Adaptation in Portuguese cities: some remarks and examples

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Portugal
Portugal: a brief description

- Total area: 92,090 km² (35,645 sq mi)
- Coastline: 943 km (mainland) + 917 km (islands)
- Population: 10.64 million
- 61% urban population
- Population density: 115 inhabitants/km²
- Life expectancy at birth: 78.7 years
- Mean years of schooling: 8 years;
  School life expectancy: 16 years
- GDP per capita, 2009: 21,370 USD (PPP)
- HDI: 0.889 (very high human development),
  41st among 187 countries and territories
Portugal: a brief description (cont.)

- One of the oldest countries in Europe (sovereign nation since 1143)
- Republic (since 1910), with democratic parliamentary government (democracy since 1974)
- Member of the United Nations (1955), and member of the European Union (EU) since 1986
Portugal: a brief description (cont.)

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As part of the EU, many of the economic and political decisions are coordinated among the 27 Members States, through a system of supranational independent institutions and intergovernmental negotiated decisions.
Climate change Adaptation in Europe

Climate change mitigation and adaptation are priorities in European policy agenda

Main expected impacts of climate change in Europe include:
- increased risk of coastal and river floods, droughts,
- loss of biodiversity, threats to human health,
- and damage to economic sectors (e.g., energy, forestry, agriculture, tourism)
Projected impacts in Europe

- **Arctic**
  - Decrease in Arctic sea ice coverage
  - Greenland ice sheet loss
  - Higher risk of biodiversity loss

- **North-western Europe**
  - Increase in winter precipitation
  - Increase in river flow
  - Northward movement of freshwater species
  - Higher risk of coastal flooding

- **Coastal zones and regional seas**
  - Sea-level rise
  - Higher sea surface temperatures
  - Northward movement of species
  - Increase in phytoplankton biomass
  - Higher risk for fish stocks

- **Northern Europe (boreal region)**
  - Less snow, lake and river ice cover
  - Northward movement of species
  - More energy by hydropower
  - Lower energy consumption for heating
  - Higher risk of damages by winter storms
  - Increased river flows
  - Higher forest growth
  - Higher crop yields
  - More (summer) tourism

- **Mountain areas**
  - High temperature increase
  - Less glacier mass
  - Less mountain permafrost
  - Higher risk of rock falls
  - Upwards shift of plants and animals
  - Less ski tourism in winter
  - Higher soil erosion risk
  - High risk of species extinction

- **Central and eastern Europe**
  - More temperature extremes
  - Less summer precipitation
  - More river floods in winter
  - Higher water temperature
  - Higher crop yield variability
  - Increased forest fire danger
  - Lower forest stability

- **Mediterranean region**
  - Decrease in annual precipitation
  - Decrease in annual river flow
  - Increasing water demand for agriculture
  - Lower crop yields
  - More forest fires
  - Less energy by hydropower
  - More deaths by heat waves
  - More vector-borne diseases
  - Less summer tourism
  - Higher risk of biodiversity loss
  - Higher risk for desertification

Source: SOER, 2010
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In April 2009, the European Commission presented the White Paper on Adaptation - a policy paper with the framework for adaptation measures and policies to reduce the European Union's vulnerability to the impacts of climate change, emphasizing the importance of knowledge and information sharing....

... complementing technology, ecosystem-based, and behaviour/management/policy adaptation measures, at the regional, national and local levels.
Climate change in Portugal

- Mild climate, with Atlantic influence in the North, and Continental and Mediterranean in the South
- Average daytime max. temperature:
  - 12°C (Winter, Dec-Feb), 22°C (Spring, March-May; Autumn, Sept-Nov),
  - 25°C (Summer, June-Aug) but can go up to 40°C

Climate change is expected to modify the timing of seasons:
shortening the growing season (Spring), prolonging drought periods,
which contributes to soil degradation and increased risk of desertification
→ especially in the South
Portugal has 10 river basins, of which 4 (Minho, Douro, Tejo and Guadiana) are internationally shared with Spain.

Water management, in cooperation context, is the oldest and most important area of environmental public policy in Portugal.

In Portugal, the current Water Law (2005) is the national correspondence to the European Water Framework Directive (2000) - the main legal framework to protect and restore clean water and ensure its long-term, sustainable use.
Adaptation in Portugal: examples

Prepare for intense rainy events and the risk of floods in river basin areas


In Portugal, the Instituto da Água (INAG, water institute) monitors the levels and the quality of water ...

... through modern radar for meteorological observations

Expl: Municipality of Loulé (Algarve) radar that captures data on intensity of rain within 200km distance
INAG also implementing projects to prevent floods, especially near by urban areas, controlling flows.
Adaptation in Portugal: examples (cont. 2)

Urban green infrastructures can also make cities more resilient to climate pressures

Under the management of local municipalities, there is now a total of 3,900 Waste Water Treatment Plants (ETARs) treating the water from industries and homes of 76% of the Portuguese population, and reducing the pollutants before discharges

Municipalities currently promote the construction of buildings with infrastructures to re-use water from rain for non-drinkable usages (e.g., gardening, washing car)
Other Adaptation examples

Mobility, vital in a city, is an area where much can be done in terms of reducing GHG, air pollution, noise, and land-take for roads and parking areas.

European cities favour the use of collective public transports, aiming for an even greater attractive frequency, comfort, easy access, reliability of services, and intermodal integration.

Several European cities are also encouraging cycling as a mean of regular transport, building dedicated paths in roads.
Concluding remarks

Cities are ecosystems, open and dynamic; they develop and adapt, through human action and in interaction with other ecosystems;

Rethinking urban design, infrastructures, and transports;
having better information (and sharing them);
and improving urban planning through coordinated efforts at local, national and regional levels...

... seems a necessary way to turn urban ecosystems at the forefront of climate change mitigation and adaptation and to improve the quality of our lives, now and in the future!
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Thank you!

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• European Commission, Directorate-General for the Environment: http://ec.europa.eu/dgs/environment