



Position Paper on Modeling Activities

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1. Introduction (1/1)

- ❑ First project 'Implications of Climate Change for the Albanian Coast', in the frame of the Coastal Areas Management Program of UNEP/MAP. (Since 1993) Available at http://www.unepmap.org/index.php?module=library&mode=mts&action=results&_stype=3&s_cat=egory=MAP%20Technical%20Reports%20MTS&s_descriptors=Climate%20Change
- ❑ First and Second National Communications of Albania to UNFCCC, prepared by the Climate Change Programme of UNDP, in the frame of the projects 'Enabling activities for the preparation of national communications of Albania related to the UNFCCC'. Available at http://www.al.undp.org/content/albania/en/home/library/environment_energy/
- ❑ The Third National Communications of Albania to UNFCCC is under preparation

(In all these reports the respective Vulnerability and Adaptation Chapters consist of climate change scenarios, impact analysis of current and expected climate changes, assessment of adaptation measures and actions.)



1. Introduction (1/2)

Impact analysis of current and expected climate changes and adaptation has been focused on sectors/systems:

- ❑ Water resources (FNC, SNC and TNC);
- ❑ Natural ecosystems (FNC, TNC);
- ❑ Managed ecosystems (agriculture, forestry- FNC);
- ❑ Energy, transport (FNC, SNC);
- ❑ Tourism (FNC, SNC and TNC);
- ❑ Population (FNC, SNC and TNC);
- ❑ Health (FNC and TNC)
- ❑ Natural disasters related to climate (TNC)



1. Introduction (1/3)

Contribution on climate modeling, Climate Impact Analyses

- ❑ The project, 'Identification and Implementation of Adaptation Response Measures in the Drini - Mati River Deltas' (DMRD), a pilot MSP project, financed by GEF/UNDP/Government of Albania. Available at http://www.al.undp.org/content/albania/en/home/library/environment_energy/
- ❑ The project "Reducing the Vulnerability of Albania's Agricultural Systems to Climate Change: Impact Assessment and Adaptation Options' Managed ecosystems (agriculture, forestry- FNC)" Financed by World Bank
- ❑ The project "Climate Vulnerability Assessments: An Assessment of Climate Change Vulnerability, Risk, and Adaptation in Albania's Energy Sector" Financed by World Bank



Methodological Approach

(used only by the project implemented by the Climate Change Programme of UNDP)

1.1 Climate modeling

- The model MAGICC/SCENGEN (v. 5.3, v 2). (The Climate Change scenarios for temperature, precipitation, mean sea level pressure and sea level rise) <http://www.cgd.ucar.edu/cas/wigley/magicc/>
- The changes are generated for each emission scenario up to the year 2100, by using a multi-model average. (Multi-model averages are often better than any individual model at simulating present-day climate)
- To evaluate the expected impacts of sea level rise, the model DIVA is run in parallel with MAGICC (with the same scenarios as in MAGICC) for Albanian coastal part. DIVA, a fully dynamic and interactive tool (product of the DINAS-COAST consortium), consists of a global coastal database, a model, a set of scenarios and a GUI that enables its users to simulate the effects of climate and socioeconomic change and of adaptation on natural and human coastal systems at national, regional and global scales)



Methodological Approach

1. 2 Model Validation

- ☐ The General Circulation Models (GCMs) used to run SCENGEN are selected on the basis of their ability to accurately represent current climate, for Europe and Balkan as well as for the globe
- ☐ In Albanian case the annual precipitation is used as the validation variable.
- ☐ For this model validation the statistics used are: pattern correlation (r), root-mean-square error (RMSE), bias (B), and a bias-corrected RMSE (RMSE-corr)

1. 3 Climate Change Scenario

- ☐ The seasonal and annual expected changes in temperature and precipitation patterns for Albania, developed by using the mentioned methodology given a low resolution (50*50 km), that is not appropriate for adaptation. Given that a statistical downscaling process up to 1*1 km, taking into account the topography, is carried out for different parts of Albanian territory as per project focus.



Methodological Approach

1.4 Climate indices

The changes in following climate indices are evaluated to be used in impact analysis:

- [Maximum temperatures \$\geq 35^{\circ}\text{C}\$](#)
- [Minimum temperatures \$< -5^{\circ}\text{C}\$](#)
- [Hazardous precipitation](#)
- [Number of days with hazardous precipitation and SPI3 values](#)
- [Expected changes in growing season](#)
- [Degree days for heating and cooling](#)
- [Tourism climate index \(TCI\)](#)



2. Impact analyses (2/1)

The impact analysis is based in three main approaches:

- ☐ Modelling
- ☐ Analogue studies
- ☐ Expert judgement



2. Impact analyses (2/2)

For impact analysis of climate change in different sectors/systems:

- ☐ Water resources: WATBAL, WEAP, empirical statistical models
- ☐ Agriculture: CROPWAT 8, statistical models, analogue studies, expert judgment
- ☐ Forestry: statistical models to evaluate the shift in bioclimatic floors, DIVA (expected changes in coastal forestry areas), analogue studies, expert judgment
- ☐ Biodiversity : GIS maps to evaluate the loss of biodiversity from sealevel increase; DIVA (total wetland area, net loss of wetland area, low unvegetated wetlands area), empirical models analogue studies, expert judgment
- ☐ Tourism : Statistical models , Tourism Comfort Index , expert judgement , GIS
- ☐ Population&settlements: GIS maps and DIVA to evaluate the population and the loss of settlements threatened by the sealevelrise in coastal areas;
- ☐ Energy: LEAP to develop the scenarios of the energy demand and supply under the climate change conditions
- ☐ After Mieczkowski Z (1985) The tourism climatic index: a method of evaluating world climates for tourism. Can Geogr 29: 220–233



3. Adaptation Analysis (3/1)

Adaptation responses and decisions proposed by each and every sector/system are categorized as measures and strategies that contribute either to:

- ☐ Building adaptive capacity – creating the information (research, data collecting and monitoring, awareness raising), supportive social structures (organisational development, working in partnership, institutions), and supportive governance (regulations, legislations, and guidance) that are needed as a foundation for delivering adaptation actions; or
- ☐ Delivering adaptation actions – actions that help to reduce vulnerability to climate risks, or to exploit opportunities (classified as EbA, CbA, hard engineering)



3. Adaptation Analysis (3/2)

Adaptation responses and decisions proposed by each and every sector/system are categorized as measures and strategies that contribute either to:

- ☐ In TNC we are using another classification for adaptation measures: green, gray, soft and fiscal adaptation measures
- ☐ The criteria already used by the adaptation team within the Climate Change Programme have been grouped under five separate **Heading Criteria** (*Financial Indicative Cost, Time Frame Criteria, Potential Partnership, Principle of Additionality Criteria, Win-Win Criteria*)



Thank you for your
attention!

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