

**UPDATE**

**REPORTING ON NATIONAL ADAPTATION ACTIONS**

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## POLICY AND LEGAL FRAMEWORK

A Strategic Framework for Climate Policy (QEPiC) was adopted by the Portuguese Government on 30th July 2015, through the Resolution of the Council of Ministers No.56/2015. QEPiC sets out the vision and objectives of national climate policy, reinforcing the commitment to develop a competitive, resilient and low-carbon economy, contributing to a new development paradigm for Portugal. QEPiC includes the National Programme for Climate Change 2020/2030 (2020/2030 PNAC), addressing mitigation goals and action, and the follow-up of the National Adaptation Strategy (ENAAAC 2020).

The first phase of ENAAAC started in 2010 and had as one of the main outcomes a progress report that highlighted the work performed by the different sectoral groups and coordination, identifying main vulnerabilities and proposals of adaptation measures in most cases.

The strengths and weaknesses identified in this progress report were properly addressed in the preparation of ENAAAC 2020. Therefore, ENAAAC 2020 focuses on better articulation between the domains (particularly the cross-cutting ones) and on the implementation of adaptation measures, along with mainstreaming in sectoral policies. Three main goals guide ENAAAC 2020:

**1. Improve the level of knowledge about climate change.**

Basis for the development of the strategy, focusing on the need for research, collect information, consolidate, and communicate accordingly to the target audience.

**2. Implement adaptation measures.**

Integrates the prioritization of measures, in harmony with the concerns of the spheres of science, policies and civil society, through benchmarking and participatory mechanisms. Additionally, the identification of funding mechanisms is addressed to support the implementation of adaptation measures.

**3. Promote mainstreaming of adaptation into sectoral policies.**

The development of adaptation is guided towards its mainstreaming into sectoral policies setting a more effective framework. This approach also must rely on proper monitoring mechanisms in order to centralize the progress on adaptation policies.

No Adaptation Action Plan is defined at national level, instead it is promoted in sectoral, local and/or regional planning. Furthermore it is given particularly attention to financing, one of main obstacles identified for implementation of adaptation in the first phase. Presently adaptation is considered within the scope of the Common Strategic Framework 2014 – 2020.

### **Considerations of EIA and SEA, in the context of Climate Change:**

State of play: Strategic Environmental Assessment (SEA)

Climate Change is always considered at the screening stage and is frequently identified as a Critical Factor for Decision-Making (CFD) in the scoping phase. When considered a CFD, both mitigation and adaptation are addressed (e.g. potential GHG emissions; flood risk plans/maps in the context of different land uses) and generally recognized as a relevant tool for considering climate change at an early stage of the decision-making process. Consideration of climate change at the SEA level also reflects on projects that may result from the implementation of the plan or programme, as well as the associated EIA.

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State of Play: Environmental Impact Assessment (EIA) - Ongoing transposition process of Directive 2014/52/EU

Scoping: establishing a list of project categories (criteria definition); Both on Adaptation and Mitigation

Assessment: Definition of information to be included and scenarios to be considered in the environmental impact report and establishment of criteria for assessing climate change and for establishing adequate measures

Post-assessment: Monitoring the impacts along the lifecycle of the project (construction, operation and deactivation phases)

**Risk Assessment:**

Climate risk assessment has been developed by the various sectoral working groups and is documented in ENAAC's progress report (APA, 2013). Furthermore it was published in 2014 by the National Authority for Civil Protection (ANPC) a report on National Risks Assessment (including climate change) for Disaster Risk Reduction purposes.

**Financing:**

Under the EEA Grants 2009-2014 it is being implemented an adaptation programme with a total budget of € 3,529,412.00 (€ 3,000,000.00 € EEA + 529,412.00 from Portuguese Carbon Fund – FPC). Programme AdaPT (<http://apambiente.wixsite.com/adapt>) was built from the needs identified previously on the ENAAC's progress report (APA, 2013) and is structured around four lines of action covering a website for climate scenarios, development of local adaptation strategies and training of local officers, integration of climate change in schools activities, and development of small scale sectoral projects:

1. The project "Portal do Clima" to develop a website in which information on past trends and future scenarios at regional level will be produced and disseminated. Climatic indicators based on climate change scenarios on a global scale for IPCC AR5 will also be developed.
2. The project ClimAdaPT.Local consists in training local officers on adaptation and developing local adaptation strategies, bearing in mind the integration of the concept of adaptation in municipal planning.
3. "Climate Change in schools and Award " consisting in a major educational project on climate change, at a school scale, which will focus on teachers' training, the production of educational materials and the promotion of a competition on measures related to climate change to be applied in the school context.
4. "Sectoral Projects" consisting in a set of sectoral projects to support work produced around the ENAAC, focusing on vulnerability assessment and cost-benefit analyses of adaptation. The following projects were selected for funding and are currently being implemented:
  - AC:T - Method to integrate the climate change adaptation dimension in the tourism sector;
  - AdaptForChange – Improve the success of reforestation in semi-arid areas: adaptation to climate change scenario;
  - adaptIS – A collaborative platform for adopting measures of adaptation to climate change in the industrial and service sectors;

- GestAqua.AdaPT – Adapting Reservoir Management Strategies to Climate Change in Alentejo;
- SOWAMO - Sowing Water in the Monchique Mountain.

Besides Programme AdaPT, the adaptation funding mechanisms to climate change are specially guaranteed by, the Common Strategic Framework 2014 – 2020 (ERDF; ESF; CF; EAFRD; EFMAF) as well as programmes such as Horizon 2020, the Interreg IV-C and LIFE.

In order to maximize Programme LIFE for national projects, including adaptation to climate change, it is being implemented a PT capacity building project (LIFE14 CAP/PT/000004). This project aims to increase the number and quality of projects that are yearly presented to the Calls for Proposals in LIFE through: a) increasing the capacity of public administrations involved with LIFE; b) creating and improving networking and best practice dissemination mechanisms; c) facilitating access to other co-financing sources; d) promoting and establishing a better interaction between project proposers and the national administrations dealing with LIFE along the whole project cycle; e) transversally to the former, increasing the dissemination/recognition of the LIFE program and projects supported by LIFE.

The Common Strategic Framework is implemented at national level by several national Programmes (Portugal 2020) with the Operational Programme on Sustainability and Resource Use Efficiency (PO SEUR) and the Transnational Operational Programme for Madeira-Azores-Canary Islands (MAC 2014-2020) standing out as the most significant in matters related to adaptation action.

Also at national level there are the Foundation's grants for Science and Technology (FCT) and the financing mechanism provided by the Environmental Fund (Decree-law No.42-A/2016) that aims to support environmental policies such as on adaptation to climate change, with special focus on actions on coastal areas and on water resources.

Furthermore the development of funding mechanisms and of selection criteria for applications are some of the issues to be addressed under the thematic area “Funding and implementing adaptation” of ENAAC 2020.

## **IMPACTS, VULNERABILITY AND ADAPTATION INFORMATION**

### ***Observations and projections***

Within the scope of national observation programmes, the following initiatives that manage national databases for extreme weather-related events can be highlighted:

- The National Authority of Civil Protection (ANPC) has a national database on disaster response and losses since 2006 and publishes that information on the yearbooks of civil protection events;
- The Portuguese Environmental Agency (APA) keeps the records of the historical marks of floods and of its network of meteorological and hydrological monitoring stations, this data is available on SNIAmb (National System of Environmental Information – <http://sniamb.apambiente.pt>).
- The Portuguese Sea and Atmosphere Institute (IPMA) is the body responsible for carrying out the observations for meteorological and climatological purposes. IPMA has the responsibility for

deployment, exploration and maintenance of the country network of meteorological stations; it is also responsible for archive and quality control of weather observations. Also promotes a project “MeteoGlobal” (<http://meteoglobal.ipma.pt/>) that allows any citizen to report in almost real-time the occurrence of severe weather events.

The most recent contributions on climate projections for the national territory can be found here:

- Climate Change in Portugal: Scenarios, Impacts, and Adaptation Measures – SIAM Project (Santos et al, 2002)
- Alterações Climáticas em Portugal. Cenários, Impactos e Medidas de Adaptação – SIAM II Project (Santos et al, 2006)
- Project CLIMAAT (Climate and Meteorology of the Atlantic Archipelagos)
- Impactos e Medidas de Adaptação às Alterações Climáticas no Arquipélago da Madeira – CLIMAAT II Project (Santos et al, 2006)
- Alexandre M. Ramos, Ricardo M. Trigo and Fátima E. Santo (2011). Evolution of extreme temperatures over Portugal: recent changes and future scenarios. *Climate Research*, Vol. 48:177-192. DOI: 10.3354/cr00934.
- Ana C. Costa, João A. Santos and Joaquim G. Pinto (2012). Climate change scenarios for precipitation extremes in Portugal. *Theoretical and Applied Climatology*, 108:217-234. DOI 10.1007/s00704-011-0528-3.
- Ricardo Filipe Domingos Tomé (2013). Mudanças climáticas nas regiões insulares. Tese de Doutoramento em Física. Universidade dos Açores.
- C. Andrade, H. Fraga and J. A. Santos (2014). Climate change multi-model projections for temperature extremes in Portugal. *Atmospheric Science Letters*, Volume 15, Issue 2, pages 149-156.
- Climate Impacts in Europe. The JRC PESETA II Project (Ciscar et al, 2014)
- Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2013)
- Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2014)
- de Lima MIP, Espírito Santo F, Ramos AM, de Lima JLMP (2013) Recent changes in daily precipitation and surface air temperature extremes in mainland Portugal, in the period 1941-2007. *Atmos Res* 27:195-209. doi:10.1016/j.atmosres.2012.10.001
- de Lima MIP, Espírito Santo F, Ramos AM, Trigo RM (2015) Trends and correlations in annual extreme precipitation indices for mainland Portugal, 1941-2007. *Theor Appl Climatol*: 119 55-75. DOI 10.1007/s00704-013-1079-6
- Espírito Santo F, de Lima MIP, Ramos AM, Trigo RM (2014) Trends in seasonal surface air temperature in mainland Portugal, since 1941. *Int J Climatol* 34: 1814-1837. doi:10.1002/joc.3803
- Espírito Santo F, Ramos AM, de Lima MIP, Trigo RM (2014) Seasonal changes in daily precipitation extremes in mainland Portugal from 1941 to 2007. *Reg Environ Change* 14: 1765-1788. doi:10.1007/s10113-013-0515-6

- Ramos A, Trigo RM, Santo FE (2011) Evolution of extreme temperatures in Portugal: reporting on recent changes and future scenarios. *Clim Res* 48:177-192. doi:10.3354/cr00934.

Furthermore, a project to develop a website with climate scenarios has been developed by IPMA under the EEA Grants' Programme AdaPT. This website (<http://www.portaldoclima.pt/en/>) aims to be the reference source of information for Portugal's future climate providing an easy access platform for the general public making available, namely: time series, climate change projections and sectoral climatic indicators for the geographical coverage of mainland Portugal.

According to the climate projections evaluated from global simulations performed within the Ec-earth consortium (<http://eearth.knmi.nl/>), average annual temperature for Portugal is expected to rise by 2040, from 0.5° to 1.0° C and by 2100 between 2° and 5°C, depending on region and emission scenario. Warming is expected to be greater in the southern and in the eastern regions in the mainland. Annual precipitation will decrease about 15% by 2040 and 30% by 2100. The decrease in precipitation will be more severe in the southern part of Portugal. Portugal will continue to get warmer and drier.

### ***Impacts & vulnerability assessments***

The SIAM projects were the most comprehensive and integrated assessments on the impacts and vulnerability associated with climate on mainland Portugal, Azores and Madeira. The studies were based on future climate scenarios and associated effects on a number of socio-economic sectors and biophysical systems including hydrological resources, coastal areas, energy, forests and biodiversity, fishing, agriculture and health. A sociological analysis of climate change in Portugal was also performed.

Besides other less comprehensive assessments of the impacts & vulnerability, it must be highlighted the Progress Report of ENAAC (APA, 2013) was produced by the coordination group of ENAAC. This report resulted from the involvement with sectoral stakeholders and compiles the impacts and vulnerabilities of the sectors, the barriers for adaptation, and the adaptation measures.

Other relevant study on scenarios and impacts for Portugal as for other European countries is project PESETA II, carried out by JRC/EC ([http://peseta.jrc.ec.europa.eu/climate\\_scenarios.html](http://peseta.jrc.ec.europa.eu/climate_scenarios.html)).

At subnational level it is important to highlight the Adaptation Strategy of the Autonomous Region of Madeira (<http://clima-madeira.pt/>) and the significant trend of development of Local Adaptation Strategies. This trend was greatly promoted by the project ClimAdaPT.Local (<http://climadapt-local.pt/>) under the EEA Grants' Programme AdaPT where 29 Municipalities are involved in training of local officers on adaptation, development of local adaptation strategies and integration in local planning. These subnational adaptation strategies are important milestones on this matter as they integrate detailed assessments of the climate change impacts and vulnerabilities on the respective territories. ClimAdaPT.Local will lead to the publication of 26 Local Adaptation Strategies and guiding manuals that will remain a reference for replication of Local Adaptation Strategies for the rest of the territory, particularly for the development of local adaptation plans, with EU funding.

### ***Research***



Although Portugal has never had a specific research programme dedicated to Climate Change, over the past decade, the Portuguese public funding agency, the Foundation for Science and Technology (FCT), has launched calls for research proposals in all scientific domains, including Climate Change.

The research on adaptation was focused within CIRCLE-2, under FP7, a European network of 34 institutions from 23 committed countries to fund research and share knowledge on climate adaptation and the promotion of long-term cooperation among national and regional climatic change programs. CIRCLE-2 maintains a searchable European InfoBase (<http://infobase.circle-era.eu/>) of Climate Adaptation projects (this database is not exhaustive), which contained a total of 132 adaptation research projects in Portugal by September 2016. The areas covered reflect more the interests of the research communities rather than any policy need or the development of any dedicated research programme. This gap is addressed on ENAAC 2020 in a dedicated Thematic Area focusing on:

- Development of a research agenda;
- Cooperation between academia and ENAAC 2020 entities;
- Support the participation of the Portuguese science in adaptation projects;
- Promote the participation of ENAAC 2020 stakeholders in international adaptation networks;
- Knowledge transfer to the business community.

Further information on Research is described in the section on Sectors

### ***Monitoring progress***

Presently the monitoring has been guaranteed for reporting purposes through ENAAC's Coordination Group. A more formal procedure is addressed in ENAAC 2020 in order to establish a monitoring and review system for the overall adaptation process, particularly with close collaboration with sectoral groups following a mainstreaming approach. A methodological approach is currently under consideration, based on a scoreboard exercise, to have a common indicator for all sectors and governance levels to measure progress on implementation of adaptation measures under plans or programmes.

## PRIORITY SECTORS AND ADAPTATION ACTION

The reflective process during the first stage of ENAAC has involved specific stakeholders and experts for each of the sectors which resulted, in many cases, in an exhaustive collection of key action areas and adaptation measures published in sectorial reports. In some cases, targets and means of verification of the implementation of measures were set, as well as the factors that may condition positively or negatively their achievement. Unfortunately it was also observed limited progress on other sectoral groups due to the availability of resources and skills which reduced the depth of the assessments conditioning the quality of the final products.

On the revised National Adaptation Strategy, ENAAC 2020, the difficulties and gaps identified in the former ENAAC were conveniently addressed. The introduction of 6 cross-cutting thematic areas (research, financing, international cooperation, communication/dissemination, spatial planning and water resources) in the governance structure provided the common ground where the sectoral groups can better articulate the objectives of ENAAC 2020. There are 9 priority sectors - Agriculture, biodiversity, economy, energy, forests, health, safety of people and assets, transports and communications, coastal areas/sea that will continue:

- to improve the impacts and vulnerability assessments;
- the prioritization of adaptation measures;
- the engagement of all relevant stakeholders;
- to promote mainstreaming in their own sectoral policies.

| ENAAC 2020<br>Thematic Area                | Planned actions   |
|--|---|
| Research and innovation                    | <ol style="list-style-type: none"> <li>1) Identification of activities and funding options for the thematic area, as well as international cooperation opportunities.</li> <li>2) Identification of priorities for research, innovation and demonstration of adaptation.</li> <li>3) Proposal of a research funding program in the area of adaptation.</li> <li>4) Disseminate among the stakeholders the financing instruments LIFE and H2020 (including ERA-NET of Climate Services "ERA4CS").</li> <li>5) Monitoring the activities of international research projects of adaptation with Portuguese partners (eg projects BASE, IMPRESSIONS, BINGO and PLACARD - H2020).</li> <li>6) Workshop interaction between representatives of H2020 and LIFE projects, as well as participants in ERA4CS, discussing also Portugal's participation in international R&amp;I networks.</li> </ol> |
| Financing and Implementation of Adaptation | <ol style="list-style-type: none"> <li>1) Cooperation with the AG POSEUR for definition of indicators, selection criteria and calls for applications.</li> <li>2) Proposal of a research funding program in the area of adaptation.</li> <li>3) Proposal of terms of reference for programmes of calls for adaptation projects to be financed (funding sources to be defined).</li> </ol>   |

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|-----------------------------------|---|
|                                   | <p>4) Monitoring the implementation of AdaPT projects.</p> <p>5) Cooperation with the AG POSEUR for monitoring of the Programme indicators, including the outcome indicator.</p> <p>6) Contribution to the report on adaptation activities to the UNFCCC (7<sup>th</sup> National Communication and 3<sup>rd</sup> Bi-annual Report).</p> <p>7) Update the report of national adaptation developments within the EU Scoreboard.</p>   |
| International Cooperation         | <p>1) Contribution to the Bi-annual report to be prepared under the RCM No. 82/2010, on the Coherence of the Policy for Development (CPD).</p> <p>2) Contribution to the EU Bi-annual report on CPD.</p> <p>3) Contribution to the OECD report on CPD (annual).</p> <p>4) Participation in LIFESHARA project - Sharing Awareness and Governance of Adaptation to Climate Change in Spain, which among other things plans to establish an Iberian cooperation system between the Climate Change Adaptation Units of Spain and Portugal to identify risks, vulnerabilities, priorities and common actions</p> <p>5) Monitor the adaptation activities promoted by the European Environmental Agency, in particular within the EIONET network.</p> <p>6) Monitor the EC Expert Group on Climate Change and Development.</p> <p>7) Promote bilateral relations with Norway, Iceland and Liechtenstein within Programme AdaPT.</p> <p>8) Report to the European Commission the development assistance activities related to adaptation (Article 16 of MMR).</p> <p>9) Contribution to the report on development assistance activities related to adaptation (7<sup>th</sup> CN and 3<sup>rd</sup> BR) In articulation with other actions of the thematic area.</p> <p>10) Follow-up the work at UNFCCC level on methodologies and approaches to MRV financing.</p> |
| Communication and Divuligation    | <p>1) Contribution to an application under the POSEUR for the construction of a National Adaptation Portal.</p> <p>2) Divuligation of the Climate Portal to the general public and promote its update and development (<a href="http://www.portaldoclima.pt/">http://www.portaldoclima.pt/</a>).</p> <p>3) Promote the addition of contents by various stakeholders in the platform <a href="http://adaptis.projectbox.pt/">http://adaptis.projectbox.pt/</a>.</p> <p>4) Participation in the tasks of Programme AdaPT's final conference for public presentation of the results of the financed projects.</p> <p>5) Promote with the Education General Directorate the project outcomes of Clima@EduMedia and evaluate a proposal of its extension at national level.</p>  |
| Mainstreaming in Spatial Planning | <p>1) Develop a database for dissemination of good practices of adaptation to climate change.</p> <p>2) Promote and monitor applications on funding lines of POSEUR for the development of municipal, intercity and regional plans of adaptation to climate change.</p> <p>3) Mapping the climate risks.</p>  |

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|  | <p>4) Development of local adaptation strategies to climate change.</p> <p>5) Development of a manual with technical guidance to ensure the integration of adaptation to climate change in planning exercises (eg. PROT) and territorial management instruments, building on the experience of the project ClimAdaPT.Local.</p> <p>6) Inclusion of adaptation measures in the National Programme for Spatial Planning Policy (PNPOT) Action Plan.</p> <p>7) Proposal of terms of reference to programmes of calls for adaptation projects to implement actions arising from municipal plans (funding sources to be defined).</p>   |
| <p>Mainstreaming in Water Resources Management</p> | <p>1) Development of water resources indicators for the climate scenarios developed by IPMA under the Climate Portal Project, for the geographical scale of the river basin districts.</p> <p>2) Collaboration in the development of an Adaptation Plan for the Water Supply sector in partnership with Águas de Portugal Group.</p> <p>3) Preparation of an Adaptation Plan to other economic sectors (agriculture, livestock, industry, including agro-industries, tourism and energy) in partnership with the respective stakeholders.</p> <p>4) Development of a methodology to estimate the incremental costs of investments related to climate change.</p> <p>5) Identification of Water Resources projects funded with POSEUR contribution to adaptation.</p> |

The following section provides an overview of the adaptation work already developed and planned for each of the sectoral groups of ENAAC 2020.

### Agriculture

In the first stage of ENAAC this sector was aggregated along with forests and fisheries and developed a National Adaptation Strategy for Agriculture and Forests (2013) that covered climate trends, sectoral characterization, assessment of climate change impacts and adaptive capacity, and definition of adaptation measures. This strategy addresses aspects such as desertification and soil conservation, main systems of agriculture production, water use, extreme situations, and plant health. The following adaptation actions stand-out:

- There are already some aspects from the Common Agriculture Policy that contribute directly and indirectly to the implementation of adaptation measures, namely: support to soil conservation, efficient use of water in agriculture, maintenance of local breeds at risk, risk prevention and restoration of productive potential.
- The Portuguese Carbon Fund supported agricultural and forestry projects (biodiverse grasslands and shrubland management) contributing both to mitigation (by increasing carbon sequestration in soil) and adaptation (by improving the content of soil organic matter, fighting erosion and desertification, increasing the resilience of grassland and forest areas) to new climatic conditions.

- The National Action Programme to Combat Desertification - PANCD (2014) also includes guidelines that interact with ENAAC.

By 2017, the agriculture working group plans to: 1) produce a report with the developments undertaken in ENAAC I including the implementation of adaptation measures, 2) define the Programme AGRI\_ADAPT 2020 covering a) the identification of gaps in the impacts, measures and policy instruments, b) identification of best practices to address these gaps, c) definition of actions to be developed until 2020.

### **Biodiversity**

The Biodiversity working group published a report (2013) covering climate trends and its impacts on biodiversity assessing the vulnerability of ecosystem services, different habitats, and species. The report provides an extensive list of adaptation measures with indicators and targets, and actions categorized by priority. These considerations have been mainstreamed into biodiversity and nature conservation policies and into other instruments such as financing. For this sector it is highlighted the following aspects:

- The National Strategy for Nature Conservation and Biodiversity - ENCNB (2001, currently being revised<sup>1</sup>) considers particularly important, studies on the impact of climate change to the stability of ecosystems and biodiversity.
- There are also documents from other sectors (e.g. agriculture, water resources and soil) that show integrated orientations with specific measures to conserve and enhance biodiversity and to promote mitigation and adaptation to climate change.
- The sector has adopted a framework for the climate validation of plans and programs, which allows diagnosing the extent to which programs integrate biodiversity adaptation to climate change, improving the outcomes of the mechanism for strategic environmental assessment of plans and programs (Decree-Law No. 232/2007).
- Conservation of *Anaocypris hispanica* (e.g. preservation of the riparian vegetation of its habitat, ex-situ reproduction plan and reintroduction program, reduce the pressure of invasive alien species, implementation of the action plan of *Anaocypris hispanica*, conservation at the Guadiana Basin (Life Saramugo - LIFE13/NAT/PT/786).
- Implementation of actions of forest fires prevention such as the conservation and reforestation of forests of native vegetation as a fire management measure.
- Implementation of the action plan for Bottlenose dolphins and for *Lynx pardinus*.
- Development of management plans for the areas classified under the RAMSAR convention in order to include adaptation to climate change.
- *Aquila adalberti* conservation in Portugal (Life Imperial - LIFE13/NAT/PT/1300).
- Conservation of temporary ponds in the southwest coast of Portugal (Life Charcos - LIFE12 NAT/PT/000997).
- Falco & Otis Project: Protect *Falco naumanni* and *Otis tarda*.

The plans defined by the Biodiversity Group for 2017 include the preparation of the Programme Biodiv\_ADAPT2020 and the support and promotion of its implementation in the following areas: a)

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<sup>1</sup> Considering the new legal and programmatic framework and international commitments undertaken by Portugal, including on adaptation to climate change.

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vulnerabilities, impacts, options and measures, b) mainstreaming of adaptation into sectoral policies, c) knowledge gaps, and d) sectoral studies. For this matter it was initiated the mapping of the projects and actions that contribute for biodiversity adaptation to climate change, which were or will be implemented in the periods 2013-2015 and 2016-2020.

### **Economy**

The Economy is a new working group on ENAAC 2020 which integrates the industry and tourism sectors previously covered on ENAAC I. Other subgroup now considered is the services sector. In the tourism subsector the following aspects stand-out:

- Publication of the annual reports about the Best Environmental Practices on Touristic Resorts based on surveys to all Touristic Resorts in Portugal. These surveys were conducted since 2008, and are specially focused on the improvement of the efficiency on resources management (energy, water and waste).
- The National Strategic Plan for Tourism (2013, currently being revised) aims, among other things, to promote sustainability and rational use of natural resources, and to protect natural and cultural landscapes focusing on the relation with the tourist. Both these aspects have synergies with adaptation action.
- The Programme of Touristic Destinations also stresses the importance to develop sustainable destinations, contributing with activities of impact assessment and identification of corrective measures, given the long-term geophysical nature concerns that interfere with the development of tourism or that are conditioned by it (bathing areas, dynamic coastlines, hydrological regime, availability of drinking water, etc.).
- In the 2020 Tourism Action Plan climate change is also integrated, stressing the concerns on sustainable practices and on efficient resource use, accompanied with the rising on environmental certification and on environmental regulation. On its strategic objectives it is highlighted the requalification of consolidated tourist areas and the adaptation to climate change in coastal areas.

The activities planned for the sector Economy under the framework of ENAAC 2020 include: a) identification of impacts, vulnerability and adaptation measures; b) mainstreaming of adaptation into sectoral policies; c) identification of needs and knowledge gaps; d) promotion of sectoral studies about the characterization of the problems and necessary measures, sources of funding and monitoring mechanisms; and e) dissemination of compiled information among sectoral stakeholders.

### **Energy**

In 2012, the energy sector prepared a progress report in the framework of ENAAC I, which identified actions on adaptation, mitigation and prevention for vulnerabilities of the sector. The report concluded that larger companies had already undertaken a number of measures, some with large investments, in order to reduce the impact of climate change. Actions were also identified to be undertaken by business and society in general. The report also contained proposals for "win-win" and "no regrets" measures, concerning horizontal measures (sector-wide) and specific measures (linear and fixed infrastructure). For example, horizontal measures for the short/medium term can incorporate best practices in building design,

vulnerability analysis, and stress testing for vulnerable infrastructure. As far as the long term is concerned firms may think of technological diversification and geographical distribution of its assets and strengthening its distribution network and transportation. The evolution of the energy supply sector, although triggered mainly by concerns about security of supply and mitigation of climate change, is convergent and consistent with the adaptation objectives. In this way the implementation of adaptation measures is being assured by various energy policies and instruments. It is essential then to develop climate proofing procedures in order to provide an overview of the adaptation performance of the energy sector. Another important issue is the need for re-examination of the vulnerabilities and climate risks identified for the energy sector. Furthermore the energy working group intends to explore in more depth in the prospect of energy demand as well as in the energy-water nexus.

### **Forests**

As mentioned above, the Forests sector was aggregated with agriculture in ENAAC I and developed the National Adaptation Strategy for Agriculture and Forests (2013). Additionally it was published the report “Forests Adaptation to Climate Change” (2013) that addressed the impacts and adaptive capacity and measures on issues such as distribution and productivity for the main forestry species, forest fires, biotic agents (pests, diseases and non-native invasive species), environmental services, fishing and inland aquaculture resources, cinegetic species, socioeconomic factors. Similarly, two other instruments at strategic level but with a stronger operational component, the National Strategy for Forests - NSF (2015) and the National Strategy for Nature Conservation and Biodiversity - ENCNB (2001, currently being revised) include specific objectives and corresponding measures, covering also adaptation to climate change. These objectives and measures are supported within the scope of rural development, the structural funds, the permanent forest fund and regular budget. In particular, some measures identified in the NSF are:

- Implementation of the National Plan of Integrated Management of Fire, encompassing the implementation of primary and secondary fuel management networks, increasing the area of intervention and the number of the fire prevention teams’ better operationalizing their action.
- Emergency restoration after large fires, regeneration of affected stands and restoring forestry production potential in stands affected by biotic agents.
- Installation of well-adapted forest stands and conversion of stands in inadequate ecological conditions.
- Promotion of resilience of the stands, adjusting the density of maritime pine stands and the improvement of the stands’ condition for the cork oak and holm oak.
- Expansion of the area under management plans improving the economic value of the goods and services they provide.

Under the framework of ENAAC 2020 the next steps for this sectoral working group are: a) the adequacy assessment of the adaptation measures identified on the report “Forests Adaptation to Climate Change” (2013) according to the current situation of the Portuguese forest; and b) monitoring of the implementation of measures based on a system of established indicators. The adequacy assessment will grasp the identification and adjustment of dysfunctional measures, identification of new measures to address gaps, revision of the measures’ indicators.

### **Health**

The health sector was also represented in ENAAC I where it produced a state of the art report on the effect of climate change in the sector. Additionally it is highlighted the following aspects:

- Implementation of plans for improved efficiency on water and energy use, and on waste management for all the buildings of the health sector.
- Since 2004 there is a Contingency Plan for heat waves, with warning system and responses to emergencies.
- Since 2007 there is a Surveillance System on Vector Born Diseases.

### **Safety of people and assets**

On ENAAC I, the sector “safety of peoples and assets” has published an exploratory report on the implications of climate change on the disaster risk reduction activities, and has developed several initiatives such as:

- Publication in April 2014 of the Report on National Risks Assessment, including the ones related to climate change ([http://www.prociv.pt/bk/RISCOSPREV/AVALIACAONACIONALRISCO/Documents/2016\\_Avaliacao\\_Nacional\\_Riscos.pdf](http://www.prociv.pt/bk/RISCOSPREV/AVALIACAONACIONALRISCO/Documents/2016_Avaliacao_Nacional_Riscos.pdf)).
- Acts to support disaster reduction policy at the sectorial level, namely in forest fires, floods; climate change adaptation and critical infrastructure protection.
- Other good practices in place including the warning systems: under adverse weather conditions, monitoring of water resources (droughts and floods), heat waves, warning in affected areas within the risk of dam break.

Besides the common responses of disaster risk reduction, the working group safety of people and assets has contributed to ENAAC 2020 with the publication of two manuals, one dedicated to best practices on flood risk management and other dedicated to best practices in risk prevention and management – resilient cities in Portugal 2016. Another manual is being prepared about best practices of resilience within the private sector

### **Transports and communications**

Transports and communications is a new sector in the national adaptation strategy. The first steps still need to be taken in order to promote sectoral stakeholders involvement, vulnerability and impact assessment and adaptation measures, and integration of adaptation into sectoral activities. Therefore, in ENAAC 2020 it will be developed the following activities:

- Establishment of a stakeholder network under the theme of adaptation to climate change in transports.
- Development of a survey focusing on the assessment of the transport infrastructures vulnerabilities to Climate Change.
- Identification of I&D lines under climate change adaptation.
- Identification of financing lines and potential projects for application for funding.



### **Coastal areas and sea**

In ENAAC I, this sectoral group was partially addressed in the sectoral adaptation strategy for water resources. Coastal protection is one of the main areas of investment given our particular vulnerability. There were several types of implementing actions under the National Action Plan on Coastal Protection 2012-2015, in priority sites:

- Insertion of buffer strips in spatial planning rules.
- Monitoring of coastal systems.
- Conclusion of risk and vulnerability assessment for most of the Portuguese coast.

In the past reactive measures were prioritised, such as sand deposition and construction of coastal protection hard infrastructure, but now it is intended to prioritise a shift towards prevention, according to knowledge and experience accumulated, with cost-benefit evaluation. This can include measures such as replacements of people and infrastructures.

In response to the winter of 2013/2014 where Portuguese coastal areas were greatly affected by storm surges a Coastal Working Group was created, with contributions from academia and governmental organizations for a deeper reflection on the coastal areas for the definition of a set of measures. These aim to reduce the exposure to risk in the medium term, including a reflection on sustainable development within climate change scenarios.

ENAAAC 2020 adds to the former sectoral group the sea dimension with the intention to develop adaptation in this important area. It is expected to register significant progresses in this sectoral group knowing that a significant component of PO SEUR, is particularly destined to fund the Coastal Areas protection taking into account adaptation (200 M€). Under the framework of ENAAAC 2020 the following activities are planned:

- Knowledge improvement on the coastal and marine systems behaviour including monitoring, data collection and its organization into a repository of geographical information making it available for the public.
- Research for better understanding of climate change impacts on the population in order to define proper adaptation measures, including the options: a) protecting the area; b) adapting the area; and c) withdrawing the population.
- Implementation of adaptation measures, including structural defense interventions and local adaptation, such as shots of artificial feeding and projects for increasing resiliency, development of warning and protection systems.
- Enhancing the effectiveness and enforcement of the legal instruments that determine the uses and activities in risk areas.
- Promoting training and innovation, dissemination and participation on adaptation policy.

Furthermore it must be highlighted the latest progress within this sector, which include:

- The approval of project COSMO: Program for Monitoring the coastal strip of Continental.
- The approval of project QUIMERA, which involves studies and actions of artificial feeding of sediments.

- The application for project SIARL for implementation of the Collaborative Platform to become an Information and Data repository essential to promote the Integrated Management of Coastal Areas.
- The ongoing elaboration of the Coastal Shore Programmes.
- The development of the Action Plan for the Coastline - Coastline XXI and Annual Action Plan.

The development of the action plan within the scope of the National Strategy for the Sea 2013-2020.

## **ENGAGING STAKEHOLDERS: PARTICIPATION & CAPACITY BUILDING**

### ***Governance***

The implementation of ENAAC 2020 is supported by a coordination group presided by the Portuguese Environment Agency – APA, and composed of the coordinators of the thematic areas and of the sectoral working groups, as well as the representatives of the Autonomous Regions of Azores and Madeira and of the National Association of Portuguese Municipalities. In this way, the coordination group brings together the central administration bodies which in turn engage their specific stakeholders.

Six cross-cutting thematic areas have been identified: i) research; ii) financing; iii) international cooperation; iv) communication / dissemination; v) spatial planning; and vi) water resources. The work to be developed under these thematic areas is essentially undertaken by the nine priority sectors that constitute the basic units of work of ENAAC 2020, under the coordination of APA and other relevant bodies of each thematic area.

This framework is backed up by two other structures: the scientific panel and the Interministerial Commission on Air and Climate Change (CIAAC). The scientific panel guarantees the engagement of the scientific community and can provide knowledge-based support to the coordination group. The political support is essentially guaranteed by the CIAAC, a structure created for the monitoring of climate policy and sectoral policies with an impact on national goals in the field of air and climate change, taking into account the synergies between these two themes.

It is important to note the relevance of the project LIFESHARA (LIFE15 GIC/ES/000033 - Sharing Awareness and Governance of Adaptation to Climate Change in Spain) recently started that will give an important contribute on the thematic area “international cooperation”. One of the outcomes of this project, which has a APA as a partner, is precisely the establishing of a framework for cooperation between the units of adaptation to climate change in Spain and Portugal in order to identify risks, vulnerabilities, priorities and common actions.

At regional level, besides their representation in the coordination group of ENAAC 2020, both Azores and Madeira autonomous regions have developed regional strategies for adaptation to climate change. Azores strategy was adopted on 19th October 2011, through the Resolution of the Council of the Government No.123/2011 which will be operationalized through a Regional Plan for Climate Change (conclusion in 2016/2017), which will integrate the measures and actions considered relevant to each sector, in particular those which are already underway. The Strategy of Adaptation to Climate Change of the Autonomous

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Region of Madeira was published in September 2015 (<http://clima-madeira.pt/>) where, among other aspects, has compiled the extensive sectoral assessment of impacts and vulnerabilities.

As for local level, several Portuguese municipalities are involved in adaptation action and significant initiatives:

- Águeda, Alfândega da Fé, Almada, Anadia, Associação Transfronteiriça do Lago Alqueva, Aveiro, Barreiro, Cascais, Coruche, Estarreja, Ílhavo, Lagoa-Açores, Leiria, Lisboa, Mértola, Torres Vedras, Vagos and Vila do Conde signed up the Covenant of Mayors Initiative on Adaptation to Climate Change, initiative willing to create a community with synergies, visibility and communication on cities' commitment to adaptation, practical and knowledge support.
- Almada, Cascais and Sintra are three of the 11 partners in the project financed by the AdaPT program on local adaptation strategies ClimAdaPT.Local. Their local developments in adaptation to climate change is used as a starting point for the work with the other 26 municipalities across the country.
- The significant know-how and involvement of local and regional communities has been realized under the project ClimAdaPT.Local which will be decisive for the development of other local adaptation plans foreseen in the Common Strategic Framework.
- Municipalities involved in the Campaign Making Cities Resilient are very active in public education to enhanced awareness of risk and protective measures. Besides the local governments, most local authorities are involved in campaigns to improve resilience and awareness campaign. Major risks are forest fires, floods and heat waves.

The establishment of the Portuguese National Platform for Disaster Risk Reduction, in May 2010, was a key measure towards better coordination of prevention, preparedness and response activities. The Platform is chaired by the Minister for Internal Affairs and composed of Delegates from Ministries and other national entities. A consultative Sub-Committee was also created within this Platform to promote DRR activities. This sub-committee includes representatives from ministries and from private sector, academic institutions, resilient cities and professional associations (engineers; architects). In 2014 the Sub-Committee constituted also the Working Group on Safety of Public and Property from ENAAC.

Portugal subscribed to the Hyogo Framework for Action (HFA) in 2005, since then, concrete steps were taken to integrate and streamline Disaster Risk Reduction (DRR) into national development strategies and legislation, recognizing its importance for the promotion of sustainable economic growth and progress.

Under the framework of European Commission, Portugal is involved in regional hazard monitoring, namely in the area of forest fire risk (EFFIS-European Forest Fire Information System: <http://forest.jrc.ec.europa.eu/effis/>) and meteorological events (Meteoalarm-alerting Europe for extreme weather: <http://www.meteoalarm.eu/>).

### ***Adaptation capacity, dissemination, education, training***

#### **Dissemination:**

InfoBase from Circle 2 (EU FP7 ERA-NET Project Climate Impact Research & Response Coordination for a Larger Europe) includes references to more than 100 Portuguese research projects on climate change adaptation (<http://infobase.circle-era.eu/>).

Civil protection authority (ANPC) provides warnings and information to general population and through the media (television, radio and newspapers).

#### **Adaptation capacity and training:**

INTERREG IVC project F:acts! – Forms for Adapting to Climate Change through Territorial Strategies, directed to exchange good practices, and transfer knowledge about climate change adaptation (Directorate General of Spatial Planning-DGT participation). Two publications have resulted:

- A handbook (which provides a framework to define and implement territorial integrated strategies in the context of climate change adaptation in risk areas);
- A study directed to a specific area, which previously defined as a pilot areas – Landscape Multifunctionality of Baixo Vouga Lagunar: a contribution for climate change adaptation - which offers a set of measures and recommendations to promote an implementation of a local governance model and a definition strategy for territorial management and landscape.

During the implementation of the project several events, about climate adaptation through territorial strategies have taken place in Portugal, including study visits, workshops to promote local stakeholders involvement, and coaching visits from foreign partners to increase adaptation capacity, for which it were also invited local stakeholders.

The project on local adaptation strategies **ClimAdaPT.Local** (Programme AdaPT financed by the EEA Grants and the Portuguese Carbon Fund) intends to effectively promote adaptation at local level in Portugal. The main objectives are: embedding the climate change adaptation dimension on local and municipal level in Portugal; creating a community of municipal actors aware of climate change issues and trained for the use of decision support tools on adaptation; promotion and provision of local adaptation knowledge particularly in the definition of strategies, planning and implementation of measures and results communication; the reduction of barriers and constraints on the local actors involvement on adaptation process; and integrating adaptation into municipal and sectoral agents decision and planning processes. Web site and "HelpDesk" Platform: <http://climadapt-local.pt/>.

Another project financed by Programme AdaPT consisted in a collaborative platform for the adoption of measures for adaptation to climate change in industry and services. This platform (<http://www.adaptis.uc.pt/>) is now a reference platform that collects adaptation measures, tools and case studies.

#### **Education:**

Civil protection authority (ANPC) provides a national wide educational programme to children already implemented in more than 300 schools. Subjects related to Disaster Risk Reduction are included in students curricula on several education levels. Universities include these issues not only in the area of civil protection but also in other areas, like land use planning, engineering and geography.

Recently a task force was established between Ministry of Education and Ministry of Environment to assess environmental integration in schools curricula, including Climate Change.

The project on education and climate change award **Clima@EduMedia** (Programme AdaPT) seeks innovative approaches for teaching and learning content related to climate change in the areas of mitigation and adaptation. The project includes several activities such as training on the use of media to communicate science, educational materials with tutorials for teachers on how to introduce media contents for climate change awareness, workshops and labs for collaborative content production, online platform for experience sharing and a final contest for schools to present their best ideas for mitigation and adaptation of climate change.

## SUMMARY TABLE

| ITEM                         | STATUS   | LINK   |
|------------------------------|--|--|
| National adaptation strategy | First National Adaptation Strategy (ENAAAC) adopted in 2010 (2010-2015) and revised in 2015 (ENAAAC 2020 for period 2015-2020); The NAS includes two Regional Adaptation Strategies for the Autonomous Regions of Madeira and Azores | <ul style="list-style-type: none"> <li>• <a href="#">National Adaptation Strategy</a> - (in Portuguese only)</li> <li>• <a href="#">Azores Climate Change Strategy</a> (in Portuguese only)</li> <li>• <a href="#">Madeira Adaptation Strategy - Resolução n.º 1062/2015 da Presidência do Governo Regional da Madeira</a> (in Portuguese only)</li> </ul> |
| Action plans                 | A Regional Climate Change (Adaptation and Mitigation) Action Plan for the Azores Autonomous Region is under development and expected to be finalised in 2017<br>Not considered at this stage   |  |
| Impacts, vulnerability       |  | <ul style="list-style-type: none"> <li>• <a href="#">Coastal National Working Group Report</a></li> <li>• BASE Portuguese case studies (<a href="#">droughts in Alentejo</a>, <a href="#">adaptation plan of Cascais</a>, <a href="#">water retention in Tamera</a>,</li> </ul>  |

|  |   |   |
|--|---|---|
| and adaptation assessments                     |   | <ul style="list-style-type: none"> <li><u>coast of Ílhavo and Vagos</u></li> <li><u>DROUGHT-R&amp;SPI project</u> – Portugal’s case-study:</li> <li><u>Adaptaclima</u> – Adaptation strategy of EPAL</li> <li><u>Project CIRAC</u> - flood risk and vulnerability mapping in climate change scenarios</li> <li><u>CLIMAAT</u> - Climate and Meteorology of the Atlantic Archipelagos</li> <li><u>ADAPTARia</u> - Climate Change Modelling on Ria de Aveiro Litoral - Adaptation Strategy for Coastal and Fluvial Flooding</li> <li><u>ImpactE</u> - Impactos na Saúde em Portugal de Eventos Extremos: Passado, Presente e Futuro</li> <li><u>Iberia Change</u> - Forecasting impacts of climate change on Iberian biodiversity</li> <li><u>Project SIAM - Municipality of Cascais</u></li> <li><u>Local strategy for climate change of the Municipality of Almada</u></li> </ul> |
| Research programs                              | CIRCLE - Climate Impact Research Coordination for a Larger Europe (includes an InfoBase with references to more than 100 Portuguese research projects on climate change adaptation) | <ul style="list-style-type: none"> <li><a href="http://www.circle-era.net/">http://www.circle-era.net/</a></li> <li><a href="http://infobase.circle-era.eu/">http://infobase.circle-era.eu/</a></li> </ul>  |
| Currently Climate services / Met Office        | <ul style="list-style-type: none"> <li>Observation: Established</li> <li>Climate scenarios: Project under progress (Portal do Clima)</li> </ul>                                     | <ul style="list-style-type: none"> <li>Climate scenarios portal (<a href="http://portaldoclima.pt/en/">http://portaldoclima.pt/en/</a>)</li> <li>SNIAmb - National System of Environmental Information (<a href="http://sniamb.apambiente.pt">http://sniamb.apambiente.pt</a>)</li> <li>Disaster response and losses (<a href="http://www.prociv.pt/">http://www.prociv.pt/</a>)</li> <li>Met Office (<a href="http://www.ipma.pt/en/">http://www.ipma.pt/en/</a>)</li> <li>MeteoGlobal – collaborative observations (<a href="http://meteoglobal.ipma.pt/">http://meteoglobal.ipma.pt/</a>)</li> </ul>   |
| Web portal                                     | Planned   | <ul style="list-style-type: none"> <li>Information about adaptation policy is available at: <a href="http://www.apambiente.pt/index.php?ref=16&amp;subref=81&amp;sub2ref=118">http://www.apambiente.pt/index.php?ref=16&amp;subref=81&amp;sub2ref=118</a></li> </ul>  |
| Monitoring, Indicators, Methodologies          | Addressed under the ENAAC 2020 Thematic Area of “Financing”   |   |
| Training and education resources               | Developed through projects  | <ul style="list-style-type: none"> <li><u>ClimAdaPT.Local</u></li> <li><u>Project F:acts! – Baixo Vouga Lagunar</u></li> <li><u>Clim@EduMedia</u></li> </ul>  |
| 6th National Communication on the UN Framework | Submitted (2014)  | <ul style="list-style-type: none"> <li><u>6th National Communication, NC6 (in English only)</u></li> <li><a href="http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/prt_nc6_addendum.pdf">http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/prt_nc6_addendum.pdf</a> (addendum)</li> </ul>  |

|                                    |  |  |
|------------------------------------|--|--|
| Convention<br>on Climate<br>Change |  |  |
|------------------------------------|--|--|

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The Thematic Areas under the ENAA 2020 are coordinated by the following entities:

- Research and innovation – [FCT Foundation for Science and Technology](#); [APA Portuguese Environmental Agency](#)
- Spatial planning - [DGT General Directorate of Territory](#); [ANMP National Association of Portuguese Municipalities](#); [APA Portuguese Environmental Agency](#)
- Water resources - [APA Portuguese Environmental Agency](#)
- Funding, implementation and report - [APA Portuguese Environmental Agency](#)
- International cooperation - [Camões – Institute for Cooperation and Language](#); [APA Portuguese Environmental Agency](#)
- Communication and divulgation – [IPMA Portuguese Sea and Atmosphere Institute](#); [APA Portuguese Environmental Agency](#)

The Sectoral Groups under the ENAA 2020 are coordinated by the following entities:

- Agriculture - [GPP Directorate of Planning and Policies](#); [DGADR Directorate General for Agriculture and Rural Development](#)
- Biodiversity - [ICNF Institute of Nature and Forest Conservation](#)
- Economy - [DGAE General Directorate of Economic Activities](#)
- Energy - [DGEG General Directorate of Energy and Geology](#)
- Forests - [ICNF Institute of Nature and Forest Conservation](#)
- Health - [DGS General Directorate of Health](#)
- Safety of people and assets – [ANPC National Authority for Civil Protection](#)
- Transports and communications – [IMTT Institute of Mobility and Transports](#); [ANACOM National Authority for Communications](#)
- Coastal areas and sea - [APA Portuguese Environmental Agency](#); [DGPM Directorate General for Maritime Policy](#)

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