

PORTUGAL

Plano Estratégico Nacional Desenvolvimento Rural 2007-2013

(National Strategic Plan for Rural Development together with 3 Rural Development Programmes)¹

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Climate Change and Renewable Energy issues in 2007-2013 RDP

Climate change (CC) is fundamental to the context for agricultural 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. CC 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 billion EUR⁽²⁾ have been made available for Member States (MS) to spend on this issues⁽³⁾. As a consequence, the operations related to these new EU priorities have been further strengthened in the RDPs.

Introduction - overview of Member State RDPs

According to the Portuguese National Strategic Plan (NSP), the consequences of climate change resulting from the greenhouse effect are inducing significant impacts in agriculture due to the

⁽¹⁾ The Portuguese Rural Development Programmes include Madeira (MD), Azores (AZ) and the five NUTS II regions (North, Centre, Lisbon, Alentejo and Algarve) from Mainland Portugal (MN). These programmes are designated for PRODERAM, PRORURAL and PRODER, respectively.

 $[\]binom{2}{3}$ 19.8% of the total additional funds released.

⁽³⁾ The budget allocated to the 'new challenges' includes the funds released by the HC of the CAP (including voluntary modulation and transfers according to Art. 136 of Regulation (EC) No. 73/2009) and the European Economic Recovery Package (EERP).



extreme drought and high temperatures situation. As a result the growth cycle of agricultural and forest productions is being affected and the risk of fire is increasing.

Agriculture in Portugal has increased its greenhouse gases (GHG) emissions 7% since 1990 and there has been an effort to reduce them, by means of increases in eco-efficiency, more energy efficient technologies and land uses. Due to its commitment to follow the Kyoto Protocol, Portugal has been making a significant effort to reduce emissions. The eco-efficiency sector has improved as regards GHG emissions and energy consumption, as well as fertilizer consumption.

Having the awareness that in one hand forests play a key role in air quality, but on other hand fires that occurs can lead to serious net emissions, Portugal implemented national strategies for forests and for climate change. The application of a National Plan for Forest Fire Protection will also contribute to a sustainable development of the Portuguese forest, increasing its carbon sink capacity, its water storage capacity and its ability to improve air quality.

Regarding renewable energies, the use of forest waste biomass to produce it, is currently at 526 thousand tonnes of dry matter/year in electric power plants and in co-combustion in cellulose industries (in addition to its use in small units) mostly to produce heat. The forest contribution as a source of renewable energy is being developed, given the need to reduce the forest fuel load, the construction of new electric power plants being already in progress. Portuguese NSP shows the importance of the biogas production from livestock waste and the use of annual and permanent crop residues to produce energy, assuming that the development of biofuels appears to be a viable alternative with multiple technological and economic perspectives in several sectors of the agricultural and even forest activity.

The Portuguese NSP identifies several strengths and opportunities related to the challenge of climate change:

- Increase in forest stands with higher environmental value;
- Increasing use of environment-friendly production methods;
- Upward trend in eco-efficiency;
- Agro-forestry and extensive systems with high carbon fixation potential;
- Biomass from agricultural and forest by-products and waste that can be used to produce energy;
- Increasing valorisation of renewable energies;
- Increasing valorisation of the multifunctional role of forests;
- Need to meet the Kyoto agreements.

Despite the existing opportunities, there are some threats to rural development as a consequence of climate change:

- Climate variability with cyclic extreme phenomena, such as droughts;
- High risk of forest fires, specially at Summer

According this overview of the analysis developed in the Portuguese NSP related to climate change, it is important to understand how the theme is being integrated in the strategy adopted at a national context to address these issues.

The NSP establishes the promotion of the sustainability of the countryside and natural resources as a strategic objective in order to guarantee or to improve the quality of the environment and the landscape and the good use of resources.

The strategy to protect the environment and water soil resources and to reduce climate changes implies the promotion of forest replanting and sustainable management. Complementing this strategy, incentives will be display in order to approach production



methods combining protection of the environment, landscape, biodiversity and natural resources such as soil and water, at the same time as they originate products of quality recognized by consumers with added value for the development of the rural world.

In order to achieve the purpose of dealing with the issues of the climate changes, the NSP identifies the following guidelines to follow:

- Acting in a land management perspective;
- Valorising tradable environmental products;
- Orienting producers towards a sustainable management of natural resources;
- Fostering environmental behaviour with additional positive impacts;
- Correcting environmental problems;
- Acting favourably in areas associated with high risk of natural disasters.

In order to achieve the strategic objectives set out in the NSP, specific guidelines in relation to the issues of climate changes highlight the importance of "Promoting eco-efficiency and reducing pollution". This objective is part of **Axis I**, under the main objective "Restructuring and developing physical potential", and **Axis II** under the main objective "Contributing to, adapting to and reducing climate change".

Furthermore, one of the objectives under **Axis I** is to promote enterprise efficiency by supporting their qualification and sustainability through incentive measures. The aim is to promote an economic sector based on enterprises producing better products and in an alternative way that is fully implementing Community legislation and national strategies, namely regarding the Water Framework Directive; the management of agricultural wastes and agroindustrial effluents, and; climate change. The modernization effort of the enterprises will be supported, in order to obtain a better environmental performance in terms of the sustained use of natural resources (efficient use of water, management of effluents and waste, including the energetic valorisation of agricultural by-products, or eco-efficiency). Investments designed to adjust and to purchase specific equipment for the production and use of renewable energies will also be considered.

In the forestry sub-sector, the aim is to increase the added value of forest products, as well as to improve tree stands and to increase business qualification. These objectives will be pursued by giving priority to the consolidation of existing areas, with improvements in economic value and contributing to reduce climate change through the increase in carbon sink capacity, and by promoting the active management of stands and the conversion from species below their production potential to others better ecologically adapted to their locations.

Another objective related to climate change issues, is to support the initiatives regarding the use of forest biomass, resulting from operations of consolidation and exploitation of tree stands. This aim is achieved together with actions under **Axis II** (regarding the strategic management of fuel sources in the case of forest fires by employing preventive and control measures) to guarantee as much as possible the valorisation of these products through the market, as a source of renewable energy and also to contribute to a general improvement in the environment.

All interventions at the forestry sector level will contribute to pursue the objectives established in the National Programme for Climate Change.

As previously referred to, Axis II integrates actions that aim at improving the environment. The main objective identified within this axis related to the referred issues is "Contributing to adaptation to climate change and its mitigation".



In terms of programming, the environmental and territorial management dimension gives forest areas and activities a specific regulatory framework focused on Axis II. Given the strategic importance of the national forestry sector, measures and actions in Axis II contribute to the environmental valorisation of forests and the countryside in different aspects, namely the conservation of water resources and soil, the contribution to preserving and improving biodiversity and landscape values and in terms of climate change and desertification.

The following table (I) summarizes the main objectives and the specific objectives defined in the NSP related to the CC issues. It also refers the group of measures established, enabling to implement those objectives.

Table I - Main objectives and the specific objectives defined in the NSP regarding CC issues

Axis	Main Objectives	Specific Objectives	Group of Measures	EAFRD Measures	
	Restructuring and developing physical potential	Promoting eco-	Promotion of forestry competitiveness		
I		efficiency and reducing pollution	New financial instruments and management of risks and crises	121/122/123/126	
II	Contribute to adaptation to climate change and its mitigation	Encourage the introduction or maintenance of production methods compatible with the protection of environmental values and water and soil resources within the agriculture and forestry activity	Promotion of sustainable production methods	214	
	3	Improving the sustainability of forest stands	Management of forestry and agro-forestry areas	221/222/223/226 /227	
		Promoting eco- efficiency and reducing pollution	Investment in environmental requalification	216	

The revised National Strategy Plan (NSP) of Portugal (2009) for rural development encompasses the following national priorities: restructuring of the dairy sector, water management and renewable energies in Axis I; biodiversity and climate change adaptation in axis II; broadband Internet infrastructure in Axis III.

Some changes occurred regarding the climate changes issues. The main restructure concerning this theme is developed under Axis II, where the priority given to "biodiversity" and "climate change" will be materialised by reinforcing the EAFRD funding of integrated production and organic farming. This option is justified by the importance that these production systems have for the environment and the countryside and the effect they produce on a sustainable protection of the environmental, water resources and soil.



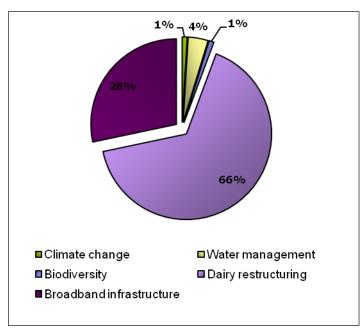
To clearly understand the practical consequences of the HC revision and how the modifications will be implemented is necessary to identify the main changes at each RDP (see Table II).

Table II - Description of the changes related to HC revision at RDP level regarding CC issues

RDP	Description of the changes	Expected impacts of the amendments
Mainland Portugal	Under axis II, the priority given to "biodiversity" and "climate change" will be materialised by increasing the EAFRD contribution by EUR 1.998 million to the existing measure 214 (Agri-environment payments to integrated production and organic farming).	Reduction of methane (CH ₄) and nitrous oxide (N_2O) emissions.
Madeira	Action 1.10.1, "Development and management of collective irrigation systems" (code COM 125) was reinforced with EUR 4 million (EAFRD contribution), in order to fund the reinforcement and modernisation of water storage and irrigation infrastructures. The increasing of irrigated areas is not supported.	More sustainable utilisation of regional water resources. Better adaptation to climate change phenomena.

Allocation of the additional resources per type of priority – PORTUGAL

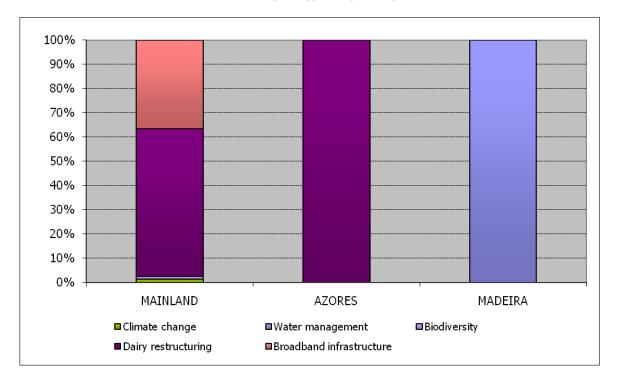
The total public expenditure allocated to this Member State amounts to €5,120,395,811.29 of which €4,047,235,053 corresponds to EAFRD contribution.



This includes an additional allocation of €105,998,000 (EAFRD contribution) as a result of the new challenges raised by the HC and the adoption of the European Economic Recovery Plan (EERP).



Allocation of the additional resources per type of priority - RDP detail



The additional allocations per type of priority are different for each RDP.

As far as the Mainland RDP (PRODER) is concerned, the additional budget was mostly allocated to "Dairy restructuring" (47.3%). "Broadband infrastructure" represents 28.4% of the total additional budget, "New sectors" represents 22.4% and "Biodiversity and Climate changes" receives 1.9%.

The Madeira RDP (PRODERAM) allocates the total additional budget to the priority "Climate change", while Azores one (PRORURAL) uses its additional resources in the priority "Dairy restructuring".

Full details of the overall RDP budget allocations for Portugal can be found in the RDP 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

Mitigation

Activities aimed at reducing agricultural greenhouse gas emissions

In general, the three Portuguese RDPs have a relevant uptake concerning mitigation objectives, namely in terms of farm, soil, land, manure and pasture management, as well as fertilisation efficiency and afforestation.

Axis II plays an important role addressing the climate changes issues in this MS. In this context, measures 214, 216 and 221 promotes actions and operations mobilised in terms of climate change mitigation objectives. While measures 214 and 216 promotes certain production methods that support mitigation objectives (such as Integrated Farming and Organic Farming),



climate change is directly addressed in **measure 221** through, namely, the carbon sequestration in forest biomass resulting from the establishment of new forest stands in agricultural land.

Measure 214 includes three actions – Changes in agricultural production methods, Protection of domestic biodiversity and Conservation and improvement of genetic resources – in order to:

- Encourage farm management and agricultural production practices based on commitments contributing to the protection and improvement of the environment, landscape, natural resources and soil that exceed the basic requirements of the "Good Agricultural and Environmental Conditions";
- To encourage the conservation and improvement of animal and plant genetic diversity;
- To contribute to the production of certified quality products.

Either **measure 214 or measure 216** are related with several Integrated Territorial Interventions (ITI). ITI are a combined approach of several policy instruments applied consistently to a territory subject to a prevailing objective, the conservation of natural and landscape values. This was the approach chosen for acting in territories classified by their nature and/or landscape value, namely in the Natura 2000 Network and in the Demarcated Region of Douro (North Region – Mainland Portugal). For each ITI, relevant agricultural and forestry systems are identified for the conservation of the natural values identified. In this case, the measures proposed aim to support the maintenance and recovery of systems threatened with abandonment or conversion, by reimbursing the cost of the landscape conservation or maintenance service provided.

In the context of measure 214, the following ITI operations are mobilised in terms of climate change mitigation objectives:

		Douro Vinhat.	Peneda Gerês	Monte- sinho Noqueira	Douro Inter.	Serra da Estrela	Tejo Inter.	Aire e Candee iros	Castro Verde	Costa Sudoes te
1)	Grazing management in wasteland areas		√			√				
2)	Aid to the conservation of the basic ecological structure		√	√	√	√	√	√		
3)	Maintenance of terraces	√	√							
4)	Maintenance of non- irrigated cereal-fallow rotation			√	√	√	√		√	√
5)	Direct drilling			\checkmark	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark
6)	Maintenance of high nature value permanent pastures		√	√	√	√				
7)	Maintenance of natural and improved non- irrigated permanent pastures									√
8)	Grazing management in Mediterranean brushwood							√		
9)	Conservation of remarkable Terra Fria chestnut tree groves			√						

Axis I also deals with the climate change challenges through measures 111, 114-115 and 124.

Training and information activities (**measure 111**) could be a crucial tool to improve specific competences of human resources engaged in the agricultural, food and forestry sectors, increasing their business and technical ability, namely, to deal with climate change challenges. Examples are the on-going training for young farmers or within the framework of integrated projects. Measure 111 includes actions related with enterprise modernisation and capacity



building, specialised training and thematic networks of information and dissemination and objectives such as:

- To promote the development of chain competitiveness, namely by introducing innovation;
- To conserve and improve the environment, ensuring compliance with environmental and safety standards;
- To contribute to improve specific capabilities in persons engaged in the agricultural, food and forestry sectors, increasing their business and technical ability;
- To foster the emergence of information processing and dissemination networks to organize the available technical and scientific knowledge in order to optimize its transfer to those who need it.

Adaptation

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

The Portuguese RDPs focused on adaptation mainly through water supply, management and efficiency issues, especially in terms of co-financing irrigation projects, being the action associated with adaptation less frequent than with mitigation.

Measure 125 in PRODER and PRODERAM integrates projects and actions not only related with irrigation but also targeting an adequate management of water resources according to the characteristics of the territories. PRODER has four actions within this measure related with CC topic: development of irrigated land; Alqueva irrigation project (Alentejo Region); sustainability of public irrigated plots and modernisation of traditional collective irrigated plots. In PRODERAM, the action is towards the development and beneficiation of collective irrigated plots systems. In both RDPs the measure exclusively covers collective interventions, either public or private and its main objectives include, namely:

- To promote water availability, in order to be able to face irregular rainfall distribution within
 a year and between years, by increasing equipped areas, thus valorising and rationalising
 water use, reducing pressure on its exploitation, ensuring a more efficient use and
 safeguarding natural values and landscape, conserving or recovering streams, in a global
 and integrated way;
- To support the development of irrigation, including the secondary irrigation network
 associated with the Alqueva Multi-purpose Project, as a key instrument to the development
 and competitiveness of Portuguese agriculture, namely its strategic chains, taking into
 account environmental aspects and the need to ensure an adequate and sustainable use of
 water, infrastructures and soil, and strictly enforcing the Water Framework Directive;
- To improve the efficiency and management of the existing irrigation infrastructures, primarily aiming to modernise them;
- To intervene in some irrigation dams in order to enforce the new safety standards;
- To contribute to eco-efficiency and pollution reduction by supporting environmental regualification;
- To contribute to improving the competitiveness of farm holdings and to develop strategic chains.

Measure 126 – included in the three RDPs – frames the maintenance production conditions that may be affected by severe natural disasters through the investment regarding the reestablishment/restoration of fixed capital, including on-farm plantations, greenhouses and infrastructures. Disaster or calamity situations are included, namely those caused by climate (changes) or fire hazards.



Finally, to contribute to reducing the effects of climate change the RDPs, the establishment of agro-forestry systems in agricultural land and corresponding infrastructures (**measure 222**) are favoured. The forest stand planning and recovery actions have as main objectives:

- To restore forest production potential in areas affected by the occurrence of fires and harmful biotic agents, including restoring and rehabilitating forest stands, ecosystems and communities/habitats, and also conserving soil and water (immediate post-fire rehabilitation);
- To contribute to reduce the effects of climate change, to improve biodiversity, to minimise the effects of soil erosion and to protect water resources;
- To introduce appropriate preventive measures associated with forest stands, at the level of the infrastructure network to be restored or established.

Analysing the changes derived from HC revision, it is evident in the RDP for Mainland Portugal (PRODER) the priority given to climate changes issues, materialised by increasing the EAFRD contribution to measure 214 by EUR 1.998 million.

Additionally, the new funds from the modulation in new sectors (EUR 23.7 million) will also be allocated to measure 214. The priority given to "biodiversity" and "climate change", by reinforcing the support to integrated production and organic farming, is justified by the importance that these production systems have for the environment and the countryside and the effect they produce on a sustainable protection of the environmental, water resources and soil.

In Madeira within Action 1.10.1 (code COM 125) is proposed that the types of eligible expenditure include the cost of infrastructure for water storage, including floodplains.

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

Axis/ Measure	Description	Type of operation	Potential effects	Frequency				
Axis I								
111	Vocational training and information actions	Mitigation Vocational training and information actions approaching these themes: -Environmental Protection and Natural areas management; -Production Techniques compatible with environmental and natural resources management.	Improvement of competiveness and environmental compliance of supported businesses. Improvement of specific competences of human resources engaged in the agricultural, food and forestry sectors, increasing their business and technical ability, namely, to deal with climate change challenges.	Mainland Portugal Madeira Azores				



125	Infrastructure related to agriculture and forestry	Adaptation Development of irrigated land. Adaptation Alqueva irrigation project. Adaptation -Sustainability of public irrigated plots. Adaptation Modernisation of traditional collective irrigated plots.	Increase in irrigated area (8,000-9,500 ha). Decrease in the number of plots per holder (20 to 30%). Reduction of the water consumption (m³) per ha (<6,600). Increase in irrigated area (90,000 ha). Decrease in the number of plots per holder (20 to 30%). Reduction of the the water consumption (m³) per ha (5 to 10%). Reduction of the the water consumption (m³) per ha (5 to 10%). Improvement of the management and safety of hydro-agricultural projects and infrastructures. Reduction of the the water consumption (m³) per ha (5 to 10%).	Mainland Portugal
		Adaptation Development and beneficiation of collective irrigated plots systems.	Increase in GVA of agricultural explorations supported (+25%). Increase in water available for irrigation (+2*10 ⁶ m ³).	Madeira
126	Natural disasters prevention/restoring work	Adaptation Maintenance of the production conditions that may be affected by severe natural disasters through the investment regarding the reestablishment/restoration of fixed capital, including on-farm plantations, greenhouses and infrastructures.	Restoration of production conditions after disaster or calamity situations related, namely, with climate changes phenomena.	Mainland Portugal Madeira Azores



Axis II				
214	Agri-environment payments	Mitigation Cultivation and management practices to be adopted, specially referring to water preservation and efficiency in use, promoting soil fertility (rational use of fertilisers included), manure management and tackling erosion through soil conservation techniques.	Cover successfully with management systems at least 150,000 ha of land in order to fight against climate change. Qualitative improvement in High Nature Value (HNV) areas. Improvement in gross nutrient balance. Carbon sequestration (5 ton CO ₂ per ha). Reduction of methane (CH ₄) and nitrous oxide (N ₂ O) emissions	Mainland Portugal
214	Agri-environment payments	Mitigation Grazing management in wasteland areas. Aid to the conservation of the basic ecological structure. Maintenance of terraces. Maintenance of cereal-fallow rotation.	Cover successfully with management systems at least 7,000 ha of land in order to fight against climate change. Improvement of soil quality and decrease in its	Mainland Portugal
216	Non-productive investments - agri- environmental component	Direct drilling. Maintenance of HNV permanent pastures. Maintenance of natural and improved non-irrigated permanent pastures. Grazing management in Mediterranean brushwood.	erosion. Quantitative and qualitative improvement in High Nature Value (HNV) areas. Improvement in gross nutrient balance.	Madeira Azores



221	First afforestation of agricultural land	Mitigation Establishing of new forest stands in agricultural land.	Carbon sequestration in forest biomass.	Mainland Portugal Madeira Azores
222	Agroforestry systems on agricultural land	Adaptation Establishment of agro-forestry systems in agricultural land and corresponding infrastructures.	Cover successfully with management systems at least 15,000 ha of agricultural land in order to fight against climate change.	Mainland Portugal Madeira Azores

Renewable energies

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

In general, the three programmes (PRODER, PRODERAM and PRORURAL) have focused their actions as far as renewable energies are concerned in the production and use of that kind of energies having as input by-products from the agricultural and forestry activities. In terms of biomass, the three RDP programmes lack operations targeting the development and implementation of energy crops as a renewable energy source.

Measure 121 (included in the three RDPs) supports operations of adapting and purchasing specific equipment for producing and using renewable energies, namely to promote the economic value of by-products and waste from agriculture and forest sectors (e.g. biogas). In the same context, although energy crops are not directly mentioned, they could be supported by multi-annual cultures general schemes. This measure also supports important mitigation activities.

Other actions such as the development of uses for biomass (e.g. bio-products) could be supported in **measures 123 and 124**, concerning the development of new products, technologies or processes. Measure 123 has more relevance in the domain of biomass, once it considers support to the harvesting, marketing and processing of woody material, namely by supporting the investment in plants for the reception and sorting of these types of raw materials.

Although PRODER does not consider relevant operations in **measures 311 and 312**, PRORURAL and PRODERAM do it, promoting investment in the production of renewable energies, as well as financing the creation of companies in this field.



Main implemented RDP measures related to the development of RE sources

Axis/ Measure	Description	Type of operation	Potential effects	Frequency
Axis I				
121	Farm modernisation	Adapting and purchasing specific equipment for producing and using renewable energies, namely to promote the economic value of by-products and waste from agriculture and forest sectors (e.g. biogas).	Replacement of fossil energies by renewable energies and reduction of CO ₂ emissions.	Mainland Portugal Madeira Azores
123	Adding value to agricultural and forestry products	Development of uses for biomass. Development of new products, technologies or processes.	Replacement of fossil energies by renewable energies and reduction of CO ₂ emissions.	Mainland Portugal Madeira Azores
124	Cooperation for development of new products, processes and technologies in the agriculture and food sector and in the forestry sector	Development of uses for biomass. Development of new products, technologies or processes.	Replacement of fossil energies by renewable energies and reduction of CO ₂ emissions.	Mainland Portugal Madeira Azores
Axis III				
311	Diversification into non-agricultural activities	Promoting investment in the production of renewable energies, as well as financing	Improvement of renewable energies	Madeira
312	Support for creation and development of micro-enterprises	the creation of companies in this field.	production and alternatives to fossil energies	Azores