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Scoping document: state of agroforestry information across Europe

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1 Objectives and structure

Task 1.7.5.B.III.iii of ETC/BD 2015 Action Plan entails the “preparation of a scoping document on the state of agro-forestry information across Europe”. The major objectives of this document are to review the concept of agroforestry from a European perspective and present in a synthetic way the main projects, initiatives and maps concerning agroforestry practices.

The scoping document is structured in the following chapters. Chapter 2 briefly reviews the definitions of the term agroforestry in a broad sense and the classifications of agroforestry practices in Europe. An overview of the Pan-European maps delimiting agroforestry areas and related lands is shown in Chapter 3. The next chapter goes into detail about some relevant ongoing projects and initiatives (Chapter 4). Chapter 5 presents some examples of agroforestry mapping activities in several countries. Chapter 6 draws some conclusions.

2 Agroforestry overview

2.1 Definitions

Agroforestry can be broadly defined as “a sustainable way of land management which integrates both agricultural and forestry practices on the same land management base” (Mosquera-Losada et al., 2009) or as “a land use practice combining trees, crops and/or livestock on the same area of land in all spatial or temporal arrangements” (Nair, 1993). The term is defined by global and European organizations as shown in Table 2.1.

Table 2.1 Some definitions of agroforestry in global and European organizations

| |
|--|
| World Agroforestry Centre (ICRAF) publications (http://outputs.worldagroforestry.org/, last accessed 30 November 2015) |
| Agroforestry is “a dynamic, ecologically based, natural resources management system that, through the integration of trees on farms and in the agricultural landscape, diversifies and sustains production for increased social, economic and environmental benefits” (Leakey, 1996). |
| FAO (http://www.fao.org/forestry/agroforestry/80338/en/, last accessed 23 November 2015): |
| Agroforestry is “a collective name for land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land-management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence. In agroforestry systems there are both ecological and economical interactions between the different components” (Lundgren and Raintree, 1982). Agroforestry can also be defined as “a dynamic, ecologically based, natural resource management system that, through the integration of trees on farms and in the agricultural landscape, diversifies and sustains production for increased social, economic and environmental benefits for land users at all levels” (ICRAF definition). In particular, agroforestry is crucial to smallholder farmers and other rural people because it can enhance their food supply, income and health. Agroforestry systems are multifunctional systems that can provide a wide range of economic, sociocultural, and environmental benefits There are three main types of agroforestry systems: <ul style="list-style-type: none">• Agrisilvicultural systems are a combination of crops and trees, such as alley cropping or homegardens.• Silvopastoral systems combine forestry and grazing of domesticated animals on pastures, rangelands or on-farm.• The three elements, namely trees, animals and crops, can be integrated in what are called |

agrosylvopastoral systems and are illustrated by homegardens involving animals as well as scattered trees on croplands used for grazing after harvests.

AGFORWARD Project (<http://www.agforward.eu/index.php/en/>, last accessed 23 November 2015):

Agroforestry is “the practice of deliberately integrating woody vegetation (trees or shrubs) with crop and/or animal systems to benefit from the resulting ecological and economic interactions”.

European Agroforestry Federation (EURAF) (<http://www.agroforestry.eu/AgroforestryInEurope>, last accessed 23 November 2015):

Agroforestry is “the integration of woody vegetation, crops and/or livestock on the same area of land. Trees can be inside parcels or on the boundaries (hedges). Agroforestry can be applied to all agricultural systems, in all parts of Europe. Agroforestry systems are obtained by planting trees on agricultural land or introducing agriculture in existing woodland/orchards (e.g. silvopasture)”.

From these definitions, it must be highlighted that agroforestry areas are widespread across Europe and are not restricted to the Iberian dehesas and montados, as frequently considered.

Agroforestry systems were largely developed in Europe ever since the Antiquity but declined severely after the second world war, with intensification of farming practices. Most agroforestry systems have proved to provide a wide range of social and environmental benefits but also economical (see Box 2.1). The biodiversity rates are often high within agroforestry lands and many provisioning, regulating and cultural ecosystem services are usually supplied. Agroforestry practices are also suitable for climate change mitigation and wildfire prevention. Agroforestry is also crucial for the conservation of livestock breeds and genetic diversity and the production of food in a sustainable way.

Box 2.1 Benefits of agroforestry systems. Compilation from the following sources: Den Herder and Rois-Díaz, 2014; <http://www.agroforesterie.fr/definition-agroforesterie.php>, last accessed 4 December 2015; and <http://www.bioenergie-promotion.fr/23639/techniques-et-avantages-de-lagroforesterie-en-france/>, last accessed 4 December 2015)

- ✓ Increase of farm production by optimizing land resources.
- ✓ Diversification of farm activities and the enterprise base, providing a variety of products that are often highly valued by the consumers.
- ✓ Improvement of the quality of wood products.
- ✓ Increase of the income for the farmer from selling crops or other products on an annual base and in the long run additional income from selling wood.
- ✓ Restoration of soil fertility and control of erosion.
- ✓ Guarantee of water quantity and quality.
- ✓ Enhancement of biodiversity and reconstruction of ecological networks.
- ✓ Conservation of genetic diversity through the provision of appropriate habitat for some of the autochthonous and locally adapted livestock breeds in Europe.
- ✓ Provision of an ideal environment for the conservation of European farmland birds and grassland butterflies, which have suffered a severe decline in the last decades.
- ✓ Storage of carbon for climate change mitigation.
- ✓ Increase of landscape amenity and rural tourism.

In a policy context, agroforestry is “a recognized practice in the ecological focus areas of the Common Agricultural Policy (European Commission, 2013a) and as a measure in rural development programmes (European Commission, 2013b). It is also mentioned in the EU Forestry Strategy

(European Commission, 2013c) and as a sustainable land management practice by the Intergovernmental Panel on Climate Change (IPCC, 2014)” (den Herder et al., 2015).

2.2 Classifications of agroforestry practices in Europe

The combination of the different components of agroforestry systems (i.e. woody vegetation, crops and pasture/animals) allows a broad categorization of agroforestry practices (McAdam et al., 2009; see Table 2.2).

Table 2.2 Classification of agroforestry practices by components (McAdam et al., 2009)

| Category | Components |
|--------------------------|---|
| Agrisilviculture | Crops and trees including shrub/trees and trees |
| Silvopastoral | Pasture/animals and trees |
| Agrosilvopastoral | Crops, pasture/animals and trees |
| Other | Multipurpose tree lots, apiculture with trees, aquaculture with trees |

In a European context, agroforestry practices have been classified by Mosquera-Losada et al. (2009) as shown in Table 2.3.

Table 2.3 Agroforestry practices in Europe (Mosquera-Losada et al., 2009)

| Agroforestry practice | Brief description |
|---------------------------------|---|
| Silvoarable agroforestry | Widely spaced trees inter-cropped with annual or perennial crops. It comprises alley cropping, scattered trees and line belts. |
| Forest farming | Forested areas used for production or harvest of natural standing specialty crops for medicinal, ornamental or culinary uses. |
| Riparian buffer strips | Strips of perennial vegetation (tree/shrub/grass) natural or planted between croplands/pastures and water sources such as streams, lakes, wetlands, and ponds to protect water quality. |
| Improved fallow | Fast growing, preferably leguminous woody species planted during the fallow phase of shifting cultivation; the woody species improve soil fertility and may yield economic products. |
| Multipurpose trees | Fruit and other trees randomly or systematically planted in cropland or pasture for the purpose of providing fruit, fuelwood, fodder and timber, among other services, on farms and rangelands. |
| Silvopasture | Combining trees with forage and animal production. It comprises forest or woodland grazing and open forest trees. |

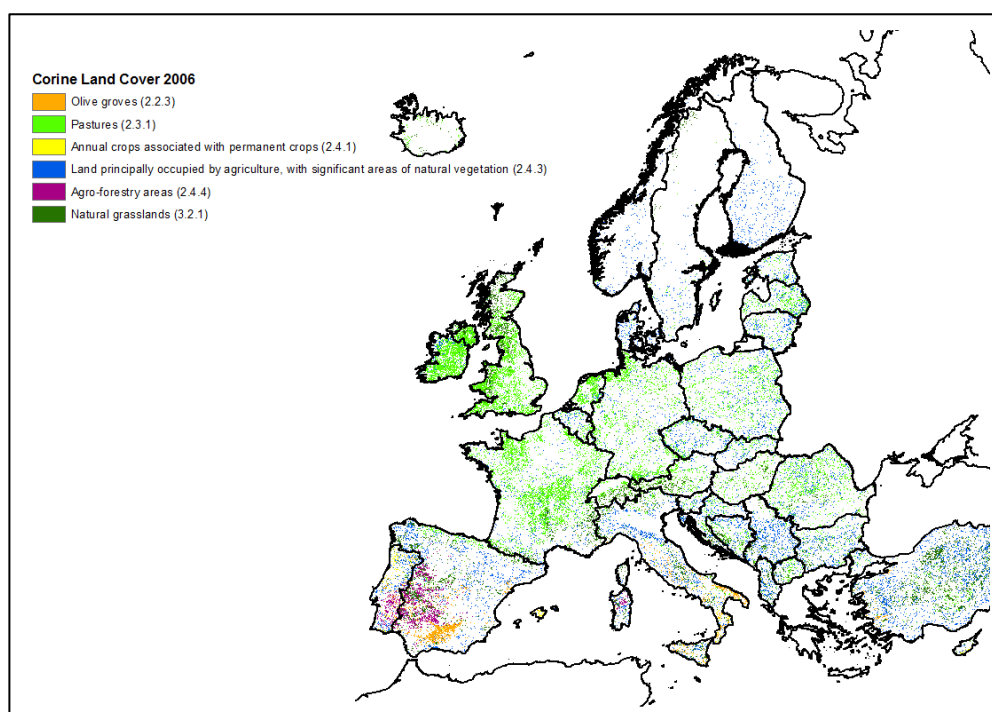
3 Mapping of agroforestry lands at the European scale

According to den Herder et al. (2015), “in Europe there is a lack of cartographic information on the location of different types of agroforestry practices. Moreover, the information that is available is scattered and fragmented. European land cover and land use classifications have traditionally

separated “farmland” from “forests” and this in turn feeds through discrete policies and incentives which can cause problems both to farmers and policy makers”. The scale at which agroforestry operates (i.e. field, farm or landscape) is also critical for mapping.

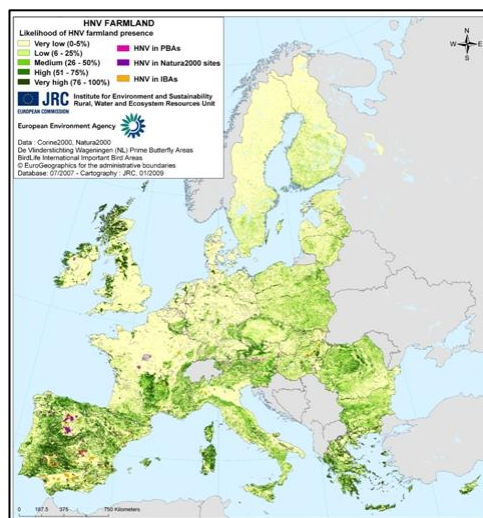
Several attempts to map agroforestry areas or related lands at the European scale have been carried out. In first place, Corine Land Cover class 2.4.4 is “agro-forestry areas”, which are defined according to its nomenclature as “annual crops or grazing land under the wooded cover of forestry species, where the annual crops or grazing land and fallow land cover less than 50 % of the surface; it includes combinations of forest trees with fruit and olive trees and agricultural land shaded by carob and palm trees”. However, according to Rois-Díaz et al. (2006), agroforestry areas may fall under several classes of Corine Land Cover, such as “olive groves”, “pastures”, “annual crops associated with permanent crops”, “land principally occupied by agriculture, with significant areas of natural vegetation” or “natural grasslands”. Figure 3.1 shows the distribution of all these Corine Land Cover classes to give a taste of the potential extent of agroforestry lands.

Figure 3.1 Corine Land Cover (2006) classes that can potentially hold agricultural practices



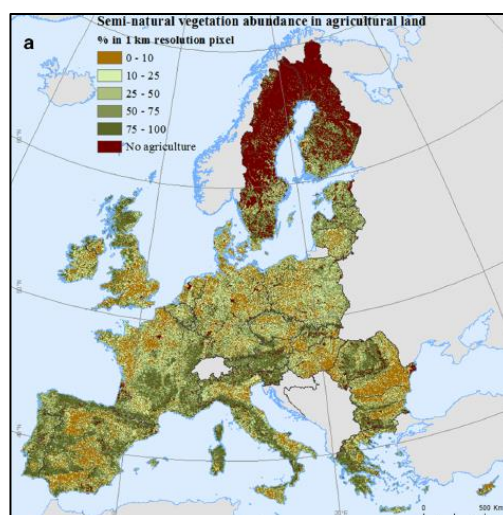
Another mapping activity at the European Union scale is related to the High Nature Value (HNV) farmlands (Paracchini et al., 2008; see Figure 3.2), which are defined as “those areas in Europe where agriculture is a major (usually the dominant) land use and where that agriculture supports, or is associated with, either a high species and habitat diversity or the presence of species of European conservation concern, or both” (Andersen et al., 2003). According to these authors, HNV farmland can be classified into three main types: farmland with a high proportion of semi-natural vegetation (Type 1); farmland dominated by low intensity agriculture or a mosaic of semi-natural and cultivated land and small-scale features (Type 2); and farmland supporting rare species or a high proportion of European or World populations (Type 3). Although not all HNV farmland is agroforestry land, it is clear that agroforestry practices may be widespread in these extensive agricultural areas.

Figure 3.2 High Nature Value Farmland in Europe. An estimate of the distribution patterns on the basis of land cover and biodiversity data (Paracchini et al., 2008)



In the Joint Research Centre (JRC) of the European Commission, a first Pan-European map of abundance of semi-natural vegetation (both semi-natural grasslands and woody vegetation) in agricultural land was generated using remote sensing images and available European spatial datasets (García-Feced et al., 2015; see Figure 3.3). The improvement of Copernicus products (<http://land.copernicus.eu/pan-european/high-resolution-layers/#>, last accessed 1 December 2015) and the increasing resolution of imagery may enhance the discrimination capacity between land uses/covers and, more concretely, agroforestry areas.

Figure 3.3 Abundance of semi-natural vegetation in European Union agricultural lands (García-Feced et al., 2015). The map integrates semi-natural grasslands and woody vegetation.

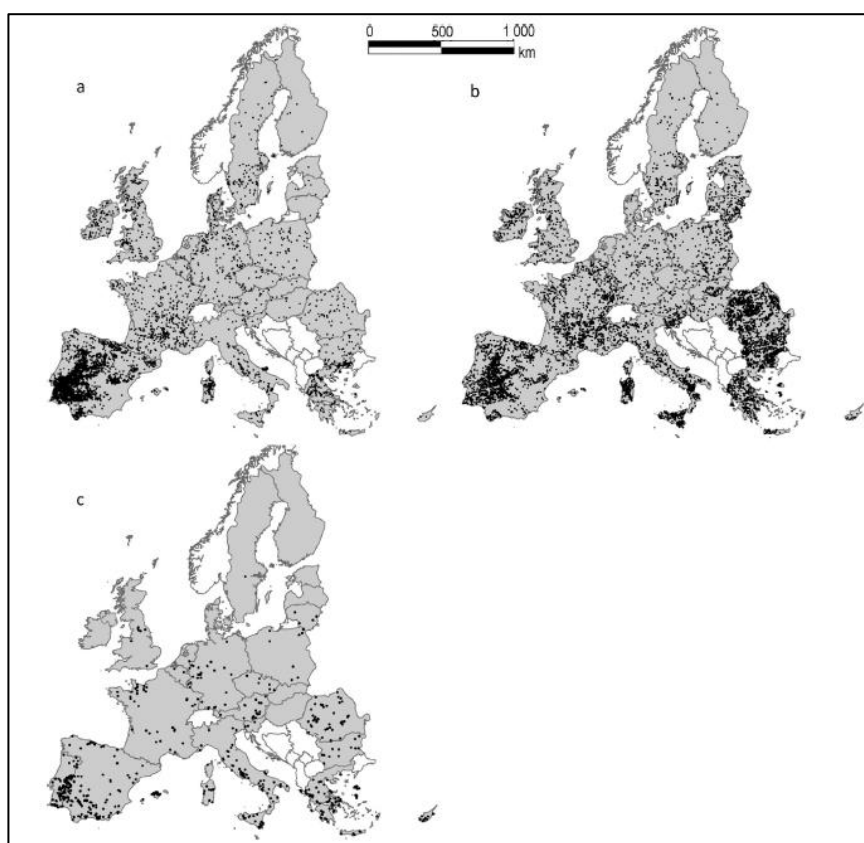


In the EUNIS Habitat Classification, given its strict assignation rules, agroforestry lands are distributed across several habitat types. Particularly, “pasture woods” (with a tree layer overlying pasture) are included in the group “habitat complexes” (code X09), and are defined as “the products of historic land management systems, and represent a vegetation structure rather than being a particular plant community. Typically this structure consists of large, open-grown or high forest trees (often pollards) at various densities, in a matrix of grazed grassland, heathland and/or woodland

floras. This habitat is most common in southern Britain, but scattered examples occur throughout the UK. Outgrown wood-pasture and mature high forest remnants occur in northern and central Europe, but the number and continuity of ancient (veteran) trees with their associated distinctive saproxylic (wood-eating) fauna and epiphytic flora are more abundant in Britain than elsewhere. Component habitat types include beech and yew woodland (G1.6 and G3.97), heathland (F4) and dry acid grassland (E1.7). A range of native species usually predominates amongst the old trees but there may be non-native species which have been planted or regenerated naturally” (<http://eunis.eea.europa.eu/habitats/531>, last accessed 1 December 2015). A better discrimination of agroforestry lands within the EUNIS Habitat Classification is therefore needed. On the other hand, the European Forest Types classification (European Environment Agency, 2007) does not consider agroforestry areas strictly although grazing may be a recurrent activity in some of the defined forest types.

Den Herder et al. (2015) recommend that “it would be good to properly include agroforestry in existing Land Use and Land Cover classification nomenclatures, for instance in the Land Use and Land Cover Aerial Frame Survey (LUCAS)”. Plieninger et al. (2015) have used LUCAS information to generate the first Pan-European map of wood-pastures and quantify their extent (see Figure 3.4).

Figure 3.4 Distribution of wood-pastures in Europe (extracted from Plieninger et al., 2015): a) pastures in open woodland; b) pastures with sparse trees; and c) pastures with cultivated trees). Grey background indicates the surveyed area, while areas in white remained unconsidered. Note that points represent the location but not the extent of wood-pastures as they are not at scale.



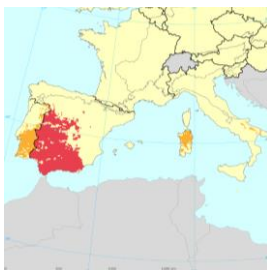





On the other hand, the Land Parcel Identification Systems (LPIS) should provide accurate information of the different agroforestry practices within each country.

On the policy side, reporting under Article 17 of the Habitats Directive provides distribution maps and assesses the conservation status of habitat types every six years. Regarding wood pastures, Beaufoy et

al. (2015) highlight that “in addition to the two types of wood pasture explicitly cited in Annex I of the Habitats Directive (“6310 Dehesas with evergreen *Quercus* species” and “9070 Fenoscandian wooded meadows”), many types of Annex I forest habitat have a long tradition of use as wood pastures, and appropriate grazing is a key tool for their conservation management in these cases, especially where they exist in a mosaic with shrub and grass habitats. Examples include “9230 Galicio-Portuguese oak woods with *Quercus robur* and *Quercus pyrenaica*” and “5210 Arborescent matorral with *Juniperus* spp.”. Hartel and Plieninger (2014) add that “among the 233 European natural habitat types listed in Annex I, no less than 65 are to some extent related to wood pasture. Of these, only four habitat types are explicitly recognised as grazed woody formations (i.e. “5130 *Juniperus communis* formations on heaths or calcareous grasslands”, 5210, 6310 and 9070). Figure 3.5 displays the distribution of these habitat types and shows their conservation status in each country.

Figure 3.5 Description, distribution and assessment of conservation status at the Member State level in some habitat types related to wood pastures. Conservation status legend: Favourable (green), Unknown (grey), Unfavourable-inadequate (orange) and Unfavourable-bad (red). <http://bd.eionet.europa.eu/article17/reports2012/habitat/summary/>, last accessed 1 December 2015.

| Annex I habitat type name and description | Distribution |
|--|---|
| <p>5130 <i>Juniperus communis</i> formations on heaths or calcareous grasslands</p> <p>Formations with <i>Juniperus communis</i> of plain to montane levels. They mainly correspond to phytodynamic succession of the following types of vegetation: a) generally, mesophilous or xerophilous calcareous and nutrient poor grasslands, grazed or let lie fallow, of the Festuco-Brometea and Elyno-Sesleretea; b) more rarely, heathlands of the Calluno vulgaris-Ulicetea minoris.</p> |  |
| <p>5210 Arborescent matorral with <i>Juniperus</i> spp.</p> <p>Mediterranean and sub-Mediterranean evergreen sclerophyllous scrub organized around arborescent junipers with a high taxonomic variety: <i>Juniperus oxycedrus</i>, <i>J. phoenicea</i>, <i>J. foetidissima</i>, <i>J. excelsa</i> and <i>J. communis</i>, <i>J. drupacea</i>, <i>J. thurifera</i>.</p> |  |
| <p>6310 Dehesas with evergreen <i>Quercus</i> spp.</p> <p>Dehesas with evergreen <i>Quercus</i> species form a characteristic landscape of the Iberian peninsula in which crops, pasture land or Meso-Mediterranean shrubby matorral (in juxtaposition or rotation) are shaded by a fairly closed to very open canopy of native evergreen oaks (<i>Quercus suber</i>, <i>Q. ilex</i>, <i>Q. rotundifolia</i>, <i>Q. coccifera</i>). It is an important habitat of endangered animals. This habitat type is only reported in the Mediterranean region Although typical of Spain and Portugal (where this habitat is known as montado), the habitat is also found locally in France and Italy. The percentage of coverage by Natura 2000 sites of this habitat type by country is 33% in Spain, 10% in Italy and unknown in Portugal.</p> |  |

| | |
|--|--|
| <p>6530 Fennoscandian wooded meadows</p> <p>Fennoscandian wooded meadows represent a species-rich vegetation complex consisting of small copses of deciduous trees and shrubs and patches of open meadows. Ash (<i>Fraxinus excelsior</i>), birch (<i>Betula pendula</i>, <i>B. pubescens</i>) and <i>Quercus robur</i>, <i>Tilia cordata</i>, <i>Ulmus glabra</i> or <i>Alnus incana</i> are the common tree species. Nowadays very few areas are managed but traditionally these areas were managed by a combination of raking, hay-cutting, grazing of grassland and pollarding or lopping of trees.</p> |  |
| <p>9070 Fennoscandian wooded pastures</p> <p>A vegetation complex in which the tree layer varies from sparse forest to small copses of trees and shrubs and patches of open grassland. These habitats have a representative mosaic of copses of trees (usually deciduous trees) and grassland with a long continuity of grazing. The tree layer consists either of deciduous broad-leaved species such as <i>Quercus robur</i>, <i>Fraxinus excelsior</i>, <i>Tilia cordata</i>, <i>Betula</i> spp., <i>Alnus incana</i> or conifers (<i>Picea abies</i>, <i>Pinus sylvestris</i>). Particularly in Sweden there are pastures with old, large oaks.</p> |  |
| <p>9230 Galicio-Portuguese oak woods with <i>Quercus robur</i> and <i>Quercus pyrenaica</i></p> <p>This habitat includes a varied group of forests dominated by Pyrenean oak (<i>Quercus pyrenaica</i>) from the Iberian Peninsula and southwestern France with five regional subtypes. <i>Quercus robur</i>, <i>Fraxinus angustifolia</i> and <i>Acer granatense</i> occur in the tree layer.</p> |  |

4 Main activities at the European level

4.1 AGFORWARD Project

AGFORWARD (AGroFORestry that Will Advance Rural Development) is a four-year (2014-2017) research project funded by the European Union's Seventh Framework Programme for Research and Technological Development (<http://www.agforward.eu/index.php/en/>, last accessed 1 December 2015). The overall aim of the project is to promote agroforestry practices in Europe that will advance rural development. The project involves two international institutions and over 23 universities, research and farming organisations from across Europe. The project tasks are subdivided in 9 Work Packages, namely "Existing agroforestry systems in Europe" (WP1), "High Natural and Cultural Value Agroforestry" (WP2), "Agroforestry for High Value Tree Systems" (WP3), "Agroforestry for arable farmers" (WP4), "Agroforestry for livestock farmers" (WP5), "Field- and farm-scale evaluation and innovations" (WP6), "Landscape-scale evaluation of innovative agroforestry" (WP7), "Agroforestry policy development" (WP8) and "Dissemination" (WP9).

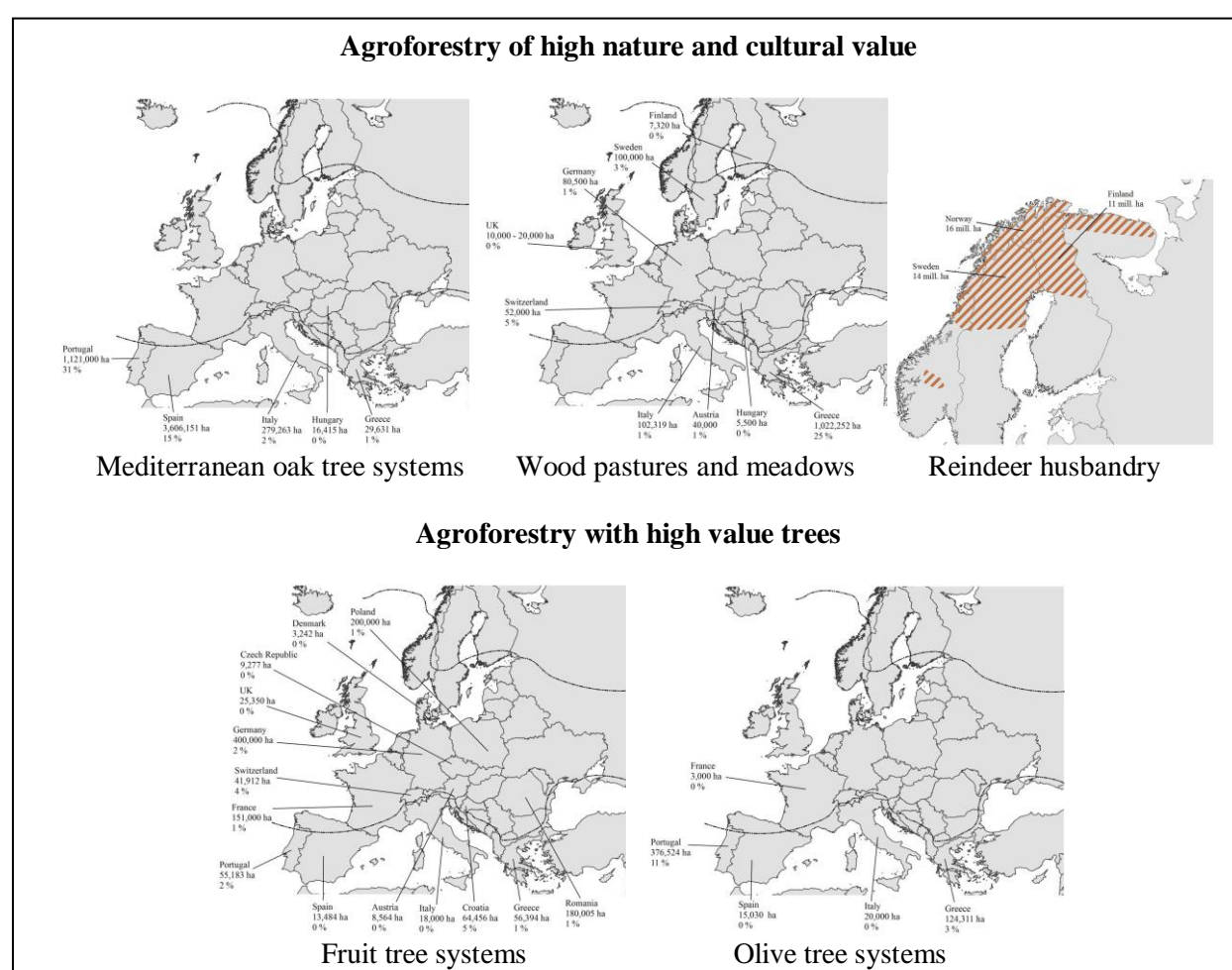
WP1, i.e. "Existing agroforestry systems in Europe", is especially relevant in relation to this scoping document. One of its main objectives is "to inventory and explain using existing EU27 land cover and land use databases the extent and recent changes of agroforestry systems in Europe". As a result, a report entitled "Preliminary stratification and quantification of agroforestry in Europe" (den Herder et al., 2015) has been delivered. The report is a very valuable source of information overarching all the agroforestry systems in Europe. Along with a fine introduction to the topic (definitions and classification) and the used approach, it provides detailed lists of agroforestry systems existing in European countries, providing as well their estimated extent based on a literature review. Agroforestry systems are classified in four target groups that are further explored in the above-mentioned work packages 2 to 5: agroforestry of high nature and cultural value, agroforestry with

high value trees, agroforestry in arable systems and agroforestry practices for livestock systems. In more detail, these are the different agroforestry systems that are included in each group:

- Agroforestry of high nature and cultural: oak dominated agroforestry in the Mediterranean, other wood pasture systems, hedgerow systems and scattered trees, and reindeer husbandry.
- Agroforestry with high value trees: agroforestry with fruit trees and agroforestry with other trees (olive, vine, pine tree, chestnut and carob tree).
- Agroforestry in arable systems: linear features with trees and within-field agroforestry.
- Agroforestry practices for livestock systems.

The report provides maps of the preliminary quantification of agroforestry systems of the first two groups (Figure 4.1).

Figure 4.1 Estimation of the extent of selected agroforestry systems in each country (den Herder et al., 2015)



Another interesting output of this project is an interactive map of agroforestry research and demonstration in Europe, displaying the location of the project's stakeholder groups, replicated experiments, demonstration or trial sites, other agroforestry replicated experiments and other demonstration and trial sites (see Figure 4.2).

Figure 4.2 Interactive map of agroforestry research and demonstration in Europe (<http://www.agforward.eu/index.php/en/map-of-agroforestry-research-and-demonstration-in-europe.html>, last accessed 24 November 2015)



4.2 SAFE Project

The SAFE research Project (Silvoarable Agroforestry For Europe) was sponsored by the European Union and coordinated by INRA (France). More than 70 scientists from eight European countries participated in the project from August 2001 to January 2005 (<http://www1.montpellier.inra.fr/safe/english/index.htm>, last accessed 1 December 2015). In the context of the project, silvoarable agroforestry was defined as “a land management technology where widely spaced trees are intercropped with arable crops”. In support of the European Common Agricultural Policy, the SAFE project provided models and databases for assessing the profitability of silvoarable systems and suggested unified European policy guidelines for implementing agroforestry. The final report of the project was delivered in May 2005 (Dupraz et al., 2005).

4.3 European Agroforestry Federation (EURAF)

The European Agroforestry Federation (EURAF) aims at “promoting the use of trees on farms as well as any kind of silvopastoralism throughout the different environmental regions of Europe” (<http://www.agroforestry.eu/>, last accessed 1 December 2015). EURAF has about 280 members from 20 different European countries, such as Albania, Belgium, Bulgaria, Denmark, Finland, France, Sweden, Germany, Switzerland, Greece, United Kingdom, Hungary, Italy, Poland, Portugal, Spain and The Netherlands. EURAF also contributes to the above-mentioned AGFORWARD project by “doing in-depth policy analysis to identify the successes and understand the constraints linked to the adoption of agroforestry across Europe”. The Federation also participates in the AgroFE project (Agroforestry for education in Europe; <http://www.agrofe.eu/>, last accessed 1 December 2015). The main objective of the AgroFE project is to favour agroforestry by providing a training through transfer of knowledge (training of farmers, advisers and trainers), which means by transforming research results into pedagogical material (preparing guide book, teaching material and training units).

The Federation promotes agroforestry by any communication means, including lobbying for agroforestry adapted policies at the European scale. In particular, “EURAF accomplished that incentives for the promotion of agroforestry plots had been introduced to the Common Agricultural Policy: Agroforestry practices are listed as Ecological Focus Areas and farmers can receive greening payments for such plots in pillar I (Reg.(EU) 1307/2013). The establishment of agroforestry plots can be supported through national or regional Rural Development Programmes in pillar II (Reg.(EU)1305/2013)”.

EURAF has participated in agroforestry events in the Expo Milano 2015 and the United Nations Climate Change Conference (COP21) in Paris. The Federation also organizes the European Agroforestry Conference every two years. The first of these conferences took place in Brussels in 2012 (http://www.agroforestry.eu/conferences/I_EURAFConference, last accessed 1 December 2015).

4.4 European Forum on Nature Conservation and Pastoralism (EFNCP)

The European Forum on Nature Conservation and Pastoralism (EFNCP) is “the only European organisation focusing on the maintenance of low-intensity livestock farming. This type of farming is widespread on less productive land in many European countries, typically using semi-natural pastures and meadows. It is the most important farming for conserving biodiversity across Europe, and for other environmental services, such as managing water-catchments and preventing wild fires. EFNCP's main focus is on low-intensity livestock farming. This type of farming makes up the majority of what has become known as 'High Nature Value' farming in Europe - those types of farming that deliver the highest levels of biodiversity and other environmental services” (<http://www.efncp.org/>, last accessed 1 December 2015). The most relevant publication of the Forum is a book that compiles the experiences and perspectives of High Nature Value Farming in 35 European countries (Beaufoy (ed.), 2015). The Forum's webpage also shows the projects that have been carried out in the following countries: Bulgaria, Estonia, France, Ireland, South-Eastern Europe countries, Spain, Sweden, Romania and the United Kingdom.

4.5 Conferences and seminars in a European context

The European agroforestry and pastoralism associations are very active in promoting the benefits that these systems provide to society and environment and advocating for policy improvements in relation to these practices. In order to show some examples of their activities, these are several EU-context seminars and conferences that have taken place during 2015:

- The EU Policy Seminar with title “Europe's wood pastures: condemned to a slow death by the CAP? A test case for EU agriculture and biodiversity policy” was held in the European Parliament on the 17th of November 2015. (<http://www.efncp.org/events/seminars-others/wood-pastures-brussels2015/>, last accessed 30 November 2015). Some conclusions and recommendations extracted from the booklet of the seminar are the following: “CAP Pillar I direct payments rules and implementation discriminate against wood pastures”, “CAP Pillar II Rural Development Programmes are not doing enough to support sustainable management of wood pastures”, “all wood pastures in active farming use should be fully eligible for CAP direct payments, in EU regulations and in Member State implementation”, “an urgent evaluation should be undertaken of the impacts of the new CAP eligibility rules for permanent pastures and how to harmonise them with other policy areas” and “Member states should make full use of Rural Development Programme (RDP) measures for supporting positive management of wood pastures”. The booklet also presents the perspective from Spain, Sweden, Romania, France and England.
- Natura 2000 Farmland Management and Biodiversity Conference (http://ec.europa.eu/environment/nature/natura2000/platform/events/events-upcoming/193_natura2000_farmland_management_biodiversity_conference_en.htm, last accessed 30 November 2015). This Natura 2000 Biogeographical Process networking event took place in Madrid from 29th of September to the 1st of October 2015. “Best practice experience and case studies from across Europe were presented to illustrate measurable results that not only lead to better Natura 2000 planning and management, but also the generation of new economic opportunities for rural development and better integrated policy-making. At the heart of such examples, lie the effective relationships established between farmers, public and private landowners, land managers and businesses. The event demonstrated how multiple benefits can be and are being achieved through implementation of practical and pragmatic approaches in

agricultural areas within and around Natura 2000 sites, which take nature conservation objectives fully into account”.

- The European Forum on Nature Conservation and Pastoralism (EFNCP) participated in the 2015 edition of the Green Week (3-5 June 2015, Brussels; <http://www.efncp.org/events/seminars-others/green-week-brussels2015/>, last accessed 30 November 2015), which is the biggest annual conference on European environment policy. “The Forum was invited to take part in Session 4.2: the support of the Common Agricultural Policy for nature-based tourism, which was organised in collaboration with DG AGRI. They contributed to this session by presenting several examples of nature-based tourism related to pastoralism and analysing to what extent the CAP is giving support to these HNV livestock systems. The focus was put on Spain, where the Forum had run a survey in collaboration with the Spanish Platform for Extensive Livestock Systems and Pastoralism (Plataforma por la Ganadería Extensiva y el Pastoralismo, in Spanish; <http://www.ganaderiaextensiva.org/>, last accessed 27 November 2015) to explore some of the existing tourism-pastoralism initiatives. The first results of this survey have already been published online in Spanish, and were summarised in the slideshow presented at the Green Week session”. The Spanish Platform for Extensive Livestock Systems and Pastoralism is a network of over 200 people and organisations committed to supporting this farming activity. Some of their lines of work focus on “the need for a coherent and effective legal framework, the need to properly address pastoralism and grazing livestock systems on the Common Agricultural Policy and the social visibility and image of pastoralism and pasture-based livestock farming”.

5 Mapping of agroforestry lands in some countries

As mentioned above, there is a lack of available maps explicitly delimiting agroforestry lands across Europe. However, some countries have already put in place mapping activities of specific agroforestry practices. The following are some examples from selected countries compiled from an internet review and information available through the AGFORWARD project webpage (<http://www.agforward.eu/index.php/en/FarmerNetworks.html>, last accessed 1 December 2015):

- **In France**, the Ministry of Agriculture, Food and Forests has launched the national plan for the development of agroforestry (Plan de développement de l’agroforesterie, in French) during the 2nd national conference of agroforestry (Paris, 17th of December 2015; <http://agriculture.gouv.fr/stephane-le-foll-presente-le-plan-national-de-developpement-de-lagroforesterie>, last accessed 18 December 2015). This plan aims at dinamizing and promoting the agroforestry practices in France and internationally (see Box 5.1). In particular, Action 5.1 seeks to promote the development of agroforestry practices at the European level.

Box 5.1 French national plan for the development of agroforestry (Plan de développement de l’agroforesterie). The plan is comprised by 23 actions grouped in the following axes (http://agriculture.gouv.fr/sites/minagri/files/151215-ae-agrofesterie-v2_plan.pdf, last accessed 18 December 2015):

1. Better knowledge of the diversity of agroforestry systems and their functioning.
2. Improvement of the regulation and legal framework and reinforcement of the financial support.
3. Development of the counselling, education and promotion of agroforestry.
4. Improvement of the economic valorisation of the sustainable agroforestry production.
5. Promotion and diffusion of agroforestry practices at the international level.

Many french regions are implementing projects related to agroforestry. The French Agroforestry Association (Association Française d'Agroforesterie, in French, AFAF) shows in its website some of these regional projects (<http://www.agroforesterie.fr/index.php>, last accessed 1 December 2015). In the AGR'EAU project, the farms with agroforestry practices within the Adour-Garonne basin have been identified. In the resulting interactive map, the search can be done by type of agroforestry system, planted species or French Department (see Figure 5.1.a). The project SMART (Systèmes Mixtes Agroforestiers: création de Références Techniques & économiques, in French) provides a map of the market gardens with agroforestry practices at the national level (see Figure 5.1.b). In the region of Ile-de-France, the actions, new projects and potential areas for agroforestry practices have been identified (see Figure 5.1.c). The French Agroforestry Association is also very active in organizing events such as the first European meeting of agroforestry (Premier rencontre européenne d'agroforesterie, in French) that took place in Paris in 2011.

Figure 5.1 a) Farms with agroforestry practices and soil conservation

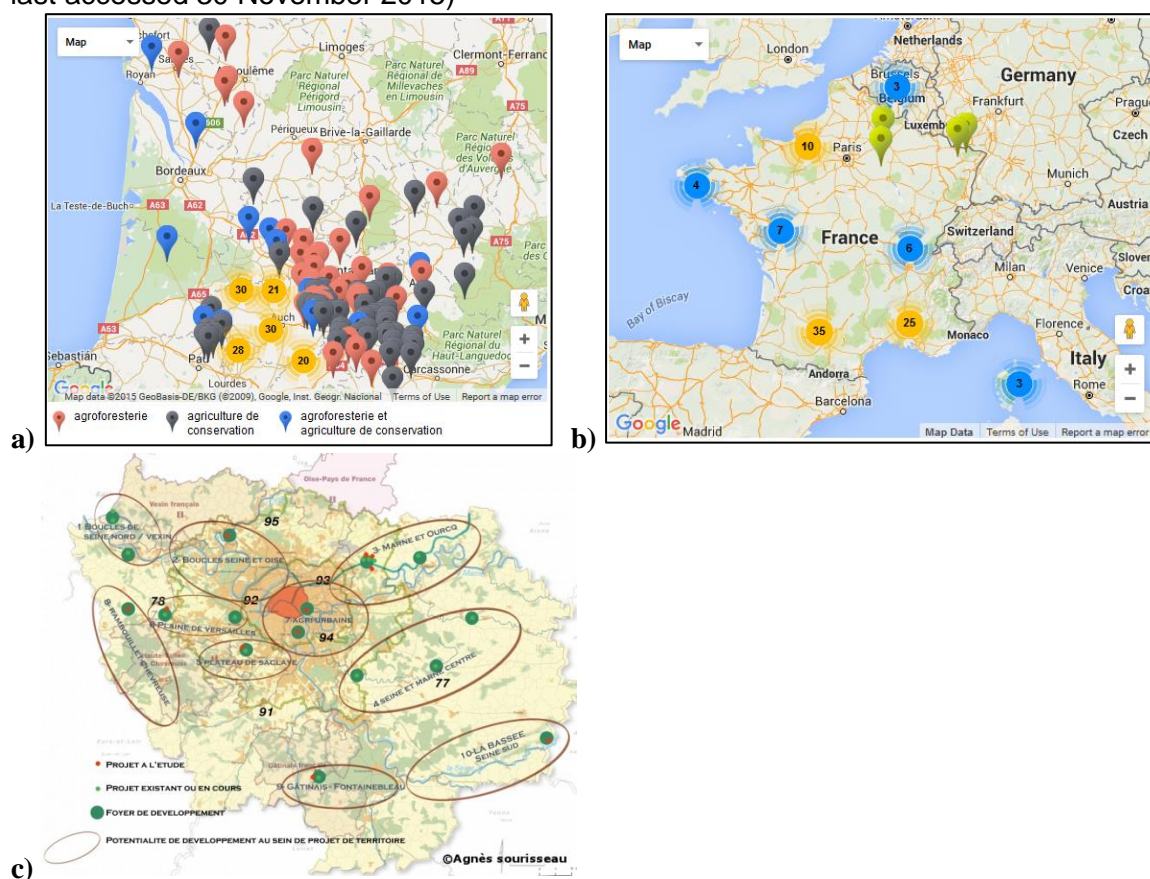
(http://www.agroforesterie.fr/AGREAU/cartographie_AGREAU/agreau-agroforesterie-couverture-vegetale-des-sols-cartographie-des-agriculteurs-references-dans-le-programme.php, last accessed 24 November 2015);

b) Market gardens with agroforestry practices

(http://www.agroforesterie.fr/SMART/cartographie_SMART/smart-cartographie-des-projets.php#, last accessed 30 November 2015);

c) Agroforestry projects in the region of Ile-de-France

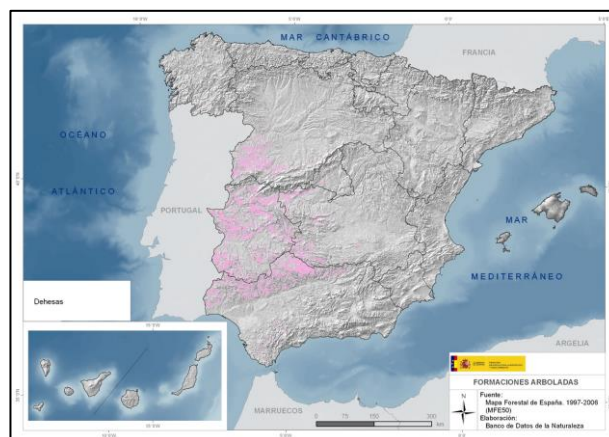
(<http://www.agroforesterie.fr/agroforesterie-et-agriculture-durable-en-ile-de-france.php>, last accessed 30 November 2015)



- **In Spain**, the Spanish Forest Map (1997-2006, scale 1:50.000) delimits the dehesas country-wide (see Figure 5.2). These unique agrosilvopastoral systems have an extraordinary ecological, economic and cultural importance in Spain. A National Federation of the Dehesa (Federacion

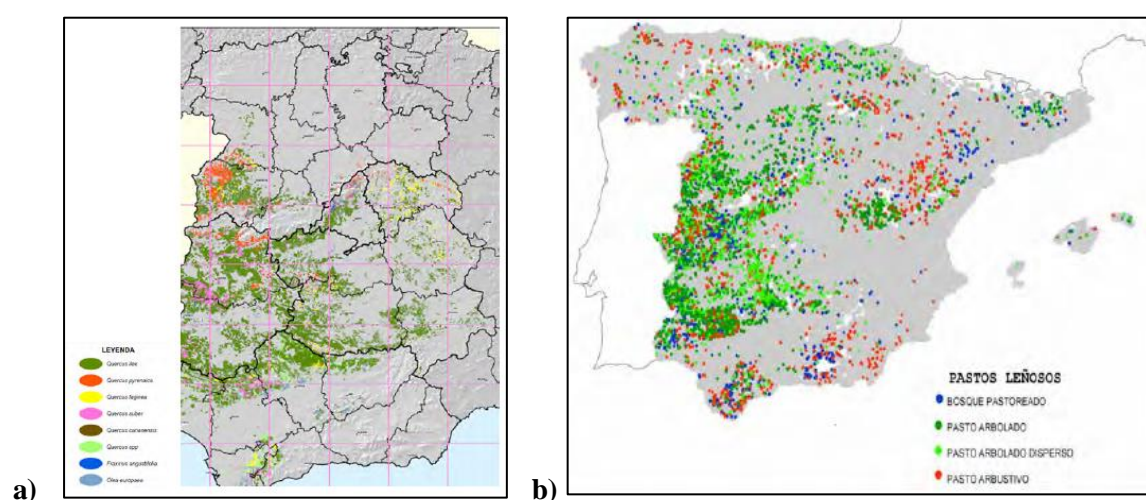
Nacional de la Dehesa, in Spanish, FEDEHESA) was constituted in 2014 aiming at the protection of the dehesa and the extensive livestock farming.

Figure 5.2 Distribution of dehesas in Spain (Spanish Ministry of Agriculture, Food and Environment, 2006; <http://www.magrama.gob.es/es/biodiversidad/servicios/banco-datos-naturaleza/informacion-disponible/mfe50.aspx>, last accessed 1 December 2015)



The Spanish Platform for Extensive Livestock Systems and Pastoralism (Plataforma por la Ganadería Extensiva y el Pastoralismo, in Spanish; <http://www.ganaderiaextensiva.org/>, last accessed 27 November 2015) published a report on the eligibility of Spanish wood pastures for the direct payments of the CAP (Informe sobre la elegibilidad para pagos directos de la PAC de los pastos leñosos españoles, in Spanish; Ruiz and Beaufoy, 2015; www.ganaderiaextensiva.org/InformeElegibilidadPastos.pdf, last accessed 1 December 2015). In this report, the distribution of Spanish dehesas (MAPA, 2008) and the types of wood pastures are shown (Figures 5.3.a and 5.3.b respectively).

Figure 5.3 a) Distribution of Spanish Mediterranean dehesas (MAPA, 2008). Colours represent the dominant tree species (several *Quercus* species, *Fraxinus angustifolia* and *Olea europaea*); **b) Distribution of types of silvopastoral lands in Spain based on LUCAS database:** grazed woods (blue), Wood-pasture (green), Scattered wood-pasture (light green) and shrub-pasture (red).



On the other hand, the Spanish Society for the Study of Pastures (Sociedad Española para el Estudio de los Pastos, in Spanish) has carried out several projects to classify, map and assess pastures in several regions (e.g. Balearic Islands, Cantabria, Madrid and Murcia). Among them,

they have mapped wooded pastures (pastos arbolados, in Spanish; <http://www.seepastos.es/proyecto%20pastos%20espa%F1oles.html>, last accessed 30 November 2015). Particularly, in the region of Madrid they have typified and mapped wooded pastures according to 16 classes depending of the dominant tree species (Consejería de Medio Ambiente, Vivienda y Ordenación del Territorio de la Comunidad de Madrid, 2009). Figure 5.4 shows the map of wooded pastures in Madrid and Figure 5.5 provides some pictures of agroforestry lands in different locations of Madrid.

Figure 5.4 Characterisation of wooded pastures in the region of Madrid (Consejería de Medio Ambiente, Vivienda y Ordenación del Territorio de la Comunidad de Madrid, 2009)

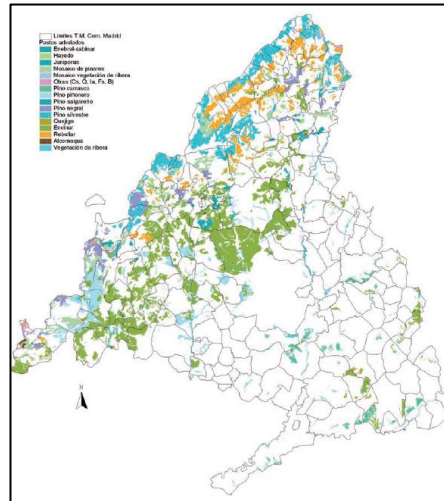


Figure 5.5 Examples of agroforestry lands in the region of Madrid. Source of all the pictures: Celia García Feced.



Cattle in *Fraxinus angustifolia* wooded pasture



Sheeps in *Fraxinus angustifolia* wooded pasture



Dehesas of *Quercus ilex*



Quercus ilex wooded pasture



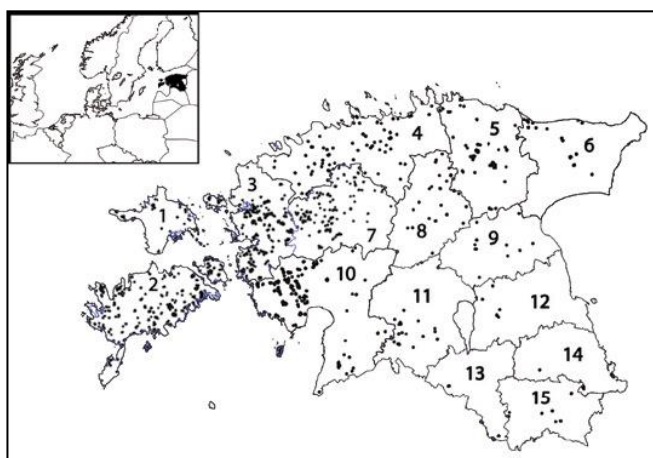
P. sylvestris and *Q. pyrenaica* wooded pasture



Cattle in *Quercus pyrenaica* wooded pasture

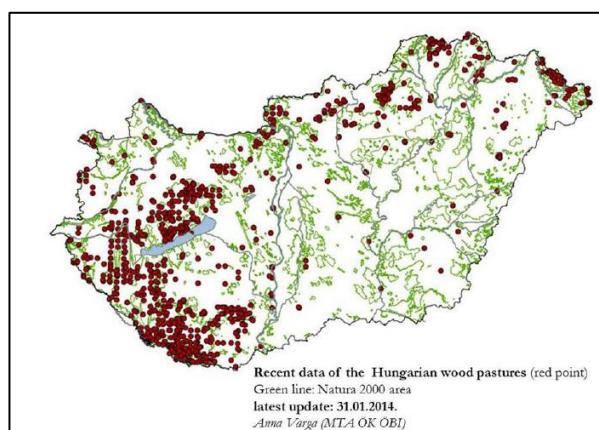
- **In Estonia**, the distribution of wooded meadows has been mapped by Talvi (2010) (Figure 5.6).

Figure 5.6 Current distribution of wooded meadows in Estonia (Talvi, 2010). The numbers mark the counties.



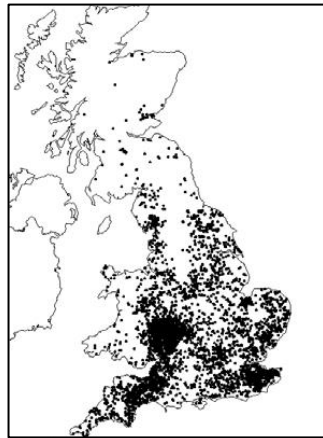
- **In Hungary**, “the term agroforestry is not widely used but there are traditional wood pasture and wood meadow systems”. Wood pastures have been identified by Varga et al. (2014) (Figure 5.7).

Figure 5.7 Presence of wood pastures in Hungary (Varga et al., 2014)



- **In the United Kingdom**, traditional orchards have been mapped by the UK BAP Biodiversity Reporting and Information Group (BRIG, 2011; see Figure 5.8). Traditional orchards are described as “structurally and ecologically similar to wood-pasture and parkland, with opengrown trees set in herbaceous vegetation, but are generally distinguished from these priority habitat complexes by the following characteristics: the species composition of the trees, these being primarily in the family Rosaceae; the usually denser arrangement of the trees; the small scale of individual habitat patches; the wider dispersion and greater frequency of occurrence of habitat patches in the countryside. Traditional orchards include plantings for nuts, principally hazel nuts, but also walnuts”.

Figure 5.8 Distribution of traditional orchards in the UK (BRIG, 2011)



6 Conclusions

- Agroforestry is the integration of woody vegetation, crops and/or livestock on the same area of land. The combination of these components originates the different categories of agroforestry practices: agrisilviculture, silvopastoral, agrosilvopastoral and others. Therefore, the widespread conception that only Iberian dehesas and montados are agroforestry areas is very reductive. The varied forms of agroforestry are practiced throughout Europe and consequently a change in mentality is needed.
- Agroforestry lands are not properly included or neglected in the available Pan-European land use/land cover, ecosystem and habitat classifications. Their double character of forest and agriculture land makes difficult its positioning into classifications. It would be advisable to better define agroforestry-related classes in the existing European datasets.
- Although there have been some attempts to map agroforestry areas and related lands at the Pan-European and national scales, there is still a lack of explicit delimitation of agroforestry areas in the majority of Europe. Mapping activities should be coordinated and harmonized across Europe. Copernicus land monitoring products could play an important role in that respect.
- Several relevant projects and associative initiatives are taken place in Europe, such as the project AGFORWARD, the European Agroforestry Federation (EURAF) and the European Forum on Nature Conservation and Pastoralism (EFNCP). They are very active in raising awareness about agroforestry systems and improving the knowledge base.
- Agroforestry lands have proved their value as biodiversity-rich systems and ecosystem services suppliers, and their suitability for climate change mitigation and wildfire prevention. Their conservation must be a priority in European policies. With this aim, the agroforestry sector is advocating for the improvement of EU regulations and Member State implementation, and particularly, for the revision of the CAP eligibility rules for direct payments.

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