PRIORITY ACTIONS PROGRAMME

Strategic Partnership for the Mediterranean Large Marine Ecosystem
MedPartnership
Together for the Mediterranean Sea

GEF UNEP

"Together for the Mediterranean"

Report of the 4th Integrative Working Group (IWG) meeting

Split, October 14, 2011

Developing an Integrative Methodological Framework for Coast, Water and Biodiversity Management[1]

Background information

The aims of the meeting were the following:

1. To update on the drafted **guidelines** for the preparation of coastal plans for the Mediterranean; to update on the implementation of the guidelines in the two integrative coastal plans; to update on the methodological and practical integration of climate change aspects; and to agree on the continuation of the work.

Attendance:

PAP/RAC:
Branka BARIĆ, Programme Officer
Marina MARKOVIĆ, Programme Officer
Daria POVH ŠKUGOR, Programme Officer
Marko PREM, Deputy Director
Neven STIPICA, Programme Officer

PAP/RAC consultants:
Veronique EVERS, ICZM Junior Consultant
Anil MARKANDYA, Consultant, Climate Change Specialist
Brian SHIPMAN, Consultant, Methodology Specialist, IWG Team Leader

UNESCO-IHP:
Matthew LAGOD, Consultant, Methodology Specialist
Jose Luis MARTIN BORDES, IHP Project Co-ordinator

GWP Med:
Dimitris FALOUTSOS, Programme Co-ordinator for South-eastern Europe
Michael J. SCOULLOS, Chairman

Date and venue:
October 14, 2011
PAP/RAC premises in Split.

[1] Strategic Partnership for the Mediterranean Large Marine Ecosystem (Med Partnership)
Regional Component: Implementation of agreed actions for the protection of the environmental resources of the Mediterranean Sea and its coastal areas
Component 1. Integrated approaches for the implementation of the SAPs and NAPs: ICZM, IWRM and management of coastal aquifers - Sub-component 1.2. ICZM

The Agenda of the meeting is attached as Annex I. The power point presentations given are attached as Annex II.

Major topics discussed and meeting results:

I Draft Guidelines for the preparation of coastal plans

1. Mr. M. Prem opened the meeting and welcomed the participants on behalf of PAP/RAC. He then provided an overview of meeting objectives, agenda items and the background.

2. Mr. B. Shipman presented a revised and summarised version of the Guidelines. He pointed out that some of the titles of the ICZM process stages had been revised in order to be simpler, more user friendly and precise. The participants of the meeting expressed their satisfaction with the changes made, as well as with the presented summarised part of the Guidelines.

3. Their first comments referred to the graphical presentation of the process, which, as presented in a linear mode, could not completely express the practice, which is more dynamic and spiral. The proposal was given to represent the process with a spiral in order to emphasise its flexibility and avoid the linear representation of the process, if graphically feasible. In addition, it was pointed out that the real process was more of a continuum and not step-wise, as it was presented. However, these artificial steps could remain if the milestones and outputs were added.

4. In order to emphasize the importance of the socio-political process for the ICZM, it was proposed to present it graphically as a parallel road map of the technical process where the milestones could be the meetings with stakeholders. Finally, it was recommended by GWP representatives to present this issue briefly in the introduction.

5. Several other proposals were given, as follows:
   - to identify places for the feedback, possibly in the three central parts of the diagram;
   - to emphasise that the vision and other results achieved during the early stages of the plan preparation process could be revisited and reconsidered in the following stages;
   - importance of planning of actions that were aiming to secure the ownership and sustainability of outcomes was stressed;
   - related to the analysis of the future, to focus on the key economic sectors and risks;
   - as to the title “designing the future”, it was claimed that only a plan could be designed, not the future. It was also recommended that the future should be first identified. Finally, the participants remarked that the term “future” was a substitute for scenarios;
   - to introduce a toolkit and good examples, as well as some guidance for the operationalisation.

6. Regarding the introduction, it was proposed to show better the need for integration, starting from the ICZM Protocol and WFD, and the MSFD. The key message for the authorities should be that if they want to plan for any of the three areas – river, coastal zone or the sea, they should do it in an integrated way. Benefits of integrative planning should be more emphasised in the Guidelines. The fact of relevance of the WFD and MSFD for the southern Mediterranean countries was questioned. However, many of these countries have been undertaking different forms of obligation related to IWRM in front of the EU and Rio, and these would be tackled in the Introductory part of the Guidelines. All the partners will contribute to the introductory chapter.

Conclusion 1:

- all the partners approved a new simplified version of the Process, as well as a Short Summary of the Guidelines and agreed on the inclusion of an Introductory part;

- partners should send contributions to the introduction to PAP **by November 15**;
- PAP should update the remaining part of the Guidelines accordingly**.**

7. A discussion followed on the strengths and weaknesses of the integration between the river basin plans and the coastal zone plans emphasising that in case when a plan (or some other document) already existed, eventual gaps should be revealed and a focus put on issues not covered by the relevant plan.

8. Having in mind different policies and status of Mediterranean countries, the need was expressed to determine at which stages and levels the institutional, legal or other interventions should be included in the existing legal and institutional mechanisms, frameworks or documents.

9. The partners agreed to start thinking about and sending proposals on "Integrative Issues", chapters in the Guidelines in each of the stages. For these chapters practical experience of the two plans will provide some input, but the partners' experience from other projects, as well as a general knowledge, is a source of information as well.

Conclusion 2: The following workplan was agreed:

- GWP to send the methodological input for the Stakeholder Analysis with an Involvement Plan and for the Communication Strategy **by November 30;**
- all the partners to start sending contributions to the integrative issues following the agreed stages of the ICZM Process.

II Update and emerging issues from the demonstration projects

10. Partners reported the impressions from the 1st harmonization meeting and from the related field trip. As for the Stakeholder Analysis, it was concluded that the Scoping Report should contain only stakeholder identification or mapping, while the analysis should be performed by the expert in the field and presented as a self standing output.

11. Related to the governance structure under establishment in the Buna/Bojana integrated management plan, the example of the CAMP Spain of PAP/RAC was illustrated where besides the technical committee, a Coastal Council was established including administration representatives and experts, as well as a Coastal Commission formed by policy makers. The GWP representatives remarked that the Coastal Council was a peer of the Water Council and pointed out that in Albania a Water Council was established by the legal decree. WFD asks for the transboundary Water Council that should facilitate countries to fulfill their obligations. In addition, in Albania, there is a transboundary Flood Committee and a Drin Core Group.

12. Related to the vision, the GWP representatives described the process undertaken with the Drin dialogue, where the process of building a vision was delivered through 2 to 3 meetings. The starting point of the process is to define what is unacceptable and unsustainable. In this process it is important to identify the most important steps in order to remove the obstacles and proceed towards the "desired direction". Finally, the participants agreed that there was no need for the vision document, since the short vision statement was more powerful. The World Bank's vision - "World free of poverty" was given as a good example. The importance of the meaning of sustainability to the stakeholders was emphasized, as well as the importance of the vision objectives for the selection of indicators. It was recommended that these objectives should be agreed with the responsible authorities.

13. The Buna/Bojana team representatives expressed the need for advice on indicators. Also, they stressed the need for a closer analysis of the key issues and limits, as well as the importance of

agreeing with the authorities on the issues that were presented in the Scoping Report. Therefore, it was concluded that the Guidelines could propose the methodology to identify the key issues, whether in the form of interviews, questionnaires or some other forms of stakeholder consultations. It was pointed out that the experts were the ones to propose solutions, but that the stakeholders should decide on the priority issues and on the vision. Therefore, it was concluded, the consensus among the stakeholders and the experts is quite important for a good plan.

Conclusion 3: Partners agreed to add the following to the Guidelines:

- presenting a process to reach the Vision and the guidance on typologies or main driving forces needed to be considered in order to readjust the Vision;
- a toolkit;
- good examples;
- hyperlinks;

- Improvements to the Guidelines proposed by partners:
  - to identify the opportunities for the feedback and reconsidering some of previous ideas;
  - in order to avoid the linear representation of the process, to add the outputs and the milestones/meetings; in addition, Prof. Scullos to present the process by a spiral in the Introduction;
  - to present the socio-political process as parallel to the technical one (Prof. Scullos proposed to add this into the Introduction as well);
  - to add the option of issue identification through interviews or questionnaires and other forms of stakeholder consultations;
  - Scoping Report to contain only stakeholder mapping/identification;
  - Vision to be presented as simple as possible; there is no need for a Vision document but for a Vision statement.

III Integrating the Climate Change into the ICZM planning process

14. Integration of climate change was proposed following the planning process agreed. The key issues, concerns, ideas, challenges, tasks and actions were proposed by Prof. Markandya going from the one stage to another. The recommendations on how to present the climate change information to the stakeholders were given pointing out that the stakeholders should be informed that possible actions should include low regret or no-regret measures; action *vs*. postponement; hard *vs*. soft options; and long-term *vs*. short-term options. As regards the vision and objectives, on the climate front a clear statement was needed of the importance given to adaptation to climate change as a high-level objective. That could be followed by a list of the areas where action was seen as required, and the cross-sectoral priorities (e.g. adaptation to climate *vs.* short-term development imperatives). The main guidelines for indicator selection were proposed. The climate change impacts are to be considered for different sectors and alternative scenarios and options considered. Finally, it was stressed that the ICZM involved a wide range of instruments to implement the strategy and the plan, whereas the central pillar was the land-use regulation and certain standards. In addition, different fiscal instruments were proposed like transferable development rights, the use of charges that better reflect the cost of services, development of insurance markets and charges on tourists. It was recommended that the ICZM should not give priority to hard solutions, but to look for lower cost options, which involved early warning systems and as mentioned use of fiscal and other incentives. The ICZM should also provide guidance to the private and to the construction sector on how to address the additional climate risks.

15. In the discussion that followed the participants agreed on the importance of integrating climate change issues into the ICZM process and the Guidelines, as presented, stage by stage. The importance of considering a wide set of different adaptation options was discussed, emphasizing the natural adaptations as well. The importance of communicating with the National Climate Offices

was emphasized, as well as the overarching Cairo principle. A UNESCO representative informed the participants on the UNESCO set of guidelines for transboundary rivers. Also, he reminded the participants that UNESCO wasn't participating directly in the new GEF Climate variability and Change project, but expressed their interest to participate. The impression of politicians preferring hard solutions was shared, and the importance of informing public well about all pros and cons was pointed out.

Conclusion 4: PAP, in collaboration with Prof. Markandya, is going to integrate a part on the climate change in the revised version of the Guidelines.

Application of a Methodology for Climate Change Risk Assessment in the Buna/Bojana integrated management plan

16. A study in progress for the Buna/Bojana area was presented. The key tasks of this study were: to identify the key climate change variables and socio-economic change; to identify the key areas of impact and risks to assets and people; and qualification and quantification of impacts. Although the uncertainties regarding climate change are many, some mean values could be taken into account. Impacts to expect are generally in the mid to long term. It was concluded that the most important impacts are likely to be the sea level rise, extreme events and impacts on tourism. Actions taken into account should be robust, justified for a small and for a large type of impact.

17. In the discussion that followed, Mr. Shipman informed that the list of possible options could be proposed, but that the identification of possible costs of the hard options required serious engineering calculations. A UNESCO representative summarized that the plan should consider, inform, have agreed approaches and informed explanations. The GWP representatives pointed out that prior to conclusion of the study, several inputs should be taken into consideration:
    - flooding models from the World Bank Scodar project;
    - information on the existing hydro-power plants upstream;
    - impact on existing infrastructure.

18. In concluding the meeting IWG decided to meet again on the occasion of the next GEF MedPartnership Steering Committee meeting scheduled for April 2012 in Turkey.

Conclusion 5: The next IWG meeting will be organised back-to-back to the next Steering Committee meeting to be held in Izmir, Turkey, in April 2012.

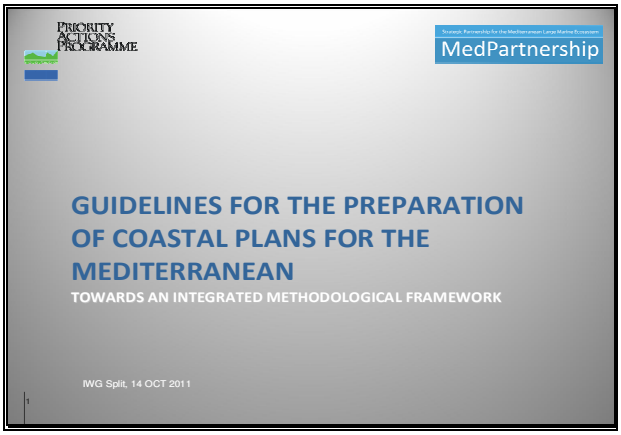
Annex I
AGENDA / TIMETABLE

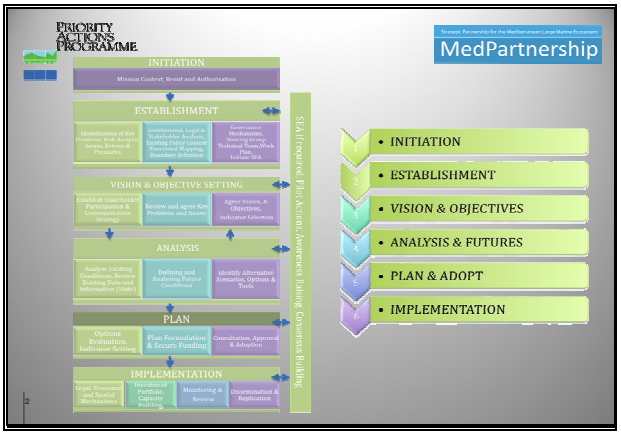
1.	Opening of the Meeting and Meeting objectives (M. Prem, PAP/RAC Deputy Director)	9:00 - 9:10
2.	Introduction to the Draft Guidelines for the preparation of coastal plans (B. Shipman, consultant, Methodology Specialist, IWG Team Leader)	9.10 – 9.45
3.	General discussion and impressions	9:45 – 10.30
4.	Update and emerging issues from the demonstration projects (M. Marković, PAP/RAC and D. Fatsiolus, GWP-Med)	10.30 – 10.45
5.	Discussion	10:45 – 11.15
6.	The way forward – programme of work (B. Shipman)	11.30 – 11.50
7.	Discussion	11.50 – 13.00
8.	Integrating Climate Change (A. Markandya, Consultant, Climate Change Specialist)	14.00 – 14.45
9.	Application of a Methodology for Climate Change Risk Assessment in the Buna/Bojana Integrated Management Plan (A. Markandya)	14:45 – 15:15
10.	Discussion	15:15 – 16:30
11.	Concluding remarks and closure (PAP/RAC)	16.30 – 16:45

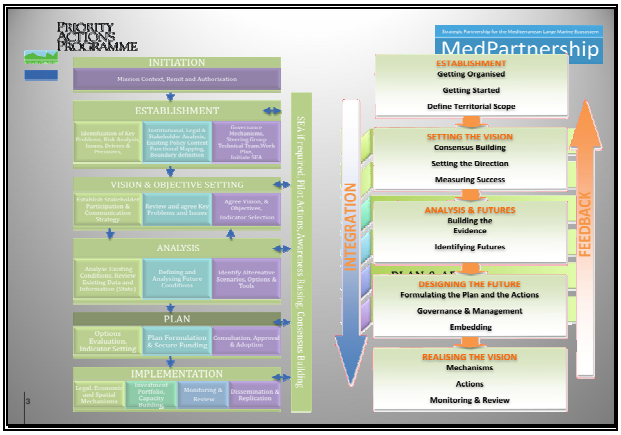
Annex II

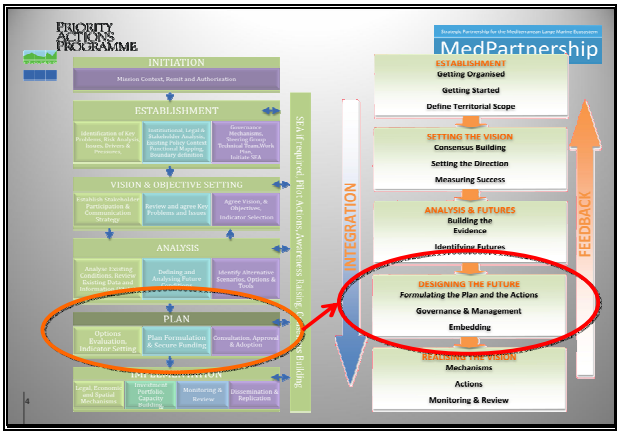
Introduction to the Draft Guidelines for the preparation of coastal plans

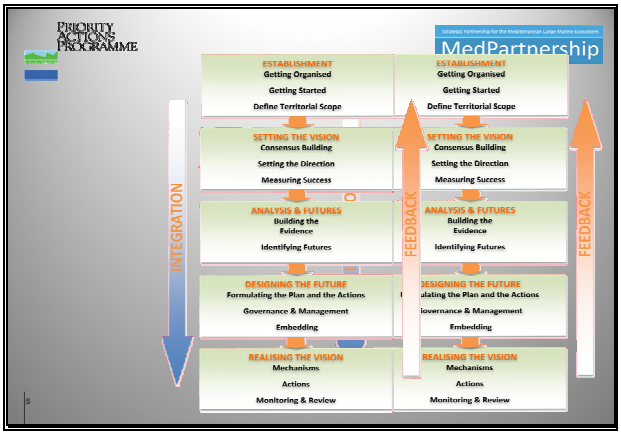
Brian Shipman

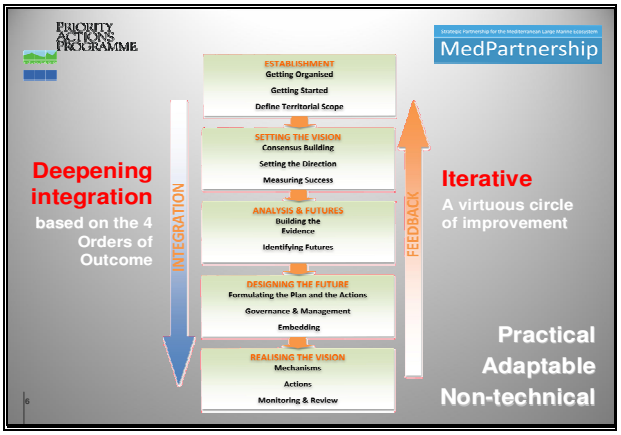


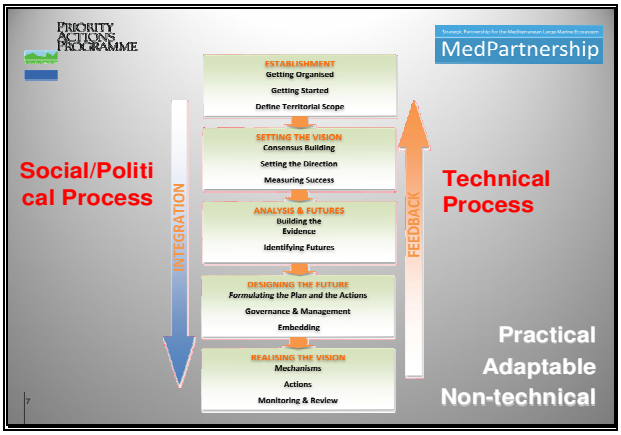








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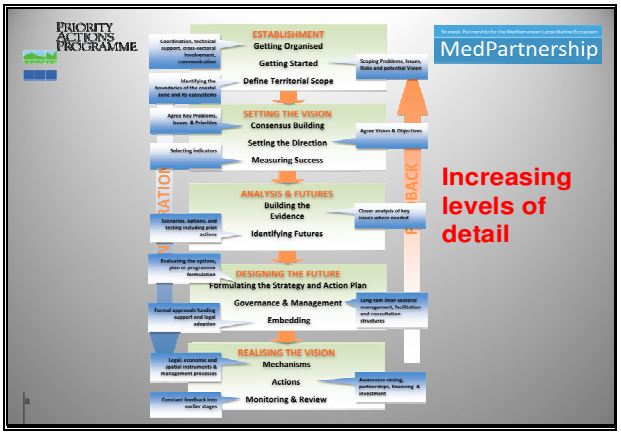
MedPartnership
Social/Political Process
Technical Process
Practical
Adaptable
Non-technical
INTEGRATION
FEEDBACK
ESTABLISHMENT
Getting Organised
Getting Started
Define Territorial Scope
SETTING THE VISION
Consensus Building
Setting the Direction
Measuring Success
ANALYSIS & FUTURES
Building the Evidence
Identifying Futures
DESIGNING THE FUTURE
Formulating the Plan and the Actions
Governance & Management
Embedding
REALISING THE VISION
Mechanisms
Actions
Monitoring & Review
7


PRIORITY ACTIONS PROGRAMME
MedPartnership
Increasing levels of detail
ESTABLISHMENT
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Governance & Management
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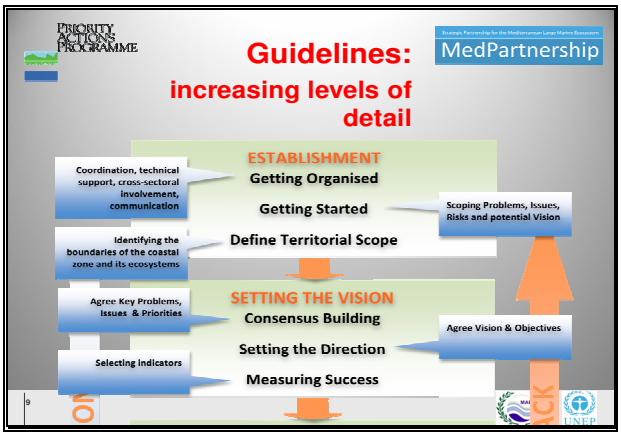
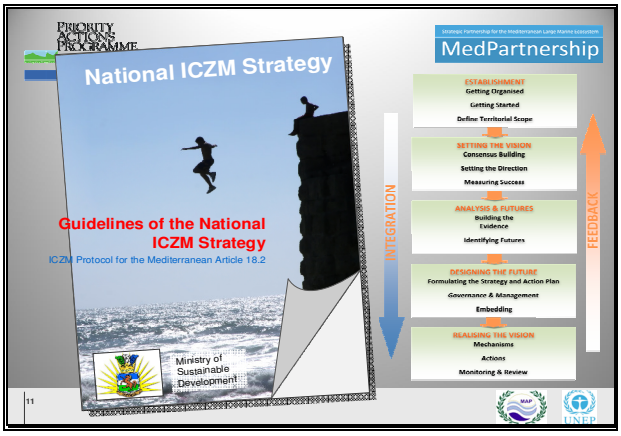
Mechanisms
Actions
Monitoring & Review
8


PRIORITY ACTIONS PROGRAMME
MedPartnership
Guidelines:
increasing levels of detail
ESTABLISHMENT
Getting Organised
Getting Started
Define Territorial Scope
SETTING THE VISION
Consensus Building
Setting the Direction
Measuring Success
Coordination, technical support, cross-sectoral involvement, communication
Identifying the boundaries of the coastal zone and its ecosystems
Agree Key Problems, Issues & Priorities
Selecting Indicators
Scoping Problems, Issues, Risks and potential Vision
Agree Vision & Objectives
9


ANALYSIS & FUTURES
Building the Evidence
Identifying Futures
Scenarios, options, and testing including pilot actions
Closer analysis of key issues where needed
DESIGNING THE FUTURE
Formulating the Strategy and Action Plan
Governance & Management
Embedding
Evaluating the options, plan or programme formulation
Formal approvals funding support and legal adoption
Long-tem inter-sectoral management, facilitation and consultation structures
REALISING THE VISION
Mechanisms
Actions
Monitoring & Review
Legal, economic and spatial instruments & management processes
Constant feedback into earlier stages
Awareness raising, partnerships, financing & investment
10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National ICZM Strategy
Guidelines of the National ICZM Strategy
ICZM Protocol for the Mediterranean Article 18.2
Ministry of Sustainable Development
INTEGRATION
FEEDBACK
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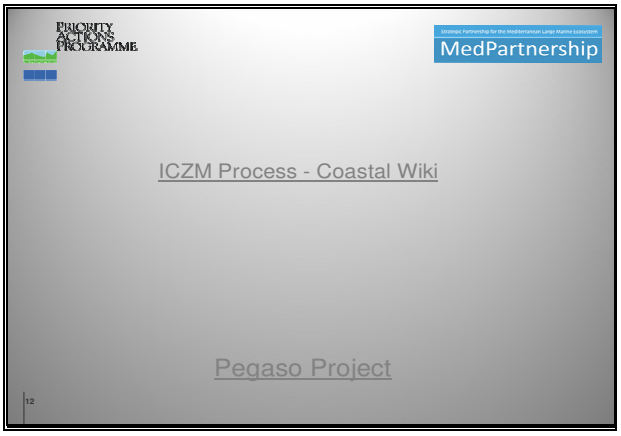
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ICZM Process - Coastal Wiki
Pegaso Project
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Guidelines Structure

For each stage in the Process:

SUMMARY DESCRIPTION & KEY TASKS

OVERALL AIM

LIKELY OUTPUTS

KEY INTEGRATIVE ISSUES (TO BE COMPLETED BY PARTNERS).

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Guidelines Structure

Plus more detailed technical breakdown:

TOOLS & TECHNIQUES

INTEGRATIVE ISSUES

INTEGRATING CLIMATE CHANGE

OUTPUTS OF THE DETAILED TASKS

EXAMPLES

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The Vision Thing…

The Six Principles of Coastal Sustainability – a coast that is:

- **resilient** – resilient to climate change, resilient to natural processes, resilient to human processes
- **productive** – productive financially, competitive, high in value, increasing GDP, alleviating poverty
- **diverse** – diverse in ecological, diverse in experiential terms
- **distinctive** – distinctive culturally, distinctive in marketing
- **attractive** – attractive to visitors, investors and to local people
- **healthy** – free from pollution

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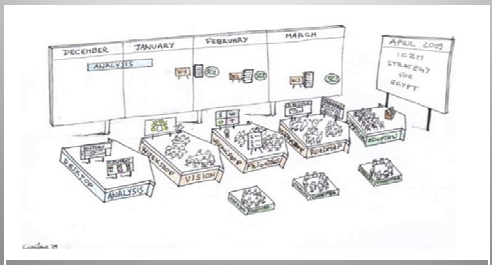
Egypt ICZM statement…



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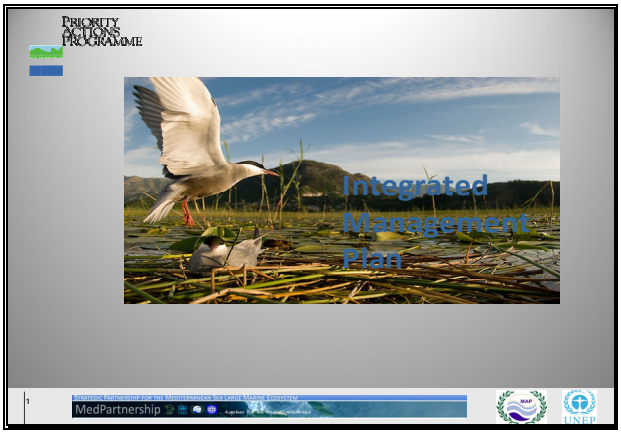
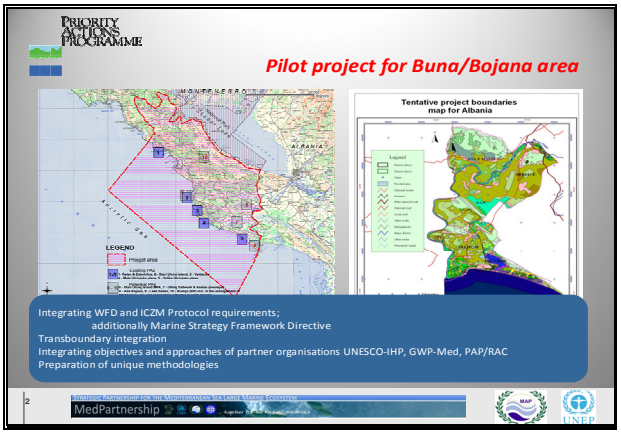
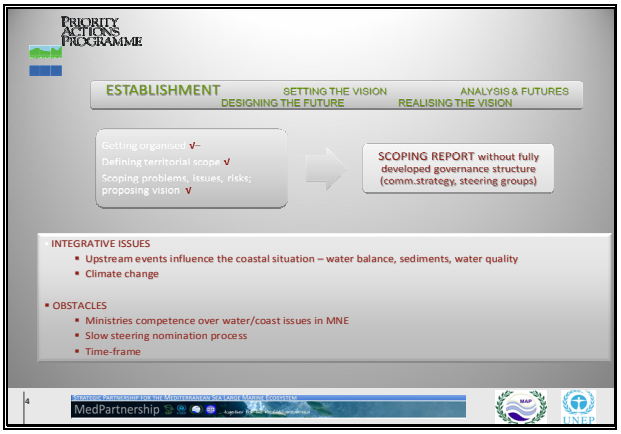
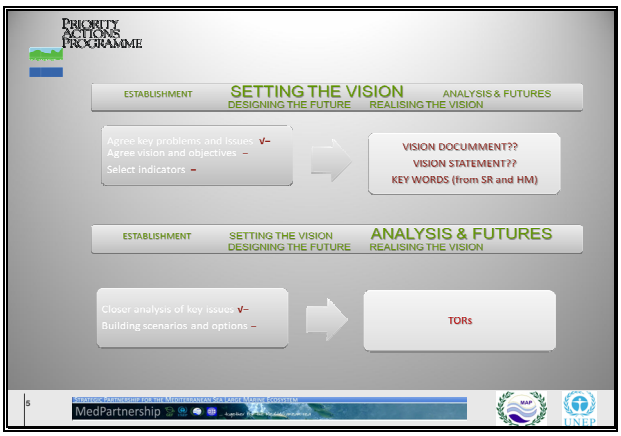
brian.shipman@ppa.t-com.hr

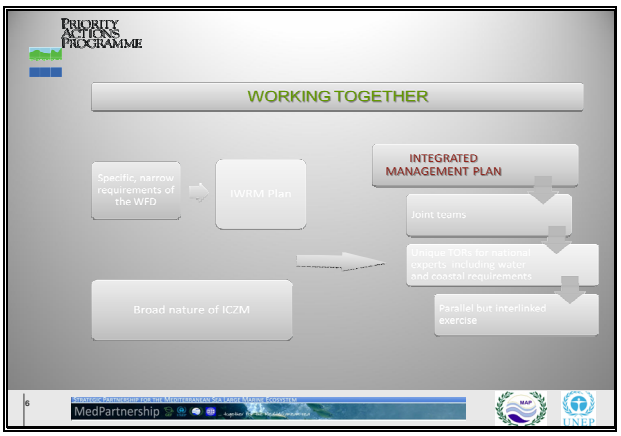
Update and emerging issues from the demonstration projects
Marina Marković and Dimitris Fatsiolus











Integrating climate change into the ICZM planning process
Anil Markandya

INTEGRATING CLIMATE CHANGE INTO THE ICZM PLANNING PROCESS

Anil Markandya
BC[3]

KEY STEPS IN AN ICZM STRATEGY

- INITIATION: Mission Context – the ICZM Protocol
- ESTABLISHMENT OVERVIEW: Aim & Objectives
- VISION & OBJECTIVES OVERVIEW: Aim & Objectives
- ANALYSIS & FUTURES OVERVIEW: Aim and Objectives
- PLAN OVERVIEW: Aim & Objectives
- IMPLEMENTATION OVERVIEW: Aims and Objectives

INITIATION

- As far a climate change is concerned, the main concern is to ensure that there is institutional coordination with bodies responsible for climate adaptation and mitigation strategies and plans.
- All countries have an obligation to produce a communication to the United National Framework Convention on Climate Change, detailing greenhouse gas emissions (GHGs), as well as vulnerability assessments and some actions to adapt to climatic changes.
- Thus from the outset any actions on climate change under the ICZM should be coordinated with the National Communication Office of the country. In addition, local authorities in many coastal zones are already planning to introduce measures to respond to some of the expected impacts of climate change. It is essential that these authorities and their plans and procedures be brought into the ICZM process at this initiation stage.

ESTABLISHMENT OVERVIEW

- The aim is to set out an operational foundation for the subsequent preparation of the Plan and its implementation.
- The scoping report, which is the output of this stage when preparing the Plan, should cover:
  - Drivers and Pressures
  - Identification of Key Problems and Issues
  - Risk Identification
  - Boundary Definition
  - Institutional, Legal & Policy Context
  - Work Plan
  - Governance Mechanisms & Technical Team
  - Initiate Strategic Environmental Assessment
  - Stakeholder Participation & Communication Strategy.

DRIVERS AND PRESSURES

- Main drivers are:
  - Sea level rise
  - Changes in precipitation
  - Increased frequency of extreme events
  - Possible increases in risks of vector and water borne diseases.
- At this stage an identification of these pressures, and an idea of where and when they are likely to be most serious, is required. This is a desktop exercise.

IDENTIFICATION OF KEY PROBLEMS & ISSUES

- Main issues are:
  - Damage to infrastructure from sea level rise and flooding
  - Declines in agricultural yields
  - Health risks from heat waves
  - Risks to human life from extreme weather events
  - Changes in tourism
  - Shortages of water due to changes in precipitation and possible saline contamination of groundwater
  - Damages to ecosystems from changes in temperature and water availability.
- These are the general set of problems that should be noted in the ICZM strategy but not all will apply in all coastal zones.

RISK IDENTIFICATION

- **Nature** of the risk and its consequence
- **Magnitude** of the possible adverse consequences from each risky event
- **Probability** of occurrence of each risky event
- Broad probability categories are available for some pressures and impacts. E.g. when an event such as an increase in temperature is 'likely' (the probability of it being exceeded is less than 50%); or 'unlikely' (if the probability of it being exceeded is less 10%).
- At this stage the exercise should see which of the key impacts identified in the previous stage have some probabilistic information. This is likely to be available for extreme events, sea level rise, temperature increase and possibly change in precipitation.

BOUNDARY DEFINITION

- Climatic changes will have impacts on areas that do not respect the defined boundaries of a coastal zone. E.g. SLR may well affect areas outside the defined zone yet are part of an integrated area that includes the coastal zones.
- Necessary to be practical. 'competent' coastal units should be reconciled with the ecosystem, economic, social and political criteria as appropriate.
- The issue of boundary definitions is something to be brought up at the strategy stage, with a pragmatic view as outlined above being the recommended approach.

INSTITUTIONAL LEGAL & POLICY CONTEXT

- Institutional context for climate change planning is already well established. Agencies include:
  - National Communications Office
  - Ministry of Agriculture, for possible impacts in terms of crop yields
  - Ministry of Environment, especially the Department dealing with water management and ecosystem health
  - Ministry of Health, dealing with consequences of heat waves, vector and water borne diseases and increased risks of food contamination with higher temperatures
  - Departments responsible for land
  - Ministry of Tourism
- The ICZM needs to liaise with all of them to understand their positions and, ideally, play the role of coordinating their efforts for the effective management coastal zones.
- It also needs to coordinate with the private sector, which will be actively engaged in climate adaptation.

GOVERNANCE MECHANISMS

- At least one representative from national government or the higher-level competent local administration(s) should have familiarity with climate issues, possibly because s/he is involved in one of the other bodies dealing with this topic.
- The technical group needs at least one person with working knowledge of adaptation to climate change
- The consultative group should include someone from the National Communication Office as well as representative from all sectors where climate issues have been assessed as being important at stages

STRATEGIC ENVIRONMENTAL ASSESSMENT

- *" a systematic process for evaluating the environmental consequences of proposed policy, plan or programme initiatives in order to ensure that they are fully included and appropriately addressed at the earliest stage of decision-making, on a par with economic and social considerations."*
- Maybe a statutory requirement for the ICZM.
- It is a complicated exercise and time consuming.
- If a SEA is not done, some assessment of the cross effects of the different policies will be needed.
  - Development programmes that expand land use in coastal areas have to be undertaken with the consequences for future climate costs in mind.
  - Expansion of tourism that does not take account of the impacts of climate change on visitors or of changes in water availability on the water balance could result in failure.
- Hence such cross effects should be accounted for at the analytical stage, whether it is through a SEA or through other more *ad hoc* methods, which may prove easier to carry out.

STAKEHOLDER PARTICIPATION

- As far as climate change is concerned key groups need to be informed about the major climate changes in the area of interest, the likely consequences of these changes and the increased risks they represent. This can be done without providing too much technical detail
- The groups who need to be involved will include local communities, government agencies, NGOs, business, media and opinion formers etc., providers of tourism services, private developers, and those engaged in agriculture and fisheries. Based on these consultation options for action will be drawn up.
- The same groups need to be consulted once the options have been evaluated technically to get their feedback. The final plan will be based on a consensus that includes opinions from these key stakeholders.

VISION AND OBJECTIVES

- Review and Agree Key Problems & Issues, identify Priorities, begin DPSIR
- Agree Vision & Objectives
- Indicator Selection

REVIEW AND AGREE KEY PROBLEMS IDENTIFY PRIORITIES, BEGIN DPSIR

- Climate change priorities are drawn from a range of possible actions. These should include:
  - *Low regret or No-regrets measures*
  - *Action vs Postponement*
  - *Hard vs Soft Options*
  - *Long term vs Short term*
- Examples of options under each of these categories can help the discussion on how to set priorities.

AGREE VISION &OBJECTIVES

- On the climate front a clear statement is needed of the importance given to adaptation to climate change as a high level objective. This can be followed by a list of the areas where action is seen as required, and the cross sectoral priorities (e.g. adaptation to climate versus short term development imperatives).
- Additionally some objectives will be predetermined in existing international, national and sub-national policies, such as 'Horizon 20-20', the Water Framework Directive and other water quality standards.

INDICATOR SELECTION

- Main guidelines propose:
  - **Sustainability Indicators** that seek to show how the Plan's purpose is realised
  - **Impact Indicators that seek to** measure how well the Plan's outputs are being achieved
  - **Performance Indicators that** measure how well the project activities are being implemented.
- From the climate change perspective the broad objectives of relevance are likely to be:
  - Sustainable development of the region
  - Protection of human life and natural and physical capital in the face of climate change.
- Possible indicators are shown on table

INDICATOR SELECTION

		Climate related indicators for selected years					
		Popn. at flood risk	Popn. at heatwave risk	Property at risk	Water balance	Ecosystems under stress	Tourist Visitor nos.
Broad Indicator	Sub Objectives						
A Health and Productive Economy	Maximising economic development	X		X	X		X
	Increase employment						X
	Foster diversification						X
A Healthy and Productive Environment	Minimize habitat destruction					X	X
	Reduce volume of all pollutants					X	X
Public Health and Safety	Protect human life and public and private property	X	X	X			
Social Cohesion	Maintain a sense of equity and social justice						

ANALYSIS & FUTURES OVERVIEW

- Existing State/Future Conditions (Baselines)
- Application of Tools
- Alternative Scenarios & Options
- Pilot Actions & Sourcing Funding

EXISTING STATE/FUTURE CONDITIONS

- From a climate viewpoint the key tasks are to:
  - Identify the main elements of climate variability in the short- (10-20 years), mid- (30-40 years), and long-term (60+ years) periods.
  - Increases in average annual temperature at a Mediterranean Basin scale are likely to be slightly higher than at a world level. This increase is estimated at approximately between 2°C and 6.5°C by the end of the century (compared with a global mean increase between 1.1°C and 6.4°C). The probability of temperatures rising by between 3 and 4°C is estimated at 50%.
- These broad estimates of climate impacts in the region are a strong indication of the size of the impacts that need to be taken into account in any ICZM plans. National data are available from climate studies. Local data may be more difficult to get but can be requested from climate modellers.

IMPACTS OF CLIMATE VARIABILITY

- Impacts on agriculture
- Coastal infrastructure (housing, public buildings, roads etc.)
- Impacts of extreme events (heat waves, floods etc.)
- Sea level rise
- Availability of freshwater
- Impacts on tourism
- Loss of ecosystem services through low river flows, flooding etc.
- Supply and demand for energy

AGRICULTURE & HEALTH

Impact	Estimate of Impact	Sources of Data
Agriculture	The average percentage change in crop yield for the Mediterranean North region in the PESETA study for the A2 2011-2040 scenario is -2% with a standard deviation of 13%. Some estimates also for individual countries but rarely for coastal zones.	The PESETA project (Ciscar, 2010) looked at the impacts of climate change on agricultural productivity of crops in different regions of Europe (Iglesias et al., 2009). Other key studies are Cline (2007, 2008), Mendelsohn and Schlesinger, 1999 which also look further forward. Issues of water availability need to be accounted for and carbon fertilization effect is uncertain. Some detailed studies also exist for individual countries, taking account on more factors.
Health	The potential health impacts of climate change include temperature related changes in mortality and morbidity, higher frequency of food-, water- and vector-borne diseases due to temperature increases as well as an increase in the incidence of other diseases such as tick-borne diseases.	The cCASHh project provides functions relating climate variability to health impacts. These can be applied with local variability data. See (Menne and Ebi, 2006), Kovats et al. (2006), (Ciscar, 2009). Dessai (2003). The PESETA study quantifies health impacts for all of the EU-27 countries for two climate change scenarios namely A2 2011-2040 and 2071-2100 (A2 and B2). (Ciscar, 2010).

EXTREME EVENTS & SLR

Extreme Events	The PESETA study estimates the physical impacts of river floods in terms of the additional expected population affected to be about 49,000 people per year for Southern Europe for the A2, 3.9°C temperature increase during 2071-2100 scenario from the baseline period (1961-1990). ABI (2005) note that a 20 percent increase in the frequency of top 5% of storms wind speed increases average annual total financial losses by 35% for Europe.	Estimates can be obtained from IPCC, 2007; Pollner et al., 2008; the Peseta study (Ciscar et al., 2010); Leckebusch and Ulbrich (2004) on wind speed changes.
Sea Level Rise SLR	Estimates are available from National Communications in most countries. Specific projections are complicated by local subsidence, especially in deltas and coastal cities.	IPCC, 2007; Hallegatte et al. 2007. The PESETA study (Ciscar, 2009) estimates of the number of people who are expected to be affected by coastal floods due to sea level rise are presented for different regions in Europe for different climate change scenarios.

WATER, TOURISM AND ECOSYSTEMS

Freshwater	The North Western tip of South East Europe will see an increase of rainfall by 5 percent in 2071-2100 relative to 1961-1990 (Pollner et al. 2008) However, the rest of the Adriatic coastline and Western Balkans region annual mean precipitation is expected to decrease by 10-20 percent over the same period (European Commission, 2007). Lehner et al. (2006) project a significant increase in drought in S and SE Europe and by the 2070s the drought that currently occurs 1:100 years could have a return period of less than 10 years.	Pollner et al. 2008; European Commission, 2007; Lehner et al. 2006;Lopez- Francos (ed.), 2010 provides a number of papers that look at climate change and drought in an economic context. IPCC, 2007, forecasts reductions by 2030 for different coasts. Specific impacts for different river basins are needed to make more accurate projections. These may be available from the National Communications to the UNFCCC or from other country specific research.
Tourism	Changes in temperature and precipitation will affect attractiveness of coastal areas for tourism. For a survey see Fisher, 2007.	Ciscar, 2010. Detailed estimates of changes in demand for visits are available for different regions.
Ecosystems	Low river flows will change supply of ecosystem services and some species will be at risk. Impacts are very location specific.	Country specific studies are needed to identify where ecosystems are at risk. See outputs from the CIRCE project and National Communications to the UNFCCC.

CLIMATE CHANGE & IMPACTS

- Many of the predictions are for a wider area than just a coastal zone, and certainly wider than the part of a coastal zone likely to be of interest to the drawing up of an ICZM strategy. Thus more downscaled estimates is needed.
- The projections that are available have a high level of uncertainty. This makes taking a risk assessment approach important.
- The timing of the impacts is important. Several are long term (over 60 years) and therefore less relevant to the current plans for many but not all activities. Areas where such impacts are a matter of concern include investments in infrastructure, roads, land use planning and some energy supply systems. On the other hand long term agricultural and health projections are not so important for current plans. Cases where shorter term impacts are important include water, flood protection, tourism and agriculture.
- What matters for policy purposes is the number of people affected, or the damage to property, crops or other economic activities. This will require some further work on the part of the team drawing up the ICZM, but even in this case local studies on the 'downstream' consequences of the impacts may be available.

ALTERNATIVE SCENARIOS & OPTIONS

- Agriculture:
  - Of wider interest and relevance than just to the coastal community. Adaptation measures undertaken will include research and development on crop varieties better suited to the new climate, improved irrigation where appropriate and extension and other support to farmers to assist them to adapt to climatic changes.
- Infrastructure
  - Sea level rise and changes in extreme events have a direct bearing on coastal infrastructure. Fortunately this is an area that is most developed in terms of tools for the assessment of appropriate responses. In particular the DIVA model has been used to estimate the required investment in coastal protection for different parts of the European coastline. It estimates best responses and their costs and benefits.

ALTERNATIVE SCENARIOS & OPTIONS

- Health:
  - As with agriculture, this is a wider issue than just for coastal zones, although the latter could be specially impacted if there is an increase in vector borne diseases. Impacts of climate on health through contaminated food and water will require stricter controls on vendors of products to the public.
- Water
  - Adaptation to changes in water supply will take the form of reductions in demand (measures that promote more efficient use, increases in water charges) as well as increases in storage and available supply. The latter could involve building of reservoirs, increasing capacity to manage runoff, plans for water allocation in periods of drought and even the transfer of water from surplus to deficit areas. There is also the option of building desalinisation facilities to meet water deficits.

ALTERNATIVE SCENARIOS & OPTIONS

- Extreme Events:
  - Appropriate actions include land use changes, improved flood and hurricane protection, better insurance to provide coverage against damages. Current thinking on this issue for coastal zones in developing countries is summarized in the Cairo overarching principles.
- Tourism
  - The Mediterranean will become too hot during summer, but the climatic conditions will improve during spring and autumn. This data will determine the nature of the facilities offered as well as the volumes of visitors that can be expected.
- Ecosystems
  - The impacts on ecosystems are very location specific. Studies under the CIRCE project identify low flows in rivers as an important impact, but there are also expected consequences on marine systems and fisheries. This is an area where those responsible for the ICZM should undertake a local assessment

IMPLEMENTATION OVERVIEW

- ICZM involves a wide range of instruments to implement the strategy. A central pillar is land use regulation and the limitation on the use of certain areas on environmental grounds. But also important are standards for building, energy etc. In addition it is important to use fiscal instruments to promote desired certain actions.
- Areas where fiscal instruments could be used, specifically to address some of the climate change impacts that have been discussed are:
  - Transferable development rights, where an individual whose rights have been taken away in one location can have them reallocated in another location. These make the introduction of new regulations easier and allow a market in such rights to develop.
  - The use of charges that better reflect the cost of services, especially water.
  - Development of insurance markets to provide cover against risks of flooding etc. To the extent that they bear at least part of the costs this encourages the private sector and individuals to modify their behaviour and not take excessive risks, as they tend to do when all damage costs are covered through public funds.
  - Charges on tourists to cover the additional burden of the public services they demand, as a source of finance for improved environmental protection.

INVESTMENT & INFRASTRUCTURE

- Some actions will involve investment in protective infrastructure, such as sea walls, dykes and desalinisation facilities.
- The ICZM should not give priority to such solutions, but look in the first instance for lower cost options which involve early warning systems, use of fiscal and other incentives etc.
- However, some investments will be needed, and some proposed investments will need to be modified in the light of climate change. Examples include measures in buildings to withstand increased impacts from extreme weather events, transport systems that have to take account of increased risks of subsidence etc. Some of these investments will be in the public sector and some will be in the private sector.
- The ICZM should provide guidance to the private sector on how to address the additional climate risks.

THANK YOU

Application of a Methodology for Climate Change Risk Assessment in the Buna/Bojana Integrated Management Plan

Anil Markandya

Methodology for Climate Change Risk Assessment for Integrated Coastal Zone Management in Buna/Bojana Region of Albania and Montenegro

Tim Taylor, Lavanya Anneboina and AnilMarkandya
Metroeconomica

Five Tasks Undertaken in Study

- *Identification of Key Climate Change Variables and Socioeconomic Change*
- *Identification of Key Areas of Impact and Risks to Assets and People*
- *Quantification of Impacts*
- *Quantification of Impacts*
- The above steps have been carried out for the Buna/Bojana region, which is the coastal zone surrounding the river Buna/Bojana in Albania and Montenegro. This river is an outflow of Lake Skadar that flows into the Adriatic Sea.

Projections of Climate Variables

- National Projections for Montenegro indicate that by 2050:
  - *temperature* - increase by 1.8 – 2.2 ^{0}C especially during the summer and with a notable difference between the temperatures of land and the sea
  - *precipitation* – reduction by 6 % to 14% especially during summers, with reduction of relative humidity in air and land and increase in evaporation
  - *increased frequency of extreme weather conditions*
  - *sea-level rise* - expected rise by 18 – 22 cm
- Estimates vary by part of the country (North vs. South) , be socio-economic scenario and by time period (2030, 2050, 2100).
- Similar projections are available for Albania.

Projections of Temperature

Climate Scenario	Season	Temperature (°C)	
		Southern Part of Montenegro	Northern Part of Montenegro
A1B Scenario (2001-2030)	DJF	0.5°C	0.9°C
	MAM	0.8°C	1.1°C
	JJA	1.0°C	1.3°C
	SON	0.7°C	0.7°C
A1B Scenario (2071-2100)	DJF	1.6°C	2.6°C
	MAM	1.6°C	2.6°C
	JJA	2.4°C	3.4°C
	SON	1.6°C	2.4°C
A2 Scenario (2071-2100)	DJF	2.6°C	3.4°C
	MAM	2.8°C	3.6°C
	JJA	3.4°C	4.8°C
	SON	2.6°C	3.0°C

Source: Ministry for Spatial Planning and Environment (2010)

Projections of Precipitation

- Projected changes in precipitation show a change in the seasonal distribution of rainfall, with the most significant changes being in summer months (JJA). Under the A2 scenario the reductions could be up to a 50% reduction in rainfall for Southern Montenegro by 2071-2100.
- For Albania, annual reductions in precipitation of up to – 3.8% by 2025, -6.1% by 2050 and –12.5% by 2100 are anticipated.

Sea Level Rise

- Evidence on sea level rise is mixed – with projections from the Albania case suggesting increases of up to 20 -24 cm by 2050 and 48-61 cm by 2100.
- These compare to increases in sea level of up to 35 centimetres in the Montenegran case. The First National Communication of Montenegro highlights some of the risks to the coastal zone, including inundation of areas currently at risk of flooding, impacts of tidal floods, decline in beach areas. Under Scenario A2 there is likely also to be an increase in the amplitude and frequency of tidal flood waves.

Main Areas at Risk

- Agriculture;
- Health;
- Tourism;
- Forestry;
- Fisheries.
- We also examine the consequences of extreme weather events, which are a special type of climate change impact and deserve separate attention
- Impacts based on local studies where possible. Where these are not available we have taken data from neighbouring regions.

Agriculture

- The main impacts of climate change for the agricultural sector are the changes in the productivity of crops and livestock as a result of the changes in the mean temperatures and changes in precipitation levels.
- we use two sets of percentage change in agricultural productivity estimates, one from the PESETA study for the 2011-2040 scenario and the other from the Cline (2007) study for the 2080s with and without carbon fertilization, to estimate the changes in agricultural output for the Buna/Bojana region as a result of climate change.
- Once we calculate the change in output, we use producer prices of the different crops for the year 2003 to calculate the value of this change in output in terms of 2003 Euros.

Value of Change in Output Due to 2% Decline in Total Yield 2011-2040 (€)

	Montenegro	Bar	Ulcinj	Bar & Ulcinj	Budva	Kotor	Tivat	Herceg Novi	All coastal municipalities*
Maize	-15750	-424	-4211	-4635	-9	-66	-17	-12	-4739
Wheat	-10265	-15	-1952	-1968	-10	-	-		-1978
Rye	-415	-	-	-	-	-	-	-	-
Barley	-4670	-12	-	-12	-	-4	-	-	-16
Potatoes	-792707	-20475	-112000	-132475	-1071	-2520	-1050	-12600	-149716
Beans	-35164	-140	-2282	-2422	-100	-2054	-	-86	-4661
Total	-858972	-21066	-120446	-141512	-1190	-4644	-1067	-12698	-161110

Estimates for 2080 vary with whether we assume a carbon fertilization effect or not. By that time decline in yields could be as much as 8.6% or an increase of as much as 5.1%!

Human Health

- The main impacts of future climate change on human health are the increases in summer heat related mortality and morbidity and the decreases in winter cold related mortality and morbidity, changes in the burden of vector-, water- or food- borne diseases and increases in the risk of accidents from extreme weather events like storms and floods.
- Estimates not available for Albania and Montenegro but some studies for other EU countries, including Bulgaria. These provided estimates of cold and heat related mortality which were used for the countries of interest.

Health Related

Annual Heat Related Deaths

Country/Municipality	Average population base case (1961-90)	All deaths base case (1961-90)	Heat-related deaths base pop. & climate (1961-90)	Average population (2011-40)	All deaths (2011-40)	Heat-related deaths with base climate & pop. for (2011-40)	No acclimatisation: Heat-related deaths with pop. & climate for (2011-40)	No acclimatisation: Climate change induced difference	With acclimatisation: Heat-related deaths with pop. & climate for (2011-40)	With acclimatisation: Climate change induced difference
Bar	30506	196	4	34953	386	9	14	5	10	1
Ulcinj	20240	130	3	23191	256	6	9	4	6	1
Montenegro	592211	3535	77	630429	6866	154	250	96	173	19
Albania	2419286	17862	388	3338000	26315	580	944	364	653	73
Croatia	4492913	48449	1051	4233143	54749	1206	1964	758	1359	152
Death rate per 100,000 for Croatia applied here (from PESETA study)			23.4			28.5	46.4	17.9	32.1	3.6

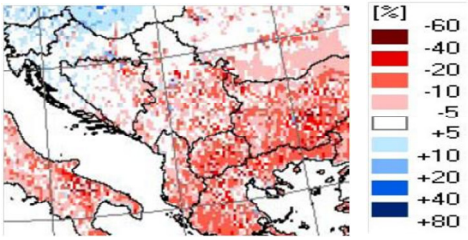
Annual Cold Related Deaths

Country/Municipality	Average population base case (1961-90)	All deaths base case (1961-90)	Cold-related deaths base pop. & climate (1961-90)	Average population (2011-40)	All deaths (2011-40)	Cold-related deaths with base climate & pop. for (2011-40)	No acclimatisation Cold-related deaths with pop. & climate for (2011-40)	No acclimatisation Climate change induced difference	With acclimatisation Cold-related deaths with pop. & climate for (2011-40)	With acclimatisation Climate change induced difference
Bar	30505	196	10	34953	386	19	16	-4	19	0
Ulcinj	20240	130	6	23191	256	13	10	-3	13	0
Montenegro	550211	3535	177	630429	6966	352	283	-69	346	-6
Albania	2419286	17862	893	3338000	26315	1329	1068	-260	1306	-22
Croatia	4492913	48449	2822	4233143	54749	2764	2222	-542	2718	-47
Death rate per 100,000 for Croatia applied here (from PESETA study)			53.9			65.3	52.5	-12.8	64.2	-1.1

Extreme Weather Events

- Climate change is expected to have significant impacts on extreme weather events in Europe (IPCC, 2007).
- The World Bank notes that South East Europe (which includes Albania and Montenegro) will be one of the European regions that will be hardest hit by global warming.
- The NW tip of South East Europe will see an increase of rainfall by 5 percent in 2071-2100 relative to 1961-1990. However, the rest of the Adriatic coastline and Western Balkans region (including Albania and FY Macedonia), annual mean precipitation is expected to decrease by 10-20 percent over the same period Moreover annual runoff is expected to fall sharply by 25 percent.

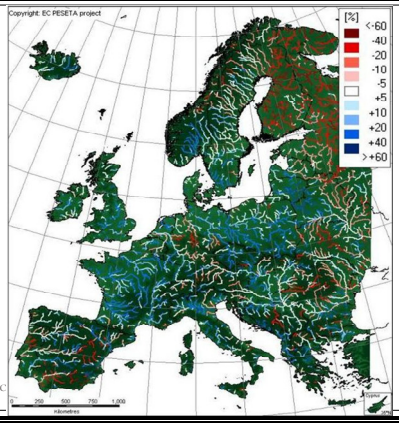
Change in mean annual precipitation in 2071-2100 relative to 1961-1990 (%)



Droughts and Floods

- The decrease in precipitation and the increase in temperature will lead to greater frequency and severity of drought. Also, despite the decrease in rainfall in South East Europe, it is expected that flooding will increase in these countries. In terms of river floods in Europe, the PESETA project gives the relative change in the river discharge for flood events that have a probability of occurring once every hundred years between the scenario run (2071-2100) and the control run (1961-1990) for Europe.
- For the Buna/Bojana region ((contained within the pink circled area in the figure below) there appears to be a 20-40 percent increase in the river discharge for flood events that have a probability of occurring once every hundred years between the scenario run (2071-2100) and the control run (1961-1990). This implies that 100-year flood events in this region will become more severe.
- It is also predicted that the northern Adriatic coast will be prone to more severe and longer lasting floods due to higher wind speeds, which will intensify storm surge.

River discharge for flood events: change in 100-year return level (%)



Extreme Events

- It is estimated that a 20 percent increase in the frequency of top 5 percent of storms with associated wind speed increases causes an increase in the average annual total financial losses of 35 percent for Europe.
- Based on that data and on differences between European averages and the expected increases in frequency of such storms in the Buna/Bojana region we estimate an increase in financial losses of 2.1 percent.
- Annual average economic losses from all disasters were US$69 million in Albania (1972-2006) and US$82 million in Serbia and Montenegro (1989-2006). Currently Albania and Montenegro have only US$ 0.4 million and US$ 0.52 million respectively, available annually from their government budget funds to finance large losses from extreme events

Sea Level Rise

- The First National Communication by Albania notes that the predicted sea level rise for Albania is in the range of 20-24 cm by 2050 and a more significant sea level rise of 48-61 cm is expected by 2100.
- Similarly the First National Communication by Montenegro to the UNFCC (Ministry for Spatial Planning and Environment, Montenegro, 2010) notes that, depending on the applied IPCC scenario, the sea level rise estimates for Montenegro are in the range of 18-59 cm for the decade 2090 – 2099 compared to the period 1980 – 1999.

Sea Level Rise: Main Impacts

- Direct flooding of coastal area. With increasing sea level rise, flooding will be intensified both directly by the sea and indirectly by changes in water tables. The beaches belonging to the areas affected by land subsidence (those of Shëngjin, Kune-Vain, Tale, Patok, Ishëm), and a substantial number of fields (drained in the late '50s and early '60s.) will be impacted by floods. Likewise, these floods will find their way into important segments of the local and national roads (including a part of the new road Fushë Krujë-Lezhë running through the former Lac swampland).
- Increase in the salinity of aquifers especially for the coastal area would impact the potable water supply sources (located in Lezha and Laç plains), as well as many lodging and tourism structures which have been, and continue to be built along these beaches.

Sea Level Rise: Main Impacts

- Floods will partially affect the beaches situated in the territories undergoing elevation (those of Durrës, Golem, Divjakë, Himarë, Borsh, etc.), in addition to the tourism infrastructure.
- Natural communities associated with such areas are expected to move inland. However, certain communities including existing coastal dunes, saline marshlands and wetlands are likely to reduce in surface area, although new dunes, marshlands and wetlands may gradually form elsewhere
- Infrastructure such as sewers, water supply, electricity and other service could be flooded and corrosion of pipes and intrusion of seawater into pipes and sewage systems will occur.

Impacts on Bojana

- For the Bojana case in particular, there is the implication that the mouth of the river Bojana will be affected. There is the suggestion that *"the river Bojana flow will be stopped much before its current end, which means that this whole part of the area, which is now practically even with the surface of the river Bojana will be flooded."* This is clearly significant for coastal zone management looking ahead in the Buna/Bojana area.

Tourism

- Models have been developed to estimate the change in the number of tourists due to changes in temperature in different tourist destinations.
- Applying these models to the Buna/Bojana region we note:
  - In 2007 and 2008, there were 226,431 tourists visiting Bar and Ulcinj per annum
  - The expected changes in numbers could result in a change in income of between -26€ million and + 11.5 million € according to one model and between -7€ million and -98€ million according to another model.
  - There are expected to be changes in the pattern of visitors by season.

Fisheries

- The mouth of the Buna/Bojana river is a significant habitat for fish. Beside the various bird and fish species, the marine turtles are an important asset.
- There is increasing evidence that the distribution of fish species is changing, as waters begin to warm.
- Salinity is also likely to have an impact, as sea level rise extends the reach of brackish water.
- It is likely that there will be impacts of this on the fisheries and tourism sectors .Threats also come from invasive species, overfishing and destruction of habitat. The distribution of the Sardinella aurita has been shown to be changing in the Western Mediterranean (Sabates et al, 2006). More work is needed in this area to enable estimation of the impact of climate change on fisheries.

Forestry

- Forests are particularly important in Albania and Montenegro. Forests cover 29 percent of Albania and 26.4 per cent of Montenegro
- The impacts on forestry of climate change in the case study area are likely to include:
  - Impacts of coastal erosion and flooding;
  - A change in the distribution of species;
  - Changes in pest and disease incidence; and
  - Increases in forest fires.
- Coastal erosion has already been noted as having an impact on forests in Albania, for example. FAO (2010) highlights the impacts of inundation and rising salinity of water bodies and the increased frequency of forest fires

Conclusions

- The study has attempted to identify key impacts of climate change in one area of the Mediterranean – the area around Buna and Bojana in Montenegro and Albania.
- The estimates presented may help refine ICZM to take into account the need for adaptation. A number of issues arise, however, that make this a complex process.
  - **Existing estimates of impacts are based on a number of scenarios and have high uncertainty**
  - **The impacts are generally in the mid- to long term**
  - **Socioeconomic change may be more significant than the climate signal**
  - **The most important impacts are likely to be: (a) sea level rise, (b) extreme events and (c) tourism.**

Thank you