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ANALYSIS OF CLIMATE AMBITION OF THE RURAL DEVELOPMENT PROGRAMS IN TARGETED COUNTRIES

GERMANWATCH

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Supported by:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

based on a decision of the German Bundestag

European
Climate Initiative
EUKI

This report has been produced under the project “An Unavoidable Step After Paris: Cutting Emissions from Farming” and funded by the European Climate Initiative (EUKI) of the German Federal Ministry for the Environment. The contents of this report reflect only the views of the authors. The funder cannot be held responsible for any use which may be made of the information this document contains.

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INTRODUCTION

The year 2019 once again demonstrated how much farmers are already being affected by the increasing frequency and magnitude of extreme weather events caused by climate change. At the same time, the farming sector is also a major source of greenhouse gases (GHG), namely methane (CH_4), nitrous oxide (N_2O) and carbon dioxide (CO_2). It is imperative to mitigate these emissions.

This is recognised under the Rural Development Regulation of the CAP, which made climate action one of the six Union priorities, that Members States should pursue through their Rural Development Programmes (RDPs)[1]: "*promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors, with a focus on the following areas:*

(a) increasing efficiency in water use by agriculture;

(b) increasing efficiency in energy use in agriculture and food processing;

(c) facilitating the supply and use of renewable sources of energy, of by-products, wastes and residues and other non-food raw material, for the purposes of the bio- economy;

(d) reducing greenhouse gas and ammonia emissions from agriculture;

(e) fostering carbon conservation and sequestration in agriculture and forestry;"

The objective to reduce agriculture emissions complies with the EU's obligation under the United Nations Framework Convention on Climate Change (UNFCCC; Article 208) and is related to the Sustainable Development Goals (SDG 13 - Climate Action).

With the current Common Agricultural Policy (CAP) coming to an end and the future CAP pursuing an even stronger climate ambition, it is time to assess exactly how and to what extent the Rural Development Programmes of the current CAP contributed to achieving our common climate objectives. Therefore, this report aims to analyse the current climate ambition of the RDPs in five targeted countries where project members are set up, namely: France, Ireland, Germany, Hungary and Spain.

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1 Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005

SCOPE AND METHODOLOGY

The RDPs are assessed with respect to the chosen priorities, focal areas and the GHG mitigation measures proposed. A template was developed to collect measures in each case study country, reflecting the best current practices but also the worst current practices (see Annex 1). This was mainly done comparing the factsheets and summaries of the European Network for Rural Development (ENRD)[2] and the European Commission[3] itself. Where available, this information was complemented with national reports.

Climate change can be mitigated by using different practices or technologies to reduce the emissions intensity of a certain activity and/or the level of that activity. However, adoption of a new technology or practice[4] by a certain group, in this case farmers and land managers, is always hampered or slowed by barriers. Such barriers can be of technical, cognitive, economic, political, cultural, social, behavioural and institutional character. Barriers are context specific, change over time and vary across countries. The role of policy is to remove these barriers to promote human behaviour change and economic activities that contribute to our common societal objectives, such as climate change mitigation.

THE CONCEPT OF MITIGATION POTENTIAL

In order to assess the climate ambition of the studied countries' RDP programmes, the ***mitigation potential*** of different measures must be ascertained. To reach the full mitigation potential, several sub-categories need to be addressed:

- The ***technological potential*** is the emission reduction which a technology is known to achieve, regardless of barriers or costs.
- The ***socio-economic potential*** is the emission reduction achievable by institutional and behavioural changes.
- The ***economic potential*** is the emission reduction achieved by the removal of market barriers.
- Finally, the ***market potential*** represents the emission reduction currently achievable given the current behaviours, institutional settings and markets. Therefore, it also presents the baseline against which technologies and policies are assessed.

None of these variables are static. Barriers change and new technologies may become available or more cost-effective. Hence the mitigation potential will change over time.

Policy measures do not necessarily address all potentials but often focus on specific aspects. Additionally, other policies can create new barriers. For instance, policy X could negatively affect the economic potential of a certain technology. This report therefore assesses each dimension to the best of available knowledge.

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2 https://enrd.ec.europa.eu/policy-in-action/rural-development-policy-figures/priority-focus-area-summaries_en
3 https://ec.europa.eu/agriculture/rural-development-2014-2020/country-files_en
4 Hereafter just referred to as technology

CLIMATE MITIGATION UNDER THE RDPs

Member States (MSs) address the different sources of emissions and sectors to various extents in their RDPs. The €100 billion available for the period 2014-2020 for all MSs, can be spent on projects or agri-environment & climate measures (AECMs), which need to address at least four of the six priorities (see Table 1). Most MSs chose one or more as a main priority. Some of these priorities are broken further down into more specific focal areas (FA).

Priority 5 is directly linked to climate measures, but other priorities can also contribute to GHG reductions. For instance, priority 4 is often linked to climate, either because MSs tackle emissions within this priority directly, or because measures for soil fertility, water quality and biodiversity can also indirectly reduce GHG emissions. For example, Denmark addresses energy efficiency and renewable energy/biogas under priority 5, but also lists measures such as afforestation, fertiliser reduction, converting arable land into grassland, and livestock management under priority 4.[5]

The European Commission estimates that €57 billion will be spent on climate action in the period 2014-2020 through RDPs, more than half of the budget. Using the 'Rio markers', the Commission applied a 100% coefficient to all focal areas under Priorities 4 and 5. Yet, this methodology was found to drastically overestimate climate spending in rural development funding: the European Court of Auditors assessed that if measures under priority 4 and 5 were reviewed individually and classified according to international standards, the amount of climate funding under the European Agricultural Fund for Rural Development (EARDF) would be reduced by 42%, to €33 billion[6]. Such an approach is already applied in the European Commission's LIFE Programme for Environment and Climate Action, where different and more conservative coefficients are applied to each sub-programme.

Regardless of climate mainstreaming in the EU budget, the priorities and measures chosen by MSs are most important for delivering actual GHG reductions. Of all MSs with a single RDP for the whole country (i.e. excluding BE, DE, ES, FI, FR, IT & UK), only Ireland chose priority 5 as its main priority. On the other hand, the majority (15 countries) chose priority 4 as their main or one of their main priorities.[7]

5 Factsheet on 2014-2020 Rural Development Programme for Denmark
6 European Court of Auditors (2016)
7 Rural development 2014-2020: Country files

Table 1 *Rural development priorities and Focal areas for priority 4 & 5*

Priority 1	**Fostering knowledge transfer in agriculture, forestry and rural areas**
Priority 2	**Enhancing the competitiveness of all types of agriculture and enhancing farm viability**
Priority 3	**Promoting food chain organisation and risk management in agriculture**
Priority 4	**Restoring, preserving and enhancing ecosystems dependent on agriculture and forestry**
FA 4A	Restoring, preserving and enhancing biodiversity
FA 4B	Improving water management
FA 4C	Preventing soil erosion and improving soil management
Priority 5	**Promoting resource efficiency and supporting the shift toward a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors**
FA 5A	Increasing efficiency in water use by agriculture
FA 5B	Increasing efficiency in energy use in agriculture and food processing
FA 5C	Facilitating the supply and use of renewable sources of energy
FA 5D	Reducing greenhouse gas and ammonia emissions from agriculture
FA 5E	Fostering carbon conservation and sequestration in agriculture and forestry
Priority 6	**Promoting social inclusion, poverty reduction and economic development in rural areas**

ANALYSIS OF MITIGATION POTENTIAL IN STUDIED COUNTRIES

IRELAND

Figures published in 2014 show that Irish agriculture was responsible for 30.7% of all Irish GHGs. Methane accounted for 61.5% and nitrous oxide accounted for 38.5% of the emissions in the sector in 2014 figures. The Irish Rural Development Programme 2014-2020 includes subsidies, programmes and schemes which are focused on reducing GHGs from agriculture. In total, 11.2% of the funding for the RDP has been allocated to these schemes, with an additional 73.4% allocated to Priority 4 'Restoring, preserving and enhancing ecosystems in agriculture and forestry'. A percentage of this latter funding is also attributed to climate action, especially where the funding is spent on farming practices which protect soils or support the proper functioning of peat-based, and other, carbon sequestering habitats.

The RDP includes voluntary climate actions such as the Green Low-Carbon Agri-Environment Scheme (GLAS), the Beef Genomics Data Scheme (BGDS), the Targeted Agricultural Modernisation Schemes (TAMS), Knowledge Transfer Schemes. Some of the European Innovation Partnership (EIP) projects also include climate actions. None of the schemes have been evaluated for their actual GHG reductions potential or actual emissions reductions. It is also the case that some of the RDP measures (TAMS, Collaborative Farming) facilitate expansion of the dairy sector leading to increased cow numbers and GHGs. The main actions leading to potentially positive climate action in the GLAS scheme are low input permanent pastures supporting carbon stock retention in soil, through field margins, hedgerow planting, native woodland planting, catch crops cultivation and minimal tillage. The TAMS supports investment in machinery which could reduce GHGs in agriculture (i.e. incentive to purchase low-emissions 'trailing shoe' slurry equipment). The BDGS aims to improve the genetic character of the national herd to ensure that it has a reduced emissions profile. There has been good uptake for most of the GLAS measures, for TAMS and the EIPs. However, it is not clear what emissions reductions have been achieved thus far. The relevant EIPs include farmer-led projects which support farming which support peat-based habitats.

Ireland's long-term vision for the agriculture and land-use sector is to achieve carbon neutrality by 2050, including increasing afforestation as mitigation, and without compromising its capacity for food production. Yet, the Environmental Protection Agency has projected that Ireland will fail to meet its target of 20% emissions reduction by 2020 compared to 2005 levels. Despite improvements, agricultural emissions are projected to grow up to 2030, due to increases in livestock numbers, particularly in the dairy herd. The Irish RDP interventions facilitate expansion of the dairy herd with limited measurable climate action opportunities for this sector and significant focus on reducing the emissions of the beef herd.

In 2018 emissions from agriculture accounted for 34% of national emissions, an increase of 3.3% during the implementation of the RDP. Significant additional measures are required to tackle GHGs from Irish agriculture; particularly to address emissions from nitrous oxide and methane. Significant reductions in reactive nitrogen use (in fertiliser and feed) would make substantial gains for climate by reducing nitrous oxide pollution. Deep and fast cuts in absolute emissions are required in the first instance. Carbon sequestration, including the protection and restoration of peatlands on farmland is also urgently required to reduce GHGs from degraded peatlands. The national ambition for growth in dairy and beef production is not coherent with what is required to tackle climate change. It will be important for Ireland to manage the transition needed to reduce emissions in agriculture. Supports for High Nature Value farming are essential to maintain and restore biodiversity on farmland.

FRANCE

In France, each administrative region has its own Rural Development Programmes. The analysis of the mitigation potential of these Programmes relied on a survey among the regional members of project member France Nature Environnement (FNE). Only 4 members replied to this survey, which suggests weak involvement of environmental organisations in the elaboration and monitoring of Rural Development Programmes.

For those who answered, the regional members of FNE replied that their Rural Development Programmes will not enable the farming sector to contribute sufficiently to the mitigation targets. In the Provence Alpes Côte-d'Azur region, measures are in place to promote carbon storage, but not to reduce emissions. Good examples of climate mitigation measures include: the preservation and development of permanent pastures, which fosters carbon storage, and the installation of renewable energy production on farm buildings. There were also examples of measures which have a negative impact on climate mitigation, such as mobilisation of biomass from forests and the expansion of irrigation to produce aromatic plants in areas sensitive to water stress.

When asked about the gaps in RDPs with regards to climate action, FNE members pointed to a lack of support for the transition of farming systems towards agroecology or high environmental value farming (a French environmental certification scheme), insufficient incentives for the introduction of leguminous crops in rotations, and no action to support a reduction in animal protein consumption.

Climate ambition can also be evaluated by measuring the budget share dedicated to agri-environment and climate measures (AECM). In a previous survey on the environmental ambition of RDPs[8], the envelope was deemed satisfactory in Basse-Normandie (€32 million), Nord Pas-de-Calais (€26 million EAFRD), and Provence Alpes Côte-d'Azur (€115 million), whereas it was judged insufficient in Poitou-Charentes (€114 million), Alsace (€32 million), Champagne-Ardennes, and Rhône-Alpes (€50 million).

The national low carbon strategy (SNBC) sets an objective of 20% reduction of the emissions from the agricultural sector towards 2033. According to the results of the surveys led amongst FNE members, the regional RDPs in France are not ambitious enough to meet this target.

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8 https://www.fne.asso.fr/publications/politique-agricole-commune-pac-fne-livre-son-analyse

GERMANY

The German Rural Development consists of 13 decentralised separate RDPs on a regional basis. These include a diverse range of subsidies, programmes and schemes. In addition, there is a National Framework that consists of elements that are part of several RDPs. A total of 4.4% of the funding for the RDPs has been allocated to Priority 5 aiming at a "resource-efficient, climate-resilient agriculture". Furthermore, 44.4% of the funding is going to measures under Priority 4 "Restoring, Preserving and Enhancing Ecosystems in Agriculture and Forestry", which generates synergy effects on climate action in several cases.

The measures "Moor Preserving Water Levels" and "Implementing Organic Farming" include climate action, but have not yet been evaluated with regards to their potential for the reduction of greenhouse gas emissions. "Moor Preserving Water Levels" aims at protecting swamplands to reduce the emissions of greenhouse gases and at preserving the peat in the ground. The measure "Implementing Organic Farming" encourages farmers to switch to a kind of agriculture that is environmentally more sustainable. On the other hand, the measures "Conservation Tillage" and the "Agricultural Investment Programme" have no clear ecological impact. "Conservation Tillage" tries to oppose soil erosion by using conservation tillage instead of ploughing. Although there may be synergy effects with climate adaptation, this measure remains controversial as it has the potential to heavily raise the use of pesticides, and by doing so damaging living soil layers. Furthermore, the measure "Agricultural Investment Programme" may have the potential to further increase greenhouse gas emissions, as it encourages farmers to fulfil only the lowest standards of intense livestock farming. This has only very little potential to reduce greenhouse gas emissions.

Germany wants to achieve a transition to low-carbon farming and carbon neutrality in the agriculture and land-use sector in the long term. The country will fail to meet its target of 40% emissions reduction by 2020 compared to 2005. According to the German Government's National Climate Action Plan 2050 ("Klimaschutzplan 2050"), Germany has to reduce its emissions from the agricultural sector to a level of 58-61 million tonnes CO_2 equiv. This is a reduction of 11 to 14 million tonnes CO_2 equiv. compared to 2016.

Significant actions are required for Germany to achieve its climate targets for 2030. A drop in livestock numbers is essential to achieve even the lowest emission reduction target. Concerning farming, it is highly necessary to combat nitrogen surplus. Furthermore, transitioning on a broader level towards more agroecological farm management practices has a great potential to further reduce greenhouse gas emissions. Such measures are essential to help getting Germany back on track towards achieving its climate targets.

HUNGARY

In Hungary, the current RDP contains six subsidy-based measures that contribute to climate change mitigation (this does not include investments in renewable technology and other similar schemes). The available budget indicated in the calls related to these six measures, is €273.8 million (89.91 billion HUF) out of the total budget of the current 7-year Rural Development Programme of Hungary which is €4.2 billion. By far the largest portion of the budget allocated to the six analysed measures, is for supporting forestation (€153.5 million).

The Hungarian RDP's climate measures are supported by goals and regulations set by the EU, as well as by the Hungarian Rural Strategy (2012-2020). However, the lack of a quantified target on a national level to underpin climate action, has been identified as a factor weakening their significance and implementation.

The measures are aimed at different focal areas: two with an economic focus and three with a direct focus on climate: 5B - 'Increasing efficiency in energy use in agriculture and food processing', 5D - 'Reducing greenhouse gas and ammonia emissions from agriculture' and 5E - 'Fostering carbon conservation and sequestration in agriculture and forestry'. The measures were designed in consultation with farmers, landowners and forestry managers, and are targeted at these same groups as well as agricultural enterprises and young farmers.

All the analysed measures serve climate mitigation (and/or adaptation) goals directly or indirectly. Either by planting trees, increasing the resilience of forest ecosystems, modernising animal farms or building new types of manure storage facilities. The measures cover several of the potential main alternative technologies or general investments that the EUKI project also builds on, but there is still significant room for improvement and extension: for example, greater emphasis could be placed on regenerative agriculture, no-tillage farming or agroforestry.

The analysed measures, however, still have great potential in:

1. restoring forest and farmland ecosystems;
2. significantly reduce the greenhouse-gas emissions of various livestock farms;
3. reducing the occurrence of nitrate pollution;
5. protecting the good quality of groundwater;
6. harmonising nutrient circulation processes with agro-technological needs.

The level of emissions abatement from the 2014-2020 RDP is unclear, as all the projects are still ongoing, and developments are underway. The targets and means of the measures are supported by relatively significant incentives and clear indicators. Thus, they have the potential to have measurable, long-term impacts from a climate mitigation and adaptation perspective. Importantly, added values and co-benefits are expected for farmland biodiversity, by diversifying habitats, increasing their resilience, supporting pollinators, and preventing soil erosion.

SPAIN

In accordance with the EU's rural development policy 2014-2020 and the division of competences which exist in Spain, 18 RDPs coexist in the country: one National Programme and 17 regional programmes. Each have specific measures that respond to the different situations and needs of the territories. All Spanish RDPs, except for Cantabria's, include priority 5 on climate mitigation.

Most of the measures foreseen under this priority are associated with focal areas 5A on efficient water use and 5E on carbon storage and sequestration in agriculture and forestry; and are mainly aimed at supporting investments in physical assets and in forest areas, respectively. In addition, 10 RDPs include measures which address focal area 5D on reducing GHG and ammonia emissions to a varying degree. These include knowledge transfer and information actions (6 RDPs), advisory services (4 RDPs), support for investments in physical assets (5 RDPs), support for more environmentally friendly farming practices (4 RDPs), organic farming (1 RDP) and cooperation measures (7 RDPs).

The measures with the highest mitigation potential included in all Spanish RDPs, are ones which support an increase in forest area through reforestation on abandoned agricultural land (more than one million hectares in 2017) or forest land that has suffered fires (about 100,000 hectares are burned each year). Pine trees, which have high CO_2 sequestration rates, are common species in Spain. Especially *Pinus halepensis* and *Pinus pinea*, which absorb around 50 and 27 tonnes of CO_2 per hectare per year, respectively. As most of the Iberian Peninsula is an ideal habitat for this type of conifer, the mitigation potential is very high.

Support for investments in physical assets that promote the treatment of livestock waste through anaerobic digestion (AD), also has high mitigation potential given the magnitude of the livestock sector in Spain, particularly pig farming. With over 30 million head of livestock, Spanish farmers are dealing with more than 50 million tonnes of slurry each year. This measure can reduce GHG emissions by improving manure management and recycling as organic fertilisers and renewable energy sources. A typical on-farm AD plant that treats manure achieves a reduction of 50 to 70 kg CO_2 equiv. per tonne of manure, compared to a reference situation where manure is used as fertiliser after 4-6 months of storage. Anaerobic digestion of manure is currently underused in Spain. Nevertheless, caution and appropriate safeguards are essential to not stimulate a situation where producing manure become so profitable, that the overall Spanish herd size increases.

Wider implementation of agroecological practices and use of technology to reduce inputs is also critical to increase the contribution of the agricultural sector to climate mitigation. Therefore, measures in RDPs relating to the transfer of knowledge and information and practically oriented advisory services have a very important role to play. In fact, there is a certain reluctance by parts of the sector to adopt new practices, as a lack of information or understanding often leads to rejection or mistrust. In addition, certain circumstances in the agricultural sector such as age, lack of training or isolation pose a challenge. Farmers often have difficulties in accessing relevant and quality information on science, technology, innovation or the environment, even though their activities are closely interlinked with developments in these fields.

Spain allocates 13% of the total public expenditure foreseen for Spanish RDPs to priority 5, i.e. about €1.66 billion. Of these, the majority are allocated to measures M4 (investments in physical assets) and M08 (investments in forest areas), both with 46%. As for the rest of the activated measures (M01, M02, M06, M07, M10, M11, M13, M15, M16) each have an allocation of around 1%.

CONCLUSION

The RDPs identify climate mitigation and adaptation as one of the priorities against which MSs must programme their RDP expenditure. However, the EU policy framework, and particularly the CAP, does not yet set any quantified reduction targets for GHG emissions or the increase of sinks for agricultural emissions. It does require that the SWOT analysis on which Member States' RDPs are based should assess specific needs for climate mitigation and adaptation, and that a minimum proportion of RDPs spending should be on climate. However, some of the measures that count as "climate spending", such as payments to areas with natural constraints, do not necessarily contribute to climate action objectives and are not conditional to the adoption of new climate friendly practices.

Although several measures in our case studies include some wording in their description around climate change and mitigation, authorities rarely assessed the GHG emission mitigation potential to justify their funding or their failure/success. None of them suggest any figures regarding their mitigation potential. When independent scientific studies exist on one specific measure, national authorities do not have any obligation to report on it. Additionally, the voluntary nature of some of those measures, does not lead to any major structural changes in the agricultural sector or changes in farmers' behaviour. In Ireland for example, despite choosing priority 5 of their RDP as main priority, agricultural emissions are projected to grow steadily up to 2030.

While most of the measures studied are identified as having mitigation potential, it is unlikely that they, in their current form, will lead to effective GHG reduction.

The main common weaknesses of the measures are:

- The absence of clear targets and quantifiable outcomes linked to specific measures;
- The absence of independent scientific assessment of the measures after a certain number of years or the absence of the obligation to report their impacts when scientific assessments exist;
- The absence of strategic planning ensuring coherence between the objective pursued with certain measures of the RDPs and other policy instruments;
- The voluntary nature of some measures and the limited available fund for them.

The current programming period of the RDPs offers us a glimpse of what could be the future of CAP in terms of climate ambition. MSs in their RDPs, are free to design the measures and allocate funds in a very flexible way. Such an approach is likely to be adopted for the future CAP post 2020. If the current weaknesses of the RDPs programmes are not considered in the drafting of the future National CAP Strategic Plans, it is unlikely that the agricultural sector will begin reducing its GHG emissions in the future programming period.

ANNEXES

ANNEX 1
THE IRISH GREEN, LOW-CARBON, AGRI-ENVIRONMENT SCHEME - GLAS

This programme is implemented at national level pursuant to EU Regulation 1305/2013 by the Irish Department of Agriculture, Food and the Marine. The GLAS combines nature friendly farming and some measures with climate mitigation potential. GLAS is built on basic environmental actions core requirements, priority environmental actions as a first requisite for scheme entry and general environmental actions as funds permit.

The supported measures include among others minimum tillage, hedgerows, low-input permanent pastures, environmental management of fallow land. GLAS payments are conditional on attending compulsory training and participants must complete a Farm Improvement Plan which usually includes either a Nutrient Management Plan or a Carbon Navigator Plan (which assesses GHGs but is not obligatory to reduce emissions). The design of the scheme was based on consultation with nature conservationists though the actual signed off measures varied somewhat to proposals. In the end it is the results that matters, and these are based on the correct implementation of the scheme, the climate and ecological knowledge of farm advisors, the effectiveness of knowledge transfer, implementation of cross compliance laws and monitoring of the scheme.

GLAS has a semi-flexible combination of different measures instead of a single-action compensation scheme and this will hopefully lead to positive environmental benefits. However, it is unclear at this point the level of success of measures. The interim review of GLAS sampled only 30 farmers sometimes clustering the assessment of some measures whereas there are approximately 43,000 farmers in some of the more popular GLAS measures.

This measure could potentially be net-zero compatible but actual emissions reductions are currently not quantified. No estimate was provided from the outset of the potential GHG reductions from any of the measures in GLAS.

ANNEX 2
BEEF DATA AND GENOMICS SCHEME, IRELAND

This programme is implemented at national level pursuant to EU Regulation 1305/2013 and 1306/2013 by the Irish Department of Agriculture, Food and the Marine and implemented through the Irish Cattle and Breeding Federation (ICBF). Farmers receive subsidies through Pillar 2 of the CAP on a voluntary basis. This programme is worth €52 million per annum to Irish farmers, or over €300 million over the lifetime of the RDP.

The most recent Teagasc National Farm Survey (2017) shows that average level of emissions across all beef farms in Ireland between was 11.9kg CO_2 equivalent per kg beef of live-weight produced. The main objective of the Beef Data and Genomics Scheme is to encourage the introduction of animals of a higher genetic merit into the national beef herd. By improving the quality and efficiency of the suckler herd, it will reduce the greenhouse gas intensity of beef production in Ireland by improving production efficiency. The scheme works on the principle that increasing the genetic merit of the suckler herd will result in maintaining the existing beef herd size but with reduced greenhouse gases per livestock unit.

National GHG emissions reductions have been projected for the scheme and farmers must complete mandatory training and utilise the Carbon Navigator by 2016, which is an online farm carbon assessment tool but actions to reduce carbon equivalent are voluntary only. The cumulative climate benefits from this scheme are estimated at 1.6 Mt CO_2 by 2030 or 235,000 tonnes of CO_2 annually in 2030 according to the numbers of cows enrolled in the scheme in 2018. This would represent approximately 11% of marginal abatement from the suckler herd in 2030. These projections are dependent on the continued implementation of the practices at farm level that were learned through the BDGP. Approximately 24,800 farmers were enrolled in 2019 down 5000 farmers since the programme began.

ANNEX 3
SUPPORTING AFFORESTATION SCHEME, HUNGARY

This programme is implemented at national level pursuant to Government decree No. 1248/2016. (V.18.) by the Hungarian Ministry of Agriculture. Farmers received subsidies from Pillar 2 of the CAP on a volunteer basis. The total budget indicated in the call is 50.32 billion HUF (€153.5 million), altogether approximately 300 applications can get funding through this subsidy.

The scheme targets farmers and land-owners and aims to promote carbon sequestration through agriculture and forestry. One part of the budget is for compensating for lost income, another for maintenance and a third for purchasing trees for afforestation. Furthermore, selectable activities/investments can be applied for in combination with one of the previously mentioned main activities (e.g. costs of fences etc). The measure supports the establishment of forests for industrial purposes with the earliest harvest after 8 years and the latest after 20 years and the highest subsidies are given for hardwood species.

Potential co-benefits of the measure are climate change adaptation, increasing forest biodiversity, preventing soil erosion, supporting water-retention and pollinators, providing timber as a renewable energy source as well as for other timber products, and thus supporting the local economy and the local community.

In its current form, the measure lacks ambition and well-targeted objectives with supported contributing activities. In the call, there is no mention of agroforestry that could potentially have significantly more benefits compared to the current measure for afforestation. Also, there is no preference given to applicants who plant polycultures instead of monocultures which might incentivise applicants to choose grant maximising over species diversity. Thus, the measure is likely to support short-lived monocultured instead of long-lived diverse polycultures that would bring more environmental benefits. No assessment or estimations of expected GHG reduction of the measure have been carried out yet.

ANNEX 4
MODERNISATION OF LIVESTOCK FARMS SCHEME - HUNGARY

This programme is implemented at national level pursuant to Government decree No. 1012/2016 (I.20.) by the Hungarian Ministry of Agriculture. Farmers received subsidies from Pillar 2 of the CAP on a volunteer basis. The total budget indicated in the call is 5.95 billion HUF (€18.1 million), altogether approximately 300 applications can get funding through this subsidy.

In Hungary, a significant part of livestock farms are outdated and expensive in production. The main objective of the measure is to improve the competitiveness of livestock farms, to increase the number of employees working in this sector and to add value by promoting innovative and environmentally friendly technologies. To update infrastructure, farmers and agricultural enterprises can be compensated up to 50% of the total cost of investments which contribute to improve competitiveness, energy efficiency, animal welfare and health and contribute towards the compliance with environmental and climate goals.

Climate positive activities include support for increasing energy efficiency, which requires a minimum efficiency increase of 10%. Another supported activity with potential to reduce GHG emissions is targeting manure utilisation and developments for improved manure storage. It appears as a voluntary target to utilise at least 50% of the manure produced at the livestock farm before agricultural application. This, either through composting or utilisation in biogas plant, either on own or on other farms.

As we know, 15% of the direct European agricultural GHG emissions are related to manure management. So, the above investments can all contribute to reduced GHG emissions, improved air quality and odour reduction, in addition to reduced energy consumption by the installation of renewable energy-based technologies in livestock farms. It is, however, obvious that in this particular RDP measure, manure-related actions are only voluntary. By making them mandatory elements of the development or attaching further benefits to it, better results could be achieved in climate change mitigation.

ANNEX 5
INVESTMENTS IN PHYSICAL ASSETS: ANAEROBIC DIGESTERS, SPAIN

This programme is implemented at regional level in the Autonomous Community of Castilla-La Mancha pursuant to EU Regulation 1305/2013 by the Regional Department for Agriculture, Environment and Rural Development. Farmers received subsidies from Pillar 2 of the CAP on a volunteer basis.

The scheme aims to reduce GHG emissions through livestock manure treatment based on anaerobic digestion processes, but also to improve the overall performance and sustainability of farms. In Castilla-La Mancha there are areas of high concentration of intensive livestock farms that have significant problems of manure management, which in turn affect GHG emissions. Supporting the improvement of manure management facilities, especially with anaerobic digester facilities for biogas production, would improve the situation. A typical anaerobic digestion plant on a farm scale treating manure (along with 5% of the co-substrates) reduces between 50 and 70kg CO_2 equiv./ tonne of manure treated, compared to a reference situation where manure is used as fertilizer after 4-6 months of storage. This measure allows for economic benefits associated with the energetic exploitation of biogas in boilers or cogeneration engines, or with the use of the digestate as fertilizer, reducing the quantity of synthetic fertilizers needed.

The main barriers may be related to high investment costs, lack of investment capital, bureaucratic aspects, difficulty in obtaining financing due to restrictive requirements or lack of technical knowledge on how to use an anaerobic digester. Government policies are needed to encourage the implementation of such plants and to solve the lack of knowledge. So far, Spanish policies to promote biogas have been scarce and without continuity.

In other countries, such measures have led to further increase of animal density. Hence, a proper regulatory framework needs to be put in place to avoid such situation, harvesting the benefits without jeopardising other environmental goals such as water pollution by nitrate.

ANNEX 6
SUSTAINABLE RICE CULTIVATION IN WETLAND AREAS SCHEME, SPAIN

Source: Jardineria Tot, U.S.L. website

This programme is implemented at regional level in the Autonomous Community of Valencia pursuant to EU Regulation 1305/2013 by the Regional Department for Agriculture, Environment and Rural Development. Farmers received subsidies from the Agro-environmental and climate budget (Pillar 2) on a volunteer basis. This subsidy represents €440 per hectare under the scheme.

The aim of the scheme is a reduction of GHG emissions associated with business-as-usual rice straw management practices (burning or "fangueo") through the introduction of sustainable agricultural practices. 98% of rice cultivation in the Autonomous Community of Valencia takes place in the Natural Park of l'Albufera. The park is one of the most representative coastal wetlands of the Mediterranean basin with an area of more than 21 hectares, 67% of which are devoted to rice cultivation. In a wetland environment it is necessary to ensure sustainable practices, both during cultivation and in the absence of cultivation.

Traditionally, the practice for treating rice straw has been burning or abandoning the straw on the ground without crushing or burying. One alternative good practice is the removal of the rice straw for later use before the post-harvest flood. Another good practice is the incorporation into the soil immediately after the harvest. The emission reductions obtained with the removal of rice straw, compared to current practice, are 6.5 and 4.8 tonnes CO_2 equiv./ha, respectively. As for the immediate incorporation into the soil, reductions would be 3.9 and 2.2 tonnes of CO_2 equiv./ha, respectively. Additionally, the rice straw can be reused for biogas production, composting, paper production and even building materials.

The crushing of rice straw and its subsequent incorporation into the soil, is only viable if it is done properly, in terms of soil tillage, amount of straw used and time of incorporation. From a practical point of view, rice farmers might have little interest in doing this additional work in the absence of appropriate subsidies.