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AGRICULTURE & INNOVATION



# EIP-AGRI Focus Group

## Agroforestry

MINIPAPER 2: Education in Agroforestry

11 April 2017

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# Education in Agroforestry (AF)

## 1. Definition and objective

This mini paper (MP) aims at providing a **practical in-depth-view** on selected key issues within the field of education, keeping in mind the FG guiding question: How to develop AF as a sustainable farming system which can boost agricultural productivity and profitability.

The characterisation of this field follows basically the UNESCOs' **definition** of Education for Sustainable Development (ESD) (see UNESCO 2017). Adapted to the groups' needs it means allowing every farmer ('agroforester') to acquire the knowledge, skills, attitudes and values necessary to shape a profitable and sustainable AF production by means of different approaches, tools and offers adapted to their own local area. In this context, there are many topics closely associated with education like training, information, interpretation, knowledge transfer, capacity building, awareness-raising, advising etc. They are to be understood as integral, interdependent or complementary parts of the chosen topic.

The main **target group** of this MP are practitioners, especially farmers, who do or wants to practice AF. Thus, education will mainly be seen from the perspective of the farmer and his needs. However, this MP can also be an important and useful source of information for other target groups like researchers, administration, NGOs, consultants, etc.

In detail, this MP focuses on **three main aspects**,

- providing a brief overview on the topic and already available information and programs (*'what is available'*)
- depicting some of the most important deficits and challenges in terms of education and training (*'what is limiting'*)
- suggesting recommendations and potential solutions (*'what is needed'*)

## 2. 'What is available' - Status-quo of education in AF

### 2.1. General aspects

- With respect to the word cloud worked out during the first meeting in Melle/ France, the FG members agreed that **'knowledge'** has to be (one of) the most important issue, followed by the key role of farmer in making the system work. The importance of the topic education in AF, above all teaching farmer, seems to be quite evident.



- Not only that knowledge on AF is part of the word cloud, it also seems that AF acts like a cloud: difficult to forecast. It deals with a high variety of different productions systems, species, approaches, rules and so on. Thus, it is about to manage a **complex system**, requiring specific knowledge as well as systemic skills. The often unpredictable interactions between components of the same system (eg. soil-plant, animal-plant of the natural system) as well as between the systems (eg. natural-social system) underlines that inter- and transdisciplinarity are key to success.

- As pointed out above and well-grounded by different authors and sources (eg. AgroFE, AGFORWARD, AFINET, Eksvård – see also chapter 6/ references), AF is a very **competence demanding** field of practice. However, at the same time, the level of knowledge adapted to specific areas is low and there is a lack of possibilities for training and teaching in AF.

## 2.2. Overview on existing sources of information, training offers and methods for farmers

- European farmer can get information from the **umbrella of the pan European Agroforestry Federation EURAF**, which “..aims at promoting the use of trees on farms as well as any kind of silvopastoralism throughout the different environmental regions of Europe”. National delegates are representing EURAF in 20 European countries.
- A further source of information and training options are **European community projects** funded by the EU, where the integration of farmers are key of the project concepts. AgroFE for example created a knowledge database, implemented initial trainings in individual countries or a certification system for all levels of education adapted to particular country education systems and needs. AGFORWARD is currently developing an “AF Training Resources” in order to provide a central location for AF education and training resources appropriate for farmers, technicians and students. AFINET will develop a knowledge cloud or a repository of knowledge AF tools to help farmers to find the required knowledge for a better implementation.
- Furthermore, AF is being promoted by **national organisations and companies**. Sometimes they are directly related to AF and engaged in networks (eg. Agridea (CH), AFAF, AGROOF, APCA (F), Woodlandtrust (UK), Polish AF Association (PL), Spanish Agroforestry Associations (AGFE) etc.), sometimes they are dealing with specific topics (eg. associations of forest grazing, orchards management, nature conservation, universities etc.). Above all former group do sometimes offer information campaigns, trainings or field trips.
- A great number of European **universities and schools** are involved in AF related research and training questions, where students and pupils are mostly part of the agronomic and forest degrees. However, there are some examples focusing on AF: In Italy there is “the professional Agroforestry” programme, in Spain and Greek there are Erasmus intensive courses on AF. A French school offers a BAC course on AF, at Bangor University/UK, students can even achieve a MSc degree. Within the Innovative Training Network (ITN), a project is currently evaluated concerning a PHD Framework on AF. In terms of knowledge transfer to farmers, there are only scattered activities known.
- Furthermore, there are **numerous educational activities** farmers can use in some countries for the purpose of managing AF, but mainly in terms of “isolated parts of the whole picture”. Farmers are being trained in tree planting and pruning, sustainable soil management, marketing and many more issues by various institutions, yet not very often with special consideration to AF.

## 2.3. Summary of chapter 2

AF as an emerging discipline in developed countries is facing much more complexity than many other sectors related to land management, thus, education seems to be a vital subject. So far, there are some possibilities for European farmers to get informed, advised or taught, but compared to long-term established disciplines there are only little offers. Countries of the EU do have different backgrounds and approaches towards AF, some already having an established AF-community, in other countries AF is unknown or topics are spread over various knowledge areas. Education as a supporting instrument therefore follows many different approaches.

### 3. 'What is limiting' – deficits and challenges in the field of education in AF

#### 3.1. 'Soft factors' – about attitudes & values, and topics affecting AF education 'indirectly'

Though *soft factors* (above all those influencing attitudes and values, including psychological and awareness issues) are basically not core elements of classic educational programmes, however, they undoubtedly have great influence on the establishment and development of AF, either attracting farmers interests or hindering them to learn or even try agroforestry. Some important aspects are:

- There are many **concerns of farmers about regulations**, like compliances of possible activities with land management regulations including CAP support, national regulations on individual trees (nature or landscape protection could hamper AF development), woodlands and forest (here environmental policy could be developed mainly for the purpose of public bodies e.g. State forests national holding in Poland) or conservation schemes for cultural landscapes. Closely connected to regulative issues, the concern of farmers about **bureaucracy** might be a further reason to consider.
- The **lack of or knowledge gap on subsidies** in some EU countries or its potential loss by exceeding some threshold values or the opportunity costs (additional costs) for the maintenance of traditional and labour-demanding land uses may affect the decision of farmers to go/or not to go for AF.
- The **separation from arable land and forest** clearly requires a rethinking of farmers, forestry workers and the population. Trees must not be regarded as an obstacle in the field, but as an integral part of the cultivated land. The **advantages of this new "multi-dimensionality" are very often not clear** and needs to be elaborated and disseminated to a greater extent.
- A strong influence is given by the **social and natural environment**. For example in poor villages dominated by big industrial farms or on sub-urban areas where small farmers have limited access to the land. Or conversely: villages located in areas with poor soils and/or fragmented land use structure and often complicated ownerships.
- At that, there are many more bullet points, that are influencing the establishment of an AF system (positive or negative), briefly exemplified by following catchphrases: Internal and external **emigration** on rural areas; **personal factors** like satisfaction and risk aversion (correlation with other factors); the effects of **globalisation** (mechanisation, land separation, financial pressures ('growing or abandoning') etc.); **information inputs** from outside EU (eg. treeless croplands from North America and Australia establish a specific "how-it-should-look-like-image" and frames the visions of (younger) EU farmers and the public, fostering an anti tree/anti AF perception among farmers).

#### 3.2. 'Hard factors' – about knowledge & skills, and topics affecting AF education 'directly'

Whereas attitudes and values are often the basis to get started, special knowledge and skills are needed to run AF properly. Some important aspects are:

- As pointed out in chapter 2, knowledge on complex systems and **integrated thinking** is very important, however not very common among many farmers. This includes understanding protective and ecological functionalities as well as ecosystem service deliveries related to microclimate, animal welfare, soil protection, biodiversity improvement, water protection by buffers etc...).
- The **current form of teaching and support**, where agricultural and forest subjects are associated to different types of disciplines, make farmers and the people that taught farmers far away of seeing integrated systems. Thus, methods of learning and teaching do often not reach the specific requirements of the very complex system AF. At that, "supporting" groups (technicians, forester, administrations etc.) do have a very sectoral approach, as this fields have long lasting traditions and strict demarcation of their interests.

- The individual **knowledge about soil** in all its complexity is seen as a major aspect. In Agroforestry practices, many -if not most of the agronomic benefits- come through the effects that trees have on the below ground -level environment: infiltration rates, mycorrhizal development, deep nutrient cycling, enhanced soil biology etc. (when compared with tree less areas). Initial soil education of the target group is therefore a big limitation to the full understanding of benefits and use of AF. The need for a wider understanding, and therefore education regarding soil is therefore very important, only farmers and individuals who understand these aspects can come to the realisation that change towards AF is desirable (key trigger for a rethinking).
- **Practical management skills**, like effective fencing (pasture parcels), adequate mix plant integration (tree and understory components), plantation of horticultural crops, organic crops, introducing barrier covering neighbouring neglected areas) or pruning with special regards to AF are sometimes missing.
- From the financial point of view, marketing knowledge and the knowledge about **diversification of income** (e.g. biomass, timber, fruits or meat (beef, lamb) are not usually understood by farmers and major factors for the success of AF implementation. For traditional silvo-pastoral systems on wooded grasslands, woodlands or in forests for example, diversification is a good opportunity for restoration of abandoned or marginal land where animals (beef cattle, sheep, goats) are kept, as a good way to improve biodiversity and reduce risks (fire) increasing resilience.
- Integrating methods of **social farming** into farm development is a growing field all around Europe. To know about specific social programs for retired/older/disabled people, approved approaches (CSA, Networks of Education Farms etc.) might help to add a further main pillar for AF farmers.

### 3.3. Training facilities and other means of support

- There is a lack of **educational facilities**, organisational structures and resources in terms of AF education. Subsequently, AF trainers and advisors are "rare species", as well as AF local demonstration farms are lacking.
- Very often there are some **information documents** existing, but the practitioner can not find them since they are only available as printed brochures that can only be ordered at a special company, research institute or federal agencies but not at a local administration. In other cases, there are files available but they are hard to find in the internet (place & accessibility). Sometimes the guidelines and information for the practitioners are not presented in a sufficient way (amount & quality) or the practitioners cannot easily understand them (language & style). Unfortunately documents often tend to only be available in the language in which they are written.

### 3.4. Summary of chapter 3

Whereas attitudes and values are often the basis to get AF started, special knowledge and skills are needed to run it properly. One of the major driving factors is, that AF is not even recognized or well known in some countries and in others there is only a limited knowledge. Obviously there are reasons hindering people to use AF or manage it properly, which can be seen by (a) "soft factors" like specific conditions and psychological hurdles, (b) "hard factors" - lack of practical experience and knowledge, and (c) limited access to information and educational offers. Interestingly, the EIP Focus groups "Benefits of landscape features for arable crop production" and "Sustainable High Nature Value Farming" came up with a number of similar determinations and approaches compared to those stated in this chapter (eg. social concerns, broad knowledge base, collaborative learning, learning networks).

## 4. 'What is needed' - recommendations and proposed activities

Based on above described chapters, we want to highlight some selected ideas which could help to improve educational requirements of farmers in future. Regarding the underlying question "How do farmer learn about AF", there are three core conclusions/three core approaches:

### 4.1. "Farmers learn best from farmers"

- **Personal learning networks:** An enhanced European net of **demonstration farms** and demonstration plots could serve as a good practical base, where information, training and knowledge transfer could take place in a personal, participatory face-to-face way on local level. By involving the existing farm networks established in the course of different projects (eg. AGFORWARD), a joint initiative - potentially hosted by the European Commission - could be an useful approach in near future. Training & learning together "by example" should be an important methodological approach. This shift towards collaborative approaches and mutual learning has also been highlighted within the EIP-Agri FG "Benefits of landscape features for arable crop production" (final report, p 22)
- **Media exchange tools:** YouTube is currently the most frequently used media channel to achieve information on specific management issues from farmer to farmer. The consideration of this tool, as well as the development of others like a kind of "Wikipedia" or particular online search features might help to improve exchange of experiences and information directly between farmers.

### 4.2. "Farmers benefit from well established, informed or trained supporting groups"

- **Schools and universities:** It seems very important to integrate AF at all educational levels and into the different existing curricula of schools and universities. For some reasons it is also recommended to set up particular educational programmes like an European MSc course on AF, which could help shaping a separate AF discipline or at least "AF image". The training of trainers should be led by a multidisciplinary group composed by farmers, researchers, planners, university teachers etc. The enhanced participation of students in networking or research projects could be a further approach.
- **Research activities and networks** contributes significantly to the generation of valuable knowledge and a better exchange of information between researchers, consultants, multipliers and should therefore be extended on all levels.
- **The administration and decision sector** should be informed and provided with materials through the AF network. Hence, AF could achieve appreciation to a greater extend and subsequently be better integrated into national regulation or supporting schemes and into governmental/regional planning strategies. Setting up an European information initiative to increase the awareness of authorities and administration in countries with low implementation of AF practices could be a tailored activity.
- **EURAF/ AF national networks:** A strong EURAF network is undoubtedly a main basis for the development of the educational issues throughout Europe. On national level, the existing "gaps" should be closed by setting up national networks eg. through Operational Groups. The preparation of some basic materials and the allocation of interested people could be a first step to introduce the idea on national level.
- **Technicians**, like forester or agronomists, should be – comparable to the administration sector – be informed and trained on AF basics in order to raise awareness and widen up their frequently restrictive sectoral approaches. A main pillar is to be set already in the course of their educational progression (see above – schools).

### 4.3. "Farmers need improved access to information"

- **Information basis/promotion materials:** The creation or further development of a set of national or regional AF-promotion materials (eg. homepage, motivating brochure highlighting the

benefits, cooperation with chambers, video interviews etc.) would help to disseminate AF topics not only to farmer but also to different “supporting” target groups. As national approaches seems to be quite diverse, information must be adapted to those needs, EU assistance/funds to enable more AF materials to be translated into other EU languages to reach the wider audience is strongly advocated.

- **Databases and tools:** The announcement of existing tools and databases as well as the creation of new instruments with practical examples and information about AF in general (eg. systematic survey on historical agroforestry systems) or in specific (eg. description of fully-cost-tools for different AF systems) will help to close the information gap (for detailed explanations see MP 3 (Tools for optimal design and management) and MP 4 (National and European databases)).

#### 4.4. Summary of chapter 4

Regarding the availability of educational offers (chapter 2) and limiting factors and challenges (chapter 3), there are numerous links worthwhile being considered. However, we would like to stress out three key conclusions supporting “...every farmer (‘agroforester’) to acquire the knowledge, skills, attitudes and values necessary to shape a profitable and sustainable AF production by means of different approaches, tools and offers adapted to their own local area: (a) farmers learn best from farmers - either personally via learning networks/demonstration farms or via media, (b) farmers benefit most efficiently from well established, informed or accordingly trained “supporting groups”, and (c), farmers generally do need an improved access to information and promotion. However, education is very much depending on the profile of its discipline. Thus, apart from the deliberately integration of AF into existing educational programmes, a reinforced professional formation of AF through different specific offers and initiatives (eg. development of an European MSc course, prolonging educational activities after projects end (like Afinet, Agforward) could help to shape a modern profile of “the agroforester”.

## 5. References and information sources

Definition of education:

- UNESCO 2017: <http://www.unesco.org/new/en/education/themes/leading-the-international-agenda/education-for-sustainable-development/browse/4/>

AF projects (with a lot studies/documents for free download):

- AGROFE (2017): Project Homepage at <http://www.agrofe.eu>
- AGFORWARD (2017): Project Homepage at <https://www.agforward.eu>
- AFINET (2017): Project Homepage at [http://cordis.europa.eu/programme/rcn/700355\\_en.html](http://cordis.europa.eu/programme/rcn/700355_en.html) (no project webpage at the moment?)

AF networks and research institutions:

- EURAF – Pan European Agroforestry Organisation: Homepage at <http://www.agroforestry.eu/>
- IG Agroforst Schweiz: Homepage at <http://www.agroforst.ch>

Specific publications and links:

- HNV LINK (2017): “Nature Value Farming: Learning, Innovation and Knowledge”, project Homepage at <http://www.hnvlink.eu/>
- Eksvärd, K. (2016). AF – Discussion paper – REPORT; EIP\_AGRI Service Point.
- EIP-AGRI FG “Benefits of landscape features for arable crop production” (2016). Final report, March 2016, 30 p + annexes.
- EIP-AGRI FG “Sustainable High Nature Value Farming” (2016). Final report, January 2016, 25 p + annexes.
- Pannell, D. J. (1999). Social and economic challenges in the development of complex farming systems. *AF Systems* 45(1/3): 393-409.