

NATURE-BASED SOLUTIONS

Evidence-based research findings from Tour du Valat

FACT SHEET 2

AGROECOLOGY ON THE PETIT SAINT-JEAN ESTATE

- 📍 **Location:** Camargue Gardoise, South of France
- 🌿 **Habitat:** Stone pine grove, marshes and semi-natural (agricultural) environments

#agriculture #agroecology #agroforestry



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AGROECOLOGY

Agroecology is a way of designing production systems based on ecosystem functions. It enhances these production systems while aiming to reduce pressures on the environment and preserve resources. The aim is to make maximum use of nature as a factor of production while maintaining its capacity to renew itself.

THE PETIT SAINT-JEAN ESTATE

The estate covers 100 hectares. It consists of pine groves, marshes, and semi-natural (agricultural) habitats of **great ecological value**, which can be a **showcase for agroecology**. The management of the Estate has been built around the conservation of natural environments and their biodiversity while implementing a productive, sustainable, autonomous and economically viable agricultural system to optimize its transfer to other projects.



THIS PROJECT RESPONDS TO CHALLENGES FACING SOCIETY



» Food security

Providing healthy organic food.



» Economic and social development (in rural areas)

Offering productive systems that support economic and social development while hosting biodiversity.



» Mitigating the effects of climate change

Optimising the potential for carbon accumulation in the biomass of the agricultural system. Protecting soil and nutrients such as nitrogen, phosphorus, and carbon that can turn into greenhouse gases.



» Environmental degradation

- Promoting diversified and functional agrosystems.
- Improving water retention.

ECOSYSTEM-BASED APPROACHES EMPLOYED

» Ecosystem-based management

The agroecology projects on the Petit Saint-Jean Estate, which mimic the structures of natural ecosystems, help to keep agricultural systems healthy and ensure their resilience while allowing for the sustainable use of their resources.

» Establishing green infrastructure

Green infrastructure such as hedgerows are integrated into the landscape. They can be habitat for pollinators and scatterers of seeds (as birds), as well as enriching root systems (fungi, animals and bacteria).



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ADVANTAGES OVER CONVENTIONAL APPROACHES

In a monoculture system, only one plant variety is used, which facilitates large volume production at a lower cost (same seeds, use of machinery, etc.). Moreover, this practice facilitates the spread of diseases and parasites, contributes to the depletion of soil fertility, and is accompanied by a loss of biodiversity. It also leads to the widespread use of phyto-pharmaceutical products. Consequently, food may contain

an excess of chemicals that are toxic to humans as well as ecosystems.

Conversely, agroecology helps to improve soil fertility and diversify production, while respecting ecosystems and building a more resilient overall system. At the Petit Saint-Jean Estate, some plots have been selected for experiments with agroecology and agroforestry practices that are appropriate for wetlands.

SPECIES THAT ADAPT TO CLIMATIC CONDITIONS

The species selected adapt well to climate change (increased number of hot days in summer). They include fruit and nut trees, such as almond, pomegranate, pear, and pistachio. Legumes planted between rows will improve soil quality by fixing nitrogen, thus making the system more resilient. The choice of grape varieties has also taken into account their resistance to high temperatures and low summer precipitation.

» BENEFITS FOR BIODIVERSITY

The conservation of the natural habitats on the Petit Saint-Jean Estate creates remarkable biodiversity (for example, there are 350 plant species and 170 bird species).

Diversification of crops and strata (grasses, shrubs, trees) in the agricultural system:

- » Providing habitats and resources to **host biodiversity**.
- » Limiting the overall impact of climate on crops, **while protecting them from unpredictable weather** (drought, wind, etc.).
- » Helping maintain the **humidity, structure, and fertility of the soil**.
- » Providing a root network that **enhances colonization by mycorrhizae** – fungi working in symbiosis with plants.
- » Mycorrhizae improve soil fertility and structure in the long term and **mitigate pollution** (pesticides, heavy metals, etc.).
- » Attracting **pollinators**, which are essential for the production of seeds and fruit.

» ECOSYSTEM SERVICES PROVIDED BY AGROECOLOGY

» Supporting services

Preservation of biodiversity • Habitat for species • Water cycle

» Provisioning services

Human and animal food • Fire wood • Materials • Genetic resources

» Regulatory services

Climate • Air quality • Disease control • Pollination • Soil protection and fertility

» Cultural services

Recreation • Ecotourism

LESSONS LEARNED

- » This agroecology system will allow us to produce a variety of food responsibly while protecting the soil and biodiversity.
- » A diverse agricultural system that mimics a natural ecosystem by having multiple layers (grasses, trees, shrubs) must be carefully planned from the outset in order to be well integrated into the landscape.
- » Proper care of newly planted trees (watering, weeding, physical protection against herbivores) is crucial during the first two years (especially in the Mediterranean region).
- » This agroecosystem offers a wide variety of resources and often other unexpected resources from natural ecosystem development (e.g., fruit).

TARGETED SUSTAINABLE DEVELOPMENT GOALS

2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



15 LIFE ON LAND



» INFORMATIONS

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- » Fondation de France
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WHAT ARE NATURE-BASED SOLUTIONS?

Nature-based Solutions (NbS) are "actions to **protect, sustainably manage, and restore natural and modified ecosystems** that address **societal challenges** effectively and adaptively, simultaneously providing **human well-being and biodiversity benefits**". They also provide ecosystem services and contribute to achieving sustainable development goals by enhancing biodiversity. NbS are effective, flexible, technologically diverse, and economically viable. They provide an opportunity to increase the resilience of societies to climate change and will facilitate our transition toward a more sustainable and inclusive economy.



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