Expert Group Meeting Towards Assessing the Vulnerability of Water Resources to Climate Change in the Arab Region
26-28 October 2009 – UN House – Beirut, Lebanon

INFORMATION NOTE

I. INTRODUCTION

Many human and environmental systems are sensitive to climate change such as agriculture, forestry, coastal zones, marine systems, industry, tourism, human settlements, biodiversity and health. However, the projected changes that climate could have on the water resources is likely to have direct and indirect effect on each of these sectors, among many others. Flooding, drought cycles, heat waves, cyclones, wind storms and dust storms are all expected to increase in frequency and variability. While extreme weather events are expected to take a toll on infrastructure and ecosystems, gradual changes in temperature and climate are also expected to affect sea levels, groundwater and surface water salinity, water supply, and water-borne disease vectors. While these expected impacts have generally been modeled through the development of global climate models, limited research and information has been generated on the effects of climate change at the Arab region level, and specifically what implication different climate change scenarios may have for water resources and socio-economic and environmental vulnerability in the region.

It is estimated that the impacts of climate variability on the Arab region will include changes in precipitation rates, surface runoff and river flow rates, which will affect large and small river basins, including shared river basins from which Arab countries draw most of their water. Water quality in rivers and coastal areas is also expected to be affected due to sea level rise and saltwater intrusion into coastal groundwater aquifers. In addition, the changes of precipitation rates and drought frequency would reduce the recharge rates of groundwater and also further exacerbate the extraction rate of groundwater, including non-renewable fossil groundwater resources, as a result of lower availability of surface water. Climate change is also expected to have socio-economic and ecological impacts associated with changing ecosystems and human environments, which could result in serious consequences for migration, agriculture, water supply and sanitation, food security, and human health. Determining the extent to which these sectors may be affected by climate change impacts on water resources in the region, however, requires the conduct of an empirically sound and regionally-specific vulnerability assessment.

Vulnerability refers to the susceptibility of a system to harm. A vulnerability assessment of climate change impacts can then determine how and where a community is subject to climate change risks. A vulnerability assessment can be qualitative in nature (e.g. class risks in terms of high, medium, low threats) and/or quantitative and present empirical findings such as changes in the water balance, the percentage share of the population at risk, or the loss to national revenues due to increased frequency of natural disasters. Which approach to take largely depends on the question being asked, the audience being targeted, the level of accuracy needed in order to make informed policy response decisions, and the type of information and data available to carry out the analysis.

Once the purpose, scope and scale of a vulnerability assessment are identified, vulnerability indicators can be used to monitor changes in human conditions and ecosystem over time as well as measure exposure risks and the effectiveness of future adaptation strategies. Some examples of these indicators include the percentage of population living in low-lying coastal areas and floodplains, the share of rainfed cropped areas in agricultural GDP, the duration of drought cycles and flood events. Other indicators include total seasonal rainfall, the frequency of extreme events measured above peaks and thresholds, spatial and temporal variability of climate events, groundwater recharge and extraction rates, biodiversity loss, as well as mortality and morbidity trends.
Additionally, to prepare a vulnerability assessment, specific questions should be asked such as: on which geographic areas should the assessment be focused? What are the priority questions that need to be answered? To what degree of confidence should the findings be? Is there sufficient technical capacity to perform the assessment? Are there existing global and regional models that are transferable for application at the Arab regional and sub-regional levels? The purpose of this expert group meeting is thus not only to identify the purpose, scope and scale of the vulnerability assessment to be conducted, but also achieve consensus on the methodological approach to be taken in view of the fact that there is not one approach currently applied, tested and accepted that examines the Arab regional context. In determining which methodological approach to take, care should be taken to ensure that the approach is flexible, dynamic yet sufficiently specific to reflect the impact of climate changes on water resources so as to be able to translate the assessment of the natural resource sensitivity to an assessment of the vulnerability of related socio-economic and environmental conditions.

The impact of climate change on water resources is usually estimated by defining scenarios for changes in climate conditions, simulated by general circulation models (GCMs), and linking them to a hydrological model to predict changes in river runoff, groundwater recharge and extraction rates, etc. Reliable data and information on climate and hydrologic parameters are of a paramount importance to be able to construct scenarios that are suitable for hydrological impact assessments and to develop and use of realistic hydrological models and more importantly to understand the linkages between these models and climate models. Downscaling techniques are often employed to achieve the desired level of detail for regional and national assessments in terms of both time and space. For instance, GCMs have a spatial resolution of tens of thousands of square kilometers, while a hydrologic model requires data at a resolution of a few square kilometers at the most. Harmonizing these two data sources to provide a coherent and reliable picture of climate and hydrological dynamics can thus be a challenge.

There are many other challenges that must also be overcome in preparing this vulnerability assessment for the Arab region, such as the: 1) inadequacy of information and research material on the vulnerability of communities and ecosystems to climate and water resource variability; 2) limited technological skills and human resources; 3) shortage of data and available regional climate models downscaled from global GCMs; 4) high degree of uncertainty associated with extreme climate events and the effectiveness of associated contingency planning and implementation; and 5) difficulty of multi-disciplinary coordination among stakeholders and regional actors dealing with climate change issues, and the associated need to integrate the perspectives of practitioners in various sectors, including metrology, ecology, hydrogeology, economics, public health, natural resource management, disaster risk management, community development, gender, etc.

It is hoped that this meeting would result in consensus on the purpose, scope and methods to be adopted for the preparation of a regional vulnerability assessment of the impact of climate change on water resources among regional stakeholders, as well as agreement on a jointly prepared work plan, time line and budget for moving forward with its preparation.

II. OBJECTIVES OF THE MEETING

The meeting is expected to bring together member states as well as regional and international experts and organizations concerned with implications that climate change is expected to have on water resources and vulnerability. To that effect, the meeting will review the state of knowledge in this area and foster in a set of interactive discussions at the plenary and working group levels to achieve the following objectives:

- Stocktaking and exchange of lessons learned on the assessment of vulnerability of water resources to climate change from other regions.
- Review of existing models and methodologies and investigate knowledge gaps and data availability.
• Building consensus on the scope, methodological approach and associated parameters for the vulnerability assessment.
• Developing a work plan, which will identify the tasks and responsibilities to be carried out by the involved agencies based on agreed upon timelines and targets.

III. ORGANIZATION OF THE MEETING

The meeting is an outcome of a collaborative effort between the United Nations, the League of Arab States and their respective specialized organizations working in the Arab region to jointly prepare a vulnerability assessment of the impact of climate change on water resources. The League of Arab States (LAS), United Nations Environment Program/Regional Office for Western Asia (UNEP/ROWA) and United Nations Economic and Social Commission for Western Asia (ESCWA) are the lead conveners of the meeting, which is organized in collaboration and the financial support of several other regional and international organizations, including ISESCO.

IV. ADMINISTRATIVE ISSUES

The three day meeting will be held at United Nations House located at Riad El-Solh Square in Beirut, Lebanon from 26-28 October 2009. The sessions will take place in the B1 floor, Committee Room I. The meeting will be conducted in the English language.

Special arrangements have been made with a number of hotels in Beirut for accommodation packages that include a reduced room rate, transport from and to the airport, and daily transfers to United Nations House. Hotel details and daily rates will be communicated following submission of the attached registration form.

For those participants who would encounter difficulties in obtaining an entry visa to Lebanon in their home country, kindly advise ESCWA at least three weeks prior to your travel date if you need assistance with the issuance of a visa. Request for this assistance should be noted on the registration form.

V. CORRESPONDENCE

For additional information, please contact one of the following co-conveners:

Ms. Fatma El-Mallah  
Director  
Department of Environment, Housing, and Sustainable Development  
League of Arab States  
Cairo, Egypt  
Tel: +202-25-75-2966  
Fax: +202-25-77-9546  
E-mail: envsusdev.dept@las.int

Mr. Habib El-Habr  
Director  
Regional Office for West Asia United Nations Environment Program  
Manama, Bahrain  
Tel: +973-17-812-754  
Fax: +973-1- 825-110/1  
Email: Habib.Elhabr@unep.org.bh

Ms. Anhar Hegazi  
Director  
Sustainable Development and Productivity Division  
ESCWA  
Beirut, Lebanon  
Tel: +961-1-981-501 or +961-1-981-301  
Fax: +961-1-981-510 / 511 / 512  
Email: hegazi@un.org