

# How can policy support the uptake of agroforestry in Europe?

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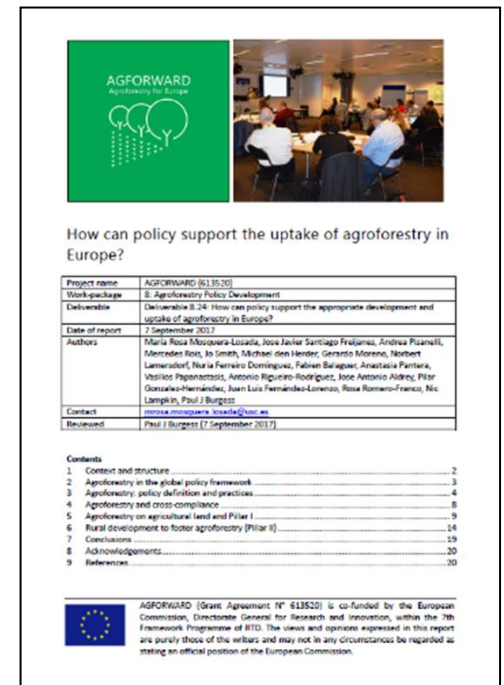
# How can policy support the uptake of agroforestry in Europe?



## Premise

**Agroforestry should be strongly supported by the CAP because it is a sustainable land management option that delivers market and non-market goods and services that address UN Global societal goals.**

Governments need to develop strategies, policies and actions that foster agroforestry within an EU policy framework.



The content of this presentation is also described by Mosquera-Losada et al. (2017)

# How can policy support the uptake of agroforestry in Europe?



## How can Agroforestry be fostered by the current EU Policies?

- Cross-compliance, Pillar I and Pillar II
- Pillar I

Basic payments

- Arable
- Permanent Grassland
- Permanent Crops

Greening

- Pillar II
  - Simplification
  - Connecting with Pillar I

Where Agroforestry can be implemented?

# How can policy support the uptake of agroforestry in Europe?



## Surveys

- AGFORWARD 2016 (200 farmers interviewed)
- AFINET 2017 (500 farmers interviewed)
- Results
  - ▶ **Lack of a clear definition of agroforestry within policy framework**
  - ▶ Policy does not adequately promote agroforestry
  - ▶ Lack of technical knowledge adapted to local conditions

# Defining agroforestry



Measure 8.2 (as a deployment of the Regulation 1305/2013) “*land-use systems and practices where **woody perennials** are **deliberately integrated with crops and/or animals** on the same parcel of land management unit **without the intention to establish a remaining forest stand**. The trees may be **arranged** as single stems, in rows or in groups, while grazing may also take place inside parcels (silvoarable agroforestry, silvopastoralism, grazed or intercropped orchards) or on the limits between parcels (hedges, tree lines)*”.

A definition of agroforestry is “the **deliberate integration of woody vegetation** (trees and/or shrubs) **as an upper storey on land, with pasture (consumed by animals) or an agricultural crop in the lower storey**. The woody species can be **evenly or unevenly distributed or occur on the border of plots**. The woody species can deliver forestry or agricultural products or other ecosystem services (i.e. provisioning, regulating or cultural)”. **Agroforestry can take place at a range of scales (e.g. plot, farm and landscape)**. At farm and landscape scale it can be implemented in systems that are able to diversify production (e.g. food, forage, timber and fuelwood), provide ecosystem services (e.g. soil restoration, water preservation, climate regulation, and biodiversity enhancement), thus increasing both resilience and profitability.

# Defining agroforestry








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# Agroforestry practices: plot scale



**Recommendation 2a:** The CAP should identify, recognize and foster the use of the following **five agroforestry practices** across Europe: silvopasture; silvoarable; hedgerows, windbreaks and riparian buffer strips; forest farming and homegardens.







Silvopastoral	Silvoarable	Hedgerows, windbreaks and riparian buffer strips	Forest farming	Homegardens
				
Combining woody perennials with forage and animal production	Widely spaced trees and shrubs intercropped with annual or perennial crops	Lines of natural or planted trees/shrubs bordering croplands/pastures to protect livestock, crops, and/or soil and water quality	Forested areas used for production or harvest of natural standing speciality crops	Combining trees/shrubs with vegetable production in urban areas



# Agroforestry and land designation



**Recommendation 2b:** In the EU **CAP context**, it is useful to distinguish between “agroforestry practices on agricultural land” and “agroforestry practices on forest land”; this is also useful for considering **the circular and bioeconomy framework**, carbon accounting and EU directives.

Agroforestry on agricultural land			Agroforestry on forest land		Urban areas
Silvopasture	Hedgerows, windbreaks and riparian buffer strips	Silvoarable	Silvopasture	Forest farming	Homegardens
					
Wood pasture Meadow orchards Grazed orchards		Alley cropping	Forest grazing	Harvest of berries, mushrooms, medicinal plants	Allotments, Gardens



# How can policy support the uptake of agroforestry in Europe?



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# Agroforestry and Cross-compliance



Woody vegetation preservation and promotion:

- a) GAEC7 (Isolated Trees, Hedgerows..)
- b) Pillar I (Greening)
- c) Pillar II (27 measures!)

as far as double funding is avoided

## **Recommendation 3: Agroforestry and landscape features**

Woody vegetation promotion and preservation linked to landscape features policies associated with Pillar I and Pillar II payments should be **simplified** and objectives should be clearly stated, and the **administrative burden reduced**.

**TOO COMPLEX, EVALUATION OF POLICY IMPACT!**

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Where Agroforestry can be implemented?

# Agroforestry and Pillar I



Agroforestry  
on arable land



Agroforestry on permanent  
grassland



Agroforestry  
with permanent crops



# Agroforestry and Pillar I



## Recommendation 4: Agroforestry Direct Payments and Management plans

**Agroforestry practices on arable and permanent grassland** should be **fully eligible** if developed with

- i) A “**management plan**” to show evidence of agroforestry
  - \* Minimum tree density (specified by member states)
  - \* Maximum tree density
    - Arable (100 mature trees ha<sup>-1</sup>, allowing high density in young stands)
    - Permanent Grasslands (idem unless Local Established Practices)
- ii) through Measure 222 and 8.2
  - Permanent crops has no CAP eligibility problems -> Encourage promotion
  - Simplify eligibility rules for direct payments ‘**agroforestry option**’

# Agroforestry and Pillar I

## Agroforestry on **arable land**



### Recommendation 5: Agroforestry and direct payments on arable land

Agroforestry (e.g. silvoarable agroforestry and hedgerow, windbreak and riparian buffer strips) should be promoted and be **fully eligible** for direct payments on arable land if a **management plan** is developed, where a minimum specification (selected by member states) and a maximum (100 mature trees per hectare) should be included, as it can **increase arable crop and woody vegetation productivity and/or resilience and the delivery of regulating ecosystem services such as increased carbon storage, reduced runoff, and improved water quality.**

# Agroforestry and Pillar I

## Agroforestry on **permanent grassland**



### Recommendation 6: Agroforestry and direct payments on permanent grassland

Permanent grassland areas where grasses and other herbaceous forage are traditionally not predominant should be **fully eligible** for direct payments if an agroforestry **management plan** is developed to increase the **resilience** of grazing systems (e.g. **reducing external inputs dependence, reducing fire risk**) from a **productive point of view**, while **enhancing ecosystem services** (e.g. promoting biodiversity). The management plan will allow agroforestry on permanent grassland (silvopastoralism) to be fully eligible for direct payments between a minimum specification (selected by member states) and a maximum of 100 mature trees per hectare when the pro-rata system is not selected by the member state.



# Agroforestry and Pillar I

## Agroforestry with **permanent crops**



### **Recommendation 7: Grazing and intercropping of permanent crops**

The grazing (silvopasture) and intercropping (silvoarable) of permanent crops are fully eligible under Pillar I and these practices should be **further promoted. Integrating animals in permanent crops improves nutrient recycling and reduce inputs at plot level and some crops and varieties can benefit from the shade provided by woody vegetation whilst also increasing the sustainability of the permanent crop system.**

In cases where farmers are seeking greening payments, they should be able to develop an agroforestry **management plan** indicating the agricultural use of the **understorey compatible** with the permanent crop.

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Where Agroforestry can be implemented?

# Agroforestry and Pillar I

## Agroforestry and greening



### Recommendation 8: Agroforestry and greening

Agroforestry practices should be included because agroforestry is one of the most powerful and effective tools to mitigate and adapt agriculture to climate change.

a) Management plan

b) Measure 222 and 8.2.

This new section will make it **easier to implement policies** and **follow up their impacts**, whilst mitigating and adapting to climate change such as **LULUCF**.

In the case of a percentage target (currently 5%) of EFA remains in the future CAP, agroforestry should also be an option to be counted for fulfilling the greening for the whole farm.

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Where Agroforestry can be implemented?

# Agroforestry and Pillar II



## **Recommendation 9: A unique agroforestry measure in Pillar II**

Unique “agroforestry” measure: encompassing the five agroforestry practices replacing the current 27 measures currently linked to agroforestry.

- a) agriculture (silvopasture, silvoarable, hedgerows and riparian buffer strips)
- b) forestry (forest farming, silvopasture, silvoarable)
- c) peri-urban (homegardens)

Those linked to arable lands should be fully eligible for Pillar I payments if less than 100 mature trees per hectare are intended as final tree density.

# Agroforestry and Pillar II

## Agroforestry on **agricultural land**



### **Recommendation 10: Support** for agroforestry establishment or management **on agricultural land**

Farmers should be given the option to undertake

- i) **establishment of agroforestry on agricultural land** including maintenance payments similar to that of afforested/woodland creation land
- ii) **improvement of management and recovery of already existing agroforestry lands.**

All areas designated as **agroforestry in agricultural lands** (arable, permanent grasslands and permanent crops) **should be eligible** for full greening and basic payments in Pillar I.

Minimum tree densities (to be given by Member states)

Maximum final tree density of 100 mature trees per hectare in arable lands unless LEP are declared on permanent grasslands

# Agroforestry and Pillar II



## Establishment

## Improvement





# Agroforestry and Pillar II

## Agroforestry on **forest land**



### **Recommendation 11: Support** for agroforestry establishment or management **on forest land**

There should be agroforestry **promotion**

- To help finance the **establishment and maintenance** (for the same period that afforestation and woodland creation measure in new agroforestry lands) of forest farming and forest grazing (if not included as Established Local Practices).
- To finance the **improvement of management** of forest farming and forest grazing of **existing agroforestry areas**.

Given the **increasing risk of forest fires** in Europe, the next Rural Development Programme should include support for **silvopasture** (forest grazing), **within the agroforestry measure**, and Member States should be encouraged to implement it.

# Agroforestry and Pillar II

## Agroforestry at **farm level**



### Recommendation 12: Agroforestry at a farm-level

**Result-based payments** can be delivered if agroforestry is implemented at a **farm-scale** as it has substantial potential to contribute to European targets such as addressing climate change, improving resource use, farming systems resilience (i.e. extreme events) biodiversity, and water quality.

There should be opportunities for farms or groups of farmers to develop GHG and carbon accounting plans such as **LCA and C footprints**.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Grass	Grass	Grass	Grass	Grass	Woody + Grass	Woody + Grass	Woody + Grass	Woody + Grass	Grass	Grass	Grass

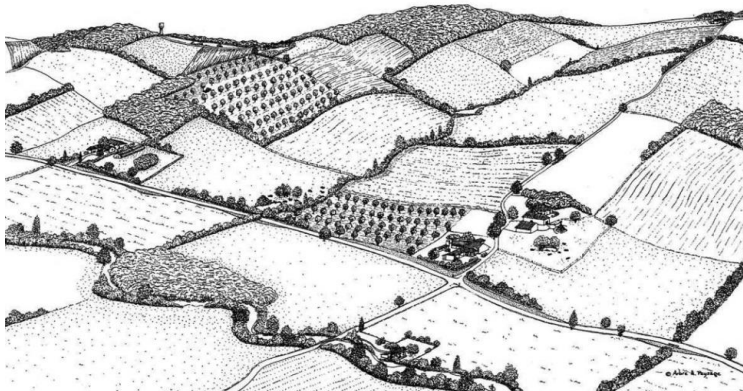
# Agroforestry and Pillar II

## Agroforestry at **landscape level**



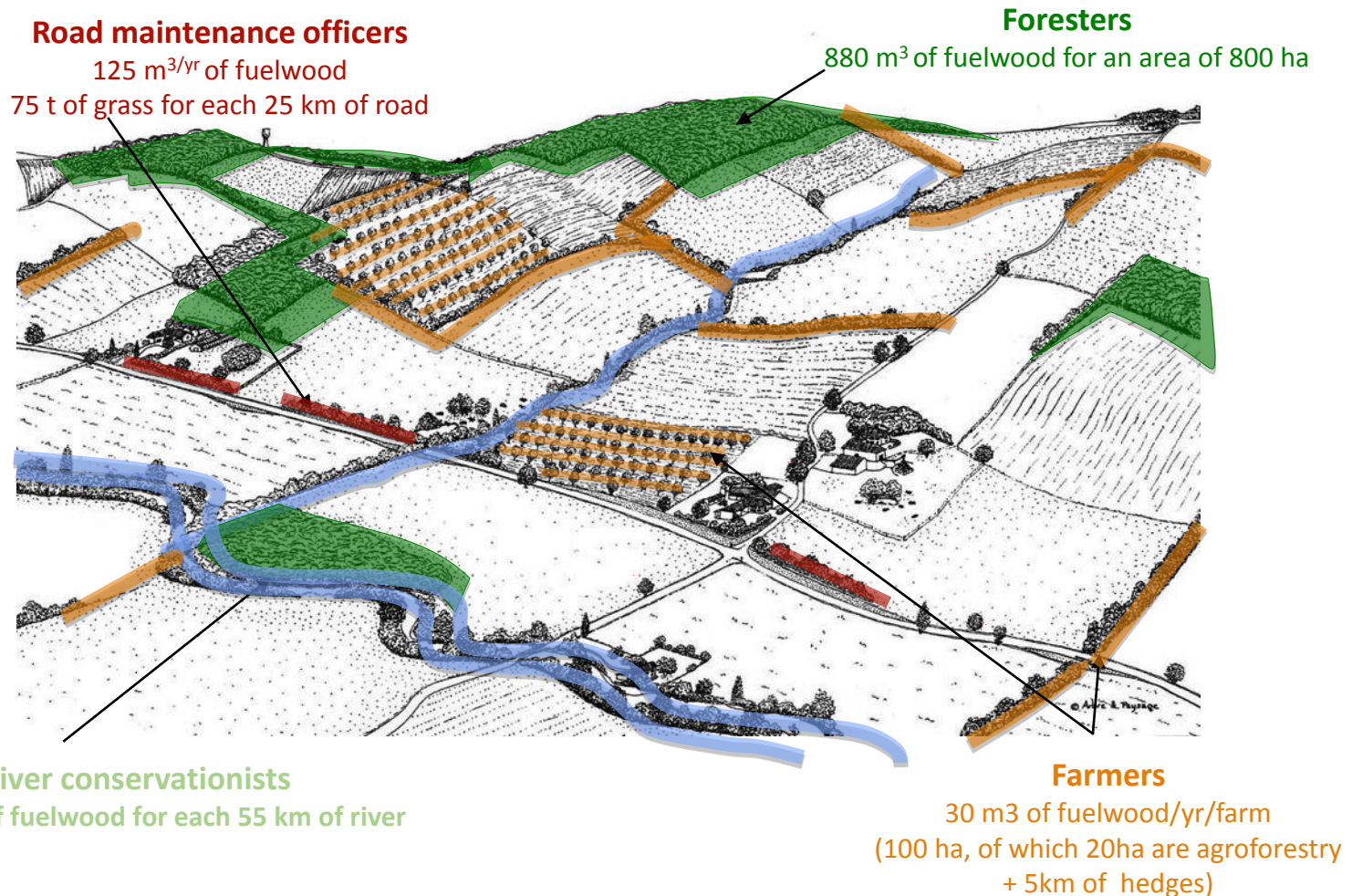
### Recommendation 13: Co-operation measures for sustainable landscapes

The European Union should support co-operation measures which allow the benefits of agroforestry to be recognised at landscape-level. This can be achieved by **facilitating co-operation** between farmers within a catchment including **landscape** linking **biodiversity of habitats**.



# Agroforestry and Pillar I

## Agroforestry at **farm level**





**The VALUE CHAIN**

**RAW MATERIAL**

Oil  
Polymers  
Polypropylene  
Polyethylene  
Polyester  
Supertensar

**NONWOVENS PRODUCTION**

Forestry  
Agriculture  
Viscose  
Cellulose  
Cotton

**FINISHED NONWOVEN**

Medical  
Hygiene  
Industrial  
Consumer

**CONVERTED GOODS**

Research institutes and test labs  
Agriculture  
Medical  
Civil  
Construction  
Industrial  
Packaging  
Consumer  
Industrial machinery

**CONSULTANTS**

Assessment  
Engineering  
Design  
Production  
Marketing  
Environmental  
Time  
Safety

**RETAILERS**

**END-USER**

# Agroforestry and Pillar II

## Agroforestry knowledge



### Recommendation 15: Agroforestry and education

Agroforestry is knowledge intensive, and so needs to be supported through excellent well-trained and independent **extension service providers**.

Activities related to **EIP-Agri**, extension services, knowledge co-creation should be promoted under relevant Pillar II measures.

FARMERS

STUDENTS

CONSUMERS

UNIVERSITIES  
AND COLLEGES

POLICY MAKERS

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## Where Agroforestry can be implemented?



# Agroforestry potential



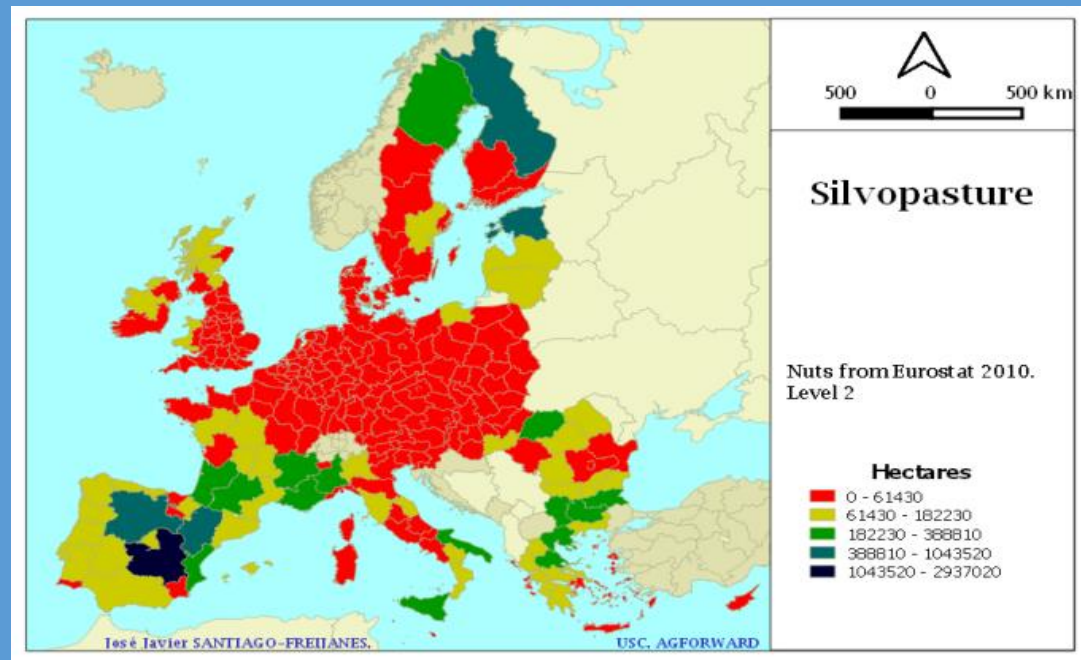
## Silvopasture



19.5 million ha<sup>a</sup>

Only used on  
10% of the EU  
potential area

## Woody + forage and animal production



Mosquera-Losada et al. (2016)

<sup>a</sup>: value including 2.66 million ha of grazed shrubland (See Mosquera-Losada et al. 2016)

# Agroforestry potential



## Silvoarable

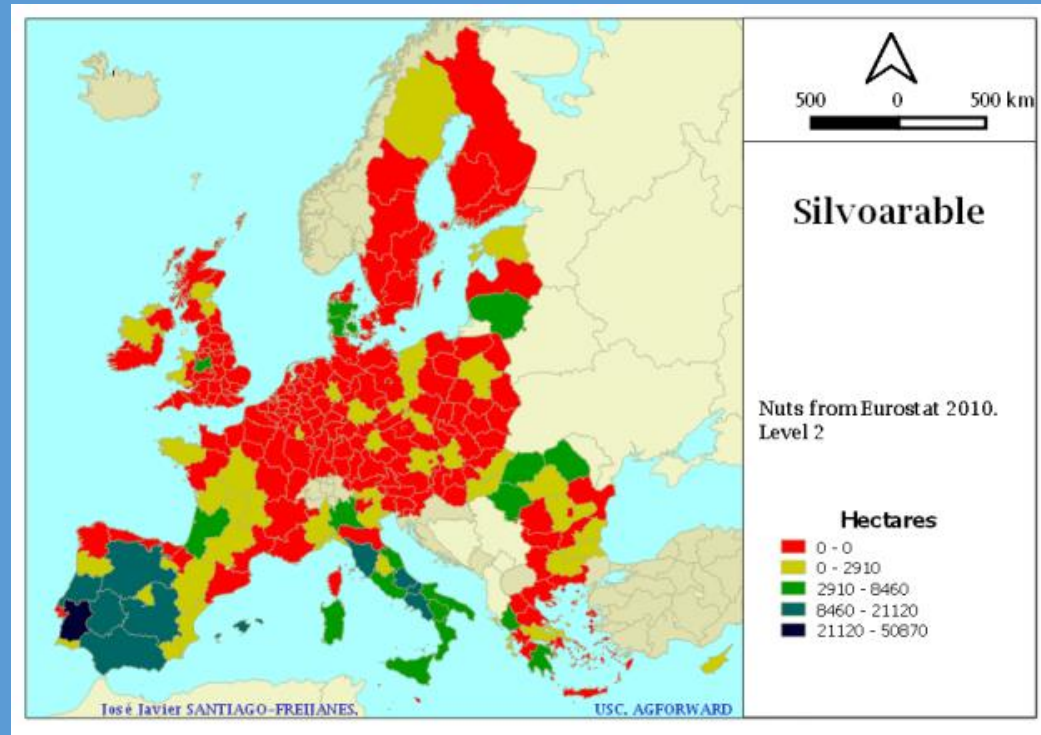


**422,250 hectares**

**0.4 % EU arable land**

**USA: <1%**

## Woody + annual or perennial crops



Mosquera-Losada et al. (2016)

# Agroforestry potential

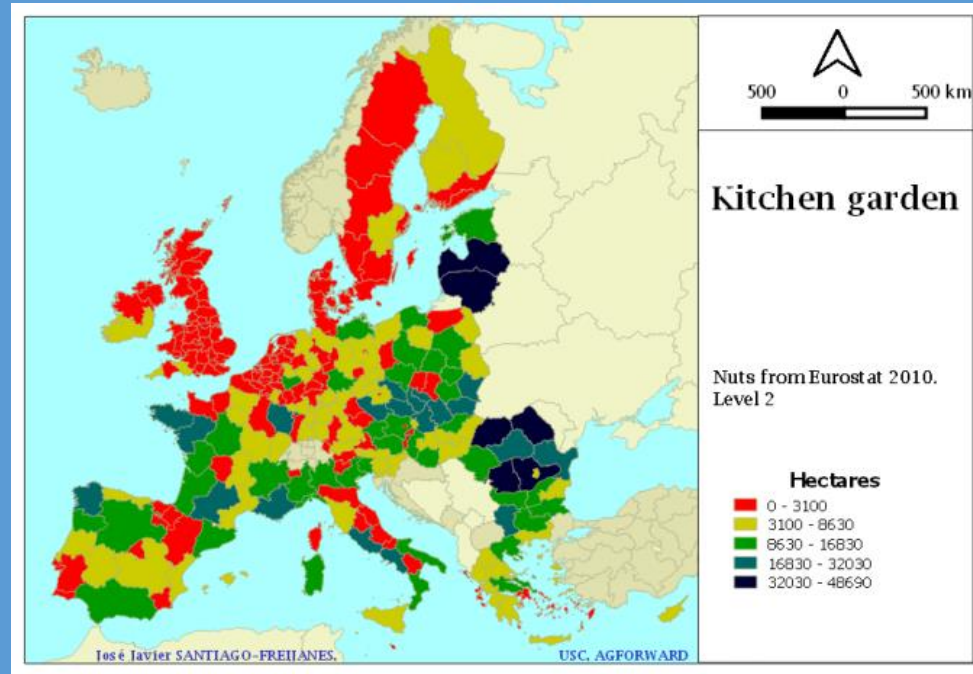


## Kitchen gardens

Trees + vegetable production in urban or periurban areas, also known as part of “trees outside the forest”



**1.8 million ha**  
**60% Agroforestry**



Mosquera-Losada et al. (2016)

**LINKING BIOECONOMY/RURAL AND URBAN AREAS/SMART VILLAGES**

# Recommendations



We have identified a series of recommendations:

- a) **fuller recognition of the wide range of existing agroforestry practices in Europe** (silvopasture; silvoarable; riparian buffer strips, windbreaks and hedgerows; forest farming and homegardens),
- b) **ensuring** the agroforestry associated with **arable lands**, **permanent grasslands**, and **permanent crops** secure direct payments, through the use of **management plans**.
- c) one **unique measure to support agroforestry establishment and improvement** of already existing agroforestry, and
- d) **support for farm-scale efficiency** including **carbon accounting** and **landscape-level, value chain** and **education** initiatives.

# Agroforestry

## Global Recommendation: Strategy

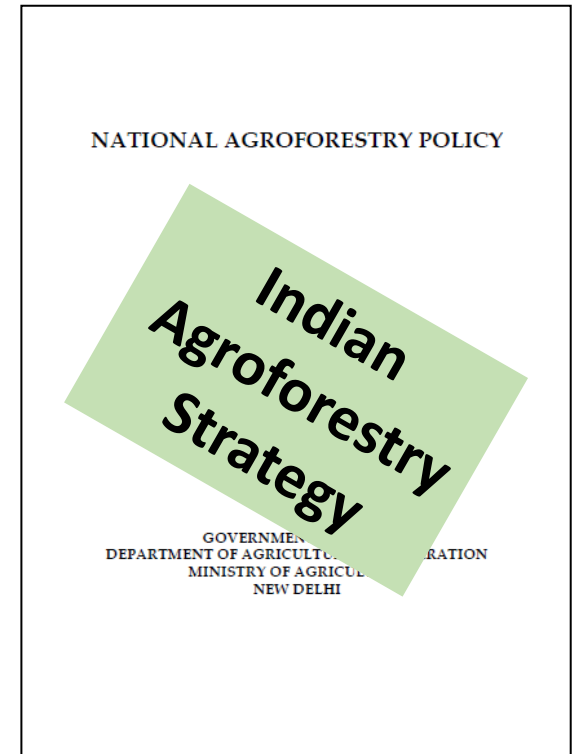
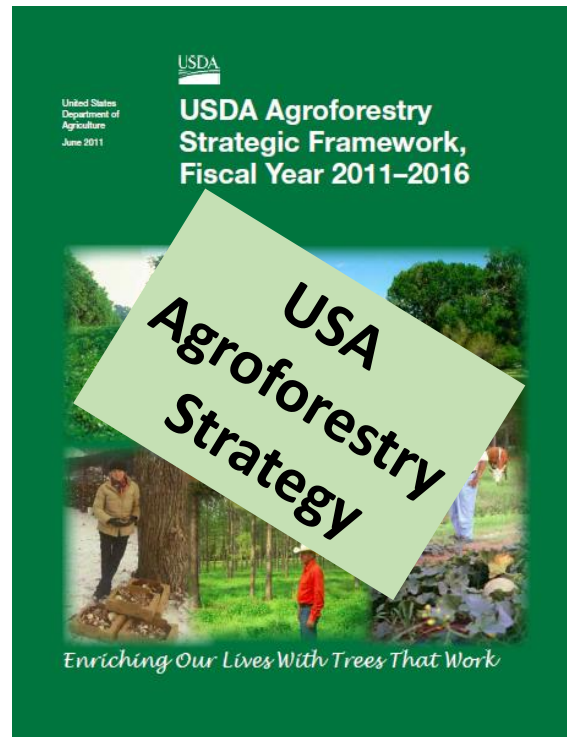
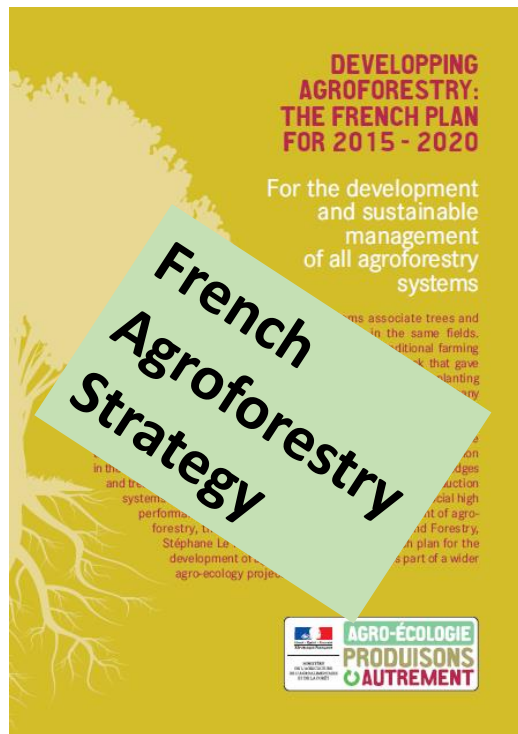


### Global Recommendation

A **European Agroforestry Strategy** should be designed to foster agroforestry in Europe. Such a strategy should include aspects related to current promotion, education, innovation and research on agroforestry at a European level, and provide guidance for national agroforestry strategies.

Policy promotion:	CAP
Education:	Integrating agriculture and forestry knowledge
Innovation	EIP-Agri, specific focus groups / operational groups
Research	Think globally but act locally





**Estrategia Agroforestal de México**

# Agroforestry and high-level societal goals



Sustainable development goals	Evidence that agroforestry can support
<b>2. Zero hunger</b>	Increasing food production whilst enhancing the environment
<b>3. Good health and well being</b>	Improving quality of drinking water and healthier food
<b>6. Clean water and sanitation</b>	Improving water quality due to tree uptake of pollutants
<b>7. Affordable and clean energy</b>	Woody vegetation in the farmed landscape used for bioenergy
<b>8. Decent work and economic growth</b>	Opportunities for added value
<b>11. Sustainable cities and communities</b>	Through the promotion of fruit trees in homegardens
<b>12. Responsible consumption and production</b>	Sustainable production systems
<b>13. Climate action</b>	Enhancing carbon storage on farm land
<b>14. Life below water</b>	Improving water quality
<b>15. Life on land</b>	Enhancing biodiversity



# References



- Howlett, D.S., Moreno, G., Mosquera-Losada, M.R., Nair, P.K.R., Nair, V.D. (2011) Soil carbon storage as influenced by tree cover in the Dehesa cork oak silvopasture of central-western Spain. *Journal of Environmental Monitoring* 13 (7), 1897-1904.
- Mosquera-Losada, M.R., Santiago Freijanes, J.J., Pisanelli, A., Rois, M., Smith, J., den Herder, M., Moreno, G., Malignier, N., Mirazo, J.R., Lamersdorf, N., Ferreira Domínguez, N., Balaguer, F., Pantera, A., Rigueiro-Rodríguez, A., Gonzalez-Hernández, P., Fernández-Lorenzo J.L., Romero-Franco, R., Chalmin, A., Garcia de Jalon, S., Garnett, K., Graves, A., Burgess, P.J. (2016). [Extent and success of current policy measures to promote agroforestry across Europe](#). Deliverable 8.23 for EU FP7 Research Project: AGFORWARD 613520. (8 December 2016). 95 pp.
- Mosquera-Losada, M.R., Santiago Freijanes, J.J., Pisanelli, A., Rois, M., Smith, J., den Herder, M., Moreno, G., Lamersdorf, N., Ferreira Domínguez, N., Balaguer, F., Pantera, A., Papanastasis, V., Rigueiro-Rodríguez, A., Aldrey, J.A, Gonzalez-Hernández, P., Fernández-Lorenzo, J.L., Romero-Franco, R., Burgess, P.J. (2017). How can policy support the uptake of agroforestry in Europe. Deliverable 8.24 for EU FP7 Research Project: AGFORWARD 613520.  
<http://www.agforward.eu/index.php/en/how-can-policy-support-the-uptake-of-agroforestry-in-europe.html>
- United Nations (2015). Sustainable Development Goals.  
<http://www.un.org/sustainabledevelopment/sustainable-development-goals/>