OSCE Participatory Workshop on Environment and Security Issues in the Southern Mediterranean Region

Kempinski Hotel Amman, Jordan
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Background Paper

1. Introduction

The Mediterranean Region has been identified as one of the most vulnerable areas in terms of environment and security linkages. Due to its climatic and topographic features, as well as the cross-boundary dimension of the Mediterranean Basin, intermixed with cultural, political and economic diversity, the region represents an area that poses potential for social and political instability, with repercussions that can also affect European countries and other neighboring regions. Furthermore, energy security is an important element on the political and economic agenda of the Southern Mediterranean countries, who are not only important exporters of oil and natural gas, but have also vast potential with regard to the development of renewable energy sources, thus affecting future energy security policies in the region and beyond.

The OSCE Participatory Workshop on Environment and Security Issues in the Southern Mediterranean Region is expected to contribute to a process whereby public decision-makers are able to motivate action to advance and protect peace and the environment at the same time. The assessment will identify environmental issues that may have an impact on security, as well as environmental implications of security policies, and will map them in an easily understandable format. Priorities for action will be identified and disseminated to decision makers and the general public through outreach activities. While focusing on the Southern Mediterranean region, the assessment process will also include inputs and outputs of environment and security aspects stemming from and to the Northern Mediterranean and adjacent regions.

Key issues to be explored include main environment and security challenges such as water scarcity and land degradation, environmental implications of climate change, environmental implications of energy and security and the role of the civil society.

The **objectives** of the workshop are to:

- Identify and map existing and especially new environmental issues that may have an impact on security as well as environmental implications of security policies in the region;

- Create wider understanding of the various national, regional and international frameworks for co-operation and co-ordination mechanisms related to environment and security issues in the region, including among governments, between governmental departments within states, between governments and civil society, and among civil society organizations;

- Stimulate the OSCE Mediterranean partners for Co-operation dialogue by putting forward ideas and recommendations for increased national, regional and international action and solutions on environment and security issues including with regard to the role of the OSCE.

2. Environmental Pressures and Forecasts

Despite various political initiatives at international level, the Mediterranean still faces serious environmental problems which are the result of both climate change and factors such as intensive agriculture, overfishing, rampant coastal development, inadequate controls over waste and wastewater disposal and increased trade and shipping. If not addressed and resolved, environmental problems related to water shortages, land degradation and pollution can become security threats. In this respect the Mediterranean is one of the world's most vulnerable areas: its basic climatic and environmental features, combined with its cultural, geopolitical and economic complexity, have high potential for social and political instability.

In order to prevent such developments, international co-operation based on more solidarity and political balance between the northern and the southern Mediterranean countries must be stepped up. All countries of the Mediterranean basin must improve, implement and enforce national and international environmental legislation, apply an integrated ecosystem-based approach in their policies and integrate it in all relevant sectors. This process requires strong political commitment, adequate funding, institutional capacity and transfer of technology and know-how.

Throughout the 20th century the world population has been tripled and, in parallel, water consumption has increased, approximately, six-fold. Increasing population is followed by an increasing pressure on natural resources for food and goods production and human settlements, which can cause the exhaustion of these resources in fragile environments. The population bulge accompanied by land stress and water scarcity may promote the displacement of population masses to other territories, usually urban centers that can spread beyond borders with destabilizing effects on the stability and security at regional, national and international level.

These phenomena are particularly relevant for countries in arid, semiarid and dry areas of the world. In this sense, a great part of the Mediterranean region shows these characteristics, together with a particular climatology with scarce rains and recurrent drought periods. These ecosystems show great fragility, being particularly sensitive to alterations in their water regime. Their situation could become more critical given future climate perspectives. The IPCC for instance predicts a clear tendency toward reducing the number of rain storms but increasing their aggressiveness, and the rise of temperatures.

These predictions run in parallel to the population growth projections for the area, and the consequent increased need of resources, mainly agriculture. It has to be considered that agriculture is the source of much of the wealth generated in the Mediterranean. However, irrigated agriculture, currently responsible for about two-thirds of the water consumption in the Mediterranean Region, increases the necessity of more water resources. The use of inadequate agricultural practices and land management are causing soil exhaustion, loss of vegetation cover, soil erosion, biodiversity loss and the advance of the desertification processes in a great part of the Mediterranean region. Actually, the associated consequences of that are clearly visible in many Mediterranean countries, being translated in shifts of population towards urban nuclei, migrations, effects on national economies, class and ethnic cleavages, alterations in the home security of countries, and international, national, and trans-boundary conflicts.

3. Water Scarcity, Land Degradation, Environmentally Induced Migration and Security

Water

According to the UNEP Blue Plan Programme, **water** resources in the region are limited and unequally shared in time and space. The southern countries have only 13% of total resources. Increasing demand for water and increasing pollution through pesticides or nitrate contents leads to pressure on the water resources, thus to changes in the water regime, drop in underground water table levels and depleted resources. Tensions on the resources are expected to be particularly high in Egypt, Israel, Libya, Palestinian territories and Spanish Mediterranean catchment areas as well as – though to a smaller extent – in Malta, Syria, Tunisia and in some catchments in Morocco.

In their EU European Neighbourhood Policy Country Reports, all the South Mediterranean countries mention water management as a priority of environmental protection. Jordan stresses the need to deal with the issue of water rights and management at a regional level, in order to minimize the threat of conflict over access to resources. As a result of its limited water sources, it is among the world's 10 water poorest countries. Aside from water scarcity, Jordan faces additional challenges in institutional aspects relating to water resource management, the financial requirements of an investment program for water and the operation and maintenance of the water and wastewater sector. (ENP Country Report Jordan, 2004)

Much of the region is semi-arid and subject to seasonal droughts with high rainfall variability. Additionally, human activities have substantially contributed to further degradation of land. High population densities in certain areas result in heavy concentrations of industry and intensive agriculture thus putting even more pressure on the soil. To a great extent poor agricultural practices lead to overgrazing and soil salinization. In addition, the use of fertilizers, pesticides and contamination by heavy metals continues to undermine the quality of the region's soils. In Tunisia, annual land losses from land degradation processes (water, wind erosion, salinization) are estimated at 37.000 hectares, 13.000 of which have suffered irreversible damage. (Blue Plan 2006) Most severe forms of land degradation can be found in the desert fringes of Algeria, the Eastern Right and High Atlas Region in Morocco and mountainous region in Morocco.

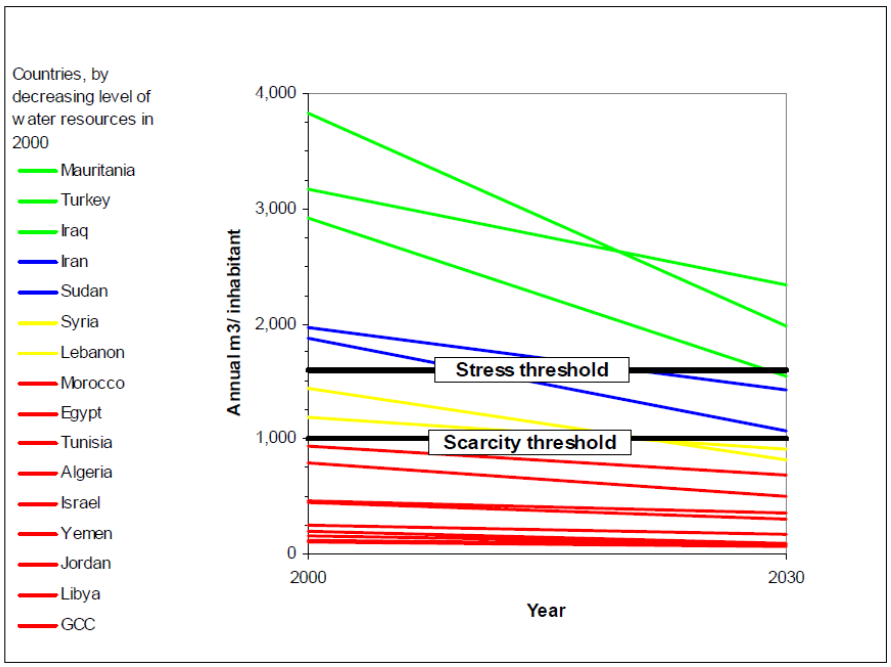

Figure 1: Freshwater Renewable Resources Per capita in the MENA region, 2000 to 2030
(Source: Based on United Nations Food and Agriculture Organization freshwater statistic and UNDP

Land Degradation

Desertification is one of the most pressing global environment challenges of our time, threatening to reverse the gains of sustainable development that have emerged in many parts of the world. It is a process that can inherently destabilize societies by deepening poverty and creating environmentally displaced persons who can often add stress to areas that may not yet be degraded.

Land degradation and the widespread loss of fertile topsoil in terms of quality and quantity is not a sudden event, but a gradual process, a creeping as well as a silent disaster. The effect of soil degradation is often not conspicuous, but nevertheless potentially very damaging, considering on one hand the soil's slow formation rate of 100 - 400 years/cm of topsoil and on the other side the irreplaceable value of soil in respect to maintaining ecosystem services and securing sustainable livelihood.

When you add to the equation climatic trends with their impact on increased aridity, water erosion, forest fires and drought, we are talking about a major emerging factor of environmental scarcity with wide socio-economic implications in all regions of the world. The challenge is not limited to the drylands: salinization in the large irrigation systems of Asia, deforestation and landslides in Latin or Central America, loss of organic nutrients and pollution in the soils of developed countries and compaction of soil due to infrastructure everywhere are some aspects of an ongoing aggression on soil health.

The "land" challenge is intimately linked to water management issues. It lies in balancing the maintenance of the soil's biological, chemical, physical and productive properties, with recognition of the land's role in sustaining human well-being, and acknowledgment of the broader development links with political and economic processes. The scientific community has widely and long recognized that soil and, more broadly, "land" is a valuable, finite resource, and that its sustainable future needs to be assured.

A major environmental threat such as desertification might bring considerable disruptive factors for the socio-economic security of nations and interstate relations. Therefore countries need to co-operate and support each other in the development and implementation of national and regional policies, programs and measures to prevent, control and reverse desertification/land degradation and mitigate the effects of drought through scientific and technological excellence, raising public awareness, standard setting, advocacy and resource mobilization, thereby contributing to poverty reduction and the achievement of other Millennium Development Goals (MDGs).

Migration

Migration has proven to be a sensitive issue and it is increasingly recognized that environmental factors, especially desertification, are adding to the migratory push factors in the Maghreb and Sub-Saharan regions. This is bound to accelerate in the future as climate change significantly alters agricultural productivity in areas that are not able to adapt especially poverty-stricken areas. This phenomenon will exacerbate the already existing problems of migration (illegal labor, trafficking, remittance management) as well as possibly increase tensions between sending and receiving countries. On the other hand, advancing research into the inter-linkages between environment and migration can serve to prioritize investments and projects and thereby reduce migratory pressure by ensuring sustainable livelihoods and local employment in degraded areas.

Although there is no internationally agreed definition for people who are displaced from their homes for environmental reasons, IOM developed a definition for "environmental migrants" as "persons or groups of persons who, for compelling reasons of sudden or progressive change in the environment

that adversely affects their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move either within their country or abroad."

Environmentally-induced migration has increasingly become a global concern in the 21st century. The impacts of natural disasters and acute environmental degradation on human security and livelihoods would lead affected population to be displaced. This comes with the alarming increase in the number of disasters, which has doubled over the past two decades. It is predicted that the number of people to be displaced due to severe environmental conditions by year 2050 may reach 200 million (European Parliament, 2011).

However, these alarming speculations about environmentally-induced migration disregard to a certain extent the migration dynamics and the presence of interlinked triggers behind population displacement. In fact, a number of researchers argue that natural conditions are rather a phenomenon occurring within a certain political context and together with other economic and social factors would lead to massive migration (Fargues, 2008). Consequently, some would argue that there is no actual presence of the phenomenon of "environmental migration" given that migration is much more complex and not attributable to a single factor.

Focusing on the migration phenomenon in the Southern and Eastern Mediterranean (SEM) countries, the region has lately become a significant receiver of migrants after decades of being an exclusive sender of migrants. Migrating groups into the SEM region can be labor migrants looking for employment opportunities offered by the SEM labor market. Another significant group is the refugees fleeing the neighboring countries in the Middle Eastern and North African (MENA) region like Iraq or Sudan or the sub-Saharan African region due to political conflicts and continuous instability. A third group is the transit migrants who are delayed to their main destination for several reasons and involuntary remain in the SEM for a period of time.

With respect to the idea previously discussed about the complexity of migration, environmental conditions come as a contributing factor or might trigger the migration factors of a population. In fact, several reports describe the MENA as the most vulnerable region when it comes to climate change and water scarcity (Fargues, 2008). Only 5 countries in the MENA region have renewable freshwater resources above the stress threshold (Iraq, Iran, Mauritania, Sudan and Turkey) while all the rest fall either between the stress and scarcity threshold or are already below the scarcity threshold (See **Figure 1**). Given these conditions, water scarcity could play a significant role in creating tensions or conflicts in the region and contribute to massive migration of populations.

Environmentally-induced migration has become a topical issue at the policy level that would require response on a global scale. The threats posed by natural phenomenon and impacts of migration cannot be addressed or resolved only by the nation-state. Mobilization of resources requires collaborative effort and joint agreements among neighboring and mostly affected countries to develop the correct strategies. The United Nations Climate Change Conference (UNFCCC) in Mexico in 2010 in its agreements on climate change emphasized particularly the following about environmentally-induced displacement: "Measures to enhance understanding, co-ordination and co-operation with regard to climate change induced displacement, migration and planned relocation, where appropriate, at national, regional and international levels." Within this context, the International Organization for Migration (IOM) has developed an approach for managing environmental migration. The main goals of this approach are first to prevent to the extent possible migration due to environmental stressors, second to deliver assistance and provide solutions to inevitable environmentally-linked migrations and third, to convert migration as an adaptation strategy and facilitate this work. Flavell provides a diagram (See **Figure 2**) describing the actions to be taken for environmental migration management.

Little effort has been done by authorities and countries of the MENA region despite the crucial impact of environmental stressors along with the previously mentioned factors that are affecting the migration landscape. Nevertheless, the issue of natural disasters and their impact on the region has been highlighted in the second Africa-Arab Summit that took place in Libya in October 2010. A decision was taken during the summit to establish a joint Africa-Arab Fund for disaster response. An agreement has been made that response to natural conditions and their implications require acting within a combined framework and joining possible resources.

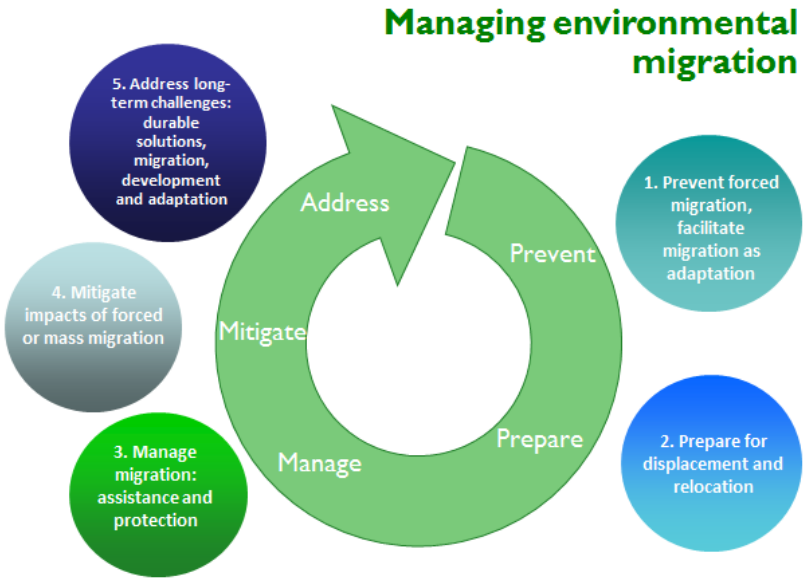

Figure 2: Managing Environmental Migration
(Source: International Organization for Migration: Climate Change, Migration, Security by Alex Flavell)

4. Climate Change and Security

Over the last five years, the reflection on and analysis of the security implications of climate change has grown remarkably. Different governments and organizations have addressed the issue highlighting the "threat multiplier" effect and possibility of fuelling and exacerbating conflicts.

In the first ever "thematic debate" on the issue at the UN Security Council in 2007, with a record-breaking attendance of participants, a lot of skepticism was voiced as to the actual connection between climate change and security in fear of securitization of the issue. The reality is that this inter-linkage has since occupied governments and organizations globally starting with the EU paper on Climate Change and International Security in 2008, which based on the fact that a fundamental aspect of security is access to essential resources such as food, water safe settlements etc. went on to identify the main areas of concern and areas to be affected harder, following the scenarios of the IPCC's fourth assessment report.

The shift in the approach is today evident after the subsequent UN General Assembly resolution on "Climate change and its possible security implications" (A/63/281), which was adopted by consensus and was the first time in history that a U.N. resolution established a direct link between climate change and international peace and security. Last July the UN Security Council revisited the issue and the message from UN Secretary General was loud and clear: "We must make no mistake." (…) "Climate change not only exacerbates threats to international peace and security; it is a threat to international peace and security".

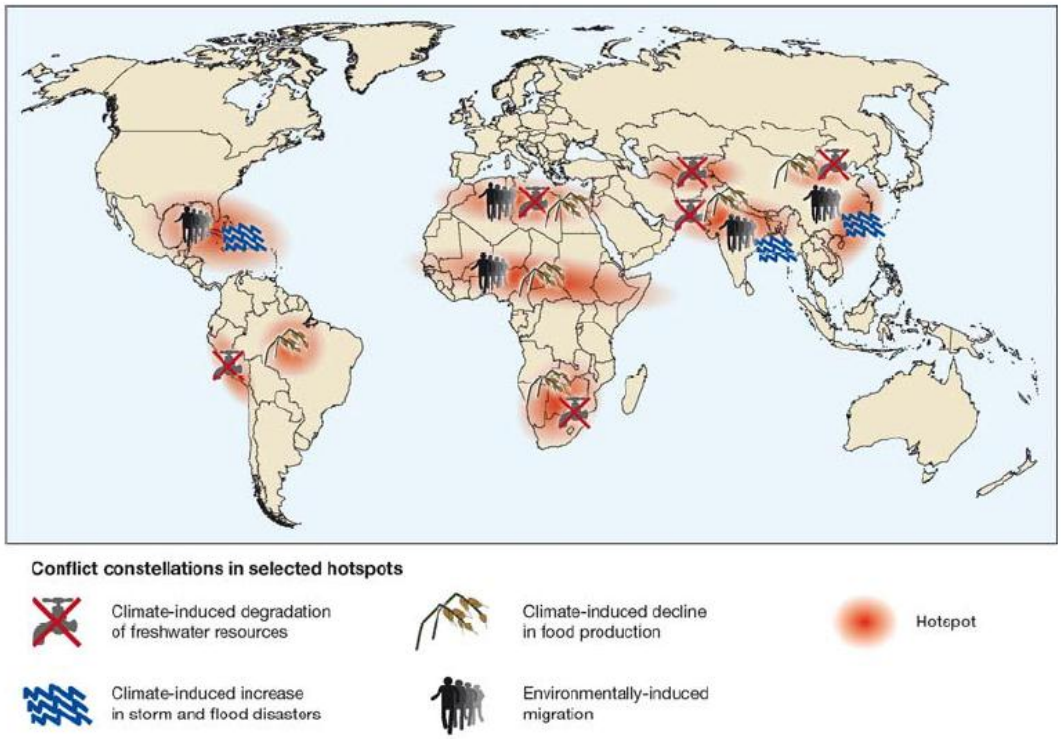

Figure 3: A map of conflict and migration induced by environmental stressors
(Source: German Advisory Council on Global Change WBGU (2007): Climate Change as a Security Risk)

Many reports converged on the following threats with emphasis on the water shortage and the extreme climatic events, stressing that the ability of states to cope would be compromised.

- **Conflict over resources**: Through the drop in agricultural productivity due to water shortages, the potential for civil unrest and struggle over depleting resources increases.
- **Economic damage:** especially to coastal cities and critical infrastructure: Sea level rise threatens coastal areas (that cover 20% of the world´s population and infrastructure) and their economic prospects. This can lead to significant environmental, social and economic loss and raise the costs for recovery.
- **Loss of territory and border disputes:** Through receding coastlines more disputes over land and maritime borders are expected as well as competition over energy resources.
- **Environmentally induced migration:** The UN estimates millions of environmental migrants and the consequence of such large waves of "forced" migration would carry negative consequences for the countries of origin, transit and destination.
- **Increase in situations of fragility and radicalization:** added pressure to fragile areas can increase the instability and overstretch their capacity to face the above challenges.

In sight of the areas more likely to be affected harder, the Mediterranean region, especially the countries of Northern Africa and Middle East (MENA), is considered as one of the most vulnerable regions due to the expected severe water shortages and the dependence on climate sensitive agriculture. (According to the IPCC scenarios the temperatures in the area are expected to increase by 1-2 degrees by 2030-2050. With higher temperatures and a drop in precipitation as expected the increase of droughts would be unavoidable.)

The European Union in its European Security Strategy in 2003 has acknowledged that global warming and climate change could raise security concerns and subsequently addressed Climate Change and international Security in March 2008 with a joint paper by High Representative Solana and the European Commission. This paper states that Climate change might lead to conflict over resources, provoke economic damage to coastal cities and critical infrastructure, deepen loss of territory and spark border disputes and exacerbate environmental migration.

The paper highlights as examples that "in North Africa and the Sahel, increasing drought, water scarcity and land overuse will degrade soils and could lead to a loss of 75% of arable, rain-fed land. The Nile Delta could be at risk from both sea-level rise and salinization in agricultural areas while 12 to 15 % of arable land could be lost through sea-level rise in this century with 5 million people affected by 2050". It also adds "The Jordan and Yarmuk rivers are expected to see considerable reduction in their flows affecting Israel, the Palestinian territories and Jordan. Existing tensions over access to water are almost certain to intensify in this region leading to further political instability with detrimental implications for Europe's energy security and other interests".

This paper and subsequent reports in December 2008 and 2009 have aimed to break the silos between different policies, and bring together stakeholders from the environment, development and security sectors to address the challenges. After the entry into force of the treaty of Lisbon and the creation of the European External Action Service (EEAS) the EU reconfirmed the need to further step up climate diplomacy and to further address the security aspects of climate change with partners through the adoption of Foreign Affairs Council conclusions on the issue in July 2011.

With a broad understanding of security and its interconnection to environment and climate change, the EU has sought to integrate the issue in its external relations and through the political dialogue and other instruments in its relations with 3rd countries at bilateral, regional and international level, placing high priority on regional dialogue and comprehensive approaches.

5. Energy Security

The Mediterranean region is expected to face several energy and climate challenges in the future which will prove essential for the development, economic welfare and stability of the region in the long-term. The challenges that lie ahead are multiple: securing energy supply, meeting growing energy needs in most efficient ways, fostering rational use of resources, optimizing synergies between producers, consumers and transit countries, and ensuring a sustainable and environmental future.

Total Mediterranean energy demand has almost doubled between 1970 and 1990 to 380 Million tons of oil equivalent (Mtoe). Since 1990, demand has increased to around 1000 Mtoe today and is expected to continue to increase. Demographic trends and economic growth are the two main determinants of energy demand. The South Mediterranean countries are facing rapid demographic growth combined with relatively low incomes, a rapid urbanization rate, and important socioeconomic development needs. As a result, their energy demand is increasing rapidly. By contrast, the North Mediterranean countries are characterized by more mature economies, illustrated by the movement of their economies toward the services sector and the saturation of energy demand for certain energy services. The share of South Mediterranean in the total Mediterranean energy demand is expected to reach around 45% in 2030 regardless of the scenario, compared to 31% in 2007.

Like the EU, the Mediterranean energy sector is and will remain fossil fuel based in the next two decades. According to the International Energy Agency, currently 80% of total energy need in the

region is met by fossil fuels. Regardless of the scenarios the share of fossil fuels in total primary energy demand will stay over 70% until 2030. Oil is the dominant fuel, with 41% share, in the energy mix of the Mediterranean region. Oil is followed by natural gas, nuclear, coal, and renewable energy sources respectively. The Mediterranean region holds nearly 5% of the world's proven oil and gas reserves. The majority of these reserves are located in Algeria, Libya and Egypt. The three largest oil producers – Algeria, Libya and Egypt – account for 87% of the Mediterranean output.

The recent discovery of substantial natural gas fields in the eastern Mediterranean might however prompt countries to look at the region in a new light. Joint exploitation of resources may change the political situation for the benefit of the whole region. However, disputes over maritime borders and sovereignty remain very important and could probably only be solved through international arbitration. Countries in the region will have to temper disputes over maritime borders and sovereignty before companies such as BP, Total, Royal Dutch Shell and others can realize its potential as an export hub, according to the Observatoire Mediterranéen de l'Energie.

Energy security is thus a key concern and challenge for the Mediterranean countries as well as for the EU. Many of the EU's existing and new energy partners in Mediterranean offer a big potential for the improvement of its energy security. These partners are endowed with important energy resources, including solar and wind.

Of particular interest is the potential for Concentrated Solar Power. **Figure 4** shows the potential distribution of alternative forms of energy in Europe and North Africa, with solar power by far the most dominant.

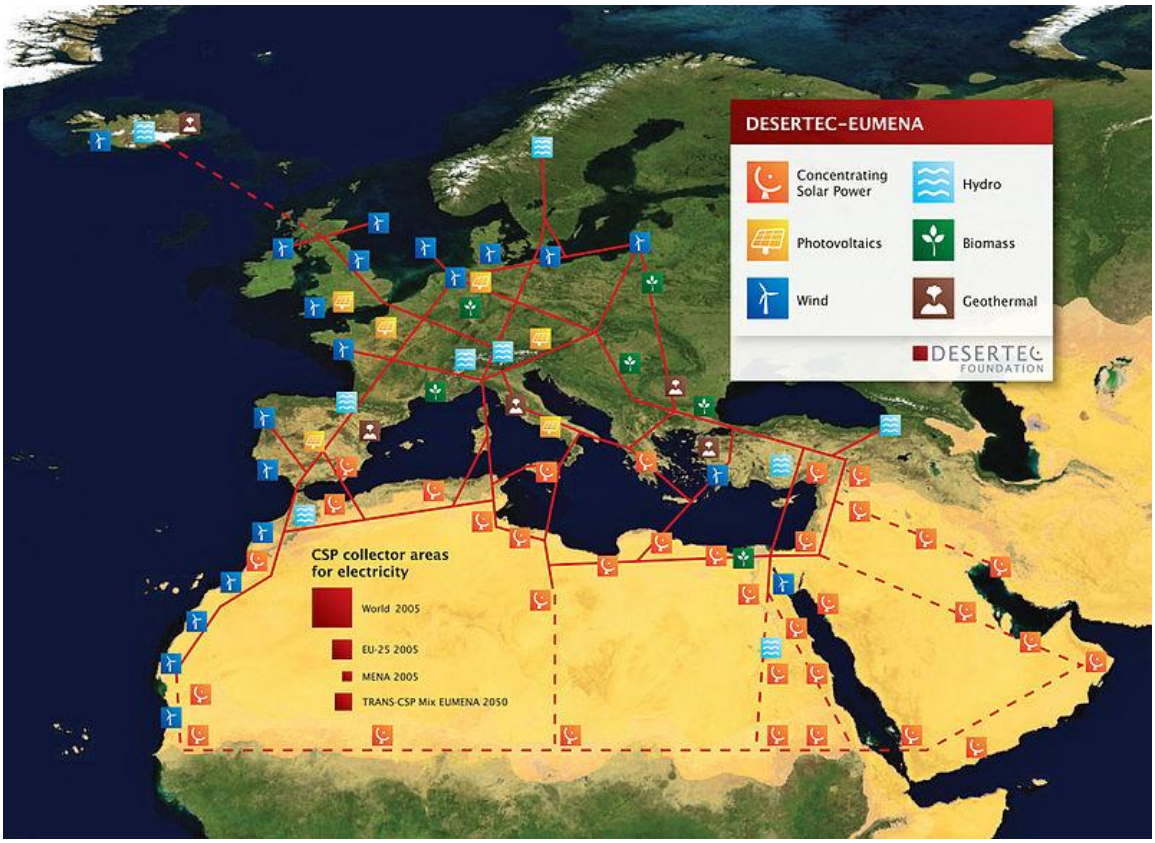

Figure 4. Hypothetical infrastructure of HVDC power supply in Europe, the Middle East and North Africa. Source: German Aerospace Center (DLR) Institute for Technical Thermodynamics (ITT)

Key in promoting renewable energy in the region is the DESERTEC Concept for Energy, Water and Climate Security of the Trans-Mediterranean Renewable Energy Cooperation (TREC), an initiative of the Club of Rome. TREC was founded in September 2003 by an initiative of The Club of Rome, the Jordanian National Energy Research Center NERC, and the Hamburg Climate Protection Foundation HKF, with the aim of achieving fast climate, energy and water security by a joint effort of the EU-MENA regions. The core of TREC is an international network of scientists, politicians and other experts in the development and implementation of renewable forms of energy. The members of TREC, approximately 60 in number (including His Royal Highness Prince Hassan bin Talal of Jordan), are in regular contact with national governments and private investors, with the aim of communicating the benefits that may be obtained from the cooperative use of solar and wind energy and promoting specific projects in this field. Regional DESERTEC networks disseminate the ideas in their home countries.

Exploitation and massive deployment of renewable energy resources will depend on implementing and effectively pursuing policy support. It will also require considerable investments, the establishment of a harmonized legislative and regulatory framework, strengthened institutional capacity, improvement in knowledge transfer and capacity building in energy technologies, and an improved business climate.

Interdependency is at the heart of energy security. To address common future challenges and improve their energy security the EU and its neighbors in the Mediterranean must intensify their efforts. The EU can help its partners develop their potential so that they can significantly contribute to the EU energy security. Implementation of investments, especially in energy infrastructure, of common interests in the Euro-Mediterranean region is vital.

Several initiatives are already under way to foster co-operation. Healthy and stable relations between the EU and its neighbors in the Mediterranean, as well as the quality of the dialog between all stakeholders involved in energy must remain a priority. A secure energy future can only be achieved if relations between stakeholders are based on the principles of transparency, common responsibility, mutual benefit, confidence, respect, fair competition and non-discrimination with commitments and actions.

6. Environmental Implications of Security Policies

Although today some countries see a role for their military and security establishments in climate change disaster relief through their national security policies, the approach varies when it comes to how they approach climate change in general and the degree to which they consider it a national or international security concern. For example, while US, UK and China are studying the effect of sea level rise on the installations of their militaries, Russia is focusing on the consequences of the melting of the arctic ice.

Since 2007, with the publication of a report of the US Centre of Naval Analysis (CNA) , an analysis on the impact of climate change to national security drafted by 11 retired military officers, it became clear that the military and the security sector need not only preemptively plan for possible security threats related to environmental and climatic changes but also act to protect installations and contribute to the efforts for protection of the environment, mitigating the “bootprint” of the military and phasing out of unsustainable energy use.

Along the same lines the EU approach, called for a paradigm shift in military capabilities in the light of the Climate Change challenges, undertaking to introduce energy efficient systems and recyclable

materials by efficient fuel consumption, reduced emissions, the lowering of fuel costs and reduced military footprint in military operations through greener operational efficiency.

Military establishments traditionally have a record of high use of natural and financial resources and when it comes to budget allocations, politics shift the weight from one to the other. Greening the military and its operations, research and practice shows, is not only about protection of the environment and prevention of fast depleting of resources. It is also about fewer casualties and less cost. The price of a gallon of fuel from the base to the theatre of operation or battlefield multiplies dramatically. The true cost of fuel, known as “fully burdened cost of fuel” is the total ownership cost of buying, moving, and protecting fuel in systems during combat. Moreover, the use of renewable energy in combat operations can reduce the need for hazardous fuel convoys. Clearly the use of sustainable energy sources in military missions and operations could significantly lower the cost and save lives while at the same time contributing to the protection of the environment.

Related to the impact of the military on the environment is, of course, the matter of the impact of armed conflict and war on the environment. Effects can range from localized events such as destruction of natural habitats, unexploded ordnance rendering land unusable, pollution of land and water - for example due to the improper disposal of (rocket) fuel – to regional impacts such in cases of oil spills due to the destruction of oil refineries or oil tankers, to even global impacts as in the case of burning of oil fields in the first Gulf War.

From a legal standpoint, environmental protection during times of war and military activities is addressed partially by international environmental law but also in areas of law such as general international law, the laws of war, human rights law and local laws of each affected country. The 1977 Environmental Modification Convention (formally the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques) prohibits the hostile use of environmental modification techniques having "widespread, long-lasting or severe effects." This treaty is in force and has been ratified by leading military powers.

Protocols I and II - amendments to the Fourth Geneva Convention - prohibit methods of warfare intended to or expected to cause "widespread, long-term and severe damage to the natural environment", or to prejudice the health or survival of the civilian population.

Although not related to armed conflict, the 1972 World Heritage Convention includes the obligations to protect cultural or ecologically significant sites. This is especially important in relation to military activities during peacetime but may also become relevant during armed conflict to deter direct attacks on such sites.

Attempts have been made to get a specific Fifth Geneva Convention dealing with protection of the environment during times of armed conflict but so far this has not been successful.

7. The Case for Co-operation at all Levels

In each of the topics covered in this brief overview (water scarcity, land degradation, migration, climate change, and energy) in relation to peace and security – and in the coverage of the environmental implications of security policies - we have aimed to illustrate why the Mediterranean Region has been identified as one of the most vulnerable areas in terms of environment and security linkages.

In each of the issue areas we have also tried to emphasize the case for international co-operation within the region and between the region and neighboring ones. Several important international organizations and initiatives involved in promoting such co-operation are listed in **Annex I**.

For environment policies and for security policies to be most effective, there is a need for an integrated approach at all levels. Public decision-makers should be aware of the need for action to advance and protect peace and the environment at the same time.
A specific area where international co-operation is proving especially effective in understanding and helping to address environment and security issues –often in integrated ways - is the area of space programs for Earth Observation and Remote Sensing. **Annex II** includes a number of specific examples.

Effective action on climate change, environment, development and peace in the region does not only depend on international and regional co-operation. It is also important to adopt an integrated government approach at the level of state institutions as well as foster close co-operation and co-ordination between governments and civil society, between the military and civil society and among civil society organizations.

Annex I: International Organizations and Initiatives

OSCE

The six **OSCE Mediterranean Partners for Co-operation** (Algeria, Egypt, Israel, Jordan, Morocco and Tunisia) have been included in several OSCE documents starting with the Helsinki Final Act in 1975, which included a Mediterranean chapter stating that security in Europe is closely linked with security in the Mediterranean as a whole. Subsequent CSCE/OSCE documents, such as the Istanbul Charter for European Security and the Maastricht OSCE Strategy to Address Threats to Security and Stability in the XXI Century have reinforced the importance of the dialogue with OSCE Mediterranean Partners for Co-operation.

The **Office of the Co-ordinator of OSCE economic and environmental activities (OCEEA)** has been instrumental in engaging and facilitating a dialogue on environment and security issues in the Mediterranean region, operating on the premise that promoting economic prosperity and co-operating on environmental problems can contribute to the enhancement of international security and stability.

In December 2007, the OSCE, in co-operation with NATO Public Diplomacy Division, organized a workshop on "Water Scarcity, Land Degradation and Desertification in the Mediterranean region - Environment and Security Aspects" in Valencia, Spain. The workshop recommended the preparation of an assessment on water scarcity, land degradation, desertification and security in the Mediterranean Region.

In March 2009, a follow-up workshop entitled "Participatory Assessment of Environment and Security issues in the Southern Mediterranean Region" was organized in Barcelona, Spain. A number of recent political developments in the region have hampered concrete follow-up activities until now. Previous assessments remain however valid and therefore the OSCE seeks to re-engage in the process.

European Union

The **European Neighbourhood Policy (ENP)** emerged in 2004 aiming at enhancing the relations between EU and its neighbors and promoting prosperity, stability and security for the whole area. This is realized through bilateral Partnership and Co-operation Agreements and Association Agreements. In its "report on activities in 2011 and roadmap for future action" endorsed in May 2012 the EU aims to "stimulate sector co-operation putting particular emphasis on: the alignment in the transport, energy and environment sectors as well as the development Common Knowledge and Innovation Space (…)" and on "joining efforts on climate change and environment in gradual development towards an EU-Southern Mediterranean Energy Community."

The EU supports financially the implementation of Horizon 2020 initiative for the depollution of the Mediterranean through the development of a Shared Environmental Information System (SEIS) focusing at improving collection and management of environmental data supporting capacity building and identification of pollution spots. Through the ENP the Mediterranean partners are encouraged to implement the UNFCCC Cancun and Durban agreements and to devise low carbon development strategies.

In the framework of the ENP, multilateral and regional co-operation initiatives are also aiming at comprehensive and area specific co-operation between the EU and partners. The **Union for the Mediterranean (UfM),** successor of the Barcelona Process, is one example that brings together the

Mediterranean neighbors and aims to promote economic integration and democratic reform. Launched in 2008, UfM has amongst its key initiatives the de-pollution of the Mediterranean Sea, including coastal and protected marine areas; the joint civil protection program on prevention, preparation and response to natural and man-made disasters; and the Mediterranean solar energy plan that explores opportunities for developing alternative energy sources in the region.

Africa-EU Strategic Partnership

The European Union (EU) and African Union (AU) work in partnership on a range of important issues referred to in the 2nd Joint Africa EU Strategy (JAES). This document was adopted at the 3rd Africa EU Summit, on 29-30 November 2010 in Tripoli, Libya.

The Action Plan 2011-2013 provides a framework to implement JAES priorities collectively agreed upon and adopted at the Summit under the overarching theme "Investment, economic growth and job creation". It was agreed that the Action Plan 2011-2013 would focus on eight partnerships including 1) Peace and Security, 2) Democratic Governance and Human Rights, 3) Regional Integration, Trade and Infrastructure, 4) MDGs, 5) Energy, 6) Climate Change and the Environment, 7) Migration, Mobility and Employment and, 8) Science, Information Society and Space.

A report on a recent AU-EU meeting states that "At the heart of this co-operation remain the Millennium Development Goals (MDGs). EU support has already led to impressive results in this area: 9 million children have been enrolled in primary education; more than 31 million households have been connected to improved drinking water; and 24 million people have been helped through social transfers related to food security.

Nile Basin Initiative (NBI)

The Nile Basin Initiative (NBI) is an inter-governmental organization dedicated to equitable and sustainable management and development of the shared water resources of the Nile Basin. NBI Member States include Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda. Eritrea is as an observer.

The NBI was established on February 22, 1999 in Dar es Salaam, by Ministers responsible for Water Affairs of each of the nine Member States. The Nile Council of Ministers (Nile-COM) agreed on a Shared Vision which states: 'to achieve sustainable socio-economic development through the equitable utilization of and benefit from the common Nile Basin water resources'.

The 20th Nile Council of Ministers' (NILE-COM) meeting is planned to take place on 5 July 2012 in Kigali, Rwanda under the theme "Institutional Sustainability for Delivery of Basin-wide Benefits." The meeting is a regular annual event that receives progress reports for the current fiscal year and considers plans for the coming year. Members of the Nile-COM from Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda are expected to participate. The event will be preceded by a meeting of the water experts (technical advisory committee) which will prepare briefs on various technical matters for Ministers' consideration. The 20th Nile-COM gathering will be followed by the Nile Parliamentarians' Forum which will discuss co-operation development of the Nile water resources.

UNEP / Mediterranean Action Plan (MAP) for the 1976 Barcelona Convention (Convention for the Protection of the Mediterranean Sea against Pollution)

MAP is a regional cooperative effort involving 21 countries bordering the Mediterranean Sea, as well as the European Union. Through MAP, the Contracting Parties to the Barcelona Convention and its

Protocols are determined to meet the challenges of protecting the marine and coastal environment while boosting regional and national plans to achieve sustainable development.

The main objectives of the MAP are to assist the Mediterranean countries to assess and control marine pollution, to formulate their national environment policies, to improve the ability of governments to identify better options for alternative patterns of development, and to optimize the choices for allocation of resources.

MAP Mediterranean Commission on Sustainable Development (MCSD)

In 1996 the creation of the MCSD by the Contracting Parties conveys their commitment to sustainable development and to the effective implementation, at the regional and national levels, of the decisions of the Earth Summit and the United Nations Commission for Sustainable Development. The MCSD dwells upon the assessment of major sustainable development issues of common concern to the countries of the region or set out in international and regional agendas. It makes relevant proposals and recommendations to the Contracting Parties.

MAP Mediterranean Strategy for Sustainable Development (MSSD)

Adopted by the Contracting Parties in 2005, the MSSD resulted from a consultation process that mobilized most Mediterranean stakeholders, including governments and civil society through the participation of NGOs and key experts. The 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 Blue Plan – Regional Development Center

For over 30 years and within a context of growing international action for the environment, the 21 states bordering on the Mediterranean and the European Community have together been developing an original mechanism for environmental regional co-operation within the framework of the United Nations Environment Programme's Mediterranean Action Plan (UNEP/MAP).

The Blue Plan is one of the stakeholders involved in this co-operation. One of the main tasks with which it is entrusted is to produce information and knowledge in order to alert decision-takers and other stakeholders to environmental risks and sustainable development issues in the Mediterranean, and to shape future scenarios to guide decision-taking processes.

NATO

NATO has also adopted the position that climate change may have potentially huge security implications and through its Science for Peace and Security program and the Public Diplomacy Division addressed the issue through various actions aiming at providing its staff with access to expert knowledge and opinions and promote dialogue and exchange of information with its partners, including the Mediterranean Dialogue partners and other stakeholders.

The Alliance is aiming at finding answers on how to best address environmental risks to security in general but also the risks that have a direct impact on military activities and vice versa and with special emphasis on the energy security for both populations in conflict situation and military. At the same time it aims at helping partner countries clean up ageing and dangerous stockpiles of weapons, ammunition and unexploded remnants of war that constitute a risk both to people and the environment.

This is realized through various initiatives that are conducted in the framework of its science program, the Euro-Atlantic Disaster Response Coordination Centre (EADRCC) and Partnership for Peace Trust Fund projects. The approach is focusing on civil emergencies, energy efficiency and renewable power, and on helping member and partner countries address the impact of climate change in vulnerable regions.

The **Mediterranean Dialogue** of NATO has two pillars: political dialogue and practical co-operation. Through the annual Work Program which includes seminars, workshops and other practical activities the issues addressed between participants include amongst others the modernization of the armed forces, civil emergency planning, crisis management, border security, public diplomacy and scientific and environmental co-operation.

Annex II: Note on the Role of Earth Observation / Remote Sensing

The use of Earth Observation (EO) and Remote Sensing (RS) technology can play an important role in addressing environment and security issues in two ways. First, EO/RS can provide valuable data for identifying and analyzing climate change, environment, development, and peace issues so that appropriate policies and programs can be designed in response. Secondly, EO/RS can help in monitoring the implementation and effectiveness of multilateral, international and national environmental agreements, policies and initiatives.

For example, with respect to **water scarcity**, according to a recent UNESCO study, "Earth Observation data, when used jointly with in situ data, can provide an essential contribution for the creation of inventories of surface water resources, the extraction of thematic maps relevant for hydrogeological studies and models (land cover, surface geology, lineaments, geomorphology,...) or for the retrieval of (bio) geophysical parameters (water quality and temperature, soil moisture,...)."

On a political level, Earth Observation appears as an essential tool in the management of internationally shared water resources and aquifers, allowing the development of basin-wide approaches and facilitating international co-operation on water resources. Indeed, "Earth Observation's simultaneous area wide and transboundary coverage provides a uniform spatial information layer to correlate or extrapolate isolated field data. It thus can be a cost efficient and objective mapping and monitoring instrument." (UNESCO, 2010)

A team of scientists from Stanford led by Jessica Reeves may have found a way to cheaply and effectively monitor aquifer levels in agricultural regions. To do so, they use data from satellites that are already in orbit. The scientists used interferometric synthetic aperture radar, known as InSAR, to calculate the variation of ground elevation on uncultivated patches of land and managed to extrapolate the level of groundwater.

Earth Observation is also used in raising awareness on the need to save water. The World Bank Save the Rain initiative allows web users to calculate the value of capturing and saving rainfall on rooftops anywhere in the world. The program enables users to be aware of the amount of rainfall that can be harvested in one year and how many kilograms of different crops could be grown from the captured water.

Land use/cover and agricultural monitoring are among the first applications in Satellite EO since the start of the first Landsat Satellite in the early 1970s. Earth observation can provide the necessary data to forecast evolutions in weather patterns and its impacts on crop yields. Any sustainable agricultural policy should therefore use satellite systems to identify in advance weather changes that can impact food production and establish the conditions ensuring access to food to the most vulnerable communities.

Earth Observation's possibilities for supporting **climate change** policies range from observing climate change impacts to monitoring human-induced emissions and providing space-based evidence for policy implementation. Again, Earth Observation is important not only in the context of better understanding and predicting changes in the Earth's climate and in providing data needed in the formulation and implementation of climate change mitigation efforts but is also vitally important in detecting threats caused or exasperated by the effects of climate change as well as providing information for the development and implementation of future climate change adaptation policies and measures especially in the context of the nexus between climate and security.

Regarding **migration**, earth observation is currently used in monitoring conditions that may lead to population displacements in several regions throughout the world. For instance, the International Organization for Migration has been using satellite imagery to create environment and livelihoods vulnerability maps in Darfur. These maps are aimed to improve the quality of information available to humanitarian actors on environment and livelihoods, and community vulnerability to environmental change, water shortages, livelihood disruptions and other effects.

Concerning **hazards and disasters**, earth observation and initiatives like the Global Monitoring for Environment and Security (GMES) Programme are essential tools in setting up an early warning system to predict and prevent natural and man-made disasters. Satellite observation is also useful in coping with disasters once they have occurred.

Finally, Earth Observation increasingly appears as a key tool for ensuring **peace and security**. Satellites have long been able to detect movements of troops, migrant flows, fires, etc. Today, this data is also increasingly accessible to the public, making it more difficult for warring factions to hide their actions and control information.

For more information on the role of Earth Observation / Remote Sensing see ***Recent Trends in EU External Action in the Fields of Climate, Environment, Development and Security: Report for the European Space Agency***, Institute for Environmental Security, December 2011.
http://www.envirosecurity.org/actionguide/view.php?r=531&m=publications

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