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AGRICULTURE & INNOVATION



EIP-AGRI Focus Group

Agroforestry

MINIPAPER 7: A territorial approach to agroforestry development: from theory to practice
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Introduction

Developing agroforestry in an efficient, sustainable way requires dealing with a wide array of subjects/disciplines, taking into consideration a diversity of perspectives and scales. Agroforestry, in its full definition, falls at the crossroad of sectors such as production of food and other goods (timber, energy...), natural resource management, biodiversity preservation, soil regeneration, climate change mitigation and adaptation, etc.

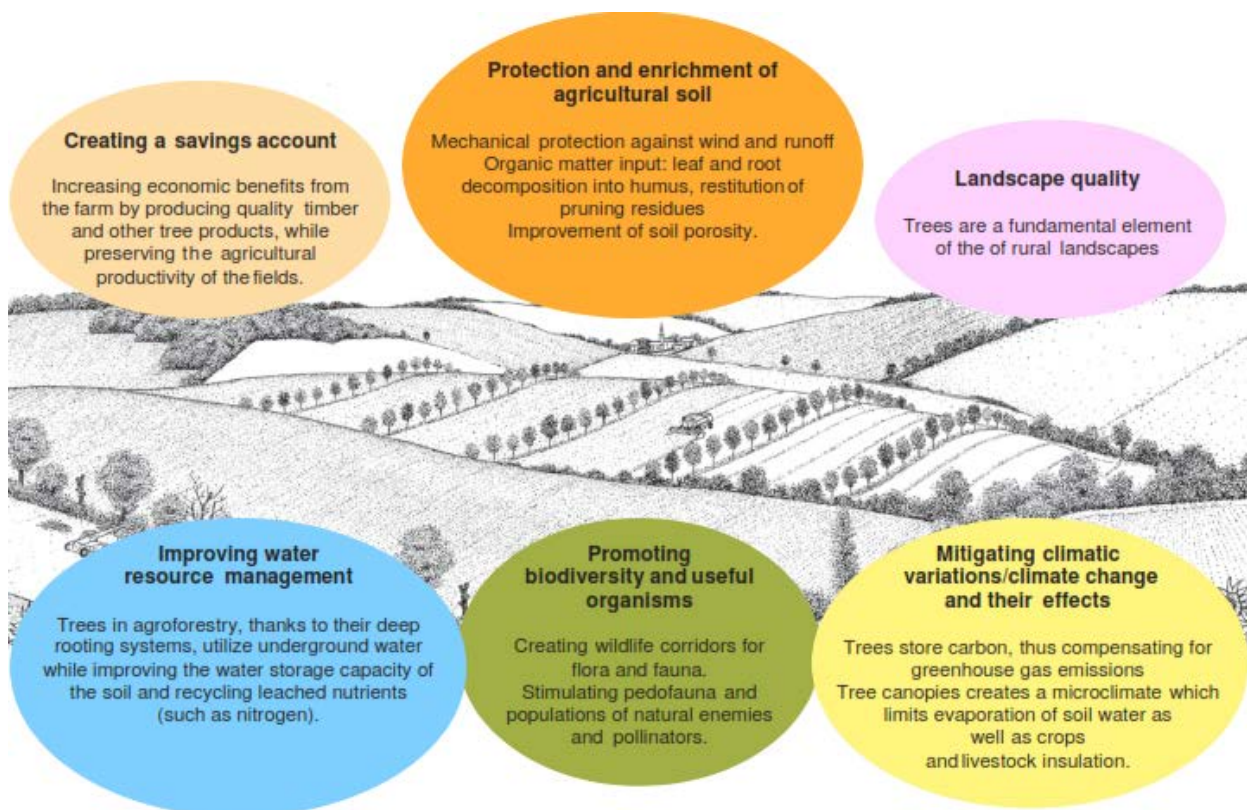
This implies that agroforestry, as a deeply cross-sectoral topic, needs for its development the cooperation of all landscape stakeholders, at a territorial level and beyond.

Whereas a lot of development initiatives are being implemented here and there, still a lot is to be done to make them more successful and connect them together.

Agroforestry, at the landscape level

Trees, if appropriately positioned and managed in the agricultural area are capable of protecting while producing. The right tree in the right place, for the right usage and with the right management strategy...

At the landscape level, agroforestry aims at making the most useful use of space and resources, increasing the productivity of each and every available square meter of land. Trees can help build a productive landscape even by just "filling up" the gaps between fields (hedges), on riparian areas (buffers), on field corner (tree clumps) or along roads and pathways (tree lines and hedges). Larger plots can also be divided into smaller strips using alley cropping. All of these tree arrangements will contribute to producing more biomass (photosynthesis intensification), thus more marketable products, while creating ecological connections and providing ecosystem services.



Building locally-based innovation networks

But agroforestry most importantly aims at integrating trees and shrubs (in a word, woody perennials) into agronomy and farming practices, thus implying a global change at the system level, requiring not only a wide set of agro-ecological knowledge and specific technical skills (managing trees in the middle of crops and the other way around), but also a great amount of practical innovation. As always in farming, but with a certainly greater extent in agroforestry, farmers are the keystone of development.

Day after day, innovative farmers integrate empirical knowledge with new, site specific experience gained through practice and experience. Exchanges among farmers and between farmers and other practitioners (extensionists, etc.) are essential to acquiring new knowledge. Facilitation work play a key role in encouraging experience transfer, analyzing successes and failures, and identifying new practices to be explored. This requires local development organizations/extension services working on building and implementing farmer-centered dynamics in each and every territory to help stimulate innovation, share views and ideas, and create a collective momentum on the subject. This should involve not only farmers from every major type of system in the area but also all professionals who could find interest in/contribute to agroforestry development at the landscape level (river conservationists, foresters, highway engineers, beekeepers, wildlife conservation officers, etc.).

Validating innovation: linking research to the field... and vice versa

While field-based innovation is the basis for sound technical solutions easily appropriable by farmers, research has an essential contribution to bring to the challenge of improving farming practices. When embedded into development, research is an important ally to assess results and propose solutions to identified bottlenecks. Practical experience and technical questions emerging from the field can (should) also feed into research projects, helping to understand in more depth the do and don'ts of agroforestry.

In addition to R&D, technical training of farmers and practitioners is also a critical point to build a common understanding of the subject and ensure efficient cooperation (and sustainable agroforestry development) at a territorial level.



Up-scaling and out-scaling: connecting networks

While grassroots, innovative networks are essential to “build up” locally-adapted, well-thought agroforestry systems, it is also necessary to connect those networks together to help compiling/sharing knowledge at a wider geographical scale.

National agroforestry associations, in countries where they exist, are aimed at ensuring such connection/cooperation and make agroforestry development initiatives more visible/efficient, helping recognition of the work being done locally, on every territory.

As an example, in France two main networking initiatives help reach this objective:

- The Rural Network for Agroforestry (RRAF)¹ bringing local agroforestry networks in each of the 13 administrative regions of France together;
- The Mixed Technological Network (RMT) for agroforestry, connecting together research organizations, development and extension stakeholders, and teaching/training bodies.

At a wider level, the European Agroforestry Federation (EURAF) was created in 2011 to connect existing national associations across Europe together, thus building further a collaborative network aiming at sharing experiences, informing, communicating and raising awareness among every sector of society (from consumers to decision-makers). EURAF also is a key tool to take the agroforestry challenge to the EU level, helping to integrate it to the EC working groups/discussions and policy agenda.

An example from South-West France: The “Agr’eau” innovation network, an initiative for and by farmers

Over 20 years of agroforestry and restoration agriculture experience in South-West France have led stakeholders to work together on continually “upgrading” their approach based on practice, research, and feedback. Analyzing and promoting grassroots innovations brought about by pioneer farmers has helped push the limits beyond the basics of agroforestry (association of trees and shrubs with crops and/or livestock).

In 2013, the Agr’eau² project, a regional multi-partner initiative based on a network of nearly 300 farms of all types across the Adour-Garonne basin, was launched to build upon these experiences and insights.

Agr’eau, which is funded by the local water agency and other local authorities, takes an integrated landscape approach to water and soil management while encouraging both its farmers and technical partners to develop and validate resilient systems together, thus continually seeking solutions to the present challenges.

Their approach has been economic as well as environmental: the agroforestry systems they have selected, adapted and promoted increase the yields not just of crops, but also provide fuelwood, timber, fibre, woodchip bedding for livestock and more.

The transition to this new kind of farming requires creativity and a capacity to innovate. But above all, it demands a clear and subtle understanding of the farm and its environment, and a strong cooperation of every landscape users/stakeholders. In practice, such collaborative innovation process is very much depending on the synergy between:

- Funding partners;
- Well established local associations/organizations (technical bodies) identifying pioneer farmers, connecting them together and working in tight relation with them to encourage, analyze and transfer innovations;

¹ Rural Network for Agroforestry (RRAF): <http://www.agroforesterie.fr/Reseau-Rural-Agroforestier-Francais.php>

² Agr’eau: <http://www.agroforesterie.fr/agreau.php>

- Coordinating/networking partners giving strength and visibility to the work implemented on the field up to the national level and beyond (in this case the French Agroforestry Association).

One of the major innovations that came out from the local development work over the last two decades was to complement tree planting/management with no-till, cover crop farming practices. Today, this has enabled to develop diversified, multi-layer agroforestry systems that maximize the plant cover of the soil, both spatially and temporally. Recorded benefits include:

- Enhanced soil biota – the “motor” of fertility – as well as above-ground biodiversity, including pollinators and other beneficial crop organisms;
- More photosynthesis per unit of land area, and therefore more productivity;
- More economically resilient farmers thanks to newly diversified income sources (that have been shown to create new economic activities locally);
- Optimized water cycle and enhanced quality of water bodies (both above and below ground);
- Higher carbon capture, in both soils and the tree biomass;
- Reduced input requirement, especially of pesticides and fertilizers due to greater ecological resilience and of fossil fuels due to no-till farming.

At a landscape level, this approach is optimized by Assisted Natural Regeneration (ANR) of trees in riparian zones, on field boundaries, on road verges etc. that can easily be made more productive in terms of both resources and ecosystem services.

What Agr’eau shows is that farmers who have the opportunity (and make the effort) to engage in this kind of collective continual improvement process find that their patience is amply rewarded.

In 2016, the “Bagages” research project was launched to build upon the Agr’eau promising experience. This initiative, that still targets the Adour-Garonne Basin, is aimed at setting up scientific experiments based on the most successful farmers stories obtained and “enhanced” within Agr’eau. With the local water agency remaining one of the main funders, Bagages brings together more than 20 organizations and nearly 70 of the most innovative farmers in the area, making it one of the largest farmer-centered R&D platforms in agroforestry/agroecology across Europe.

Building a European agroforestry innovation network

In early 2017 a consortium of 13 partners from 9 European countries launch **AFINET**³ (AgroForestry Innovation NETworks), a thematic network aimed at fostering the exchange and knowledge transfer between agroforestry practitioners. AFINET acts at the EU level in order to take up research results into practice and to promote innovative ideas to face challenges and solve practical issues identified in the field. To achieve this objective AFINET proposes an innovative methodology based on:

(i) The creation of a European interregional network, composed of “Regional Agroforestry Innovation Networks (RAINs)”. These are working groups created in 9 strategic regions of Europe (Spain, UK, Belgium, Portugal, Italy, Hungary, Poland, France and Finland), interconnected and articulated together. The RAINs represent different climatic, geographical, social and cultural conditions and they include a balanced representation of the key actors with complementary type of knowledge: farmers, policy makers, advisory services, extension services, etc

(ii) The creation of a European reservoir of scientific and practical AF knowledge with an end-user friendly access (the “Knowledge Cloud”), where all the information collected and the materials created in the project will be published.

This 3-year initiative will help efficiently up-scale and out-scale tried and tested innovative solutions to build up more sustainable and profitable farming systems in a wide diversity of contexts across Europe.

³ AFINET: <http://www.agroforestry.eu/afinet>