



Vulnerability of agricultural employment to climate change

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Employment rate for the agricultural sector

Study area



People

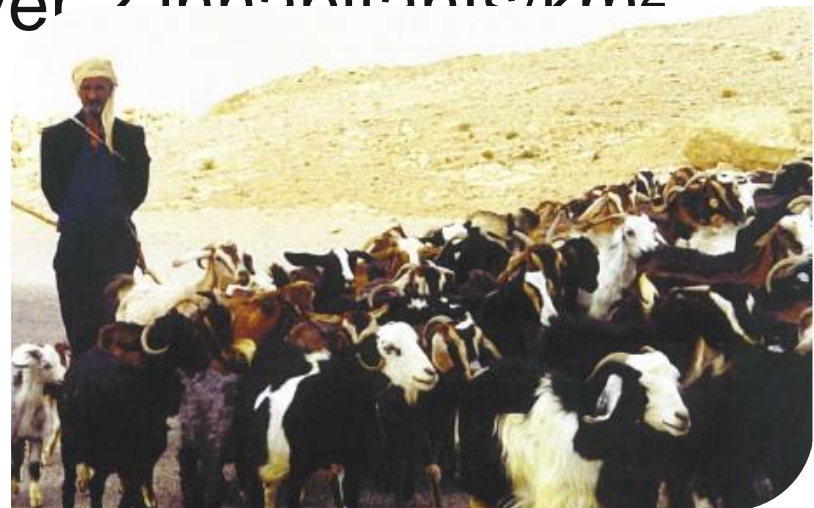
Water available for drinking

Health conditions due to heat stress

Employment rate for the agricultural sector

Study area based on *population density* indicator

Population density over 2 inhabitants/km²



EXPOSURE (0.50)

RCM

- Change in temperature (0.17)
- Change in precipitation (0.17)

RHM

- Change in evapotranspiration (0.17)

EXTREME EVENTS INDICES

- Change in maximum length of dry spell (0.16)
- Change in annual count of 10 mm precipitation days (0.16)
- Change in annual count of 20 mm precipitation days (0.16)

6
Exposure
indicator
s

SENSITIVITY (0.50)

POPULATION (0.50)

- Population density (0.10)*
- Share of agricultural labor force in total labor (0.50)
- Share of water consumption in agriculture (0.12)
- Share of agriculture in GDP (0.11)
- Refugee population (0.09)
- Migrant population (0.09)

NATURAL (0.25)

- Degradation of vegetation cover (0.34)
- Livestock density (0.30)
- Rainfed crop areas (0.36)*

MANMADE (0.25)

- Irrigated crop areas (1.0)*

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Sensitivity
indicator
s

ADAPTIVE CAPACITY (0.50)

KNOWLEDGE & AWARENESS (0.10)

- E-Government development (0.34)
- Tertiary enrollment (0.32)
- Adult literacy rate (0.34)

TECHNOLOGY (0.10)

- Number of scientific and technical journal articles (0.42)
- Information and communication technologies index (0.58)

INSTITUTIONS (0.10)

- Governance index (0.56)
- Disaster risk reduction committees (0.44)

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 (0.16)

- Environment performance index (1.0)

ENERGY (0.17)

- Access to electricity (0.50)
- Energy consumption (0.50)

TRANSPORT (0.17)

- Density of road network (1.0)

ECONOMIC RESOURCES (0.11)

- GDP per capita (0.36)
- ODA (0.29)
- Food imports as % of merchandise exports (0.35)*

EQUITY (0.08)

- Female-to-male unemployment rate (0.32)
- Female-to-male literacy ratio (0.31)
- Migrants/refugees index (0.37)

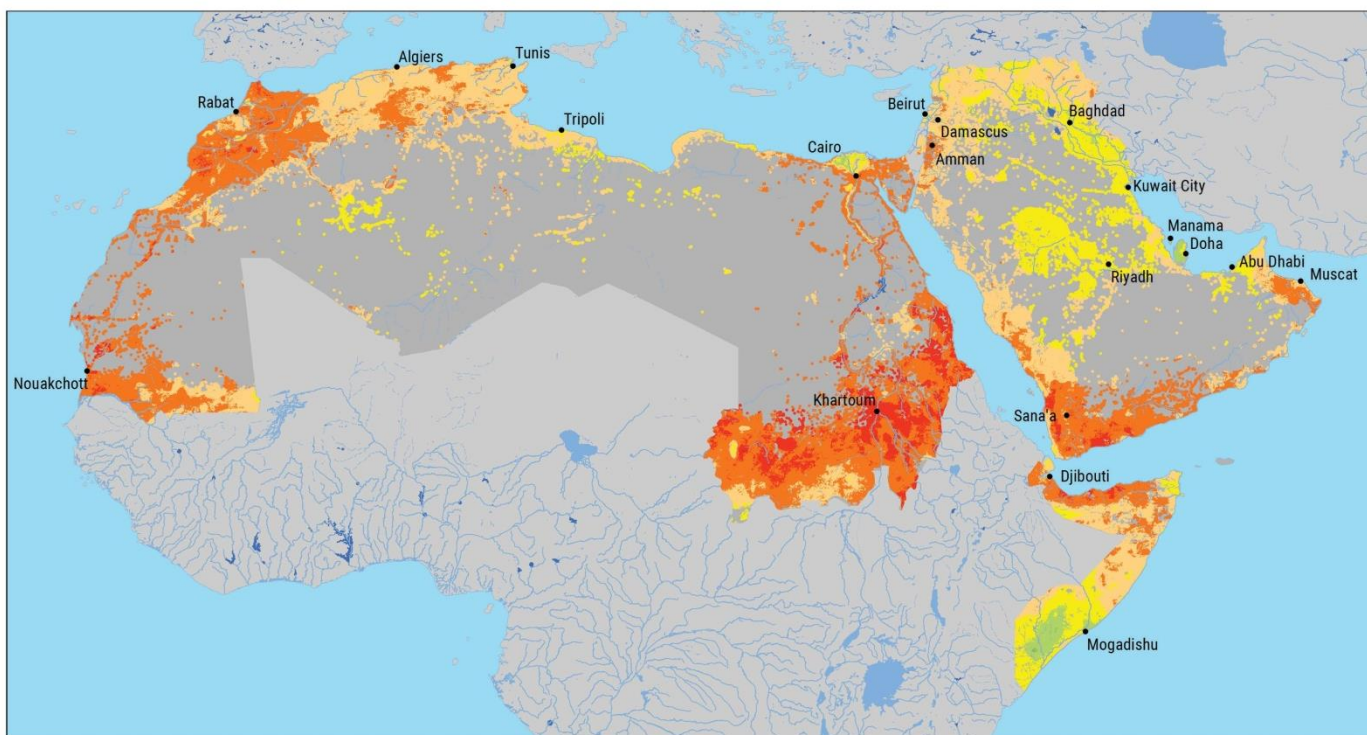
23
Adaptive
Capacity
indicator
s

POTENTIAL IMPACT
(0.50)

VULNERABILITY
ASSESSMENT

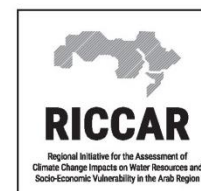
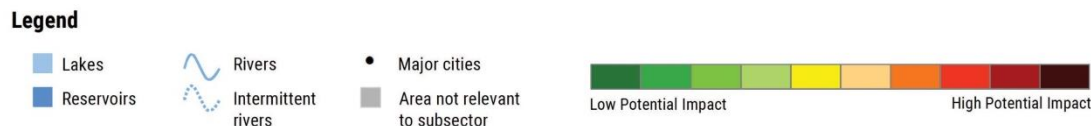
Impact chain:
Employment
rate for the
agricultural
sector





PEOPLE: EMPLOYMENT RATE FOR THE AGRICULTURAL SECTOR

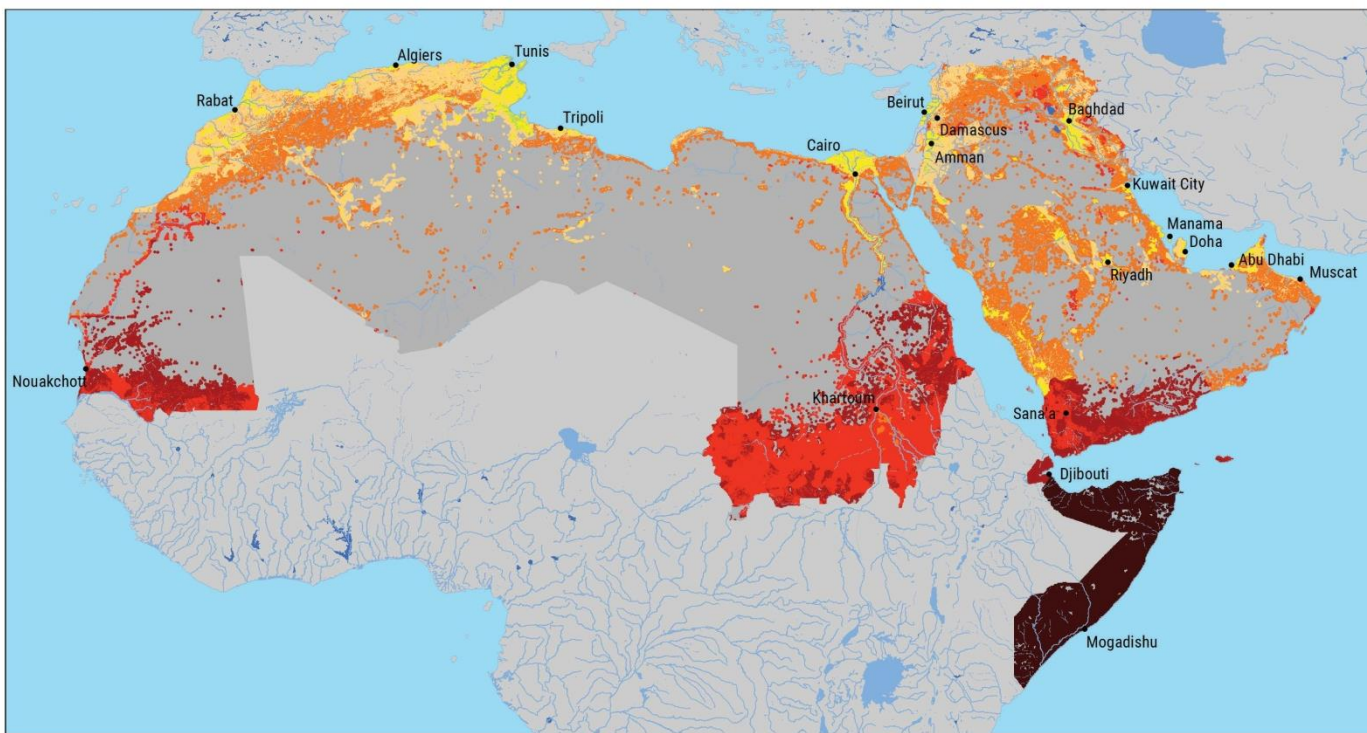
POTENTIAL IMPACT: RCP8.5 END-CENTURY (2081-2100)



Areas with highest potential impact:

- Rif region
- Western Tindouf basin/Taoudeni basin
- Western North Africa coastline
- Upper Nile Basin
- Southern coastline of the Arabian Peninsula

Scenario	Percentage of study area		
	Low PI	Moderate PI	High PI
RCP 4.5 Mid-century	0%	86%	14%
RCP 8.5 Mid-century	0%	70%	30%
RCP 4.5 End-century	0%	71%	29%
RCP 8.5 End-century	0%	54%	46%



Areas with lowest adaptive capacity:

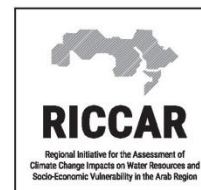
- Horn of Africa
- Western Sahel
- SW Arabian Peninsula

PEOPLE: EMPLOYMENT RATE FOR THE AGRICULTURAL SECTOR

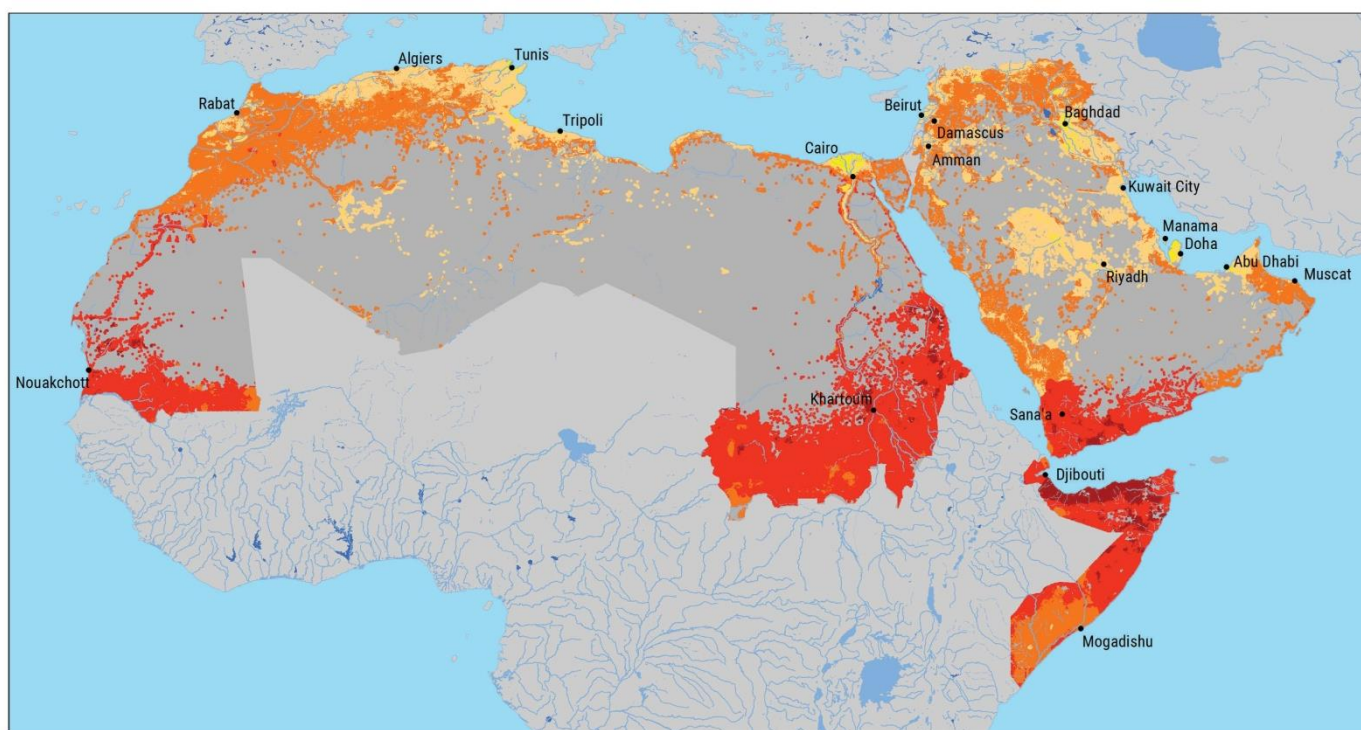
ADAPTIVE CAPACITY

Legend

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



Scenario	Percentage of study area		
	Low AC	Moderate AC	High AC
All climate scenarios	45%	54%	1%

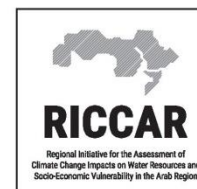


PEOPLE: EMPLOYMENT RATE FOR THE AGRICULTURAL SECTOR

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

Legend

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



Areas with highest vulnerability:

- Selected areas near Gulf of Aden
- Central eastern Red Sea area

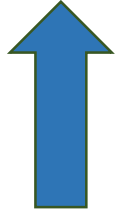
Areas with lowest vulnerability:

- Lower Nile River valley

Scenario	Percentage of study area		
	Low Vul	Moderate Vul	High Vul
RCP 4.5 Mid-century	0%	39%	61%
RCP 8.5 Mid-century	0%	28%	72%
RCP 4.5 End-century	0%	36%	65%
RCP 8.5 End-century	0%	23%	77%

Vulnerability trends mid- to end-century

Employment rate for the agricultural sector



- Sub-Saharan Africa
- Northern Maghreb
- Central eastern Red Sea area



- Horn of Africa
- Tigris–Euphrates basin
- Oman Mountains



Averages for selected sensitivity indicators

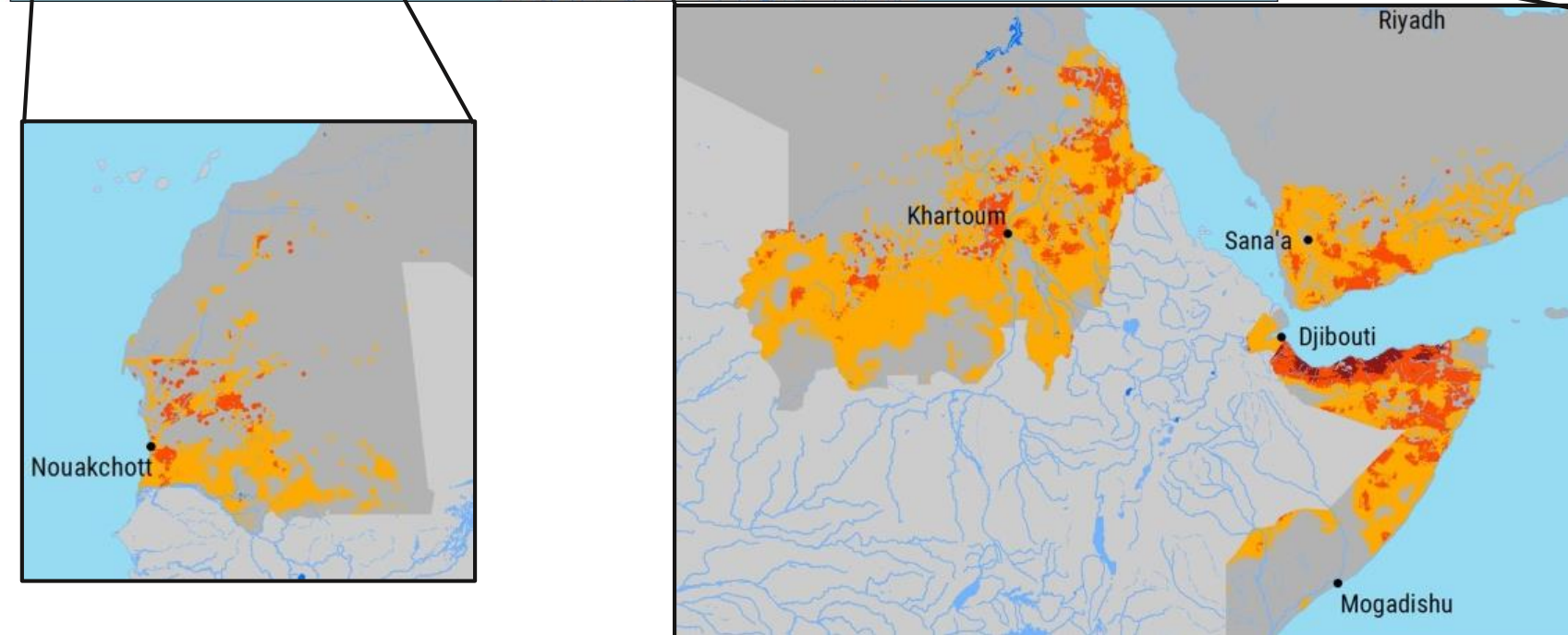
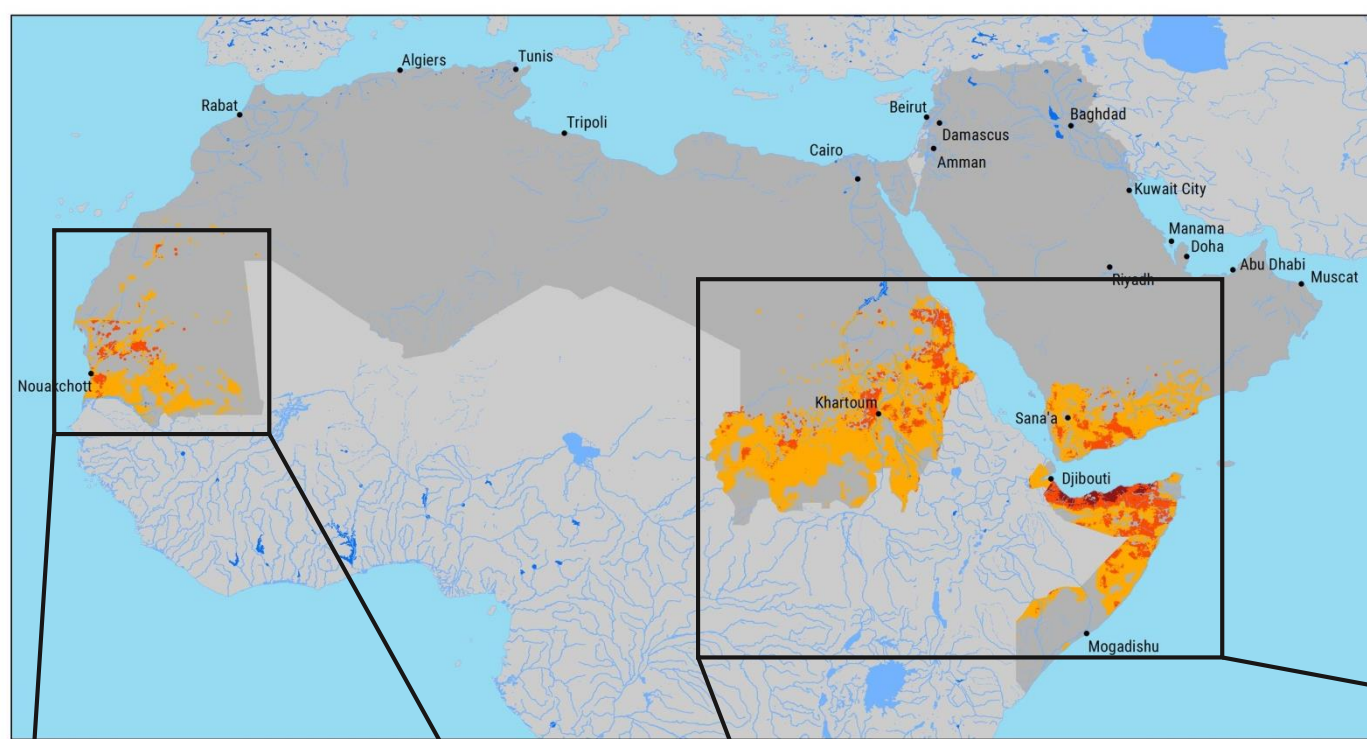
Employment rate for the agricultural sector

Sensitivity indicator	Units	Climate scenario	Average vulnerability classification for subsector		Average all agricultural areas
			Moderate	High	
Per cent rainfed cropland area	%	Mid-Century RCP 4.5	14.5	5.4	10.2
		Mid-Century RCP 8.5	17.3	5.7	
		End-Century RCP 4.5	15.9	5.3	
		End-Century RCP 8.5	17.8	6.3	
Per cent irrigated cropland area	%	Mid-Century RCP 4.5	5.4	0.6	2.7
		Mid-Century RCP 8.5	7.1	0.6	
		End-Century RCP 4.5	6.0	0.6	
		End-Century RCP 8.5	8.4	0.6	
Average livestock density	heads/km ²	Mid-Century RCP 4.5	17	35	33
		Mid-Century RCP 8.5	18	32	
		End-Century RCP 4.5	18	34	
		End-Century RCP 8.5	18	31	

Vulnerability

hotspots:

- North and central Horn of Africa
- SW Arabian Peninsula
- Sub-Saharan Africa





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

Thank you



People

Water available for drinking
Health conditions due to heat stress
Employment rate for the agricultural sector

