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**2nd Standing Committee on Economic, Social and
Environmental Cooperation**

Special Task Force on Environment

“The Mediterranean environment in jeopardy: a call for urgent action”

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Abstract

Despite the Mediterranean nations' past commitments, today more than ever, the Mediterranean ecosystem is under threat. This is what comes out of an alarming report published in October 2011 by the National Centre for Scientific Research (CNRS-France). Concerns range from climate change and water or air pollution to population growth, urbanization, loss of biodiversity, and the growing scarcity of the Mediterranean's natural resources. In order to curb these alarming trends and ensure the Mediterranean Region remains habitable in the future, it is time that action – more than commitment – is taken by the countries of the region.

This report does not attempt to give an overall state of the Mediterranean environment. It aims, instead, at providing policy makers with a comprehensive picture of all major hazards – *natural* and *technological* – that are facing the Mediterranean community today. The report also aims to shed light on the multiple complex interconnections that exist between environmental degradation, technological hazards, vulnerabilities and natural disaster risk while emphasizing the need for governments to set up a comprehensive approach for disaster risk management and the protection of populations and environment.

Eventually, this report analyzes the various consequences of both natural and technological hazards on the Mediterranean countries' economy and population and puts forward the responses that are required to prevent and mitigate the risks in the light of the various organizations working in the field such as United Nations International Strategy for Disaster Reduction (UNISDR).

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I. Introduction

1. Since the dawn of time, mankind has depended on oceans and seas. Not only do oceans and seas represent a source of crucial economic importance, favouring trade and the exchange of wealth and knowledge, and offer incommensurable food resources, they also regulate climate while covering no less than 70% of the planet's total surface. Undoubtedly, if life began in its waters, humanity's future is also conditioned by the oceans' and seas' preservation.

2. Acknowledging that marine environment forms an essential component of the global life-support system, nations of the world, gathered at the Earth Summit of Rio De Janeiro in 1992, recognised, for the first time in history, in the conference's final declaration (*Agenda 21* 1992, chap.17), the need for an environmental action aiming at protecting our oceans, seas and coastlines and their living resources. Likewise, the same urge was re-emphasized in 1995 when 21 countries bordering the Mediterranean together with the European Community renewed their commitment to follow the Mediterranean Action Plan (MAP), first-ever plan adopted as a Regional Seas Programme under UNEP's umbrella and signed twenty years before.

3. However, despite the nations' past commitments, today more than ever, oceans, seas and coastal areas are under pressure. If the world's maritime ecosystems are deteriorating, the Mediterranean Region is particularly threatened. This is what comes out of an alarming report published in October 2011 by the French National Centre for Scientific Research (CNRS), the largest fundamental research organization in Europe. The Mediterranean is indeed extremely vulnerable to natural hazards and climate change due to its particular geographical position between two different climates and its geodynamic structure. Eventually, the problems identified range from climate change and pollution to population growth, loss of biodiversity, and the growing scarcity of the Mediterranean's natural resources. Today, in order to curb these alarming trends and ensure the Mediterranean Region remains habitable in the future, it is time that action – more than commitment – is taken by the countries of the region.

4. In 2009, the PAM members focused the essential part of their efforts in committing in unison to contribute to the prevention and management of natural and manmade disasters¹. This 2012 report emphasizes clearly that PAM parliamentarians must reinforce their commitment on tackling those disasters while raising their awareness about the comprehensive and alarming threats posed by natural constraints and human activity on the Mediterranean ecosystem. In view of the seriousness of the threats and the worrying condition of the Mediterranean Sea, further action is crucial if not vital for both the ecosystem itself and the 450 million people living on the Mediterranean shores.

II. Main environmental threats affecting the Mediterranean Region

a) *How man-made environmental degradation and natural hazards are interconnected*

5. The Mediterranean Region has quite a unique character due to its geographical position and geodynamic structure. It lies, indeed, between two different climates, cold and wet in the north, warm and dry in the south, and has an unique land-locked configuration caused by the collision of the Africa and Eurasian plates. All these attributes make it therefore especially vulnerable to natural hazards (CNRS 2011).

6. Natural hazards could be defined as "*natural processes or phenomena that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage*" (UNISDR 2009). They refer to atmospheric,

¹ See "Malta Declaration" (2009)

hydrologic and geologic (especially seismic and volcanic) phenomena that, because of their intensity and frequency, have the potential effect to cause human, material, economic or environmental losses in the form of natural disasters.

7. If it is still unclear to which extent natural hazardous events are triggered by human activity, it is widely accepted that unsustainable human practices exacerbate the vagaries of the nature. On top of that, environmental degradation caused by human activity tends to multiply the impacts of natural disasters as it limits the capacity to absorb those shocks while making human beings more exposed or vulnerable to them.

8. Natural and man-made or anthropogenic hazards are, thus, strongly intermingled. In this paper, we will refer to "technological hazards" to define:

"Those hazards originating from technological or industrial conditions, including accidents, dangerous procedures, infrastructure failures or specific human activities, that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage". (UNISDR 2009)

9. Both natural and technological hazards put the Mediterranean Region under stress. Their strong interconnection also invites us to see them as a whole. This session aims at exploring the most severe threats affecting the Mediterranean Region and their causes in the light of the lessons arising from the CNRS report, the work of its various specialized programs and the European Environment Agency reports (EEA). According to the CNRS, these threats relate to flooding, geological disasters, air pollution, water pollution and the loss of biodiversity.

b) Flooding

10. The Mediterranean Region is very prone to hydrological hazards due to the complex interaction between oceanic-atmospheric-hydrological processes and the geographical position that characterize the region (i.e. a nearly enclosed sea surrounded by mountain chains and fed by rivers the quasi-totality of which are intermittent). If the Mediterranean precipitating system is particularly inclined to produce heavy rains, the high population densities of the Mediterranean coastline brings in another element explaining why heavy precipitations, flash-flooding and floods can have devastating effects on people (HyMeX 2008). According to CNRS' program on hydrological cycle in the Mediterranean (HyMeX), flooding is the most destructive natural hazard in terms of human losses and infrastructure in the Mediterranean. Over the passed twenty years, it also has caused over 4000 fatalities and generated financial losses of 25 billion euro (CNRS 2011).

11. A 2010 HyMeX report recorded more than 175 flood events between 1990 and 2006 in the Mediterranean Region, 59% of which have affected Spain, the South-East of France and Italy. The UNESCO, in its World Water Assessment Program, has also shown that the number of hazardous events such as floods has experienced an increasing trend over the last decades in Europe (Adikari & Yoshitani, 2009).

12. Unfortunately, hydrological hazards are still poorly understood and the ability to predict them is hindered by the fact that flooding usually takes place in isolation, without any connection with large-scale processes. However, climatologists have demonstrated that climate change will lead to a lengthening of dry periods and thus of a higher risk of droughts. Also, "increasing of temperature" resulting from climate change "is expected to major rainfall and flood risks", scientists say (HyMeX 2008).

c) Geological hazards

13. Like hydrological hazards, the Mediterranean is particularly suitable to occurrence of geological hazards such as seismic and volcanic phenomena resulting from the tectonics of slab dynamics in the Mediterranean's subduction zones. Those potential hazardous events also threaten considerably the daily life of the people living on its shores and especially in the most critical high-risk zones such as the most exposed megalopolises: Algiers, Beirut, Naples, Messina, Istanbul or Athens. Seismic/tectonic risk is one of the potential geological hazards and corresponds to the probability of earthquakes with a certain magnitude. While it is potentially affected by seismic appearances, the Mediterranean area is also one with the most intense volcanic activity in the world (TerMEEx 2010). Although seismic and volcanic hazards are not technological, they intensify the need for a better protection of our coasts.

d) Air pollution

14. The Mediterranean ecosystem functioning is strongly related to the complex dynamics of the intense sea-air exchanges associated with the very strong winds that affect the area. The heat and water budgets in the Mediterranean Sea are regulated by these successive intense air-sea exchange events and the associated sea surface with formation of dense water and deep ocean convection during winter and early spring (HyMeX 2010). However, the Mediterranean atmosphere and, with it the entire ecosystem, is the first affected by disturbances arising in the complex interplay between air masses flowing from the European and African continents. Warm and cold air masses, indeed, converge over the region and affect its equilibrium by bringing with them pollutants. This explains why air pollution in the Mediterranean, whose level is usually higher than in continental Europe according to scientists, must be approached as a local, regional and transboundary problem (EEA 2011).

15. The EEA (2011) has showed the potential damaging effects on human health, the ecosystem and the climate of air pollution caused by emissions of specific pollutants such as nitrogen oxides (NO_x), organic compounds and particles either directly or indirectly, through chemical reactions.

16. Air pollution is, first of all, a major environmental risk to health. It has been showed that it affects not only the respiratory system, leading to the development and aggravation of respiratory diseases or problems, but also harm other systems of the body (cardiovascular, nervous and reproductive) and create cancer. Air pollution also damages the environment. Its most important effects are eutrophication² leading to changes in species diversity for example, acidification of both terrestrial and aquatic habitats leading to damage of soil and freshwater and vegetation damage leading to yield loss affecting agricultural crops, forests and plants.

17. In addition, air pollution may also impact the Earth's climate through the release of dangerous gases known as "climate forcers" that interfere with the Earth's energy balance. According to the ChArMEEx coordinators, the effect on climate caused by air pollution is reinforced by the gigantic dust clouds formed in the Sahara, which, as they mix with forest fires and other fines particles, intercept solar radiation while heating the air and reducing surface evaporation (CNRS 2011). Finally, it leads also to the deterioration of buildings and cultural heritage due to soiling and exposure to acidifying pollutants.

² Eutrophication "constitutes an oversupply of nutrient nitrogen in terrestrial and aquatic ecosystems" (EEA 2011, p.12).

e) *Water pollution*

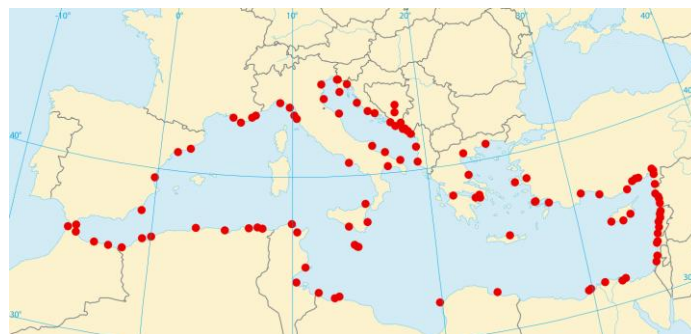
18. A comprehensive paper published in 2006 by the EEA has shed light on the creeping degradation of the Mediterranean marine ecosystem caused by increasing water pollution, which is evidently attributed to human activity.

19. Unsurprisingly, one of the main causes of water pollution is the inadequate treatment of sewage and urban run-off in the Mediterranean coastal cities. In 2006, there were still 21% of the coastal cities with more than 10 000 inhabitants that had not adopted a wastewater treatment plant. However, in cities operating a plant, the efficiency of the system is often considered too low (the degree of the wastewater treatment is tertiary in only 15% of the cases) or inadequate (4% of the plant are not in operation for various reasons) to remove pollutants. Another important source of water pollution relates to industrial effluents such as heavy metals, hazardous substances and persistent organic pollutants³ (POPs), which are discharged by mining and chemical industries (including oil processing) bordering the coast.

20. The issue of industrial effluents is widespread around the Mediterranean Sea but concerns also the hinterland as pollutants may also reach the marine environments indirectly through rivers or run-offs. In addition to industrial waste, stockpiles of obsolete chemicals (such as POPs and pesticide) are also a major concern. Finally, solid waste disposal along the coast (in particular in poorly managed coastal dumping sites and landfills, especially in the southern and eastern countries) is also responsible for the pollution of the Mediterranean waters. Discharge of fine solids originates from industrial plants or from construction activities and results in blanketing the sea-bed with land-based material (EEA 2006a).

21. In 2003, the UNEP published the results of a study carried out in the framework of the Strategic Action Program (UNEP/WHO 2003), which identified the most polluted zones or point of pollution sources around the Mediterranean coast. It was furthermore showed that out of those 131 hot spots (see Fig.1), 26% were urban, 18% industrial and 56% mixed (urban and industrial) (EEA 2006a, p.13).

Fig. 1 Pollution hot spots along the Mediterranean coast
Source: EEA 2006, based on UNEP/WHO 2003



22. When it comes to speak about water pollution problems, one cannot avoid drawing a parallel between this issue and that of water scarcity, which is also of great concern in the Mediterranean. "The Mediterranean is", indeed, "among the most arid regions in the world, with limited renewable water resources that are unequally distributed in space and time" (GWP 2012).

³ POPs include certain prohibited pesticides and industrial chemicals the manufacturing of which is also prohibited. For a detailed overview of POPs' concentration along the Mediterranean coast, refer to the 2006 report of the EEA.

23. Today, whereas around 180 million are considered water poor⁴ and 60 millions are said to be under water stress⁵. Eventually, "trends of rapid demographic and urbanisation growth, coupled with resource-intensive socio-economic development (e.g. agriculture is accounting for 80-90% of the water use), place additional pressures on scarce resources and fragile ecosystems" (GWP 2012).

f) Loss of biodiversity

24. The diverse climatic and hydrological influences and the Mediterranean-specific biotopes account for the unique richness and diversity of the living species in the Mediterranean area. Despite its small surface area (0.82% of the world's ocean surface) and relative oligotrophy, the Mediterranean biodiversity represents 8 to 9% of the total number of species in the world's seas recording a total of 10 000 to 12 000 marines species, a large proportion (28%) of them being endemic. Yet, a lot of species are still being recorded today according to the EEA (EEA 2006a).

25. However, the Mediterranean experiences today an important biodiversity loss resulting from a reduction (or extinctions) of both the number of indigenous species and the genetic diversity of their habitats and ecological communities. The increasing pressure on the Mediterranean marine ecosystem is due to human activities in the form of land-based and offshore sources of pollution, habitat destruction and physical alteration of the coastline. However, a range of emerging problems is increasingly jeopardising this already looming picture. The Mediterranean marine ecosystem is, indeed, threatened by biological invasions, which are introduced in the sea through ballast waters, fouling or import and result in the establishment of a wide range of alien species in the environment.

26. In addition, unstable and excessive fishing practices have caused the over-exploitation of fisheries resources. Also, eutrophication resulting from untreated sewage or agricultural run-offs has allowed increasing the catch of pelagic fish, often at the expense of the ecosystem. This pressure is often exacerbated by the great expansion of aquaculture, which often takes place in coastal areas where human impact on the marine environment is already large due to tourism, urban development, transport and agriculture.

III. Challenges ahead

27. The catastrophic flash-floods in the Gard (France) in 2002 and in Genoa (Italy) in 2011, the massive forest fires that broke out in several areas across Greece in 2007 or the earthquake affecting Aquila (Italy) in 2009 remind us of the disastrous consequences natural hazards can have on human beings and infrastructures. However, if the potential dangers of natural hazards are widely recognized, it is often undermined how pernicious technological hazards also can be.

28. Consequences of air or water pollution, urbanization of our coasts, etc. exert yet considerable pressures on the Mediterranean ecosystem. They materialize in the change of provisioning (e.g. food), regulating (e.g. water purification) and cultural (e.g. recreation) ecosystem services on which we depend, which, on its turn, endangers people's health and Mediterranean countries' economies (EEA 2007). In other words, technological hazards tend to exacerbate the impacts of natural disasters.

29. The following section gives an overview of the potential consequences of natural and technological hazards on human lives and prosperity and of the varied responses that are required to mitigate them. It also raises the key question of growing urbanization along the Mediterranean coastline, which aggravates these observed threats.

⁴ The available amount of water is less than 1000 m³ of renewable water per capita per year (GWP 2012).

⁵ The available amount of water is less than 500 m³ of renewable water per capita per year (GWP 2012).

a) *The stumbling block of overpopulation*

30. Overpopulation is both a cause for the degradation of the marine ecosystem and a factor aggravating the burden of natural risks. Population patterns of the Mediterranean have been growing steadily since the 1970s. Today, the total population of the 26 000 km coastline is 132 million whereas the combined population of the countries bordering the sea is about 450 million (MerMex 2011).

31. However, according to recent estimates, the total population should keep growing to 520-570 million by 2030 (EEA 2006a). Certainly, urban areas will be the first affected by this sharp population increase. And the rising number of city dwellers, which is estimated to reach 380 million people by 2025, will not help alleviate the pressure on cities and, because of this, on the environment (CNRS 2011).

32. The population density around the Mediterranean also experiences high seasonality as the region is subject to mass tourism during the summer. The 275 million people that flock around the Mediterranean Sea each year represent one third of the world's international tourism. If most Mediterranean countries are dependent on tourism to sustain their economy⁶, they often undermine the deteriorating effect of mass tourism on the ecosystem. The generation of large volumes of solid waste and the discharge of dangerous substances and other pathogens into the sea strongly affect the marine ecosystem.

33. Furthermore, the high development and urbanization rates of Mediterranean coasts make them increasingly vulnerable to coastal erosion risks, especially on the north-western shores where tourism is concentrated (CNRS 2011). The consequences of erosion on the coastal ecosystem, which is caused by the poor quality of waterfront constructions, excessive sand extraction from beaches or the trapping of sediments at drainage-basin level, are presented in the 2006 EEA report. The main threats are: desertification and reduction of the biodiversity; the alteration of beach dynamics following the destruction of dunes; water salination through the removal of sandy littoral lanes; and groundwater pollution or the reduction of water resources caused by the destruction of soil surface layers (EEA 2006a).

34. If the pressure exerted by mass population is significant today, it will undoubtedly be even irreversible in a few decades as tourism in the Mediterranean is forecasted to attract about 637 million people in 2025 (CNRS 2011).

b) *Consequences: a call for action*

35. Natural hazards by themselves do not cause disasters (UNISDR 2008). Disasters arise in the presence of an exposure to a hazard, conditions of vulnerability of a geographical area or population and the insufficient capacity to respond to the threat. Hence, we can define them as "*serious disruptions of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources*" (UNISDR 2009).

36. Technological hazards will therefore affect natural hazards by increasing the probability of incidence of weather or climate hazards and the vulnerability of populations to natural hazards. The latter happens mainly through the degradation of ecosystems and the depletion of water and food resources. Moreover, changes in livelihoods or behaviours attributed to rapid and unplanned

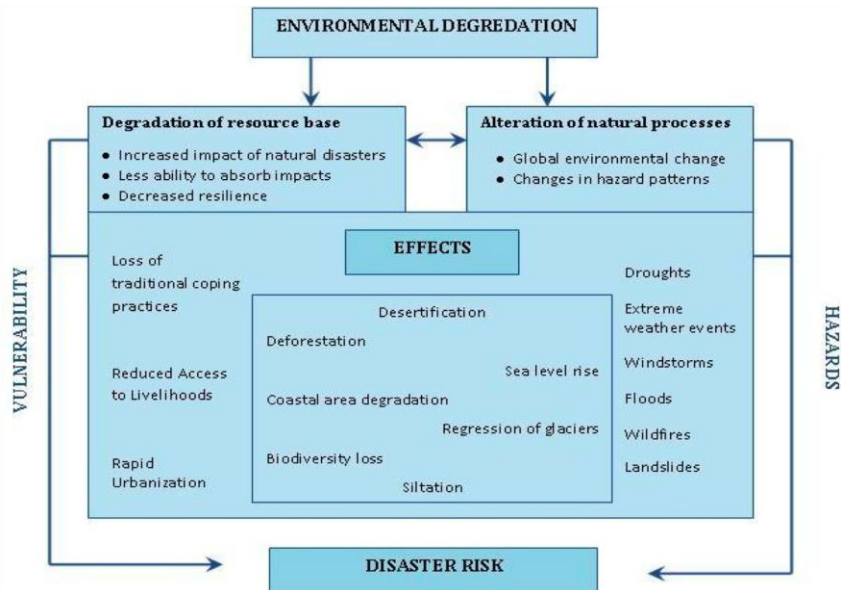
⁶ In Morocco, tourism accounts for 8% of the Gross Domestic Product (CNRS 2011).

urbanization is yet another major factor influencing disaster risk as it further reduces the ability to cope with natural hazards.

37. Understanding and recognizing the interconnections and synergies between environmental degradation attributed to technological hazards, vulnerabilities and disaster risk is crucial to set up a comprehensive approach for disaster risk management and protect populations (Fig. 2).

Fig. 2 The synergies between environmental degradation, vulnerability and natural hazards

Source: UNISDR 2011a



38. In its 2011 global assessment report on disaster risk reduction, the International Strategy for Disaster Reduction hosted by the United Nations (UNISDR) has showed that, despite of a global decline of the mortality rate associated with weather-related hazards, economic losses have continued to increase in all regions of the world since 1980. Hence, while jobs and economic assets are created, so is the risk of losing economic assets and livelihoods from disasters. This striking imbalance is even more depicted in low and middle-income countries like in the South of the Mediterranean (UNISDR 2011b).

39. If it is undeniable that natural and technological hazards imply potentially high costs and losses of income, reducing their incidence is often discounted when compared to standard economic preoccupations such as tackling inflation and unemployment or ensuring fiscal stability. Yet, their impacts, when all costs are calculated can represent major losses in terms of jobs, energy or health (ISDR 2012).

c) How to prevent and mitigate the risks?

40. With reference to disastrous events, the ultimate aim of communities is to enhance their capacity to "resist, absorb, and recover from the effects of a hazard in a timely and efficient manner" (PPRD South 2011). The resilience of countries is therefore an important indicator of a country's risk governance capacity.

41. In the Mediterranean, the present state of the ecosystem and the potential hazardous events that put its survival in jeopardy calls for concerted efforts from the countries bordering the Mediterranean Sea. On top of that, it requires disaster risk management to be embedded in climate change management, environment preservation and sustainable development. Policies aiming at tackling those various issues are strongly interlinked, but have not been fully internalized in

a comprehensive approach for disaster risk management so far.

42. It is therefore essential for countries around the Mediterranean to continue to "harmonize, integrate and embed disaster risk reduction within poverty eradication and sustainable development policies and programmes" as is advocated within the UNISDR global assessment report on disaster risk reduction (2011b) (see Fig. 3).

43. In the three-step approach advocated by the UNISDR, governments should primarily take responsive measures capable of revealing the risks their country is confronted to. Only when disaster risks are adequately reckoned will governments, indeed, be in state to assess their needs, which will urge them into action. This could be achieved with the help scientific organizations whose cooperation in the Mediterranean Region is already under progress, as we will see below. Eventually, governments must decide which part of the risk they commit to mitigate, which part they want to insure or transfer to capital markets. In respect to risk prevention and mitigation, prospective strategies (anticipate and avoid the build-up of risk) are usually more cost-efficient than corrective ones⁷.

44. Increasing resilience among Mediterranean populations requires, secondly, integrating disaster, climate and technological risks into standard development mechanisms. Hence, a development paradigm shift is advocated as formulated in the UNISDR recommendations. A first step towards this change consists in internalizing disaster risk in public investment and ensuring inclusion of cost-effective risk reduction measures.

45. This will be facilitated through the adaptation of existing social protection mechanisms and the implementation of additional programmes such as market-based micro-credit and insurance, which often contribute to the creation of risk-reduction community assets⁸. Ecosystem-based investments provide multiple benefits in that respect and should therefore be privileged. However, this requires that the value of ecosystem services is recognized (which is rarely the case). Finally, redefining land use planning and building is also of utmost importance as unplanned urbanization is considered both a cause for the degradation of the ecosystem and for increasing vulnerability.

46. The third and final priority for governments to build a successful disaster risk management is to adopt a radical reform of risk governance. This new type of governance should aim at enhancing political commitment and policy coherence in central ministry, as much as the accountability and competence of local government, while engaging the civil society in the culture of public administration.

Fig. 3 Key elements for successful disaster risk management (DRM) across governance scales and development sectors

Source: UNISDR 2011b

⁷ An example of prospective strategy would be to improve building and land use decisions compared to the reinforcement of unsafe buildings, the relocation of exposed settlements to less hazardous locations, or the construction of hazard mitigation measures, which are all corrective measures.

⁸ Providing timely capital following disasters through micro-credit and micro-insurance can help protect households from losses and quicken recovery. They act, however, as complements and not substitutes of social protection measures.

TAKE RESPONSIBILITY FOR RISK

<p>Invest in risk reduction</p> <p>Use cost–benefit analysis to target the risks which can be most efficiently reduced and which produce positive economic and social benefits</p>	<p>Take responsibility</p> <p>Develop a national disaster inventory system to systematically monitor losses and assess risks at all scales using probabilistic models</p>	<p>Anticipate and share risks that cannot be reduced</p> <p>Invest in risk transfer to protect against catastrophic loss, and anticipate and prepare for emerging risks that cannot be modelled</p>
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INTEGRATE DRM INTO EXISTING DEVELOPMENT INSTRUMENTS AND MECHANISMS

<p>Regulate urban and local development</p> <p>Use participatory planning and budgeting to upgrade informal settlements, allocate land and promote safe building</p>	<p>Protect ecosystems</p> <p>Employ participatory valuation and management of ecosystem services and mainstreaming of ecosystem approaches in DRM</p>	<p>Offer social protection</p> <p>Adapt conditional cash transfer and temporary employment schemes; bundle micro-insurance and loans; consider social floor and poverty line</p>	<p>Use national planning and public investment systems</p> <p>Include risk assessments in national and sector development planning and investment</p>
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BUILD RISK GOVERNANCE CAPACITIES

<p>Show political will</p> <p>Place policy responsibility for DRM and climate change adaptation in a ministry with political authority over national development planning and investment</p>	<p>Share power</p> <p>Develop decentralized, layered functions; use principle of subsidiarity and appropriate levels of devolution including budgets and to civil society</p>	<p>Foster partnerships</p> <p>Adopt a new culture of public administration supportive of local initiatives and based on partnerships between government and civil society</p>	<p>Be accountable</p> <p>Ensure social accountability through increased public information and transparency; use performance-based budgeting and rewards</p>
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IV. Existing initiatives in the field of natural and technological hazards in the Mediterranean

47. As far as the Mediterranean Region is concerned, there exist different initiatives that aim to address the problems of environmental degradation, climate change and natural disasters management. The present section provides an extensive list of the different programs at play. Although attempts to federate countries of the Mediterranean around the environmental cause has often delivered unsatisfying results, the scientific community has been able to broaden its knowledge on climate change, technological and natural hazards thanks to different cooperation initiatives.

48. Scientific cooperation's will also be looked at in this section. As the UNISDR argues, governmental decision makers should work in unison with experts and scientists in order to be capable of taking "well informed decisions on how best to invest in risk reduction measures to prevent the risks associated to weather-related hazards" (UNISDR 2011c).

*(UN)ISDR –
(United Nations)
International for
Strategy for
Disaster Reduction*

The ISDR is a strategic framework adopted by UN Member States in 2000. The ISDR guides and coordinates the efforts of a wide range of partners to achieve a substantive reduction in disaster losses. It aims to build resilient nations and communities as an essential condition for sustainable development.

The UNISDR is the secretariat of the disaster risk reduction community, which comprises numerous organizations, States, intergovernmental and non-governmental organizations, financial institutions, technical bodies and civil society, working together and sharing information to reduce disaster risk.

UNISDR serves as the focal point for the implementation of the *Hyogo Framework for Action* (HFA) – a ten-year plan of action adopted in 2005 by 168 Member States of the UN at the World Disaster Reduction Conference to protect lives and livelihoods against disasters (UNISDR 2012c).

*UNFCCC – United
Nations
Framework
Convention on
Climate Change*

The UNFCCC is a 1992 international treaty setting an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases. The Convention gave rise to Kyoto Protocol, which was adopted in 1997 and legally binds 37 developed countries and the EU to emission reduction targets. The Protocol's first commitment period started in 2008 and ends in 2012.

*WMO – World
Meteorological
Organization*

The WMO is the UN system's authoritative voice on the state and behaviour of the Earth's atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resources. In 2009, it had a membership of 189 Member States and Territories.

The WMO provides a framework for international cooperation on weather, climate and the water cycle through the establishment of networks for making meteorological, climatological, hydrological and geophysical observations, and the exchange, processing and standardization of related data. It also fosters collaboration between the National Meteorological and Hydrological Services of its Members and furthers the application of meteorology to a wide range of sectors.

The WMO supports the implementation of a number of environmental conventions and is instrumental in providing advice and assessments to governments on related matters, which contribute towards ensuring the sustainable development and well-being of nations.

**UNEP/MAP –
United Nations
Environment
Programme's
Mediterranean
Action Plan –
Barcelona
Convention**

UNEP/MAP is the world's oldest regional seas programme which was adopted by 21 Mediterranean countries and the European Community since its creation in 1975 as a way to ensure marine pollution control in the Mediterranean and jointly manage the resources on which the region and the world depends.

In the framework of MAP, the parties adopted various concrete agreements on coastal zone management and planning. A good example is the "*Mediterranean Strategic Action Programme for Biodiversity*" (SAP/BIO), signed in 2003, which contains well-defined objectives and targets based on the Johannesburg Plan of Implementation and relevant commitments taken under the Convention on Biological Diversity. The "*Mediterranean Strategy for Sustainable Development*" (MSSD), launched in 2005 by the *Mediterranean Commission for Sustainable Development* (MCSD) is another example of initiative established under the UNEP/MAP. MCSD framework "provides guidance for national decision makers to address sustainable development issues, implement international agreements and initiate partnerships. It is also a benchmark against which the entire Mediterranean community can monitor and assess its contribution to a common vision of a sustainable Mediterranean" (UNEP/MAP 2012).

In 2010, MAP, with the support of the Global Environment Facility, has joined forces with the World Bank, international and regional organizations, nongovernmental organizations and twelve Mediterranean countries and began implementing a new strategic partnership known as "*MedPartnership*". The partnership enables a coordinated and strategic approach to the policymaking, reforms and investments necessary to reverse degradation of the Mediterranean's marine ecosystem, coastal habitats and biodiversity. With total funding in excess of 1.5 Billion USD, including co-funding, the MedPartnership has two key elements: a UNEP/MAP led Regional Component that implements actions agreed by the countries (with 47 million USD funding), and the World Bank-led Investment Fund for the Mediterranean Sea Large Marine Ecosystem Partnership (MAP 2010).

***The "Malta
Declaration" of
the Parliamentary
Assembly of the
Mediterranean
(PAM)***

The *Malta Declaration* is a statement adopted by the members of the PAM at the International Roundtable of Parliamentarians on Disaster Risk Reduction and Climate Change Adaptation in 2009 in which they committed to "*ensure immediate action to finalize a legally-binding agreement, with progressive and accessible financing mechanisms adequate for reaching the goals of disaster risk reduction, coupled with accessible appropriate technology, to ensure availability based on region-specific vulnerabilities*" in the 15th Conference of the Parties (COP15) taking place in Copenhagen.

***H2020 – Horizon
2020 Initiative***

H2020 is an ambitious EC-funded project which aims to de-pollute the Mediterranean by the year 2020 by tackling the sources of pollution that account for around 80% of the overall pollution of the Mediterranean Sea: municipal waste, urban waste water and industrial pollution. It was launched during the 10th Anniversary Summit of the Barcelona Process in 2005 and is now one of the key initiatives endorsed by the Union for the Mediterranean (UfM) at its launch in Paris in 2008.

"Horizon 2020 builds on existing institutions, initiatives and results, filling gaps where it could bring added value. It operates within the framework of existing and developing policy instruments, and supports the implementation of the commitments undertaken in the framework of the Barcelona Convention: MAP's Strategic Action Programme (SAP) to address pollution from land-based activities (SAP MED); the MSSD, launched by the MCSD established under the UNEP/MAP" (H2020).

***PPRD South
Programme –
Euromed
Programme for
Prevention,
Preparedness and
Response to
Natural and Man-
made Disasters
(PPRD South)***

PPRD South programme is the successor of two EU-funded programmes on civil protection launched in the aftermath of the Barcelona Process in 1998. It aims to contribute to the development and reinforcement of the quality of Civil Protection services in the Euro-Mediterranean Region and to the continuation of institutional cooperation in the field, both between the EU and the Mediterranean Partner Countries and among the Mediterranean Partner Countries themselves, thereby promoting political and social stability.

In December 2008, the 36 months service contract for the implementation of the PPRD South was signed between EuropeAid and the Consortium established by the Italian Civil Protection Department, as leader, jointly with the Civil Protection Authorities of Egypt and France and the UNISDR.

The PPRD South programme organizes numerical conferences and training workshops for staff and high-level managers on the theme of disasters. It also supports, through its unique portal, the establishment of a regional collaborative Knowledge Management Mechanism (KMM) aimed at facilitating the exchange of information on prevention (e.g. risk maps and Regional Risk Atlas), preparedness and response to disasters among the Programme's stakeholders while improving the coordination of existing warning systems and of the relevant operational centres.

SWIM –
*Sustainable Water
Integrated
Management*

SWIM is an EC-funded project aiming to contribute to the implementation and extensive dissemination of sustainable water management policies and practices in the European Neighbourhood and Partnership Instrument (ENPI) South countries (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, occupied Palestinian territory, Syria and Tunisia) through the cultivation of a water culture based on experience sharing, consultation and replication of good practices.

More importantly, SWIM aims to add value and complement regional processes and other on-going relevant initiatives through replicable regional and national activities and demonstration projects implemented in the ENPI South Countries on urgent issues related to the prevention of water resources pollution and degradation, adaptation to climate change risks and promotion of local governance issues. It strongly interacts with the Members of Parliaments active in the relevant Committees and activities are planned towards strengthening the capacity of legislators in the above-mentioned issues (SWIM 2012).

EUR-OPA –
*European and
Mediterranean
Major Hazards
Agreement*

EUR-OPA is a platform for co-operation in the field of major natural and technological disasters between Europe and the South of the Mediterranean. Its field of competence covers the major natural and technological disasters - knowledge, prevention, risk management, post-crisis analysis and rehabilitation.

The main objectives of the EUR-OPA Major Hazards Agreement are to reinforce and to promote co-operation (through recommendation and resolutions) between Member States in a multi-disciplinary context to ensure better prevention, protection against risks and better preparation in the event of major natural or technological disasters. Set up by the Committee of Ministers of the Council of Europe in 1987 (Resolution (87)2), the Agreement is "open" because any non-member State of the Council of Europe may apply to become a member. It has to date 26 Member States.

MISTRALS -
*Mediterranean
Integrated Studies
at Regional and
Local Scales*

MISTRALS is to date the most ambitious interdisciplinary program dedicated to understanding the processes at work in the Mediterranean Region. This program, which was launched in 2008, is jointly led by the CNRS and the Research Institute for Development (RID) and involves 26 Mediterranean countries. The objective is to shed light on the processes that shape and influence landscapes (notably through the seven thematic programmes: SicMED, HyMEx, TerMEx, MerMEx, ChArMEx, BiodivMEx, and PaleoMEx), the environment, and the effects of human activities in the Mediterranean. It also aims to quantify the impact of global change on the area, and predict the evolution of its habitability in the future generations. Its various projects are currently under work, and are expected to deliver its enlightening results in the near future.

*MEdIES -
Mediterranean
Education Initiative
for Environment
and Sustainability*

MEdIES is the major educational and training tool of the Mediterranean Information Office for the Environment, Culture and Sustainable Development (MIO-ECSDE 2012) working in the direction of awareness raising and education in the Mediterranean Region for prevention and mitigation of environmental hazards and risks through various means and activities. It has been launched in Johannesburg during the World Summit on Sustainable Development and is in line with the principles of the UN Decade on Education and Sustainable Development.

V. Recommendations: the role of PAM parliamentarians

49. The Mediterranean Region is very prone to natural hazards due to its unique geographic situation and geodynamic structure. In the last decades, human-related pressures together with climate change have been responsible for exacerbating the threats already posed on the Mediterranean environment.

50. Today, the various natural and man-made hazards are seriously putting the Mediterranean environment at risk while threatening the people living on its shores. If disasters cannot be prevented, they can yet be reduced/managed to a large extent with pro-active strategies aiming to strengthen the Mediterranean countries' resilience, preparedness and response to them. Today, more than ever, there is an urgent need to develop successful cross-cutting strategies capable of addressing the needs of the Mediterranean countries' populations.

51. The present report magnifies the importance for all PAM countries to set disaster risk reduction as a national and international top priority to be factored into policies and programming related to sustainable development.

52. Certainly, a starting point of disaster risk reduction lies in the knowledge of the disaster risk that Mediterranean societies are facing, but also of their exact social, economic and environmental vulnerabilities. Disaster risk assessment has to be achieved by relying on serious probabilistic models, which will facilitate more considered decisions in the long term, based on a correct assessment of the costs, benefits and trade-offs internalized in public investment.

53. Furthermore, the extremely complex interactions between the various types of natural and technological hazards governing the Mediterranean Region, together with climate change and environment degradation should lead us to consider this geographical area as one global ecosystem where all countries are affected equally.

54. While each country has primary responsibility for its own disaster defensive measures, the effective reduction of disaster risk won't be achieved without the existence of an enabling international environment capable of promoting the implementation of the *Hyogo Framework of Action* (2005-2015) advocated by the UNISDR. PAM national parliaments have therefore the leading responsibility to strengthen international cooperation and dialogue in the fight against technological and natural hazards, regardless of their political, economic, social and cultural differences, and to redouble their efforts to reach agreements on the most sensitive topics (e.g. water).

55. On top of that, there is a need to enhance the cooperation of the national relevant entities with expert centres of excellence and institutions specialized in climate change and disaster management and prevention across the Mediterranean Region such as MAP, WMO, UNISDR and CNRS.

56. Finally, the creation of a culture of disaster resilience in the Mediterranean Region won't be achieved without the involvement of its people. The present report emphasizes the necessity to

engage "community participation" in the fight against environment degradation by, among other things, raising awareness and implementing a strategy for Mediterranean Education for Sustainable Development (MESD) so as to build a real "culture of prevention" among the Mediterranean Region and its people, in line with the "Horizon 2020 Initiative".

57. The concrete proposals presented in this report should be adopted after careful consideration between PAM parliamentarians. The resolutions aiming to tackle hazardous events as a whole should, therefore, be taken by Mediterranean countries in a two-step process: the first phase should lead parliamentarians to debate the trends, challenges and solutions in order to better understand the complex interconnections between climate change, technological and natural disasters, unplanned urbanization, sustainable development and poverty eradication; the second phase should focus on determining the key priorities to be translated into actions.