Research and Development (R&D)

Research and Development (R&D) refers to the process of generating new knowledge to improve the understanding of agricultural practices and their role in addressing climate change. It supports key objectives such as enhancing soil carbon storage, improving food security, conserving biodiversity, and fostering rural development through scientific research and technological innovation. By investing in new farming techniques, crop varieties, and precision technologies, R&D aims to boost agricultural productivity while reducing environmental impact and promoting more sustainable farming systems. In some cases, farmers may receive payments for participating in R&D initiatives.

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REWARDING MECHANISM: RESEARCH AND DEVELOPMENT (R&D)

Tier 1	Supportive
Tier 2	Research and Development (R&D)
Tier 3	
Description	**Research and Development (R&D)** expands knowledge by generating, testing, and implementing innovative solutions to advance sustainable agricultural practices that promote carbon sequestration and climate change mitigation. It focuses on developing and evaluating farming methods that enhance soil health, capture atmospheric carbon, and reduce greenhouse gas emissions. In Europe, various programmes support R&D and foster collaboration between researchers, farmers, and policymakers to deliver practical solutions for carbon farming. In some cases, farmers may receive payments for participating in these R&D initiatives.
References	- European Commission. (2023). *Carbon removals and carbon farming*. Retrieved from https://climate.ec.europa.eu/eu-action/certification-permanent-carbon-removals-carbon-farming-and-carbon-storage-products/carbon-farming-and-carbon-storage-products_en - European Commission. (2023). *Research and innovation – Agriculture and rural development*. Retrieved from https://agriculture.ec.europa.eu/sustainability/research-and-innovation_en

Advantages	**Disadvantages**
Participation in R&D programmes can provide farmers with access to new technologies and practices that support both sustainability and business performance (European Commission, 2023f).	Participation in R&D programmes can be costly for farmers in terms of time and administration complexity (Barbato, C. T., et al., 2023).
R&D involvement may open pathways to carbon markets, certification schemes, or premium product opportunities (Sharma, M., et al., 2021).	Innovations do not always reach or resonate with farmers, particularly when knowledge transfer mechanisms are weak (Sharma, M., et al., 2021).
Opportunities to receive monetary compensation for participating in R&D programmes, in certain cases.	The tangible benefits of R&D may take several years to materialize at the farm level.

Example Research and Development (R&D): LIFE Carbon Farming

Tier 1	Monetary	Supportive	Regulatory
Tier 2	Research and Development (R&D)		
Tier 3			
Example	**LIFE Carbon Farming**		
Summary	The **LIFE Carbon Farming** project is an initiative funded under the European Union's LIFE Programme, which supports environmental protection and climate action across the EU. Running from 2021 to 2027, the project brings together 50 partners from six countries—France, Belgium, Germany, Italy, Ireland, and Spain—with the goal of promoting climate-smart farming practices that reduce greenhouse gas emissions and enhance soil carbon sequestration. The project's core objective is to achieve a 15% reduction in the carbon footprint of agricultural products over a six-year period. It supports 700 mixed livestock farms across Europe, offering tailored advisory services and monitoring tools to help farmers design and implement effective emission-reduction strategies at the farm level. A key feature of the project is the development of a harmonised sustainability assessment methodology and a standardised Monitoring, Reporting, and Verification (MRV) framework. These tools enable farmers to assess their progress in reducing carbon footprints and facilitate the certification of low-carbon farming practices. The MRV framework will also support the introduction of a results-based reward mechanism, allowing for the establishment of contracts between farmers, project developers, and carbon buyers, thereby enabling farms to generate revenue through carbon credits.		
Type of climate action	**Carbon removal**	**Emission reduction**	**Climate adaptation**
Appropriate for: Who can benefit from this type of rewarding mechanism (in the agricultural sector?)	- Farmers - Farm Advisors - Research institutions		
Source of rewarding mechanism: Who provides the rewarding mechanism?	**Public**	Private	Public-Private
Rewarding method: What is the reward based on?	Result-based		

REWARDING MECHANISM: RESEARCH AND DEVELOPMENT (R&D)

Type of on-farm action: What is the recipient obliged to deliver in return?	- The farm undergoes visits by an accredited advisor at the start and end of the project, using standardised environmental and carbon diagnostic tools. - The farmer and farm advisors jointly develop a tailored action plan together. The farmer has 5 years to implement it, during which two technical visits will be financed. - After six years, a third-party audit certifies the carbon footprint reductions. These certified reductions enable the carbon credits validation.
Governance: Who manages the programme, provides the reward, and where does the money come from?	The LIFE programme
References:	- LIFE Carbon Farming. (2024). *The project LIFE Carbon Farming*. Retrieved from https://life-carbon-farming.eu/life-carbon-farming/ - European Commission. (2025). *Development and implementation of a result-based funding mechanism for carbon farming in EU mixed crop livestock systems*. Retrieved from https://webgate.ec.europa.eu/life/publicWebsite/project/LIFE20-CCM-FR-001663/development-and-implementation-of-a-result-based-funding-mechanism-for-carbon-farming-in-eu-mixed-crop-livestock-systems

Example Research and Development (R&D): Climate Farm Demo

Tier 1	Monetary	Supportive	Regulatory
Tier 2	Research and Development (R&D)		
Tier 3			
Example	**Climate Farm Demo**		
Summary	Climate Farm Demo (CFD) is a unique pan-European network of Pilot Demo Farmers (PDFs) covering 28 countries and all pedo-climatic areas, allowing different practices to be tested in diverse contexts. Its goal is to accelerate the uptake of climate-smart farming practices and support the transition towards a carbon-neutral agricultural sector by 2050. The project connects 1,500 PDFs and their Climate Farm Advisors (CFAs) at European and national levels through demonstration events and peer-to-peer learning. Farmers can observe practical solutions, exchange ideas and experiences, and receive advisory support for implementing adaptation and mitigation measures. CFD also includes 10 living labs across Europe, where technical and social innovations will be tested through six annual demonstration campaigns, resulting in approximately 4,500 events with the participation of farmers, advisors, and researchers. This project helps to close the gap between research and practice by focusing on solutions that work on real farms. By monitoring outcomes, identifying farmers' needs, recognising effective incentives and rewarding mechanisms, and demonstrating feasible agricultural practices, CFD can help to inform policymakers and contribute to the development of improved agricultural policy at the EU level.		
Type of climate action	**Carbon removal**	**Emission reduction**	**Climate adaptation**
Appropriate for: Who can benefit from this type of rewarding mechanism (in the agricultural sector?)	- Farmers - Farm Advisors - Research institutions		
Source of rewarding mechanism: Who provides the rewarding mechanism?	**Public**	Private	Public-Private
Rewarding method: What is the reward based on?	Action based		

Type of on-farm action: What is the recipient obliged to deliver in return?	- Farmers should be open to participate or host Demonstration events. - Farmers are expected to implement climate-smart farming practices on their farms. - Farmers should collaborate closely with the farm advisors to design, implement and monitor a tailored "adaptation and mitigation plan" using specific tools to monitor the farm´s progress.
Governance: Who manages the programme, provides the reward, and where does the money come from?	Horizon Europe
References:	- EIP-AGRI. (2022). *Horizon Europe: Creating knowledge to boost agricultural innovation*. Retrieved from https://ec.europa.eu/eip/agriculture/en/horizon-europe-creating-knowledge-boost.html - European Commission. (2024). *Horizon Europe*. Retrieved from https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en - European Commission. (2024). *Horizon Europe – How to apply*. Retrieved from https://rea.ec.europa.eu/horizon-europe-how-apply_en