Overview of RICCAR and the Arab Climate Change Assessment Report

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High Level Conference on Climate Change Assessment and Adaptation in the Arab Region – Beirut, Lebanon – 26-28 September 2017
Intergovernmental Mandates calling for & supporting Climate Change Assessment in the Arab Region

2007 – 2017
10 Year Anniversary of Formalized Action on Climate Change at the Arab Regional Level

Arab Ministerial Declaration on Climate Change
CAMRE 2007

Arab Economic and Social Summit Resolution on Climate Change & Water 2007, 2008, 2012, 2014


ACSAD Board of Directors Resolution 2013

Environment
Foreign Affairs & Planning
Water
Met
Agriculture
To assess the impact of climate change on freshwater resources in the Arab Region through a consultative and integrated regional initiative that seeks to identify the socio-economic and environmental vulnerability caused by climate change impacts on water resources based on regional specificities.

**RICCAR Objective**

*RICCAR aims to provide a common platform for assessing, addressing and informing response to climate change impacts on freshwater resources in the Arab region by serving as the basis for dialogue, priority setting and policy formulation on climate change at the regional level.*
RICCAR Partnerships

Implementing Partners

- United Nations ESCWA
- United Nations Environment
- World Meteorological Organization (WMO)
- League of Arab States (LAS)
- SMHI (Swedish Meteorological and Hydrological Institute)
- UNESCO
- UNU-INWEH
- United Nations Office for Disaster Risk Reduction (UNISDR)
- Sweden
- Cairo Office

Collaborating Research Institutes

- Center of Excellence for Climate Change Research/ King Abdulaziz University (CECCR/KAU) - KSA
- King Abdullah University of Science and Technology (KAUST) - KSA
- Climate Services Center 2.0 (CS2.0) - Germany

Implemented by:

- ACCWaM (Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ] GmbH)
Pillars of Work

REGIONAL KNOWLEDGE HUB

INTEGRATED ASSESSMENT

Climate Change Impact Assessment

Climate Change Vulnerability Assessment

CAPACITY BUILDING & INSTITUTIONAL STRENGTHENING

AWARENESS RAISING & INFORMATION DISSEMINATION
Integrated Assessment

GCM: Global Climate Modelling
RCM: Regional Climate Modelling
RHM: Regional Hydrological Modeling
VA: Vulnerability Assessment
IM: Integrated Mapping
Arab Domain

CORDEX-MENA/Arab Domain | 0.44° (50 km)

- Active Domain
- Full Domain (SMHI-RCA4)
IPCC regional domains

From R.K Kolli, WMO
RICCAR EGM #2 (Beirut, 2010)
Figure AI.3: Overview of the SREX, ocean and polar regions used.

SREX: Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation
Representative Concentration Pathways (RCPs)
As first represented in IPCC AR5 Projections

None represent a 1.5°C Temperature increase scenario

Graph adapted from: Meinshausen et al., 2010
Extreme climate events

RCMs & RHMs

Different GCMs

Same RCP

Ensembles used to reduce uncertainty at level of RCMs & RHMs

Ensembles aggregate findings of different RCMs & RHMs applied for same RCP & Domain

General Circulation Model (GCM)

Regional Climate Model (RCM)

Regional Hydrological Model (RHM)

50km x 50km

25km x 25km

300 km x 300 km
Vulnerability Assessment

EXPOSURE

SENSITIVITY

POTENTIAL IMPACT

ADAPTIVE CAPACITY

VULNERABILITY

Source: Based on IPCC, 2007
Consultations & Capacity Building

INTEGRATED ASSESSMENT

IMPACT ASSESSMENT

Regional Climate Modelling
Regional Hydrological Modelling

VULNERABILITY ASSESSMENT

Vulnerability Assessment Working Group (2013 to 2015)
Regional Knowledge Hub Working Group (2013 to 2014)
Vulnerability Assessment Sensitivity Task Force (2014)
Vulnerability Assessment Adaptive Capacity Task Force (2014)
RCM Ensemble Task Force (2011)
CORDEX Working Group (2014)
Expert Peer Review Meetings (April and December 2016)
• **Increasing** data availability through Climate Data Rescue
• **Fostering** an Arab Climate Outlook Forum
• **Developing** Disaster Loss Databases
• **Establishing** a Regional Knowledge Hub for informing policy & research through RICCAR Publication Series & Data Portal

Main Report  
Technical Notes  
Training Manuals  

Technical Reports  

Peer Reviewed Journal Articles for IPPC use
Regional Knowledge Hub

Arab Ministerial Water Council Technical Committee

Regional Knowledge Hub

ACSADE-ESCWA Coordinating Secretariat
FAO Data Portal

Regional Knowledge Hub Network

Thematic Nodes*
Technical Assistance & Training
Sector Nodes*

Link to ArabCOF

* tbc
PART I. IMPACT ASSESSMENT

CHAPTER 1
Pursuing Regional Climate Modelling and Hydrological Modelling in the Arab Region

CHAPTER 2
Regional Climate Modelling Results for the Arab Domain and Selected Subdomains

CHAPTER 3
Regional Hydrological Modelling Results for the Arab Region and Selected Subdomains

CHAPTER 4
Findings for Selected Shared Water Basins in the Arab Region

CHAPTER 6
Impact of Climate Change on the Agricultural Sector

CHAPTER 7
Impact of Climate Change on Human Health in Selected Areas

PART II. INTEGRATED VULNERABILITY ASSESSMENT

CHAPTER 8
Background and Methodology

CHAPTER 9
Water Sector – Vulnerability

CHAPTER 10
Biodiversity and Ecosystems Sector – Vulnerability

CHAPTER 11
Agriculture Sector – Vulnerability

CHAPTER 12
Infrastructure and Human Settlements Sector – Vulnerability

CHAPTER 13
People Sector – Vulnerability

CHAPTER 14
Integrated Vulnerability Assessment – Summary

CONCLUSION

Technical Annex

PART I. IMPACT ASSESSMENT

PART II. INTEGRATED VULNERABILITY ASSESSMENT
Main Findings and Conclusions

1. The temperature in the Arab region is increasing and is expected to continue to increase until the end of the century.

2. Precipitation trends are largely decreasing across the Arab region until the end of the century, though limited areas expected to exhibit an increase in the intensity and volume of precipitation.

3. Extreme climate indices and seasonal projections provide valuable insights into climate change impacts, particularly at smaller scales of analysis.

4. Analysis of climate change impacts on shared water resources can benefit from regional and basin-level assessments.

5. Sector case studies enhance understanding of climate change implications.

6. Predicted vulnerability is largely moderate to high and exhibits a generally increasing gradient from north to south across the Arab region.

7. Both components of potential impact are important to consider when conducting vulnerability assessments.

8. Of the three components of the VA, adaptive capacity is most likely to influence vulnerability, suggesting that the ability of mankind to influence the future is stronger than that of climate change and environmental stressors.

9. Areas with the highest vulnerability, which have been defined as hotspots, generally occur in the Horn of Africa, the Sahel and the south-western Arabian Peninsula, irrespective of sector, subsector or projected climate scenario.
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<thead>
<tr>
<th>Number</th>
<th>Main Findings and Conclusions</th>
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<tbody>
<tr>
<td>10</td>
<td>Despite declining precipitation, areas with the lowest vulnerability relative to the region include the western Mediterranean, coastal Maghreb, and the coastal Levant due to higher adaptive capacity in this area compared to other parts of the region.</td>
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<td>11</td>
<td>Even though the central Mediterranean coast and Green Mountains are subject to particularly strong warming, the area is indicative of moderate vulnerability due to relatively higher adaptive capacity, as compared to other parts of the region.</td>
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<td>12</td>
<td>Despite precarious environmental, economic and social conditions within the lower Nile River Basin, the area demonstrates projected moderate vulnerability due to high adaptive capacity relative to other parts of the region.</td>
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<td>13</td>
<td>Although the Euphrates and Tigris rivers face challenges due to demographic pressures, hydro-infrastructure developments and water quality degradation, socioeconomic vulnerability to climate change is found to be moderate relative to other parts of the region.</td>
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<td>14</td>
<td>Despite remaining among the hottest areas in the Arab region, and signalling increasing temperatures, the Arabian Gulf generally projects moderate vulnerability to climate change.</td>
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<td>Region-specific integrated vulnerability assessments can be drawn upon to inform regional cooperation, as well as basin level, country level and sector level analysis to advance understanding and collective action on climate change.</td>
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Thank You

www.unescwa.org/climate-change-water-resources-arab-region-riccar

www.riccar.org