teles, F.; Rodrigues Fernando Ramos, C.; Botelho, A.; Palgrave MacMillan, 1-6, <https://doi.org/10.1007/978-3-031-20577-4>
- Rogelja, T.; Ludvig, A.; Weiss, G.; Prah, J.; Shannon, M.; Secco, L. (2023) Analyzing social innovation as a process in rural areas: Key dimensions and success factors for the revival of the traditional charcoal burning in Slovenia, *Journal of Rural Studies*, 97, pp. 517-533
- Santiago-Freijanes, J.J.; Pisanelli, A.; Rois-Diaz, M.; Aldrey-Vazquez, J.A.; Riguero-Rodriguez, A.; Plantera, A.; Vityi, A.; Lojka, B.; Ferreiro-Dominguez, N.; Mosquera-Losada, M.R. (2018) Agroforestry development in Europe: Policy issues, *Land Use Policy* 76, 144-156
- Sterbova, M.; Stojanovski, V.; Weiss, G.; Salka, J. (2019) Innovating in a traditional sector: Innovation in forest harvesting in Slovakia and Macedonia, *Forest Policy and Economics*, 106
- Sipikal, M. (2013) Tailoring innovation policies to sectors and regions - The case of Slovakia. *DANUBE: Law and Economics Review* 4, 277-291
- Sterbova, M.; Vybostok, J.; Salka, J. (2021) A classification of eco-innovators: Insights from the Slovak forestry service sector *Forest Policy and Economics*, 123
- Varela, E.; Olaizola, A. M.; Blasco, I.; Capdevila, C.; Lecegui, A.; Casaus, I.; Bernues, A.; Martin-Collado, D. (2022) Unravelling opportunities, synergies, and barriers for enhancing silvopastoralism in the Mediterranean, *Land Use Policy* 118
- Weiss, G.; Ludvig, A.; Zivojinovic, I. (2023) Embracing the non-wood forest products potential for bioeconomy - Analyses of innovation cases across Europe, *Land*, 12
- Weiss, G.; Hansen, E.; Ludvig, A.; Nybakk, E.; Toppinen, A. (2021) Innovation governance in the forest sector: Reviewing concepts, trends and gaps, *Forest Policy and Economics*, 130
- Weiss, G.; Ludvig, A.; Zivojinovic, I. (2020) Four decades of innovation research in forestry and the forest-based industries - A systematic literature review, *Forest Policy and Economics*, 120
- Winkel, G. (ed.) (2017) Towards a sustainable European-based forest-based bioeconomy – assessment and way forward, *EFI What science can tell us* 8, <https://efi.int/publications-bank/towards-sustainable-european-forest-based-bioeconomy-assessment-and-way-forward>

Survey design

Question No.	Category influencing factor	0. Intro	Answer categories
		<p>Hello! The FOREST4EU project seeks to reveal how innovations in the forest sector can be improved. To this end, we would like to learn about your views and perspectives on the topic - either because you are a practitioner, policy-maker or interested stakeholder in the field of forestry and/or agroforestry. The online survey is open until February 18, 2024 and will be conducted in 11 different languages across Europe. The anonymised finding will inform our discussions with policy-makers and interest groups, and will be made available on our website and FOREST4EU on LinkedIn. You can register in our stakeholder database to stay up to date on the project's progress.</p>	
		I. Your view of general conditions for innovations in the forest sector	
1.	General	The forest sector is innovative if ...	Please conclude the sentence
2.	General	How innovative is the forest sector in general in your country?	5 point Likert scale, n.a.
3.	Knowledge	Innovation is about implementing new ideas into practice.	5 point Likert scale, n.a.
4.	Knowledge	Innovation in the forest sector requires knowledge transfer from research into practice.	5 point Likert scale, n.a.
5.	Environment	Because of climate change, innovation in forestry is needed.	5 point Likert scale, n.a.
6.	Environment	Loss of biodiversity calls for innovative approaches that improve nature conservation in forestry.	5 point Likert scale, n.a.
7.	Society	In view of society's changing demands on forestry, innovations have become important.	5 point Likert scale, n.a.
8.	Markets	The bioeconomy is a driver for innovations in the forest sector.	5 point Likert scale, n.a.
9.	Markets	Markets for forest ecosystem services are a driver for innovations in the forest sector.	5 point Likert scale, n.a.
10.	Markets	Innovations in the forest sector do not bring direct profit.	5 point Likert scale, n.a.
11.	Markets	In my country I am aware of at least 3 start-ups in the forest sector with innovative business models.	5 point Likert scale, n.a.
12.	Government & Policy	In my country, government programs support innovations in the forest sector.	yes - unsure - no, n.a.
13.	Government & Policy	Government support programs for innovations in forestry should focus on the following:	Drop down list with answer categories (multiple choice, three answers max.): Forest

			management, Agroforestry systems, Adaptation to climate change, Climate protection, Nature conservation, Renewable energies, Rural development, Social issues, Forest & health topics, Income support, Incentives for entrepreneurship, Other
14.	Government & Policy	In my country, there is EIP-Agri funding for Operational Groups in the forest sector.	yes - unsure - no, n.a.
15.		Are you or have you been a member of an Operational Group?	yes - no
		If yes, we would like to ask more specifically about the conditions for innovation of your OG.	
		II. OG-specific influencing factors	
16.	General	Which topic most closely covers the innovation of your OG?	Drop down list with answer categories (multiple choice): Wood mobilization, Establishing new value chains, New business models, Digital solutions for forests/agroforestry, Adaptation to climate change, Forest management, Ecosystem services, Non-wood forest products, Agroforestry systems, Other
17.	General	Which type of innovation is implemented in your OG?	Drop down list with answer categories (multiple choice): Introduction of new technology, Introduction of new process/methodology, New product, New service, Organizational renewal, Social issues (inclusion of local population, collaboration with civil society, "social forestry"), Other

18.	Values & attitudes	In our OG, we try out something new.	5 point Likert scale, n.a.
19.	Values & attitudes	Failure is a part of innovation processes.	5 point Likert scale, n.a.
20.	General	In our OG, the practical implementation of the innovative idea is (was) more difficult than planned.	5 point Likert scale, n.a.
21.	Knowledge	I try to stay up to date about the topic that covers the innovation of our OG.	
22.	Knowledge	Which channels do you use to stay up to date on the topic of your OG?	Drop down list with answer categories (multiple choice): print, social media, websites, newsletter, email list, events, excursions, talking to colleagues, foreign contacts, Other
23.	Knowledge	Please evaluate the importance of forestry research for your practical work in the OG.	5 point Likert scale, n.a.
24.	Cooperation	Please select the sectors that collaborate in your OG.	Drop down list with answer categories (multiple choice): Forst owners, Forestry, Farming, Research, Wood processing/manufacturing, Food, Industry, Services, Policy, Administration, Consulting, Associations, Civil society, Other
25.	Cooperation	For me it is easier to work with people from forestry than with people based in other sectors.	5 point Likert scale, n.a.
26.	Cooperation	In our OG, we first had to learn to work together.	5 point Likert scale, n.a.
27.	Cooperation	In our OG, all members are active.	5 point Likert scale, n.a.
28.	Resources	When our OG was founded, securing funding was a major challenge for those involved.	5 point Likert scale, n.a.
29.	Resources	Our OG needs (needed) more resources to implement the innovation than planned (e.g., staff, time, money).	5 point Likert scale, n.a.
30.	Government & Policy	In the event of difficulties in implementation, our OG obtains (obtained) helpful advice from authorities.	5 point Likert scale, n.a.
31.	Government & Policy	The de minimis rule for forestry makes it difficult to support innovation through EIP-Agri funds.	5 point Likert scale, n.a.
		III. Application procedure OG	
32.		In my country, information about EIP-Agri funding for innovation can be easily found.	5 point Likert scale
33.		How many members are (were) involved in your OG?	Window for number
34.		How many months did it take from the time you submitted the application for the OG to the time it was approved by the relevant authority?	Window for months

35.		What is your overall impression of the OG application procedure?	5 point Likert scale
36.		How do (did) you perceive the project management for your OG?	5 point Likert scale
37.		Would you recommend EIP-Agri funding for OGs to others as a useful support program for innovation in the forest sector?	yes - unsure - no, n.a.
<p>Thank you for taking the time to complete our questionnaire. To better understand your views, we would like to ask you to provide a few details about yourself as a person and your professional activities.</p>			
IV. End			
38.		In which country and region do you live?	Drop down list of 27 EU Member States. Add the list of regions because implementation of EIP Agri differs between regions (NUTS 2 or 3)
39.		Are you a forest owner?	Yes, No
40.		Are you a farmer?	Yes, No
41.		In which area do you work?	Drop down List (One answer): Private forest enterprise, Public forest enterprise, Municipal forest, Forest owner cooperative, Forest-based industry, Farming, (Non-forestry) enterprise, Start-up, Self-employed, Consulting, Research, Education, Ministry, Administration, EU-Commission, Politician, Forest Owner Association, Environmental NGO, Other
42.		What is your year of birth?	Window for year
43.		What is the highest level of education that you have completed?	Drop down List (One answer): 0 = early childhood education (less than primary education) 1 = primary education 2 = lower secondary education (entrance level certificate for vocational training programs) 3 = upper secondary

			education (entrance level certificate for university programs) 4 = vocational training (post-secondary non-tertiary education) 5 = professional training (short cycle tertiary education, non-academic) 6 = bachelor level education 7 = master level education 8 = doctoral level education
44.		Sex	female, male, diverse

Response to survey

Overall, 125 women and 194 men answered the survey. Two respondents indicated that they are diverse, five did not announce their sex. The highest share of respondents lives in Italy. Large numbers of respondents also live in Germany, Croatia, Portugal, Spain, and Finland. Overall, the FOREST4EU partner countries are well represented in the survey (Fig. 18)

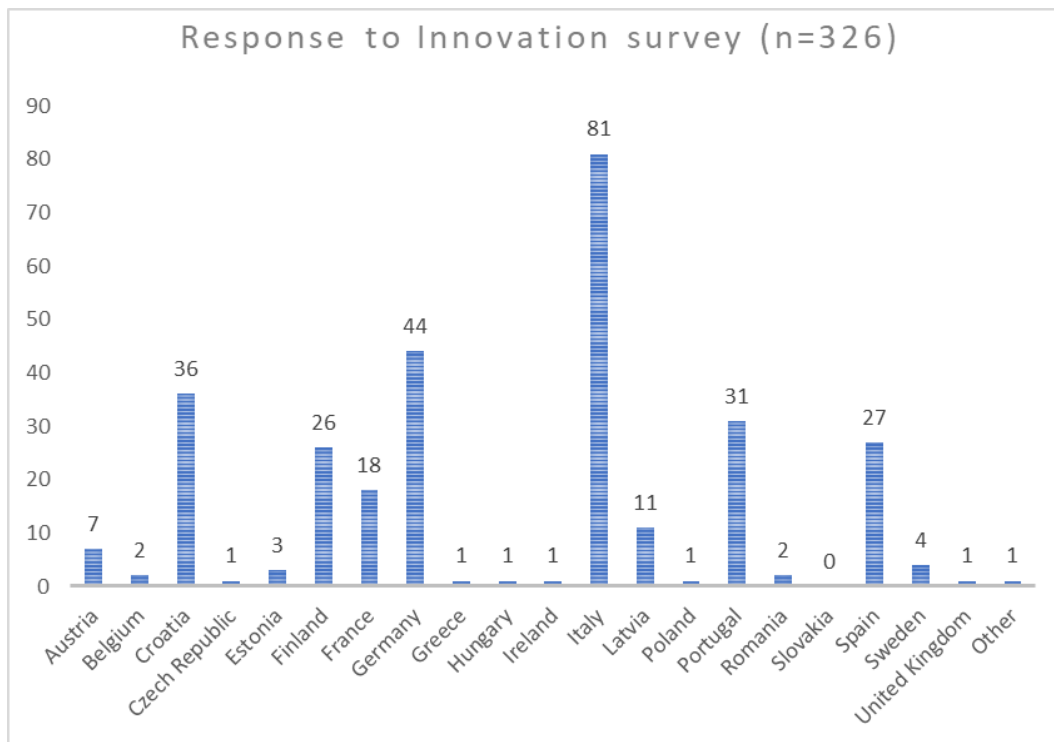


Figure 18: Country response to FOREST4EU survey

326 people have answered the survey. Farmers and the forest-based sector represent 26% of the sample. The largest share of respondents, however, works in research and consulting (39%). Government representatives constitute 15% whereas self-employed people and enterprises represent 9% of the sample. Rather few NGO representatives participated in the survey (Fig. 19).

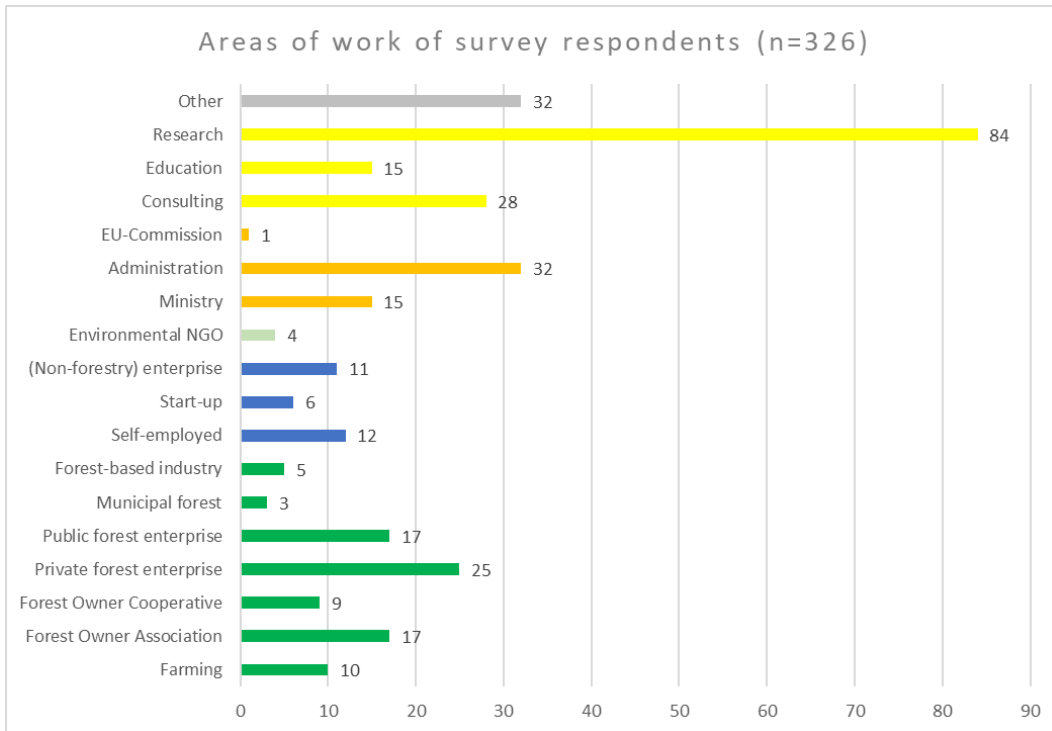


Figure 19: Respondents' areas of work