

# Agroforestry innovation networks (AFINET): Knowledge Transfer and Innovation

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**Abstract** Agroforestry is recognised as climate-smart agriculture, being a powerful tool for climate change mitigation and adaptation. Considering knowledge transfer a capital challenge to overcome the needed transition towards this for the European Commission, the AFINET (Agroforestry Innovation NETWORKS) project intended to boost a groforestry through a multi-actor approach by defining challenges and providing solutions for end-users. Knowledge transfer is key to maximize dissemination, being innovation networks an instrument that allows the source of knowledge to reach end-users straightforwardly. As part of AFINET, a list of a groforestry innovations was elaborated according to the challenges and bottlenecks raised by end-users enrolled in the project. To obtain the list, regional groups of local stakeholders (RAINS) were created in the nine covered countries involving over 1400 participants. Regional Innovation Network (RAIN) meetings were organized with innovations as focus, providing finally 96 innovations grouped in topics; i) technical challenge, ii) economical challenge, iii) communication/education challenge and iv) policy and governance challenge. Education for consumers, CAP as a major agricultural and forest land use driver, but mainly technical innovations linked to design and farming systems and economic challenges were highlighted by actors on the importance of woody perennials use in a agricultural lands or performance from forestlands in Europe.

**Keywords:** Climate change, Agriculture, Circular Economy, Bioeconomy, Stakeholders.

## 1. Introduction

Agroforestry (AF) is largely recognised as climate-smart agriculture and, therefore, is considered a powerful tool for mitigation and adaptation on climate change (FAO and ICRAF 2019). Consequently, AF implementation, is supported by the European Commission (EC) through different strategies within the European Commission's Green Deal as the From Farm to Fork and the 2030 Biodiversity strategy (EC 2020a, b). Furthermore, AF is also considered key on the Green Architecture of the new CAP. In order to achieve its objectives, EC considers knowledge transfer one of the main challenges to overcome the needed

transition towards a sustainable agriculture. Thus, the AFINET (Agroforestry innovation network) project, funded by the H2020 Programme of the EC, intended to boost AF in Europe through multi-actor approach by defining challenges and providing solutions for end-users. As defined by the EIP-Agri, an innovation is "a new idea that proves successful in practice" (EC 2014). Considering knowledge transfer key to maximize dissemination, innovation networks are a perfect tool that allows the source of knowledge reaching end-users straightforwardly achieving the scientific knowledge to be applied. The overall objective of this manuscript is to disseminate the final list of innovations obtained through the AFINET Project for the promotion and innovation of the European Agroforestry.

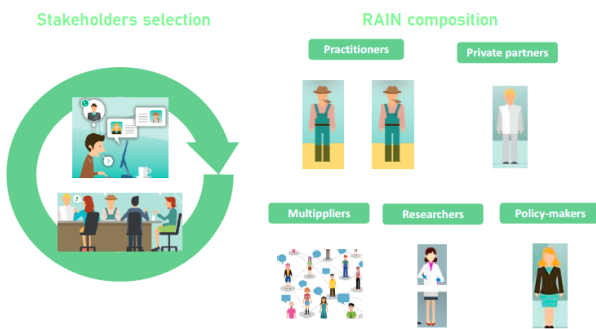
## 2. Agroforestry Innovation Networks

The AFINET project (AFINET 2019) started in 2017 for a total time extension of 4 years. With 13 partners from 9 different countries (Fig. 1), it was based on the creation of a European Interregional network consisting of nine "Regional Agroforestry Innovation Networks – RAINs" in nine strategic regions involving different climatic, social, geographic and cultural circumstances at the European level. The RAINs were created on a multi-actor approach basis (Fig. 2), through the figure of the Innovation Broker as RAIN manager and bonding, and including stakeholders such as farmers, policymakers, advisors, extension services, researchers etc. Five RAIN meetings were organized, being (i) the first one allocated to identify the main challenges, (ii) the second one to find potential solutions for the identified and the third one to (iii) validate the innovations list to reach the final list of innovations. These three first meetings, ground for this paperwork, were complemented by two additional RAIN meetings on (iv) the establishment of synergies, and (v) the presentation of the dissemination materials created based on the Final List of Innovations.



**Figure 1.** AFINET partners origin

For its development, innovations were grouped in topics based on the agreed main challenges from the second RAIN meeting.



**Figure 2.** RAINs creation and stakeholders involvement

### 3. Results and discussion

The AFINET project obtained a broad set of results from its proposed goals and objectives. The Final List of Innovations is a major result that allows project completion. The topics that Innovations cover are (i) the technical challenge, including four innovation clusters: livestock management, lower story, woody perennial management and a horizontal innovation cluster linked to several specific innovations; (ii) the economical challenge with 18 specific innovations; (iii) the communication/education challenge involving six specific innovations and (iv) the policy and governance challenge related to 10 specific innovations. Considering the aforementioned, a set of 34 broad innovation topics (Table 1) were considered for a total of 95 innovations in the Final List of Innovations result from the previous RAIN meetings.

Continuous learning, Design, Farming systems, Alternative use of woody component, Marketing, Pruning and Lower Story Management are the more requested topics.

**Table 1.** List of broad innovation topics obtained from the RAIN meetings. Numbers between brackets indicate the number of specific innovations linked to the topic.

INNOVATION TOPICS			
Continuous learning (13)	Design (9)	Farming systems (7)	Alternative use of woody component (7)
Marketing (7)	Pruning (5)	Lower story management (4)	Climate change (3)
Tree management (3)	Recreation (3)	Hedgerows (3)	Tree fodder (2)
Soil management (2)	Farmers cooperation (2)	Medicinal plants (2)	Economic analyses (2)
Consumer education (2)	Woody perennial varieties (2)	Mushrooms (2)	Biodiversity (1)
Fertilization (1)	Forest management (1)	Lower story quality (1)	Lower story varieties (1)
Regular education (1)	Forestry (1)	Restoration (1)	Animal welfare (1)
Lower story adaptation (1)	Fire risk (1)	Protectors (1)	Animal feeding (1)
Digitization (1)	Irrigation (1)		

The Final List of Innovations is an end-user-based tool that provides support for key policies within the European CAP as the echo schemes (EC 2021). In this way, knowledge and dissemination materials, as a subsequent step within the AFINET project, offer support on policies application for both administration and farmers, being key to identify the potential end-users target group in order to adapt dissemination materials. Dissemination materials were created in different formats trying to maximize the range and reach the maximum amount of stakeholders. Thus, more than 30 videos including innovation tutorials ([AFINET youtube channel](#)), 6 newsletters, 45 factsheets and 106 practice abstracts were included in the [AFINET Handbook](#), but also the AGFORWARD Project translated Leaflets (AGFORWARD 2014). In addition, all this material was compiled and included in the OpenAir based AFINET Knowledge Cloud. The Innovation list also favours regions to identify potential synergies between regions, with the collaboration of the innovation broker, based on common challenges and possible best practices.

### 4. Conclusion

The Final List of Innovations includes the inputs of more than 1400 stakeholders participating in the first three RAIN meetings of the AFINET project. Technical and economic challenges were highlighted by end-users as key for sustainable development in the future, being the promotion of woody perennials one of the main concerns both for economic complementation in agricultural land and the agricultural production in forest land, but also high value trees with multiple uses. In order to fill the existing gaps between rural and urban areas educational challenges were raised, as well as the importance of a new CAP adapted to the promotion and implementation of a groforestry in Europe.

## **Acknowledgements**

This study has been supported by the European Commission through the AFINET project (grant agreement no 727872) and XUNTA DE GALICIA, Consellería de Cultura, Educación e Ordenación Universitaria (“Programa de axudas á etapa posdoutoral modalidade B DOG nº 213, 08/11/2019 p.48018, exp: ED481D2019/009”).

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