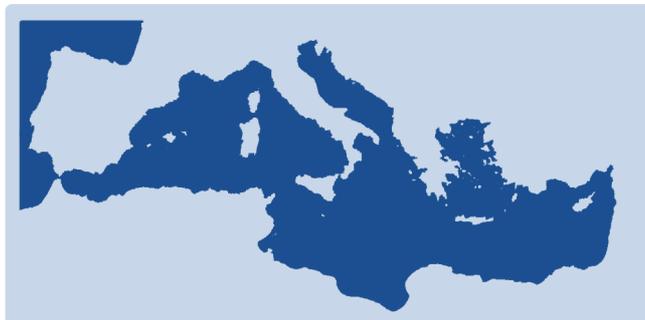


Collaborative Project



CLIM-RUN

Climate Local Information in the Mediterranean
region Responding to User Needs



WP 1 – Climate Services Analysis and Support
Task 1.3 Guidelines for climate service network

D 1.4: Recommendations

Project No. 265192– CLIM-RUN

Start date of project: 1st March 2011

Duration: 36 months

Organization name of lead contractor for this deliverable: ENEA

Due Date of Deliverable: November 2013

Actual Submission Date: Dec 2013

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1 - INTRODUCTION

A better application of climatic information throughout several productive sectors need to be facilitated. The simplified scheme, where the data-providers (Met-services, climatic centers, etc) develop tailored products and dialogue directly with a large number of different type of users, does not fit with a large diffusion of climate information into several societal niches. A more complex framework is needed, considering an intermediate layer between data-providers and users, able to interact with both, to translate information and languages, to identify requirements and to trigger new perspectives.

The Clim-Run project aimed at developing a protocol for applying new methodologies and improved modeling and downscaling tools for the provision of adequate climate information at regional to local scale that is relevant to and usable by different sectors of society (policymakers, industry, cities, etc).

In this context, the main objective of the Clim-Run protocol is to support the envisioned bottom-up approach for the development of climate services and the transfer of improved climate information to stakeholders. More precisely, the protocol is intended to support this bottom-up approach at two main levels:

- the first aim of the protocol is to propose some methods and tools to be used to involve and communicate with stakeholders at the Clim-Run project level.
- the second aim of the protocol is to propose a business model for the development of climate services at the Mediterranean level, based on the results of the bottom-up approach of the project.

These two elements have been widely detailed in D1.1. Here, we would like to discuss the recommendations for the development of a Mediterranean wide climate service network, and how the Clim-Run experience can provide some key elements.

2 - WHY DO WE NEED A MEDITERRANEAN CONTEXT

The Mediterranean region has been assessed by the Intergovernmental Panel on Climate Change (IPCC) as one of the most vulnerable region to the impacts of climate change, particularly its southern and south-eastern parts and a lot of material is available in the Fourth Assessment Report, and all these results have been confirmed by the Fifth Assessment Report.

Main impacts of climate change in the Mediterranean coastal and marine zones are related to the consequences of changes in the meteorological conditions, mainly temperature, precipitation patterns, and extreme events, and changes at sea, temperature, acidification and sea level rise.

Profound changes may occur at the level of ecosystems and their richness in terms of biodiversity. The gradual increase of terrestrial and marine temperatures will cause the modification of natural habitats, which in the Mediterranean are already subject to intense pressures (pollution, over fishing, habitat degradation, invasive species). Equilibrium conditions of ecosystems will be disrupted and there are many uncertainties about the way in which different species will be able to adapt or otherwise to these changes – their pace of evolution being indeed slower than that of the expected climate changes. A massive loss of biodiversity, in addition to that already projected as a result of direct human pressures, is possible during the 21st century, with a drastic reduction in associated ecosystem services (supply of fresh water, productive soil conservation, resistance to invasive pests, pollination of plants, reproduction of fish resources, moderation of coastal erosion, climat regulation...). Ecosystems on land will also be affected by climate change in addition to pressures from human activity. One of the domains where increased risks are already felt is the occurrence of forest fires.

The expected rise in sea level will generate submersion of low coastal areas and the intrusion of marine water into aquifers will cause problems of groundwater salinisation. Furthermore, growing littoralisation of activities and settlements has led to the proliferation of coastal developments, most of which continue to have catastrophic effects in terms of coastal erosion.

Changes in precipitation and evapo-transpiration patterns will affect run-off, river flow and ground water, therefore the availability of freshwater. Climate change will tend to increase the differences of water availability which already exist between the North and South shores of the Mediterranean. A concerted adaptation strategy for water resources is certainly one of the most crucial needs for Mediterranean countries.

Tourism may directly suffer from problems of temperature increase, water supply scarcity, coastal erosion, changes in the marine environment, reduced marine water quality, and possible restrictions or new regulations on coastal infrastructures. Urban areas are particularly sensitive to heat waves, water scarcity, extreme events, and coastal cities may in addition be affected by sea level rise. Energy services and resources will be increasingly affected by climate change, changing trends, increasing variability, greater extremes, and the availability of water.

3 - A REGIONAL MEDITERRANEAN FRAMEWORK FOR CLIMATE SERVICES

The Regional Framework for Climate Services is intended to enable the establishment of regional mechanisms for successful cooperation between all Mediterranean countries, in dealing with adaptation to climate change impacts in several sectors (coastal, tourism, energy etc) and in providing actionable climate information for present climate and near future (seasonal to decadal time frame). Its strategic objective is to ensure the Mediterranean countries build their capacity to be resilient to the risks and impacts of climate variability and of climate change through implementing adaptation measures; improving decision making and good governance, improving understanding of climate change and their effects; education and awareness; and developing and strengthening partnership and cooperation.

The Regional Framework for Climate Services can guide countries to improve and share understanding of climate change impacts, particularly in coastal and marine areas of the region. It will stimulate national capacity building and awareness raising by reviewing and revising policies to incorporate climate change risks in sectorial policies, plans and programmes, improving awareness and mobilization among key stakeholders. In addition, the Framework will help establish a regional

system of exchange of information and best practices on adaptation to climate change impacts in key thematic areas of Mediterranean interest, such as freshwater resources, energy, urban areas, tourism, coastal agriculture and fisheries. It will, also, assist establishing partnerships and cooperation between the countries in the Mediterranean and with other regions.

This Regional Framework can integrate several ongoing activities developed by WMO (the GFCS), UNEP/MAP, and the European Commission. It should indicate long term goals, to be further developed in objectives that have to be achieved in the mid-term period (8-10 years), and relevant type of activities at regional and national levels for achieving the established objectives.

4 - AIM AND OBJECTIVES OF THE REGIONAL FRAMEWORK FOR CLIMATE SERVICES

The long term vision is that the Mediterranean people, their livelihoods and their environment are resilient to the risks and impacts of climate variability and of climate change.

The overall objectives of the Regional Framework for Climate Services are to:

- Coordinate existing initiatives in order to have a cost-effective approach;
- Increase the use of climate information at different levels of the society;
- Trigger the development of research initiatives at regional and national level;
- Help raise awareness and build-up capacities in the Region to take adaptation actions;
- Support adaptation policy setting and planning at the regional and national levels;
- Help establish mechanisms to exchange experience and disseminate knowledge, training, information and best practices on adaptation to climate change impacts throughout the region and with other regions.

5 - PRIORITIES FOR ACTION

Three main issues need to be first addressed in order to develop and support this Mediterranean framework:

1. Building information, understanding and capacity to cope with climate variability, climate change and impacts;
2. Integrating initiatives at the Mediterranean level;
3. Strengthening regional and national research activities to support the development of reliable and actionable climate information.

5.1 - Building information, understanding and capacity to cope with climate variability, climate change and impacts

In order to make a proper decision for planning and implementing adaptive measures decision makers have to be well informed. There are substantial gaps in knowledge on impacts of climate change, vulnerabilities to those impacts and effectiveness of adaptation options. Better understanding of climate change and its consequences, not only at the global scale but at the regional scale, is needed in order for better planning and implementation of adaptive measures. This requires research developments focused on the Mediterranean region with respect to atmospheric and oceanic patterns, biological aspects and socio-economic issues, the reinforcement of observation capabilities and of means to collect and make use of data in the various relevant domains. There is also a need to improve the synthesis and dissemination of information for decision-makers. Decision-makers need improved information, guides and tools which are tailored to their field and scope of operation to enable effective adaptation. Translating climate change science into applicable information products through user-friendly materials and tools is necessary to inform decision makers at all levels.

5.2 - Integrating initiatives at the Mediterranean level

This Regional Framework can integrate several ongoing activities developed by WMO (the GFCS), UNEP/MAP, and the European Commission. WMO is fostering the GFCS with three main levels: global, regional and national. A priority will be to work at regional scale in order to tailored global products and to trigger national initiatives. The regional outlook forum could be an essential tool, but it would be important to cover all the Mediterranean basin in order to bridge experiences

between European and African countries. UNEP/MAP initiative to develop a Mediterranean framework for climate adaptation is another key ingredient. Both initiatives should collaborate in order to strengthen the adaptation capacity and the preparedness of the Mediterranean society to climate variability and extremes. EU could play a relevant role in order to build an adaptive capacity: establishing systems for data collection and monitoring, evaluation processes, awareness-rising initiatives, and policies to encourage, support and require responsible persons to incorporate climate change risks and adaptation into decision-making.

The Copernicus Climate Change service and the JPI-climate responds for Europe to environmental and societal challenges associated with human-induced climate changes. These two initiatives can contribute to the development of a regional framework and they could support the integration action in terms of resources and of scientific expertise. These actions can concentrate first on the following priorities:

- involving met-services, but also educational and research institutions in a multi-disciplinary and multi-stakeholders approach;
- developing a strategy for data monitoring and access for several climate user-oriented parameters (rainfall, radiation, ...);
- developing targeted training activities for the intermediate tier which will trigger and maintain most of the hand-user services in the Mediterranean; most of weather services are driven by the production of forecasts, while the climate services define operational side starting from the users point of view. So, we need to foster the layer which is client specific.

5.3 - Strengthening regional and national research activities to support the development of reliable and actionable climate information

A key element for developing new products at regional scale is the availability of large data-sets of climate simulations. CORDEX is an important example of how down-stream products of the research activities will trigger new business initiatives and new services. Euro-CORDEX and Med-CORDEX are producing significant data-base for the Euro-Mediterranean region. The maintenance and further development of tailored products for different impact sectors should be continuously funded.

A long term strategy should be envisaged to support the development of large ensemble of simulations, decadal exercise and modeling improvement to better reproduce local and regional climate and to better simulate extreme events (i.e., floods, droughts, heat waves). Some needs of the stakeholders are not addressable with current research/knowledge (ex. high resolution data-sets of direct solar radiation which can be produced by assimilating aerosol properties in regional models), but will be possible in two year. For climate services in five years we should start now developing new fundamental research.

Lot of demands from stakeholders need new knowledge in impact's sectors and new capacity in impact modeling, but the climate community is generally not well prepared to address this issue. The European research should strengthen the impact modeling community through initiatives such as ISI-MIP. Multi-sector impact modeling needs to gather a large amount of non –conventional observations (i.e., energy production and consumption, tourism indicators etc) with new challenges and costs.