



ADAPTATION TO A CHANGING CLIMATE IN THE ARAB COUNTRIES

Dorte Verner¹

Introduction: The Arab people have been adapting to climate change for centuries. The first settlements in the world began in this region, and all of them have changed in response to the variable climate. For thousands of years, the people of MENA have coped with the challenges of climate variability by adapting their survival strategies to changes in rainfall and temperature. But the message is clear: over the next century this variability will increase and the climate will experience unprecedented extremes and existing coping mechanisms and strategies are likely inadequate. Temperatures will reach new highs, and in most places there will be less rainfall. Water availability will decrease, and with a growing population, the already water-scarce region may not have sufficient supplies to irrigate crops, support industry, or provide drinking water. Fortunately, Arab countries can take steps to reduce climate change impacts and build resilience. Climate change is also bringing attention overlooked issues. For example, low quality urban drainage systems have contributed to flooding in some Arab cities and the threat of more flooding could be the impetus to finally rebuild this infrastructure. In rural areas, climate change is forcing communities to rethink gender roles that perpetuate gender inequality. Finally, adaptation governance can be improved and implemented throughout the region. The Quick Note is based on the longer October 2012 World Bank report entitled *Adaptation to a Changing Climate in the Arab Countries*.²

Climate Change in the Arab Countries Today: The Arab people and policy makers already experience the effects of a changing climate; higher temperatures and extreme events such as drought and flash floods have become the new norm. The year 2010 was the warmest since the late 1800s, and when this data began to be collected, 19 countries had set new national temperature highs. Five of these were Arab countries, including Kuwait, which set a record high of 52.6 °C in 2010, only to be followed by 53.5 °C in 2011. Extreme climate events are widely reported in local media, and a 2009 Arab region survey showed that over 90% of people sampled agree that climate change is occurring and is largely due to human activities; 84% believe it is a serious challenge for their countries; and respondents were evenly split on whether their governments were acting appropriately to address climate change issues. The sample came mostly from the better-educated population, but it shows that there is a firm base and desire for action regarding climate change across the Arab region.

Water Scarcity in the Arab countries: The Arab region has the lowest freshwater resource endowment in the world. All but six Arab countries (the Comoros, Iraq, Lebanon, Somalia, Sudan, and the Syrian Arab Republic) suffer from water scarcity - defined as having less than 1,000 m³ of water per person per year. It is estimated that climate change will reduce water runoff by 10% by 2050. Currently, the region suffers a water deficit and with increasing populations and per capita water use, demand is projected to increase a further 60% by 2045.

Climate Change and Agricultural Production: Projections suggest that the rate of increase in agricultural production will slow over the next few decades, and it may start to decline after about 2050.

¹ Dorte Verner, Senior Economist, Environment Unit, Middle East and North Africa Region (MNSEN), The World Bank.

² Verner, Dorte (Ed.). *Adaptation to a Changing Climate in the Arab World: A Case for Adaptation, Governance, and Leadership in Building Climate Resilience*, World Bank, Washington, D.C.

Most of the Mediterranean region, which supports 80% of production, is projected to have less rainfall and hotter conditions. This will increase water use and likely limit the productivity of some crops. Other areas, such as the Nile Delta, will have to contend with saline intrusion from the sea. Farmers will face additional problems from higher temperatures. For example, the chilling requirements for some fruits may not be met; new pests will emerge; and soil fertility is likely to decline. This is alarming because almost half of the region's population is rural, and 40% of employment is from agriculture. Compounding this are troubling poverty rates: 34% of the rural population is poor, and unemployment is high, especially for women and youth.

Arab Cities and Climate Change: Currently 56% of Arab people live in urban centers, and by 2050 these populations will increase to 75%. Droughts have been shown to increase rural-to-urban migration in the region. A recent multi-year drought in the Syrian Arab Republic is estimated to have led to the migration of about one million people to informal settlements around the major cities. Many cities are already experiencing severe housing shortages because of this urban population growth.

Urban Areas Are Vulnerable to Climate Change. Flash flooding is increasing in cities across the region as a result of more intense rainfall events, concrete surfaces that do not absorb water, inadequate and blocked drainage systems, and increased construction in low-lying areas and *wadis*. The number of people affected by flash floods has doubled over the last ten years to 500,000 people across the region. Climate change projections suggest that average temperatures in the Arab countries are likely to increase by up to 3°C by 2050. The urban heat island effect is projected to increase nighttime temperatures by an additional 3°C. In addition, providing water to urban areas is becoming increasingly difficult. Reasons for this include aging pipes, water loss from leakage of 40% or more in some major cities, and no water infrastructure in informal settlements.

Tourism and Climate: Tourism today contributes about US\$50 billion per year to the Arab region, which is about 3% of its total gross domestic product (GDP), and tourism is projected to grow by about 3.3% per year for the next 20 years. It is also an

important sector for jobs, because roughly 6% of the region's employment is tourism related. Higher temperatures are an obvious threat to tourism in a region that is already regarded as hot. Analyses of tourism patterns suggest that in the long-term, destinations on the north Mediterranean coast or within Europe will become more attractive than will the Arab region. Snowfall in Lebanon (for skiing), Red Sea coral reefs, and many ancient monuments across the region are threatened by climate change and severe weather. Ecotourism is an expanding sector, but the ecosystems (coral reefs, mountains, and oases) on which it depends will have to be managed carefully as they adjust to a changing climate. Extreme events, such as heavy rains, or more chronic pressures, such as increased salinity in groundwater, can threaten the region's historic buildings, paintings, and artifacts. Some destinations, such as Alexandria, will be further threatened by seawater inundation as sea levels rise. In most cases, there is already a need to better conserve and protect these cultural sites. Climate change increases its urgency.

Climate Change and Gender Equity: Men and women possess unique vulnerabilities to climate change impacts, largely based on their respective roles in society. However, in the majority of cases, rural women tend to be vulnerable in more ways than are rural men. Climate change will further affect rural livelihoods, and more men will feel obligated to move to cities to seek paid employment, which is mostly unskilled and temporary, with little security, low wages, crowded living conditions, and poor health support. As a result, on top of their already heavy domestic workload and local natural resource management, rural women assume the departed male's community role, but with additional challenges. Women tend to have less education; they find travel difficult because of cultural norms, pregnancy and child care; and often lack the cultural and legal authority to assert their rights. For example, their access to credit might be limited, access to and control of water is usually ceded to landowners—rarely a woman—and even access to rural organizations and support systems is often thwarted. Women's representation in Arab governments is only 9% - half of the global average.

Women as Active Agents of Climate Adaptation: Because of their central role in family, household, and rural activities, women are in a position to

change the attitudes, behaviors, and livelihoods that are needed for successful adaptation. A focus on gender is not an add-on to policy formulation but an essential part of any development strategy. Effective adaptation can only be achieved if the many barriers to gender equity are removed and, in particular, women are empowered to contribute. While women still have a literacy rate 15% lower than men and little voice in decision making, this may be changing. For example, in some Gulf countries, more women than men graduate from universities.

Climate Change and Health: Higher temperatures are known to lead directly to increased morbidity (deaths) through heat stress and indirectly to strokes and heart-related deaths. Warmer conditions also affect the geographic range of disease vectors such as mosquitoes. A warmer climate will expose new populations to diseases such as malaria and dengue, for which they are unprepared. In the region, disruptions to existing agricultural practices will lead to increased malnutrition, due to higher food prices and greater exposure to diseases and other health problems—especially in case of higher migration to unsanitary, informal settlements. The impact of malnutrition on children is particularly worrisome because this leads not only to increased child mortality, but also to developmental and long-term physical and mental impediments.

Climate Change and Socio-Economic Impact: These largely depend on a country's coping capacity, which is often linked to its level of development. The Arab countries include six least developed countries (LDCs) with mostly rural populations and annual per capita GDP as low as US\$600 (Somalia). By comparison, Kuwait, Qatar, and the United Arab Emirates have GDP per capita of over US\$50,000 with 80–90% of the people living in cities. It is likely that all economies will be increasingly affected by climate change as time passes, but it is clear that some countries will be affected more than others. Wealthier or more diverse economies are more resilient to climate change than poorer or less diverse economies, where many live off the land and remain vulnerable to negative climate impacts. This is illustrated by background case studies prepared for this report on income, livelihoods, well-being, and poverty in Syria, Tunisia, and the Republic of Yemen. Nevertheless, results show that over the next 30–40 years, climate change is likely to lead to a cumulative reduction in

household incomes of 7% in Syria and Tunisia, and 24% in Yemen.

Taking Action to Reduce Vulnerability to Climate Change: The report proposes an Adaptation Pyramid (see the figure below) providing a framework to support Arab countries in integrating climate change related risks and opportunities into development activities. This is based on an adaptive management approach, highlighting the importance of leadership, without which adaptation efforts are

The Adaptation Pyramid: A Framework for Action on Climate Change Adaptation



Source: Authors.

unlikely to achieve the commitment to be successful. The framework assesses climate risks and opportunities and identifies options in the context of other development planning. The next step is to identify and prioritize adaptation options within the context of national, regional, and local priorities. Finally, adaptation responses will be implemented and outcomes monitored over time. It is important to take into account the long-term consequences of these decisions, because short-term responses may not be efficient or could lead to maladaptive outcomes.

An effective approach for prioritizing options is “robust decision making,” which identifies choices that lead to acceptable outcomes under many future scenarios. This approach is particularly well suited to climate change, a problem that will be constantly evolving in the coming decades and will require many options during multiple iterations of decision making. The risk of policy errors is present when dealing with climate change, but a robust decision making process reduces risk. Other important measures for Arab region policy makers to implement are discussed below:

1. *Facilitate the development of publicly accessible and reliable information related to climate change.* Access to

quality weather and climate data is essential for policy making. Without reliable data on temperature and precipitation levels, it is difficult to assess the current climate and make reliable weather forecasts and climate predictions. For example, information on river flows, groundwater levels, and water quality and salinity is critical for assessing current and future water availability. However, climate stations across the region are limited compared to other regions and what data exists is often not digitized or publicly available. Conflict in parts of the region disrupts both the collection and sharing of data. Information on food production and food supply chains (such as changes in agricultural yields and production for important crops, forage, and livestock) needs to be linked with weather and water data to better monitor and understand the effects of a changing climate. In addition, socioeconomic data (including household and census data) and other economic data related to the labor market and production should be collected and made available.

2. Build climate resilience through social protection and other measures. Resilience is determined by factors such as an individual's age, gender, and health status, or a household's asset base and degree of integration with the market economy. Underinvestment in social safety nets and public services such as water supply and wastewater treatment, and housing and infrastructure—make people more vulnerable to climate change. Measures are needed to ensure equitable access to health care and quality education. Such social protection measures include insurance schemes, pensions, access to credit; cash transfer programs, relocation programs, and other forms of social assistance. These investments and instruments facilitate economic and social inclusion, which creates co-benefits between adaptation and development goals.

3. Develop a supportive policy and institutional framework for adaptation. Basic conditions for effective development, i.e. the rule of law, transparency and accountability, participatory decision-making structures, and reliable public service delivery at international quality standards support effective development and adaptation action. Climate change adaptation also requires new or revised climate-smart policies and structures at all levels.

National Adaptation Strategies: Sound adaptation planning, strong governmental and

nongovernmental cooperation, and plentiful financial resources are all important for building resilience to climate change. Developing national adaptation strategies are important for prioritizing adaptation activities that respond to urgent and immediate needs, and for setting forth guiding principles in the effort to cope with climate change. National governments have a key role in developing these strategies and as a result play an important role in promoting collaboration and cooperation. This cooperation should include the government, civil society, the private sector, and international institutions. Within governments, inter-ministerial coordination is especially critical, because adaptation responses often require activities involving multiple ministries and sectors. Finally, to do any of the activities above it is important to secure the necessary financial resources. There are many sources for adaptation funding, but first the Arab countries will need to build their capacity to analyze their financial needs and generate and manage these resources.

Conclusion: The Arab region's climate has already begun to change, often to the detriment of Arab society. But what makes climate change particularly difficult is that it is not a static problem; a more variable and unpredictable climate will not be solved by one round of policy making. Adaptation governance will be a dynamic process of multiple responses to new threats. Political change, including changes originating from the Arab spring, can provide opportunities to strengthen civil society participation in adaptation governance and enable a move toward more inclusive approaches to addressing climate change issues and building climate resilience. A key message is that climate change should be taken into account in all activities, including those not directly addressed here. Anticipation of climate change can be the stimulus for improving interventions, galvanizing support, and improving governance.

Contact MNA K&L:

Laura Tuck, Director, Strategy and Operations.
MENA Region, The World Bank

Regional Quick Notes Team:

Omer Karasapan, and Roby Fields

Tel #: (202) 473 8177

The MNA Quick Notes are intended to summarize lessons learned from MNA and other Bank Knowledge and Learning activities. The Notes do not necessarily reflect the views of the World Bank, its board or its member countries.