

SPAIN

Plan Estratégico Nacional de Desarrollo Rural 2007-2013

(National Strategy Plan for Rural Development 2007-2013, together with 17 regional Rural Development Programmes)¹

(The text of this summary sheet was finalised in December 2010 in accordance with the RDP versions that were current at this time)



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Climate Change and Renewable Energy issues in 2007-2013 RDP

Climate change (CC) is fundamental to the context for agriculture and policy making. EU agriculture must play an important role in mitigating this phenomenon by curbing greenhouse gas (GHG) emissions; at the same time it needs to adapt to the expected climatic adversities which will have serious consequences on production processes. Rural development offers a range of possibilities to support farming practices and investments that can contribute to climate change *mitigation* efforts (including the increase of the use of *Renewable Energy* (RE) resources) and additionally effect *adaptation* benefits. Climate change challenges have been well recognized in the baseline analysis of the 2007-2013 EU Rural Development Programmes (RDP) and addressed in their strategies. Following the Health Check (HC) of the Common Agricultural Policy (CAP), the 'new challenges' of the RD policy include 'climate change' and 'renewable energy' for which an additional budget of approximately €1 billion² have been made available for Member States (MS) to spend on this issues³. As a consequence, the operations related to these newly introduced Community priorities have been further strengthened in the RDPs.

¹ The Spanish RDP regions are: Andalucía, Aragón, Asturias, Baleares, Canarias, Cantabria, Castilla La Mancha, Castilla y León, Cataluña, Extremadura, Galicia, Madrid, Murcia, Navarra, País Vasco, La Rioja and Valencia. See also Annex II for their abbreviations used throughout this fiche.

² 19.8% of the total additional funds released.

³ The budget allocated to the 'new challenges' includes the funds released by the CAP Health Check (including voluntary modulation and transfers according to Art. 136 of regulation (EC) N. 73/2009) and the European Economic Recovery Package (EERP).

Introduction - overview of the Spanish RDPs

Rural development policy is an area of devolved responsibility within Spain, which results in 17 regional RDPs being implemented at regional level by the Autonomous Communities. With a total surface of 504,411 km² and a population of 44.5 million inhabitants (2006), Spain is one of the most heterogeneous EU countries in terms of climate, geography, natural resources and economic activity, and subsequently with a large variety of climate change issues amongst its regions.

Spanish regions contain important assets in terms of diversity of natural resources landscapes (wet in the North and dryer in the South), areas of high natural value, rich biodiversity, an important network of Natural Parks, Natural Reserves and Protected Spaces and agricultural and forest areas belonging to the Natura 2000 network, all of which are prone to be affected by climate change effects. Spain has the highest percentage of surface in the EU dedicated to permanent dry crops (olive trees, vines, almond trees, etc.) that help prevent erosion and protect landscapes and biodiversity. There is increased interest in the generation of renewable energies, especially wind energy, while there are significant differences between regions in terms of the quality and quantity of natural resources and their management.

One of the main problems facing certain rural areas in several Spanish regions are the high levels of erosion and desertification due on one hand to climatic factors (irregular rainfall, drought periods) and on the other hand to human activity (use of traditional agricultural practices such as intensive farming and/or depopulation). Soil erosion aggravates the problem of low content of organic material in the soil in many areas and increases the risks of forest fires. Water deficits are particularly acute in the South and in regions with arid. Inefficient irrigation infrastructures exacerbate the problem of water deficits, while there is water contamination from nitrates in several regions.

Given the above context, all three dimensions of climate change (mitigation, adaptation and the potential for renewable energies) are addressed by the baseline analysis provided in the Spanish RDPs. These three aspects have been considered and correspondingly tackled in the RDP strategy and within the implemented measures with different intensities according to their regional specificities.

Following the CAP HC, Spanish RDPs were revised to give further emphasis on the new challenges stressed by the HC in relation to climate change, biodiversity, water management and renewable energies. These priorities were already addressed in the original RDP strategies, more specifically, water management was mainly addressed under axis 1, biodiversity and climate change were addressed under axis 2, while renewable energies were addressed in particular under axis 1 in the context of increasing the value added of agricultural and forestry products. However, the revised RDPs place additional emphasis in particular to mitigation of and adaptation to climate change.

The table below depicts the climate change issues adopted in both the original and revised RDP strategies. For the revised RDPs, the proportion of the additional funding from the CAP HC is given in brackets, while all the new priorities are shown in order to highlight the relative focus on climate change issues in each RDP. All revised RDPs recognise the need to deal with climate change issues, however, some chose to reinforce aspects like the restructuring of the dairy sector, technical assistance, support to LAGs or less favoured areas as these were their most pressing issues, while climate change was considered to be adequately covered by existing measures.

Region	Original RDP	Revised RDP
AND	Mitigation through organic farming, integrated production, conservation agriculture, extensification, afforestation and a particularly strong focus on erosion.	Biodiversity (45%), water management (37%), support to LAGs (11%) and climate change (8%).
ARA	Emphasis on efficient irrigation systems, organic farming, integrated agriculture, valorisation of agrarian waste for renewable energy production, establishment of agri-forestry systems.	Water management (68%), biodiversity (19), modernisation of agricultural holdings, support to LFAs (5% of total), provision of advisory services.
AST	Prevention of forest fires and mitigation of their impact, valorise the potential of forests since the region is rich in forests. Promotion of forest ecosystems as a source of renewable resources, organic farming, sustainable management of water resources and a reduction of GHG emissions from agriculture.	Restructuring of the dairy sector (100%).
BAL	Organic farming, first forestation of rural areas, water management, energy savings, soil erosion, and forest fires.	Biodiversity (76%), water management (24%).
CAN	Increase organic farming and integrated farming, sustainable use of water resources and the soil, reduce emissions from agricultural activity, maintain autochthonous livestock species, promote afforestation and agroforestry systems, improve management capacity and defence of the forest sector, restoration of water and forestry systems to fight problems of erosion and desertification.	Water management (45%), biodiversity (36%), reinforcement of Technical Assistance (19%).
CANT	Mitigating the effects of climate change through agri-environment and forestry measures.	Restructuring of the dairy sector (100%).
CLM	Sustainable water management, organic farming and fight against soil erosion, desertification and forest fires.	Biodiversity (59%), climate change (30%), water management (5%), renewable energies (4%), restructuring of the dairy sector (1%).
CYL	Afforestation, recuperation of the forest potential and preventive measures to reduce fire risks.	Biodiversity (50%), water management (31%), the restructuring of the dairy sector (18%), climate change (1%), renewable energies (1%).
CAT	Energy savings and efficiency, organic farming, improve soil and water quality and reduce contamination from nitrates and fertilisers, prevent forest fires, new methods for energy production using local resources.	Biodiversity (66%), increased financing of axis 1 and 2 measures (31%), support to co-operation activities in areas related to the new challenges of climate change, renewable energies and innovation (4%), reinforcement of the set up of young farmers (0.2%).
EXT	Mitigating the effects of forest fires, increase the efficiency of irrigation systems, awareness raising and information related to renewable energies.	Restructuring of the tobacco sector (82%) and restructuring of the wine sector (18%), including the promotion of renewable energies and the protection of biodiversity in these sectors.
GAL	Afforestation of non-agricultural land and its contribution to CO2 absorption, prevention of soil erosion and reduction of forest fire risks, organic farming, preservation of biodiversity.	Restructuring of the dairy sector (52%), renewable energies (37%), support to enterprises in the wine sector (11%).
MAD	Enrich the organic material in the soil and maintain the green cover, promotion of sustainable agriculture and agro-environmental activities, rational use of water, organic farming.	Water management (84%), additional support to village renewal and development, LAGs and Technical Assistance (16%).
MUR	Focus on mitigation measures: reduce fertilisers, increase surface of energy crops, reduce burning of agricultural waste, afforestation of abandoned or degraded forest lands, promotion of hardwood crops, increase forest surface, sustainable management of forests, prevention of fires. In terms of adaptation the key issue is water management to address the severe dryness problems; also addresses forest fires.	Climate change mitigation and adaptation (57%), reinforcement of Technical Assistance (43%).

NAV	Strategic focus is on renewable energies and forest protection/prevention of fires.	Water management (65%), support to LFAs (35%);
PV	Emphasis on valorisation of forests based on sustainable forest management, optimisation of water resources, promotion of renewable energies.	Restructuring of the dairy sector (31%), renewable energies (25%), biodiversity (21%), water management (16%), support to LFAs (6%), climate change (2%);
RIO	Main focus is on improvement of irrigation systems. Also, waste treatment from livestock, agro-food industry and forest production, promotion of agrarian practices that reduce erosive and contamination processes, organic production, spatial planning and forest sustainability and management. Adaptation focused on forest fires.	Water management and biodiversity (100%). These funds were transferred to advisory services and the modernisation of agricultural holdings measures.
VAL	Focus on biodiversity and water savings. Mitigation through organic and integrated production. Adaptation through water management and prevention of erosion and forest fires.	Climate change mitigation and adaptation (45%) and reinforcement of several axis 1 and 2 measures (55%).

One of the main challenges clearly identified by most RDPs relates to **mitigation** of climate change through the adoption of environmentally friendly agricultural practices such as organic farming and livestock production, integrated farming and extensification of livestock, all methods which involve reduced use of fertilisers and phytosanitary products and farm/land management in a way that reduces GHG emissions from agriculture, protects the soil from erosion and preserves natural landscapes. The revised RDPs place further emphasis on such practices with a view to protect and preserve biodiversity, the prime 'new challenge' taken up by the revised strategies.

Mitigation actions are implemented mainly through axis 2 actions, in particular through agri-environment measures (they absorb 43% of total axis 2 budget in Spain) and afforestation actions (they absorb 12% of total axis 2 budget).

Adaptation to climate change is also strongly supported by RDPs, primarily through water management measures that aim to achieve water savings and improve the efficiency of irrigation systems.

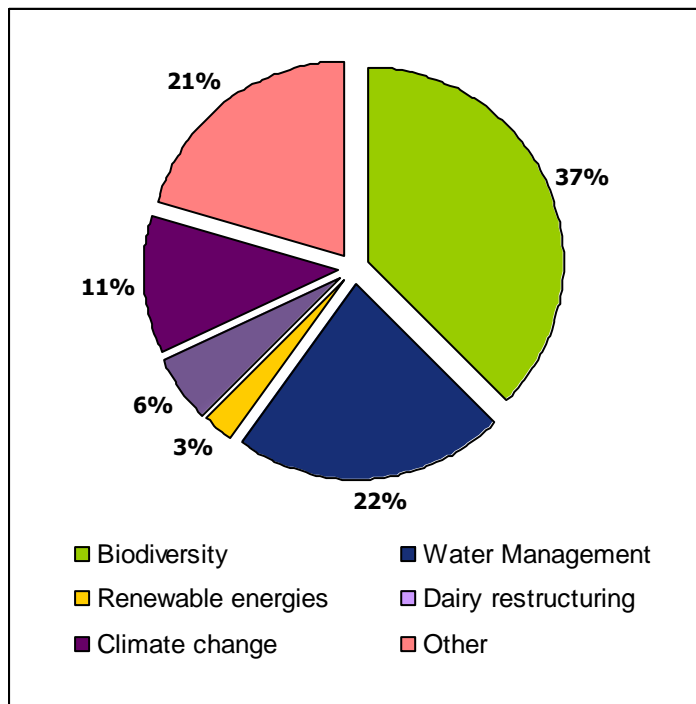
A significant percentage of the Spanish territory suffers from very high erosion processes (13%) while another 34% suffers from medium erosion processes⁴. Irregular rainfall, droughts, forest fires and inadequate use of water resources contribute to different degrees according to the region to these soil erosion processes. Efforts to address water management issues are mainly taken on by axis 1, in particular the modernisation of farms and the development of infrastructure for the adaptation of agriculture and forestry (absorbing 21% and 14% of total axis 1 budget in Spain), through operations for the improvement of irrigation systems, techniques and processes. These operations complement other national and regional initiatives. For instance, the Spanish state has developed a National Action Programme against Desertification while regional governments undertake actions for the transposition of the EU Water Framework Directive.

Further efforts to address adaptation to climate change are undertaken by forestry measures of axis 2, in order to reduce the effects of forest fires and prevent the deterioration of soils from adverse climate conditions and risks (irregular rainfalls, combined with periods of drought). Landscape management actions, mainly for restoring forestry potential and introducing preventive actions (absorbing 14% of total axis 2 budget) address adaptation to climate change. Water management is the second most important priority endowed with additional funding in the revised RDPs following the CAP HC.

⁴ "Environmental profile of Spain 2006", Ministry of Environment and of Rural and Marine Areas

In relation to **renewable energies**, Spain is the sixth largest producer of agri-fuels in the EU27 and also sixth in the production of forest biomass⁵. Renewable energies are covered by operations under axes 1 and 3: the former through modernisation of agricultural holdings where actions include investments for energy efficiency such as the processing of biomass or agricultural/livestock waste for energy production purposes; the latter through investment support for local energy supply (installations/infrastructure for renewable energy using biomass and other renewable energy sources) mostly through the provision of services to the economy and rural population (absorbing 26% of total axis 3 budget).

Allocation of the additional EAFRD resources per type of priority



The overall budget for Spain (total of 17 RDPs) in terms of total public expenditure amounts to €25,733,428,305, of which €7,927,444,586 is the EAFRD contribution.

This includes an additional allocation of €827,027,051 (EAFRD contribution) as a result of the new challenges raised by the CAP HC, the adoption of the European Economic Recovery Plan (EERP), the wine reform and modulation adjustments. Following these changes, additional financial support to the RDP objectives relate to biodiversity (+€310.0 million representing 37%, of the new EAFRD funds allocated to the programme), water management (+€185.6 million, 22%), climate

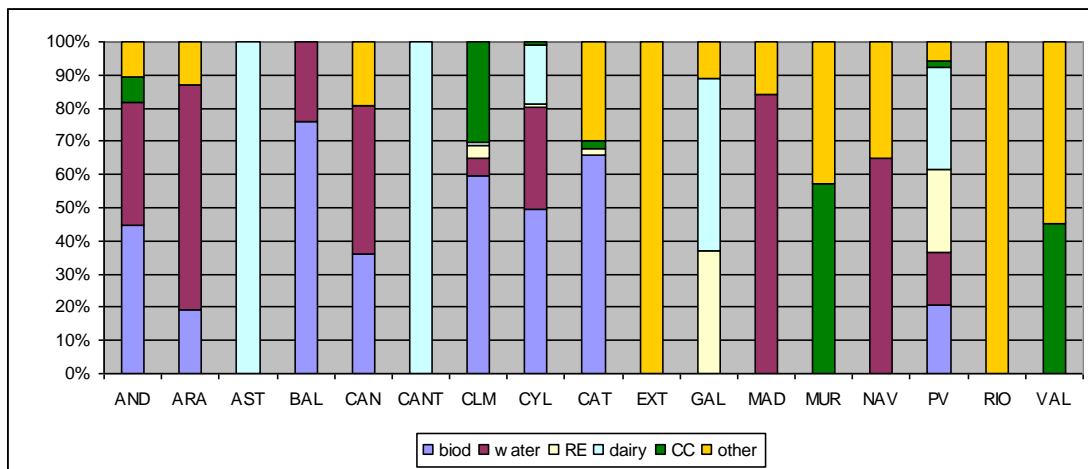
change (+€93.4 million, 11%) and renewable energies (+€20.8 million, 3%). This new financial support is additional to the initial RDP which was already addressing climate change and renewable energies.

Full details of the overall budget allocations for the Spanish RDPs can be found in the RDP summary fiches that are available at:

http://enrd.ec.europa.eu/rural-development-policy/country-information/rural-development-policy-fiches/en/rural-development-policy-fiches_home_en.cfm

⁵ Eurostat 2007

Regional break-down of the new challenges following the RDP revisions⁶



The graph depicts that biodiversity is the main challenge addressed by many RDPs, followed by water management. There are significant differences between regions which reflect their different priorities and needs. Targeting investments in support towards more environmentally friendly agricultural production practices (e.g. organic and integrated farming, extensification of livestock, soil conservation techniques, etc.), improved irrigation technology/methods and afforestation are the most common climate change related actions supported under the enhanced RDP strategy.

Mitigation

Activities aimed at reducing agricultural greenhouse gas emissions

The Spanish RDPs provide comprehensive support for a range of activities which could contribute to reducing agricultural emissions. Following the HC revision and the adoption of the EERP, new strengthened operations have been implemented for environmental protection and sustainable agriculture which enhance the uptake of the priority of climate change mitigation. These are particularly related to the promotion of sustainable farm and land management practices, followed by investments in new environmental technologies in agricultural holdings (mostly fertilisation and energy efficiency and to a smaller extent waste treatment and manure management).

The main measure through which RDPs seek to support efforts to reduce agricultural GHG is **measure 214 - agri-environment payments** although other measures also contribute. Measure 214 is also the one absorbing the majority of axis 2 funds (in most RDPs around 50% or more of the axis 2 budget reaching as much as 73%). A considerable number of operations are referenced under this measure which could help to reduce emissions, including:

- support for the introduction of organic farming prevails as the most common method for the implementation of environmentally friendly agricultural practices (included in all 17 Spanish RDPs) as it involves the elimination of synthetic fertilisers, the exclusion of chemical products for the control of plagues and diseases and no cultivation of the same species in other parts of the farm that do not employ organic agriculture methods;
- it is followed by integrated farming (13 RDPs) which stresses the introduction of biological and chemical control methods that are compatible with the environment, including as objectives the conservation and improvement of water resources and the conservation of the soil through maintenance of organic material in the soil;

⁶ Source of the graph: revised RDPs and EC working papers.

- soil conservation techniques are also promoted (13 RDPs) that help increase the content of organic material in the soil, including crop rotation techniques, maintaining fallow land and eliminating the use of phytosanitary products, cultivation of vines in terraces, conservation of meadows, planting of a green cover, amongst others;
- extensification of livestock through increasing grazing in meadows and grasslands (6 RDPs);
- conservation agriculture (3 RDPs) such as the establishment of green zones in slopes or direct sowing which has as an environmental objective to reduce the consumption of fossil fuels through the reduction of labouring;
- investments for extensive agricultural systems of dry land (un-irrigated land), made up of herbaceous crops and fallow to reduce soil pollution and erosion and maintain biodiversity extensive agricultural systems of dry land (3 RDPs);
- management of wetlands (3 RDPs) which is basically about preservation of biodiversity and includes requirements to use maximum doses of nitrogenous fertilisers and reduce the use of phytosanitary products and pesticides;
- extensification of pastures management (2 RDPs) which involve reduced/no fertilisation and practices to maintain/increase soil organic levels such as diversification of grass species.

	Organic farming	Integrated production	Soil conservation techniques	Extensification of livestock	Extensification of pastures management	Conservation agriculture	Extensive agricultural systems of dryland	Management of wetlands
AND	√	√			√	√		
ARA	√	√	√	√				
AST	√		√	√	√			
BAL	√	√		√				
CAN	√	√	√	√				
CANT	√		√					
CLM	√		√				√	
CYL	√	√					√	
CAT	√	√	√					√
EXT	√	√	√					
GAL	√	√	√	√				
MAD	√	√				√		
MUR	√	√	√				√	√
NAV	√		√					
PV	√	√	√			√		
RIO	√	√	√	√				
VAL	√	√	√					√

This measure is further supported with additional funding following the CAP HC in the vast majority of RDPs (Andalucía, Aragón, Asturias, Baleares, Canarias, Castilla La Mancha, Castilla y León, Cataluña, Extremadura, Basque Country, La Rioja and Valencia), in many cases involving the inclusion of new sub-measures in relation to extending the crop coverage under organic farming, introduction of integrated farming for key crops, further extensification of agriculture/livestock and other actions that contribute to mitigate the effects of climate change in terms of GHG emissions, soil erosion soil and water contamination.

In this context it is important to note that even in regions where the bulk or all of the additional funding goes to support the restructuring of a specific sector (such as dairy in Asturias and Galicia or tobacco in Extremadura), this is done with a view to promote agri-environmental protection through extensive grazing, control of stocking density, organic practices, crop/grazing rotation, etc., therefore contributing to mitigation objectives.

Again under Axis 2, **measure 221 – first afforestation of agricultural land** supports the establishment of forests and their maintenance directly contributing to the uptake of CO₂ emissions. This measure absorbs 12% of the total axis 2 budget in Spain and is included in practically all but one RDP. Actions include afforestation with natural productive species to fight serious problems of soil erosion and desertification in many regions, spatial planning of pastures and conservation and improvement of forest lanes.

Further support for activities which could help to mitigate climate change is possible under **measure 121 – modernisation of agricultural holdings**. Under this measure explicit reference is made to supporting investments in new processes and technologies which aim at addressing environmental and climate change challenges. In particular, measure 121 aims at reducing GHG emissions from livestock production through investments in manure storage and treatment facilities (Balears, Galicia, Navarra and the Basque Country).

Again under axis 1, the measures relating to training, advice and information, **measure 111 – vocation training and information actions** and **measure 114 – use of advisory services** – have a small share of the axis 1 budget (0.6% and 1.4% respectively), however, where they are included in the vast majority of RDPs and play an important role in enabling farmers to increase their knowledge and awareness in relation to sustainable agriculture issues. Topics covered take into account to a greater extent environmental and climatic effects and in some cases also animal welfare (in particular in Asturias, Canarias, Castilla La Mancha, Extremadura, Murcia, Basque Country, La Rioja and Valencia). Following the RDP revisions as a result from the CAP HC, a number of regions have allocated additional funding to advisory services (measures 114, 115) in order to allow a higher number of farmers to benefit from the provision of these services (Aragón, Cataluña, Valencia) while others expand the types of eligible actions and/or the rate of support to address the HC 'new challenges' (Canarias, Cantabria). Of particular interest here is the RDP Castilla La Mancha which introduced a new measure 114.2 aiming to address climate change mitigation and adaptation by promoting access of forest owners to advisory services.

Measure 112 – set up of young farmers - includes in its priority criteria in some RDPs the setting-up of farms with environmental management objectives. Of special interest is the RDP for Valencia where the support amount can increase to €2,000 if the operations of young farmers include systems for minimising emissions of greenhouse gases.

Adaptation

Prevention of, and coping with, potential impacts of climate change on agriculture

In terms of adapting to cope with the potential impacts of climate change the Spanish RDPs focus on two key sets of actions: one relating to water management through efficiency improvements in irrigation infrastructures and enhancement in the capacity to store water; and one relating to the restoration of agricultural and forest potential after natural disasters (especially forest fires but also adverse climate conditions) and preventative actions such as management of wetlands, establishing green cover, fire prevention infrastructures and improving genetic resources. The improvement of water management has benefited in particular from the additional resources released by the CAP HC (as seen above, 22% of additional EAFRD funds are allocated to water management).

The main measure through which RDPs seek to support efforts to adapt to climate change is **measure 125 – infrastructure related to the development and adaptation of agriculture and forestry** – which covers operations related to water supply and efficiency. This is an important measure as it absorbs 15% of the total axis 1 budget. Under this measure explicit reference is made to supporting investments in irrigation infrastructures for better management and sustainable use of water resources in agriculture. Examples of supported actions include improvement of hydraulic structures to reduce water losses, modification of pumping, transport and distribution systems, installation of water consumption meters, communication technology to improve information on irrigation and energy networks, investments in waste water treatment systems, improvement of electric installations for irrigation. Improvements in irrigation infrastructures are practically covered in all RDPs except for those regions where irrigation plays a small role in agricultural practices (Asturias, Cantabria). Water management (improvement and development of irrigation infrastructures) under measure 125 is reinforced

with additional funding stemming from the CAP HC in 9 RDPs (Andalucía, Aragón, Baleares, Canarias, Castilla La Mancha, Castilla y León, Navarra, Basque Country and La Rioja).

Water management is also addressed by **measure 121** – *modernization of agricultural holdings* – including investments for the modernisation of irrigation systems, deposits, pumping, drainage, establishment of new structures and improvement of existing ones and systems to improve water quality, with the objective to save water. Water management actions under this measure are contained in the RDPs of Canarias, Castilla La Mancha, Extremadura, Madrid, Murcia and Valencia. As a result of the RDP revisions, additional funding to measure 121 is addressed to water management in the regions of Galicia and Madrid, which include the improvement of irrigation systems as a sub-measure of measure 121.

As already noted, **Measure 112** – *setting-up of young farmers* - includes in its priority criteria in some RDPs the setting-up of farms with environmental management objectives. Again, of particular interest is the RDP Valencia where available support can increase to €2,000 if the operations of young farmers include systems for water saving and re-utilisation.

Finally under axis 1, and complementing mitigation actions, are **measures 111** – *vocational training and information actions* and **114** – *use of advisory services* – which aim to increase knowledge and awareness in relation to sustainable agriculture issues. Following the RDP revisions as a result of the CAP HC and the EERP, Castilla La Mancha has introduced a new sub-measure 111.2 (Information and knowledge dissemination about forest wild fauna and flora for their sustainable use) aimed at increasing professional capacities of those dedicated to forestry work so as to apply work practice that take into consideration the conservation and improvement of habitats and landscape. The preservation of forests is the main objective of the region's forestry policy, where forest fires, land use changes, desertification, erosion and loss of biodiversity are the main threats.

Under axis 2, **measure 226** - *restoring forestry potential and introducing prevention actions* - and **measure 227** - *non-productive investments* – have as objectives to use the establishment of preventive measures in order to prevent natural risks, such as forest fires. Measure 226 includes actions for fighting erosion and desertification from natural catastrophes such as forest fires and floods. Measure 227 includes actions such as hydro-forest restoration to address adverse effects of heavy rainfalls in some areas, restoration of green cover and activities of re-plantation, construction of structures like ditches, fences, bays, etc and restoration of forest lanes when there is a need to deter erosive processes. Both these measures are practically found in all RDPs and absorb 14% and 8% of total axis 2 budget.

Measure 214 – *agri environment payments* – demonstrates synergies between climate change mitigation and adaptation since it includes sub-measures that deal with both aspects of climate change. Measure 214 includes operations that deal with the adaptation to climate change through the conservation of genetic resources (relevant sub-measures are found in 60% of RDPs (Andalucía, Aragón, Baleares, Canarias, Cantabria, Castilla y León, Cataluña, Extremadura, Galicia, Murcia). This includes in most cases, conservation of plant species under risk of genetic erosion, conservation in-situ and ex situ, classification, collection and re-utilisation of genetic resources, including the establishment of inventories/banks of genetic material. It also includes genetic selection and improvement of livestock genetic resources involving actions of registering and control of livestock. However, the main objective of measure 214 remains to mitigate climate change by replacing traditional agricultural practices with those that reduce emissions stemming from agriculture and increase the organic content of soils (organic and integrated farming, extensification of livestock and pastures, etc.)

In this view, other measures implemented within the RDP under Axis 2 are likely to create synergies in order to improve the management conditions of farmlands and cope with adaptation to climate change particularly against recurring forest fires. These are measures

225 – forest environment payments - and measure 222 – establishment of agro-forestry systems. However, their overall financial weight in axis 2 and in the programme in general is rather small so as to imply significant impact.

Main RDP measures which contribute to addressing CC mitigation/adaptation issues

Axis/Measure	Description	Type of Operation	Potential Effects
Axis 1			
Measure 125	Infrastructure related to the development and adaptation of agriculture and forestry	Investments in irrigation infrastructures particular in relation to: hydraulic structures, pumping, transport and distribution systems, water consumption meters, communication technology, waste water treatment, drainage networks, capacity to regulate, store and control water, control systems to regulate water consumption.	Improved water management. Water savings / reduction of water losses. Increased efficiency of irrigation infrastructures.
Measure 121	Modernisation of agricultural holdings	Investments in new environmental technologies particular in relation to: modernisation of irrigation systems; water consumption efficiency; manure storage and treatment; water quality and biodiversity.	Reduce emission of GHG on farm level and the leakage of fertilisers and pesticides. Improve water consumption and water quality. Reduce methane emissions especially in areas with high livestock density.
Measures 111 and 114	Vocational training and information actions. Use of advisory services.	Support for training, dissemination and advisory services aiming at the improvement / exchange of knowledge on sustainable agriculture and forestry. Topics take into account environmental and climatic effects and in some cases also animal welfare.	Improved competitiveness of Spanish agriculture through sustainable agricultural and forestry practices.
Axis 2			
Measure 214	Agri-environment payments	Organic farming. Integrated production. Soil conservation techniques. Extensification of livestock. Extensive agricultural systems of dry land. Management of wetlands. Extensification of pastures management.	Reduced use of fertilisers and phytosanitary products. Improvements in environmental protection and restrictions on pollution caused by agriculture. Reduced emissions of CO ₂ Increased organic material in the soil.

Axis/Measure	Description	Type of Operation	Potential Effects
		Conservation agriculture through green zones in slopes and direct sowing. Conservation of genetic resources.	Reversal of erosion and desertification processes. Increased adaptation capacity to climate change through preservation of genetic resources.
Measures 226 and 227	Restoring forestry potential and introducing prevention actions. Non-productive investments	Establishment of preventive measures in order to prevent natural risks, such as forest fires. Actions for fighting erosion and desertification from natural catastrophes. Hydro-forest restoration, restoration of green cover and activities of re-plantation, construction of structures like ditches, fences, bays, etc and restoration of forest lanes.	Increased capacity to adapt to climate change effects and natural catastrophes. Reversal of erosion and desertification processes. Restored forest and agricultural land that has suffered from natural catastrophes or adverse weather conditions.
Measure 221	First afforestation of agricultural land	Establishment of forests and their maintenance. Afforestation with natural productive species. Spatial planning of pastures. Conservation and improvement of forest lanes.	Reduce serious problems of soil erosion and desertification. Increased uptake of CO ₂

Renewable energies

Electricity, heating and transport fuels produced from biomass (such as bio-fuels, bio-gas) and other renewable sources (solar, wind, geothermal).

The Spanish RDPs integrate several aspects of renewable energy, specifically they encourage the reduction of energy use and support improvements in energy efficiency mainly under axis 1 and investments in local energy supply from renewable energy sources under axis 3.

The overall strategy for Spain stresses the high potential of the country for renewable energy generation, in particular wind and solar energy and the increased interest in the generation of this type of energy. In all regional RDPs, relevant axis 1 measures highlight the importance of energy savings and a more efficient use of energy through renewable sources and the use of biomass from agricultural, forestry and livestock waste. Renewable energies are further supported in the revised Spanish RDPs with €20,811,157 or 3% of total additional EAFRD funding addressed to the promotion of renewable energies.

The key measure for supporting renewable energies is **measure 123 – adding value to agricultural and forestry products** - under Axis 1. It includes actions like: investments directed at energy savings, more efficient use of energy, use of renewable energies and co-generation; investments that aim at transforming primary material from agriculture and forestry in bio-

energy plants; transformation of agricultural, livestock and forestry waste into bio-fuel. Such actions are promoted in 8 RDPs (Aragón, Asturias, Canarias, Cantabria, Castilla y León, Extremadura, Basque Country and La Rioja). Measure 123 has a particular weight in rural development as it is covered by practically all Spanish RDPs and is allocated almost half of the axis 1 budget. Additional funding from the CAP HC and the EERP is allocated to the production of renewable energies through the processing of agriculture and forestry biomass in Castilla La Mancha and Castilla y León and the introduction of a new sub-measure for the processing of agricultural and forest biomass in Extremadura.

Again under axis 1, **measure 121** – *modernisation of agricultural holdings* - supports several actions related to all aspects of climate change (mitigation, adaptation and renewable energies). In relation to renewable energies, this measure supports the introduction of new technologies in agriculture and livestock production, including investments for energy efficiency, the production of bio-fuels, the acquisition of "green" machinery to improve energy efficiency, the introduction of renewable energy sources (especially bio-energy) destined to agrarian activity in the farm itself in 9 Spanish RDPs (Andalucía, Aragón, Asturias, Cataluña, Madrid, Murcia, Navarra, Basque Country and Valencia).

Renewable energies in the context of measure 121 are further supported with additional funding from the CAP HC and EERP in Castilla La Mancha which includes a new sub measure for the production of energy crops, Murcia and Valencia which also add a new sub-measure each for the improvement of energy efficiency in greenhouses (using cogeneration with natural gas as a fuel).

Furthermore under axis 1, **measure 125** – *infrastructure related to the development and adaptation of agriculture and forestry* – although it is in the majority of RDPs addressed to water management, it has particular significance for renewable energies in the Basque Country. The measure objectives for this region include the production of renewable energies, while there is also a quantifiable objective to develop an average of five projects per year on infrastructures based on renewable energies. Such infrastructures will be focused on the production of energy from biomass or organic waste. Eligible costs include investments in waste treatment plants and other organic sub-products coming from agrarian and forestry holdings, investments for the production of biogas and other renewable energies.

Further funding for installations and infrastructures for the production of renewable energy using biomass and other sources is allocated to measure 125 following the RDP revisions in Castilla La Mancha.

Finally, although **measure 124** - *co-operation for development of new products, process and technologies*- (included in nine RDPs) represents a small proportion of the axis 1 budget, it plays a supportive role through improvements and co-operative developments in the field of environmentally efficient technologies in Aragón and Galicia, such as transforming primary material from agriculture in bio energy plants and introducing new technologies that allow the development of renewable sources of energy and bio-fuels.

It is interesting to note that although it is not common to allocate additional funding following the CAP HC and the EERP to measure 124, the Cataluña RDP does so in order to support cooperation activities in the new challenges, including the improvement of energy efficiency, the use of agricultural biomass for energy purposes and innovative operations for the development of renewable energies.

Axis 3 measures contribute to different degrees in each Spanish region to the promotion of renewable energies. Measure 311 – *diversification into non agricultural activities* - includes investments related to the acquisition and commercialisation of alternative energies in Cataluña, Murcia and the Basque Country. Measure 312 -*support for business creation and development*

– gives priority to enterprises that pursue amongst others the activities of installation of alternative energies (solar, wind, geothermic) in Valencia. Measure 321 *-basic services for the economy and rural population* – supports the construction and improvements in small infrastructures for energy supply (including amongst others renewable energy) in Baleares, Canarias, Cantabria and the Basque Country. Measure 322 *-village renewal and development* – includes in its objectives the promotion of renewable energy sources and innovative ways for using them in Asturias. Finally, measure 323 *-conservation and upgrading of the rural heritage* – which supports integrated improvements in municipal buildings/properties includes amongst others renewable energies and promotes the installation of renewable energies in Extremadura.

Additional EAFRD funding following the RDP revisions has been allocated to measure 321 in Galicia and measure 311 in the Basque Country to further support the objectives of reducing the use of fossil fuels by including additional operations in the sub-measure related to infrastructures for the production of renewable energy using various renewable energy sources (solar, wind, geothermal).

Main implemented RDP measures related to the development of RE sources

Axis/Measure	Description	Type of Operation	Potential Effects
Axis 1			
Measure 123	Adding value to agricultural and forestry products	Investments directed at energy savings, more efficient use of energy, use of renewable energies and co-generation. Investments that aim at transforming primary material from agriculture and forestry in bio-energy plants. Transformation of agricultural, livestock and forestry waste into bio-fuel.	Reduced emissions as a result of higher use of renewable energy sources.
Measure 121	Modernisation of agricultural holdings	New technologies in agriculture and livestock production, including investments for energy efficiency. Production of bio-fuels. Acquisition of "green" machinery to improve energy efficiency. Introduction of renewable energy sources (especially bio-energy) destined to agrarian activity in the farm itself. Production of energy crops. Cogeneration with natural gas as a fuel.	Increased quota of renewable energy derived from RES (bio-energy) from agriculture. Reduced emissions as a result of higher use of renewable energy sources.
Axis 3			
Measure 321	Basic services for the economy and rural population	Construction and improvements in small infrastructures for energy supply	Creation of an attractive quality of life in rural areas through the provision of local energy supply from renewable sources and

Axis/Measure	Description	Type of Operation	Potential Effects
			the improvement of environmental conditions.
Measure 311	Diversification in non-agricultural activities	Investments related to the acquisition and commercialisation of alternative energies	Increased production of sustainable energy at a local level. Reduced use of fossil fuels.