

Economic and Social Commission for Western Asia

Climate and Environmental Challenges in the MENA Region

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Director, Arab Centre for Climate Change Policies
Cluster Leader, Climate Change and Natural Resource Sustainability Cluster
United Nations Economic and Social Commission for Western Asia



Shared Prosperity **Dignified Life**

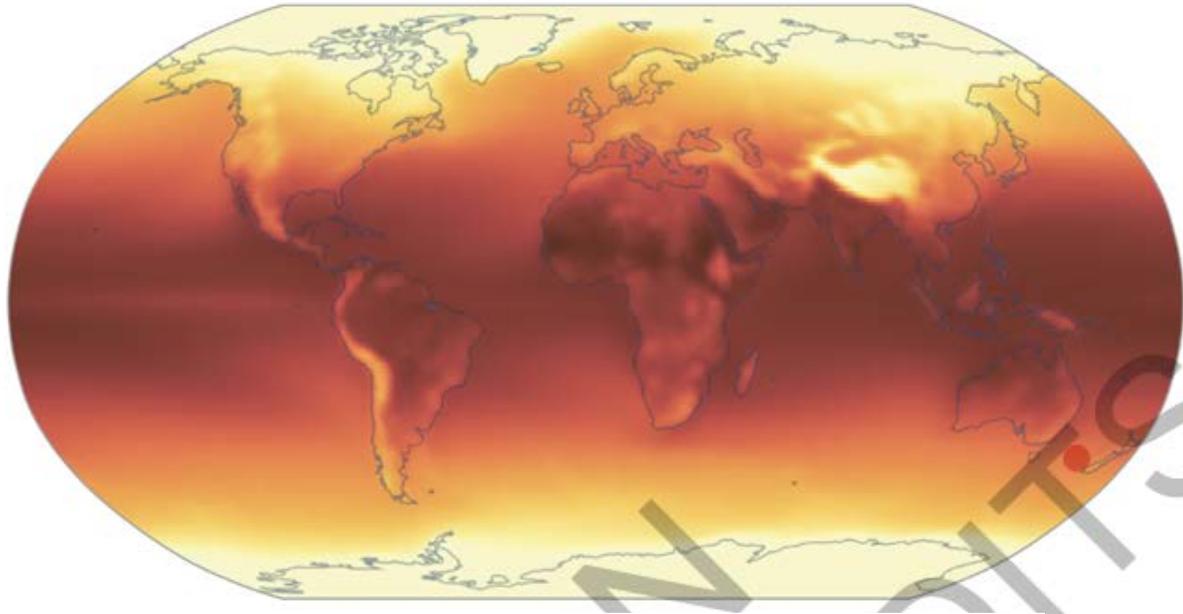


Euro-Mediterranean Guarantee Network
Spring Academy 2022
Greening CGIs in the MENA Region
21 March 2022

IPCC WGII Sixth Assessment Report: Climate Change 2022

Part II on Impacts, Adaptation and Vulnerability approved 27 February 2022

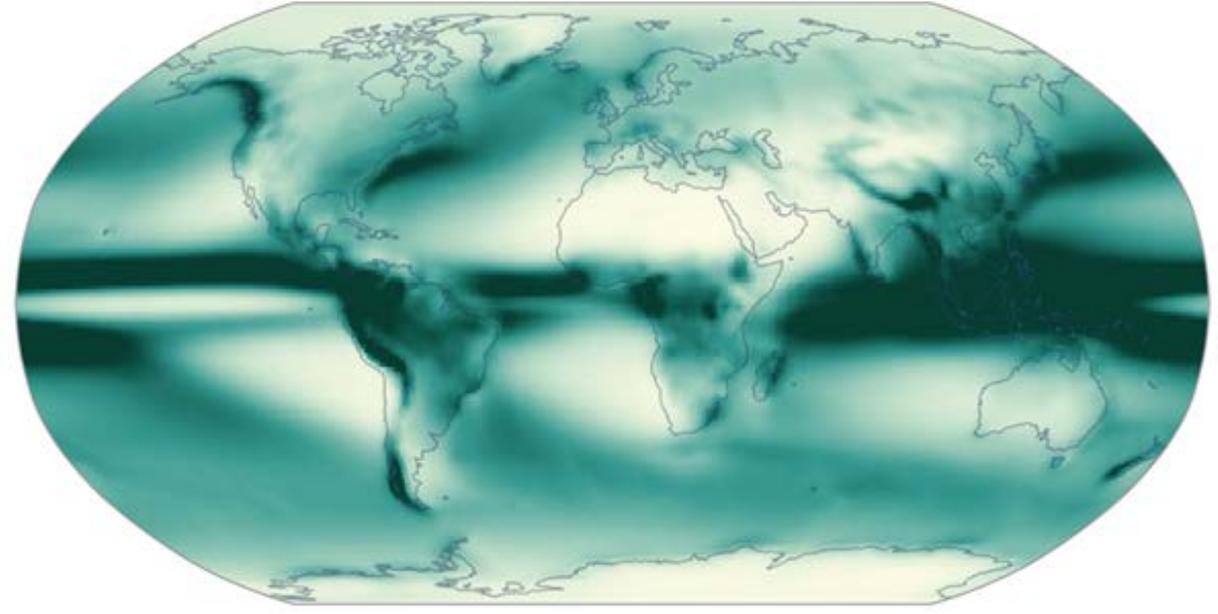
Observed Temperature Change



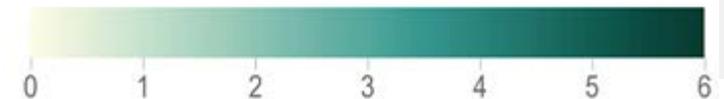
Mean temperature (°C)
Period 1995–2014



Observed Precipitation Change



Total Precipitation (mm/day)
Period 1995–2014
CMIP6 - Annual (34 models)



Intergovernmental Panel on Climate Change (IPCC)

SELECT VISUALIZATION



MAP



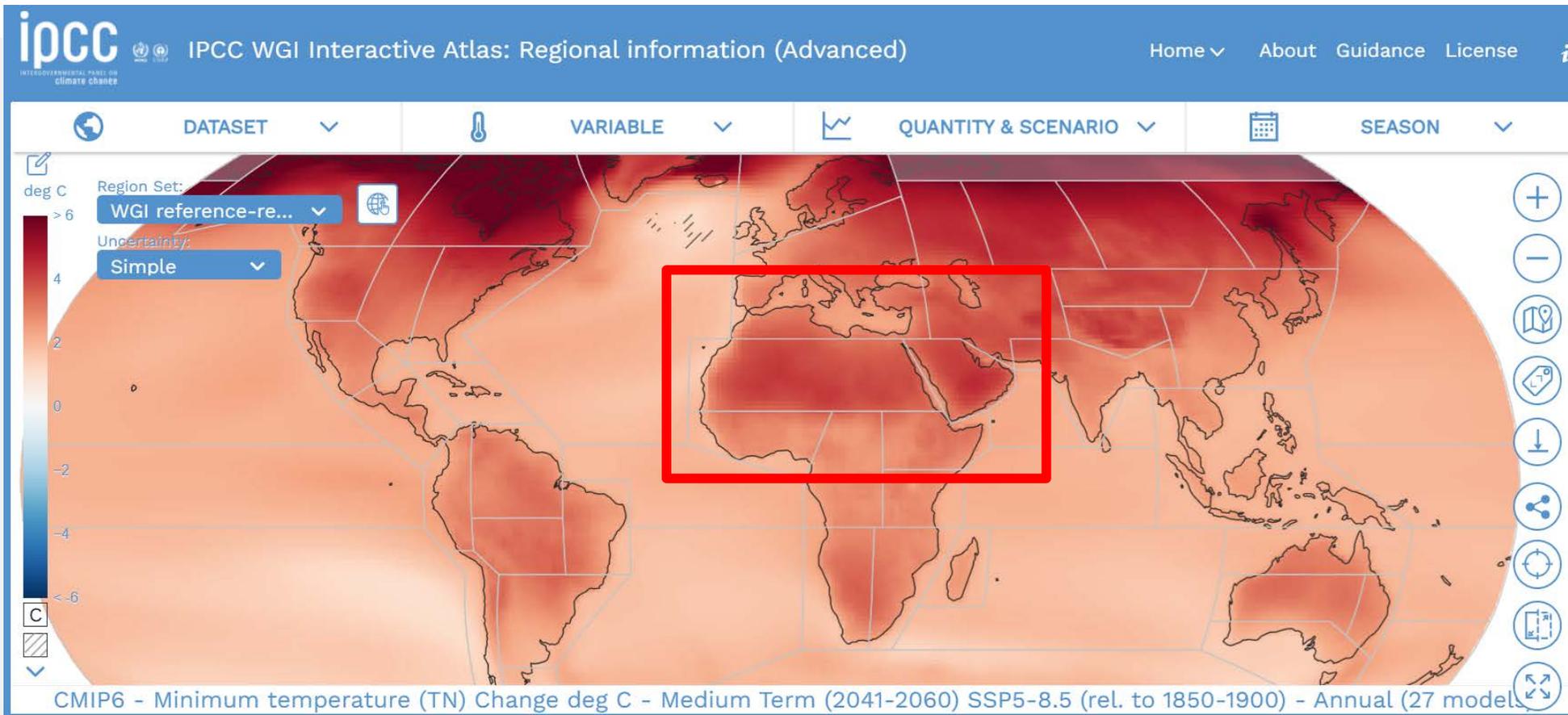
REGIONS

AFRICA

- North Africa
- Sahara (SAH)
- Western Africa (WAF)
- Central Africa (CAF)
- North Eastern Africa (NEAF)
- South Eastern Africa (SEAF)
- West Southern Africa (WSAF)
- East Southern Africa (ESAF)
- Madagascar (MDG)

ASIA

- Arabian Peninsula (ARP)
- West Central Asia (WCA)
- West Siberia (WSB)
- East Siberia (ESB)
- Russian Far East (RFE)
- East Asia (EAS)
- East Central Asia (ECA)
- Tibetan Plateau (TIB)
- South Asia (SAS)
- South East Asia (SEA)



<https://interactive-atlas.ipcc.ch/regional-information>

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.

Since 2010, RICCAR has provided 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

Regional Initiative for the Assessment of Climate Change Impacts on Water Resources & Socio-Economic Vulnerability in the Arab Region

Assessment

Adaptation
& Disaster
Risks

Mitigation

Negotiations

Finance



RICCAR Founding Partners

RICCAR implemented under Arab Centre for Climate Change Policies



Shared Prosperity Dignified Life



United Nations Educational, Scientific and Cultural Organization

Cairo Office



UNITED NATIONS UNIVERSITY
UNU-INWEH



SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY



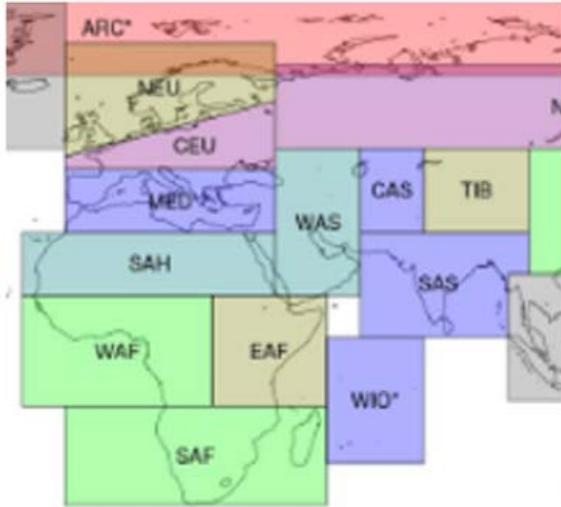
Implemented by



ACCWaM

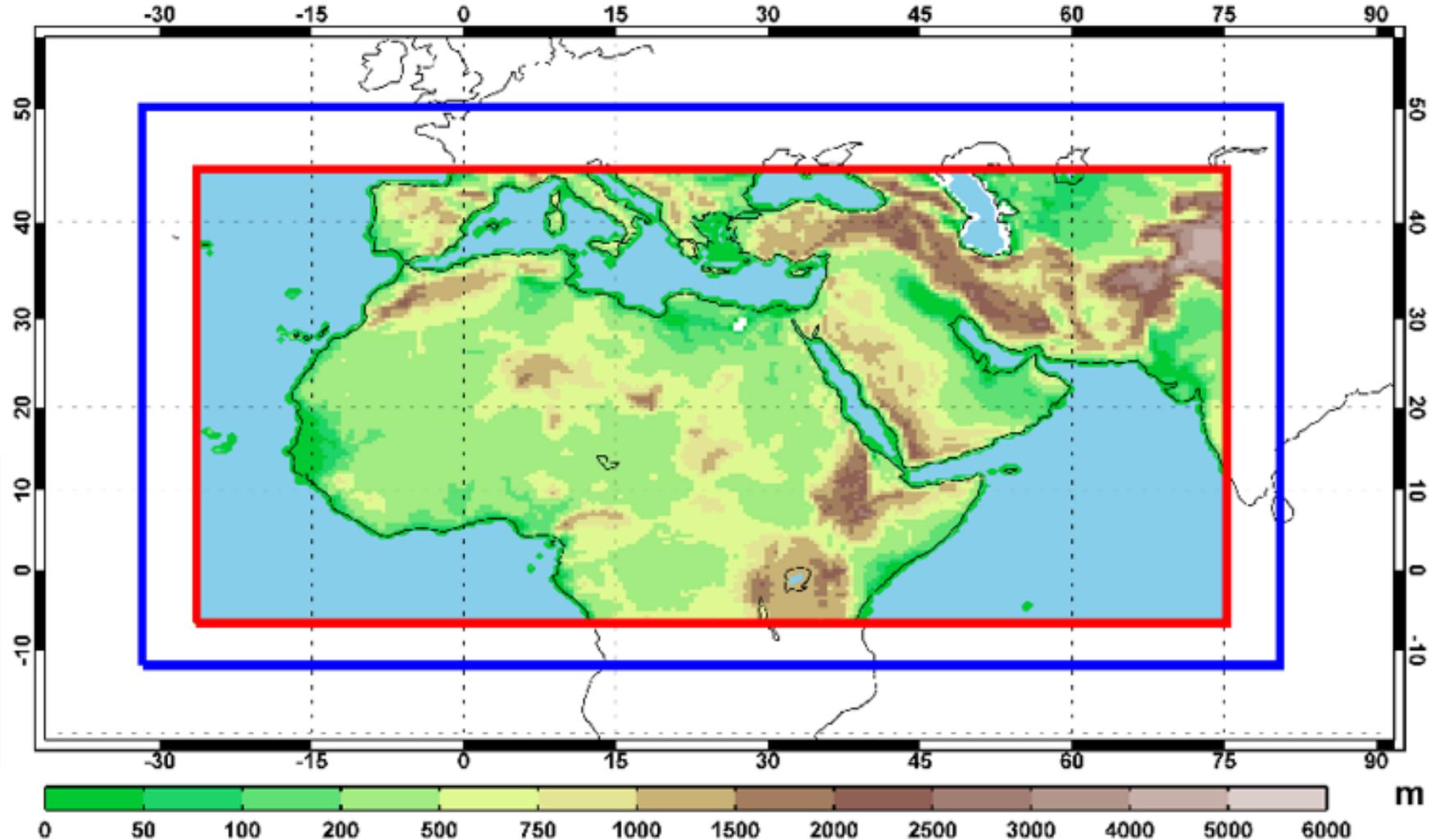
MENA/Arab Domain & RICCAR Regional Knowledge Hub

IPCC Spatial Boundaries



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

— Active Domain — Full Domain (SMHI-RCA4)




RICCAR About RICCAR Knowledge Resources Meetings & Events Knowledge Nodes Partners Contact Us

KNOWLEDGE RESOURCES
The central aim of this Regional Knowledge Hub is to provide access to information that can facilitate cooperation, coordination, dialogue and exchange among Arab States, organizations

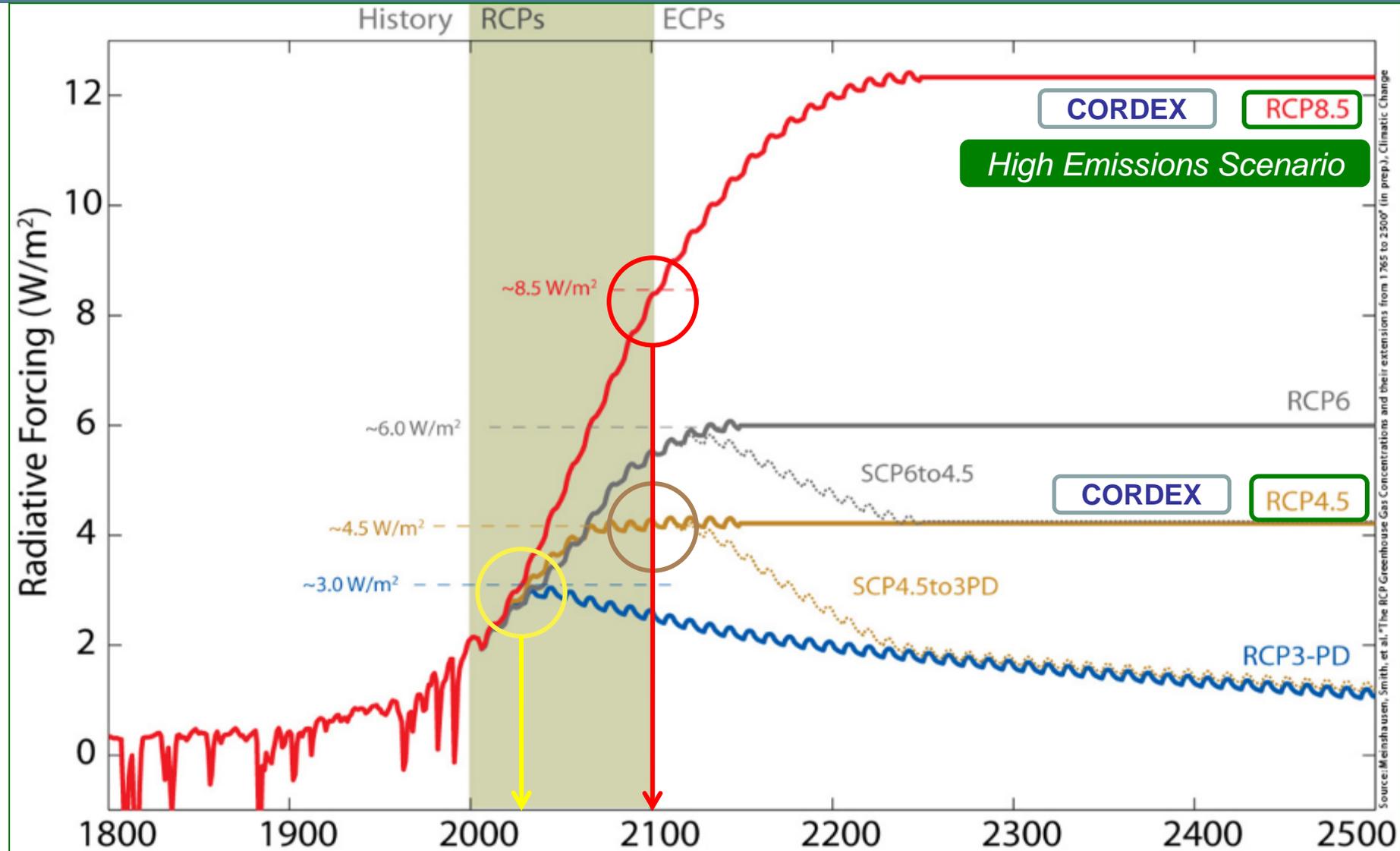
KNOWLEDGE NODES
Innovation of National, Regional and International Nodes for the Transfer and Sharing of Knowledge

PARTNERSHIPS
Strategic partnerships for supporting strategic objectives to implement climate change adaptation and mitigation programs at the national and regional levels

DATA PORTAL
The data portal allows interactive visualization of RICCAR maps and provides access to RICCAR data repository.

Representative Concentration Pathways (RCPs)

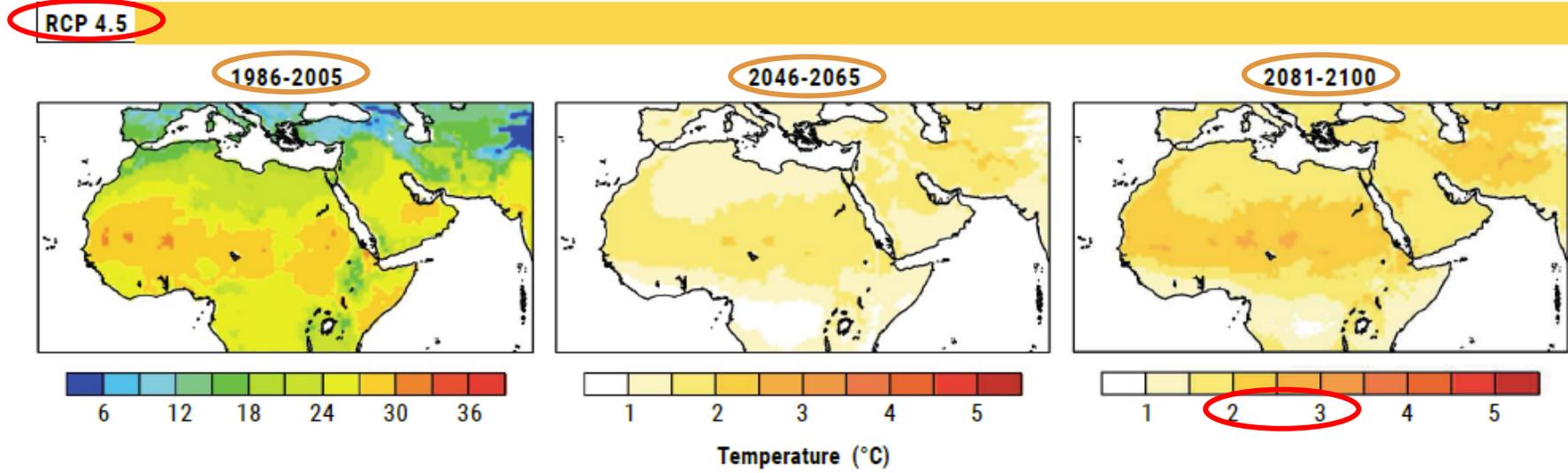
Scenarios used in IPCC AR5



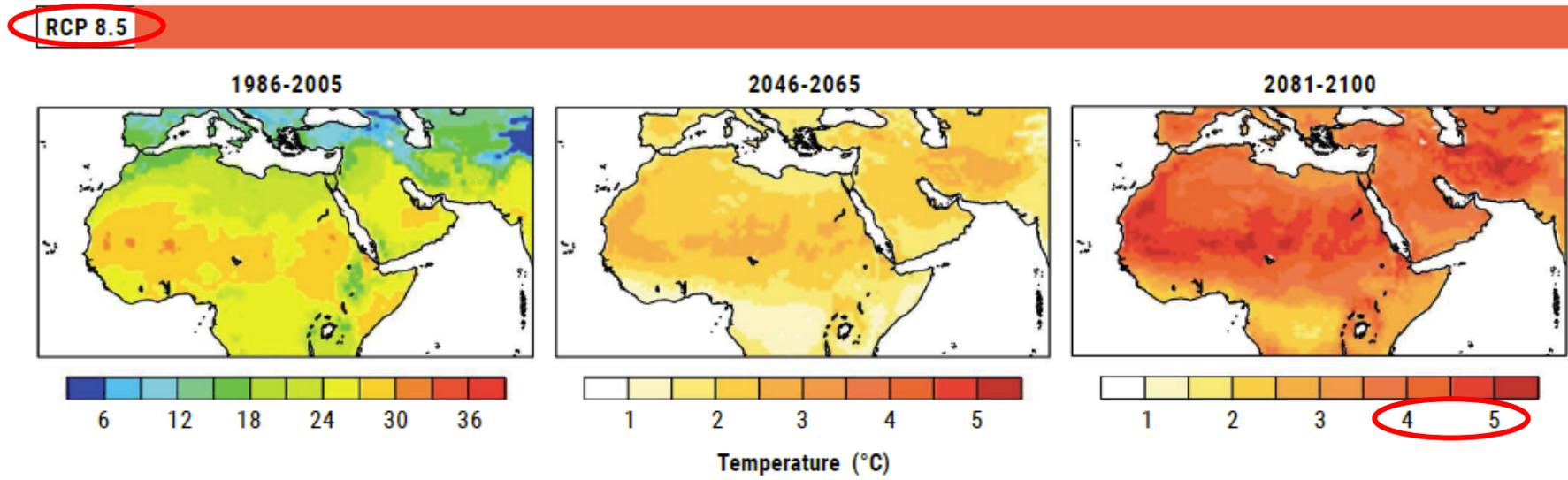
Graph adapted from: Meinshausen et al., 2010

Projected Temperature Increase in Arab Region of up to 5°C by End-Century

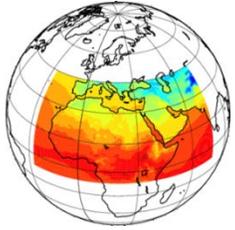
Moderate Emissions Scenario



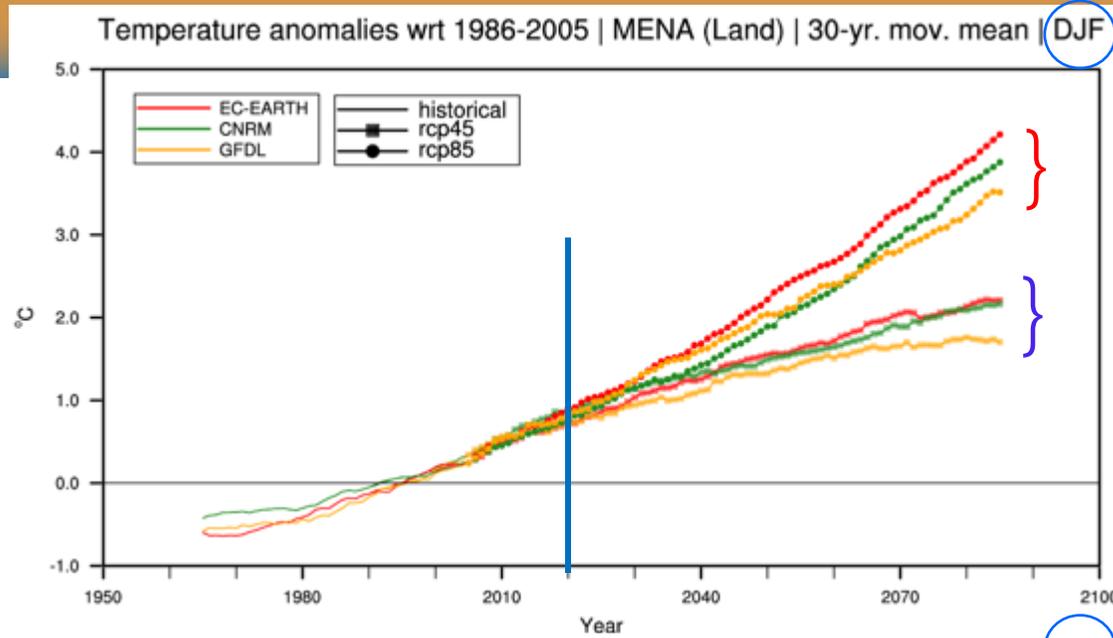
Business-as-Usual Emissions Scenario



Temperature Ensembles through a Seasonal Lens



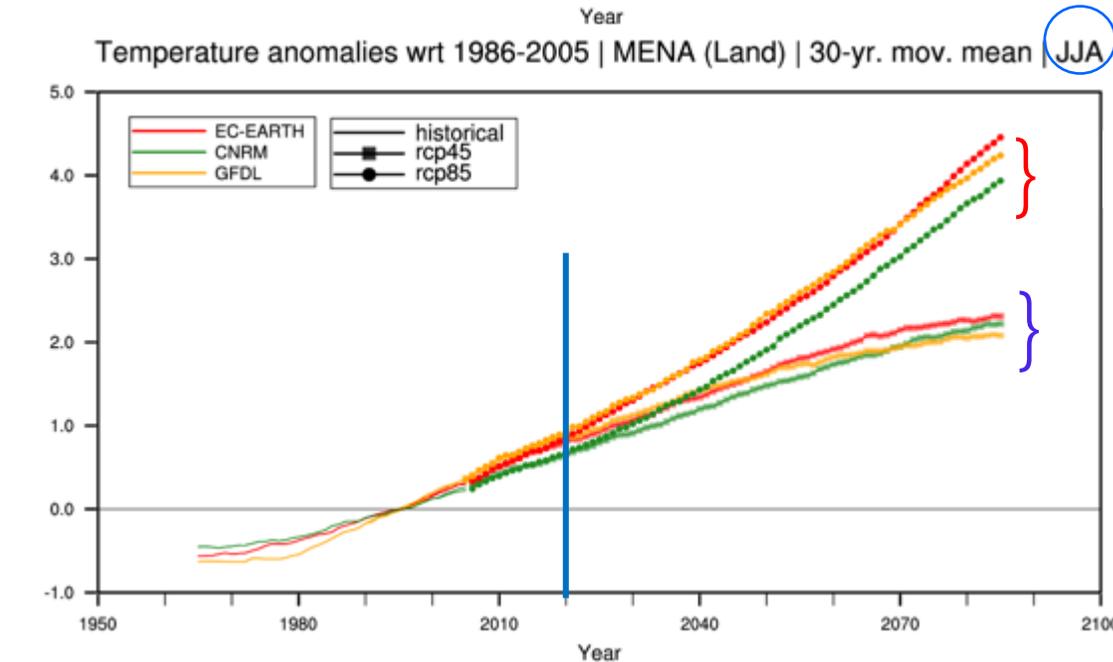
temperature



Winter

RCP 8.5 Ensemble

RCP 4.5 Ensemble



Summer

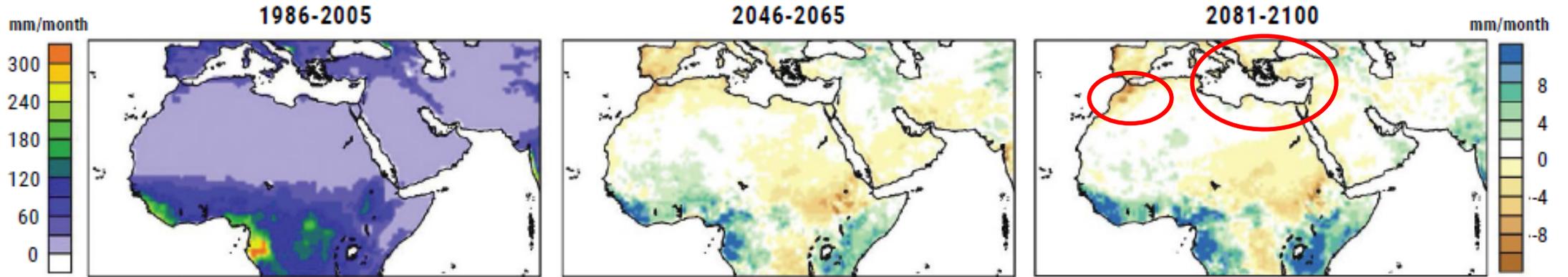
RCP 8.5 Ensemble

RCP 4.5 Ensemble

Projection depends on which future (which climate scenario) one plans against, and which time period of interest

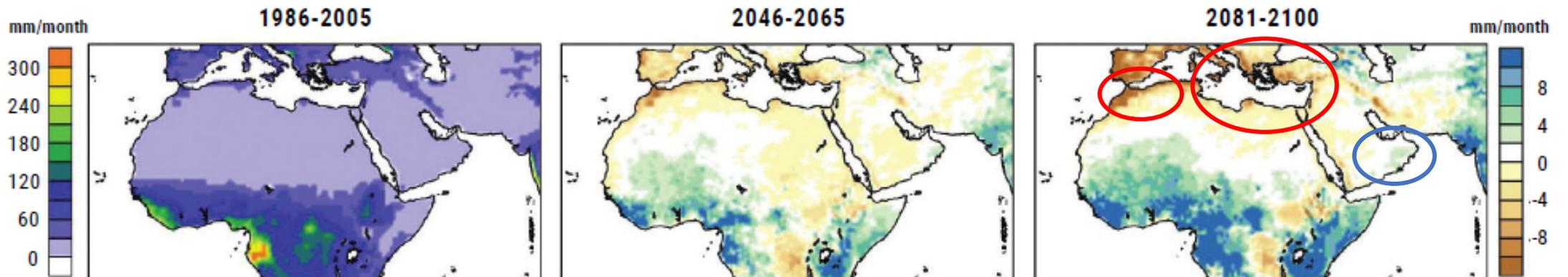
Precipitation trends are largely decreasing across the region until the end of the century, though limited areas expected to exhibit an increase in the intensity & volume of precipitation.

RCP 4.5



Moderate Emissions Scenario

RCP 8.5

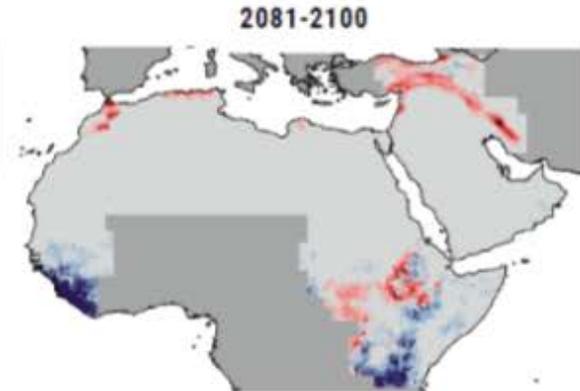
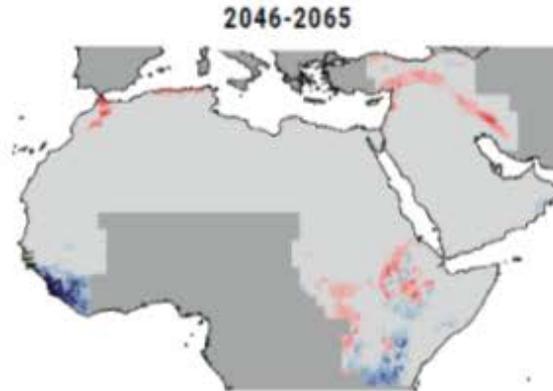
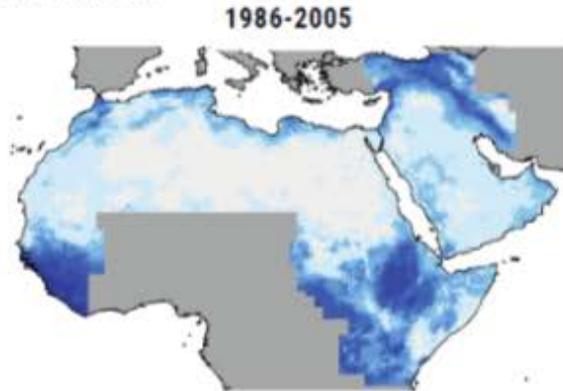


Business-as-Usual Emissions Scenario

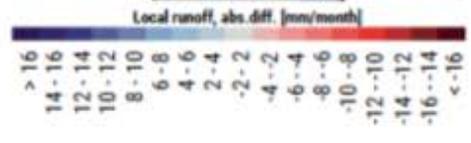
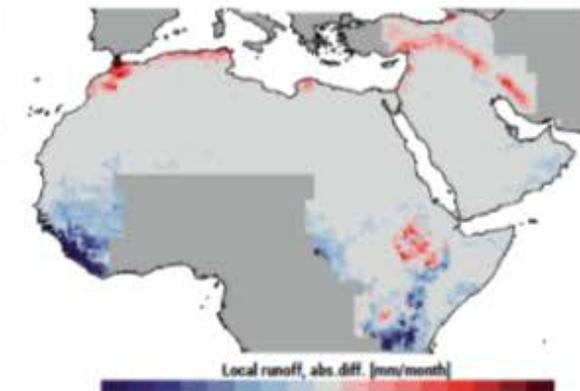
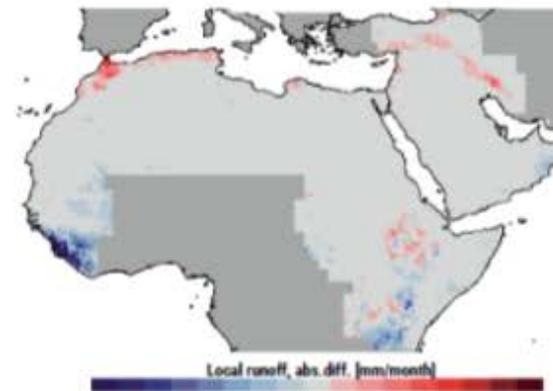
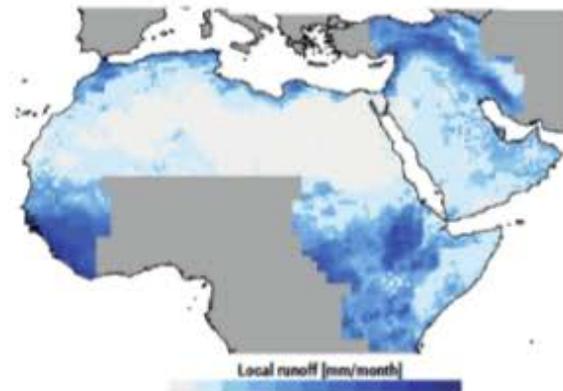
Arab Region is no stranger to Water Scarcity, but Mean Change in Annual Runoff projected to significantly decrease in Mediterranean Coast and several Transboundary Basins

RCP 8.5

HYPE MODEL



VIC MODEL



Jordan, Euphrates & Medjerda Rivers

Jordan R.



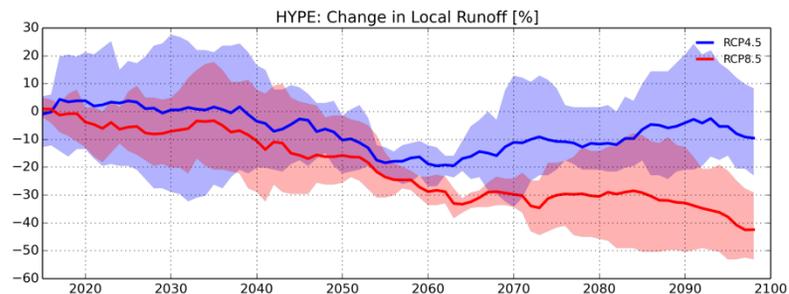
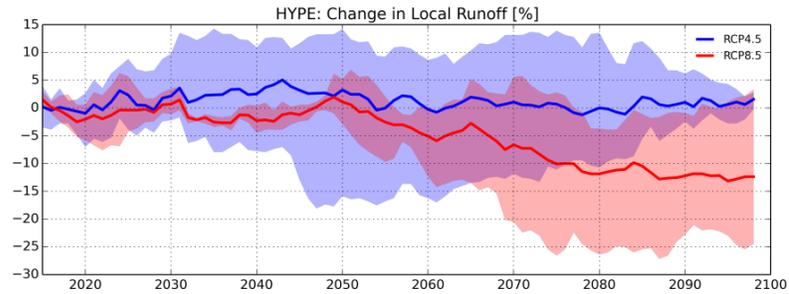
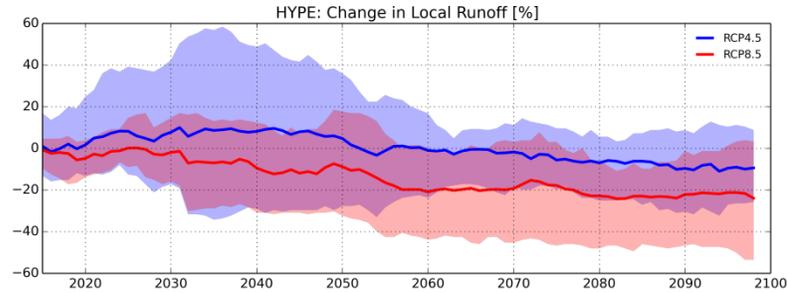
Euphrates R.



Medjerda R.



Runoff RCP4.5 RCP8.5



Future change - 2100

Variable	RCP4.5	RCP8.5
Temp.	1.5°C	3.2°C
Precip.	-7%	-13%
Runoff	-9%	-23%

Variable	RCP4.5	RCP8.5
Temp.	2.3°C	4.8°C
Precip.	3%	0%
Runoff	-2%	-12%

Variable	RCP4.5	RCP8.5
Temp.	1.6°C	3.5°C
Precip.	-4%	-9%
Runoff	-10%	-42%

Annual change: 3-member ensemble

Extreme Climate Indices

Index	Description
SU35	Number of days when $T_{max} \geq 35 \text{ }^{\circ}\text{C}$
SU40	Number of days when $T_{max} \geq 40 \text{ }^{\circ}\text{C}$
R10	Number of days when daily precipitation $\geq 10 \text{ mm}$
R20	Number of days when daily precipitation $\geq 20 \text{ mm}$
CDD	Maximum consecutive number of dry days
CWD	Maximum consecutive number of wet days
SDII	Simple precipitation intensity index

Available

Index	Description
WDSI	Warm spell duration index
R5	Number of days when daily precipitation $\geq 5 \text{ mm}$

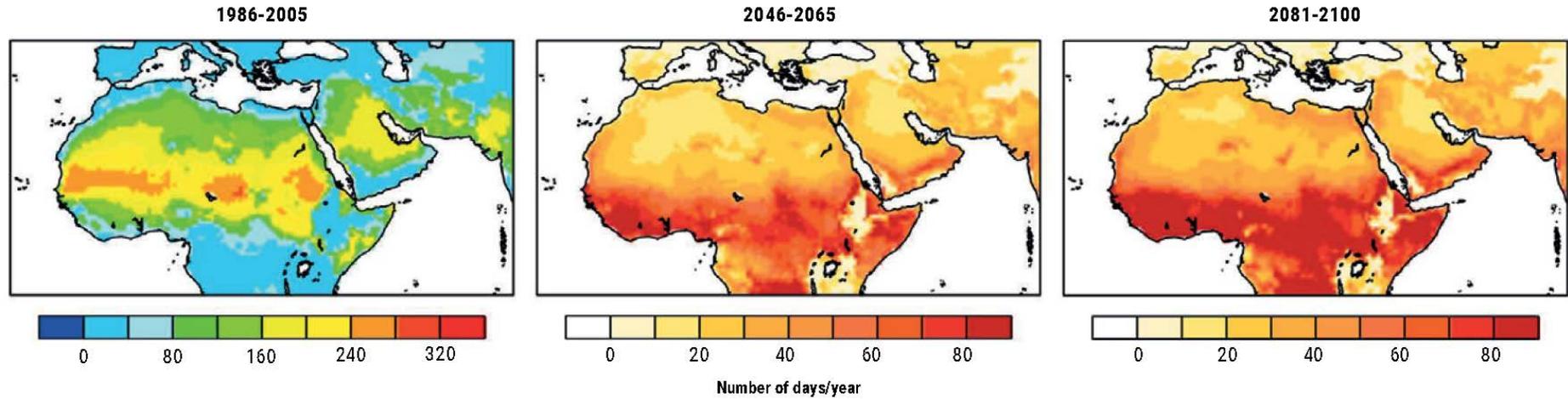
Other possible indices

Can be evaluated annually,
seasonally, and/or monthly

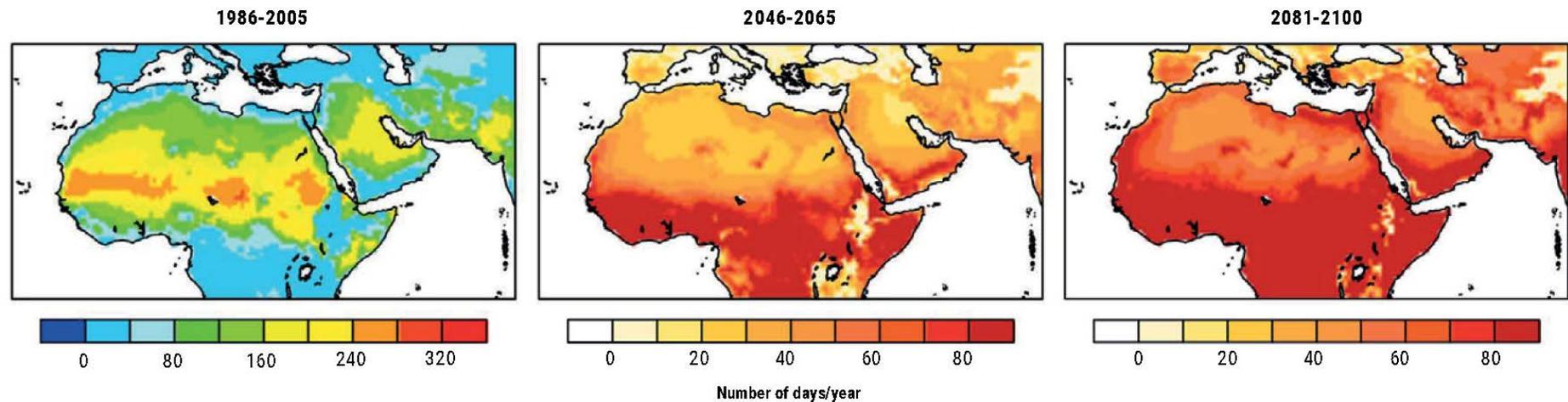
Temperature – “Hot” days (>35°C)

Change in
number of
'hot' days
per year

RCP 4.5



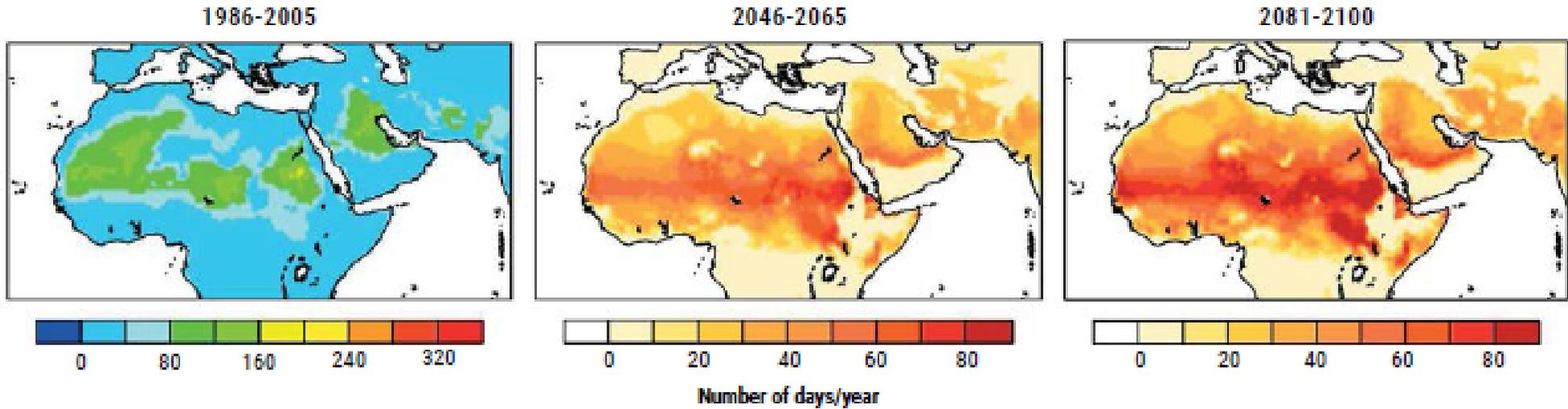
RCP 8.5



Temperature – “Very Hot” days ($>40^{\circ}\text{C}$)

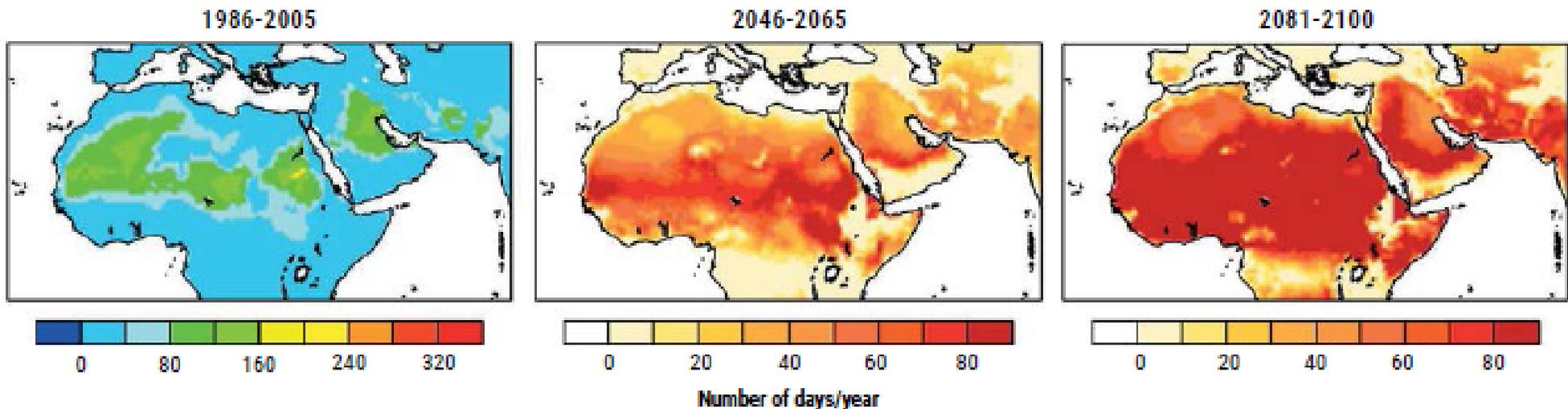
RCP 4.5

Moderate
Emissions
Scenario

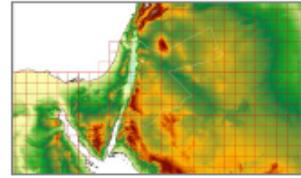
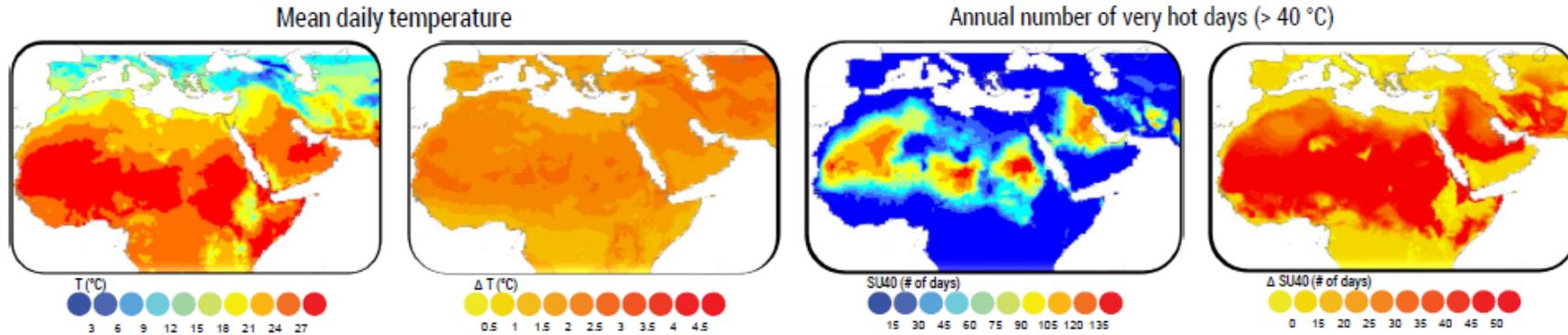
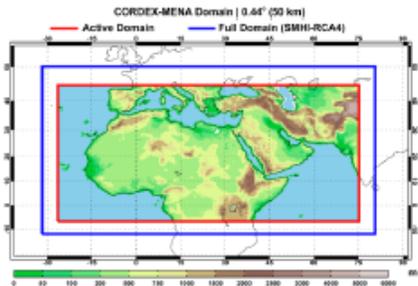


RCP 8.5

Business-
as-Usual
Emissions
Scenario

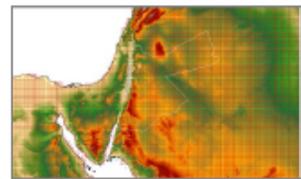
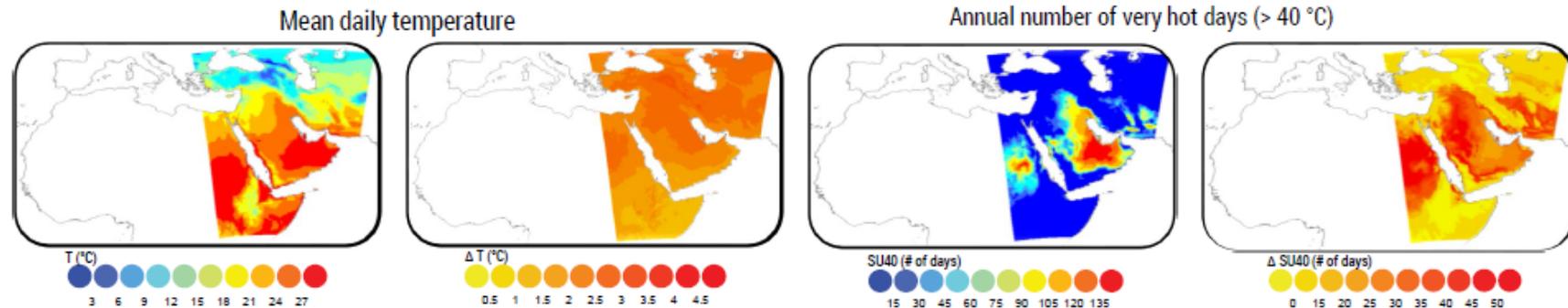
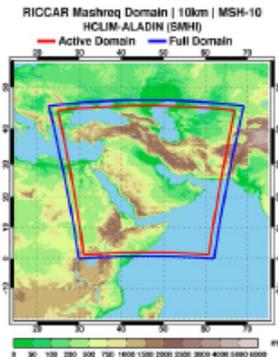


From CMIP5 across the CORDEX-MENA/Arab Domain to support regional cooperation . . .



50 km² scale

. . . To CMIP6 within the Mashreq Domain to facilitate more detailed analyses to inform regional action

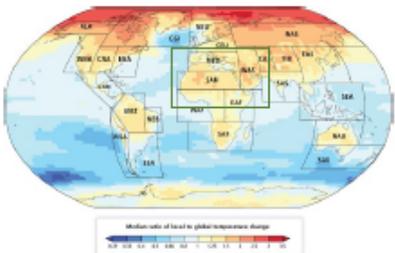


10 km² scale

Mean changes in annual temperature and number of very hot days (> 40 °C) are for 2041–2060 (RCP8.5/SSP5-8.5) compared to 1981–2000.

Increasing temperature will give rise to extreme events, including heat waves, and impact water availability, agricultural productivity, biodiversity and vulnerable populations.

The RICCAR Regional Knowledge Hub provides climate analysis that informs regional cooperation & policymaking in Arab States.

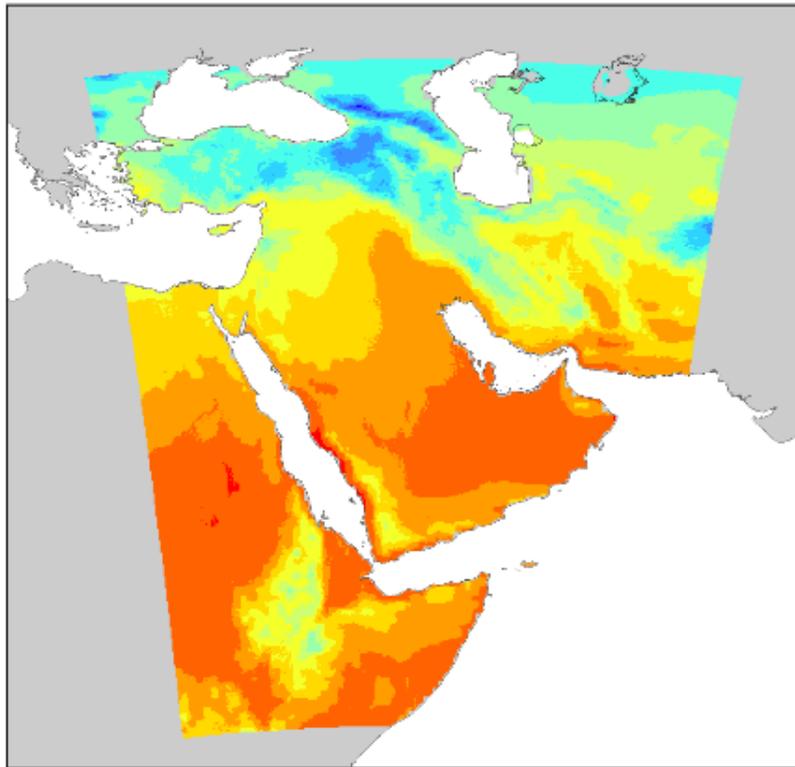


Mashreq Domain: Temperature Change

Mean change in annual temperature compared to the baseline period

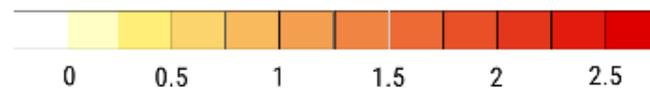
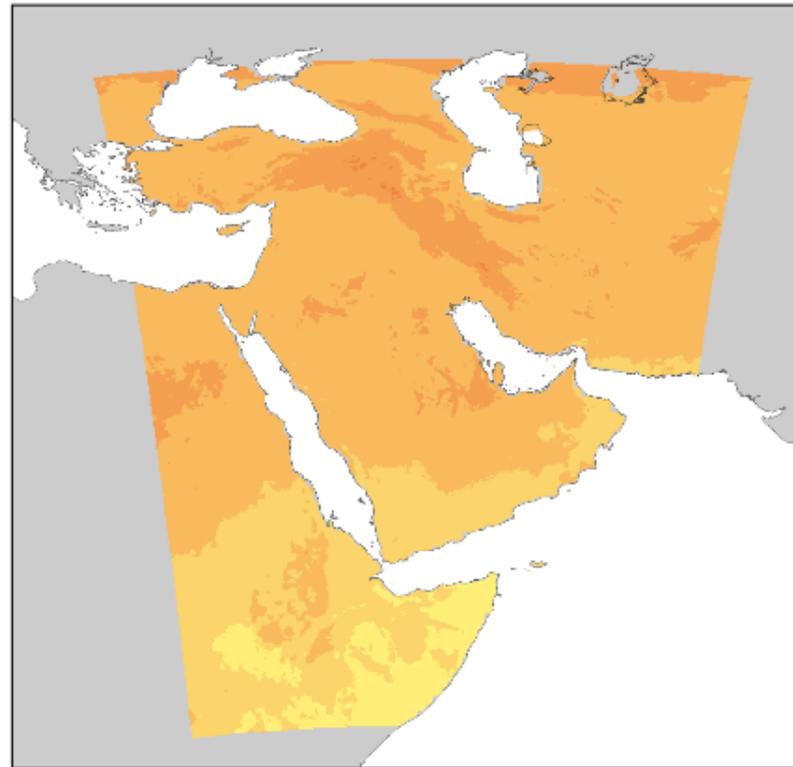


Baseline
1995 – 2014



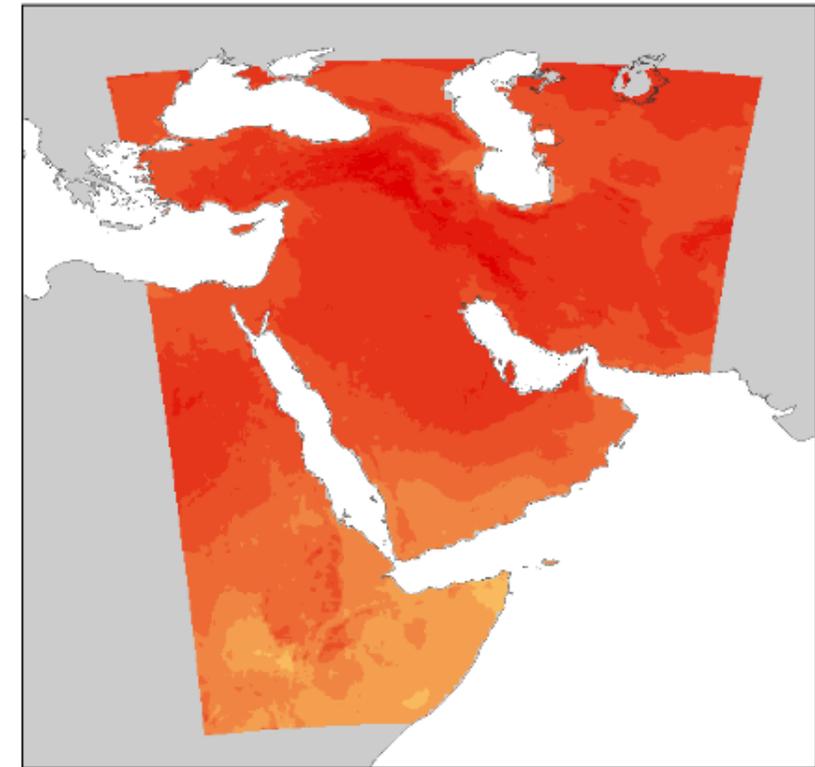
Temperature (°C)

Near-term
2021 – 2041



Change in temperature (°C)

Mid-term
2041 – 2061

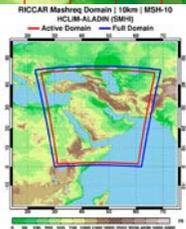
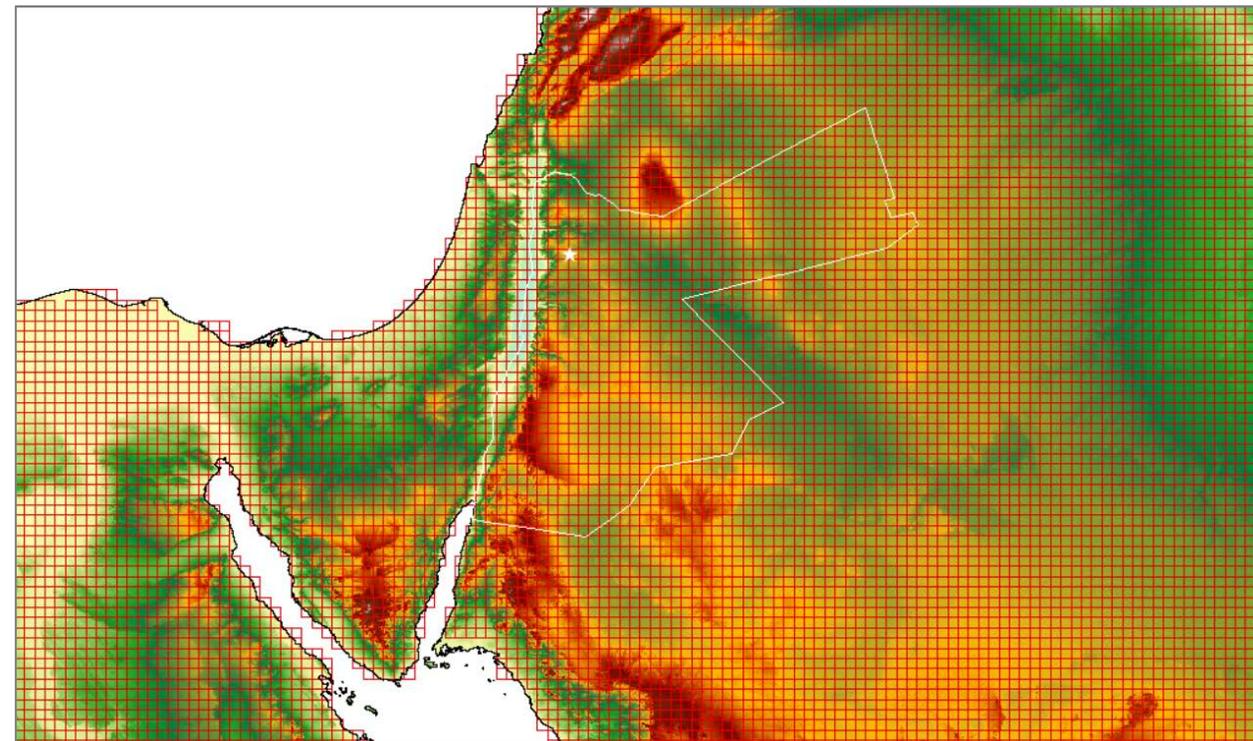
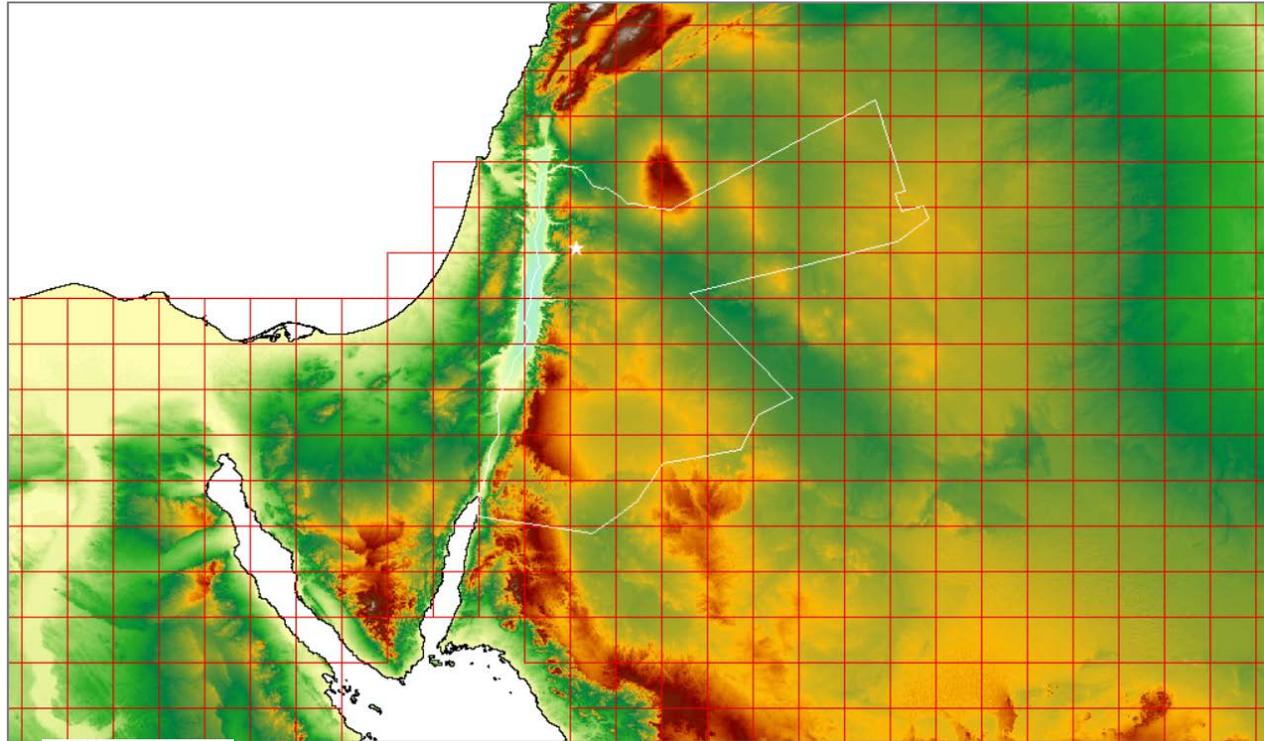


Change in temperature (°C)

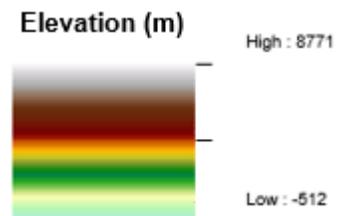
High-Resolution Outputs through Mid-century

50 km²

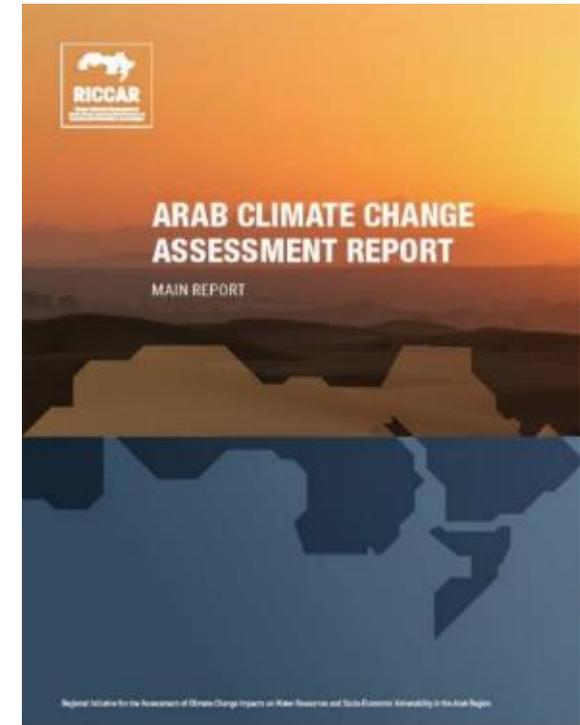
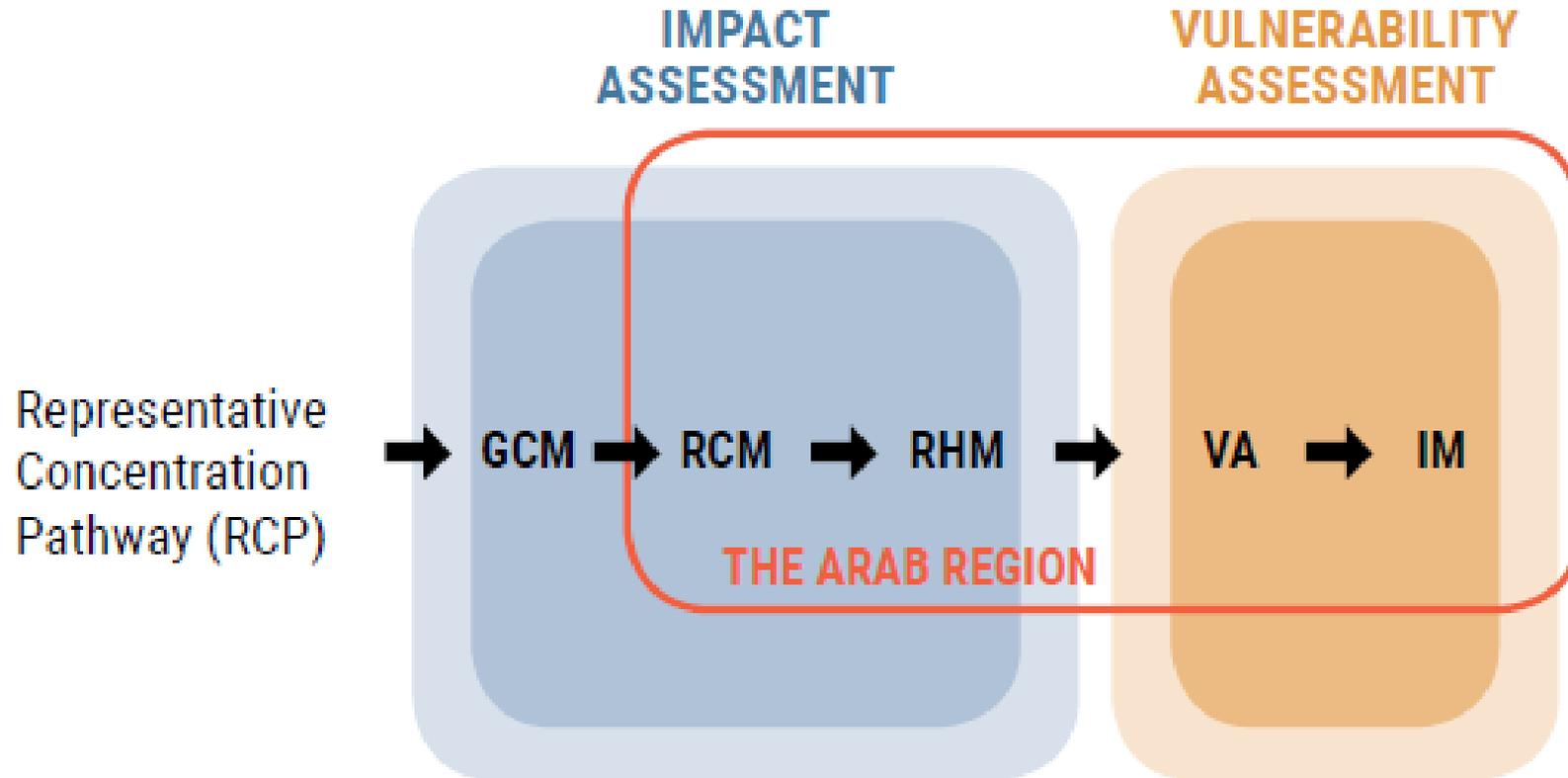
10 km²



Six-member ensemble for SS-RCP 8.5 through 2070 at 10 km²



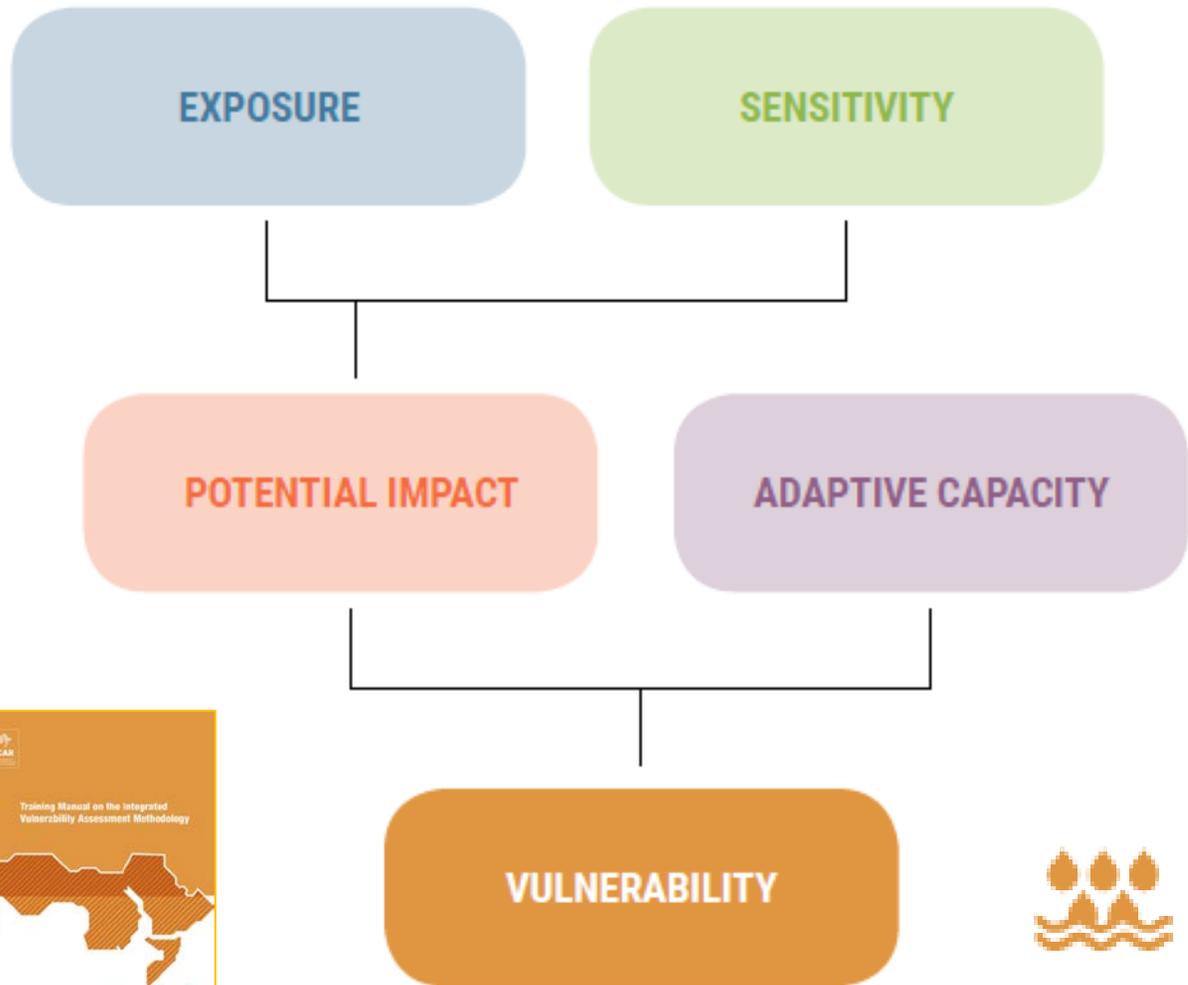
Integrated Vulnerability Assessment for Hotspots Identification and Informing Projects



GCM: Global Climate Modelling
RCM: Regional Climate Modelling
RHM: Regional Hydrological Modelling (optional)

VA: Vulnerability Assessment
IM: Integrated Mapping

Integrated Vulnerability Assessment Methodology



POPULATION (0.50)

- Population density (0.14)
- Total renewable water available per capita (0.50)
- Water consumption per capita (0.13)
- Share of water consumption in agriculture (0.13)
- Refugee population (0.10)

NATURAL (0.26)

- Land use/land cover (0.27)
- Soil storage capacity (0.25)
- Degradation of vegetation cover (0.26)
- Wetlands (0.22)

MANMADE (0.24)

- Urban extent (0.47)
- Areas served by dams (0.53)

KNOWLEDGE & AWARENESS (0.10)

- E-Government development (0.33)
- Tertiary enrollment (0.32)
- Adult literacy rate (0.35)

TECHNOLOGY (0.10)

- Number of scientific and technical journal articles (0.46)
- Information and communication technologies index (0.54)

INSTITUTIONS (0.10)

- Governance index (0.54)
- Disaster risk reduction committees (0.46)

INFRASTRUCTURE (0.50)

WATER & SANITATION (0.50)

- Areas served by dams (0.17)
- Installed desalination capacity per capita (0.17)
- Fossil groundwater (0.17)
- Access to improved water (0.17)
- Access to improved sanitation (0.16)
- Area equipped for irrigation (0.16)

ENVIRONMENT (0.50)

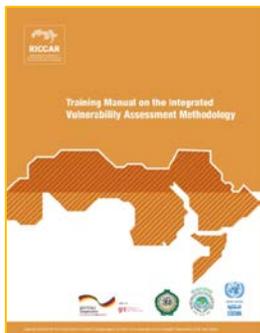
- Environment performance index (1.0)

ECONOMIC RESOURCES (0.11)

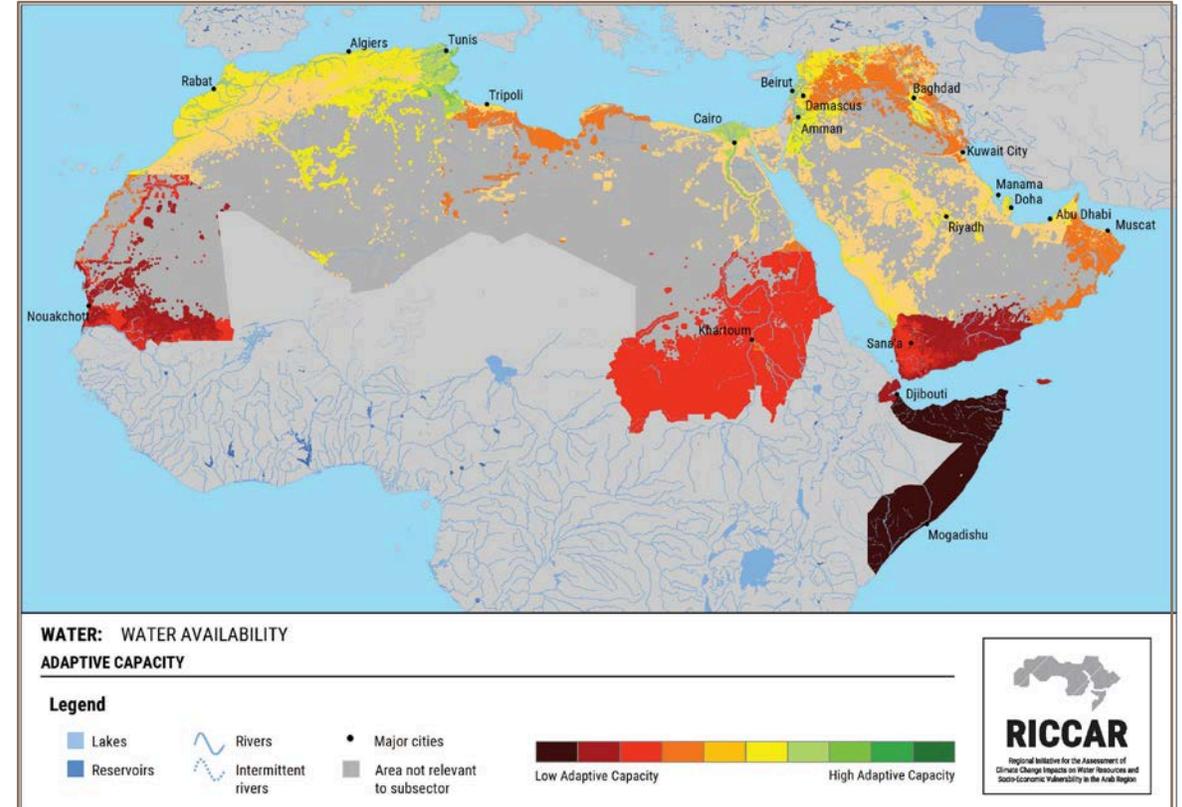
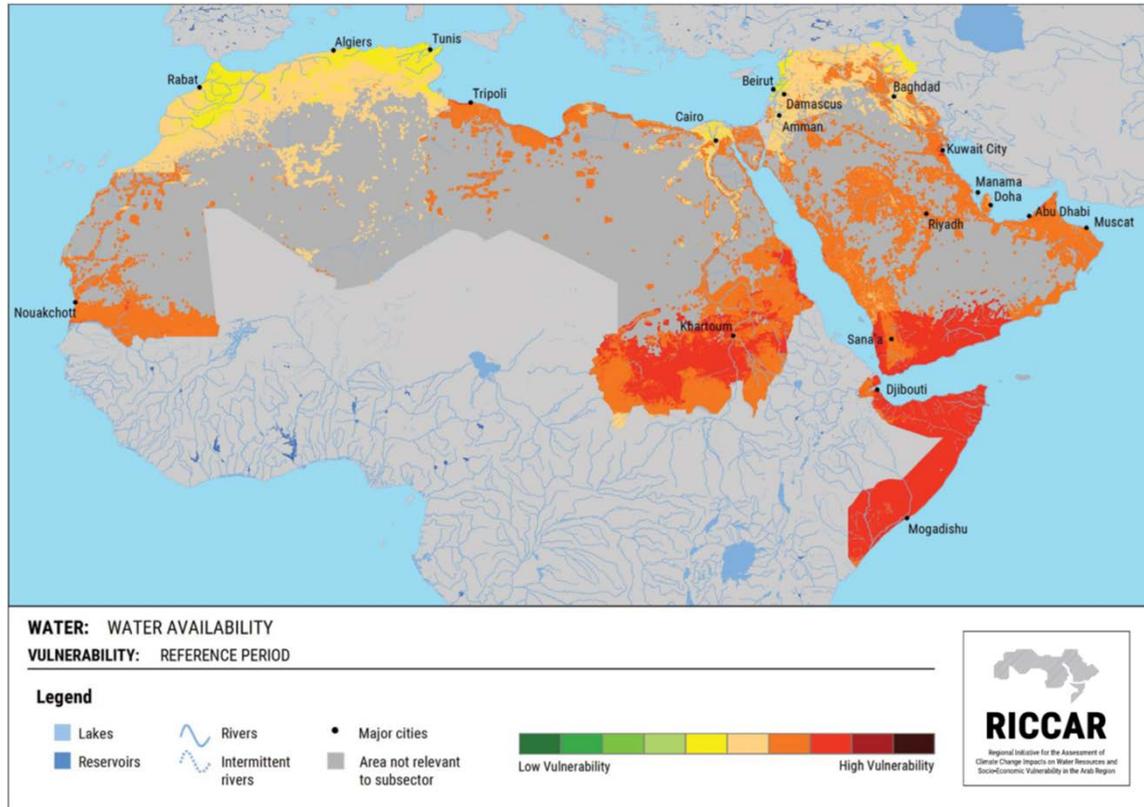
- GDP per capita (0.36)
- ODA (0.30)
- Food imports as % of merchandise exports (0.34)

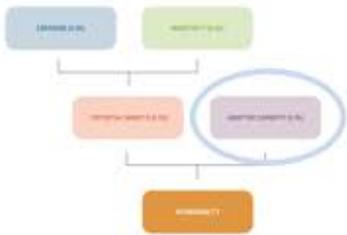
EQUITY (0.09)

- Female-to-male literacy ratio (0.51)
- Migrants/refugees index (0.49)



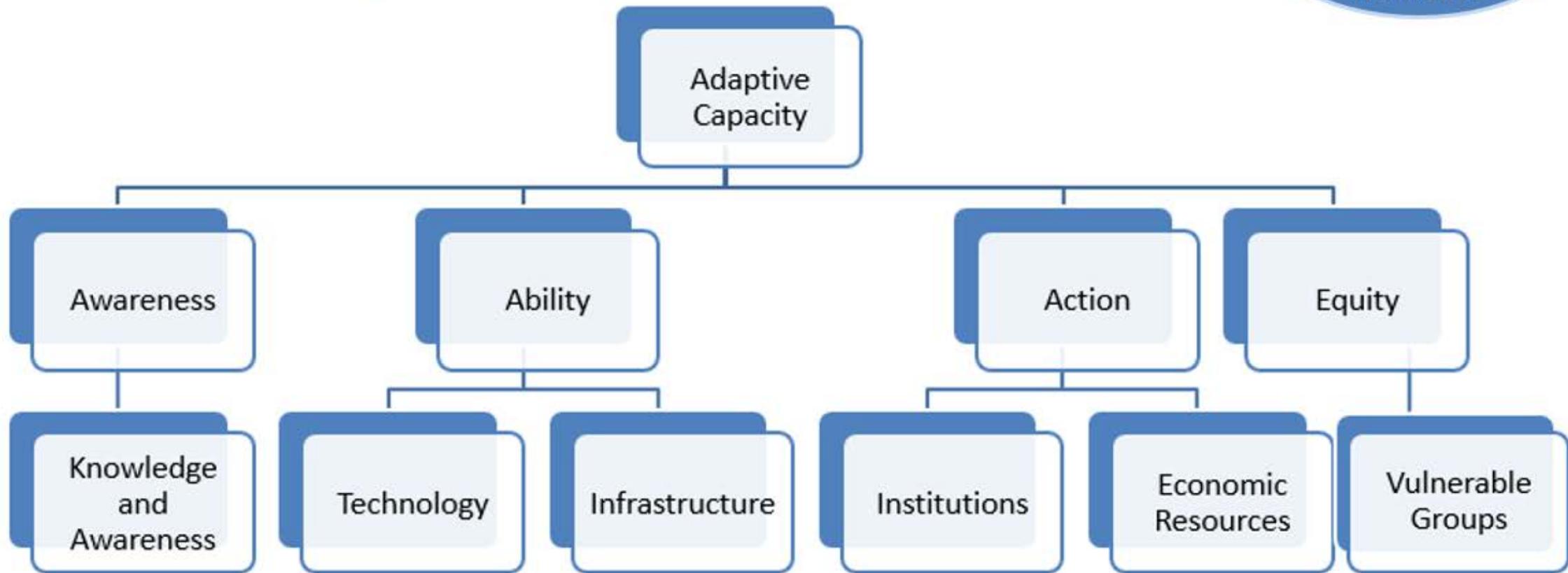
Climate Vulnerability is not only about Impacts, but also about Adaptive Capacity





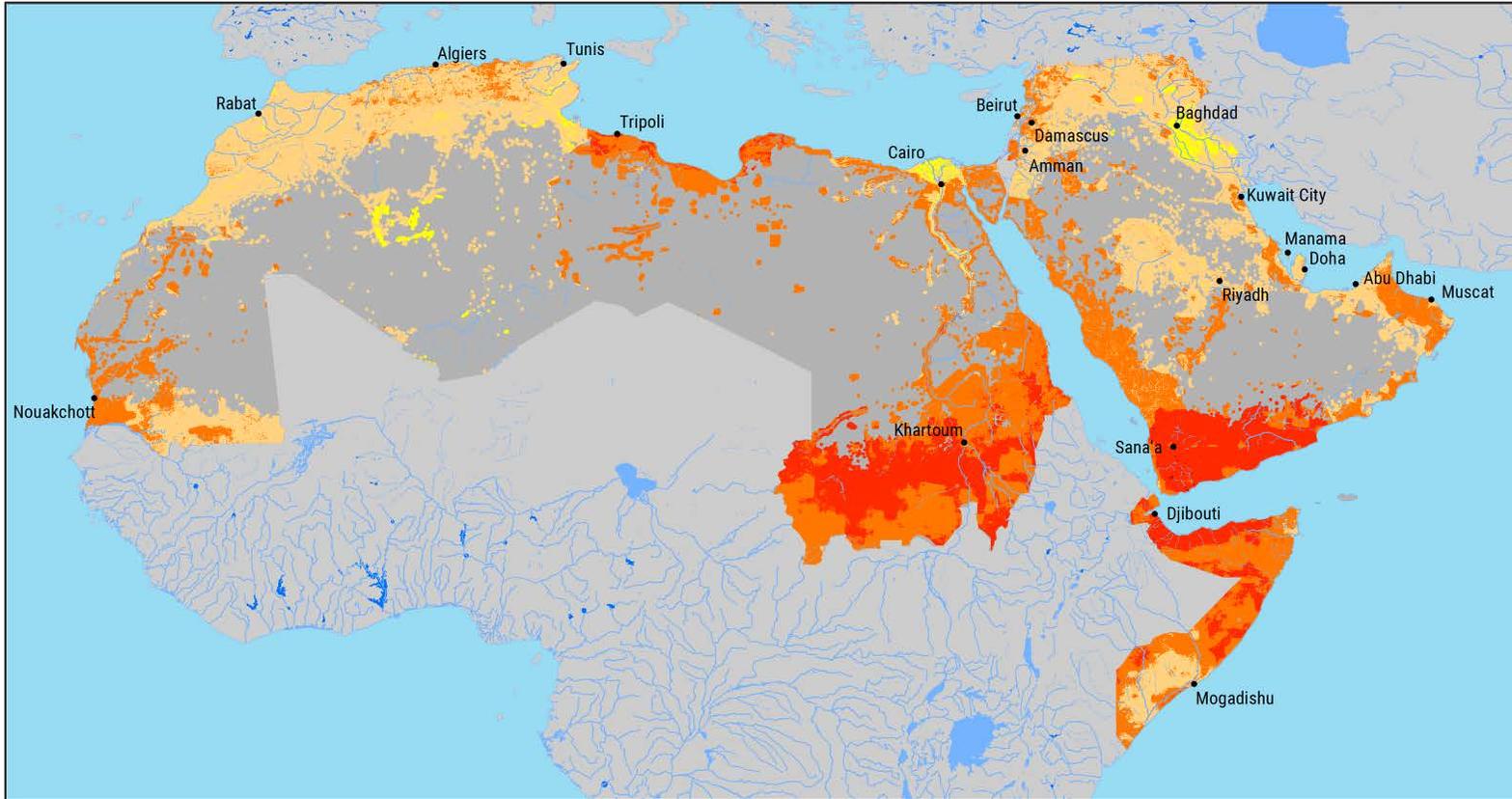
Adaptive Capacity: Dimensions and Determinants

*Strengthen
Adaptive Capacity
for
Climate Change
Resilience*



Adaptive capacity is “the ability or potential of a system to respond successfully to climate variability and change, and includes adjustments in both behavior and in resources and technologies” - IPCC (2007)

Water Availability Vulnerability to Climate Change



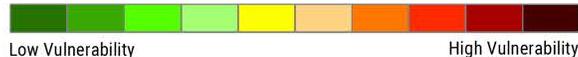
Areas with highest vulnerability:

- Upper Nile Valley
- Southwestern Arabian Peninsula
- Northern Horn of Africa

WATER: WATER AVAILABILITY
VULNERABILITY: RCP8.5 END-CENTURY (2081-2100)

Legend

- Lakes
- Reservoirs
-  Rivers
-  Intermittent rivers
- Major cities
- Area not relevant to subsector



Scenario	Vulnerability (% of study area)		
	Low	Moderate	High
RCP 4.5 Mid-century	0%	57%	43%
RCP 8.5 Mid-century	0%	48%	52%
RCP 4.5 End-century	0%	52%	48%
RCP 8.5 End-century	0%	43%	57%

Lebanese Agricultural Sector Vulnerability Assessment

FIGURE 23: Percentage of cultivated area with high vulnerability by caza (End-century RCP8.5)

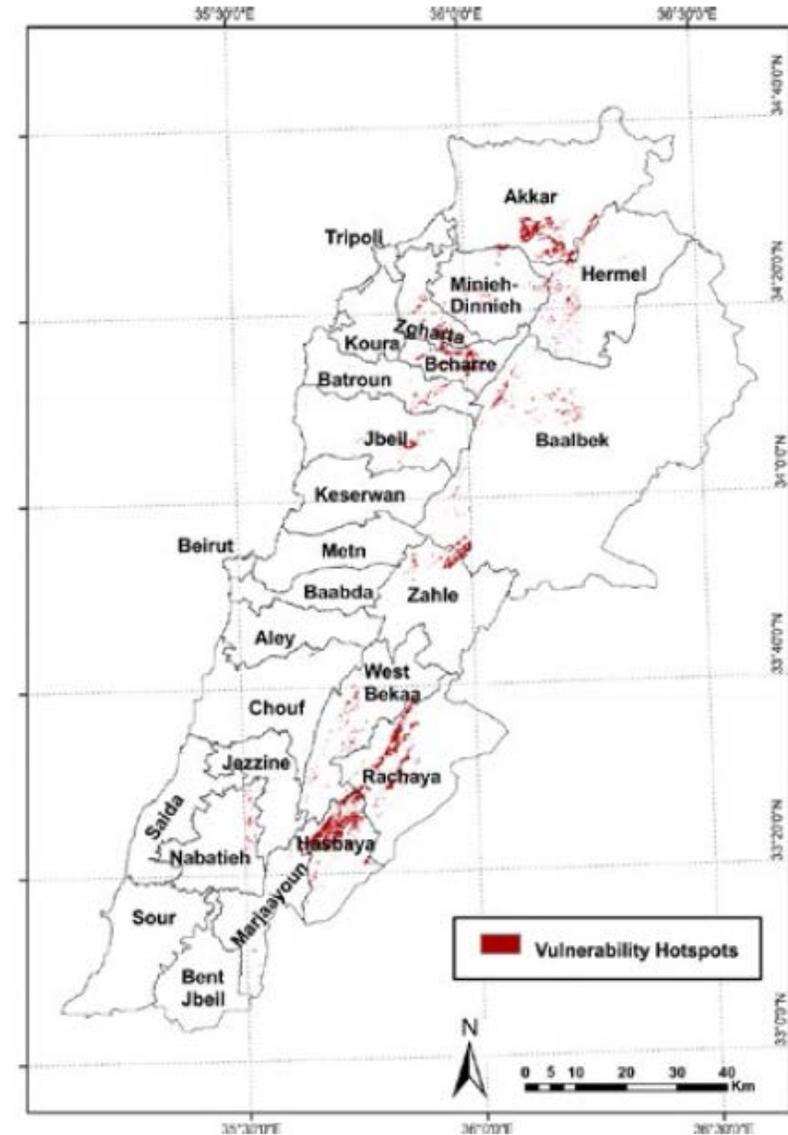
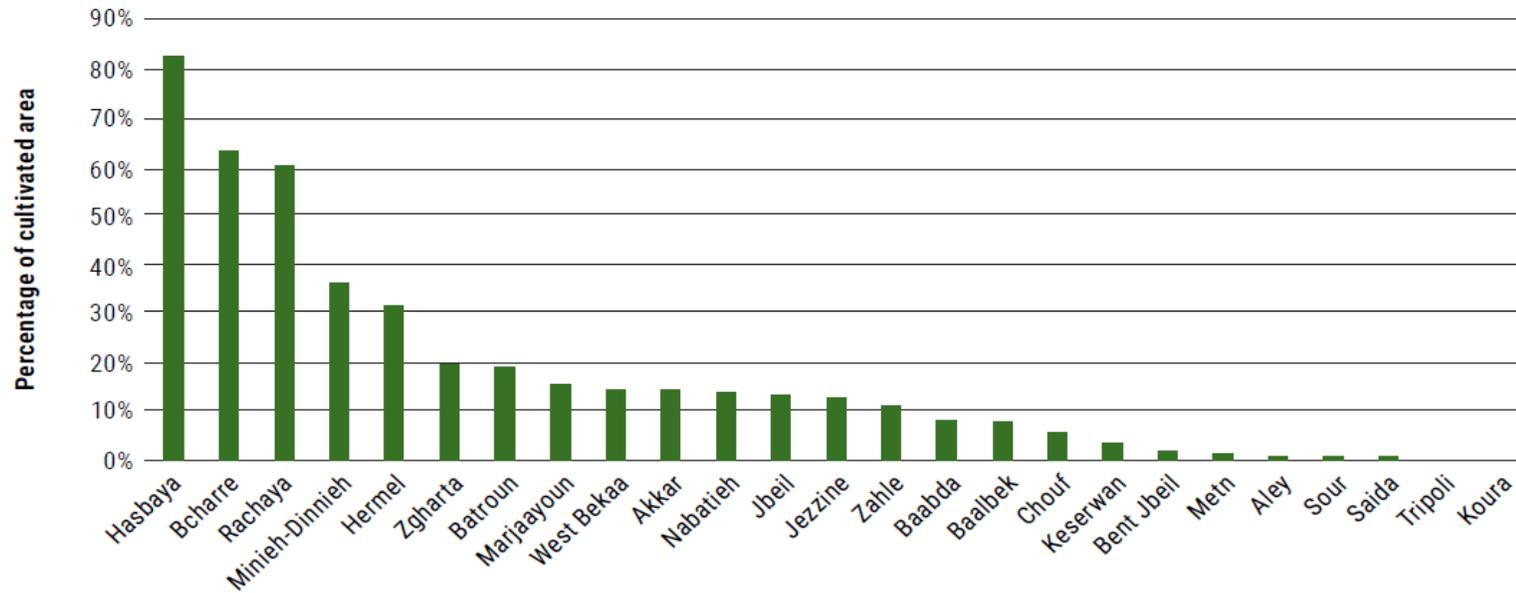
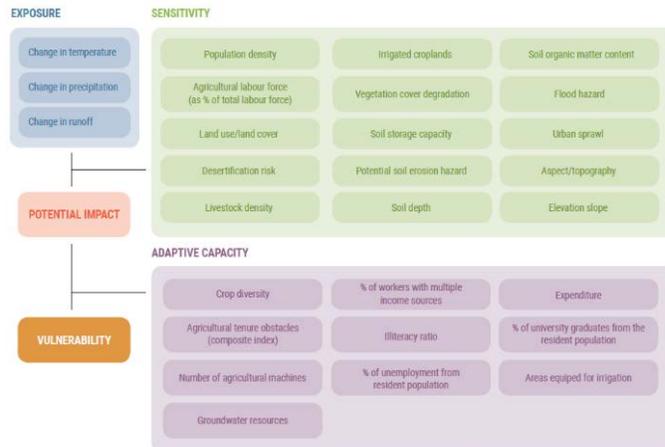
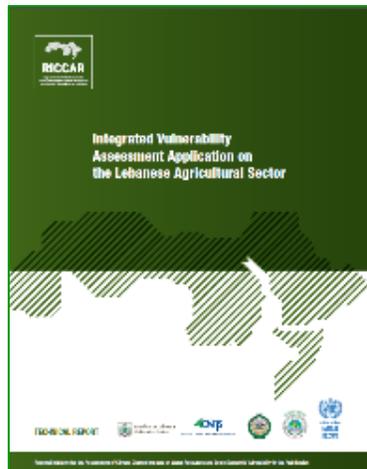
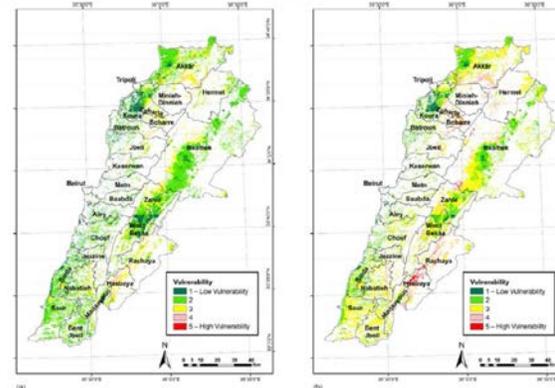
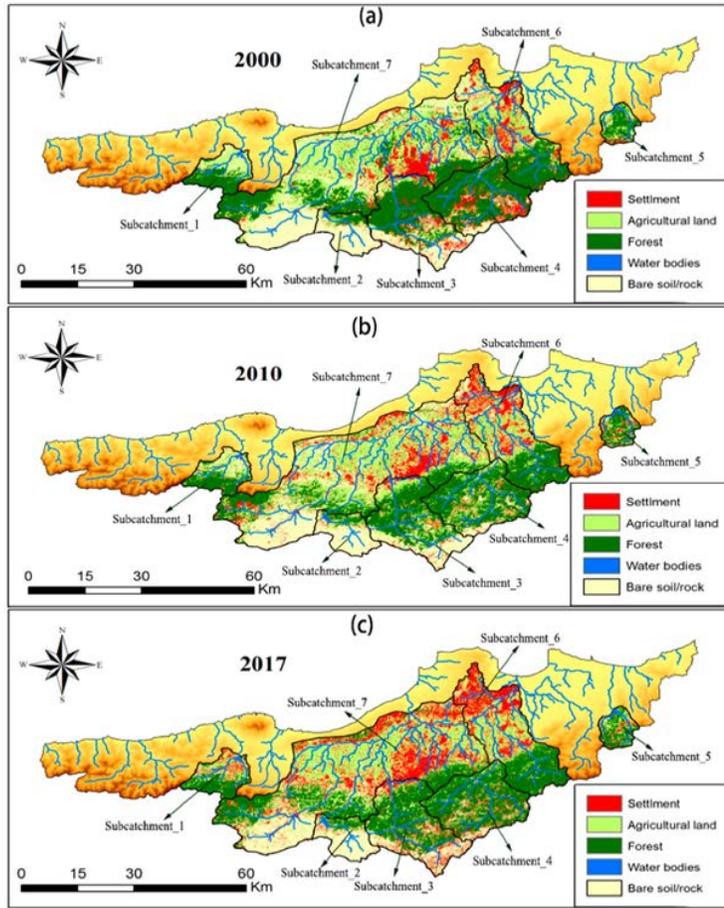


FIGURE 22: Vulnerability at end-century for (a) RCP4.5 and (b) RCP8.5



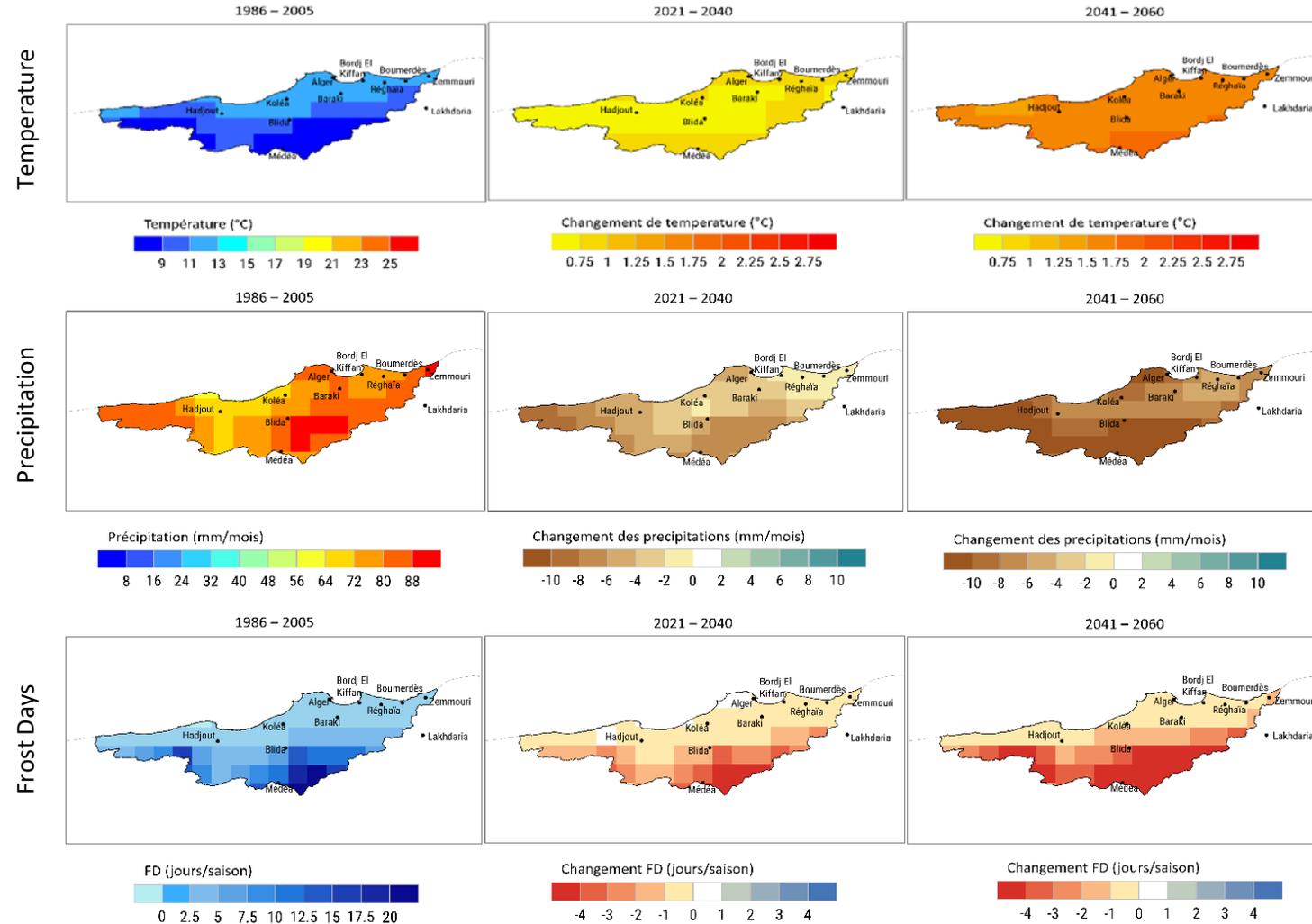
Algérois Watershed

Landuse and Land Cover Map

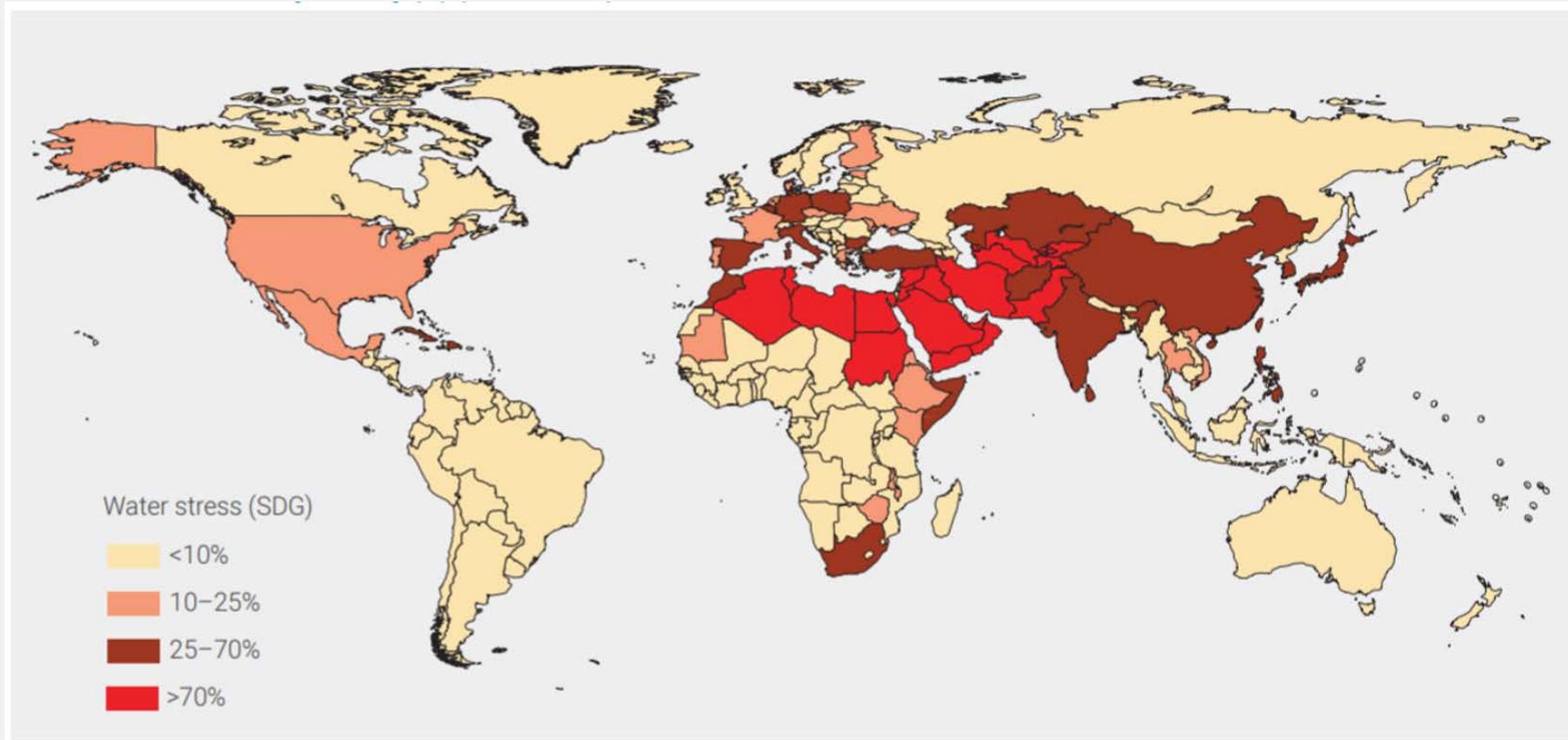


Winter Season

Climate Projections (Winter, Spring, Summer and Autumn)

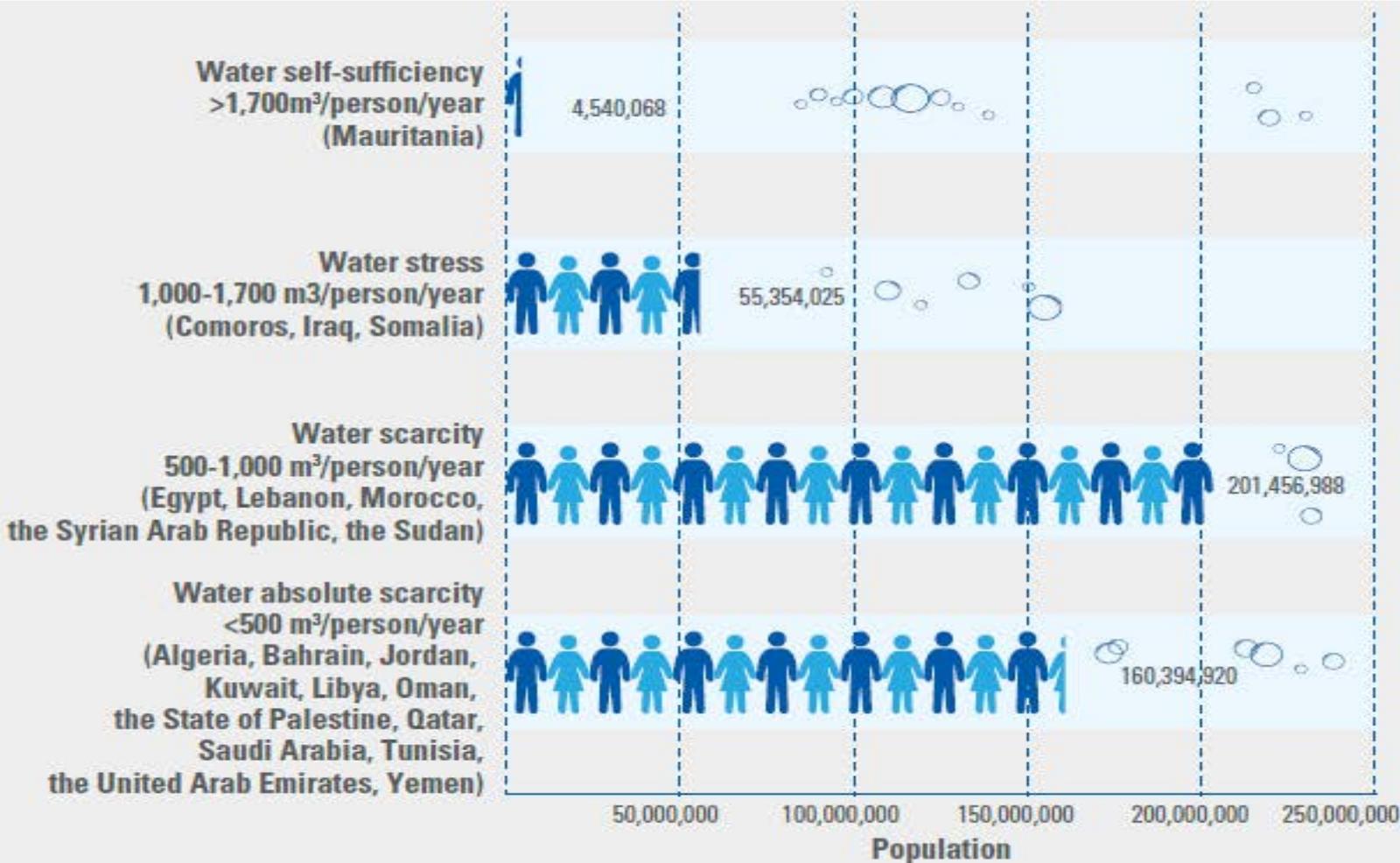


Level of water stress by country (%), 2000-2015



Source: FAO, 2018. Progress on level of water stress - Global baseline for SDG 6 Indicator 6.4.2. Rome. FAO/UN-Water.

Freshwater Scarcity in the Arab Region



18 out of 22 Arab States are below the renewable water resources scarcity annual threshold of 1,000 m³ per capita per year

13 of 22 Arab States are below the absolute water scarcity threshold of 500 m³ per capita per year

362 million people in the Arab region live in countries under water scarcity to absolute scarcity conditions

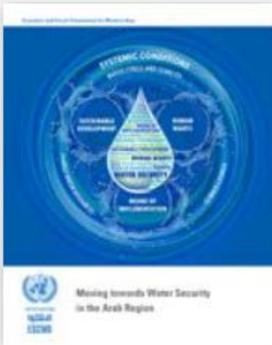
With only **76%** of the region's population having water available when needed

Nearly **94** million people without access to water at all times

In many countries, the norm is intermittent supply

Source: <https://www.unescwa.org/publications/moving-towards-achieving-water-security-arab-region>

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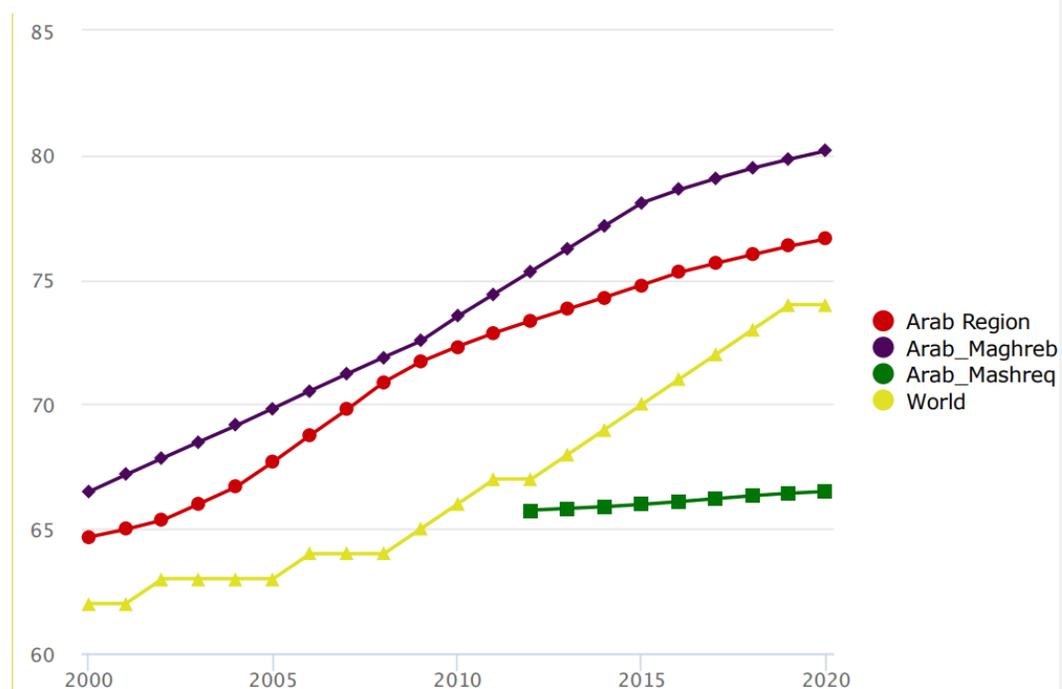


Safely Managed Water and Sanitation Services: *Insufficient sanitation affects surface & groundwater water*

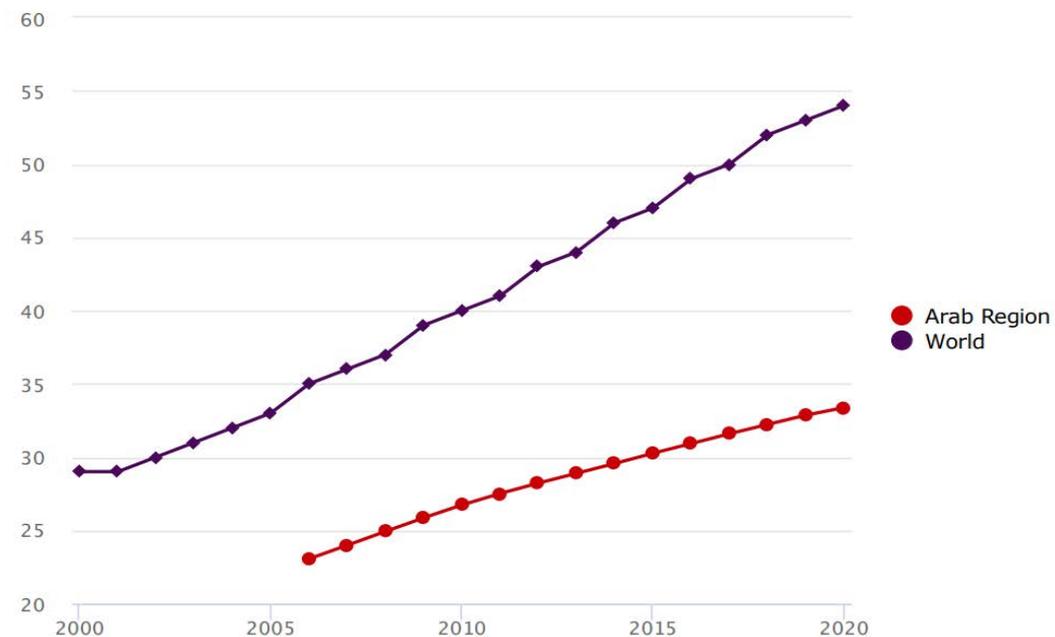
Good

Not so good

6.1.1 Population using safely managed water (Percentage)



6.2.1 Population using safely managed sanitation services (Percentage)



Source: ESCWA, Annual SDG Report, 2022; <https://www.unescwa.org/sites/default/files/inline-files/annual-sdg-review-2022-data-english.pdf>

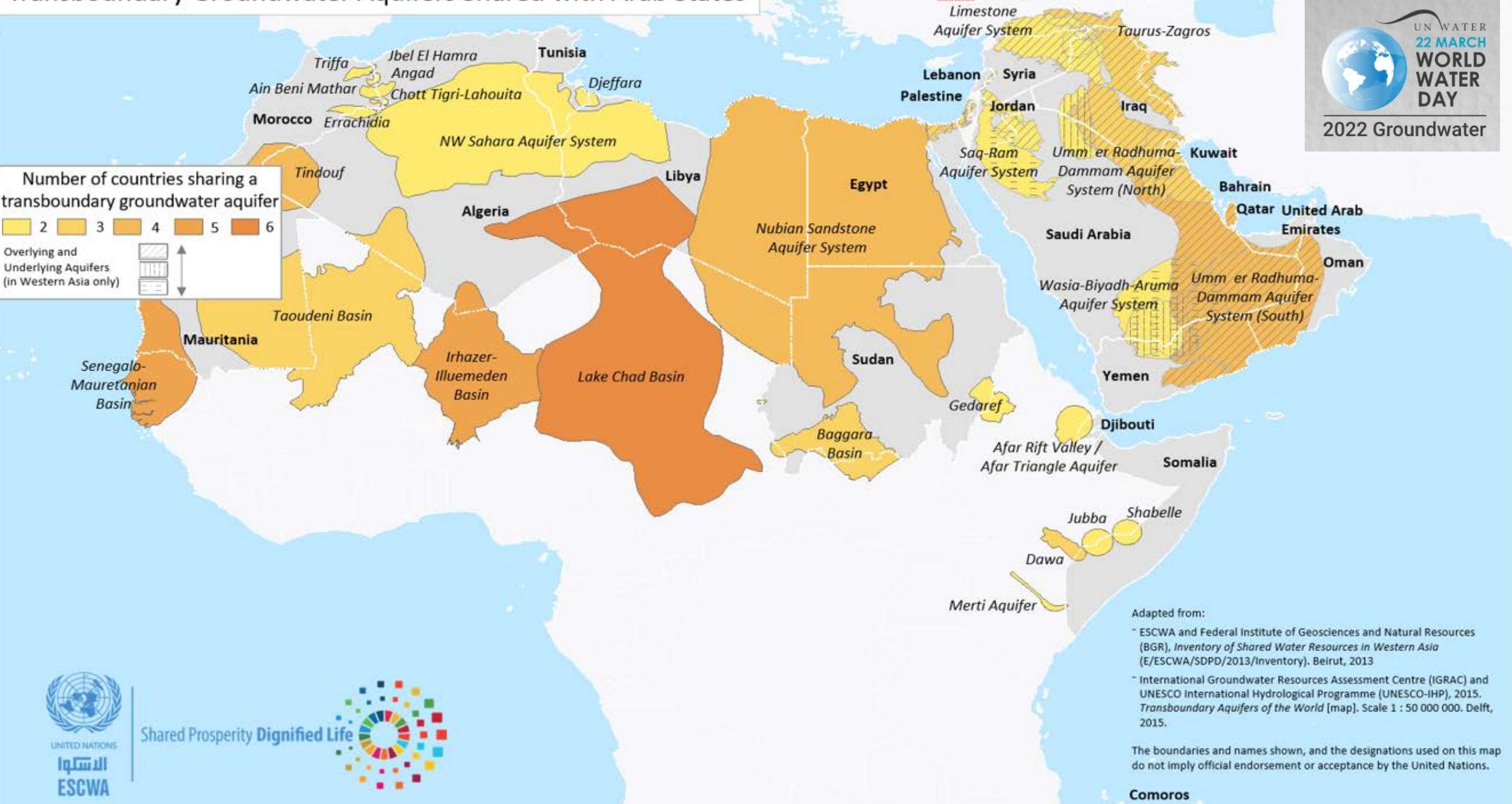
Transboundary Groundwater Aquifers Shared with Arab States



Number of countries sharing a transboundary groundwater aquifer

2 3 4 5 6

Overlying and Underlying Aquifers (in Western Asia only)



Adapted from:

- ESCWA and Federal Institute of Geosciences and Natural Resources (BGR), *Inventory of Shared Water Resources in Western Asia* (E/ESCWA/SDPD/2013/Inventory). Beirut, 2013
- International Groundwater Resources Assessment Centre (IGRAC) and UNESCO International Hydrological Programme (UNESCO-IHP), 2015. *Transboundary Aquifers of the World* [map]. Scale 1 : 50 000 000. Delft, 2015.

The boundaries and names shown, and the designations used on this map do not imply official endorsement or acceptance by the United Nations.



Shared Prosperity Dignified Life

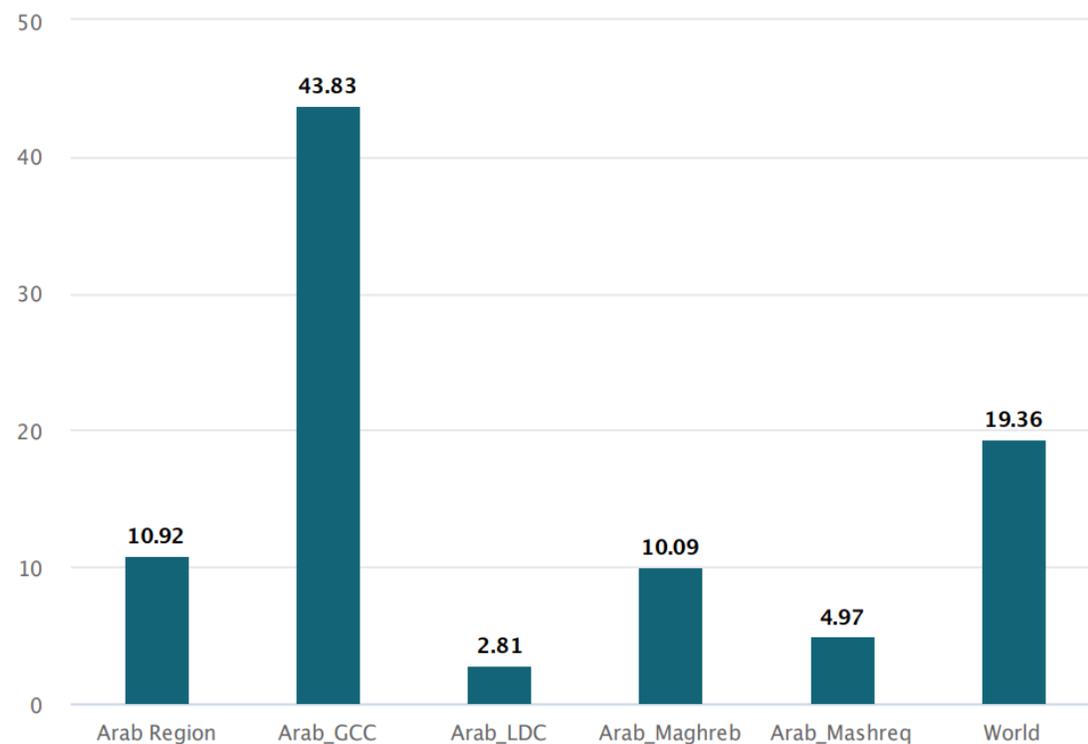


Comoros



Water Use Efficiency, 2018

6.4.1 Water use efficiency, 2018 (USD/m³)



Water use efficiency in agricultural sector particularly low in *Maghreb, Mashreq and Arab Least Developed Countries*

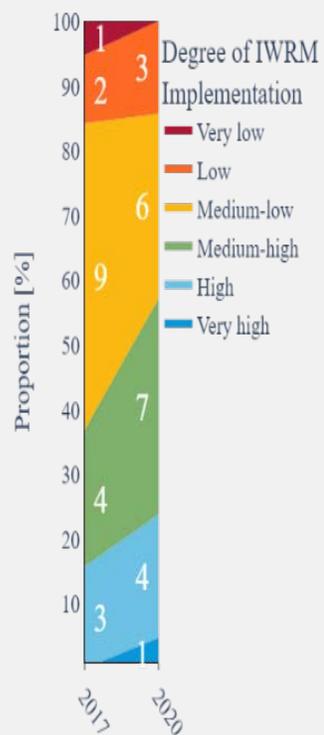
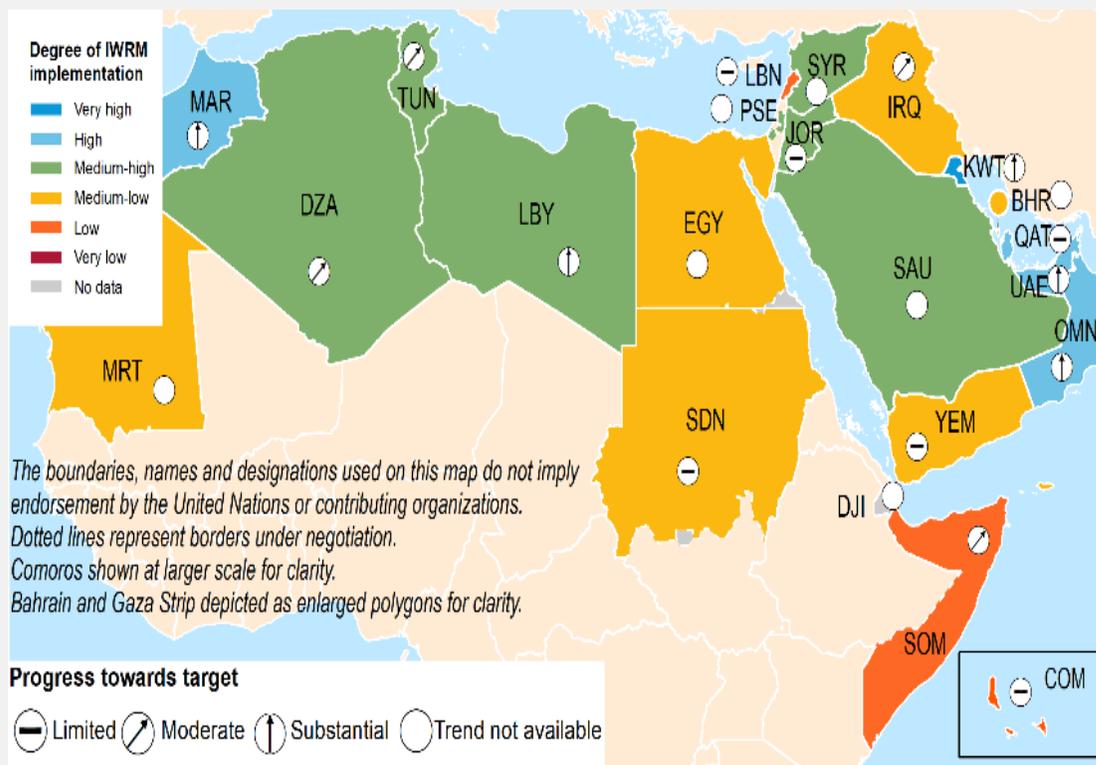
Source: <https://www.unescwa.org/sites/default/files/inline-files/annual-sdg-review-2022-data-english.pdf>

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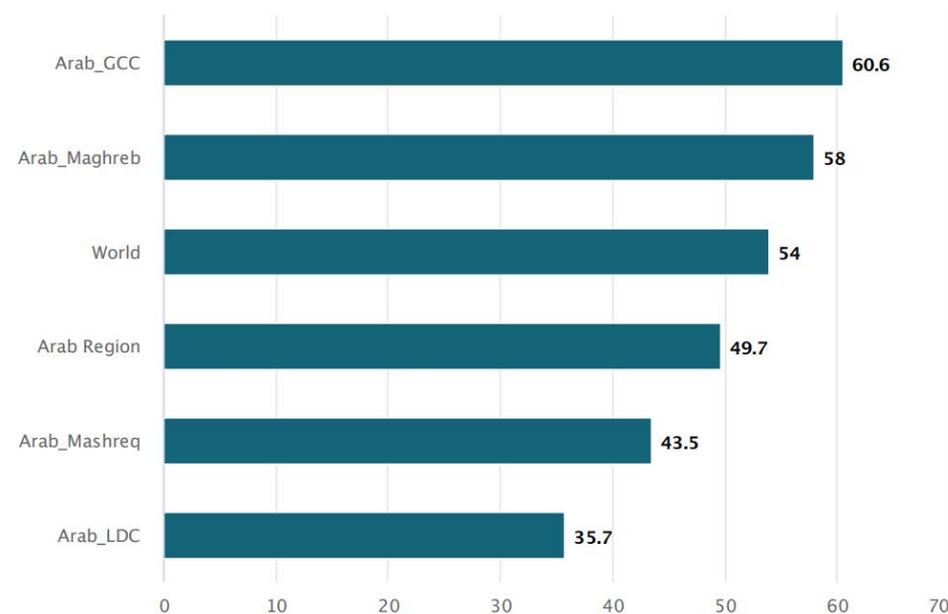


Integrated Water Resources Management

Degree of IWRM implementation (2020) and level of progress towards SDG target 6.5 (2017 and 2020)



6.5.1 Degree of integrated water resources management implementation (Percentage)



Source: <https://www.unescwa.org/sites/default/files/inline-files/annual-sdg-review-2022-data-english.pdf>

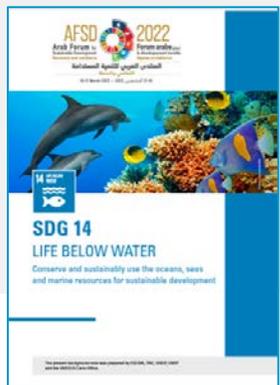


Oceans, Seas & Fisheries: Threats to Biodiversity & Livelihoods

- o The Arab region is surrounded by five oceans and seas
- o Marine areas surrounding the region are under threat from ocean warming, acidification, illegal fishing, and marine pollution from offshore and onshore development activities
- o Single-use plastics during pandemic increased marine plastic waste globally, including in Arab region
- o Pandemic affected supply chains & seafood demand, and associated impact on livelihoods.
- o In the Maghreb, aquaculture production plummeted from 21,169 to 14,049 tons between 2019 and 2020, a decrease of 34%



Small-scale fisheries are vital to the food security, health, nutrition, income and livelihoods of coastal communities throughout the region, particularly in Lebanon, Mauritania, Morocco, Oman, Somalia, the State of Palestine and Yemen. However, unsustainable fishing practices, illegal fishing, dwindling fish stocks, pollution and climate change threaten the viability of small-scale fisheries.

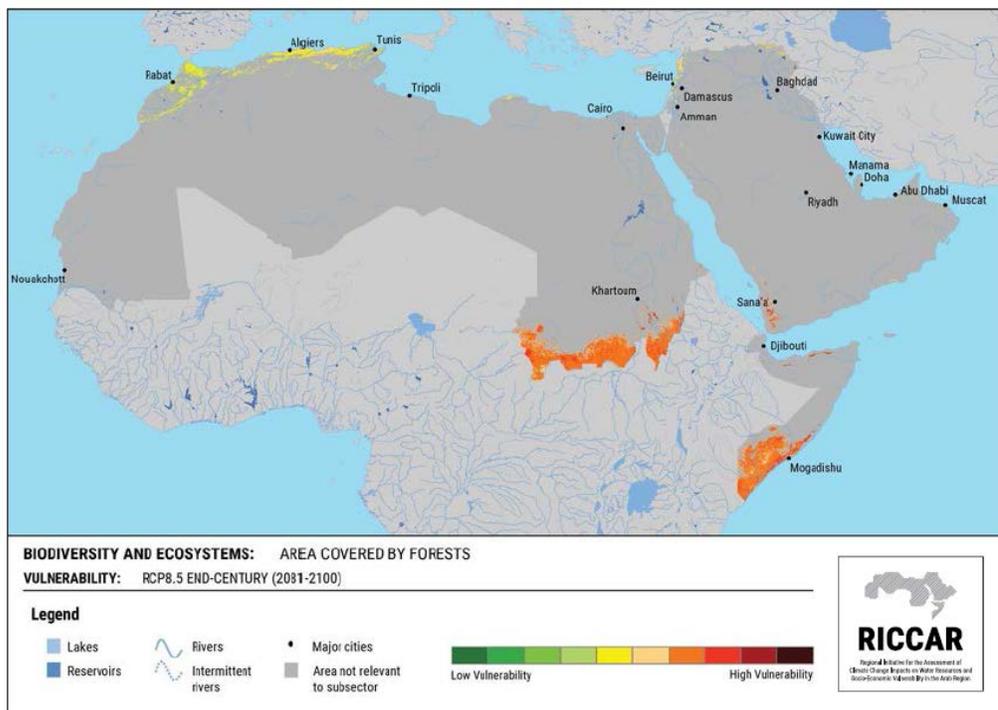


	Arab region	World
Beach litter (count per km ²)	4,412 (2018)	1,347 (2018)
Fish species, threatened	672 (2018)	8,233 (2017)
Marine protected areas (percentage of territorial waters)	2 (2018) +3 per cent since 2016	11 (2018) +1 per cent since 2000

<https://afsd-2022.unescwa.org>

Forests, Wetlands & Green Cover

- o Just 7% of Arab region covered by forests or wetlands
- o Of these, 99% are moderately vulnerable to climate change at mid and end century

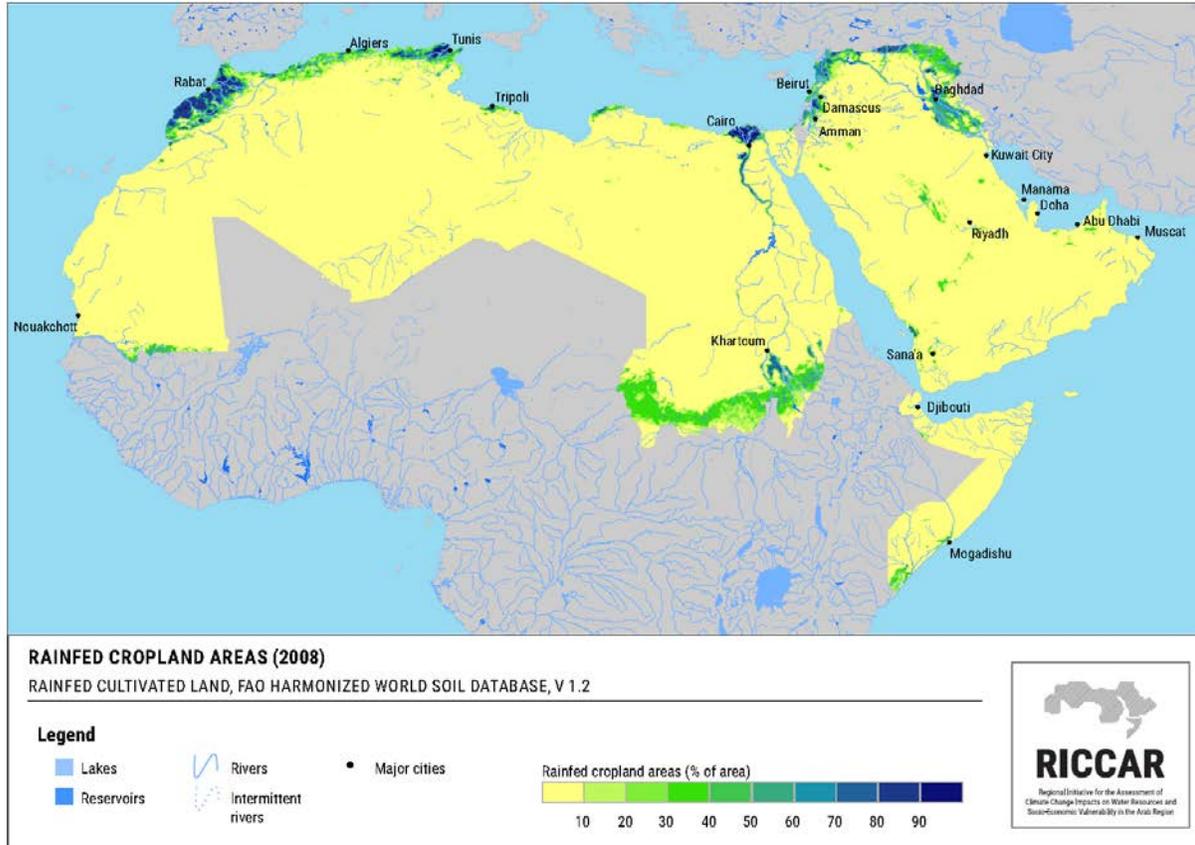


	Arab region	World
Forest area as a proportion of land area		
	2.8 per cent (2020) -0.54 per cent since 2000	31.2 per cent (2020) -0.11 per cent since 2000
Progress towards sustainable forest management		
	-0.6 per cent was the net change rate in forest area (2020) -2 per cent since 2010	-0.1 per cent was the net change rate in forest area (2020) +0.73 per cent since 2010
	33 per cent of forest area had a long-term management plan (2020) +3 per cent since 2000	58.3 per cent of forest area had a long-term management plan (2020) +0.57 per cent since 2000
	18.1 per cent of legally established protected areas were forests (2020) +2 per cent since 2000	17.8 per cent of legally established protected areas were forests (2020) +1 per cent since 2000
Mountain Green Cover Index		
	29.6 per cent (2018) +0.08 per cent since 2000	73 per cent (2018) +0.01 per cent since 2000
Countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits		
	81.8 per cent of countries were contracting parties to the International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA) (2021) +0.57 per cent since 2012	61.2 per cent of countries were contracting parties to PGRFA (2021) +2 per cent since 2012
	27.3 per cent of countries reported through the PGRFA Online Reporting System (2021) +35 per cent since 2016	23.6 per cent of countries reported through the PGRFA Online Reporting System (2021) +30 per cent since 2016
	23.8 per cent of countries reported to the Access and Benefit-Sharing Clearing-House (2012)	26.6 per cent of countries reported to the Access and Benefit-Sharing Clearing-House (2020) +53 per cent since 2015

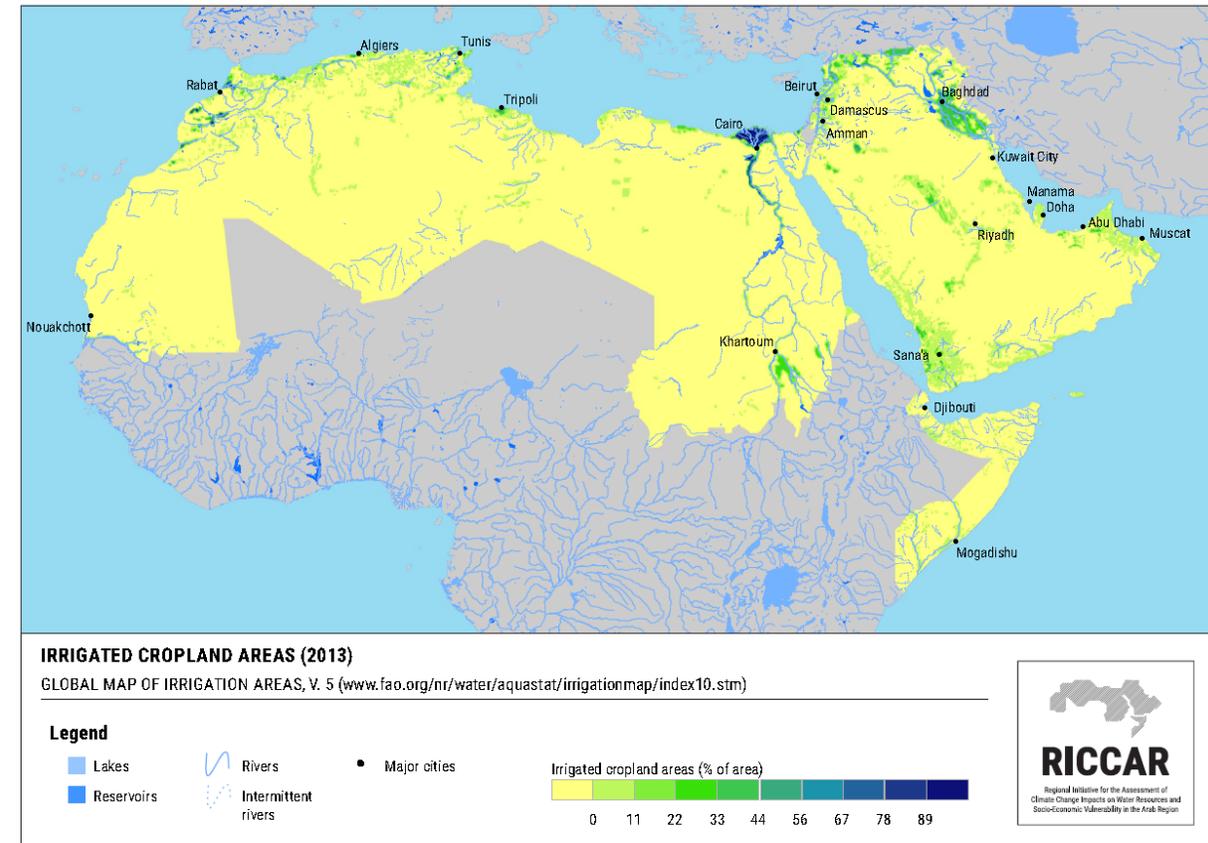
Source: ESCWA, Arab SDG Monitor.

Rainfed and Irrigated Cropland Areas in Arab Region

Rainfed

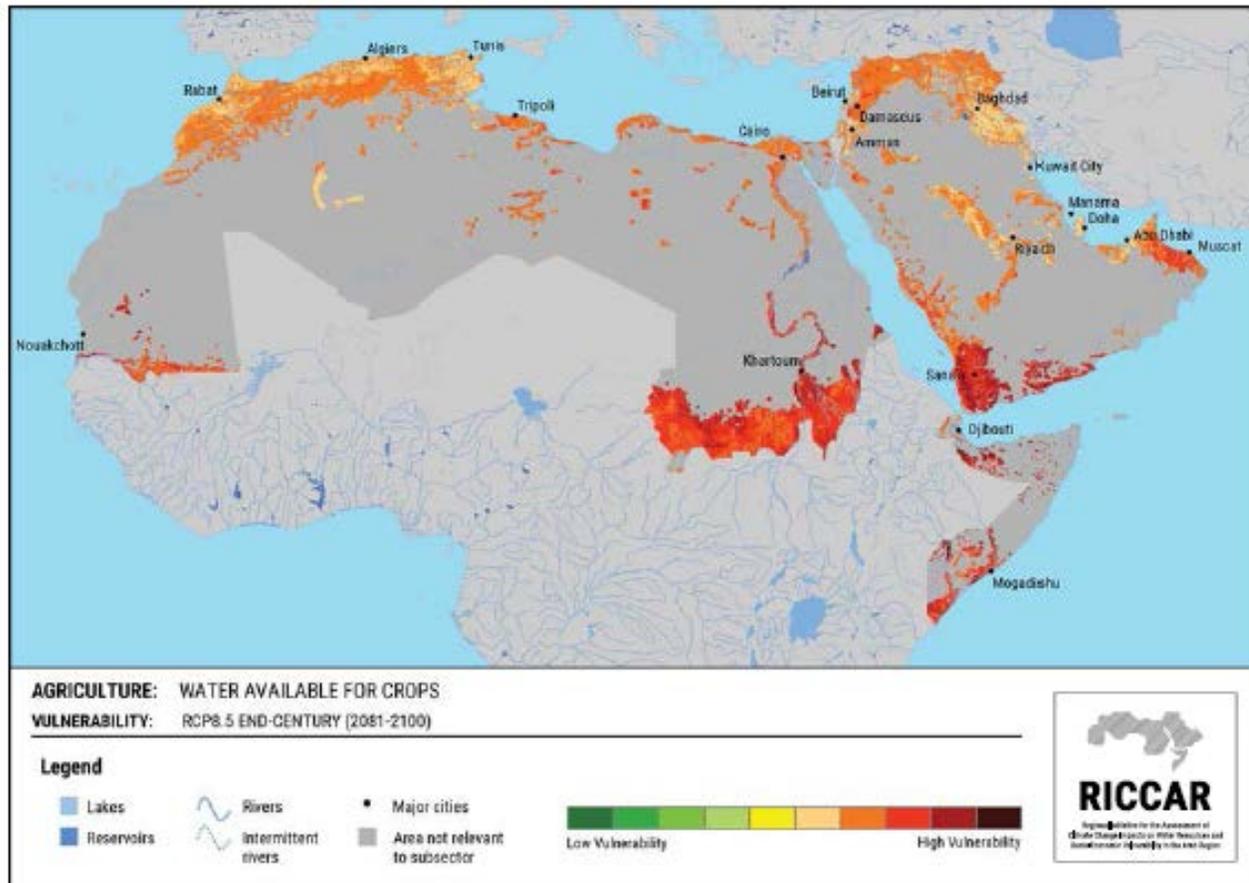


Irrigated



- Most Arab countries dependent on rainfed agriculture: Mashreq 57%, Maghreb > 80%
- Agriculture consumes up to 80% of fresh water
- Low water productivity & inefficiency in irrigation causing 60% of water losses

Climate Change Vulnerability of Crops due to changes in Water Availability



- **By 2030, climate change will reduce renewable water resources by 20%**
- **By 2080, climate change will decrease agriculture output by over 20%**
- Land degradation affects 92% of hyper arid land & 73% of arable land, costing \$9 billion/year (2-7% of countries' GDP)
- Region also affected by sand & dust storms, which impact agricultural productivity and health

Scenario	% of study area experiencing vulnerability			Study area % of Arab region	Defined study area
	Low	Moderate	High		
Mid-Century RCP 4.5	0%	50%	50%	22%	<ul style="list-style-type: none"> • Rainfed areas • Irrigated areas
Mid-Century RCP 8.5	0%	33%	67%		
End-Century RCP 4.5	0%	43%	57%		
End-Century RCP 8.5	0%	16%	84%		

Climate Resilient Agriculture: Translating Data to Policy Actions



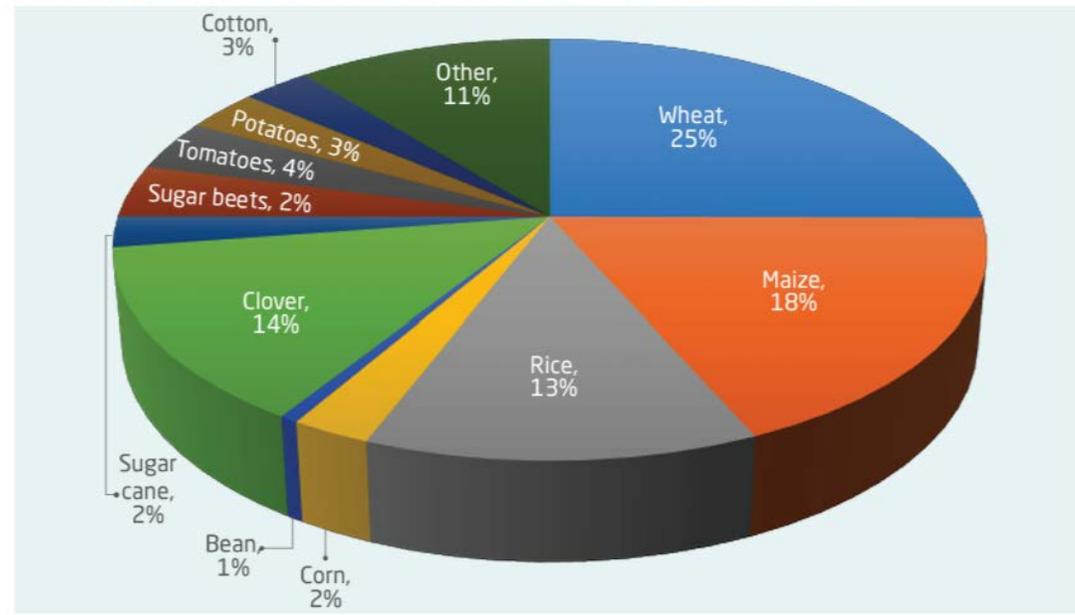
Assessing the impacts of a climate change & changing water availability on agricultural production in selected Arab countries

- Climate Resilient Agriculture: Translating Data on Policy Actions in Jordan
- Climate Resilient Agriculture: Translating Data on Policy Actions in Egypt
- Climate Resilient Agriculture: Translating Data on Policy Actions in Morocco
- Climate Resilient Agriculture: Translating Data on Policy Actions in Tunisia
- Climate Resilient Agriculture: Translating Data on Policy Actions in Lebanon
- Climate Resilient Agriculture: Translating Data on Policy Actions in Sudan
- Climate Resilient Agriculture: Translating Data on Policy Actions in Palestine
- Climate Resilient Agriculture: Translating Data on Policy Actions in Iraq
- Climate Resilient Agriculture: Translating Data on Policy Actions in Yemen

<https://www.unescwa.org/publications/climate-resilient-agriculture-translating-data-policy-actions>

Egypt: Projected climate impacts on Wheat & Maize

Figure 1. Crop distribution in Egypt (% of the total cultivated area) 2006 -2016



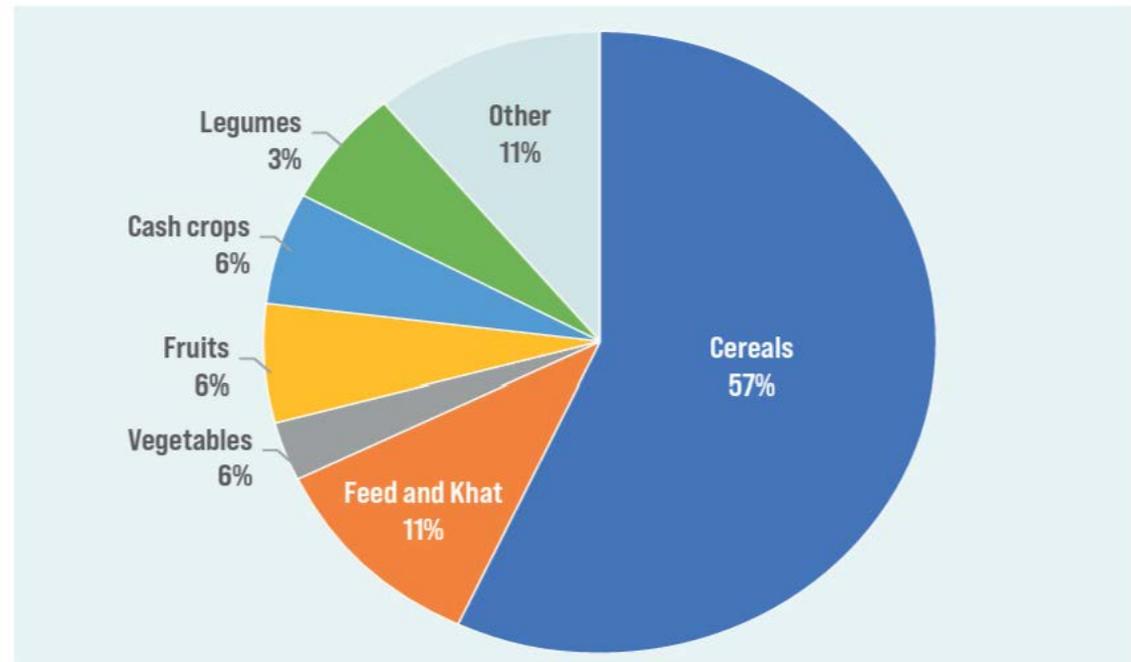
- RCP 4.5: The productivity of **wheat** decreases by 1.7 and 3.9% for 2025 and 2045 periods, respectively.
- RCP 8.5: The productivity of wheat decreases by 2.9 and 5.7 % for the 2025 and 2045, respectively
- RCP 4.5 & 8.5: The productivity of **maize** decreases by just under 3%

Source: ESCWA/ACSAD based on RICCAR & AquaCROP in cases of fixed CO2

<https://www.unescwa.org/publications/climate-resilient-agriculture-translating-data-policy-actions>

Yemen: Projected climate impacts on Wheat & Sesame

Figure 1. Distribution of crop types in Yemen (by area)



Source: Ministry of Agriculture and Irrigation, 2016.

Water losses from inefficient irrigation systems, as a significant volume of water (estimated at 50-65%)

RCP 4.5 scenario:

- For **Wheat**: length of growing season decrease by 3 days in the 2025 & 2045 periods.
- **Wheat** productivity around Sana'a decreases by 4.24 and 6.11% in the two periods; Crop water productivity decreases to 0.70 and 0.68 kg/m³ in the two periods
- For **Sesame** around Al Khoud , productivity increases by 3.7 and 3.2

RCP 8.5 scenario:

- Length of growing season decrease by 2.4 and 4.5 days the 2025 & 2045 periods.
- **Wheat** productivity decreases by 3.81 and 7.62% in the two periods; Crop water productivity decreases to 0.69 and 0.67 kg/m³ in the two periods
- For **Sesame**, productivity decreases by 1.71 and 8.39

Source: ESCWA/ACSAD based on RICCAR & AquaCROP in cases of fixed CO₂

The changing climate is suited to some crops, such as sesame, which is expected to see increasing yields in moderate scenario

Addressing climate change in agriculture: Adaptation & Mitigation



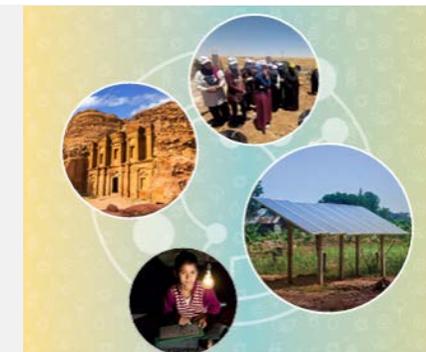
Adaptation Framework



Gender Dimension

REGEND: Regional Initiative for Promoting Small-Scale Renewable Energy Applications in Rural Areas of the Arab Region

RE for agricultural development in Jordan, Lebanon and Tunisia



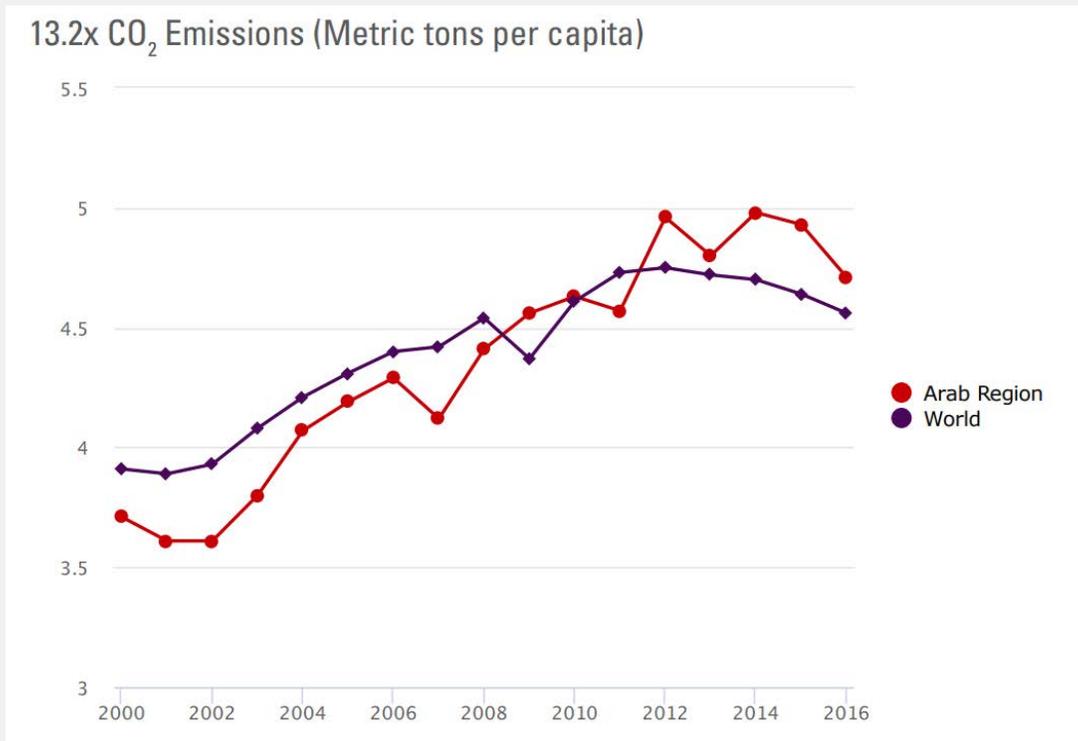
Regional Initiative for Promoting Small-scale Renewable Energy Applications in Rural Areas of the Arab Region
Study on Gender Mainstreaming, Social Inclusion, Human Rights Processes and Outcomes of Access to Energy in Targeted Local Communities in Jordan



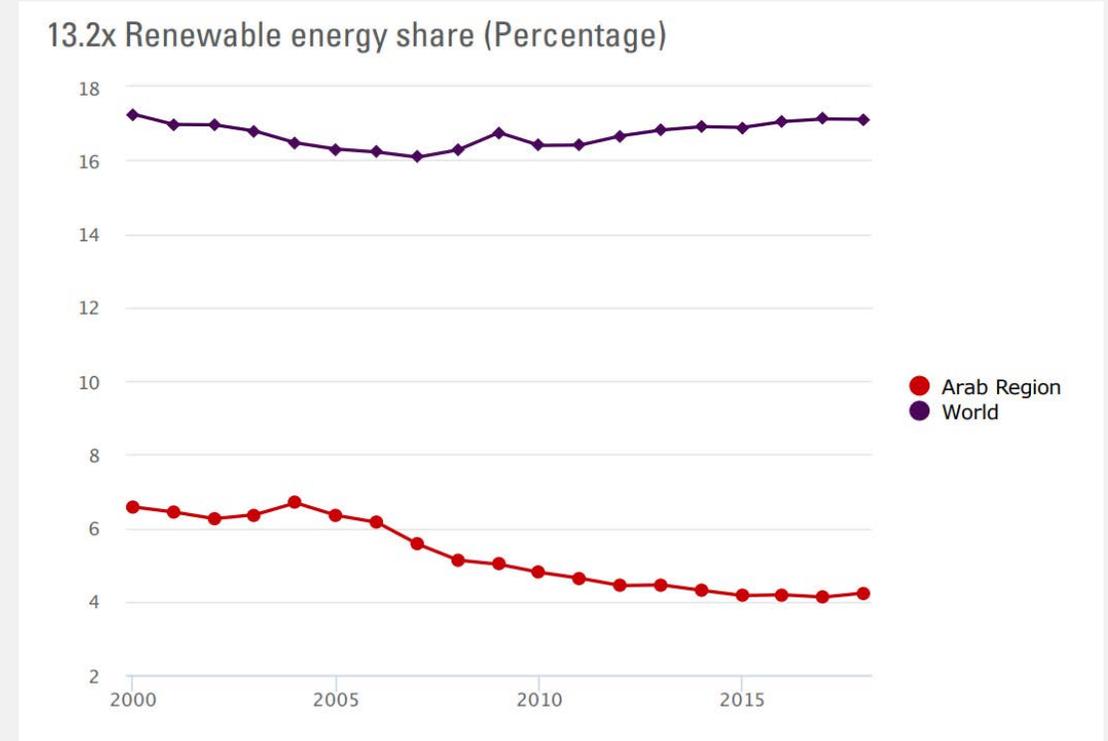
ILO, 2017; Empowering young women through Business and Vocational Training: Evidence from a field intervention in rural Egypt

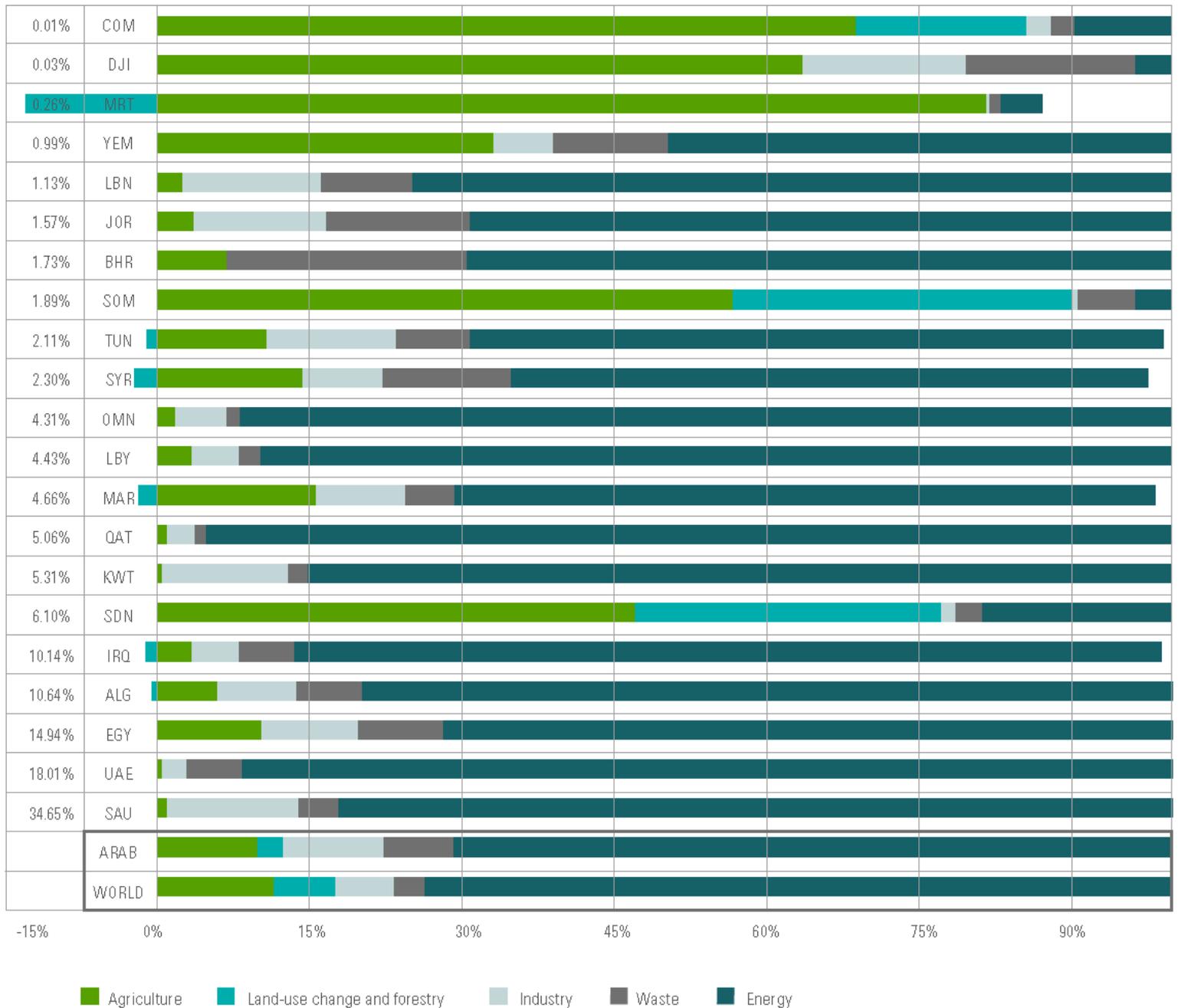
Energy - Climate Change, Environment & Development Challenge

Per capita CO₂ emissions in the region continues to hover around global averages.



The share of renewable energy in total consumption is decreasing and remains well below the world's average.





Greenhouse Gas Emissions by Sector in Arab Countries

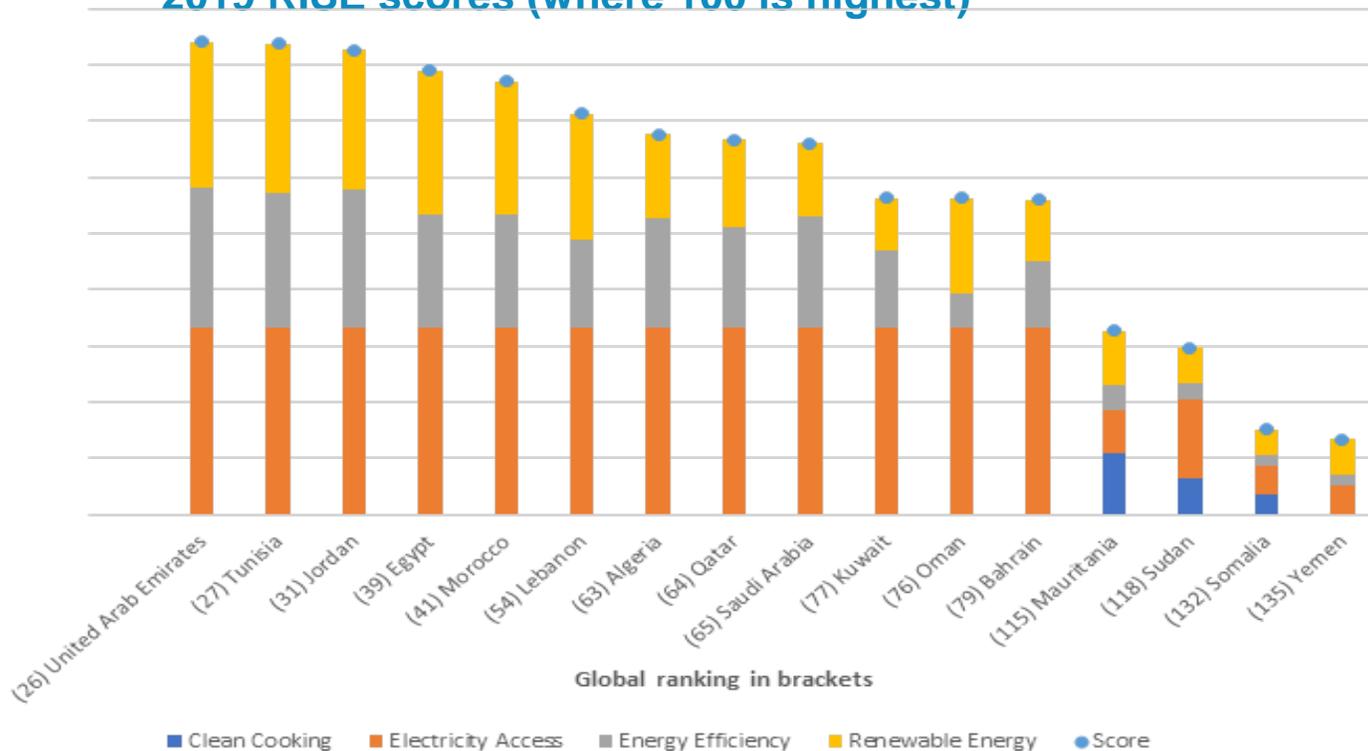
Oil and gas exports account for 65 – 90% of government revenues in the GCC economies, and for over 80% of export revenue in Saudi Arabia, Kuwait and Qatar

Source: World Bank, 2015

The Positive & The Negative

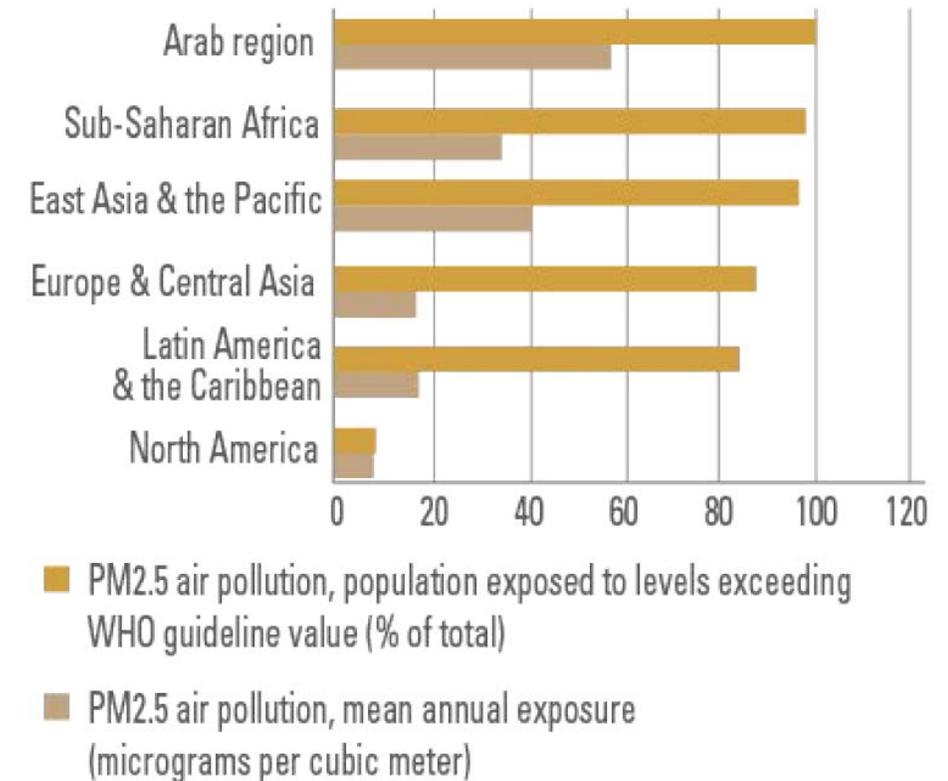
Near-universal access to modern energy but very slow progress in **energy efficiency** and a marginal role of **renewable energy**

2019 RISE scores (where 100 is highest)



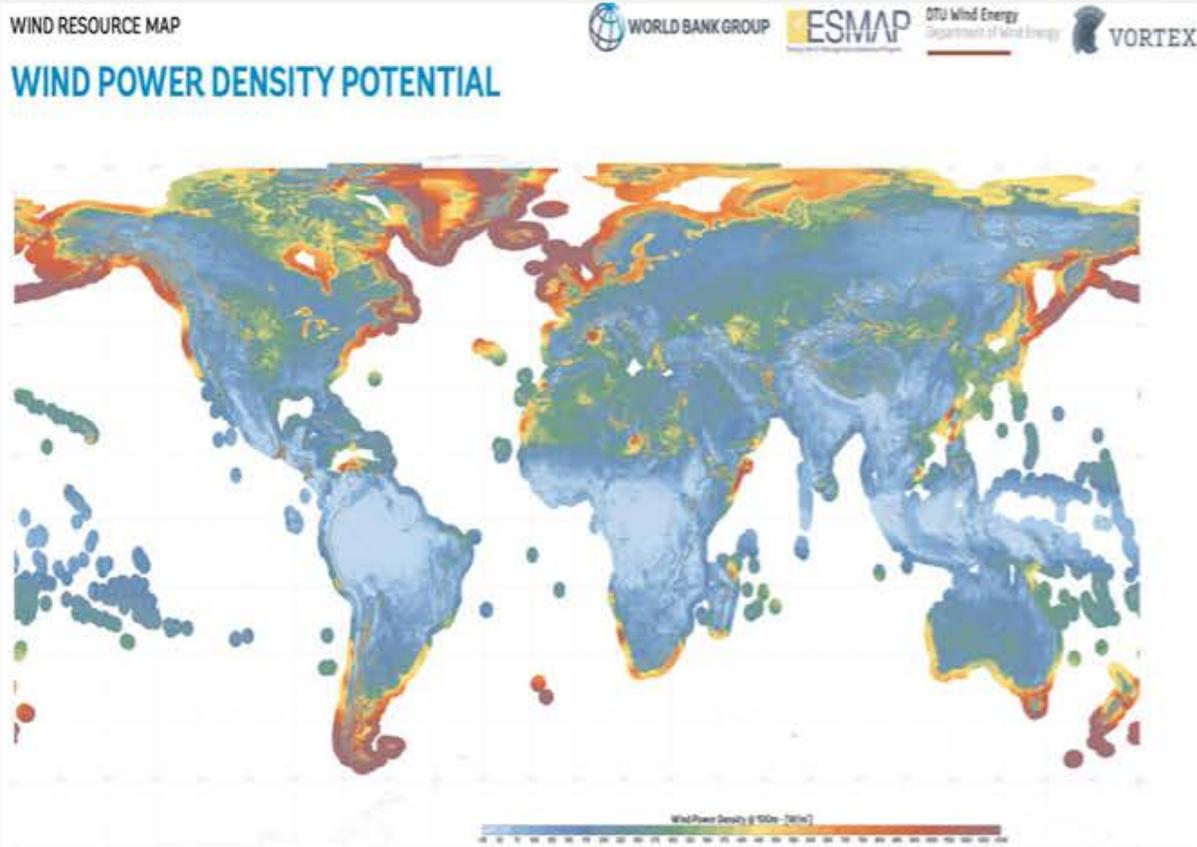
Source: Regulatory Indicators for Sustainable Energy (RISE)

M2.5 air pollution (annual mean, $\mu\text{g}/\text{m}^3$)
(WHO long-term guideline value = $10 \mu\text{g}/\text{m}^3$)

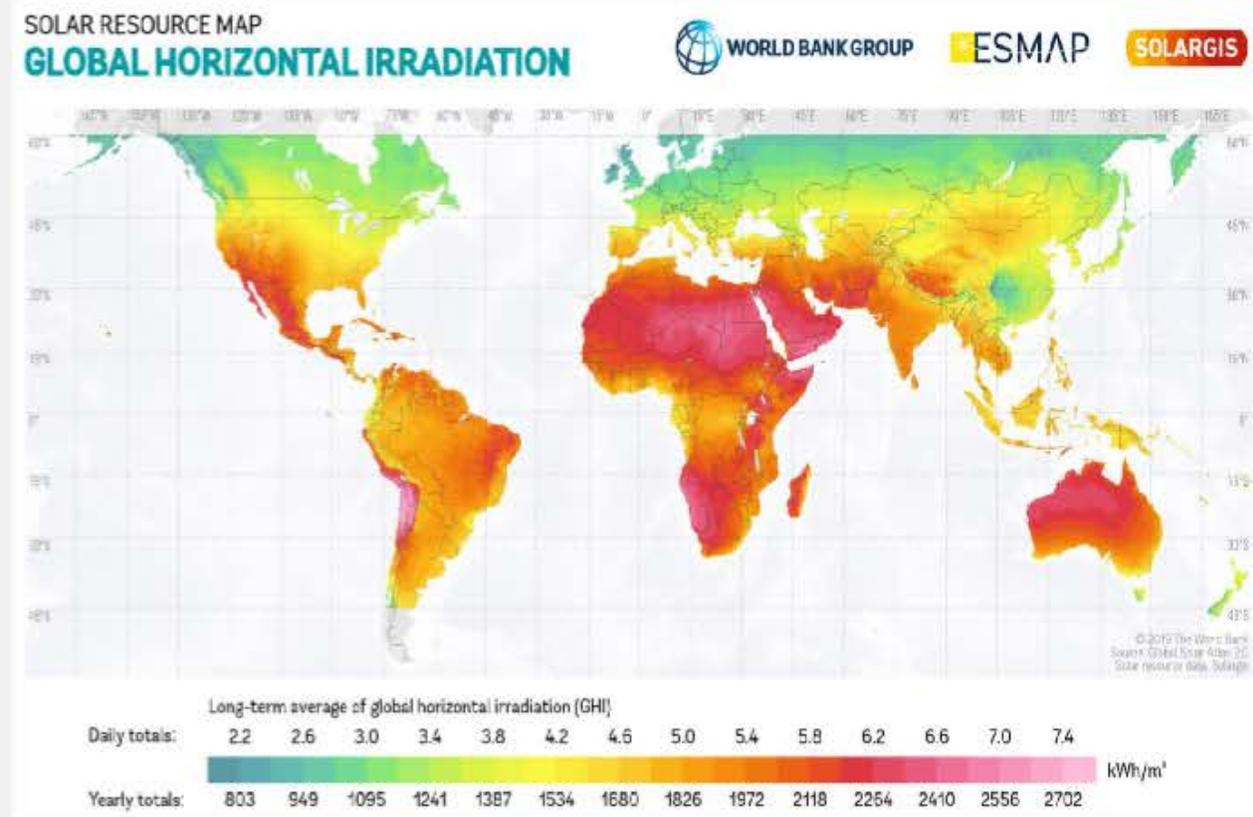


Potential for Greater Investment in Renewable Energy

Favourable wind potential



High solar irradiation

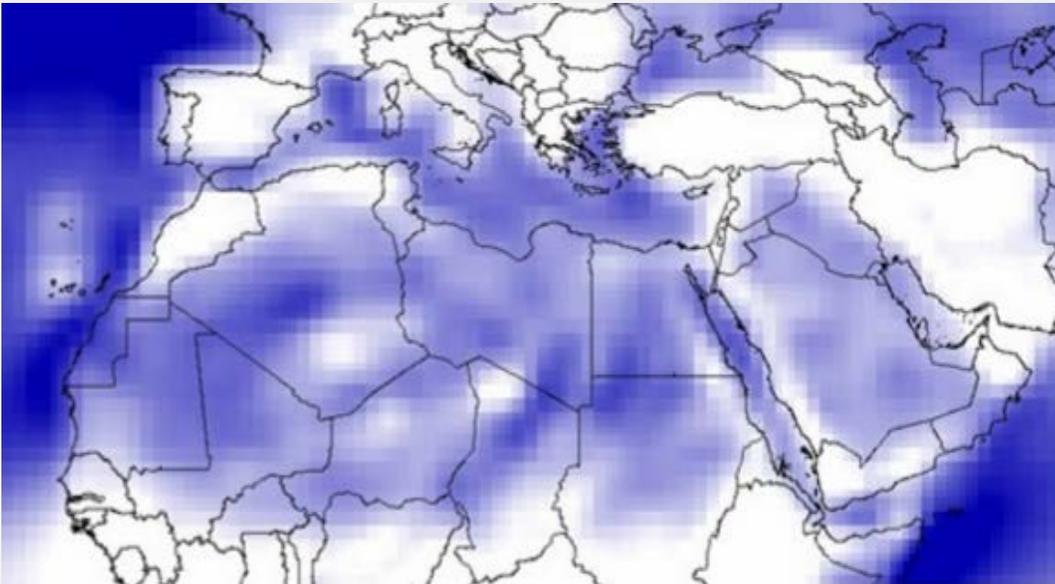


POTENTIAL BLUE AND GREEN HYDROGEN DEVELOPMENTS IN THE ARAB COUNTRIES AS WELL

Blue hydrogen produced from fossil fuels (mainly natural gas) with CCS or CCUS & Green hydrogen produced using renewable energy sources

Modern Renewable Energy

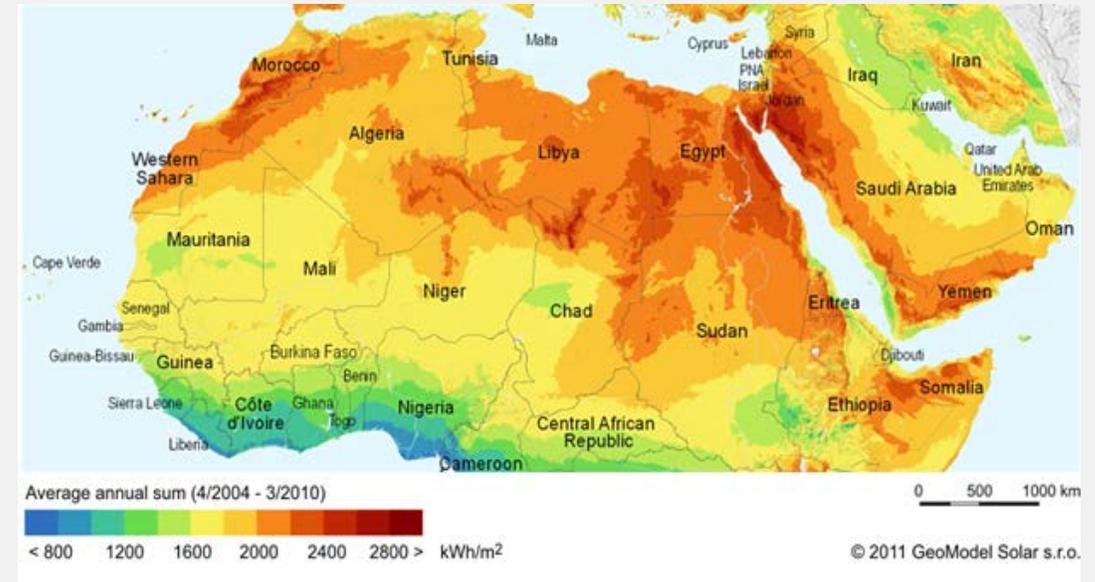
Map of the Variable Wind Speeds in the Arab Region



Source: Pan-Arab Renewable Energy Strategy 2030, IRENA 2014

- Wind speed suitable for the production of electricity in various locations of many countries
- High Solar Irradiance
- Vast desert lands, semi-flat, and mostly uninhabited

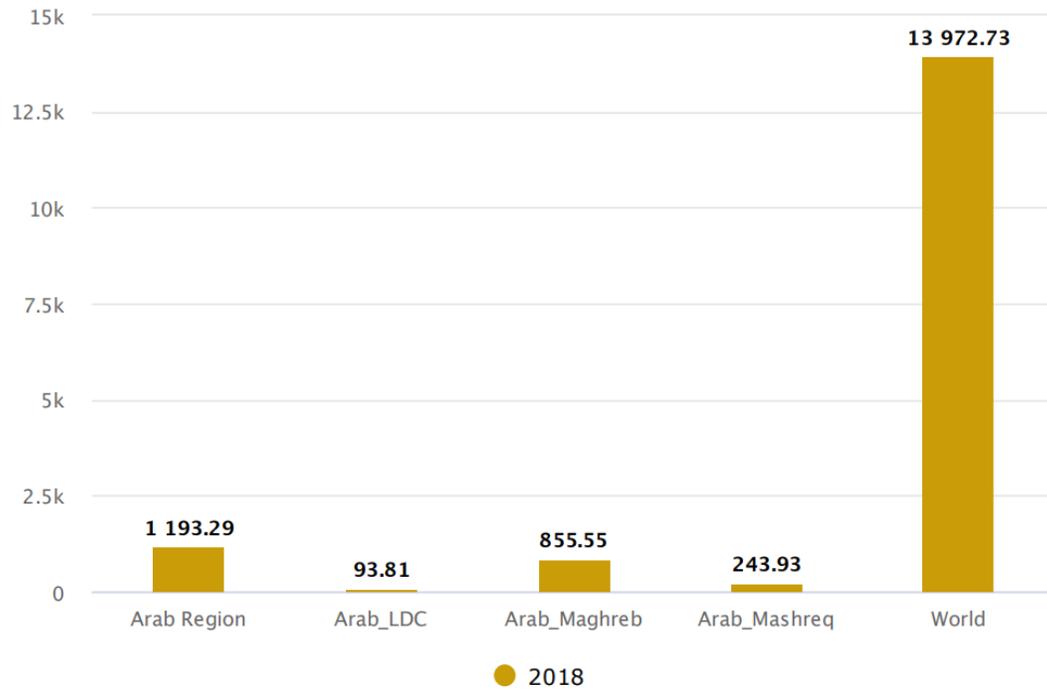
Direct Normal Radiation in the Arab Region



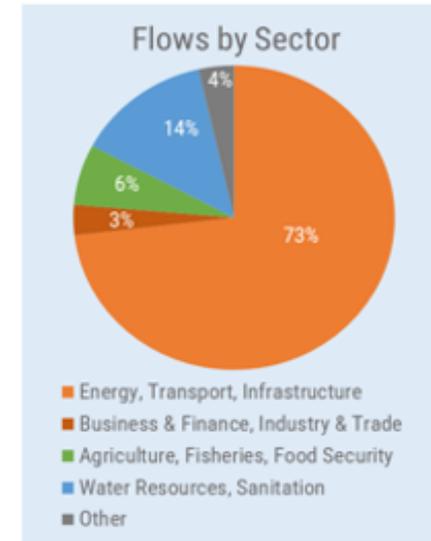
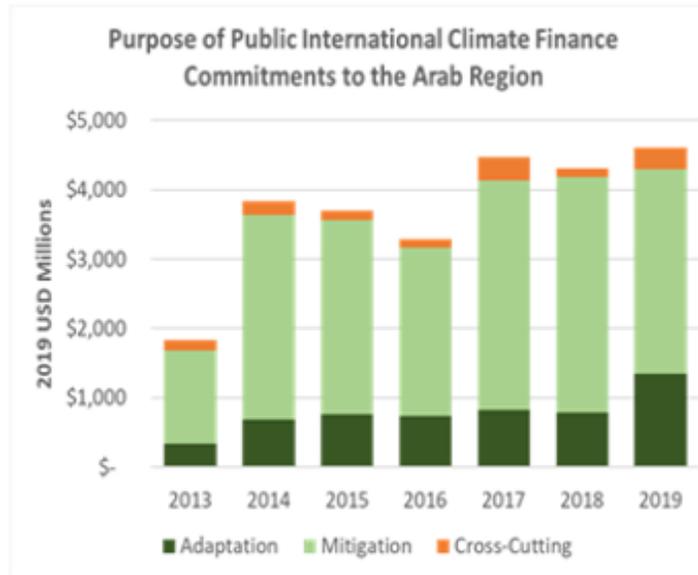
Source: solargis.info/doc/free-solar-radiation-maps-GHI

Financial Flows into Clean Energy

7.a.1 International financial flows into clean energy (Millions of dollars)



Adaptation is the priority for Arab States. Yet the region receive 3.5 times more climate finance for mitigation than adaptation (2013-2019).



Support is not reaching the most vulnerable: 6 Arab LDCs received just 5% of total commitments and 18% of adaptation commitments.

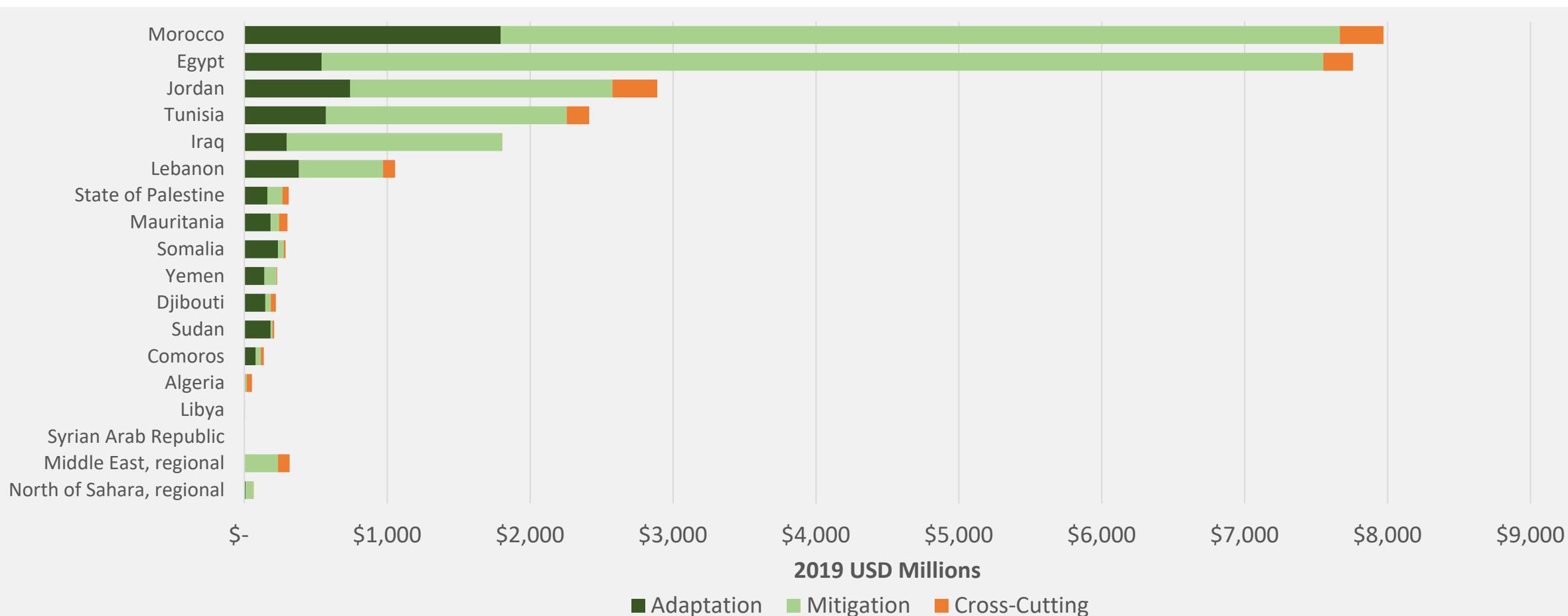
Source: ESCWA, Annual SDG Review, 2022
<https://www.unescwa.org/sites/default/files/inline-files/annual-sdg-review-2022-data-english.pdf>

Source: ESCWA, Climate Finance in Arab Region, presented at COP-26 (Glasgow)

Support is skewed towards Mitigation & is not reaching the most vulnerable.

6 Arab LDCs received just 5% of total commitments and 18% of adaptation commitments

Public International Climate Finance Commitments to the Arab Region by Purpose and Recipient (2013-2019)



Source: Figures developed by ESCWA based on OECD-DAC climate-related development finance databases. Figures labeled as "climate is primary objective" include commitments reported to the OECD with climate marked as a "principal" objective as well as "climate components" reported by multilateral development banks.

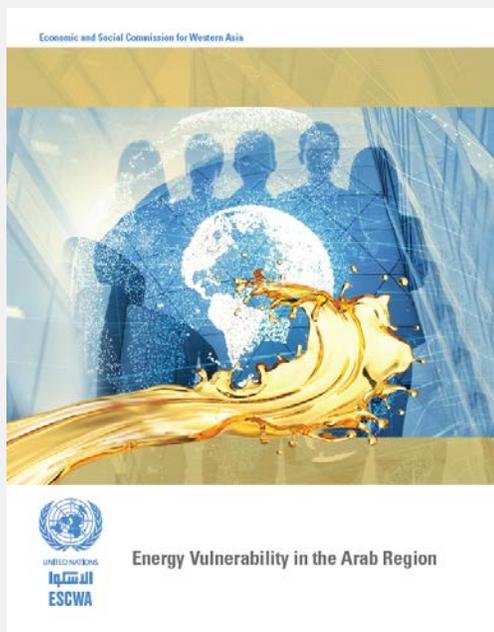
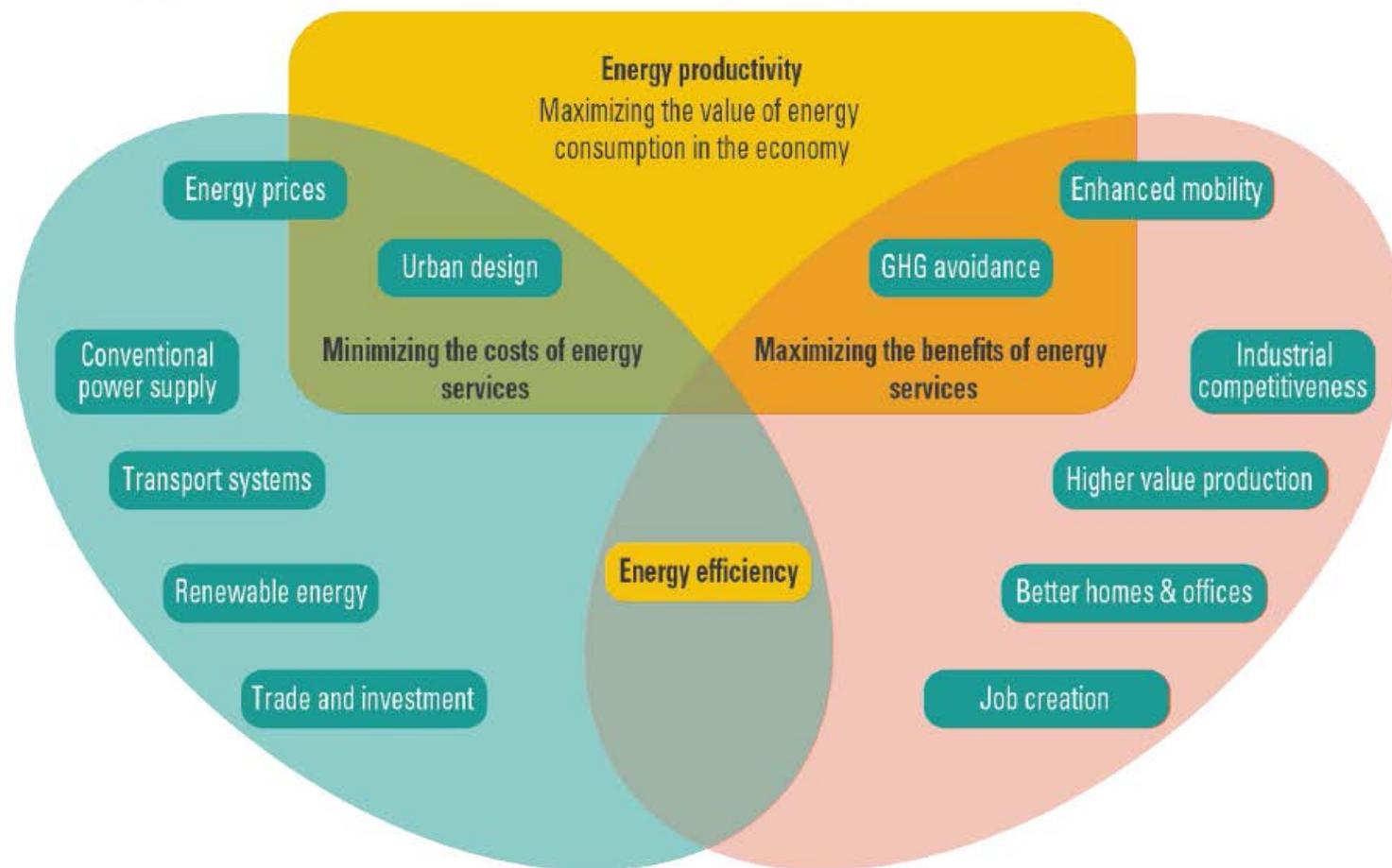
Table 6. Major renewable energy projects financed by MDBs and development institutions

Project	Location	Type	MW	Date	Financiers
Gebel El Zeit	Egypt	Wind	220	2018	JICA
Gebel El Zeit	Egypt	Wind	160	2018	EU/EIB/KfW
Quweira	Jordan	PV	103	2018	ADFD
Al Rajef	Jordan	Wind	86	2018	EBRD
Noor PV1	Morocco	PV	170	2018	EIB/KfW
Noor II & III	Morocco	CSP	350	2018	JBIC/Int. banks
Gulf of Suez	Egypt	Wind	250	2019	EIB/KfW
Tiskrad	Morocco	Wind	300	2020	EIB/KfW
Midelt	Morocco	Wind	150	2020	EIB/KfW
Jbel Lahdid	Morocco	Wind	200	2020	EIB/KfW
Boujdour	Morocco	Wind	100	2020	EIB/KfW
Tangier II	Morocco	Wind	100	2020	EIB/KfW

Source: APICORP, 2018b

Enhancing Energy Productivity requires an Integrated Development Pathway & a Just and Inclusive Sustainable Energy Transition

Figure 26. Energy productivity is an integrated economic policy agenda



<https://www.unescwa.org/publications/energy-vulnerability-arab-region>

Climate mainstreaming is a multi-stage process

- Assessment for informed planning and decision-making
- Integrated planning for advancing climate commitments
- Inclusive budgetary and regulatory processes
- Financing climate action
- Accountability through improved monitoring and evaluation for increased accountability
- Accessing knowledge and building capacity



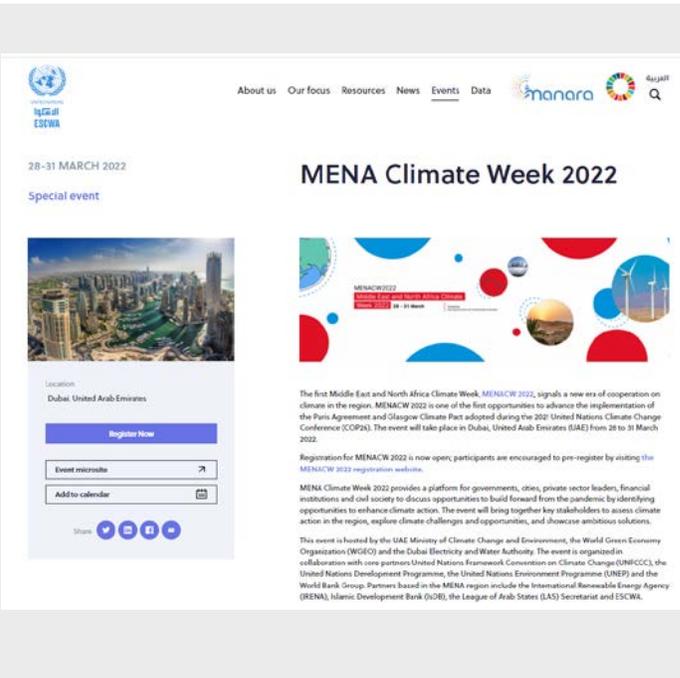


Shared Prosperity Dignified Life



Thank you

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www.riccar.org



<https://www.unescwa.org/events/mena-climate-week-2022>

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