



Environment, Climate Change and Security in the Southern Mediterranean

Literature review

Kerstin Fritzsche and Lukas Ruettinger, adelphi

REVIEW REPORT

On behalf of:

European Environment Agency



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With the support of Nils Bareither and Wera Wojtkiewicz

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Executive Summary

The OSCE-EEA project “Security Implications of Climate Change in the OSCE region” assesses the security implications of climate change in the OSCE region, namely in Southeast and Eastern Europe, Central Asia, the Arctic, as well as the Southern Caucasus, the Mediterranean, and the Arctic region. It identifies and analyses key scenarios for these regions, outlining the security implications of climate change, as well as underlying drivers and uncertainties, in order to prepare options for strategic policy-making. This report contributes to the conclusion of the three-year project by providing a literature and scenario review of the potential security implications of climate change in the Southern Mediterranean region, focusing particularly on Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia, and the Occupied Palestinian Territories.

Despite being very heterogeneous, these countries are characterized by a common set of key trends and driving forces: With an average age of less than 25, they belong to the youngest and fastest growing states worldwide. By 2060, the number of people living in these countries will have risen by approximately 121 million, although population growth will have slowed down. This trend converges with an ongoing process of urbanization, increasing levels of education and a growing middle class. However, unemployment, poverty and in particular a large divide between urban and rural areas in terms of living standards and access to drinking water, sanitation and other services are still defining characters of the region. Structural and regulatory deficits in the economic sector and an insufficiently developed private sector hinder economic development and add to the challenge of widespread unemployment, particularly among well-educated youth living in urban areas.

In addition to social and economic challenges, the Arab countries struggle with scarce and often heavily polluted water and land resources and decreasing biodiversity. Against the backdrop of growing populations, domestic water demand in the region will triple by 2050 – while water availability is projected to significantly decrease. This may increase tensions over shared water resources between and within countries and hamper economic and social development throughout the region. Furthermore, the Southern Mediterranean is already struggling with inter-state conflicts, tensions between different population groups and a deteriorating security situation as a consequence of the social upheavals of the Arab Spring.

Three critical uncertainties will have a key impact on the long-term development and stability of the region: 1) global economic development and the susceptibility of the Arab countries to global crises and price shocks; 2) climate change and its multi-faceted impacts on food and water security, poverty, infrastructure, settlements, health and economic development; and 3) the popular uprisings and dynamics triggered by the Arab Spring and their effects on peace, stability and democratic transitions in the region.

Several scenario exercises on the Arab region have dealt with these critical uncertainties and their implications for the medium to long-term development of the region against the backdrop of the key trends and drivers outlined above. They conclude that the convergence of the underlying factors with critical uncertainties such as climate change will become a major contributing factor to instability and conflict if the Arab governments fail to efficiently manage and react to pressing social, economic and environmental issues. The upheavals of the Arab Spring can be understood as a result of the Arab governments’ failure to cope with existing challenges. However, a further deterioration of security and stability will further decrease the Arab states’ capacities to develop and implement adequate adaptation and coping mechanisms to deal with the adverse impacts of global economic downturns and climate change and to address the demands of their people for greater economic and social opportunities.

Five strategic reflections can be drawn from the analysis of the report with regard to the future cooperation of the EEA and the OSCE with its Southern Mediterranean partners:

- 1) In order to identify joint priority areas for action, vulnerability assessments could be used to pinpoint climate change hotspots and to determine potential entry points for adaptation measures.
- 2) Interregional dialogue and cooperation on shared challenges could be fostered and the science-policy link strengthened to better integrate the latest research results from the region and beyond into policy-making.
- 3) Good governance practices and capacities in the area of environmental policy and natural resource management could be strengthened.
- 4) Untapped potential in the area of green growth could be exploited to contribute to economic development, innovation and job creation in the region.
- 5) The capacities and knowledge of civil society actors on environmental issues could be strengthened and awareness raised on climate change and its related challenges.

Table of Contents

List of figures	VI
List of tables	VI
List of abbreviations	VII
1 Background	1
2 Key trends and driving forces	3
2.1 Demographic trends and societal change	3
2.2 Economic development and employment	6
2.3 Degradation of natural resources	10
2.4 Regional relations and geopolitical relevance	11
3 Critical uncertainties	13
3.1 Global economic development	13
3.2 Climate change	13
3.3 Arab Spring and popular uprisings	14
3.4 Conclusion	16
4 Scenarios for environment, climate change and security	17
4.1 Scenario exercises	17
4.2 Conclusions	19
5 Strategic options & reflections	22
Bibliography	25

List of figures

Figure 1:	Map of the Southern Mediterranean region included in the report	2
Figure 2:	Non-oil and oil GDP growth in MENAP oil exporting countries, 2011-2013.	8
Figure 3:	Main findings of mapping exercise	18

List of tables

Table 1:	Overview of selected demographic indicators of Southern Mediterranean countries	4
Table 2:	Overview of selected economic indicators	7
Table 3:	Overview of selected water-resource related indicators	11

List of abbreviations

EEA	European Environment Agency
ESCWA	The Economic and Social Commission for Western Asia (UN)
EU	European Union
FAO	Food and Agriculture Organization
IEA	International Energy Agency
IPCC-AR4	Fourth Assessment Report of the Intergovernmental Panel on Climate Change
LAS	League of Arab States
MENA	Middle East and North Africa
NGO	Non-governmental organizations
OCEEA	Office of the Co-ordinator of OSCE Economic and Environmental Activities
OPT	Occupied Palestinian Territories
OSCE	Organization for Security and Co-operation in Europe
UN	United Nations
UXO	Unexploded ordnance

1 Background

The 2007 Madrid Ministerial Declaration on Environment and Security (OSCE 2007) recognizes that “climate change is a long-term challenge” and acknowledges that “the United Nations climate process is the appropriate forum for negotiating future global action on climate change, and the Organization for Security and Co-operation in Europe (OSCE) – as a regional security organization under Chapter VIII of the United Nations (UN) Charter – has a complementary role to play within its mandate in addressing this challenge in its specific region.”

Launched at the Chairmanship Conference in Bucharest in October 2009, the Office of the Co-ordinator of OSCE Economic and Environmental Activities (OCEEA) established an extra-budgetary project – which ran until 2012 – to address the security implications of climate change in the OSCE region. The aim of the OSCE-EEA project “Security Implications of Climate Change in the OSCE region” was to assess the security implications of climate change in the OSCE region, namely in Southeast and Eastern Europe, Central Asia, the Arctic, as well as the Southern Caucasus, the Mediterranean, and the Arctic region. The project also explored the inter-linkages between neighbouring regions.

By examining scenarios for action, the project aimed to identify and analyse key scenarios for the OSCE regions which outlined the security implications of climate change, explained underlying drivers, developments and remaining uncertainties, and identified early warning indicators in order to prepare options for strategic policy-making.

The project defines “environment security” in a broad sense as the capability of societal systems (communities) to withstand threats of environmental asset scarcity, environmental risks or adverse changes, and environment-related tensions and conflicts (Perelet 1994). The project started in 2010 with a global workshop, which was followed by scenario workshops on the security implications of climate change in Eastern Europe, the Western Balkans, Central Asia, and the Southern Caucasus over the next two years. In addition to the scenario exercises, the project involved an expert roundtable on the Arctic in early 2013.

The objective of this report is to contribute to the conclusion of the three-year project by providing a literature review of the potential security implications of climate change in the Southern Mediterranean region. Following the scenario development approach used in the other regions, this report will give particular attention to the major driving forces and critical uncertainties that will affect the region’s capacity to cope with and adapt to a changing climate. The goal is to assess how these challenges will interact with other developments such as the Arab Spring, environmental degradation and global economic development to create potential security challenges. The report will focus on Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia and the Occupied Palestinian Territories, as these are the OSCE Mediterranean Partners for Co-operation (Algeria, Egypt, Israel, Jordan, Morocco and Tunisia) and/or are part of the European Neighbourhood Policy. Due to the on-going civil war, EU cooperation with Syria is temporally suspended. However, given Syria’s crucial role for stability in the region, it will be included in the analysis of this paper.

Figure 1: Map of the Southern Mediterranean region included in the report



Source: iStock/pop_jop, adjusted by the authors.

In the following chapters, the report provides information on: a) key trends and driving forces in the Southern Mediterranean up until 2050 (section 2), b) critical uncertainties, in particular global economic development, climate change and the dynamics created by the Arab Spring (section 3); c) how these major trends and critical uncertainties interact and may create security challenges (section 4); and d) strategic options and reflections that could be derived from the analysis (section 5).

2 Key trends and driving forces

Despite often being labelled as “a region”, the countries of the Middle East and North Africa (MENA) are extremely heterogeneous in terms of their political, social and economic development – and have become even more diverse since the Arab Spring, which has profoundly altered the political power structures in some of these countries. However, these countries share a number of trends and challenges, which are often closely interlinked and difficult to assess independently from each other. Converging with each other, they are the driving forces for future developments and change in the Southern Mediterranean region.

The following sections will discuss four key driving forces: 1) demographic trends and societal change, 2) economic development and employment, 3) degradation of natural resources, and 4) regional relations and geopolitical relevance. Wherever possible, the report will describe the future trends of these driving forces up until 2050 and beyond.

2.1 Demographic trends and societal change

Demographic change

The Arab countries have one of the youngest and fastest growing populations in the world, having reached approximately 352 million people in 2009.¹ The nine Arab countries this report particularly focuses on contribute approximately 196 million people to this figure.² The medium age in these countries is 24.7 years old; 50.7 per cent of the population is below 24 years old. Youth, defined as youngsters between 15 and 24 years old, make up 20 per cent of the population. Due its very young population, the Arab states belong to a group of countries with high youth bulges stretching from Latin America across the Sub-Saharan Africa to the northern parts of South Asia (EEA 2013a). While population growth is still high in the region, it has slowed down over the past decades and this trend looks set to continue. However, populations in the Arab countries are growing at different speeds. Egypt and Jordan will experience particularly strong population growth of 24.2 and 35.4 per cent between 2010 and 2025. Other countries, such as Lebanon and Morocco, are expected to experience a significantly lower population growth of 16.2 and 19.2 per cent over the same period.

The decrease in population growth is related to declining fertility rates, caused by key societal trends, such as an increase in the number of girls enrolling in school and women involved in the active labour force, delayed marriages and a decrease in the size of families (ESCWA 2009). In Lebanon and Tunisia, fertility levels have already been below replacement levels since 2005 (ibid.). In spite of these trends, the Arab countries examined in this report will grow by a total of 121 million by 2060, increasing their total population by 62.9 per cent compared to today. However, the population structure in 2060 will have shifted due to decreasing fertility rates and increased life expectancy: In 2060, 43.4 per cent of the population will be above 45 years old, compared to 21 per cent in 2010. Population aging is still a slow process in Arab societies compared to other world regions. However, these figures indicate a future

¹ Figure includes the populations of all 22 member countries of the League of Arab States (LAS).

² Unless otherwise indicated, all figures in this section are based on World Population Prospects, the 2012 Revision of the UN Population Division: http://esa.un.org/unpd/wpp/unpp/panel_population.htm (26 June 2013).

trend that will need to be addressed, especially in terms of health care and social security for the elderly (ESCWA 2009).

Table 1: Overview of selected demographic indicators in Southern Mediterranean countries

	Population growth 2002-2010 in %	Population in mn (2010/2050)	Population between 14-25 in 2010 in %	Urban population in % (2010/2050)	School enrolment, secondary (% gross, 1980/1990/2010)		
Algeria	13.8	37.1/ 54.5	20.8	68.9/ 74.6	31.2	61.9	98.9
Egypt	14.3	78.1/ 121.8	19.7	45.1/ 60.8	45.6	68.3	72.5
Israel	18.9	7.4/ 11.8	15.1	91.8/ 95.6	81.9	88.7	102.1
Jordan	31.6	6.5/ 11.5	19.8	79.1/ 76.4	77.4	76.1	86.9
Lebanon	23.5	4.3/ 5.3	20.0	84.9/ 80.3	58.2	n.a.	81.4
Libya	13.1	6.0/ 8.4	19.3	81.6/ 89.4	74.4	n.a.	n.a.
Morocco	08.0	31.6/ 42.9	19.8	57.2/ 66,3	23.6	37.4	63.7
Syria	26.7	21.5/ 36.7	20.7	52.8/ 65.0	47.5	51.3	72.4
Tunisia	9.0	10.6/ 13.2	18.8	65.2/74.0	25.0	44.2	90.4
OPT ³	19.3	4.0/ 8.9	21.4	74.6/90.5	n.a.	n.a.	n.a.

Source: Population figures from UNPD 2012; school enrolment figures from World Bank 2013a.

Urbanization

Globally, the past decade has seen a trend of rapid urbanization (EEA 2013b). Although it has slowed down, the region is still undergoing this process. More than 70 per cent of the people in Arab countries live in cities. By 2050 this figure will have risen to approximately 77 per cent. Converging with population growth and the high number of young people, this trend will likely translate into increased pressure on urban infrastructure, housing, and water and food supply. Informal settlements lacking basic sanitation systems and other critical infrastructures are likely to increase as rural-urban migration often lacks regulation and sound planning (EEA 2013b). Urban labour markets – already burdened by the influx of young and increasingly educated people – will experience further stress.

Large cities in the region, such as Algiers, Casablanca, Cairo and Beirut, are already melting pots of different ethnicities and religious branches. Living conditions within these cities are extremely diverse, ranging from shanty towns (often referred to as “bidonvilles” in the Maghreb) to luxurious neighbourhoods. In areas where infrastructure and public services fail to address the needs of growing urban populations, this diversity in living standards, religion and ethnicity combined with other complex social, political and cultural dynamics could become a trigger for social unrest and political violence, threatening security on a local and national scale. In October 2009, for example, violent protests broke out in the quarter of Diar Echems, a neighbourhood in Algiers where 20,000 people lacking adequate housing live in miserable conditions (Ouazani 2009).

³ Occupied Palestinian Territories

Growth of middle classes

Strongly linked with urbanization and population growth is the rise of the middle classes, which have grown significantly over the past decades. A clear-cut definition of these societal groups is hard to provide due to the heterogeneity of the middle classes. In the Arab countries, middle classes comprise unemployed, yet well-educated university graduates, as well as older cohorts who benefitted from high government spending on the social sector and mass education during the oil boom years and now form a social stratum of doctors, engineers, lawyers and state employees. Entering this group, however, is becoming increasingly difficult for upwardly-mobile, educated youth. Social disparities within the Arab societies are growing ever-deeper due to an unequal distribution of wealth, assets, resources and opportunities (AfDB 2012). Such disparities have already become a trigger for social unrest and challenges to regimes as shown by the Arab Spring. Furthermore, poverty is still a major challenge in the Arab countries. A study of 13 Arab countries in 2007 revealed that nearly one fifth of their populations struggled with multidimensional poverty, meaning that they face hardships in terms of health, education and their general living standards, such as insufficient access to electricity, drinking water and sanitation (Nawar 2013). However, there are large differences between and within the Arab countries, with particularly high multidimensional inequalities between and within Maghreb countries (ibid.) Here, the differences in the deprivation rates of urban and rural areas are especially high (ibid.) If Arab governments fail to react to these increasing social disparities, this challenge will remain a serious security risk. However, the rise of the urban middle classes and the articulation of their demands for greater social justice and economic and political participation may also pave the way for more democratic forms of governance in the region and a greater participation of civil society actors, in particular women (see box 1).

Civil society and social media

Civil society in the Southern Mediterranean faces numerous challenges in terms of freedom of association and speech, as well as financial and regulatory constraints. Given their often ambiguous role vis-à-vis the regimes – in many cases as a mechanism for survival – civil society organizations in the Arab World have often been understood as “governmental non-governmental registered organizations (G-NGOs)” (Halaseh 2012). In the light of the Arab Spring, many of these organizations are now moving towards more democratic structures. In addition youth groups and movements have entered the scene as new dynamic actors and some of these are institutionalizing and registering as political or civic entities (ibid.). It is, however, still unclear how much influence they will have in the aftermath of the Arab Spring and to which extent political reforms will open up the space for civil society actors. The crackdowns on civil society organizations and the closure of foreign NGOs in Egypt, such as the US-based Freedom House, the International Centre for Journalists (ICFJ), and the German Konrad Adenauer Foundation (KAS), give cause for some scepticism.

Another major trend observable in the region and often linked to the issues of civil society and popular unrest is the rise of social media, such as Facebook and Twitter, and the development of information and communication technologies (ICT) in general. ICTs are a key driver not only of technological change, but also of social and economic development (BIO Intelligence Service 2011). The Internet and other new forms of communication were already widely used among youth before the Arab Spring and are still on the rise: more than 10 million Facebook users were added in the region in 2012, a growth of 29 per cent (socialbakers.com). Such numbers may give the impression that a “Facebook revolution” occurred in 2011, but this would neglect the role of more traditional lines of mobilization for the uprisings, as virtual networks often reflect already existing ties within the family and neighbourhood.

Box 1: The Arab Spring – A window of opportunity for women?

The countries of the Southern Mediterranean have made significant progress in closing the gender gap in terms of education and health over the past decades, yet without significantly increasing the role of women in political and economic life (World Bank 2013b). Traditional ways of living, conservative social norms and the assignment of specific male-female gender roles are still dominant in the region (Salehi-Isfahani 2010) and determine women's place in society. However, thanks to rising levels of education, population growth and urbanization, the Arab countries have embarked on a path towards major societal transformations – which includes changing traditional gender relations.

Indeed, women's organizations were some of the most active civil society actors in the region during the Arab Spring (FIDH 2012). On Tahrir Square and elsewhere, women and women's organizations used the Arab Spring as a window of opportunity to demand equal rights and opportunities, as well as protection against everyday harassment and gender-related violence.

However, the outcome of the uprisings for women remains largely uncertain: the participation of thousands of women in the protests may lead to a change in the perception of women's societal role in the long run. How this will be reflected in the newly developing constitutions in Tunisia and Egypt has been subject to fierce debate. The question of how potential reforms of the economic sector will create new opportunities for women also remains open. Meanwhile, due to the power vacuum and weakened security forces, particularly in Egypt, the security of women and girls has deteriorated in many places, pushing them out of public spaces (Esfandiari 2013).

2.2 Economic development and employment

Structural and regulatory challenges

The economies of the MENA countries are characterized by strong structural and regulatory constraints. Ranked on average 98 out of 185 economies in the global Ease of Doing Business index, the region still has much room to improve conditions for businesses and investors, with the Arab Gulf countries leading the scoring, Morocco reaching rank 97 and Algeria placed far behind at rank 152 (IFC, World Bank 2013). Regionally as well as internationally, the Arab economies are comparatively poorly integrated and fail to exploit comparative advantages. The efficiency of capital is lower, a lack of trade openness has a detrimental impact on growth, and adverse external shocks have a more pronounced impact on the Arab countries than on other world regions (Makdisi et al. as cited in Bhattacharya and Wolde 2010).

In addition, the Arab countries have less diversified economies that are built on insufficient and weak infrastructure and burdened by cumbersome bureaucratic apparatuses. Countries that are endowed with large fossil fuel resources, such as Algeria and Libya, particularly lag behind when it comes to diversifying their sources of income and struggle with the adverse

effects of the “Dutch disease”.⁴ Less resource-rich countries, such as Morocco, Tunisia and Lebanon, have slightly more diversified economies with tourism, agriculture and – in the case of Lebanon – financial services playing an important role. However, obstacles to entering the EU market – particularly in the case of Tunisia and Morocco – and the implications of past and current armed conflicts – as in the case of Lebanon and Syria – hamper economic development in these countries.

Table 2: Overview of selected economic indicators

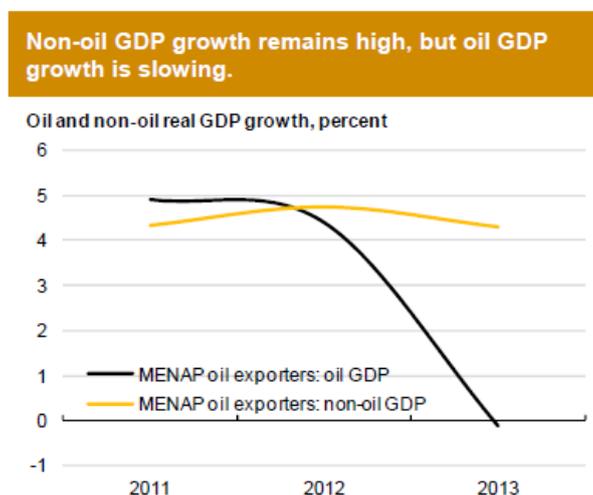
	HDI Rank	GDP per capita at current prices in US dollars (2010)	GINI-coefficient (2010)	Employment in agriculture as % of total employment (2010)	Electricity consumption in TWh (2009)*	Net Imports (Mtoe) in ktoe** (2009)
Algeria	93	4,567	n.a.	12	33.9	-111.7
Egypt	112	2,646	30.8 (2008)	28	123.5	-15.0
Israel	16	29,312	n.a.	2*	49.5	19.4
Jordan	100	4,271	35.4	2	12.5	7.5
Lebanon	72	8,781	n.a.	n.a.	13.1	6.7
Libya	64	11,275	n.a.	n.a.	26.1	-66.4
Morocco	130	2,842	n.a.	40	23.9	14.8
Syria	116	2,962	n.a.	14	31.3	-2.8
Tunisia	94	4,222	36.1	18	13.7	1.6
OPT	110	2,062	n.a.	n.a.	n.a.	n.a.

Sources: UNDP, UN Data, World Bank, IEA. *Gross production + imports - exports - losses **thousand tonnes of oil equivalent *** Data from 2009

The future economic development of the region will largely depend on two factors: oil prices and the stabilization of the political and security situation. Oil-exporting countries in the Middle East and North Africa showed robust growth in 2012 due to the recovery of the oil business in countries like Libya. However, their economic growth is projected to decrease to about 3 per cent in 2013 as oil production growth slows down due to curbed global oil demand (IMF 2013). Growth in the non-oil sector, however, will likely increase due to low global interest rates (ibid. see figure 2). Oil-importing countries had relatively low growth rates in 2012, as social unrest and political uncertainties still impeded investment in the region (ibid.). A moderate recovery of growth is projected for 2013, but inflation in countries such as Egypt, Tunisia, Jordan and Morocco is expected to rise (ibid.). Near-term challenges aside, these countries still have significant untapped potential for growth, which could be exploited if they stabilize their political systems and implement profound structural reforms (ibid.)

⁴ The term “Dutch disease” refers to the negative implications of natural resource exploitation on the competitiveness of the manufacturing sector due to an increase in the country’s exchange rate.

Figure 2: Non-oil and oil GDP growth in MENAP oil-exporting countries, 2011-2013.



Source: IMF 2013, p. 5.

Energy security

Energy security is a key issue for economic and social development in the region, as energy demand is rising due to population growth and economic development. Today, almost all countries in the Southern Mediterranean provide their populations with full or near-full access to electricity, even in rural and more remote areas. However, infrastructure is often weak and outdated, electricity black-outs are a daily occurrence and many people are reverting to diesel-driven generators to cope with the failures of public electricity provision. The poor and marginalized particularly suffer from insufficient supply of electricity and increasing prices.

At the same time, the region is rich in oil and natural gas. However, this wealth is unequally distributed between the countries of the Southern Mediterranean and an adequate integration of the region's energy and electricity systems is lacking. The development of large-scale solar power stations has been promoted over the past few years as a possible solution to ensuring a stable energy supply, as well as creating employment and new economic opportunities from electricity exports to the EU. Nearly every country in the region has set ambitious targets for the implementation of solar energy capacities: Morocco aims to install 2,000 MW of solar and 2,000 MW of wind power by 2020; Algeria announced its plan to install renewable energy technologies generating 12,000 MW for domestic use and 10,000 MW for export by 2020; by the same year, Egypt plans to source 20 per cent of its national energy mix from renewables (Brand and Fritzsche 2012).

However, the development of large-scale solar power faces multiple challenges within and outside the region: attracting investors to the Southern Mediterranean region requires massive investment in infrastructure and measures to remove the regulatory obstacles to regional integration. Adequate infrastructure and regulations would also need to be developed in Europe, the potential market for green electricity from the North African deserts. In addition, the political will – especially in “transit” countries such as Spain – to allow and facilitate the transmission of green power from the Southern Mediterranean is currently low. The Desertec Industrial Initiative (Dii) – once a key proponent of electricity imports from North Africa – recently abandoned its export visions and is now focussing on the creation of integrated markets in the Arab countries to exploit the benefits of solar power (EurActive 2013).

Private and informal sector development

In almost all of the countries in the region the private sector has grown over the past decades. Yet overall it still plays a marginal role and fails to contribute significantly to economic growth and create employment opportunities (World Bank 2009). Major structural and legal constraints, such as the lack of favourable legislation and the insufficient enforcement of legislation in place, hinder the development of the private sector and curb private investment and entrepreneurship.

Most countries have a large informal economic sector that plays a central role for income and employment in many of the Arab countries. As Angel-Urdinola and Tanabe (2012) summarize, the informal sector in a typical MENA country contributes approx. 27 per cent to the country's GDP and provides employment to around 67 per cent of its labour force. In countries like Morocco, informality is high as the agricultural sector provides a relatively large share of employment, while in Jordan and Egypt, where the public sector accounts for 30 to 35 per cent of overall employment, informality is lower (Elbadawi and Loayza 2008 as cited in Gatti et al. 2011).

Employment

The state is one of the major employers in the Arab countries – either directly (by providing employment opportunities in its bureaucratic apparatus) or indirectly (through state-owned companies). However, it is increasingly struggling to absorb the high numbers of young, well-educated people entering the labour market each year. As the private sector is still weak, this results in high unemployment rates, in particular among young people. Today, it is estimated that approx. 24 per cent of youth are unemployed in the entire MENA region (Roudi 2011).

As the working age population – which is defined as those between 25 and 65 years old – is projected to increase rapidly over the next decades (ESCWA 2009) and as more and more women enter the labour market, it is likely that unemployment will remain a major challenge if economic development in the Arab countries does not pick up. Furthermore, as the age structure of society changes and life expectancy increases, providing employment for older people may also become a long-term challenge (ESCWA 2009).

Box 2: Israel's demographic and economic development

Israel is the only high-income country in the Southern Mediterranean. However, there are strong disparities in living conditions between its Arab residents and the Jewish population in the country. Israel's population, which numbered approximately 7.8 million people in 2010, will have grown to approximately 12 million people by 2050, due to further immigration to Israel and a fertility rate that is the highest among Western countries (CBS 2010). Such high population growth converging with climate change impacts will put great pressure on the country's scarce natural resources, in particular water. This, however, could be mitigated by seawater desalination (Feitelson et al. 2012).

Economic growth has been sound over the past years and Israel managed the 2008/2009 global economic downturn quite well. Nevertheless, the decrease in global trade also slowed down economic growth in Israel. Furthermore, the country is currently struggling with trade-offs between debt reduction, spending control and tax reform, which – together with increasing housing costs – have led to a wave of popular protests (OECD 2011).

2.3 Degradation of natural resources

Water security

The Southern Mediterranean region is under great environmental stress due to a multitude of factors, such as the adverse impacts of rapid population growth, industrial pollution, remnants of war and the unsustainable use of natural resources. One of the most challenging issues is the availability of fresh and groundwater resources. With an average water availability of slightly above 1076 m³ per capita/year, MENA is the most water-scarce region in the world (Droogers et al. 2012). Despite the growth of desalinization capacities, water scarcity is projected to increase due to rapidly growing populations and increased per capita consumption. Considering the impacts of population and GDP growth, it is projected that the total domestic water demand in the MENA region will triple by 2050, growing from currently 28 km³ a year to 50 km³ by 2030-40, and to 88 km³ by 2040–50 (World Bank 2012). At the same time, water availability per capita will fall by 50 per cent by 2050 (Immerzeel et al. 2011), creating a gap between water demand and supply of approximately 200 km³ (World Bank 2012).

The unsustainable and inefficient use of water has a significant impact on the degradation of the resource. The outdated water infrastructure leads to high losses during the distribution of water. Similarly, inefficient irrigation practices which result in water draining or evaporating without reaching the plants are still widely used and contribute to the depletion of water resources – which is particularly grave as the agricultural sector is the largest water consumer in the region. Due to losses during transportation and distribution, as well as inefficient domestic use and irrigation, nearly 100 km³ of water are lost per year – this is as much as approx. 45 per cent of total water demand (220 km³ per year) (Blinda 2012).

Land degradation and desertification

In the arid and semi-arid, water-scarce Arab countries, arable land and pasture is a very limited and precious resource, threatened by land degradation and the progress of desertification. Estimates indicate that over the past 40 to 50 years, 35 per cent of the cultivated land in the MENA region has been affected by degradation (ICARDA 2007). The use of inadequate agricultural and inappropriate land management practices cause soil exhaustion and erosion, loss of vegetation cover, increased salinity of soils and a general loss of biodiversity, escalating desertification in a large part of the Mediterranean region (OSCE 2012). Land degradation will likely accelerate as the climate changes if no adequate counter-measures are taken and have severe and long-term impacts on ecosystems, water resources, recreation, tourism, and particularly on the agricultural sector (Larsen 2011).

These effects will likely add to migration from rural to urban areas, increasing the poverty risk and food insecurity in rural communities, as well as the dependency of the MENA countries on food imports, in turn making them more vulnerable to food price hikes. While water shortages and desertification are problems also faced by other regions (e.g. parts of Spain), the vulnerability of the MENA region is perceived as disproportionately high due to its low adaptive capacity (Cheterian 2010). Some countries with limited arable land and/or water resources, such as Libya and Egypt, have therefore invested in agricultural land in Sub-Saharan countries to secure their food supply. In Mali, Libya has leased 100,000 hectares to grow rice (The Economist 2009). In early 2013, Egypt and Sudan signed a landmark agreement on the joint cultivation of land and agricultural production (Egypt Independent 2013).

Table 3: Overview of selected water-resource related indicators

Country / indicator:	Dependency ratio (%) [*]	Total water withdrawal per capita (m ³ /inhab./yr.) 2002	Water resources: total renewable per capita (m ³ /inhab./yr.) 2010 ^{**}
Algeria	3.6	182 (2001)	324.3 (2011)
Egypt	96.9	973.3 (2000)	694.2 (2011)
Israel	57.9	293.3	235.4 (2011)
Jordan	27.2	166 (2005)	148 (2011)
Lebanon	0.8	370.4 (2000)	1,057 (2011)
Libya	0	796.1 (2000)	109 (2011)
Morocco	0	428.1 (2000)	898.6 (2011)
Syria	72.4	964.5	809 (2011)
Tunisia	8.7	295.8 (2001)	433.7 (2011)
OPT	3.0	83.13 (2001)	201.6 (2011)

Source: FAO Aquastat. ^{*} Indicator expressing the per cent of total renewable water resources originating outside the country. ^{**} Estimated change based on extrapolations from UNPD 2010 data (population growth 2002-2010).

2.4 Regional relations and geopolitical relevance

Inter-state conflicts

Intra and interstate conflicts and tensions are a key challenge to security and stability in the Southern Mediterranean region. Aside from the Israel-Palestinian conflict and the tensions between Israel and its Arab neighbours and Iran, relations between the Arab countries are often characterized by strong disagreements. Their opposing stances on the West Sahara conflict and their mutual claim for regional hegemony strain the relationship between Morocco and Algeria. The land border between Morocco and Algeria remains closed, despite repeated announcements of plans to re-open the road (Racelma 2013). In 2009, the underlying tensions between Algeria and Egypt erupted into violent clashes between soccer fans from Egypt and Algeria during the qualifying round for the 2010 World Cup.

Inner tensions and cleavages

Conflicts and tensions between different ethnic and religious groups exist in all of the countries in the region to varying degrees: in the Maghreb countries, particularly Algeria and Morocco, the Amazigh/Berber populations are striving to improve their living conditions and socio-economic status in predominately Arab societies. In Jordan, there is an increasing distrust between the Trans-Jordanian tribes and the Jordanians of Palestinian origin (Lübben and Fritzsche forthcoming). Religious differences between Sunni, Shia and Copts in Lebanon and between Muslims and Copts in Egypt occasionally turn violent, particularly when stability is already jeopardized either by internal turmoil – as in Egypt after the overthrow of the Mubarak regime – or due to external factors, as could once again be the case in Lebanon, which is currently facing considerable security challenges caused by a spill-over of the Syrian civil war.

Geopolitical dimension

Internal as well as inter-state conflicts are often complicated by the interference of actors from outside the region. Due to their high fossil fuel reserves and location between Europe, the emerging African countries and Asia, the Southern Mediterranean countries have a great geopolitical relevance that already turned them into the playing field of opposing world powers during the Cold War. Today, as economic, political and diplomatic power shifts away from traditional power blocs towards new ones (EEA 2013c) on a global level, the range of actors in the region has broadened significantly. In addition to the “old” powers of Europe (in particular France), the U.S. and Russia, new players are becoming increasingly involved in the region. Arab Gulf countries have scaled up their investments in the Maghreb and the Levant region, as have Japanese and Chinese investors. The latter are particularly active in infrastructure projects in the region, such as the construction of an East-West-motorway in Algeria.

At the same time, the Arab countries are reaching out to find new international partners: Over the past years, Morocco has strengthened its ties with its Southern African neighbours faced with the stalemate in the Arab-Maghreb Union and the slow and restrained economic integration of the Euro-Mediterranean region. While in conflict with the riparian countries of the Upper Nile, Egypt has enhanced its cooperation with Sudan and is investing in Sudanese agricultural land to increase its food security.

Box 3: What wars have left behind

All throughout North Africa, the Levante and the Middle East, remnants of multiple armed conflicts, including World War II, threaten people’s health and economic development. Lebanon, particularly the south of the country, is heavily contaminated with mines, explosives and cluster munitions due to 15 years of civil war and the 2006 war with Israel.* These remnants have an adverse impact on water supplies and power lines as well as on the excavation of rubble, farming, and reconstruction efforts.

In Egypt, it is estimated that approx. 20 million mines/UXO contaminating the country have caused almost 3,200 fatalities and injured 4,723 people (ITF Fund 2013). Particularly on the north and east coast of Egypt, these remnants of war hinder economic growth as they render agricultural land useless (ibid.) Moreover, an estimated 4.8 billion barrels of oil reserves and 379 billion m³ of natural gas cannot be accessed in the Western Desert due to explosive ordnances (UNDP according to the Land Mine and Cluster Munition Monitor). Libya has been contaminated with landmines and other explosives from World War II as well as conflicts with Egypt and Chad in the 1970s and 1980s. During the fall of the Gaddafi regime in 2011, the country experienced massive use of anti-personnel and anti-vehicle mines, both by the government and rebel forces.

Efforts to clear landmines and other explosives are ongoing in the region. For example, Tunisia reported the clearance of all known mined areas, especially in the South and South East, by May 2009. However, remnants from World War II continue to remain a threat.

* If not otherwise indicated, all figures and facts from: The Land Mine and Cluster Munition Monitor, www.the-monitor.org.

3 Critical uncertainties

In order to better assess potential future security challenges related to climate change in the Southern Mediterranean region, a number of key critical uncertainties have been identified based on a number of regional scenarios (in particularly OSCE 2012, Planungsamt der Bundeswehr 2011, Mabey et al. 2013), as well as the broader literature on environmental security and the potential security impacts of climate change in the region.

Critical uncertainties are driving forces that will have a very high impact, but there is great uncertainty as to how they will develop. The following sections will describe three critical uncertainties that will have a decisive impact on the potential security challenges linked to climate change in the Southern Mediterranean region.

3.1 Global economic development

The global economy is increasingly interdependent (EEA 2013c). However, given the comparably low integration of the Southern Mediterranean into the global economy, the global economic crisis which began in 2008 did not directly impact the MENA region. Instead, it was transmitted through various indirect channels: the financial markets, the crude oil market, Arab investments in global asset markets, tourism, the remittances of Arab workers abroad, and the region's non-oil exports (Habibi 2009). The high dependence of the region's countries on their energy and tourism sectors made them particularly vulnerable to such external shocks. These vulnerabilities are also likely to play a role in the future, given the fact that major structural changes in the Southern Mediterranean economies did not occur as a lesson learned from the crisis.

Furthermore, the rise of global food prices also linked to the financial crisis and other developments, such as the drought in Russia and increased speculation with food commodities, hit the countries of the region hard and challenged their capacities to buffer price hikes for their populations. This is a clear example of how global environmental challenges such as climate change converge with increasingly interconnected and interdependent markets, leading to regional and local crises and shortages in food supply (EEA 2010). The implications were apparent in the popular uprisings which began at end of 2010/early 2011.

The global economy – despite some recovery – is still struggling with the effects of the 2008 crisis as well as the ongoing Euro crisis. The possibility of major economic downturns occurring in the future cannot be ruled out. Their impact on the Southern Mediterranean region will be severe, as these countries have little capacity to shield themselves from external shocks due to their high reliance on energy exports and tourism for income, as well as their high dependence on agricultural imports.

3.2 Climate change

Climate change is a key global trend and will severely jeopardize water and food supplies, health and biodiversity (EEA 2010). Several sources, including the IPCC-AR4 Report (2007), forecast a higher increase in average temperature for the MENA region of about 50% compared to the global average (GIZ 2011: 1). According to recent simulations, the region could experience a temperature rise of up to 8°C by 2100. This would mean that some areas will

approach the limits of habitability for human populations. In addition to the temperature increase, a general reduction of rainfall by up to 10-30% and of water runoff by 10% is expected by mid-century. Soil moisture will decrease by approx. 10% due to severe evaporation. While precipitation will decrease, heavy rainfalls could become more intense and frequent, causing both a higher risk of flash floods and droughts. A drying trend is predicted along the Mediterranean coast, particularly in the summer period. The IPCC estimates that an additional 80 to 100 million people will be exposed to water stress by 2025. Demand for water will peak in the hottest and driest seasons when supply is at its lowest.

MENA countries are also heavily exposed to the risks emerging from rising sea levels that may lead to a loss of low-lying coastal areas and intrusion of saltwater into coastal aquifers. In addition, the frequency of extreme weather events will also increase. More frequent and intense cyclones, heat waves and droughts will threaten economic and social development, especially agriculture and food security, as well as biodiversity and ecosystems (GIZ 2011: 1; Mabey et al. 2013: 29-30).

These challenges mean that the MENA region is among the world's most vulnerable regions to climate change (Verner et al. 2013: 2). Climate exposure will have considerable implications for human settlements, food security, health, and economic development, such as:

- **Agriculture and food security:** Most parts of the MENA region are located in arid or semi-arid areas and depend heavily on imports for food needs. Agricultural production is already heavily reliant on irrigation. Dwindling water resources will yield a decline in agricultural productivity, thus threatening the food security of the population (GIZ 2011: 1; Mabey et al. 2013: 29-30).
- **Poverty and inequality:** The effects of climate change are likely to exacerbate the large disparities in income which already exist across the region. The poor will suffer most from weather extremes and food insecurity (Mabey et al. 2013: 29-30, Verner et al. 2013: 3). Rural areas will be worst affected by climate change, reducing the income of farmers, increasing unemployment among rural populations, and fostering migration to urban centres or less vulnerable countries.
- **Water security:** Diminishing amounts of rainfall will exacerbate the stress on water resources and will increase water salinity, eventually leading to an overall deterioration of water quality. Poor water quality will also likely lead to an increase in water-borne diseases. This also means that it will become more costly to provide freshwater for household consumption and the agricultural sector due to the increased use of desalination plants (Mabey et al. 2013: 29-30).
- **Infrastructure:** Floods and droughts will likely increase the need for public investment in infrastructure. Less water also means less capacity for production of hydroelectricity (Verner et al. 2012: 3; Mabey et al. 2013). Extreme weather events will likely exceed the capacity of protective infrastructure, e.g. extreme rainfall will stretch the capacity of sewage systems, resulting in overflow (Mabey et al. 2013: 29-30).

3.3 Arab Spring and popular uprisings

While climate change is a critical uncertainty that is likely to manifest gradually over the coming decades – with the exception of sudden changes and extreme events – in some Arab countries, the political dynamics spurred by the Arab Spring have had a very rapid and dramatic impact with major implications over the short, medium and long-term. When the popular protests began, a quick transition from autocratic regimes to more democratic systems seemed not only desirable, but also feasible.

Egypt and Tunisia

At the beginning of 2013, more than two and a half years after the first protests in Tunisia, we are faced with a different and highly diversified picture: the former front runners of the revolutions, Tunisia and Egypt, are entrapped in their constitutional reform processes and struggling with major ideological cleavages between the political actors involved. In both countries, the economy is suffering greatly from the political stalemate, spurring further popular discontent, and the security situation has severely deteriorated in many parts of the countries. A quick recovery of the political and economic situation seems rather unlikely; on the contrary, the transition in both countries is expected to take longer than anticipated.

Libya

The same holds true for Libya, where the overthrow of the Gaddafi regime was accompanied by a civil war. The country is still struggling with conflicts between rival groups and is experiencing setbacks in the development of its political institutions and other transformation processes. Despite its large fossil fuel resources, the economic situation and living conditions of the Libyan people have severely deteriorated. At the beginning of 2013, it appeared that the large fossil fuel resources were more likely to become a curse for the country, spurring political conflicts over their distribution, rather than a blessing providing the financial basis for Libya's comprehensive recovery.

Syria

In Syria the regime's reactions to the protests of people mostly from the peripheral and rural areas developed into a full-fledged civil war claiming almost 100,000 victims to date (OHCHR 2013). As the Assad regime is allied with both Iran and Lebanon's Hezbollah and has kept friendly ties with Russia, the regional and international implications of this civil war cannot be underrated. A spill-over of the conflict to neighbouring Lebanon seems likely and would probably lead to the destabilization of the already fragile balance of power between the different confessional groups in Lebanon.

Morocco, Jordan and Algeria

In Morocco, Jordan and Algeria, the Arab Spring has passed with much less turmoil than in the other countries. However, since no fundamental changes have occurred in these countries – neither in political nor economic terms – an eruption of popular discontent is likely in the future. In Jordan, in particular, demonstrations are ongoing, with protesters taking an increasingly direct stand against the monarchy.

In Algeria and Morocco, the political situation has remained largely calm over the past two years. In Morocco, the king's quick reaction to the protests, particularly the revision of the constitution and early parliamentary elections, assuaged the protests. In Algeria, a mass movement unifying different societal groups was never formed. Instead, different groups, such as the unemployed, doctors, lawyers and those in need of housing have taken to the streets and protested for their particular interests. The regime reacted by raising social spending.

However, if the Moroccan government headed by moderate Islamists fails to satisfy the demands of their constituency and if high-level political changes occur in Algeria, this could again lead to political unrest, pushing the governments to make greater concessions and political and economic reforms.

Israel

Israel viewed the uprisings in the Arab countries, particularly in Egypt, in a rather sceptical light. The rise of an Islamist government that might threaten the status quo of the relations between Israel and Egypt was one of the key concerns, as well as a general destabilization of the region and a rise in Iran's influence. The ongoing civil war in Syria and its implications for Lebanon may increase and confirm such concerns. At the same time, Israel witnessed popular protests in its major cities, spurred by the tremendous increase in living and housing costs. However, protests calmed down in 2013, without the government making any significant changes to its austerity policy (Mualem 2013).

Occupied Palestinian Territories

While the popular uprisings spread quickly throughout the North African and Middle Eastern countries in 2011, the situation in Gaza and the West Bank remained largely calm and did not appear to pick up on the revolutionary spirit of Tunisia, Libya and Egypt. The Israel-Palestinian conflict and particularly the blockade of the Gaza strip still heavily impact the living conditions in the Palestinian territories and hamper economic and social development. However, the wave of protests – especially in the West Bank in September 2012 – primarily targeted the Palestinian Authority (PA), which was already struggling with a lack of confidence and legitimacy, as well as strong internal conflicts. However, while the unrest was originally triggered by the failure of government economic and fiscal policy, the protests gradually began to address more political and strategic issues, such as general dissatisfaction with Israel-PA economic arrangements, opposition to the Oslo Accords and heavy criticism of the PA president and PLO chairman Mahmoud Abbas (ICG 2013).

3.4 Conclusion

From a long-term perspective, the following challenges remain critical for the Arab region: integration into the global economy – including the susceptibility of Arab countries to global crises –, the impact of climate change on water and food security, and the outcomes of the political transformation processes in some of the Arab countries. Despite considerable uncertainties, climate change projections can provide insight into key medium to long-term trends that Arab countries are likely to face in the future. However, even in the short term, economic and societal developments are highly volatile. The brief overview of the development of the Arab Spring illustrates these erratic dynamics. It also shows how the countries in the region have become more diversified with regard to their political systems and situations than before. Economically, the region is suffering from a decrease in tourism and a loss of trust from investors, particularly Western investors (while countries such as China and the Arab Gulf countries are heavily invested in the region). However, at the same time, one of the more important and long-lasting effects of the events of the Arab Spring may be the increased awareness of the population when it comes to issues such as regime legitimacy, personal freedoms, equality and democracy, with civil society having experienced a significant boost since the beginning of the protests. This could also increase the pressure on the Arab governments to find sustainable solutions to the adverse impacts of climate change and global shocks affecting food security in the region.

4 Scenarios for environment, climate change and security

Recently, a number of scenarios have been developed for the Southern Mediterranean countries, taking into account the multiple economic, social and environmental challenges, as well as the effects of the Arab Spring and the impacts of climate change (OSCE 2012, Planungsamt der Bundeswehr 2011, Mabey et al. 2013). The first part of this chapter briefly outlines key scenarios developed for the region. Based on these scenarios and more broadly drawing on the vast body of literature regarding the converging social, economic, political and environmental challenges in the Southern Mediterranean, the second part of this chapter summarizes some overall conclusions on how environment, climate change and security might interact in the region up until 2050.

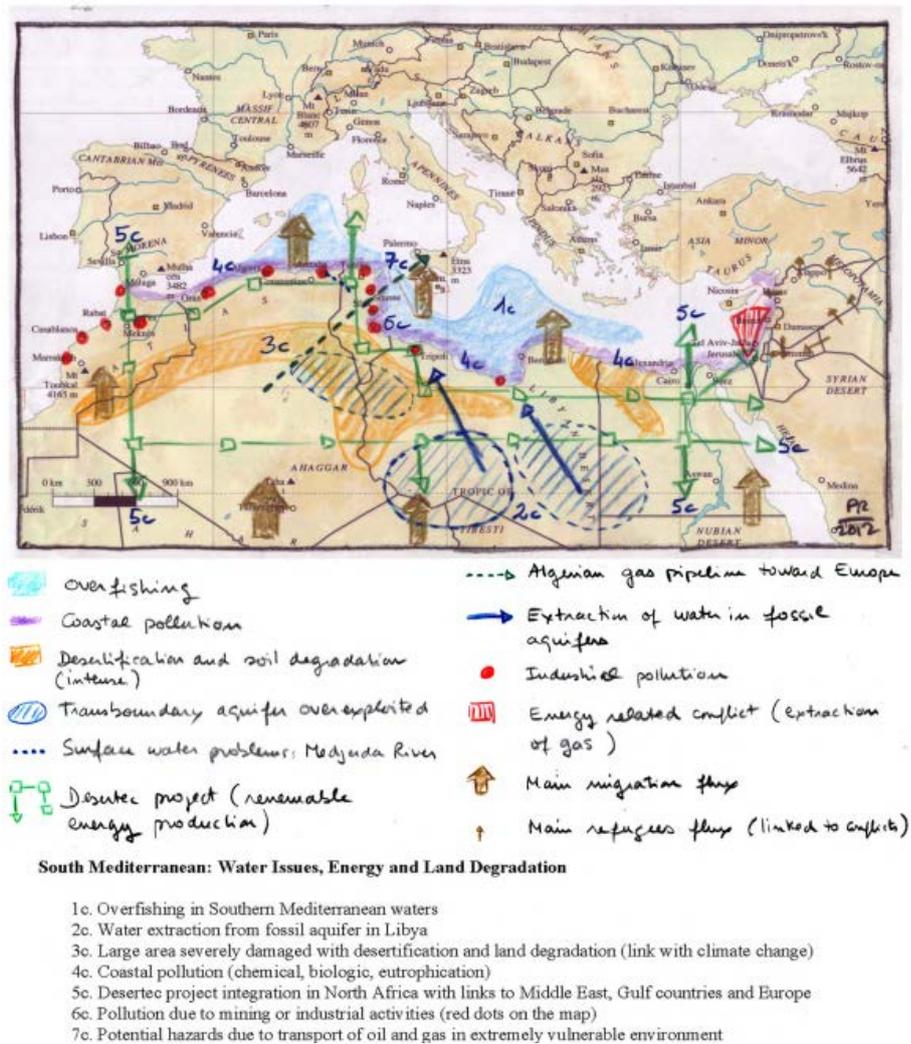
4.1 Scenario exercises

OSCE-EEA Participatory Workshop on Environment and Security Issues in the Southern Mediterranean Region, Amman, Jordan, 18-22 June 2012

The outlook for the Southern Mediterranean region developed during the OSCE-EEA participatory workshop particularly focused on environmental degradation, climate change and their implications (OSCE 2012). Participants agreed that the Southern Mediterranean is highly vulnerable with regard to environment and security linkages. Adverse climate change implications will above all be reflected in a deterioration of water availability and quality, an increased influx of environmental refugees, a decline in food security due to soil degradation, and a drop in agricultural productivity.

Key findings from the workshop highlight the importance of water efficiency measures in the region for coping with increasing water scarcity as well as the need for improved South-South and North-South cooperation to tackle the challenges of climate change. Technology transfer and collaborative research could play a crucial role in the development of suitable adaptation measures.

Figure 3: Main findings of mapping exercise



Source: OSCE 2012.

EG3 Scenario Report “Underpinning the MENA Democratic Transition” (Mabey et al. 2013)

In a recent report, the E3G institute developed worst and best case scenarios for democratic development in the MENA region up until 2025, taking political, economic and climate change impacts into consideration and focusing particularly on Egypt and Tunisia. The scenarios include a multitude of economic, social, political and environmental challenges and factors in order to identify reflections and strategic options for donor countries and regional partners.

Mabey et al. (2013) conclude from this exercise that risks to stability will likely remain high – even in the best case scenarios. These risks include popular unrest, violent regional conflict and political extremism, stemming from high unemployment, weak economic governance and development, regional and social inequalities, and further constraints in key resources such as energy and water. However, increasing investment from countries such as China,

India and the Arab Gulf states could become an important driver for economic growth and foster stability.

Report by the Federal Armed Forces on “Climate Impacts in Context: Implications for Security and Stability in the Near East and North Africa”

Another scenario exercise was conducted by the German Federal Armed Forces with a particular focus on the security impacts of the climate in the MENA region (Planungsamt der Bundeswehr 2011). The study was based on six country scenarios:

- a) the resource-rich rentier state that is experiencing a period of growth and can ensure a high level of security and stability due to its high capacity for social spending
- b) the MENA role model democracy that also has a high level of political and socio-economic stability thanks to its democratic structures and strong economic growth
- c) the precarious democracy that is characterized by an unstable political arena, low economic capacities and a lack of natural resources, leading to increasing disparities and poverty among the population
- d) the failed state, characterized by a high level of insecurity and a breakdown of the political structures and the economic system
- e) the successful modernizing autocracy that ensures political stability through repression; economic growth is positive, yet hampered by corruption and lack of transparency, and
- f) the failed modernizer that is struggling to overcome obstacles to implementing reforms and deal with deficits in water and food security, leading to increasing social disparities and potential unrest

The study concluded that the destabilizing effects of climate change will depend on political, institutional, economic and societal factors and it identified key levers that have a major influence on the unfolding of adverse climate change effects:

- 1) Water, food and agricultural development, since they are most strongly affected by climate change.
- 2) Sufficient energy supply and the development of renewable energies, which help boost resilience to the impacts of climate change.
- 3) If managed in an ecological and socially sensitive manner, urbanization could also become a driver for resilience and aid social and political transformation. However, if such a development fails, cities are likely to become centres of humanitarian crises, exacerbating social disparities.

4.2 Conclusions

In different ways and to different extents, the scenario exercises on the Arab countries outlined above deal with three key critical uncertainties: global economic development, climate change and the political dynamics triggered by the Arab Spring. Various lessons and conclusions can be drawn from the scenarios:

Context and governance matters

The Arab Spring can be understood as a result of the Arab countries' inability to cope with the challenges caused by the driving forces outlined above (see section 2). High unemployment, particularly among the youth, manifold economic hardships, such as increased food and energy prices, corruption, repression and a massive lack of trust in, and acceptance of, the political institutions and leaders were crucial elements that spurred popular unrest in the Arab countries – from Morocco to Syria and Jordan. The similarities of causes and drivers of the Arab Spring across the region underline this point. However, the underlying causes are much more diverse and vary far more than a cursory look at the issue may reveal: the countries' capacities to manage and react to the uprisings depended very much on the specific context in the country. This includes not only economic resources, but also the political power and governance structures, external influences and history. These country-specific characteristics have given rise to very different outcomes across the region (see also Planungssamt der Bundeswehr 2011).

Climate change as a threat multiplier

Some authors argue that the popular protests in the region can be directly linked to the adverse impacts of climate change – both directly via the degradation of natural resources and indirectly through increases in food prices – which have significantly added to the discontent of the people. While research on such inter-linkages is still at an early stage, particularly in the case of Syria, such a direct connection seems plausible, as the uprisings there started in the rural, marginalized periphery that was particularly hard hit by a series of droughts between 2006 and 2011 (IRIN 2010).

In Tunisia, too, the protests broke out in a rural, fairly marginalized area. However, in this case it appears more likely that the massive privatization policy in the rural sector led to a drastic transformation of rural livelihoods, disadvantaging too many people. In addition to rising global food prices and the general discontent with the Ben Ali regime, this factor might have helped trigger the outbreak of the revolution in Tunisia. The impacts of climate change may, therefore, have contributed to the popular unrest across the region – underlining climate change as a “threat multiplier” (see EU 2008; Carius et al. 2008; UNSG 2009). However, the impacts of climate change vary significantly depending on the specific context and capacities of each country – and should also be cross-referenced with other external impacts, such as global economic developments that have depleted the financial resources of the less wealthy Arab countries over the past years.

Lessons learned for future developments

Nonetheless, some important lessons can be drawn from this example for potential future developments: climate change and both its rapid and slow-onset implications and external economic impacts converging with already critical underlying conditions, such as high population growth and high unemployment, a repressive and in many ways dysfunctional political system with little capacity to deal with economic and social challenges and a degraded natural resource basis, in particular with regard to water and land, can create a vicious mixture. This convergence of different factors may provide the ground for future instability – a conclusion that has been drawn from all the scenario exercises analyzed.

This is particularly likely as the dynamics unfolding in the light of the Arab Spring have further weakened the countries' institutional capacities and financial resources. Functional institutions and a stable political system providing good governance and economic growth will be crucial to coping with the challenges of climate change, such as potential decreasing crop yields and worsening water scarcity. Furthermore, profound infrastructural decisions that need to be taken by the countries of the Southern Mediterranean – e.g. with regard to their

energy mix – may be delayed or badly implemented due to the political stalemate in some of the countries, particularly Egypt and Tunisia. In this sense, the Arab Spring has reduced the capacity of many of the countries in the region not only to adapt to climate change, but also to mitigate its impacts. It is unlikely that the increased development assistance currently being given to these countries will compensate for this.

Increasing the awareness of environmental issues

On the other hand, the Arab Spring has also led to increased awareness among the people of environmental issues and the creation of a multitude of NGOs and groups also dealing with environmental issues. While topics such as climate change, desertification, coastal erosion, and pollution of land and water already have a major impact on people's lives today, it may take some time for them to rank higher on the political agenda. Nevertheless, the Arab Spring and its influence on civil society development in the region may boost the profile of environmental topics.

Egypt could play an important role in this regard: the country is highly dependent on the Nile waters and has a vital interest in regional water resource governance and the potential implications of climate change on the Nile and its tributaries. Despite its confrontational position on a revision of the agreements concerning the sharing of the Nile's waters, the country is very much dependent on cooperation with its up-stream neighbours. How this situation develops will largely depend on how the political situation in Egypt develops, particularly with regard to its unstable government: a government elected by the people and held accountable by them may be more likely to seek cooperative ways to solve the current conflict over the Nile waters.

However, in other parts of the region, the developments spurred on by the Arab Spring may actually lead to a decrease in the already low level of regional cooperation, since countries are preoccupied by internal conflicts and the reconstruction of their political and economic systems. This would mean that the benefits of cooperation which, in turn, could allow these countries to better cope with adverse climate change impacts in the fields of trade, water and energy, cannot be exploited.

5 Strategic options & reflections

Building on the analysis above, this report identifies the following strategic options and reflections with regard to the future cooperation of the EEA and the OSCE with its Southern Mediterranean partners.

1) Jointly identify vulnerability hotspots

Vulnerability assessments help identify hotspots that are particularly susceptible to the adverse impacts of climate change and have gained widespread attention in the context of development cooperation. Currently, a regional vulnerability assessment of the 22 members of the League of Arab States is conducted as part of the Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR).⁵ Furthermore, several national and sub-national studies have been conducted by the World Bank, for example, which assessed climate change impacts on coastal cities in the Arab region (World Bank 2011).

Building on the results and experiences of such assessments, more detailed vulnerability assessments focussing, for example, on transboundary ecosystems and habitats, key economic activities (agriculture, energy production, etc.) and potentially vulnerable populations (such as rural populations and those on the urban periphery) could be conducted within the region. These assessments could be used to jointly identify areas for priority action for climate change adaptation. Such priority action based on sound vulnerability assessments could significantly reduce potential conflicts and security threats posed by the adverse effects of climate change on food and water security.

2) Foster inter-regional exchange and cooperation based on shared challenges

Where common challenges are identified, dialogue could be fostered on suitable approaches and methods to cope with negative climate change impacts. This holds particularly true for cross-cutting issues such as the vulnerability of coastal areas and agricultural land. Even if the current political dynamics in many of the Arab countries diminish the prospects of regional cooperation, the “fresh air” that has entered the ministries in many of the countries should be seen as a window of opportunity for initiating a dialogue on shared environmental challenges and adaptation options. These initiatives could build upon the sound expertise available in many of the countries in the region that often lacks platforms for meaningful exchange. Providing such platforms could help identify new entry points for Euro-Mediterranean cooperation in the area of climate change adaptation and mitigation. Furthermore, the link between science and policy-making should be strengthened to enable the integration of the latest results from research into policy making.

3) Building capacities for improved natural resource governance

There is a great need to enhance capacities to improve the management of water, arable land and energy. Good governance practices are rare in the area of environmental policy and natural resource management, but their implementation could significantly leverage the

⁵ For further information on RICCAR, please visit: <http://www.escwa.un.org/RICCAR/ri.asp?ReferenceNum=RI> (26 June 2013).

smart use of scarce resources, help countries adapt to adverse climate change impacts and foster cooperation between different user groups. In addition, environmental legislation in the region is weak and often lacks thorough implementation. Analyzing the gaps in environmental legislation and organizing training sessions on the development and enforcement of appropriate environmental laws could help build capacities to improve the management of, and thus reduce the pressure on, scarce natural assets. Such improvements would not only benefit the growing number of entrepreneurs in the region, but also boost water and food security and reduce health risks for the whole population, particularly the most vulnerable and marginalized groups, such as the poor, elderly and children.

Box 4: Syria

EU cooperation with Syria is currently suspended due to the ongoing civil war. However, Syria is geographically situated at the heart of the Middle East and, due to its geopolitical relevance, should be included in any regional efforts to mitigate the adverse effects of climate change as soon as the political and security situation allows.

This becomes particularly evident when considering the adverse effects of the series of droughts between 2006 and 2011 that pushed millions into poverty (IRIN 2010) and contributed to the uprisings against the Assad regime. Adaptation measures, such as the increased use of drought-resistant crops, improved irrigation measures, and national and regional efforts to improve the management of the scarce freshwater provided by the Euphrates could contribute to peace and stability – particularly in a post-civil war Syria.

4) Exploit opportunities for green growth

In addition to improved legislation and law enforcement, the mainstreaming of climate change adaptation issues into standards and procedures in the construction sector, for example, could not only improve the use of scarce energy and water resources, but also provide new economic prospects and foster green business cases. There are many opportunities with regard to green growth that are currently untapped in the region and could become major drivers of economic development and job creation (Abaza et al. 2011). As the deteriorating economic situation in many of the Arab countries is one of the key drivers of conflict, green economic development could contribute to increasing stability in the region, especially if it is focused on employment creation. In addition, the countries that are emerging from or are currently experiencing conflict in the region will have to reconstruct much of their infrastructure and buildings. This is also an opportunity to mainstream environmental topics and climate change adaptation into reconstruction efforts.

5) Inform and educate civil society actors on environmental issues

As mentioned before, environmental issues and climate change still rank low on the political agenda in the Arab countries. However, civil society actors are showing great interest in increasing their knowledge of climate change and environmental degradation and understanding these issues. Training sessions to raise further awareness of environmental challenges and to build capacities to cope with adverse climate change impacts could help these countries to adapt to and mitigate climate change, and also deal with other environmental challenges. In the current situation, it may still be difficult to identify relevant civil society ac-

tors in some of the countries, since they often lack formal structures and are still in the process of establishing these structures and formulating clear goals. An alternative way forward could be to engage communities and the related political actors and stakeholders, especially since communities on the sub-national level often already have direct experience of the impacts of climate change – and are frequently coping in very creative ways. Such potential could be built upon and fostered.

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