



Climate Change Impacts and water Scarcity

“Overview and *Experiences*
from the Arab Region”

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The Arab Water Council

Regional Dialogue on the Climate Change and Migration Nexus in the Arab Region
24-25 October 2022

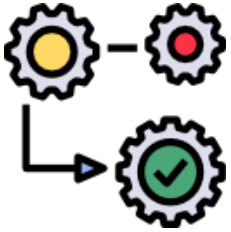


The Arab Water Council (Established 2004)

Objectives

- Shape a **strong Arab voice to face the regional challenges** and requirements for achieving water security and the Sustainable Development Goals (SDGs).
- Develop **regional strategies** and providing **policy directions**.
- Build **human and institutional capacities in water-** related issues.
- Initiate and strengthen **regional and international cooperation and partnerships** to tackle water-related challenges, for SDGs agenda 2030.
- Coordinate efforts to incorporate Integrated Water Resources Management, promote sustainable solutions for shared water resources, tackle climate change impacts on water resources and promote Water/Energy/ Food Nexus (WEF).
- Disseminate knowledge as well as enhance sharing of experiences and success stories.

Work Plan 2023-2025 Main Pillars



1. Implementing (IWRM) & Achieving Sustainable Development Goals (SDG's)



2. Promoting Cooperation & Sustainable Solutions for Shared Water Resources



3. Addressing Climate security and impacts of climate change on water resources, food security, social security and ecosystems



4. Promoting Water-Energy-Food Nexus (WEF)



5. Supporting the application of modern technology, innovative solutions & Capacity Development

AWC-Knowledge Sharing and Capacity Development Tools

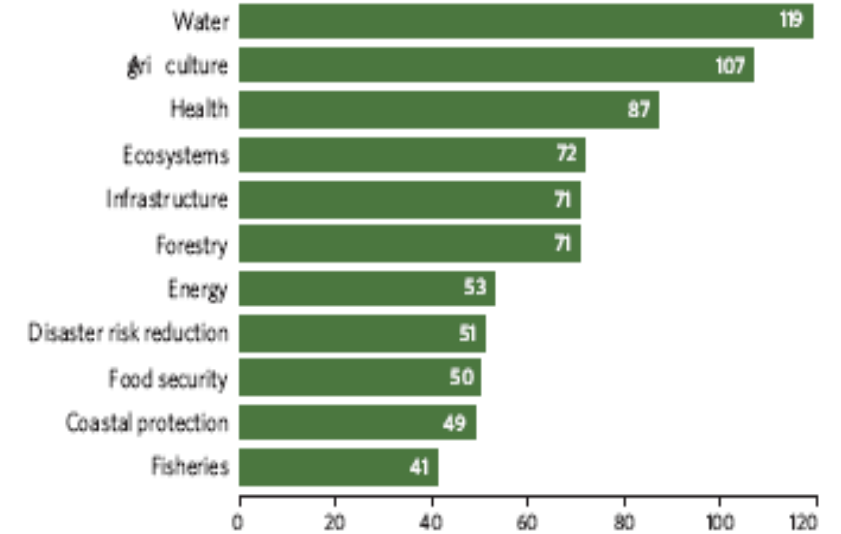


Pillar 3- Addressing Climate security and impacts of climate change on water resources, food security, social security and ecosystems.

Climate Change : A threat to Development!!

Climate change presents a major threat to development, and its widespread, unprecedented effects disproportionately burden the poorest and the most vulnerable.

Number of parties that referred to an area or sector as a priority, as communicated in the adaptation component of the INDCs



Extreme Weather Events in the Arab Countries

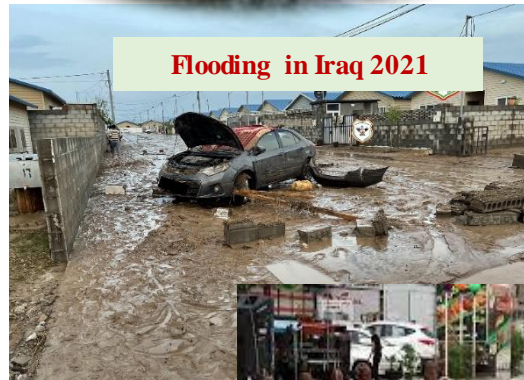


Flooding in Amman, Jordan on 2011



Flooding in /Saudi Arabia, 2021

Flooding in Morocco on 2014



Flooding in Iraq 2021



Flooding in Egypt 2020



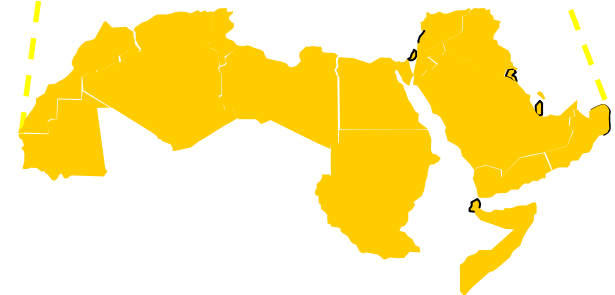
Flooding in Sudan 2021



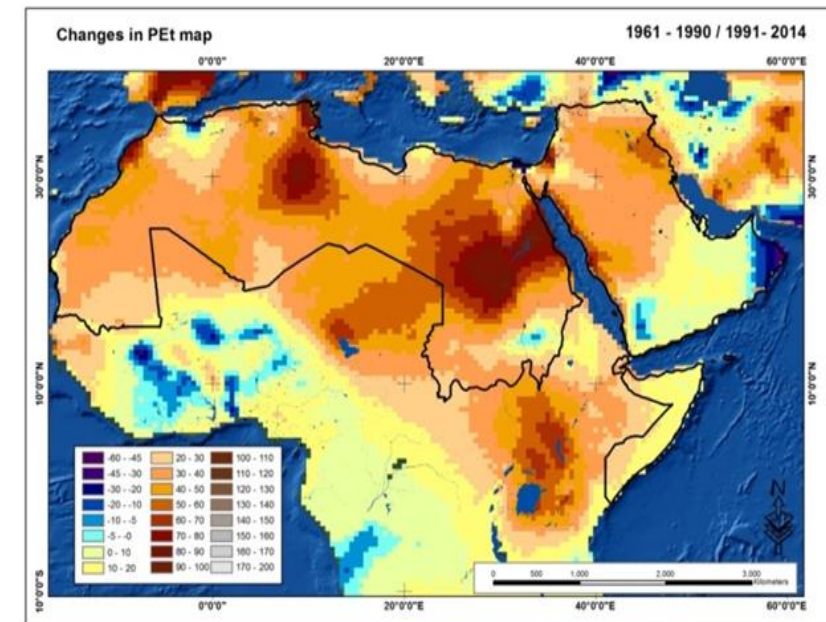
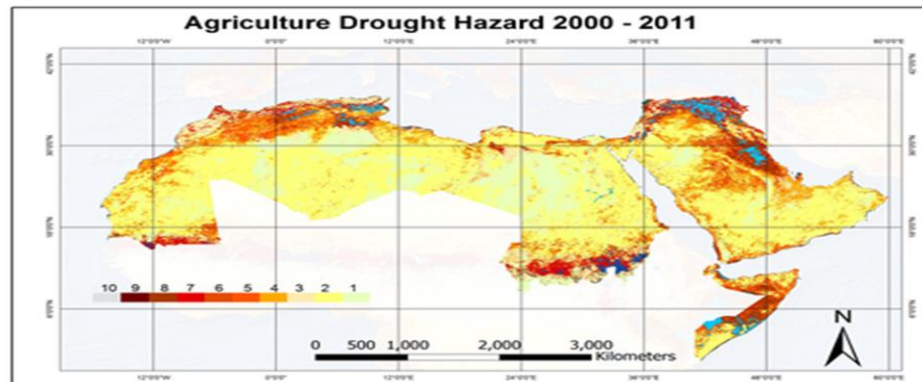
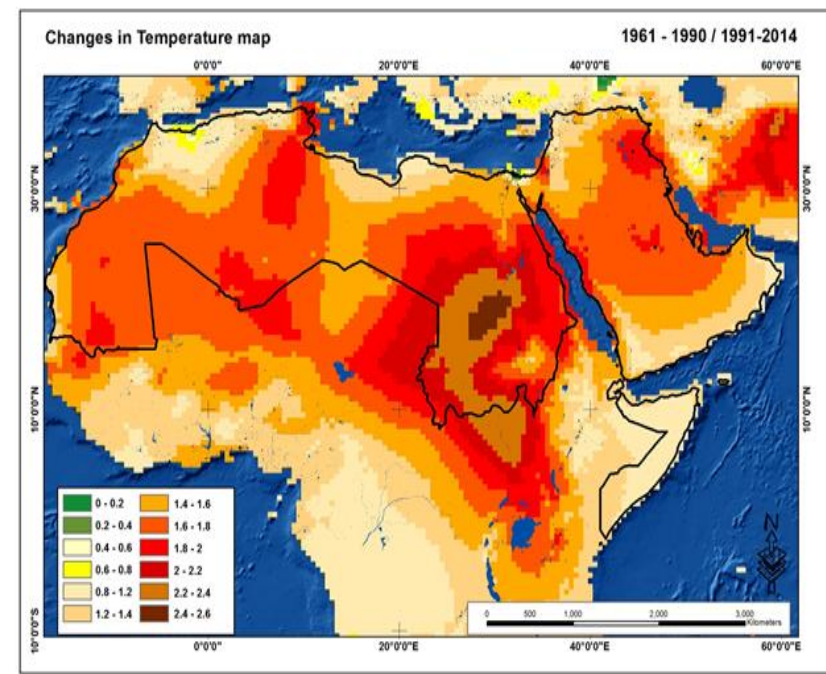
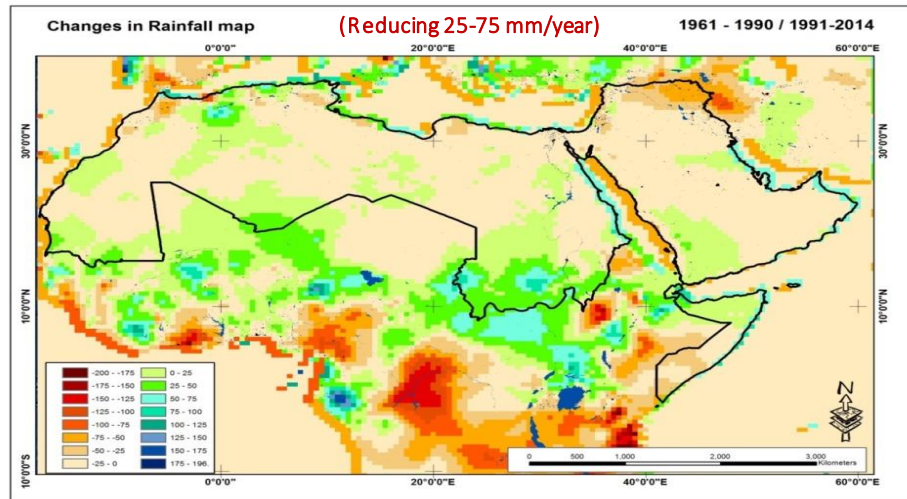
The death toll from natural disasters doubled in the Arab region by 275% in the period (2006-2015) compared to the period (1995-1999), showing that floods are the most frequent disasters and that drought led to an increase in the number of individuals affected by disasters. ((First Arab Sustainable Development Report 2012).

Persisting Climate Challenges in the Arab Region

- **Extreme aridity,**
- **High vulnerability to drought,**
- **Extreme events of Floods**
- **Desertification,**
- **Water scarcity**
- **Social Vulnerability**
- **Induced climate migration**
- **The increasing food gap**



LAS/AWC – Arab Geographical Information Room (AGIR)



Productivity Loss 2002-2012	Area (million ha)	total Area (%)
Drought	55	12-15
Land Degradation	14	62
Combined	6	27

- 2.5 million people lost jobs
- 1.1 billion \$ loss in crops productivity
- 52 billion \$ total losses

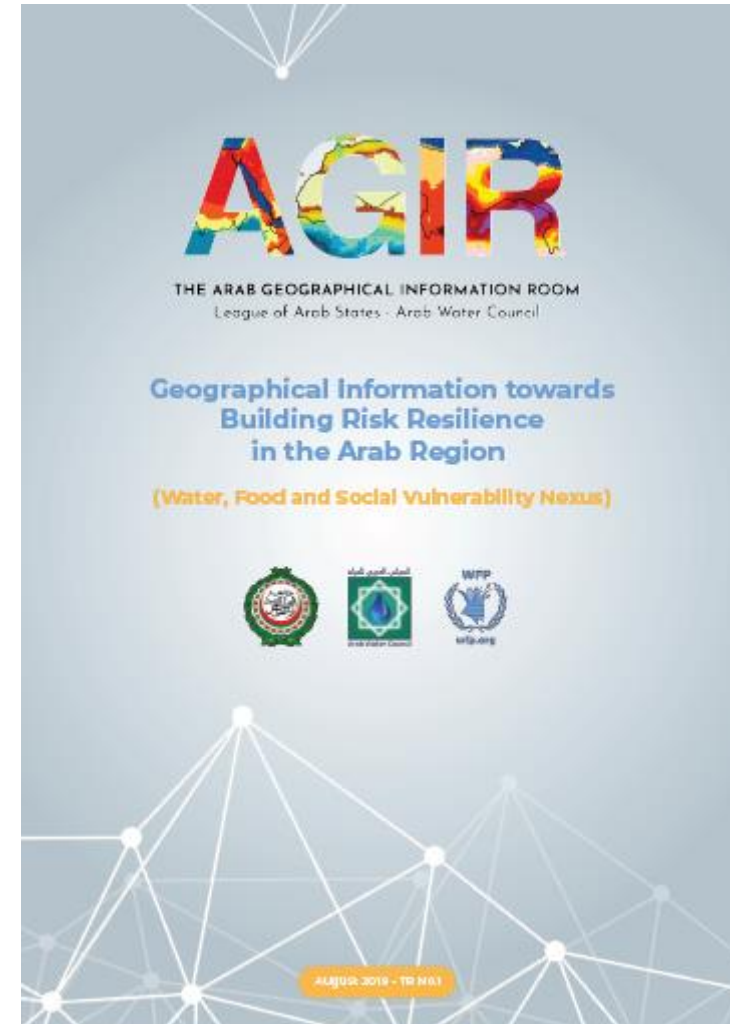
Climate Change Patterns & Hydro-Metrological Risks in the Arab Region (1961-2015)

- AGIR results provide evidence of significant changes in the occurrence of climate extremes during the past five decades. There are consistent warming trends across the region. Significant warming trends are also found in the absolute temperature values.
- This large increase in the heat-waves combined with warmer average temperatures will put intense pressure on already scarce water resources with ***major consequences on regional water and food security.***
- This large increase in the heat-waves combined with warmer average temperatures will put intense pressure on already scarce water resources with major consequences on regional water and food security.
- Crop yields could decrease by up to 30% at 1.5–2°C and by almost 60% at 3–4°C. At the same time, migration and climate-related pressure on resources might increase the risk of conflict, putting food, water and energy security at risk.

AGIR Analysis & Mapping Results (1961-2015)

- Rainfall
- Potential Evapotranspiration
- Aridity Index
- Land cover /Land use
- Drought
- Land degradation
- Vegetation losses

Part II of the report focusing on social vulnerability mapping based on floods and droughts hazards will be published 2023.



“Some Facts from the Region”

- Climate change is acting as a risk multiplier to social instability, fragility and conflict in many parts of the region.
- Both growing risks to food security in the natural sphere (i.e. drought, ground water scarcity, crop disease) and the social sphere (i.e. social instability, inflation, food price spikes) are being exacerbated by rising temperatures, increased climate variability and extreme events.
- Moreover, model results used in IPCC’s Assessment Report 5 indicate that food production may decline by up to 20% as the signal from climate change amplifies by 2050 and beyond.
- For the Arab Region, projections suggest that the rate of increase in agricultural production will slow over the next few decades, and it may start to decline after 2050 (Verner, Dorte, ed. 2012).

Climate Change & Climate Security?

*“Climate security is a new concept used to describe and understand the **combined impacts of climate-related change on natural resources, ecosystems, socio-economic development, and political stability of a country and, therefore, of a region.** It aims to emphasize the catalytic effect of climate-related change as a **risk multiplier that can lead to multiple threats on human welfare, economic resilience and national security** that most immediately affect vulnerable groups, and that necessitate integrated, cross sectoral mitigation and adaptation efforts”. (AWC, 2020)*

- Climate-related disasters are increasing in frequency and intensity and, negatively affect development pathways.
- Climate change as a complex hazard threatens livelihoods, resources and human security.
- Climate change aggravates the multiple and intense threats already facing the Arab region, including:
 - **increased population growth,**
 - **decrease in food security,**
 - **water scarcity and stress,**
 - **forced migration,**
 - **economic loss, war and conflicts,**
 - **social vulnerability**
 - **gender inequality threats.**

The Role of Research and Technology

To Face Climate Change and Water Scarcity



“Acceleration of Aquifer Storage and Recovery (ASR) in MENA Region Using RS and Geospatial Hydrologic Analysis”

This project is funded by the USAID in partnership with the USGS in collaboration with the AWC and multiple universities and research centers in **Jordan, and Lebanon.**

It aims at improving water security in the Middle East and North Africa (MENA) by accelerating the practice of aquifer storage and recovery (ASR). Through this joint work, new methods for **identifying high potential ASR sites**, based on **remote sensing and geospatial hydrologic analysis**, are applied and demonstrated across beneficiary countries of **Jordan, and Lebanon.**



Case Study Areas in Jordan and Lebanon

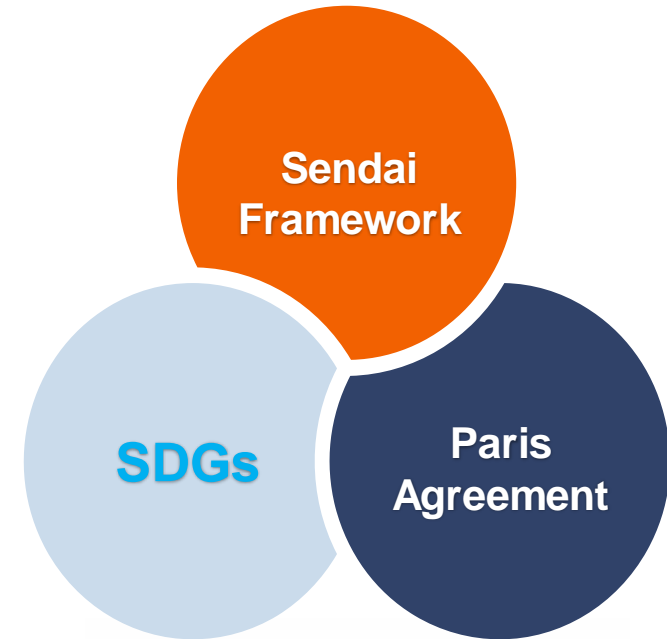
- Regional analysis methods for water availability and MAR suitability were developed using publicly available geospatial datasets and limited site-specific monitoring data and evaluations.
- Application of the methods was demonstrated by the development of regional water availability and suitability datasets, as an illustrative screening method, and by evaluation of water availability and MAR suitability in parts of Jordan and Lebanon



The SDG-Climate Facility Project: Climate Action for Human Security

The objective is to create and enhance national and regional institutions across the Region to address climate change to serve numerous development and humanitarian concerns.

The project involves **establishing an SDG-Climate Facility** for the Arab region to scale up innovative finance and partnerships **to support Agenda 2030 and its goals and targets and implement the Paris Agreement and the Sendai Framework**, which ensure coherence and integration applicable to those agreements



The **SDG-CF** project is a partnership between:



Supported and funded by



Project Duration: 2019-2023

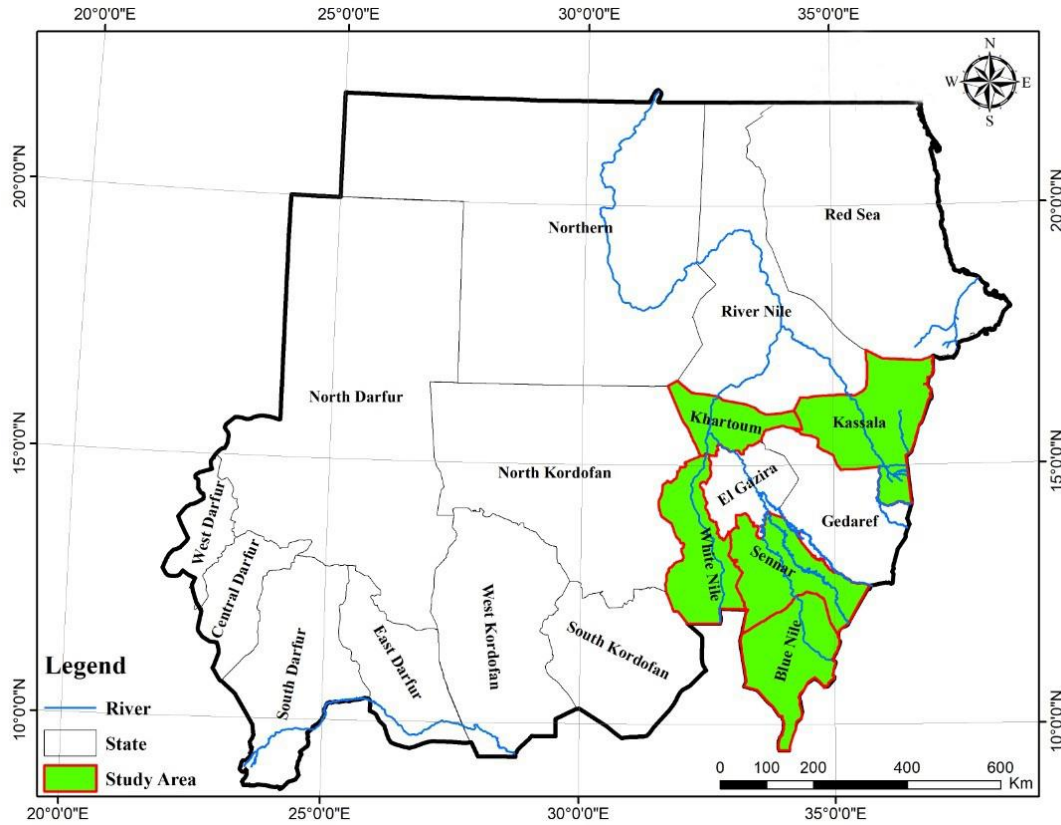
SDG-CF Project Outcomes

- **Outcome 1:** *Enhanced knowledge and coordination* on climate-security among key stakeholders at the regional level to achieve climate action with co-benefits across the SDGs, and crisis prevention/recovery goals.
- **Outcome 2:** *Enhanced access to analysis, tools and strategies* at the regional level to support a climate nexus approach to achieving SDGs and prevention/recovery
- **Outcome 3:** *Strengthened national and local capacities* to effectively integrate climate change considerations into development and crisis prevention/recovery policies and to scale-up climate finance for local innovative solutions with co-benefits across the SDGs

Study on: “Climate Change Disasters, Flood Impacts and Risk Management in the MENA Region: The Case of Sudan and its Implications for Regional Flood Responses”

Study Key objectives

1. A comprehensive overview of the nature and effects of floods in Sudan
2. Determine impact of climate change on the fluctuations with the increasing rates of floods in Sudan
3. The relationship between floods and the evolution of land cover and land use in Sudan
4. *Assessment of population vulnerability and human mobility to climate change, in relationship to floods*
5. Documentation of *best practices available appropriate for Sudan conditions to manage floods risk*
6. Development of a *strategy or guidelines for building resilience and manage flood risks* ensuring the stability of rural, pastoral and urban communities



The Final Report will include five volumes:

Volume I: Executive Summary

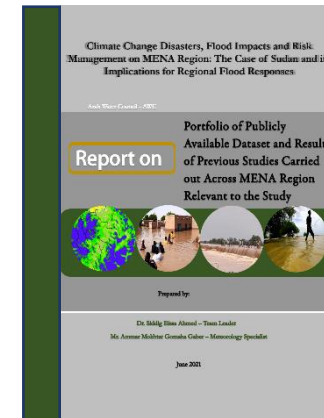
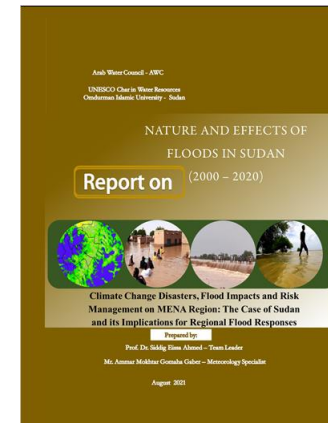
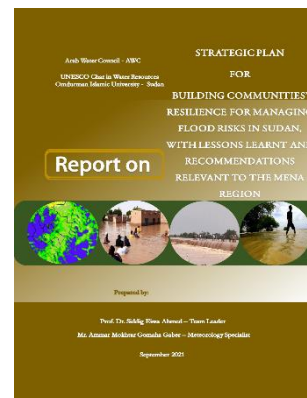
Volume II: Portfolio of Publicly Available Datasets and Results of Previous Studies Related to This Study

Volume III: Nature, Causes, and Effects of Floods in Sudan

Volume IV: Assessments of Flood Risks and Flood Management in Sudan

Volume V: Strategy/Guidelines for Building Communities' Resilience for Managing Flood Risks in Sudan

“Final reports will be published on-line in December 2022”



Study on: Climate Change Impact on Social Vulnerability

Using Compound Indicators to Assess Drought Impact on Social Vulnerability in The Agricultural And Agro-pastoral Sectors In Jordan

The study is focusing on social vulnerability through generating composite indicator indexes for climate security assessment and by researching local case studies of climate change impact on the ground, including climate change experiences and responses of vulnerable groups.

المجلس العربي للمياه



Arab Water Council



Objectives

- Developing and testing an integrated, multi-disciplinary methodology to assess climate change risk
- Integrating social vulnerability and more complex social indicators in climate risk assessments
- Mapping climate risks based on multi-sectoral indicators
- Exploring the impact of climate change on local communities on the ground
- Emphasizing the value of local evidence and community experiences of climate change impacts in developing adaptation strategies

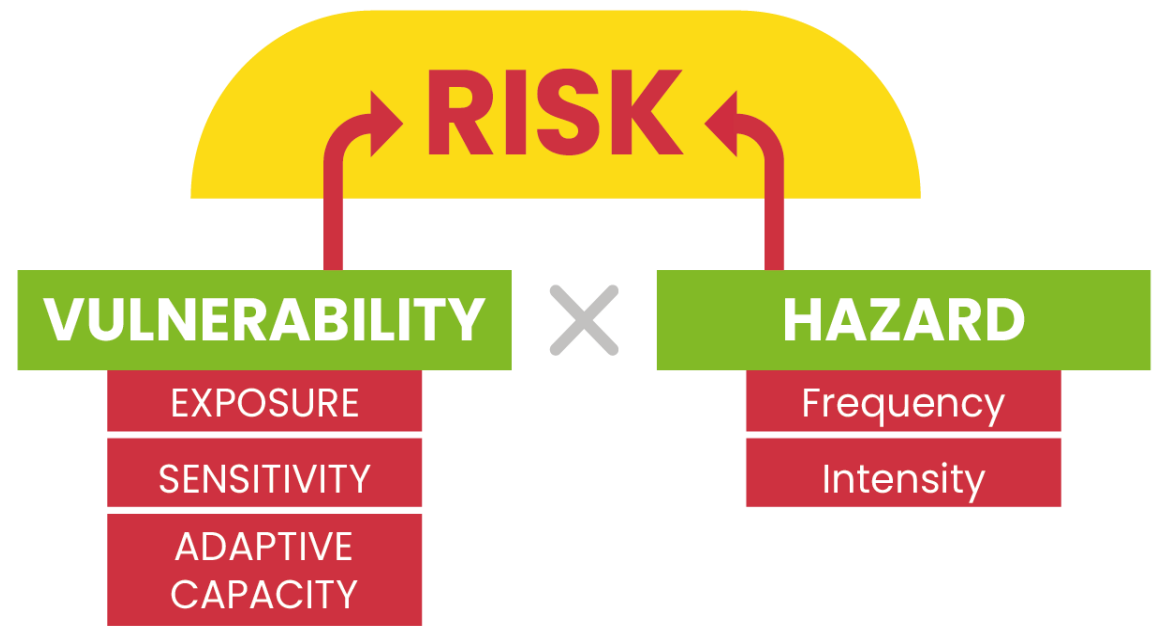
Conceptual Approach

- Climate risk assessment with focus on **social vulnerability**
- Expansion of social indicators: more complex indicators used

Exposure and Sensitivity contribute to the increase of Vulnerability, while Adaptive Capacity contributes to diminish the overall Vulnerability score.

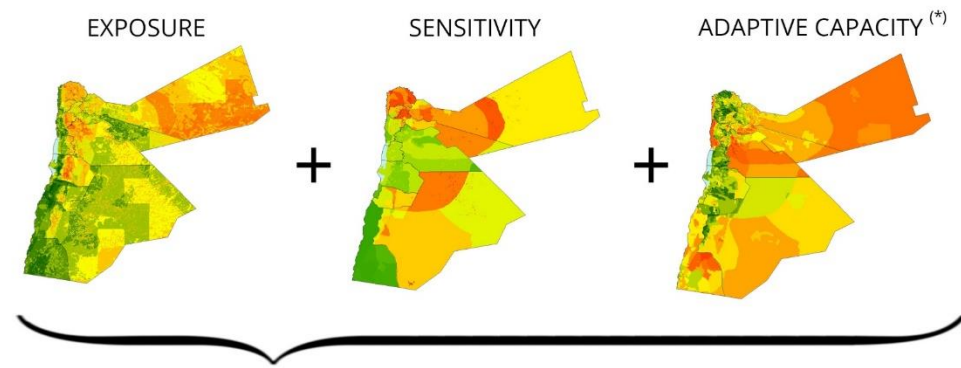
Hazard is a multiplier for Vulnerability, and it is used to calculate the final Risk.

For this study, Drought analysis has been used for the Hazard component.



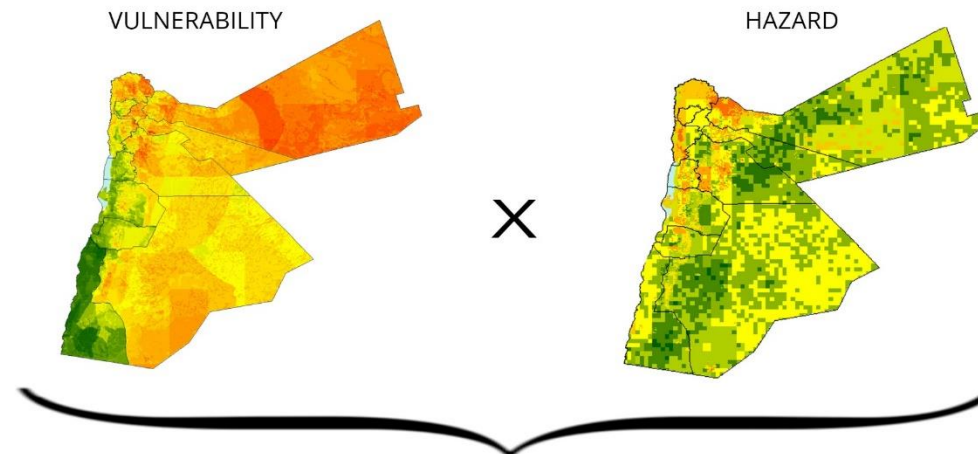
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Exposure, Sensitivity and Adaptive Capacity



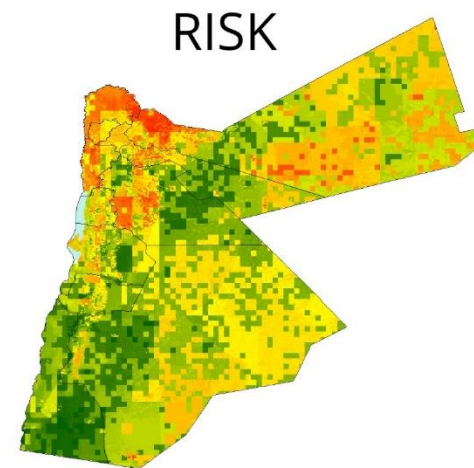
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Vulnerability and Hazard



3

Risk



Low to High Risk Score

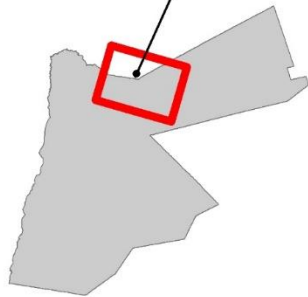


*Final Study report will be launched December 2022,
summary report is available on-line:
www.arabwatercouncil.org*

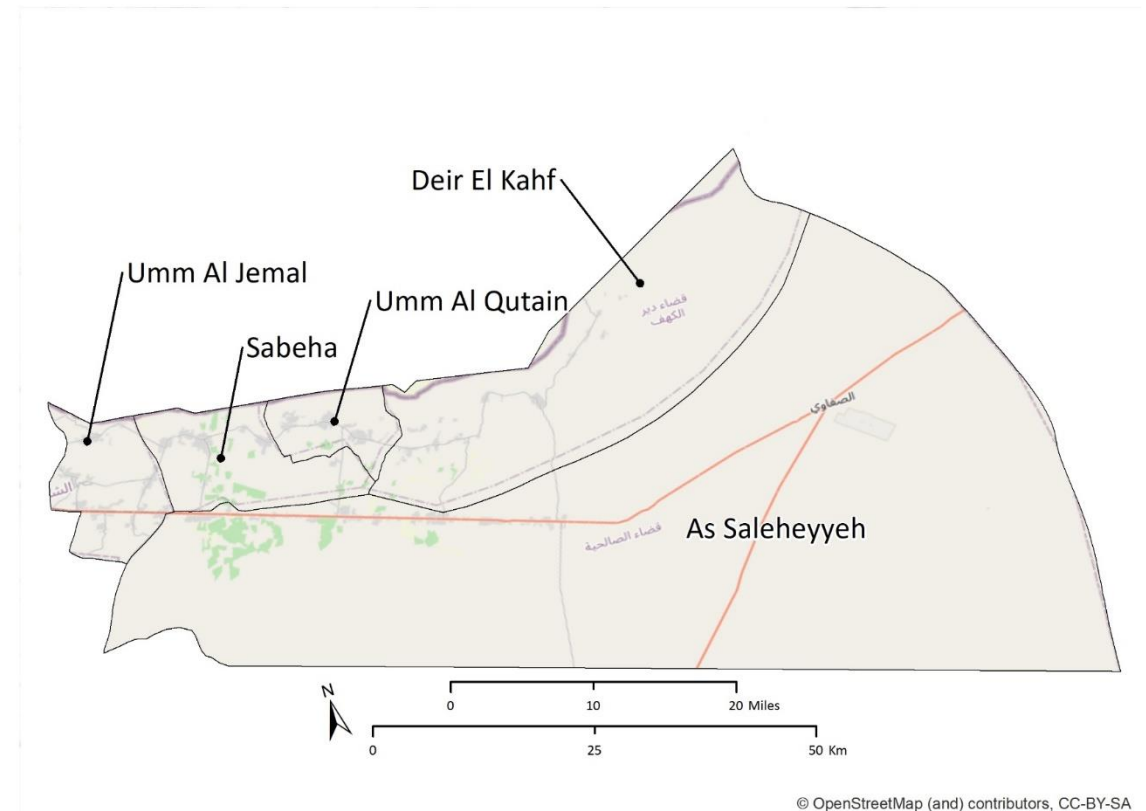
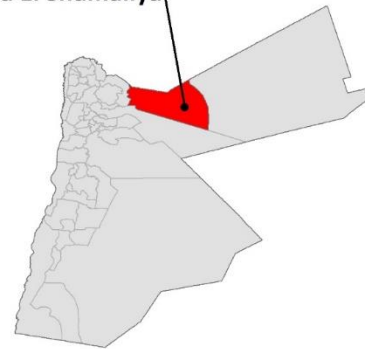
Case Study: Deir El Kahf, Mafraq

First field case study has been conducted in Deir El Kahf, located in Badia Al Shamaleya District, Mafraq Governorate.

Area Enlarged in the Map



Badia El Shamaliya



Case Study Key Findings

- The **integrated, multi-disciplinary approach** helps address the complexity of social vulnerability to climate change
- **Expanding the list of social indicators** helped include multiple dimensions of social vulnerability, e.g. pre-existing structural inequality
- Mapping results at national level confirm results of other drought studies, but add **more general complexity and focus on social vulnerability**
- Social research and **case studies on the ground** are important to build evidence:

Even though Deir El Kahf is not a red drought risk hotspot on the map, people are already losing their livelihoods and struggle to adapt

Local stories of vulnerability, adaptation and resilience should inform policies

Study on:
Climate-Induced
Migration: A Gender
Equality and Women's
Empowerment
Perspective from Jordan
and Sudan

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Objective:

Assessing the risks of climate change in generating long-term resource scarcity in crisis areas, exacerbating conflict and displacement situations in the region, with a particular focus on the risks to women.

The study seeks to *explore the relationship between climate change, migration and gender and the interaction between them, especially in the Arab region*, where such data is scarce. In addition to exploring these trends, drivers, impacts, good practices and actionable recommendations related to climate change and migration through a gender perspective.

Study General Conclusions

Climate Change *and* Migration **are Gendered**

Men and women are differently impacted by climate change

Migration types are gendered (rural-urban, international, planned, displacement)

Who decides?
Decision-making over migration is gendered

Who migrates?
Gendered patterns of who migrates and who stays behind

Men and women have different experiences and vulnerabilities at various stages of migration processes

Men and women play different roles in migration processes and have different capacities

Who moves and who stays has gendered impact on social and economic processes

Political support for leavers or stayers is gendered

The Full Study Publication will be launched during COP27 which will be held in November 2022 in Sharm El Sheikh, Egypt

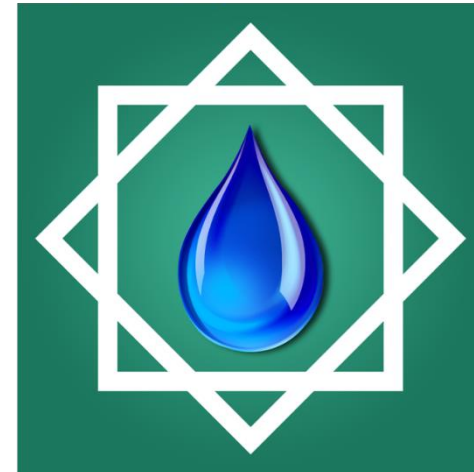
Key Messages

- Main Streaming the **Climate Security Approach** and Strengthening regional cooperation for climate and human security, by promoting regional research programmes to support development of regional strategies.
- Introducing and funding **new climate research modalities** that take into consideration the interlinkages between technical, institutional, social, economic, and political aspects.
- Enhancing and promoting the use of **non-conventional water resources** and renewable Energy to overcome the risks of climate change, floods and droughts.
- Undertake and fund research and gender sensitive data collection on localized nuances of climate, migration, and gender nexus to inform targeted policies that address the distinct priorities of men and women.
- Sharing of knowledge on previous experiences and success stories on the national, regional and international scales.

Thanks For Your Attention



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