



ARAB

CLIMATE RESILIENCE INITIATIVE

Toward a Unified Response

Draft



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Acronyms

ACRI	Arab Climate Resilience Initiative
AEF	Arab Environment Fund
AFED	Arab Forum for Environment and Development
AHDR	Arab Human Development Report 2009
CAMRE	Council of Arab Ministers Responsible for the Environment
CDM	Carbon Development Mechanism
IPCC	Intergovernmental Panel on Climate Change
MEA	Multilateral Environmental Agreement
MENA	Middle East and North Africa
MDGs	United Nations Millennium Development Goals
NGO	Non-governmental Organization
ODA	Official Development Assistance
SLR	Sea-Level Rise
UAE	United Arab Emirates
UNDP	United Nations Development Programme
UNDP-RBAS	UNDP's Regional Bureau for Arab States
UNFCCC	United Nations Framework Convention on Climate Change

Overview

As the scientific evidence of a warming planet gains momentum, climate change now makes an appearance on the agenda of every global policymaker. By most estimates, a temperature rise of at least 2° Celsius above pre-industrial temperatures is expected this century, with a possible 5° increase if mitigation is not pursued broadly and in earnest. Either scenario brings with it serious challenges to human development.

Due principally to their geographic and topographic profile, but also to underlying economic and structural factors, the Arab countries rank among the most vulnerable in the world to the impacts of climate change. Food security, water scarcity, public health and economic livelihoods are among the areas expected to be affected. This challenge comes on top of pre-existing development challenges ranging from mixed progress on poverty reduction, to high levels of unemployment, to already-low stocks of renewable fresh water.

The Arab countries are showing signs of addressing climate change as a policy priority. A number of countries have taken action to adapt to the changing climate, and various countries to the extent that resources allow have also invested in energy efficiency. But regional policy dialogues and research indicate that there is much more work to be done to safeguard development in the Arab countries from the threat of climate change. The Declaration of the 2010 Arab Summit contained many references to the need to safeguard the environment.

In response to the development needs and demand from the region, the Regional Bureau for Arab States of the United Nations Development Programme (UNDP-RBAS) has convened a broad process of consultation under the banner of the Arab Climate Resilience Initiative (ACRI). The overall objective of ACRI is to build the foundations of a regional platform to provide support for Arab countries in their processes of building and gaining knowledge related to climate change priorities, develop capacities to respond through strategic programmes and policies, and establish partnerships and other cooperation modalities to undertake joint work to address this challenge that has both local and global effects.

The process thus far has consisted of commissioning strategic research on climate change priorities as determined by national and regional partners, as well as convening a series of regional consultations to take stock of challenges and policy options within the same areas. Three regional consultations were held: the first, held in Damascus, Syria, focused on water scarcity and desertification; the second, held in Cairo, Egypt, covered sea level rise; and the third, in Manama, Bahrain, concentrated on energy efficiency. Together the research and the consultations have brought together the

expertise of over 200 individuals representing academia, the media, the private sector, national governments, regional bodies, and multilateral institutions, yielding a body of knowledge and a stream of momentum that provides ideas and impetus for the way forward.

In Rabat, Morocco, from 3-5 November, over one hundred participants from more than thirty countries including fifteen Arab countries will bring the consultation phase to its culmination. At the Arab Regional Climate Change Forum policymakers and experts will review the findings of the ACRI regional consultations, discuss the options for response in their policy contexts, and agree on a framework for action to be proposed as a way forward. The framework of action will provide a range of proposed options from which choices can be made by governments and institutions in partnership with the many actors involved in working to address climate change, so that they can address immediate needs while also charting a course to long-term climate resilience and sustainable human development. The underlying premise of the framework of action will be that the climate challenge spans sectors and areas, and so too must the response. Only integrated responses drawing on the capabilities of a range of actors and connecting sectors will suffice to meet the challenge.

The present document serves as background to the discussion and a resource for participants in the event. It begins with an overview of the linkages between climate change and development, including in the Arab countries. It proceeds to a summary of the over-arching findings of the participants in the three consultations held thus far. It concludes with a detailed presentation of the specific actions agreed by participants in the regional consultations.

Background

Climate Change and Development

Worldwide progress in human development has steadily advanced since the 1970s. While variation occurs across regions, there has been overall improvement in poverty reduction, life expectancy, literacy and gender equality.¹ Universal adoption of the United Nations Millennium Development Goals (MDGs) in 2000 made the international community's commitment to the well-being and human rights of its citizens even more concrete. However, as the world evolves, outside variables impact the likelihood of making lasting progress in human development goals. One of these variables is now often referred to as the defining challenge of the century: climate change. As the scientific evidence of a warming planet gains momentum, climate change now makes an appearance on the agenda of every global policymaker.

“As consumption grows, and as climate change gathers pace, we risk reversals in the many gains that have been made towards the Millennium Development Goals. The gulf between the aspiration for environmental sustainability and our achievements remains too wide. Improved international governance of environment and development can help close that gap.”

**United Nations Secretary General Ban Ki-Moon,
Message to the 11th Special Session of the UNEP Governing Council,
New York, 24 February 2010**

General consensus has emerged among scientists and policymakers that average global temperatures are set to increase during the 21st century. By most estimates, a rise of at least 2° Celsius above pre-industrial temperatures is expected, with a possible 5° increase if preventive actions are not taken. The impacts of such a change could reverberate around the globe, negatively affecting various domains of life such as biodiversity, food security, water availability, agriculture and tourism. Rising sea levels, melting glaciers and extreme weather conditions could leave future generations with a host of new challenges and exacerbate existing ones. The challenges of climate change will most likely be exacerbated by an expanding global population, which is forecast to reach 9 billion by 2050, with almost all the growth in developing countries.

While all countries will be affected by climate change, those countries largely responsible for setting the globe on a path to higher temperatures, are least likely to be affected. Wealthy countries that developed their economies through industrialization currently produce the overwhelming majority of greenhouse gases, which trap warm air in the environment. With only 15% of the world's population, industrialized countries account for almost half of CO₂ emissions. Meanwhile Arab countries contribute only 5%, a figure lower than any other region apart from Sub-Saharan Africa.²

An increase of 2° Celsius above pre-industrial temperatures could seriously stall or reverse development progress, including toward the Millennium Development Goals. An often-discussed worse case scenario of a 5° Celsius increase would create even more problems worldwide.

However, due to a lack of financial and technological resources, developing countries are poised to bear the majority of the impact from climate change. An increase of 2° Celsius above pre-industrial temperatures could seriously stall or reverse development progress, including toward the Millennium Development Goals. For example, the World Bank estimates that a 2° Celsius rise could put between 100 million and 400 million more people at risk of hunger, while 1 billion to 2 billion more people may no longer have enough water to meet their needs.³ With disproportionate consequences for the developing world, climate change is expected to further widen inequality between rich and poor countries.

Since pre-industrial times, scientists estimate that average global temperatures have risen between 0.7° to 1° Celsius and the effects are evident today.

But climate change is not just a forecast for the future. It is already here. Since pre-industrial times, scientists estimate that average global temperatures have risen between 0.7° to 1° Celsius and the effects are evident today. They are happening right in front of us in the form of more severe droughts, storms and flooding. Furthermore, eleven of the last twelve years have been among the hottest twelve on record and, in 2008 alone, more than 20 million people were displaced by sudden climate-related disasters.⁴ Specifically in the Arab region, Syria has had its fourth consecutive summer of drought while Yemen is struggling with what is considered its worst flooding in a decade. Morocco is also afflicted by frequent droughts. The country now experiences five or six droughts every ten years, as opposed to one every ten years, as it did in the beginning of the 20th century.⁵

According to a figure in the 2007-2008 United Nations Development Programme (UNDP) Human Development Report, one in 19 people in the developing world was affected by a climate disaster annually during 2000-2004, as opposed to one in 1,500 in a wealthy country.

United Nations Development Programme Human Development Report 2007-2008

These climate-related challenges reinforce poverty traps, making it increasingly difficult for poor people to move to higher standards of living. Weather-related disasters occur significantly more often in developing countries. While high-income citizens can manage weather-related shocks through private insurance or savings, a severe flood,

storm or drought can push people on the edge of poverty into destitution. Often located in rural settings, these households are more likely to lose their livelihoods and employment, suffer malnutrition, remove children from school, and liquidate assets after a disaster strikes. Uncertain weather patterns may also lead poor people to make less prudent investments, such as in building up businesses, farms and herds for fear that weather disasters might rob them of their investment.⁶ If climate change scenarios predicting rising sea levels and more frequent, severe weather patterns are correct, the consequences could be a rapid reversal of human development in the countries affected.⁷

In the Arab Region¹: Climate Change as a “Risk-Multiplier”

No country is immune to the effects of climate change, but due to structural, economic, geographical and topographical factors, some countries will feel the effects more than others. A recent report by the Arab Forum for Environment and Development (AFED) on climate change in the Arab region states that “categorically” Arab countries are among the most vulnerable to the effects of climate change. Essentially, this means that many of the challenges Arab countries face today, such as water scarcity, food insecurity, strains from urbanization, and environmental stress are expected to be exacerbated by climate change. Hence, climate change can be considered a “risk multiplier.”

As it stands, the Arab region is beset by number of development challenges. While there is great variation among countries, the region as a whole is expected to come up short on many of the MDG targets. The 2009 Arab Human Development Report (AHDR) provides a view of the state of development throughout the region. According to the report, up to 65 million people are living in poverty and 36.2 % of the population in low-income Arab countries are living in extreme poverty. Furthermore, the region is one of only two where the number of undernourished people actually increased in the last few decades, from about 19.8 million in 1990-1992 to 25.5 million in 2002-2004. At 14.4 %, unemployment is high compared to the rest of the world, and is expected to grow as the size of the population expands.⁸ Again with great variation in the region, illiteracy remains a challenge. A 2007 UNESCO report estimates that about 58 million people or 37% of the adult population in the Arab region cannot read or write. Two out of three of these people are women.⁹

“In terms of climate change, the Arab region’s share of greenhouse gas emissions is still negligible, although per capita emissions are rising, especially in crowded cities. Inevitably, however, Arab states will suffer numerous negative consequences resulting from climate change. These environmental issues can only be confronted through scientific research and serious technological development. Moreover, no one Arab state alone can undertake these tasks single-handedly. A serious beginning thus needs to be made on creating networks of specialized research centres in these critical areas for the purpose of distributing roles and sharing expertise in order to develop a menu of alternative solutions from which decision makers in the in the various Arab states may choose.”

Mostafa Kamal Tolba
Former Executive Director of the United Nations Environment Programme (UNEP)

¹ The Arab Region includes Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, the Occupied Palestinian Territory, Oman, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates and Yemen

The warming climate and its accompanying challenges are also occurring alongside two other regional trends that place significant strain on resources: population growth and urbanization. Since 1970, the population of the Arab countries has nearly tripled climbing from 128 million to 359 million. According to predictions by the UN Population Division, the Arab region will have 598 million inhabitants by 2050. As the population expands, so will movement away from the rural areas toward urban centers. Today, half of the people in the Arab Region are urban and by 2050, almost three quarters of the population are expected to be city dwellers. Rapid urbanization has contributed to the growth of large cities, namely, Algiers, Alexandria, Amman, Baghdad, Cairo, Damascus, Jeddah and Riyadh and governments have expressed concern about the ability to effectively provide services to ballooning populations.¹⁰

As the region endeavors to maintain development gains from the past, as well as confront the issues that lie ahead, the effects of climate change could pose a formidable added challenge. The following section lays out some of these major challenges and threats that Arab countries could face as the globe gets warmer.

Water and Food Insecurity

In a region that is 90% arid, it is no surprise that water availability is a primary concern for Arab countries, and it will become even more so as global temperatures rise. Home to six of the ten most water-scarce countries in the world, some parts of the Arab region already cope with demand exceeding supply. Currently, Arab citizens have access to an average of 1,000 cubic meters of water a year, already seven times below the world average; however, this figure is expected to decline to 460 cubic meters by 2025, lower than the extreme water poverty level according to international classifications.¹¹ Pressure on freshwater resources is huge. Additionally, Arab countries are extracting groundwater at higher rates than the mean annual groundwater recharge. Essentially, water is being used at a rate faster than can be recharged by precipitation and water flows entering the country. Thus, aquifers may be depleted which would further increase aridity in the region. In countries like Libya, Yemen and Jordan, total freshwater extraction from both surface water and groundwater exceeds the total available amount of renewable water resources.¹² By 2025, AFED predicts water scarcity will become a critical problem.

Home to six of the ten most water-scarce countries in the world, some parts of the Arab region already cope with demand exceeding supply.

This problem may be compounded by the fact that in many parts of the arid regions, precipitation is expected to decrease over the next century by 20% or more.¹³ This combination of higher temperatures and less rainfall could cause a range of difficulties for the region. Desertification and the already arid nature of the land is expected to increase, the rate at which aquifers recharge may slow, and the flow of streams and rivers may decline. In turn, agricultural yields and food security would be affected, potentially leading to malnutrition, famine and starvation among the population.¹⁴ If no new climate-resistant crop varieties are introduced, food production could potentially drop by half.¹⁵

Coastal Erosion and Flooding

Rising sea-levels pose another major obstacle to Arab countries managing climate change impacts. Due to melting snow and glaciers, global warming of about 3° or 4° could raise sea levels by approximately one meter.¹⁶ The effects could be major, particularly on the region's natural and man-made islands and coastal towns. This increase in sea level could wipe away agricultural lands, severely impact tourism and displace large swaths of people. In addition to flooding and erosion, the region would suffer from salt-water intrusion contaminating both soil and aquifers, again affecting both water availability and food security.

Countries with large populations near the coast would be most affected by the change in sea-levels. For example, over 50 % of the Egyptian population lives a mere 100 kilometers from the coastline, and higher sea levels could displace 6 to 8 million people and flood 4,500 square kilometers of agricultural land in the Delta.¹⁷ According to the Center for Global Development, three of the top ten cities at greatest risk from sea level rise and storm surges are in the Middle East: Alexandria, Egypt; Aden, Yemen; and Port Said, Egypt.¹⁸ Furthermore, many Arab economies rely on revenue from tourism to support their economies. Rising sea levels would significantly alter the nature of these industries. Jordan, Egypt, Tunisia, Morocco, Syria and Lebanon all have coastlines vulnerable to the effects of climate change.

Sea-level rise and climate related disasters are expected to generate large population migrations, particularly in the Nile River Delta and coastal areas in the Arab Gulf. According to the International Organization for Migration, in 2008, 20 million people were displaced by climate related natural disasters and there will be 200 million environmental migrants by 2050.

UNDP Regional Bureau for Arab States, Arab Human Development Report 2009, International Organization for Migration

Loss of Biological Diversity

Ecosystems may shift as the globe warms and biological diversity around the world will suffer the effects. The Arab region is no exception. According to AFED, a 2° C rise in temperatures could cause 40 % of all species in Arab countries to become extinct.¹⁹ Much of the region's unique geography would be threatened, as would animal species in Jordan, Egypt, Djibouti, Morocco, Saudi Arabia, Somalia, Sudan and Yemen. Coral reefs already endangered by pollution and petroleum spillages, would become even more vulnerable as water temperatures rise. In 1998, the hottest year on record, extreme temperatures led to the bleaching of coral reefs around the world, including in the Arabian Gulf. Unfortunately, global temperatures to date in 2010 match those in 1998,²⁰ and many Arab countries, such as Kuwait, Iraq and Saudi Arabia, experienced all time-highs in June 2010.²¹ When coral reefs die, often so do the marine life that

are supported by them; furthermore, the tourism industry also shrinks, affecting both jobs and income.

Human Health Repercussions

Climate change is also expected to have significant impacts on human health. While some regions may benefit from a warmer climate, any positive effects would be dwarfed by the overall negative repercussions, which are evident even today. The World Health Organization estimates that climate change has already caused 2.4 % of the world's cases of diarrhea and 6 % of malaria in certain middle-income countries in 2000.²² As temperatures increase, adverse health impacts are expected to be greatest in low-income countries, including from heat stroke, malaria, dengue and diarrhea. Vector-borne infectious diseases such as malaria, schistosomiasis and bilharzias may spread more easily, as could allergens in the atmosphere, which cause allergic reactions and pulmonary diseases.²³

Rising Energy Demand

Despite rich energy resources in some Arab states, energy efficiency remains a key concern for the region. While Arab homes are more likely to have electricity than in many other parts of the developing world, the International Energy Agency estimates that there are still 21 million people lacking electricity.²⁴ That demand for electricity is expected to grow as the population expands. In its International Energy Outlook 2010, the U.S. Energy Information Administration forecasts that the energy demand in the Middle East will rise 82% between 2007 and 2035.²⁵ In some countries, such as Oman, Bahrain and the United Arab Emirates (UAE) demand is expected to grow in double digits.²⁶ Access to energy would strengthen the opportunities for poor citizens to escape the worst impacts of poverty. However, at a global level, current energy systems are responsible for 60 % of total current greenhouse gas emissions and therefore play a major role in contributing to climate change.²⁷ The region faces the challenge of meeting the rising electricity demand of its citizens, while at the same time improving the efficiency of its energy systems.

“The Environmental Sustainability Index, which covers 146 countries (16 Arab countries), and classifies countries according to their plans for natural resources, low population density, and successful management of the environment and development ranks several Arab countries at the bottom. For 2005, Iraq ranked near the bottom at 143, Sudan 140, Kuwait 138, Yemen 137, Saudi Arabia 136, Lebanon 129, Libya 125, Mauritania 124, Syria 118, Egypt 115 and the U.A.E. at 110. The highest-ranking Arab countries were Tunisia at 55, Oman at 83 and Jordan at 84.”

UNDP Regional Bureau for Arab States, Arab Human Development Report 2009

Underdeveloped Preparation, Cooperation and Funding

While climate change has captured the world's attention, for many policymakers in the Arab region, it is still not a top priority and this is reflected by national development plans and a lack of related research, data, reports and overall preparation. While the League of Arab States and the Council of Arab Ministers Responsible for the Environment (CAMRE) have brought the issue to the highest political levels, substantial work still needs to be done. The AHDR claims that there is currently still no Arab institution devoted to the effect of climate change on the region. This report states that the only collective effort in the region was the earmarking of \$750 million for a fund to counter effects of climate change in Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates, established at the conclusion of the November 2007 OPEC meeting.²⁸

Official Development Assistance provides US\$5-7 billion per year for global energy-related activities, which is only 1% of the total amount required.

Meanwhile, funding for climate change adaptation remains inadequate both internally and in the form of development aid. Current levels of Official Development Assistance (ODA), while significant, are unlikely to be sufficient to finance the necessary investments. For example, ODA provides US\$5-7 billion per year for global energy-related activities, which is only 1% of the total amount required.²⁹ Furthermore, according to a background paper from the United Nations Framework Convention on Climate Change (UNFCCC), wealthy countries pledged \$176 million to an adaptation fund supporting the Least Developed Countries. However, funding requirements are likely to run to several tens of billions of dollars annually. This lack of attention to climate issues now will create future costs later. Projections often indicate that investing in anticipatory measures can save significantly in future relief costs.

“Climate change is costly, whatever the policy chosen. Spending less on mitigation will mean spending more on adaptation and accepting greater damages: the cost of action must be compared with the cost of inaction.”

World Bank World Development Report 2010: Development and Climate Change

The Arab Climate Resilience Initiative

“We emphasize the need to adopt effective policies in dealing with the issues of climate change and preservation of the environment in all national and regional fields of sustainable development, and to adopt a unified stance at the negotiations over climate change in order to secure the rights of our peoples to safeguard our national resources... We stress the importance of cooperation and coordination in all fields of development, especially in the fields of Arab road links, electricity links, use of sustainable energy, green-belt projects.....”

Declaration of Arab Summit, Libya, March 2010

In collaboration with national and regional partners, UNDP is working on a range of initiatives around the world to promote sustainable development in the face of climate change. UNDP supports climate change adaptation measures that advance human development and pro-poor growth, particularly focusing on vulnerable groups such as women and indigenous populations. UNDP is also playing a role in strengthening global and regional cooperation in both designing adaptation responses, as well as promoting approaches that slow the rate at which the globe is warming.

In the Arab region, UNDP’s Regional Bureau for Arab States (UNDP-RBAS) is planning to provide support to the Arab countries through the *Arab Climate Resilience Initiative (ACRI)*. This initiative seeks to facilitate adaptation to ongoing and future climate change impacts, while both furthering gains in human development and expanding economic growth. Three thematic consultative meetings were held in Damascus, Cairo, and Manama (September – October 2010) to support national partners in developing an integrated response to some of the key climate challenges facing the region. ACRI’s objectives are to build knowledge and foster policy dialogue, mobilize experts and policy leaders to build momentum, and support strategic interventions to promote climate resilient development in Arab countries. It strives to be consultative, demand-driven and aligned with priorities defined by Arab countries.

The first consultation, *“Climate Change Impacts in the Arab Region: Water Scarcity, Drought and Population Mobility”*, was held in Damascus, Syria in partnership with the Ministry of Environment of the Syrian Arab Republic on 15-16 September. The second consultation, *“Sea-Level Rise, Coastal Erosion and Human Development”*, took place on 20-21 September, in conjunction with the National Water Research Center in Cairo, Egypt. Finally, the third consultation focusing on renewable energy and energy efficiency, *“Towards Sustainable Energy: Resources, Challenges and Opportunities”* was held on 6-7 of October in Manama, Bahrain. Participants included regional and global experts, policymakers and other key stakeholders. The consultations were designed to foster partnerships across the region and generate key policy priorities. Outcomes from these three consultations are being used to inform the high-level regional event

in Rabat, Morocco taking place on 3-5 November, 2010, which is discussed in the final portion of the paper. This next section details some of the findings from the three consultations and provides ideas for strategic action based on consensus reached by participants.

“Adaptation to measures that address climate change shall be fully consistent with economic and social development and in such a way so as to achieve sustainable economic growth and eradication of poverty.”

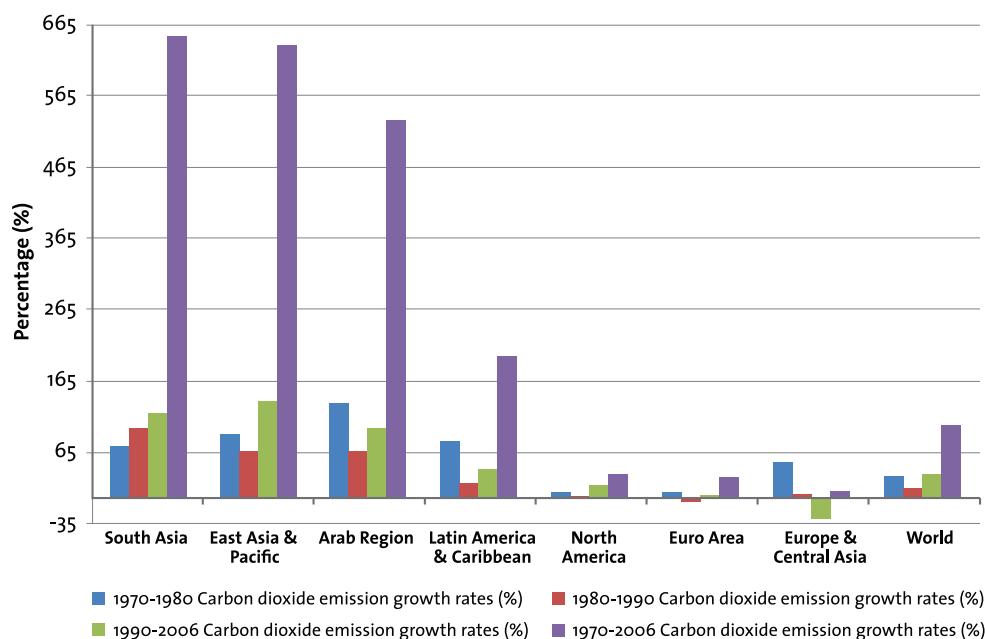
The Arab Ministerial Declaration on Climate Change, December 2007

General Findings from the Consultative Process

ACRI's consultative meetings fostered dialogue and information sharing about climate change among national representatives, world-class experts and specialists from relevant fields. The participatory approach also enabled participants to identify specific, regional-appropriate priorities and determine areas for strategic action. Some common themes were relevant and applicable throughout each consultation such as the need to build capacity at all levels and to strengthen regional cooperation and integration. Other conclusions were more specific such as suggestions for adapting crops to higher temperatures and constructing energy efficient buildings. The next section looks at eight common themes drawn collectively from all three events, and is followed by recommendations for strategic actions, grouped by subject matter.

While total greenhouse gas emissions for the Arab region are relatively low, they are steadily rising. Between 1990 and 2007, energy use, which drives greenhouse gas emissions, increased by 121% in the Arab Region. Further, the rate at which carbon dioxide emissions are increasing in North Africa and the Middle East is faster than any other region in the world, except for South Asia (driven by India) and East Asia (driven by China). From 1990 to 2004 the average annual rate of growth was 4.5 %, which means that carbon dioxide emissions had nearly doubled over that period.

UNDP Regional Bureau for Arab States, Arab Human Development Report 2009



Source: UNDP- AHDR calculations based on data from the World Bank, world development indicators accessed 2010.

1. Making the link between climate change and human development

Until now, climate change and environmental issues have been primarily managed on a sectoral basis. Better coordination among different institutions is necessary to meet the climate change challenge. Communication and collaboration needs to be strengthened across institutions and ministries to develop and implement a suitable policy response. This should involve all levels of decision-making: national, sub-national (regions, provinces, states or municipalities) and local levels. Planning for climate resilience should be integrated into all areas of development planning – livelihoods, health, agriculture, education and poverty – in line with achieving the Millennium Development Goals by 2015.

Furthermore, the active participation by all stakeholders, including public and private sectors, civil society and international partners, is a pre-condition for the successful preparation and implementation of integrated climate plans and strategies. Attention should also be given to improving governance through enhancing accountability and support for an active civil society. Various institutions at all levels require further capacity, while regulatory and enabling environments need to be strengthened and enhanced.

While the extent of the impacts of climate change cannot be fully known, the time for coordinated action should not be postponed. Many decision makers consider uncertainty to be a reason for not making strategic decisions; however, making plans for adaptation and mitigation across sectors should be an urgent priority.

“International support for adaptation has to go beyond financing. Current international efforts suffer not just from chronic under-financing, but also a lack of coordination and coherence. The patchwork of multilateral mechanisms is delivering small amounts of finance with very high transaction costs, most of it through individual projects. While project-based support has an important role to play, the locus for adaptation planning has to be shifted towards national programmes and budgets.”

United Nations Development Programme Human Development Report 2007-2008

2. Addressing challenges through capacity development

As mentioned above, effectively managing climate change requires further capacity at all levels and across sectors, including regulatory agencies, service providers, industry, financing institutions and research institutions. In the public sector, strengthened capacity of national institutions is needed to incorporate adaptive capacity and climate resilience into development and budget planning, while trainings at the sub-national and local levels are also needed. Research institutions require skills to set-up national databases and monitoring systems, and to develop and effectively transfer technology, while successfully tapping into a range of funding sources, such as the Adaptation Fund and the Carbon Development Market, also requires additional capacity. Finally,

trainings for national and regional media and civil society, especially at the local level, would enable further progress in advancing the climate change agenda.

3. Connecting scientific research to the climate challenge

The Arab states traditionally do not invest significant amounts in science and research-and-development, and the regulatory framework is not conducive to private investment in these areas. Addressing climate change requires revitalization of public support for research and development, as well as an improvement of an enabling business climate that encourages private sector investment. Strategic development of new research and educational programs should be encouraged at think tanks and universities and they should focus on a long-term, integrated approach to climate change. Investments are needed in a range of areas relevant to climate change: databases of indicators, early warning systems, space technology and robust climate models that reduce the degree of uncertainty in national and regional climate prediction. Global climate models that are already being used need to be adapted for the regional and country levels. Further research is also required in application of green technologies. Universities can partner with businesses to develop green energy products and services, and start-up companies developing from these partnerships should be encouraged and supported.

Despite having the third largest oil reserves in the world, the United Arab Emirates is seeking greener pastures. In an effort to reduce its long-term economic dependency on hydrocarbons and pioneer new initiatives in renewable energy, the government came up with the *Masdar Initiative*. The Masdar Initiative is an iconic, ambitious, and multipurpose renewable energy project that sets an example in the Arab region in commitment to tackle climate change. Its core component is a planned zero carbon, zero waste city for up to 90,000 inhabitants with a renewable ecosystem. Masdar's founders are also investing in a range of new energy technologies, establishing a post-graduate research institution and developing a carbon management unit. These initiatives are aimed at laying the groundwork for vital and sustainable new industries.

4. Accelerating technology transfer

All multi-lateral environmental agreements (MEAs) include technology transfer. Increased sharing of new information and technology among stakeholders (governments, private sector entities, financial institutions, NGOs and research/education institutions) would greatly facilitate a more effective response to climate change. Countries would benefit from better access, acquisition and utilization of new technologies related to heat-and-drought resistant crops, solar energy, energy-efficient water desalination, and more.

In order to make technology transfer as efficient as possible countries can take a range of steps: enhance enabling environments to integrate technology transfer policies; develop partnerships with the private sector and national, regional and international research centers; develop communication channels and forums to support the transfer of needed information and skills; play a role in coordinating and guiding technology needs assessment among different stakeholders; translate scientific information into a format that different stakeholders can use in practice and strengthen the links between development and the UNFCCC process.

5. Tapping new sources of funding and improving the financial climate

Many Arab countries face fiscal constraints that hold back their ability to invest significantly in adaptation activities, renewable energy or energy efficiency. Particularly in low-income countries, but also middle-income countries, there is a need for Arab states to more effectively access financial resources for these purposes. The challenge in climate finance is to find ways to mobilize a variety of resources, while at the same time ensuring that funds can be delivered with sufficient speed to where they are most needed. There is a need for greater understanding of the options available for financing development interventions, as well as attention to policies that would support its effective use. Internally, plans for climate change adaptation and mitigation should be integrated into economic planning, and investment regulations and tax policies should be amended to support investment in green technology. Externally, mechanisms for cooperation should be developed in the traditional multilateral and bilateral communities, as well as among emerging partners such as the Arab Funds, the private sector, and South-South actors.

Some ideas for increasing access to finance include: a) using regional development funds (i.e. the Kuwait Fund for Arab Economic Development, Saudi Fund for Development and the Abu Dhabi Fund for Development); b) mobilizing resources from Arab banks; c) building capacity in the Carbon Development Mechanism (CDM) so that it can be better accessed; d) harnessing venture capital; e) creating national renewable energy funds in order to promote early market development and f) developing loan facilities that offer low interest rates to projects involving energy efficiency and renewable technologies.

Recognizing the importance of attracting private sector investment and providing resources for the environmental domain in the Arab Region, the Council of Arab Ministers Responsible for the Environment (CAMRE) initiated the establishment of an Arab Environment Fund (AEF). The AEF, proposed by the Lebanese Ministry of Environment, is designed to improve sustainable ecological development in the Arab region by attracting financial resources for environmental programs and projects, and enhancing private sector investments in the environment. Currently, the AEF is seeking the involvement of new partners and preparing activities towards mobilizing resources for the commencement of the AEF.

6. Strengthening regional cooperation

Given the fact that climate challenges have no boundaries, greater regional cooperation would engender a stronger response than individual national efforts. The League of Arab States has contributed normative agreements related to climate change, such as the Arab Ministerial Declaration on Climate Change, but mechanisms for regional cooperation on implementation of adaptation and mitigation initiatives have not yet been established. There is a need for space for dialogue that can help bring countries toward agreement on key areas, as well as enable the establishment of specific partnerships among countries in the region and around the world.

Adaptation efforts would benefit from regional cooperation. A future adaptation framework is likely to be based heavily on use of regional centers of excellence to facilitate lessons learned and South-South knowledge sharing. In the absence of a clear outcome from Cancun on adaptation, a number of parties are already setting up interim adaptation partnerships, which offer potential collaboration. Countries can also call on organizations like the Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD) for support in developing new approaches to sustainable agriculture. Similarly, involvement of a regional organization such as the Regional Centre for Renewable Energies and Energy Efficiency (RCREEE) can promote energy integration. Regional cooperation would also offer opportunities to enhance cooperation on water resources and strengthen advocacy in international fora. Additional ideas include study abroad programs, faculty exchange, collaborative research and university mobility grants, establishing a regional technology transfer center, conducting a regional vulnerability assessment and creating a network of a climate change experts.

According to the DESERTEC Foundation located in the MENA region, “Within six hours, deserts receive more energy from the sun than human-kind consumes within a year.” DESERTEC was founded in January 2009 as a non-profit foundation to promote the implementation of the concept “Clean Power from Deserts” all over the world. Emerging from those roots, the DESERTEC Industrial Initiative is the most ambitious solar power project in the world. It intends to realize use of the solar and wind energy in the MENA region by implementing concentrating solar power, photovoltaic systems and wind generators in the Sahara Desert. With support from a sizable number of investors, the organization aims to provide sustainable electricity for 15% of Europe, and large parts of North Africa and the Middle East by the year 2050, with fossil fuel use only as a backup. The plan is expected to cost \$550 billion.

7. Communicating, educating and generating awareness

There are still critical gaps in knowledge about climate change, including specific projections at the local and national level, impacts on other development areas such as health and the economy, and the range of options for adaptation and mitigation. Similarly, the urgency placed on climate change in the public sphere in many parts of the world is not matched in the Arab countries. There is a need for more visibility and open dialogue on the nature of the threat and the options for addressing it. Facing up to the complex policy challenge of climate change requires sustained high-level attention, as well as a broad constituency supporting policy change. Positive communication around the options and benefits of dealing with climate change would be a useful step in building momentum. Countries can consider a range of approaches such as developing trainings for regional and national media that encourage treating climate change as a challenge for development, promotional campaigns that stimulate demand for energy efficiency, and public information on the long-term benefits of conservation technologies. Furthermore, information about climate change should be included in curricula across the education system at all levels and initiatives should be created that familiarize youth with the various dimensions of climate change.

Last year, Jordan's Minister of Environment Khalid Irani (who is now Minister of Energy and Mineral Resources) turned to modern social media to get out the message about climate change. On Blog Action Day, a worldwide event that calls on bloggers to post about the same issue on the same day, Minister Irani wrote a climate change post for one of Jordan's most popular blogs, 7iber.com, an outlet similar to the US Huffington Post. In a thorough piece, the Minister mapped out the country's adaptation and energy policies. He also encouraged readers to follow him on Twitter, another social media tool that provides brief micro-updates to subscribers: "As I know the huge potential of blogging in networking via social media tool, please bare with me in a long post in which I try to present an insight on Jordan's view of the complexity of climate change issues at the global and national levels. For future updates up you can always follow me on Twitter," Minister Irani wrote.

8. Empowering local communities and vulnerable groups

“The role of sub-national and municipal officials and authorities in the [climate change] agenda is essential. It is estimated that they are responsible for implementing the majority of climate adaptation solutions, and that mitigation measures accounting for between 40 and 70 % of all greenhouse gas emissions are influenced by their decisions.”

**Administrator of the United Nations Development Programme, Helen Clark
Climate Leaders Summit Copenhagen, Denmark, December 2009**

Involving and empowering local communities through participatory and community-based approaches improves the likelihood for success in responding to climate change. When developing climate policies, it is important to understand the local climate, culture, and business practices. Adaptation to climate change is very site-dependent, and local planning decisions are critical to tailoring adaptation action to individual locations. Similarly, from 50% to 80% of greenhouse gas emissions are influenced by local behavior and investment choices. Therefore, local communities should be involved in the planning and implementation process of climate initiatives and decision makers and opinion leaders should be particularly engaged. Community representatives in different areas can also exchange experiences with one another. Building awareness and education among local communities increases the probability that new technologies and conservation practices will be accepted and may introduce new job opportunities at the local level. Local communities can also provide data, participate in needs assessments and offer their knowledge to provide useful climate information. As climate change is more likely to affect women and persons living in poverty, consideration of their priorities and needs should be reflected in development planning, and women should be involved in all decision-making processes. The role of local civil society should also be strengthened and promoted.

“The Climate Neutral Network, a web-based project managed by the United Nations Environment Program UNEP, is seeking to federate nations, regions, local authorities, communities, associations and businesses who are pledging to significantly reduce emissions en route to zero emission economies. With over 100 members, this initiative assists in catalyzing a global response to global warming achieving a transition to a low carbon and eventually climate neutral society through information exchange and networking. <http://www.unep.org/climateneutral>”

Regions- A Solution to Climate Change (UNDP/UNEP)

Arab cities are particularly vulnerable to climate change and very few are prepared to deal with impacts. A new paradigm for urban planning is needed that includes climate change adaptation and mitigation responses in coastal management, transport planning, urban greenery and resource management. One idea is to build a network of *Resilient Cities* that test and demonstrate a range of climate change policies that can be shared with other countries in the region. A Resilient City action plan would include public education, minimizing the ecological footprint of buildings, disaster mitigation policies and increasing capacity of local governments and civil society on climate change issues. At the global level, the International Council for Local Environmental Initiatives coordinates a movement to encourage cities to adapt climate change measures. The organization, which recently signed on its 100th city, launched its Arab Campaign in Kuwait in October.

Findings from the Consultative Process Listed by Thematic Topic^{II}

Water Availability and Food Security

When policymakers are considering actions that will ensure food and water security in the face of climate change, there are primarily three broad areas to consider:

- **Investing in Practical Research and Robust Monitoring Systems**
- **Improving Water Governance to Maximizing Efficiency of Water Use**
- **Developing More Efficient and Climate-Resilient Agricultural Systems**

Having a thorough understanding of climate change risks, challenges and opportunities entails gathering and augmenting information, engaging in practical research and building robust monitoring systems. The following specific steps can be taken to support these goals: performing vulnerability and drought impact assessments, upgrading the network of hydro-meteorological monitoring stations, updating information on critical water basins, and using remote sensing and ground-truthing to identify the relationship between climate, water resources and food security, as well as for identifying stocks of underground water.

Due to existing water scarcity issues, preserving and protecting water supplies is also a vital undertaking. Movement in this direction can include investing in new technologies for water desalinization, managing usage of groundwater, reducing leakage and illegal use of water distribution networks, promoting the use of water saving devices in homes and establishments, recycling wastewater, and improving water governance by implementing regulatory and technical reforms, as well as through developing cooperation in managing regional water resources.

Additionally, there is a need to develop more efficient and climate-resilient agricultural techniques. Some possible options include developing drought-tolerant crops that can adapt to higher temperatures and different seasons, ensuring efficiency in irrigation by reducing leaks, moving away from sprinkler and drip methods, integrating climate resilience into the design of new infrastructure for irrigation and flood control, investing in crop insurance, developing rainfed agriculture and relocating crop growing areas to regions that have more rainfall or available water.

II See Annex 1 for complete list

“A wide array of adaptation options is available, but more extensive adaptation than is currently occurring is required to reduce vulnerability to climate change. There are barriers, limits and costs, which are not fully understood. Some planned adaptation is already occurring on a limited basis. Many adaptation actions have multiple drivers, such as economic development and poverty alleviation, and are embedded within broader development, sectoral, regional and local planning initiatives such as water resources planning, coastal defense and disaster risk reduction strategies.”

Fourth Assessment Report of the Intergovernmental Panel
on Climate Change (IPCC) 2007

Coastal Erosion and Sea-Level Rise (SLR)

As sea-levels rise, and countries face the prospects of eroding coasts and the intrusion of saltwater, these steps can help them prepare:

- **Scaling-up Monitoring of SLR and Assessment of Potential Impacts**
- **Developing Planning Frameworks for Addressing SLR and Coastal Erosion, Including Worst-Case Scenarios**
- **Recognizing Linkages between SLR and Coastal Erosion Planning Frameworks and Agriculture and Tourism**

Countries need to understand areas of vulnerability and high risk, assess potential impacts, as well as scale-up monitoring of sea level rise, storm surges, extreme events, water and soil salinity, coastal temperatures, erosion patterns, land subsidence as well as coastal socioeconomic parameters. Again, space technology can be utilized. When building frameworks for monitoring and impact assessment, the benefits of a regional approach and information sharing should be considered.

Integrating disaster risk reduction planning into national and regional strategies will also be an important step in managing rising sea levels. There are a number of suggestions to facilitate the creation of planning frameworks: increasing the minimum distance between buildings and shoreline; adapting materials and techniques used for buildings, roads, and utilities; assisting governments and national actors in linking their disaster risk reduction and adaptation efforts; promoting action on climate change within the disaster risk reduction community; promoting the use of the Hyogo Framework; building up coastal marine defenses; enhancing population awareness and developing insurance schemes.

Once again, when considering impacts from coastal erosion and sea-level rise, adapting agriculture to potential new realities should be a priority to ensure food security. Countries should consider introducing crops that are tolerant to salinity, developing fertilizers that can reduce salt concentration, investing in hydroponic cropping and developing progress in desalination, as well as irrigation techniques that improve water productivity. Other measures include restricting agriculture development in

hazard-prone areas and using breakwaters to protect farmers' lands from flooding and salt-water intrusion.

Since eroded coastlines are expected to impact the tourism industry, investments in alternative types of tourism that do not rely on coasts or coral reefs should also be considered. Some options for development are cultural, inland and desert tourism, as well as eco-tourism.

Sustainable Energy

In addition to adapting to climate change impacts, countries need to devise plans to moderate their own contributions to the problem and make plans for a sustainable future. Some areas of focus should be:

- **Integrating Energy Efficiency into Policy and Planning**
- **Promoting the Development of New Technologies in Renewable Energy**
- **Fostering Investment in Energy Efficient Infrastructure**
- **Identifying and seizing opportunities for employment-generation in the energy-efficiency sector**

Countries should consider a range of approaches for mainstreaming energy efficiency and renewable energy into their policies and strategies. Energy efficiency and renewable energy should become a part of development policies and plans. Legislative, institutional and regulatory frameworks need strengthening, and key barriers that prevent progress from taking root should be removed. Establishing national targets and benchmarks would also create a structure for promoting progress. Other policy options include reforms in energy coding, low emission transport, recycling programs and water conservation. In regards to improving financial environments, countries have a range of options: energy price reform, environmental taxes, harnessing the potential for carbon finance, scaling-up investments to achieve economies of scale and reduced manufacturing costs, and moving towards cost reflective pricing.

The region, like the rest of the world, is in need of developing new technologies to meet energy demands in a sustainable way. The Arab region is well positioned to take advantage of its high exposure to sun through the use of solar energy, which can be put to many uses such as desalination, heating systems and indoor illumination. Wind energy can also be harnessed for developing natural ventilation.

Current infrastructure, equipment and buildings can also be adapted for improved energy efficiency. Countries can invest in smart building systems and materials to create Zero Net Energy Buildings; green roofs and landscaping can be cultivated. Furthermore, there should be energy efficiency standards for selected household appliances, as well as a labeling program. New buildings should be held to energy efficiency codes and standards, and selected facilities should face mandatory energy audits. Research facilities can provide certification of locally and imported energy products, while businesses and international companies that provide energy services or implement projects can be enticed to comply with energy standards. Countries can

also invest in supporting centers that publish online data for the assessment of energy products, including climatic and solar data and benchmarked energy service prices.

Finally, countries can create plans for skill development and interdisciplinary education to seize opportunities for employment-generation in the energy-efficiency sector.

The main threat to maintaining progress in human development comes from the increasingly evident unsustainability of production and consumption patterns. Current production models rely heavily on fossil fuels. We now know that this is unsustainable—because the resources are finite and their impacts dangerous. The close link between economic growth and greenhouse gas emissions needs to be severed for human development to become truly sustainable. Some developed countries have begun to alleviate the worst effects by expanding recycling and investing in public transport and infrastructure. But most developing countries are hampered by the high costs and low availability of clean energy sources.

United Nations Development Programme Human Development Report 2007-2008

Regional Forum for Arab Countries on Climate Change

ACRI's goal is to address climate change through an integrated, cross-sectoral approach that facilitates adaptation to ongoing and future impacts, while enabling gains in human development and economic growth. To support and galvanize regional governmental partners in formulating such an integrated response, the Regional Bureau for Arab States at the UN Development Programme is hosting a high-level Regional Climate Resilience Forum in partnership with the government of Morocco on 3-5 November, 2010. This event solidifies gains made in previous ACRI consultations and will help identify future key policy priorities. The event brings together regional and global experts, media personalities, opinion leaders, United Nations officials, representatives from bilateral and multilateral aid agencies, and high-level policymakers from Arab countries, including Ministers of Water, Environment and Energy.

As delegates prepare for the COP16 negotiations in Cancun later this year, ACRI has endeavored to foster a shared sense of cooperation around climate change through this Regional Forum. To build momentum for this high-level event and to facilitate extensive, bottom-up engagement with regional stakeholders and governments, ACRI conducted three technical, thematic meetings across the region. These consultative meetings fostered knowledge-sharing among national representatives, world-class experts and specialists from relevant fields.

During the Regional Climate Resilience Forum, representatives from each of these consultations will present the overall findings and outcomes, as well as facilitate the review and synthesis of specific national priorities and policy options. The second day of the Regional Forum will subsequently provide platforms for ministers and high officials, as well as key regional institutions to ultimately validate these outcomes and concretely coordinate their positions and action plans. After an open ministerial and high-official discussion, participants will discuss prospects for Cancun and hear from development partners. Additionally there will be a focused discussion on the role of and opportunities for sub-national governance and local communities in furthering climate resilient development.

On the second day, the Regional Forum will also host a Knowledge Fair for governments, development agencies, multilateral partners, and private sector entities to exhibit climate change related measures and projects in adaptation and mitigation. The Knowledge Fair, which is open to the public, will provide a key opportunity to: showcase pioneering projects, know-how, and best practices; demonstrate new technology, products and services; establish inter-regional and inter-country collaboration; and meet and network with potential service providers.

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Annex 1

Findings from the Consultative Process Listed by Thematic Topic

WATER AVAILABILITY AND FOOD SECURITY

Invest in Practical Research, and Robust Monitoring Systems

- Perform vulnerability assessments and drought impact assessments
- Conduct remote sensing and ground-truthing studies to identify the relationship between climate and change in water resources, food security and agriculture
- Upgrade the network of hydro-meteorological monitoring stations; collate relevant agricultural, social and economic datasets to enhance understanding of the system
- Update knowledge on critical basins to determine safe yields and storage capacities of aquifers and surface water resources
- Develop or access technology to identify stocks of underground water; use imaging remote sensing techniques for detecting potential water resources in Arab lands and seas

Improve Water Governance to Maximize Efficiency of Water Use

- Invest in new technologies for water desalination such as solar energy
- Implement regulatory and technical reforms of the water sector
- Strictly limit and control access to groundwater
- Reduce leakage in water distribution networks and illegal tapping into the distribution network
- Promote the use of water saving devices in homes and establishments, e.g. dual flush toilets, automated and/or timed water faucets, low head showers, etc.
- Recycle wastewater: greywater and blackwater recycling at the individual and collective dwelling levels
- Create enhanced cooperation, development and implementation of integrated regional water management between countries sharing the same fresh water sources—both surface and groundwater—to ensure conservation, sustainable utilization and avoid conflicts

Develop More Efficient and Climate-Resilient Agricultural Systems

- Develop drought-tolerant crops that can adapt to higher temperatures and different seasons
- Improve irrigation efficiency, e.g. reduce leaks, move from sprinkler and drip methods
- Integrate climate resilience into the design of new infrastructure for irrigation and flood control

- Invest in crop insurance
- Develop rainfed agriculture
- Shift crop growing areas to regions that have more rainfall or available water
- Diversify production systems and enhance the adoption of integrated agricultural production systems

COASTAL EROSION AND SEA-LEVEL RISE

Scale-up Monitoring of SLR and Assessment of Potential Impacts

- Invest in research to assess projections of sea level rise and its potential, with strong participation from the private sector
- Use geographic information systems and modeling to map the areas with high risk and evaluate possible impacts
- Support space technology to monitor, coastal erosions, subsurface water freshness in extended arid Arab area
- Set-up national databases (for specific areas in vulnerable countries) aimed at the systematic observation of sea level parameters such as sea level, storm surges, extreme events, water and soil salinity, coastal temperatures and phytoplankton, erosion patterns, land subsidence as well as coastal socioeconomic parameters
- Support research for the systematic observations, time series analysis, extreme events, modeling, water desalination and wastewater treatment, salt tolerant plants, extreme events, social and economic impacts on vulnerable groups and communities

Develop Planning Frameworks for Addressing SLR and Coastal Erosion, Including Worst-Case Scenarios

- Support the undertaking of a regional assessment study on the vulnerability of coastal zones to sea level rise, land subsidence, coastal erosion and soil salinity; the assessment will be based on a mapping of existing studies, initiatives, local knowledge and traditional practices as well as capacities addressing sea level rise and coastal erosion at the national and regional levels.
- Based on a regional assessment, identify the most vulnerable areas in the region; develop capacity for the design and implementation of an integrated approach that includes monitoring and mainstreaming in sectoral strategies/plans (disaster and risk reduction, health, agriculture and fisheries, social development, migration, economy, urban planning, infrastructure, tourism and cultural heritage)
- Integrate disaster risk reduction planning in addressing sea-level rise and coastal erosion; establish early warning systems
- Adapt land use regulations to the potential rise in sea level, by increasing the minimum clear distance required between buildings and shoreline
- Adapt choice of construction materials and techniques used for buildings, roads, and utilities
- Assist governments and national actors to link their disaster risk reduction and adaptation efforts

- Promote the development of information and tools and the use of the Hyogo Framework
- Promote action on climate change within the disaster risk reduction community
- Build population awareness and educational programming to ensure that communities are prepared for potential effects
- Implement policies that facilitate adequate protection and adaptation such as insurance
- Implement and build capacity for ICZM (Integrated Coastal Zone Management)
- Build up coastal marine defenses

Recognize Linkages between SLR and Coastal Erosion Planning Frameworks and Agriculture and Tourism

- Develop irrigation techniques that improve water productivity and hence reduce water pumping and intrusion of salt (apply water at the right time and amount, drip irrigation)
- Introduce crops/species that are tolerant to salinity and with high water productivity; develop fertilizers that can reduce salt concentration; invest in hydroponic cropping (crops that can grow without soil)
- Take legal actions to restrict or prohibit agriculture development in hazard-prone areas
- Protect farmers' lands from flooding and salt water intrusion (i.e. breakwaters)
- Invest in alternative types of tourism that do not rely on coasts or coral reefs such as cultural, inland and desert tourism and eco-tourism

SUSTAINABLE ENERGY

Integrate Energy Efficiency into Policy and Planning

- Mainstream energy efficiency and renewable energy into development policies, strategies, and plans at the national level; integrate energy efficiency and renewable energy into energy, economic, and environmental planning
- Establish national targets for energy efficiency and renewable energy; establish annual benchmarks within the Arab region and against international experience
- Strengthen legislative, institutional, policy and regulatory framework; remove key barriers (policy, market, economic)
- Support energy conservation and energy efficiency policies through energy prices reform, energy coding, environmental taxes; low emission transport; recycling programs, water conservation
- Provide financial incentives for investing in renewable energies; attract private sector investments; improve overall investment climate
- Develop appropriate finance mechanisms (harness the potential for carbon finance in the region)
- Scale-up investments to achieve economies of scale and reduce manufacturing costs
- Move towards cost reflective pricing

Promote the Development of New Technologies in Renewable Energy

- Take advantage of the region's high exposure to sun through the use of solar energy
- Invest in indoor illumination, water heating and desalinization through solar insulation
- Develop natural ventilation using wind energy to ensure healthy indoor air quality

Foster Investment in Energy Efficient Infrastructure

- Develop green buildings; focus on planting and greening (landscape and roofs); develop and design smart building systems and materials toward Zero Net Energy Building
- Create temperature control and cooling using diurnal variation of humidity, temperature and wind conditions
- Invest in "Resilient Cities" based on the ICLEI model (International Council for Local Environmental Initiatives)
- Develop energy efficiency codes and standards for new buildings; establish benchmarking of buildings & building services
- Conduct mandatory energy audits for selected buildings and facilities
- Adopt a common policy for standards and labels; develop standards, testing, and certification schemes
- Create energy efficiency standards for selected household appliances; develop a labeling program for these appliances
- Enforce and reward compliance with energy standards by businesses and international companies that provide energy services or implement projects
- Empower and support public and research facilities that can provide certification of locally and imported energy products
- Develop energy supply technologies (smart grid, hybrid plants and optimized storage and use systems)
- Create energy, cooling and innovative water production technologies and systems
- Reduce gas flaring, leakage and fugitive emissions
- Promote energy efficient equipment
- Invest in supporting centers that publish online data for the assessment of energy products-including climatic and solar data and benchmarked energy service prices

Identify and Seize Opportunities for Employment-Generation in the Energy-Efficiency Sector

- Focus on green jobs; create plan for skills development
- Create educational interdisciplinary programs that prepare green energy professionals and entrepreneurs to promote and market energy services
- Implement pilot projects in the field of renewable energy and improved energy efficiency