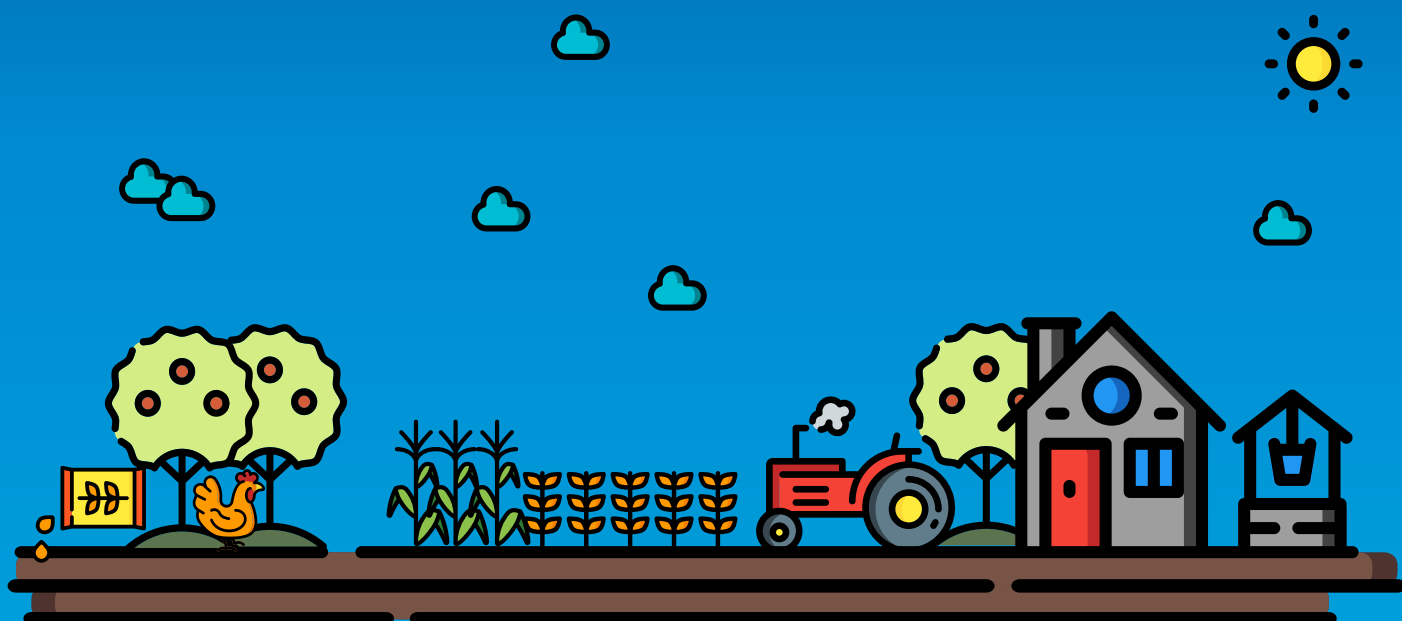


# Climate action in agriculture

Implementation at local level in the EU and support for action in countries outside the EU



# Introduction

## Supporting the Koronivia Joint Work on Agriculture



Agriculture plays an essential role in feeding a world population of 7 billion people as well as providing diverse products like fibre, ecosystem and cultural services and supporting millions of livelihoods in rural areas<sup>1</sup>.

The world's dependence on agricultural production is exacerbated even more by the challenges that the sector will face in the near future. Particularly the impacts of climate change on agriculture and a growing population, expected to reach 10 billion by 2050, are among the most important hurdles humanity will have to cope with during decades to come<sup>2</sup>.

Furthermore, agricultural-driven deforestation leads annually to considerable emissions. That is why there is an important potential for emission reductions in the land sector. In this regard, 25% of the foreseen reductions through the implementation of the nationally determined contributions (NDCs) are expected to be achieved in that sector<sup>3</sup>.

This serious background highlights the significance of the Koronivia Joint Work on Agriculture. The Koronivia process was initiated at COP23 in November 2017 under the United Nations Framework Convention on Climate Change (UNFCCC)<sup>4</sup> and represents currently the

most important platform to discuss agriculture issues in relation to climate policies.

In this short brochure, the European Union seeks to emphasise the importance of supporting this process and illustrate ways to promote the implementation of climate policies in agroecosystems by means of practical examples.

Decision 4/CP.23 contains the topics that delegates consider the most relevant ones to work on together. In this regard, the EU would like to particularly highlight the importance of addressing food security and its vulnerability to climate change<sup>5</sup> together with the high potential of agriculture for climate action.

According to the FAO, the number of undernourished people increased to 815 million in 2016, up from 777 million in 2015<sup>6</sup>. In addition, agriculture is one of the sectors most susceptible to climate change. As a result, specifically in developing countries, agricultural production is likely to decrease leading to more food insecurity<sup>7</sup>.

The FAO emphasises that without urgent action on climate change, “millions more people will be at risk of hunger and poverty, especially in Africa and Southeast Asia<sup>8</sup>”. Furthermore, climate-related events like droughts threaten food security and increase the likelihood of violence and conflict at local level. Thus, the relevance of addressing food security by building more

<sup>1</sup> IPCC (2014). Fifth Assessment Report. Working Group III. Mitigation of Climate Change. Chapter 11. Agriculture, Forestry and other Land Use (AFOLU). IPCC

<sup>2</sup> FAO (2017). The future of food and agriculture - Trends and challenges. FAO, Rome

<sup>3</sup> Grassi, G. et al. (2017). The key role of forests in meeting climate targets requires science for credible mitigation. Nature Climate Change 7, DOI: 10.1038/NCLIMATE3227

<sup>4</sup> Decision 4/CP.23 (2017). Koronivia joint work on agriculture. UNFCCC

<sup>5</sup> Decision 4/CP.23.

<sup>6</sup> FAO, IFAD, UNICEF, WFP, WHO (2017). The state of food security and nutrition in the world 2017. Building resilience for peace and food security. FAO, Rome

<sup>7</sup> IPCC (2014). Vulnerability to climate change and reasons for concern: a synthesis. In Working Group II: Impacts, adaptation and vulnerability. IPCC

<sup>8</sup> FAO (2017). FAO's work on climate change. FAO, Rome

resilience and working toward sustainable land use systems is unquestionable.

Further topics highlighted in Decision 4/CP.23 include adaptation and adaptation co-benefits, soil-related issues like soil carbon, health and fertility, as well as manure, water and livestock management. The main part of this brochure contains examples of activities that contribute to both sustainable agricultural practices and climate policies.

These examples address all issues highlighted in the Koronivia Joint Work on Agriculture. Some of the briefly described cases are being implemented in EU countries while others take place in the frame of cooperation activities in developing countries.

It is broadly recognised that climate-related policies in rural areas should account for both mitigation and adaptation<sup>9</sup>. Achieving this objective can be facilitated by re-enforcing interaction between both approaches. In fact, commonly applied mitigation measures seek to enhance the stability of the cropping systems in the face of climate variability<sup>10</sup>. That is why mitigation techniques may also improve the resilience of agriculture against drought and floods<sup>11</sup>. Correspondingly, the practical cases described in this brochure encompass the implementation of mitigation and adaptation techniques and practices as well as the synergies between them.

During the Conference of the Parties in Katowice (COP 24, December 2018) EU delegates came together to discuss the idea of elaborating a short brochure to illustrate agricultural climate actions. The inspiration came from a previous booklet devoted to REDD+<sup>12</sup> and also from our enthusiasm for the contents of the Koronivia process.

We strongly believe that the Koronivia Joint Work on Agriculture represents the appropriate platform to push for climate and environmentally friendly policies in rural areas. With this brochure we would like to publicly manifest this conviction, to share these practical approaches with other delegates and, finally, to further support the agriculture-related discussions under the United Nations Framework Convention on Climate Change.

<sup>9</sup> IPCC (2014). Fifth Assessment Report. Working Group III. Mitigation of Climate Change. Chapter 11. Agriculture, Forestry and other Land Use (AFOLU). IPCC

<sup>10</sup> Rosenzweig, C., Tubiello, F. N. (2007). Adaptation and mitigation strategies in agriculture: an analysis of potential synergies. *Mitigation and Adaptation Strategies for Global Change* 12: 855-873

<sup>11</sup> Rosenzweig, C., Tubiello, F. N. (2007)

<sup>12</sup> European Union (2015). *Forests, climate and people. EU support to combat tropical deforestation (REDD+) 2006-2014*. European Union, Luxembourg

# Conserving and enhancing soil carbon stocks through the Austrian Agri-Environmental Programme

## Federal Ministry of Sustainability and Tourism

The Austrian Agri-Environmental Programme (ÖPUL) promotes measures that contribute to environmentally and climate friendly agriculture. A considerable percentage of Austria's agricultural area – around 80%, 1.85 million hectares (ha) – benefits from measures under the programme.

Agriculture can contribute to climate action for instance through the conservation and enhancement of soil carbon stocks.

Measures to improve soil humus content and build-up of soil carbon stocks include:

- Applying organic manure: measure implemented in 2018 by 23,000 organic farms in an area encompassing 230,000 ha
- Catch crop and field forage growing (39,000 farms, 460,000 ha)
- No-till farming (130,000 ha)
- Recovery of soil carbon stocks in 20,000 ha of fallow land, an area that simultaneously contributes to the maintenance of biodiversity

Extensive grasslands and wet meadows are characterised by soils with a high organic matter content. However, these carbon stocks could be lost if the land is converted to a different use. The programme supports the maintenance of grasslands in an area of 405,000 ha. Special attention is put on the sustainable use of wet meadows, as this habitat features particularly high soil carbon stocks. 60,000 ha of wet meadows benefit from environmentally friendly measures.

Finally, 'landscape elements' such as trees, hedgerows, copses and groves play an important role in protecting the soil against erosion. The maintenance of these characteristic elements of the cultural landscape is promoted in an area of around 1.75 million ha.



*A strip of meadow managed only extensively. The pears, elms and ash trees in the background are "landscape elements"*



*This area was originally a field and was converted into a meadow. Birds, insects and other animals benefit from the extensive management. The apple tree as well as other trees and bushes are maintained as "landscape elements"*

# Supporting local communities in the Kintampo District, Ghana, to reduce emissions from land use

## Federal Ministry of Sustainability and Tourism

Diversified and highly dynamic savannah landscapes characterise the District of Kintampo in central Ghana. Local populations carry out slash and burn agriculture, charcoal production and grazing. The impact of human activities is particularly low in community and sacred woodlands.

The initiative in Kintampo aims to promote the sustainable use of agricultural and forest resources and create conditions to avoid emissions of greenhouse gases in the future. It represents a practical contribution to the implementation of REDD+ in Ghana, with a special focus on agricultural issues. The project is based on a holistic and participatory approach, involving members of fifteen local communities.

The topics of the project include the sustainable management of forest and agricultural resources, biodiversity conservation, fallow land management and gender issues. In this last regard, particular attention is paid to involving women in the initiative.

Several tree nurseries have been established to produce trees for afforestation activities. Community members also decided to produce and graft cashew tree seedlings for the establishment of orchards.

Fallow land contains important resources for the communities. The different varieties of yam that are produced in the fallows as well as information on the use of other fallow resources are being recorded.

Peasants also receive training in bee keeping and hive construction. The production of honey reaffirms the importance of maintaining diverse fallow environments with different tree species.

Other activities include the elaboration of a community map, radio campaigns, a newly developed website and the organisation of a farmer's fair.



*Yam cultivation in fallow land, Kintampo, Ghana*

# Climate-resilient and low-emission livestock systems in Sub-Saharan Africa

## Ministry for Economic Cooperation and Development (BMZ)

The German government supports climate-resilient and low-emission livestock development in eight Sub-Saharan African countries<sup>2</sup> through the Programme for climate-smart livestock systems as part of the special initiative “ONE WORLD - No Hunger”<sup>3</sup>.

The project is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in cooperation with the International Livestock Research Institute (ILRI) and the World Bank. It aims to support key stakeholders of the livestock sector to include climate change adaptation and mitigation in their farming practices, sector strategies and investment projects.

Together with livestock keepers, promising climate-resilient and low-emission livestock practices and measures are selected and tested under field conditions. They include improvements in pasture management and animal genetics, cultivation of drought resistant fodder crops, as well as improved manure management.

Research findings are disseminated among 10,000 livestock keepers through a training-of-trainers approach. Moreover, project-generated results are scaled up by mainstreaming them into large investment projects.

At policy level, the project includes designing possible development pathways in the livestock sector and applies participatory scenario planning for targeted decision-making.

In addition, the project supports partner countries in establishing adaptation monitoring systems and in shifting from the default Tier 1 method to nationally adapted Tier 2 approaches in the livestock sector, in order to improve the reporting of the livestock-related aspects of their Nationally Determined Contributions (NDCs) to the Paris Agreement.



© ILRI / Sonja Leitner

Indigenous Boran steers in East Africa fed on locally available tropical forages kept in a barn - zero grazing system - a way to sustainably intensify livestock production and contribute to climate-resilient and low-emission livestock development

<sup>2</sup> Kenya, Ethiopia, Uganda, Niger, Cameroon, Lesotho, Mauritania, one country is still to be determined

<sup>3</sup> The initiative is related to Decision - / CP.23 KJWA: 2(e) Improved livestock management systems

# From full sun to shaded cocoa agroforestry systems: Rehabilitation of smallholder cocoa farms to safeguard forest ecosystems and improve livelihoods in the High Forest Zone of Ghana

## Ministry for Environment, Nature Conservation and Nuclear Safety (BMU)

The High Forest Zone of Ghana, which covers 8.2 million hectares (ha), is highly vulnerable to agricultural commodity-related deforestation and forest degradation, predominantly by cocoa expansion.

This project addresses the socio-economic and food security dimensions of climate change and supports forest conservation as well as the enhancement of sinks. It works together with cocoa companies, smallholder farmers and local authorities to restore degraded and overaged cocoa plantations in order to increase their productivity and improve food security by introducing, among others, food crops as shade for the cocoa plants.

Four community nurseries were established, producing over 2.4 million planting materials including cocoa seedlings, plantain suckers and indigenous tree species to foster the implementation of cocoa agroforestry systems. To date, 1,800 farmers have been supported to restore 790 ha of old cocoa plantations in 25 communities<sup>1</sup>.

By creating farmer associations, the project enables farmers beyond the project to access quality seedlings and recommended farm management support services provided by public-private partnership schemes, improving their returns per ha. The cocoa yields can potentially increase 3-4-fold (from 400 kg/ha up to 1500 kg/ha) if the overaged cocoa trees are replaced by new ones and recommended shade trees are planted.

To limit the expansion or establishment of new cocoa farms in forested areas, the project initiated the creation of so-called Community Resource Management Areas (CREMAS). It also supported the development and implementation of strategic land use plans for 15 communities covering a total area of 29,000 ha, while 200 district and community-level personnel were trained to operationalise these plans.

The project also conducted farm mapping for individual farms (currently 2,000 farmers) to ensure that the cocoa traceability system to the farm level can be established and verified via a GIS database. Memorandums of understanding have been signed with private cocoa sourcing companies to monitor no-deforestation in their supplychains. In addition, over 70% of beneficiary farmers are registered with either Rainforest Alliance/UTZ or possess Fairtrade certification.



© SNV Ghana / Reuben Ottou

Newly rehabilitated cocoa farm with food crops as shade trees

<sup>1</sup> See video 'Ghana: Dying cocoa plantations' (Deutsche Welle) : <https://www.dw.com/en/ghana-dying-cocoa-plantations/av-47408729>

# Reducing emissions from drained organic soils in Germany: Towards Tier-3 methods for peatland emission mitigation measures

**Johann Heinrich von Thünen  
Institute**

Organic soils such as peatlands store vast amounts of soil organic carbon, but emit large quantities of greenhouse gases – particularly carbon dioxide – when drained for agriculture, forestry or peat extraction. Protecting undrained peatlands is thus of major importance to protect carbon stocks in soils.

Drained organic soils, however, are currently a key source in the greenhouse gas inventory of many peatland-rich EU Member States. In Germany, drained organic soils contribute nearly 40% of the emissions from agriculture and LULUCF and therefore provide the opportunity to significantly reduce emissions while only targeting a small percentage of the agricultural area.

There is no ‘one-size fits all’ solution for organic soils; measures need to be tailored according to soil properties, regional and local hydrology as well as socio-economic conditions, to name a few.

Generally, all mitigation measures need improved water management. Options include ‘classical’ re-wetting of disturbed organic soils for nature conservation, changed water management towards higher seasonal or overall groundwater levels and the development of novel forms of wet agriculture using wetland species such as reed, cattail or peat mosses (‘paludiculture’).

While adapted water management and paludiculture are still in the pilot phase, re-

wetting for nature conservation purposes has been carried out for decades. It has been shown to save, as a synergy effect, at least 4 to 16 t CO<sub>2</sub>-eq./ha yr at moderate costs (40 to 110 €/t CO<sub>2</sub>-eq.)<sup>1</sup>.

Optimising water management for climate mitigation or focusing on currently deeply drained peatlands will strongly improve these numbers and under optimal conditions, re-wetted peatlands might again sequester carbon and thus improve soil carbon stocks.

This wide range of measures needs adequate reporting and accounting methods, especially due to the fact that emissions from drained peatlands are also highly variable. Methods comprise both flux measurement and the development of upscaling measures using ground-based measurements of soil and hydrological parameters, databases and remote sensing.



© Bärbel Tiemeyer

Adjustable weir in the Lake Dümmer lowlands. It is used to optimize water levels for meadow bird protection.

<sup>1</sup> Drösler, M., Schaller, L., Kantelhardt, J., Schweiger, M., Fuchs, D., Tiemeyer, B., Augustin, J., Wehrhan, M., Förster, C., Bergmann, L., Kapfer, A., Krüger, G.-M. (2012): Beitrag von Moorschutz- und -revitalisierungsmaßnahmen zum Klimaschutz am Beispiel von Naturschutzgroßprojekten. *Natur und Landschaft* 87, 70-76.

## InfoAdapta-Agri I & InfoAdapta-Agri II: Hand books for adaptation to climate change in the agriculture sector & Adaptation to climate change through precision agriculture

**UPA - Unión de Pequeños Agricultores y Ganaderos, supported by Fundación Biodiversidad- Ministerio para la Transición Ecológica**

INFOADAPTA-AGRI I Project, developed in 2017-2018, aimed to raise awareness and train the agricultural and livestock sector on the need to implement specific adaptation practices and measures that reduce the climate change impacts.

For this purpose, the project collected all practices and measures of adaption to climate change that have been studied and tested in geographical and climatological areas similar to those in Spain. With all this information 4 sectorial handbooks were elaborated for farmers and other interested stakeholders, which include the most recommendable adaptation practices and measures on: irrigated and rainfed herbaceous crops, woody crops and livestock.

The diffusion of these handbooks has been done through meetings, workshops and websites:

<https://www.upa.es/camposeguro/servicios-camposeguro/cambio-climatico/>

INFOADAPTA-AGRI II (continuation of INFOADAPTA-AGRI I), currently being implemented, focuses on analysing in detail eight adaptation measures identified for the agricultural and livestock sector.

A survey has been conducted by farmers identifying the disadvantages, advantages and opportunities of each measure.

The analysis of these measures has been deepened to publish again a handbook that

includes eight adaptation proposals. At the same time, 3 demonstration experiences are being developed on: sustainable soil management, pest monitoring, precision agriculture to reduce water consumption, fertilizers and seeds. Field trips and talks with farmers are foreseen as well as the diffusion through media and social networks.



## Rescue of ancestral knowledge of peasant communities in the Apurímac region in the southern highlands of Peru for ecosystem management and conservation in a climate change context and with a gender perspective

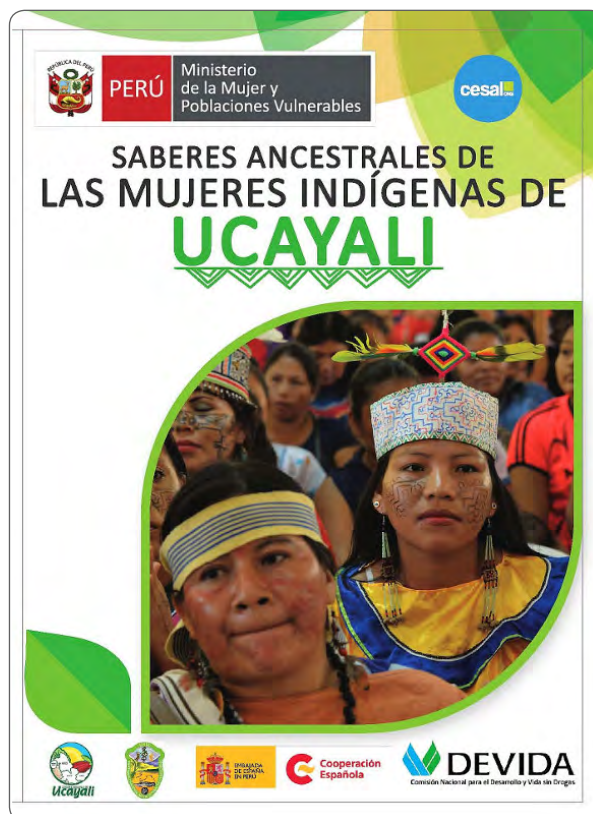
**CESAL; Supported by AECID – Spanish Agency for International Development Cooperation**

The project aims to establish practices for the conservation of high Andean ecosystems, from the heads of the basin to the middle floors, with the active participation of organized peasant communities and local authorities in the region of Apurímac to preserve two critical factors of these ecosystems: soil and water.

The project is framed at the national level within the “Action Plan on Gender and Climate Change in Peru (PAGCC Peru)” and proposes the active participation of social organizations and local authorities for the conservation of ecosystems with a gender approach.

The project includes adaptation and mitigation measures, including agroforestry in the family plots.

More information: [https://www.cesal.org/ong/peru/protegiendo-los-saberes-ancestrales-para-mitigar-los-efectos-del-cambio-climatico\\_3441\\_156\\_4906\\_0\\_3\\_in.html](https://www.cesal.org/ong/peru/protegiendo-los-saberes-ancestrales-para-mitigar-los-efectos-del-cambio-climatico_3441_156_4906_0_3_in.html)



# Building capacities for climate change mitigation in agriculture in Kenya and Tanzania

## FAO

This Finnish-funded project was part of the UN Food and Agriculture Organisation's (FAO) Mitigation of Climate Change in Agriculture (MICCA) programme.

The project focused on identifying climate-smart agricultural practices in smallholder systems in Kenya and Tanzania in collaboration with World Agroforestry (ICRAF), compiling and sharing knowledge on climate-responsible management of peatlands, developing tools for life cycle assessment in livestock production, as well as developing tools to support nationally appropriate mitigation action planning.

The project also prepared guidance for better gender mainstreaming in climate change work and invested strongly in communication, information sharing and online learning.



# Territorial project for water resource management in southwest France

## Institution Adour, Local Public Basin Establishment

Drought and climate change are significant issues for the Midour watershed in southwest France because of quantitative and qualitative water resource management challenges.

A territorial project has been launched to build a programme consisting of various operational actions for sustainable and effective water resource management. Local stakeholders are involved in the co-construction process, including farmers and agricultural industry, environmental organisations, municipalities and local residents.

More than fifty actions have been defined to meet the quantitative needs of water uses, to improve water resource quality and aquatic habitat and to anticipate and adapt to climate change.

These include efficient irrigation equipment, sustainable cropping practices, better water management, wastewater re-use, and water storage. Other actions include the development of agroforestry, intermediate crops and soil conservation agriculture to increase both soil water retention and biodiversity.

A simulation study of the watershed evolution was conducted to measure quantitative and qualitative impacts of the proposed actions within the next five years and in 2050, depending on the decrease of water resources, the temperature rise and the increase of plant needs.



© Institution Adour

Stakeholders of Midour watershed during a co-construction workshop

# Climate and climate change

## High nature value farming

## Biodiversity and nature management

### Inishowen Upland Farmers Project in Ireland

The Inishowen peninsula sits on the northwest coast of Ireland, which is dominated by high nature value (HNV) farmland. It has a population of approximately 40,500, comprising approximately 2,700 farmers with an average farm size of 27 hectares. The majority are part-time farmers with an off-farm income, and younger generations often seek alternative employment.

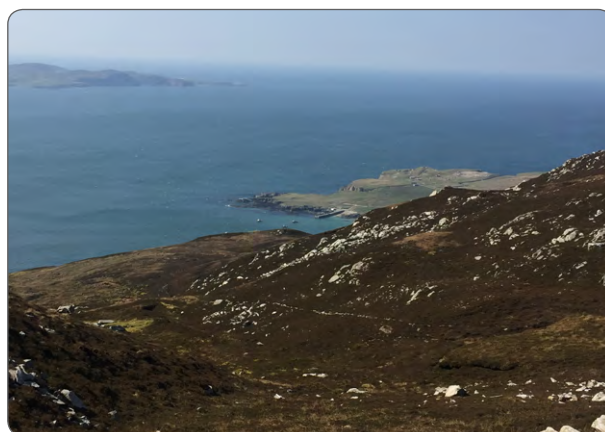
While tradition and culture mean that farming will continue, new thinking is required to exploit the benefits and co-benefits that follow from farming in the area, i.e. the provision of public goods or the landscape and amenity values. In reality, some farmers in the Inishowen peninsula are not capable of generating a sufficient income. However, the provision of public goods including support for a climate resilient agricultural landscape could provide a return and improve the long-term sustainability of these farms.

The uplands and mountains in Inishowen are covered in blanket bog, which is of ecological importance and constitutes areas of high nature value. Ireland has the largest covering of blanket bog within Europe. The conservation and proper management of this blanket bog, coupled with climate mitigation measures on improved low land, would yield important environmental benefits such as good quality water, carbon sequestration, high-quality biodiversity and flood mitigation.

The project (2019-2023) aims to improve the economic sustainability of high nature value land in Inishowen, County Donegal. This will be achieved by implementing a range of innovative measures in the mountainous upland and lowland farming areas. These measures will

combat climate change, increase biodiversity and improve water quality.

The project will provide a best practice management template to increase farm profitability for participating farmers. It also aims to demonstrate that economic and environmental aspects of the area will be improved by a long-term whole farm approach. The greatest benefit of the project will be the retention of people to farm and manage the land, which will benefit the local economy and the county as a whole.



© AFOLU

# Improving knowledge and data on soil and biomass organic carbon for reporting croplands and grasslands emissions in the Mediterranean

**Project coordinator: University of Tuscia (Italy). Partners: Portuguese Environment Agency and the Instituto Tecnico Superior (Portugal)**

The LIFE+ project ‘Mediterranean Network for Reporting Emissions and Removals in Cropland and Grassland’ (Life MediNet<sup>1</sup> -) created a network among EU institutions in the Mediterranean region and experts involved in various aspects of the carbon cycle in agriculture and grazing lands in order to increase the accuracy of countries’ greenhouse gas inventories.

Countries and institutions involved include Italy, Portugal, Spain, Slovenia, Malta, Cyprus, Greece, France and the Joint Research Centre of the European Commission.

The project (2016-2018) facilitated the exchange of relevant experience and systemised existing knowledge, data and approaches for measuring and reporting croplands and grasslands emissions in Mediterranean conditions, in particular for mineral soil and aboveground biomass of perennial crops. The project also actively involved agriculture stakeholders that play a key role in climate change mitigation and adaptation.



© Medinet LIFE

<sup>1</sup> [www.lifemedinet.com](http://www.lifemedinet.com)

# Carbon sequestration by optimising grassland use in Luxembourg

## FILL (Förderverein Integrierte Landwirtschaft Luxembourg)

The Luxembourgish FILL European Innovation Partnership (EIP) project 'Méi Weed' (better pasturing) aims to develop a model for forecasting the output of high quality biomass on grassland.

Farmers need reliable regional grassland based biomass production forecasts to ensure a sustainable use of these regionally provided production sources. Besides decreasing imports of means of production from abroad, maintaining or even increasing grassland area will improve carbon sequestration in Luxembourg.

Local weather labs, specific soil analyses and the measurement of biomass grown on different pilot farms all over the country will deliver the relevant data. Bringing the output of the grassland together with the required input for cattle will help to keep agricultural production linked to the regional agricultural surfaces.



© ASTA

# Farm typology approach for better understanding of greenhouse gas emission mitigation potential in Latvia

## Latvia University of Life Sciences and Technologies

To address the role of agriculture in climate action, Latvia is among those EU countries that have developed national agricultural marginal abatement cost curve (MACC), along with France, Ireland, Denmark, the Netherlands, Belgium and the United Kingdom.

MACC is an approach used to understand and analyse costs and greenhouse gas (GHG) emission mitigation benefits of intended actions that farmers and land managers can take to meet climate targets. Latvian experience in developing MACC for the agricultural sector is innovative and unique, as it has chosen to use a disaggregated approach based on a typology of farms<sup>1</sup>.

The farm typology and the indicators characterising the performance of different farming systems were used to determine the role and contribution of farms to total agricultural production and GHG emissions, identify target farms and emissions reduction measures for each farm type.

Five farm types or clusters were identified:

1. Intensive mixed specialisation farms that keep their livestock indoors (0.4% of total number of farms, 15% of total utilised agricultural area (UAA))
2. Intensive cereal farms (0.1% of farms, 15% of UAA)
3. Medium-large mixed specialisation farms that graze their livestock (25% of farms, 46% of UAA)
4. Organic farms (4% of farms, 10% of UAA);
5. Household plots (70% of farms, 20% of UAA).

The research results showed very different GHG emission intensities, which were significantly higher for intensive farms (clusters 1 and 2) compared with organic farms (cluster 4) and small farms (cluster 5).

These differences could be explained by a series of factors, such as the type of market strategies, availability of agricultural machinery, information about soil quality and properties, availability of financial sources for the purchase of fertilisers, and livestock keeping and feeding practices.



© Dzidra Kreismane

<sup>1</sup> Eory V, Pellerin S, Carmona Garcia G, Lehtonen H, Licite I, Mattila H, Lund-Sørensen T, Muldowney J, Popluga D, Strandmark L, Schulte R (2018) Marginal abatement cost curves for agricultural climate policy: State-of-the art, lessons learnt and future potential. *Journal of Cleaner Production* 182, 705–716. Contact person: assoc.prof., Dr.oec. Dina Popluga, Latvia University of Life Sciences and Technologies, dina.popluga@llu.lv

# Low carbon agriculture

**IUNG-PIB - Institute of Soil Science and Plant Cultivation – State Research Institute, Puławy, Poland**

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## **Support for low carbon agriculture able to adapt to climate change in Poland in the 2030 and 2050 perspective**

Under the BioStrateg national strategic programme, the LCAgri<sup>1</sup> project aims to implement pre-defined innovative low carbon farming practices (e.g. direct seeding, tailoring nitrogen application to actual crop needs, direct soil application of fertilisers, soil and yield mapping and parallel motion technology) and evaluate their economic and environmental performance.

The project aims to determine related to climate change impacts on Polish agriculture and develop climate change adaptation recommendations for policy strategies in the 2030 and 2050 time scale.

Moreover, the carbon footprints of farms in Poland were evaluated using surveys based on farm accountancy data network (FADN).



<sup>1</sup> <http://www.lcagri.iung.pl/en/>

# Good practices to reduce effects of global changes

**National Research and Development  
Institute for Soil Science,  
Agrochemistry and Environment  
– ICPA Bucharest University of  
Agronomic Sciences and Veterinary  
Medicine of Bucharest Kiwi  
plantation from Ostrov Kiwi nursery  
from Lugoj**



## **Adapting crop management to a changed environment: kiwi crop in Romania**

Selecting appropriate varieties or cultivars could minimise agricultural practices negatively affecting the environment and may increase the efficiency of the farm's use of natural resources.

Recommendations to farmers include selecting varieties/cultivars that are resistant to abiotic stresses (i.e. water shortage, drought, high temperatures), have a shorter germination period and shorter growing season, or are naturally resistant to specific new diseases.

Advantages for farmers:

- Improving water management in agriculture
- Reducing energy consumption for irrigation
- Better use of the soil moisture conditions after sowing
- Improving ability to compete with weeds
- Reducing the need for agro-technical works

[http://lp.rs.ro/upload\\_img/1907\\_culturixotice.ideideafaceri.ro/images/1.jpg](http://lp.rs.ro/upload_img/1907_culturixotice.ideideafaceri.ro/images/1.jpg)

# Rural development measures applicable on agricultural land implemented through Romania's National Rural Development Programme

## Ministry of Agriculture and Rural Development

The implementation of environmental and climate measures<sup>1</sup> through Romania's National Rural Development Programme (2014-2020) contributes to the objectives of the EU Regulation on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) by reducing greenhouse gas and ammonia emissions from agriculture and fostering carbon conservation and sequestration in agriculture.

These measures promote extensive agricultural practices, including manual work and avoiding the use of mechanised machinery, prohibition of the application of chemical fertilisers and limiting the use of organic fertilisers on agricultural land, while reducing the number of animals on permanent grassland.

Other measures include the use of crops with a high capacity to fix nitrogen in the soil, organic farming practices and the application of cross-compliance standards that contribute to the reduction of greenhouse gas emissions in agriculture.

The financial support provided by these measures has a compensatory character, with the amount of payments calculated on the basis of the assessment of the additional costs and income foregone resulting from the application of the specific requirements of each measure, exceeding the unpaid mandatory level of the basic requirements, and is granted based on the voluntary commitments assumed by the beneficiaries.

The measures are applied on agricultural land (both arable land and permanent grassland), both at national level and in areas designated as eligible at sub-measure/package level, according to the objectives set for them.



<sup>1</sup> Measure 10 - Agri-environment and climate,  
Measure 11 - Organic farming,  
Measure 13 - Payments to areas facing natural or other specific constraints

# Swedish development cooperation contributes to reducing poverty in the world

## Swedish International Development Agency (Sida)

Swedish development cooperation contributes to reducing poverty in the world, with the aim of helping improve living conditions for people living in poverty and under oppression. The rights perspective, gender equality, environment and climate change as well as conflict sensitivity are other equally important perspectives that should permeate all development work funded by the Swedish International Development Agency (Sida).

Sida continuously develops tools and methodological materials<sup>1</sup> to guide staff and partners in the process of operationalising Swedish development cooperation. These guidelines address specific themes such as women and food security, women and land rights, their participation in the labour market and their access to land, as well as financial services and agriculture and ecosystem services.

As a donor agency, Sida promotes the application of climate-smart and sustainable agriculture in several ways, for instance when supporting components in broad development programmes such as:

- Sustainable management of natural resources (e.g. support to projects involving land management, biodiversity and water resources)
- Capacity building (e.g. of land, agricultural, forest institutions, local authorities, universities as well as private sector actors and farmers)
- Research, economic development and capital goods (e.g. research, services for financial and market access, entrepreneurship, value chain development, migration from subsistence farming to income generation and small-scale commercial farming).

Everyone who lives in Sweden and pays taxes contributes to this work. Sida decides on about half of the Swedish aid budget and is governed by the Ministry of Foreign Affairs.



Mutinta Mwiinga is one of many small scale farmers in Zambia who has developed her farming and production through the Sida financed programme Musika.

<sup>1</sup> <https://www.sida.se/English/partners/resources-for-all-partners/methodological-materials/>

# Livestock Management

## Department for Environment, Food and Rural Affairs

### Beef Feed Efficiency Programme in the United Kingdom

Genetic improvement has the potential to deliver a substantial positive impact on both the economic and environmental sustainability of beef cattle production in the UK. The Beef Feed Efficiency Programme aims to enable farmers to recognise and capitalise on the significant natural variation in the efficiency with which cattle convert feed into meat by breeding for resource-efficiency in their cattle.

This would allow animals to be brought to market with a reduced lifetime requirement for feed. It has been calculated that in the UK this could result in a 39% increase in farm-level profits and a reduction in greenhouse gas emissions by 22% across the sector.

The project is now entering its fourth year, having been commissioned with an initial budget of around £1.75 million funded by Defra (UK Department for Environment, Food and Rural Affairs) and AHDB (Agriculture and Horticulture Development Board), with an additional Scottish unit funded by Scottish Government and ABP Ltd.



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## **Climate action in agriculture:**

Implementation at local level in the EU and  
support for action in countries outside the EU



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