PRIMA
PARTNERSHIP FOR RESEARCH AND INNOVATION IN THE MEDITERRANEAN AREA

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Transition

Innovative resilient farming systems in Mediterranean environments

Mediterranean agroforestry and mixed farming systems: challenges, and policy priorities

Innovative resilient farming Systems in Mediterranean environments

Team: 10 partners from 6 different countries. 5 study regions (3 in the north Mediterranean: France, Italy, Spain; 2 in the south Mediterranean: Algeria, Egypt), and climate modelling specialists (Greece).

Project duration:
06/2021 - 11/2024

To cope with global change effects, Mediterranean agro-ecosystems must shift from conventional farming to diverse, productive, and sustainable systems like agroforestry and mixed farming. This transition would strengthen the resilience of farmers and rural communities, restore traditional uses, and incorporate innovative activities.

Using a participatory approach, TRANSITION works to provide:

- ✓ A solid understanding of the barriers that limit the adoption of sustainable agricultural practices including agroforestry and mixed farming systems.
- ✓ Tools for evidence-based decision-making aligned to stakeholder priorities.
- ✓ Development of a basin-level roadmap for wider adoption.

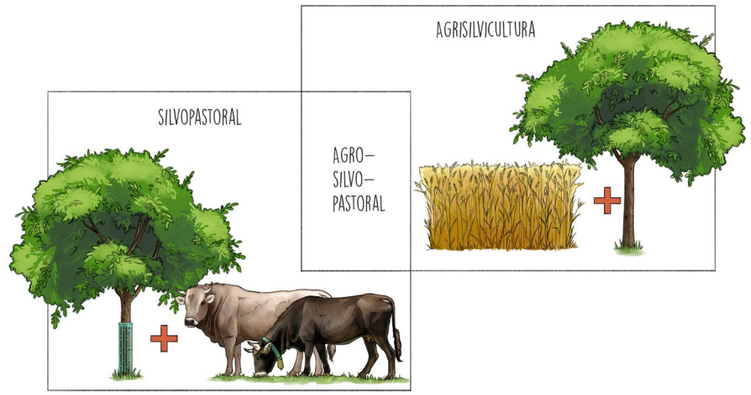
Definitions

FAO defines agroforestry as “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” [1].
The European Agroforestry Association defined Agroforestry as “All forms of association between trees and crops and/or animal production on an agricultural parcel whether it is in the interior ofthe parcel or on its edges” [2].

Additionally, FAO defines mixed farming systems as those in which “producers have some combination of perennial and annual crops, livestock, and/or fisheries” [3].

Agroforestry and mixed farming systems can be classified in general categories according to the elements that they integrate in the system:

- Agrosilvicultural or silvoarable: combination of crops and trees
- Silvopastoral: combination of trees and grazing of domesticated animals on pastures, forest or on-farm
- Agrosilvopastoral: combination of trees, animals, and crops, integrated in one system



Farmers in the Mediterranean face environmental constraints (drought, water erosion, flooding, salinisation, steep relief), underlying the value of combining trees, livestock, and crops for ages [4]. Safeguarding traditional agroforestry landscapes and establishing new designs to address current and projected global challenges require aligning stakeholder priorities with governmental and intergovernmental policies.

Agroforestry practices are recognized as a way of mitigating and adapting agriculture to climate change [5, 6, 7, 8, 9]. Specifically, agroforestry is mentioned among the agricultural practices that support the achievement of the EU's climate objectives [10]. Other initiatives at supra-national level also mention agroforestry (The European Green Deal, Farm to Fork Strategy, the EU Biodiversity, Forest and Soil Strategies and the Circular Economy Action Plan, among others).

Table 1. Variables considered in the policy study

Variable	Description
Demonstration countries	Algeria, Egypt, France, Italy, Spain
Territorial scopes	supra-national, national, regional, and local
Sectors	public research centre, public education entity, private sector, public administration, farming
Actors profile	technic, politician/decision maker, advisor, farmer, student, researcher

Policies aborded through Transition project

Agroforestry and mixed farming regulations, policies, and economic barriers affecting the adoption of these systems were investigated through a participatory approach together with bibliographical research. Table 1 summarises the variables considered for the study done in five Mediterranean demonstration countries A total of 138 stakeholders were interviewed, encompassing different territorial scopes and profiles.

The current document summarises the main outputs regarding the technical, economic and political challenges proposed by each participant country in the interviews and by the bibliographical research (Table 2). Then a series of proposals for overcoming the challenges are presented (Table 3). Proposals are grouped into two groups: north Mediterranean countries under the European Common Agricultural Policy (CAP) framework and south Mediterranean countries, ruled by national regulations.

Agroforestry and mixed farming practices are gaining interest among farmers, agricultural technicians, public entities, and decision-makers. The agricultural sector is determined through sets of legislation, practices, socio-economic barriers, and opportunities. There are still a number of technical, social, economic and political challenges that decelerate the implementation of these strategies.

Table 2. Summary of identified challenges by country

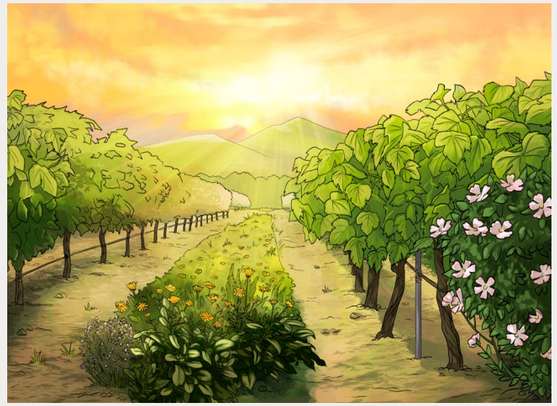
CHALLENGES	COUNTRY				
TECHNICAL AND SOCIAL	Algeria	Egipt	France	Italy	Spain
Access to technical knowledge and support on agroforestry and mixed farming	■	■	■	■	■
Cultural acceptation of moving forward new agricultural practices	■	■	■	■	■
Time scale for implementation	■	■	■	■	■
Lack of agroforestry and mixed farming model systems to farmers; lack of demonstrative and experimental plots	■		■	■	■
Insufficient plant production to meet demand	■	■	■	■	
ECONOMIC					
High cost of initial investment	■	■	■	■	■
Difficulty to know and get access to existing financial subsidies	■	■	■	■	■
Access to the market and price fluctuations	■	■	■		■
Difficulty to know and get access to existing financial subsidies	■	■	■	■	■
Access to land propriety	■				■
POLITICAL					
The short-term political agenda timing	■	■	■	■	■
Lack of knowledge and Lack of knowledge and recognition in the legal framework	■		■		
Involvement of private sector			■	■	■
Bureaucracy complex bureaucracy procedures and difficulty to understand legal framework	■	■	■	■	■

One of the main technical challenges identified is the limited training programs for agroforestry and mixed farming systems. In Spanish, for example, the CAP provides some measures for technical assistance and assessment of climate change adaptation and mitigation, such as for fruit and vegetable or wine sectors, but not specifically for agroforestry. **Socially, the main challenges** are the cultural environment of rural communities, a lack of understanding, and cultural judgement.

The high cost of investment was the main **economic challenge** identified. For example, in France, agroforestry projects cost between 14€ and 40€ per tree, including technical support. With an average number of 400 and 700 trees per farm (considering that tree density is normally 70-150 trees per ha), the investment amounts to several thousand euros for the farmers [11].

Integrating agroforestry and mixed farming into the policy agenda was the main **political challenge** identified. For example, in Egyptian, short-term political agendas need a long-term vision. Currently, the political agenda prioritises food security, particularly wheat production, leading to policies and credit programs that heavily favour wheat. It is undoubtedly important, but the narrow focus overlooks the potential to implement more sustainable and resilient farming systems.

Proposals from the participant countries cover aspects such as knowledge dissemination, economic viability, technical support, networking, funding, market development, land management, and research. The proposals emphasise collaboration among various stakeholders, including farmers, technical advisors, public entities, and the private sector, to foster sustainable (socially, technically, economically) agricultural practices.



The TRANSITION project, through a participatory approach and research, generated 21 proposals to address challenges in adopting agroforestry and mixed farming systems. These proposals are relevant across northern and southern regions and are categorized into governance, knowledge, market, networking, and subsidy.

Proposals of governance emphasize integrating agroforestry and mixed farming into public policies and projects taking advantage of the CAP and including local stakeholders and context. In addition, proposals to overcome challenges related to the complexity of bureaucracy for subsidies, or to the land access for small farms.

Knowledge proposals were the most numerous, focusing on enhancing technical and educational frameworks. They aim to develop technical advice and training programs for different stakeholders. Emphasis was also placed on Mediterranean-level research and knowledge sharing. In the networking aspects, proposals seek to build collaborative networks to support agroforestry and mixed farming.

Related to the market, proposals aim to improve the economic viability of agroforestry and mixed farming products by fostering a supportive environment for these agricultural practices, economic stability for producers, and market integration.

Proposals about subsidies highlight the demand for financial incentives to lower economic barriers. Targeted financial assistance aims to make agroforestry and mixed farming viable options for farmers, promoting widespread adoption.

Table 3. Proposals to promote agroforestry and mixed farming systems (AF and MF, respectively) in the Mediterranean context (north and south participant countries).

Proposals for promoting AF and MF systems in the Mediterranean					
Governance	**Knowledge**	**Networking**	**Market**	**Subsidy**	**Knowledge Subsidy**
Create a Good Agricultural and Environmental Conditions (GAEC) document dedicated to AF systems within the future CAP*****. Develop **territorial projects** including municipalities, farmers, rural actors and local citizens. **Reduce bureaucracy** for the subsidies and public programs. Improve **access to land property** and/or land extensions for small farms	Develop **technical advice** and professional **training** for the **farmers** in AF and MF. Develop **training** for workers of the agricultural **public administration** departments in AF and MF. Publicise existing **pilot farms** and innovative spots in AF and MF to demonstrate their economic sustainability and promote these models. Keep developing international and national **research programs** around the Mediterranean. Publish and widely **disseminate knowledge** about AF and MF models. Development of **Carbon farming** models for the Mediterranean conditions.	**Foster networking and synergies** between technical advisors, and farming communities.	Guarantee **direct market access** and **price stability** for production. Open **public loans and self-financing** through banks other than the national bank system******. Involve the **private sector** by encouraging them to implement AF and MF among their providers/ sourcing. Improve **seedlings** supply **and** homogenise the **nursery supply** market in all the territories. Implement **Carbon markets** in AF and MF.	Create and develop **public and private subsidies** in addition to CAP programs*****. **Open subsidies** for fertilisers, water irrigation systems or forage systems. Create and promote public **funding programs adapted to local contexts** to encourage farmers' transition towards AF and MF.	Integrate **long-term technical support** within the funding programs.

*****Proposal only reported for North Mediterranean countries

****** Proposal only reported for the South Mediterranean countries

Conclusions

Agroforestry and mixed farming practices are in growing development and the interest is growing among farmers, technicians in agriculture, public entities, and decisions makers. These practices align with global and Mediterranean initiatives for climate change adaptation and mitigation, having multiple co-benefits including increasing the productivity per land unit and the protection of soil, water and biodiversity. Decision-makers must work faster to promote these practices, by developing new policy and financial mechanisms. It is essential to create local and international collaborations around the Mediterranean basin for a sustainable agriculture, adapted to climate change to enhance the resilience of rural communities.

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