

Larnaca (CY)
10-11 Feb. 2014



national rural network

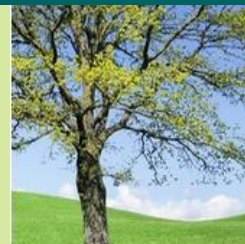


Kamaries - Larnaca (CY)

The European Evaluation Network for Rural Development (Under the guidance of DG AGRI - Unit E4)

Good Practice Workshop

Climate change mitigation and adaptation in Rural Development Programmes



Introduction

[Link to the event](#)

The Good Practice Workshop (GPW) on “Climate change mitigation and adaptation in RDPs: assessing the scope and measuring the outcomes” took place on 10 and 11 February 2014 in Larnaca (CY), and was hosted by the Cypriot National Rural Network and the Ministry of Agriculture (MoA) of Cyprus.

70 participants (Managing Authorities, evaluators and researchers) from 20 countries participated with the objective to:

- **Share good practice** in national and international experiences with Climate Change (CC) adaptation and mitigation in agriculture and forestry;
- **Identify effective approaches** to assess the contribution of the CC mitigation and adaptation related measures of 2007-2013 RDPs;
- **Review the main challenges and solutions** adopted to assess the contribution of CC mitigation and adaptation related measures;
- **Draw main lessons** to assess the effectiveness and efficiency of mitigation and adaptation related measures of the 2014-2020 RDPs.



Evaluation of climate change in the RDP

[Bill Slee's presentation available here](#)

The rural sector impacts on climate change (CC) in multiple ways. The desire of the European Commission to devote 20% of European spending on climate changes forces attention onto the Rural Development Programmes (RDPs) and their role in climate mitigation and adaptation. As climate science has developed and the pooled resources of the International Panel on Climate Change (IPCC) teams and other scientists have begun to generate much better understanding of anthropogenic climate forcing by rural land use and rural socio-economic activity, so national and European policy has engaged to try to slow down what Lord Stern has described as the greatest negative externality ever to impact on mankind.

Rural land uses and rural communities are both a source and a sink in relation to greenhouse gases (GHGs). Whilst food and fibre production necessarily produces emissions, some parts of the production of food and fibre also entails the sequestration of carbon, most strongly above and below ground in forestry but also in soils, especially under permanent pasture. Farms can also produce renewable energy and this too should be accounted for.

The rural land use sector is faced with two challenges. What can it do to mitigate CC and what can it do to adapt to CC? The apparent mutual exclusiveness of these categories can break down when we look at actual examples. Tree planting can mitigate CC and reduce flooding, so is both a mitigative and an adaptive strategy with respect to CC.

For the evaluation of the 2007-2013 RDPs, the only CMEF common impact indicator is the production of renewable energy. It is now widely accepted that this can give a partial and misleading picture of the GHG balance on any particular farm and is therefore not sufficient.

What are the principal challenges?

1. Getting the science right

There is almost unanimous recognition by the scientific community and the European policy community of the reality of anthropogenically influenced CC. It is also known that globally the farm sector contributes significantly to global warming with estimates from some EU Member States (MS) that over 30% of emissions come from the farm sector (using IPCC measures). However, knowledge of detailed processes in some parts of the farm sector are less clear (e.g. Nitrous Oxide emissions are highly variable).

2. Measuring the footprint

The conventional way of measuring emissions from the land use sector has been using IPCC methods but MS are encouraged to advance beyond this. The most frequently used tier 1 approach is based on global averages applied to a country's cropping and stocking. It is a blunt approach. Tier 2 approaches seek to improve such estimates based on national level studies whilst tier 3 approaches work on the basis of country-specific models.

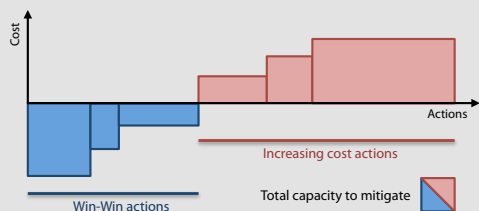
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SOCIAL DIMENSIONS OF BEHAVIOUR

The *Marginal Abatement Cost Curve* (MACC) is the economist's tool showing what ought to be the least cost options. But many farmers do not even take the win-win outcomes.

Why not? Is it ignorance, preferences for particular farming or land use systems or that it is not really a win-win measure at all? This means that a focus on the social dimensions of behaviour may help understand and overcome reluctance to act.

Fig. 1: A standardised MACC curve



3. Understanding cost-effective responses and the role of the MACC

The standard way of estimating the scope for reducing emissions is to construct a *Marginal Abatement Cost Curve* (see box on the left). This shows which activities can be undertaken to reduce emissions and their costs, and have been widely constructed at country level. The suite of measures that could mitigate CC is now relatively well known for each of the major enterprise types, but unless we can construct a farm-specific range of actions and associated costs, it is impossible to recommend the standard strategy of picking "the low hanging fruit" because we cannot know what the low hanging fruit are for any particular farm.

4. Monitoring and evaluation

What are the lessons for monitoring and evaluation? **First**, we need a reliable benchmark estimate of emissions if we are trying to reduce them. **Second**, we need to be able to assess the costs of the GHG mitigating action(s) at farm scale. The benefits comprise the public good of reduced global warming but there may also be benefits to farm business income through the more effective use of inputs. We need to explore both farm level impacts (in terms of reduced emissions from any measure) and wider societal benefits (quantified in money and carbon terms if possible). This should become the most important farm level indicator for CC. **Third**, we should continue to monitor net energy use on the farm, thereby recognising renewable energy production. **Fourth**, wherever possible, we should be monitoring the social learning taking place which empowers the individual farmer or landowner to take effective action.

Results of the survey on CC mitigation and adaptation activities in EU MS

Before the workshop, a quick online survey was addressed to all national rural development authorities with the aim to: (i) Explore the level of awareness of the stakeholders in the MS in relation to CC mitigation and adaptation activities; (ii) Assess experiences in the 2007-2013 RDPs regarding the evaluation of CC mitigation and adaptation activities; (iii) Identify obstacles and potential challenges linked to implementation and assessment of CC mitigation and adaptation activities in the new RDPs. Here is a summary of the results taken from the 13 questionnaires answered by the Managing Authorities:

Angelos Sanopoulos' presentation available [here](#)

Besides RDP, which are the other policies that address CC mitigation and adaptation?

- Emission trading scheme;
- Renewable energy source investment support;
- GHG emissions reduction by agriculture;
- Electric Mobility Programme;
- Carbon Footprint for foodstuff;
- Biofuels;
- Interception of Bovine virus diarrhoea
- National CC strategy.

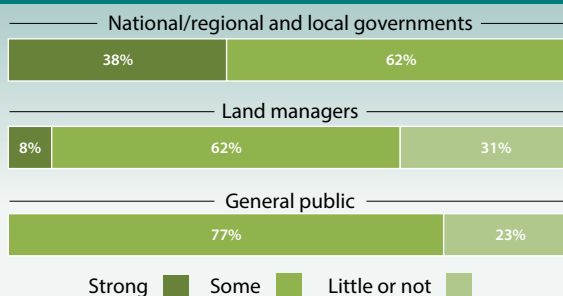
Has any assessment of impacts been conducted of the different RDP-measures on CC?

- In most cases, no climate related assessment of impacts;
- Few cases on:
 - Impact of the supported investments on the reduction of GHG and the production of renewable energy;
 - Extensification and restrictions on fertilisers (M214);
 - Direct support of investments in renewable energy sources (M123, M311, M312).

What are the main challenges during the ex ante assessment of 2014-2020 RDPs of the potential impacts of CC related measures?

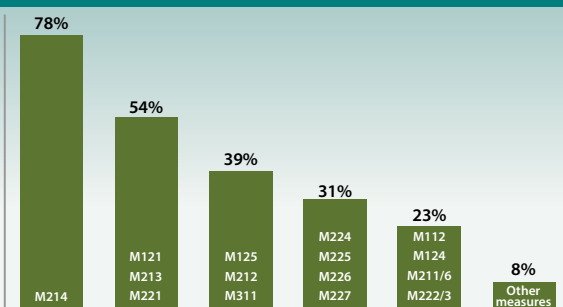
- Complex and in many cases unclear relationships;
- Knowledge gaps;
- Measures untested at holding level;
- Unclear intervention logic;
- No quantified CC targets;
- Difficult to depict in the Indicator Plan;
- Difficult to define selection criteria and conditions.

LEVEL OF AWARENESS



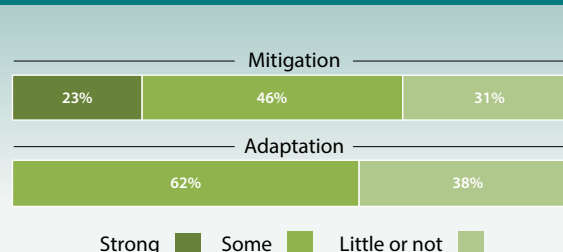
- The level of awareness of the need for the rural sectors to contribute to European, national and regional CC targets decreases gradually when moving away from the RDP level;
- However, to a certain extent there is some awareness on the issue.

RDP MEASURES CONTRIBUTING TO CC MITIGATION AND ADAPTATION



- M214 is the measure which is expected to contribute most to CC mitigation and adaptation;
- Also M121, M213 and M221 are expected to contribute significantly to CC.

EVIDENCE FOR RDPs 2014-2020

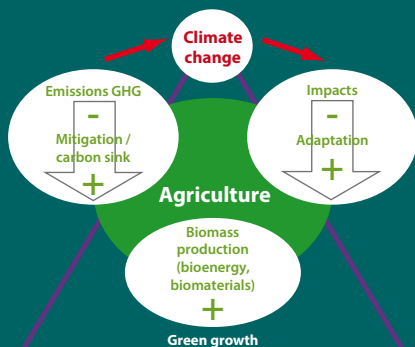


- Most mitigation activities are designed in new RDPs on the basis of previous experience and knowledge;
- Still little is reported for adaptation activities.

Background information

Extreme weather events (heat wave, cold event, wildfire, storm, drought and flood) have dramatically increased over the last 20 years;
This has a negative impact on the agricultural sector, a field of activities which however strongly contributes to CC;
GHG emissions from agriculture have decreased 23% from 1990 to 2001.

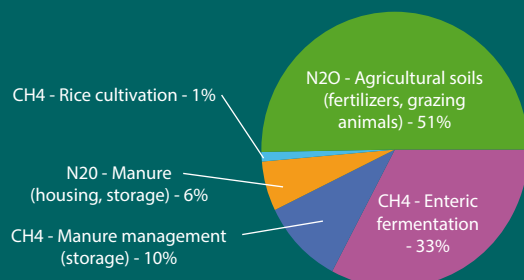
Link between agriculture and CC



Agriculture influences CC but at the same time is a sink and opportunity to reduce emissions;

Agriculture could mitigate CC but being subject to CC too, it has to adapt.

Emissions inventory from Agriculture, EU-27 (2010)



It aims to enhance resilience of economic sectors and systems (infrastructures, agriculture and forestry) and environmental resources (biodiversity, soil, water).

EU climate policy - key policy instruments

The objective is to dedicate at least 20% of EU budget 2014-2020 on actions linked to climate change;

An integrated approach using all funds is foreseen;

Climate tracking, which provides an indicative estimate of spending related to CC (mainstreaming).

What is mitigation?

It aims to: (i) Diminish direct emissions from farm operations (CH4 and N2O); (ii) Diminish emissions by improving farm energy profile; (iii) Improve CO2 balance of farmland soils by protecting and expanding carbon sinks and diminish CO2 from fossil fuel use in other sectors by supplying feedstock for bio-energy and industrial applications.

Mitigation potentials are highly variable and depend on baseline climates, soil types, farm production system.

Possible mitigative solutions

(i) Increase production efficiency (fertilizer, resource use); (ii) Improve manure and slurry management (storage, application); (iii) "Waste to worth" (anaerobic digestion for animal waste - biogas); (iv) Grassland management (improving livestock "carbon footprint" and carbon sink).

What is adaptation?

It aims to enhance resilience of economic sectors and systems (infrastructures, agriculture and forestry) and environmental resources (biodiversity, soil, water).

It has a longer-term perspective compared to risk prevention measures.

Possible adaptive solutions

(i) Adapt timing farm operations (planting, sowing); (ii) Technical measures (frost protection, ventilation systems, livestock, housing); (iii) Better adapted and more resilient crop varieties (less water intensive); (iv) More effective pest and disease controls; (v) Improve efficiency of water use and irrigation equipment; (vi) Protect and build "green infrastructure" (hedgerows, floodplain, wetlands).

Assessing RDPs' contribution to CC challenges

2007-2013

Policy framework

Regulation (EC) 1698/2005:

- [Recital 31](#);
- [Recital 38](#).

Regulation (EC) 1974/2006:

- [Annex II 3.1](#)

A stronger focus on CC was introduced in 2009 with the CAP Health Check.

Evaluation

MTE reports provided little information.

Need to do better in the *ex post* by:

- *Link to National Strategic Plan, RDP objectives (including Health Check), impact on Community priorities;*
- *Identify likely measures to investigate;*
- *Use CMEF indicators + add programme-specific:*
 - Baseline (Soil erosion, renewable energy, gas emissions, etc.);
 - Result (Axis 1 new products, techniques, Axis 2 management linked to climate change);
 - Impact (Renewable energy production).

2014-2020

Policy framework

An explicit "climate action" objective is linked to the overall EU policy objectives;

Mainly three Pillar II priorities (priority 1, 4 and 5) could have some impacts on CC;

Within each priority, several activities could be implemented for CC adaptation and mitigation (e.g. Within Art. 20 "Basic services and village renewal", a possible action is: Climate proofing of local development plans).

Evaluation

A more extensive range of indicators is available linked to climate actions:

- *Impact indicators:* e.g. emissions from agriculture, FBI, HNV farming, water quality, soil organic matter in arable land, etc;
- *Result indicators:* e.g. supply and use of renewable energy, reducing GHG emissions and NH3 emissions, etc;

Complementary result indicators should capture achievements from all relevant projects.

Sharing experiences on the assessment of climate change mitigation and adaptation activities

Four case studies (Cyprus, Spain, Ireland and Wales) showed the CC context in their area, the ways CC challenges have been addressed through RDPs, the ways the RDP interventions on CC mitigation and adaptation have been addressed and the main lessons learned.

George Nikolaous' presentation available here



CYPRUS



GEORGE NIKOLAOU

Officer at the Department of Agriculture

“Regulation (EU) 1305/2013 (Art. 46) foresees subsidies only for new irrigation systems which can save between 5 and 25% of water compared to previous irrigation systems”

CLIMATE CHANGE CONTEXT IN THE MS/REGION

Average precipitation of approximately 500 mm per year, reducing at a rate of 1 mm per year since 1970.

For 95%, water depends on rainfall. Therefore, water is scarce and at high cost.

Nine droughts over the last 40 years had devastating effects on agriculture (drop in production, loss of trees, economic damage for farmers, etc.).

To solve the water scarcity problem, currently:

- Several drilling exercises have been conducted to dig out underground water;
- Water is imported from Greece.

ADDRESSING CLIMATE CHANGE CHALLENGES THROUGH RDPs

Subsidies through the RDP 2007-2013 for the:

- Installation of Pressurized Irrigation Systems (P.I.S.);
- Tanks for rain water harvesting to reuse for irrigation purposes;
- Agro-environmental measures (e.g. Crop rotation).

Subsidies through the RDP 2014-2020 for the:

- Maintenance/repairation of small scale irrigation infrastructure schemes;
- Distribution network for recycled water in agricultural areas;
- Installation of tanks for rain water harvesting from greenhouses roofs;
- Application of intelligent systems for recording and management of irrigation networks to save resources and energy by the optimization of the existing infrastructure.

APPLICATION OF PRESSURIZED IRRIGATION SYSTEM IN CYPRUS



Compared to traditional irrigation methods, the application of P.I.S. increases the efficiency and water uniformity up to 95%.

RAINWATER HARVESTING SYSTEM FROM GREENHOUSES ROOFS



RWHS not only conserves water resources but also reduces the overall carbon footprint of water collection and distribution cycle.

CONCLUSIONS AND LESSONS LEARNED

Future trends to adapt to water scarcity:

- Rearrangement of crops; use of recycled water; use of marginal quality water; increase education campaign; increase the yield per unit of water applied by fertigation, the application of water requirements and the use of advanced irrigation technology; innovation measures through RDPs.

Main evaluation results:

- P.I.S. increased efficiency compared to traditional irrigation up to 95%.
- P.I.S. and rain water harvesting has enhanced uniformity of water supply.

Sharing experiences on the assessment of climate change mitigation and adaptation activities

Ricardo Pedraz Gonzalez's presentation available [here](#)



SPAIN



RICARDO PEDRAZ GONZALEZ

Geographic Expert of the Evaluation Helpdesk on behalf of the Ministry of Agriculture, Food and Environment of Spain

“Regulation (EU) 1305/2013 (Art. 24) foresees grazing animals as potential fire prevention measure”

CLIMATE CHANGE CONTEXT IN THE MS/REGION

Spain is located in an area particularly vulnerable to climate change.

Forests and other wooded lands have increased by almost 5% from 1980 to 2011 although from the end of '70s to mid '90s, more than 400,000 ha of forest and wooded lands have burned every year.

Since mid '90s, fire prevention measures have reduced the problem (from almost 200,000 ha in 2005 to 50,000 ha in 2010).

Most fires are related to farming and traditional rural activities such as:

- Agricultural burning (36%);
- Burning to regenerate pastures (33%);
- Others (vandalism, pyromaniacs, hunting-related, etc.) (21%)

ADDRESSING CLIMATE CHANGE CHALLENGES THROUGH RDPs

All Spanish RDPs 2007-2013 have compulsory forest fire prevention measures such as:

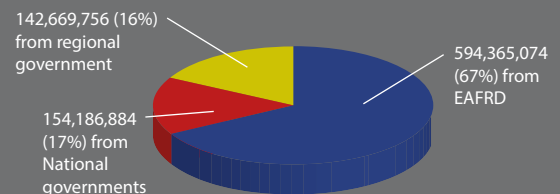
- Vegetation management;
- Specific rural activities for wildfire prevention (e.g. Firebreaks, preventive silviculture, specific infrastructure).

SUPPORT TO REGIONAL GOVERNMENTS FOR FIRE PREVENTION (M €)



The support increased by 60% from 2006 to 2007.

CO-FINANCING FOR WILDFIRE PREVENTION MEASURE (€)



ASSESSING THE RDP INTERVENTION ON CLIMATE CHANGE MITIGATION/ADAPTATION

Additional information is needed to allow an in-depth analysis (effectiveness, efficiency, impacts and results) at the municipal level of the operations carried out by forest prevention measures. This information comprises:

- Type of action (firebreak, trail, grazing,...);
- Expenditure (€);
- Unit of measure (ha, km, units,...);
- Location (Municipality).

Identification and sharing of good practices, e.g.:

- *Andalucía* - local shepherds have been hired for the management of firebreaks by grazing;
- *Castilla y León* - farmers are part of vegetation reduction actions, refusing to use fire as vegetation control action.

CONCLUSIONS AND LESSONS LEARNED

Challenges:

- To improve the M&E framework, CMEF is not sufficient to capture the contribution of fire prevention measures.
- To increase the number of actions where the population is in charge of fire prevention (grazing).

Main evaluation results:

- Reduction of forest fires by 6% in evaluated regions (up to 39% in some counties) through grazing schemes.
- Linking fire prevention to rural population activities (like grazing) is cheaper and yields more value added than administrative prevention actions.

Sharing experiences on the assessment of climate change mitigation and adaptation activities

John Muldowney's presentation available [here](#)



IRELAND



JOHN MULDOWNEY

Officer at the department of Agriculture, Food and the Marine

“The National Farm Survey in conjunction with soils maps and LPIS data can be used to downscale national inventories BUT tier 2 factors and also climate sequestration base-lines for land management are needed”

CLIMATE CHANGE CONTEXT IN THE MS/REGION

Agriculture is the largest contributor to national GHG emissions (dairy and beef sector represents the bulk of it).

EU 2020 Target for non-Emission Trading System emissions is 20% reduction.

Irish Food Harvest 2020 targets is 50% increase in dairy production.

ADDRESSING CLIMATE CHANGE CHALLENGES THROUGH RDPs

Significant research has been conducted on dairy emission to identify mitigation measures for GHG emissions, namely:

- Comparing grass based system with confinement;
- Comparing counting mechanism (LCA vs IPCC);
- Economic Breeding Index;
- Electricity usage;
- Slurry management;
- Fertiliser use and type;
- Inhibitors - DCD and urease;
- Anaerobic digestion.

A Marginal Abatement Cost Curve is used to identify which cost-effective mitigation measure to promote among others to reduce GHG emissions.

ASSESSING THE RDP INTERVENTION ON CLIMATE CHANGE MITIGATION/ADAPTATION

Two approaches are conducted for assessing GHG emissions and for decision making at farm level:

- Carbon Auditing and verification method and National farm survey and fertiliser use survey;
- Online software “Carbon navigator”.

NATIONAL FARM SURVEY (NFS) AND FERTILISER USE SURVEY

The NFS is a survey based on a random, nationally representative sample (1000-1200 farms) selected annually.

Several variables are included in the survey:

- Animal numbers and type and sub-type;
- Area of land in tillage, pasture, forestry;
- Energy use, housing type;
- Timing/amount of fertiliser/manure application;
- Fertiliser/manure type and application method;

Thanks to these surveys, the impacts of fertiliser type and inhibitors on emissions and yield were calculated.

CARBON NAVIGATOR

The carbon navigator is an on-line software to assist farmers:

- To understand how their farms produce GHG emissions
- To identify mitigation capacity
- To set targets and a path way to reduce emissions

For mainly methane and nitrogen management related measures, the software allows the user to set up the current and targeted emissions performance, displaying the changes in GHG emissions and the economic benefits. The software is complemented by a scoring chart which compares the current performances with the targeted ones.

CONCLUSIONS AND LESSONS LEARNED

In Ireland, climate change per se may have positive impacts (longer growing season) but weather volatility could offset any gains.

Mitigation and reduction options are available to increase profit and reduce emissions while maintaining productivity.

The Carbon Navigator shows at individual farm level how an increase in profitability can be achieved by emission reduction actions.

Sharing experiences on the assessment of climate change mitigation and adaptation activities

James Skates' presentation available [here](#)



WALES



JAMES SKATES

Soil Policy and Environmental Monitoring Specialist

“Knowledge transfer to identify economic win-win situation between farm business and CC mitigation”

CLIMATE CHANGE CONTEXT IN THE MS/REGION

In 2010, agriculture contributed to 12% of total CO₂ equivalent emissions. The trend is however decreasing.

The Welsh Government has an annual 3% reduction target across all sectors it is competent for.

The climate change strategy for Wales (2010) identified potential savings of 600 kt CO₂e from agriculture by 2020.

ADDRESSING CLIMATE CHANGE CHALLENGES THROUGH RDPs

The prime mechanism by which CC mitigation is addressed are:

- Woodland creation and management (100,000 ha increase by 2020);
- Axis 2 Agri-Environmental Scheme (AES) Glastir;
- Knowledge transfer to achieve the cost effectiveness of measures;
- Sector roadmaps.

AXIS 2 SCHEME GLASTIR

Glastir is a 5 years whole farm Axis II scheme with 4 elements, all of which have CC mitigation measures. The key feature of the scheme is the spatial targeting of measures, which focuses the intervention where it has the biggest return on investment (e.g. soil carbon measures targeted

to high carbon soils). Each element has multiple specific intervention measures such as: stock reduction, soil and fertiliser management, manure/slurry management, woodland expansion and management, infrastructure management.

ASSESSING THE RDP INTERVENTIONS ON CLIMATE CHANGE MITIGATION/ADAPTATION

6 steps for collecting data on Glastir: (i) Split Wales into 1km square grid; (ii) Select 45 squares to represent overall situation; (iii) Select further 45 squares for targeted survey; (iv) Surveyors are sent to the field to undertake ecosystem field survey; (v) Additional specific data collection measurement to ensure causal relationship to specific measures; (vi) Annual reporting in order to report on the impact of payment for specific measures on the stock of natural capital and delivery of ecosystem services plus modelling.

MODELLING THE IMPACTS OF GLASTIR

The CC modelling framework is a model framework ensemble approach made up of 4 distinct models using a wide range of parameters (water quality, biodiversity, etc.). It is a predictive analysis populated with scheme intervention data that takes into account primary emissions and

sequestration sources in each agricultural sector. On the basis of a sample of about 600 farms, the model framework provides information annually on the emissions and sequestration data associated with each activity carried out by the farm.

CONCLUSIONS AND LESSONS LEARNED

Challenges that still need to be addressed in using this approach include evidence gaps and undifferentiated assumptions (e.g. Soil GHG flux dynamics, IPCC default emissions factors, system boundaries, etc.).

Main evaluation findings:

Organic farm schemes resulted in 10-18% carbon sequestration;

National impact (of Axis 2 measures) calculated a 5.2% reduction of emissions from rural land and 12.5% increase in sequestration.

Future applications:

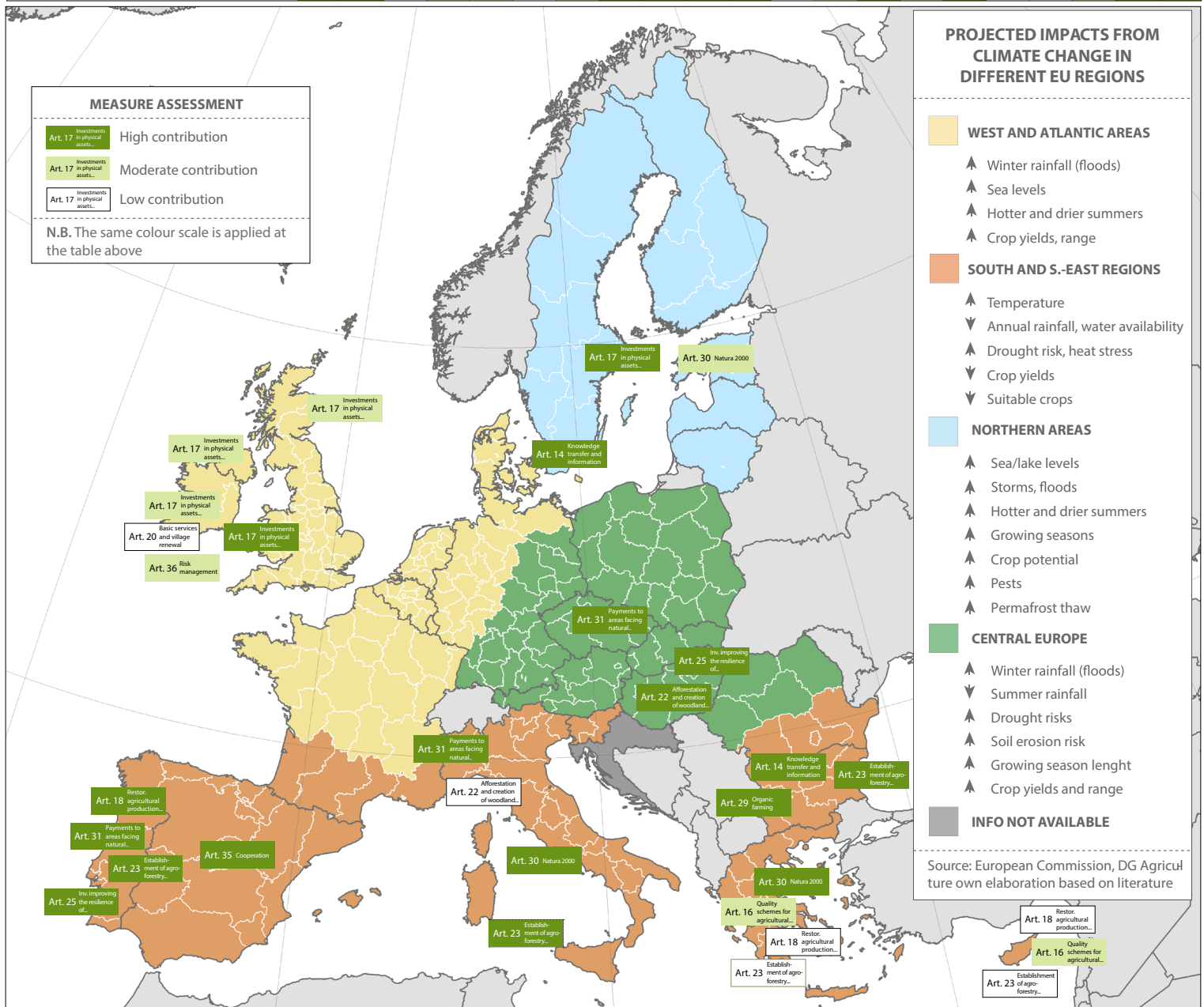
- Run trade off and synergies simulations in order to seek optimal intervention;
- Run simulations including potential policy interventions across a wide range of parameters in a way that the model framework is informing the new RDP design.

GROUP WORK OUTCOMES

Participants' assessment of the potential contribution of RDP 2014-2020 measures for CC mitigation and adaptation

Participants gathered in small groups according to EU climatic regions and assessed the potential effectiveness of 2014-2020 RDP measures in addressing CC mitigation and adaptation challenges. Results are reported for EU climatic zones (table) and at the regional level (map).

	Art. 14	Art. 15	Art. 16	Art. 17	Art. 18	Art. 19	Art. 20	Art. 22	Art. 23	Art. 24	Art. 25	Art. 26	Art. 27	Art. 28	Art. 29	Art. 30	Art. 31	Art. 33	Art. 34	Art. 35	Art. 36
West and Atlantic Areas																					
South and S-East Regions																					
Northern Areas																					
Central Europe																					



Outcomes of the reflection session following the case studies and group work

COST EFFECTIVENESS OF MEASURES

Evidence becomes essential to create effective and efficient strategies and use the RDP measures' potential in a proper way. There are sophisticated evaluations linked to some RDP - share and make use of this information.

SETTING UP THE BOUNDARIES OF THE ASSESSMENT

Common methods for the assessment of RDP actions linked to CC are required both at the EU and national levels but also according to EU climatic zones.

IDENTIFY METHODS FOR THE ASSESSMENT

Impact indicators should be adequate to conduct proper assessment of impacts and data should be available to allow the use of common and comparable methodologies. But common indicators will not be enough, additional information needed.

HUMAN DIMENSION OF CLIMATE CHANGE ACTION

To build awareness and address social behaviour of stakeholders and beneficiaries towards CC is essential.

The Evaluation Helpdesk operates under the guidance of DG AGRI - Unit E4

The contents of this publication do not necessarily reflect the official views of the EC

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