Vulnerability of agricultural employment to climate change

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Employment rate for the agricultural sector

Study area

Study area based on *population density* indicator

Population density over 2 inhabitants/km²
Impact chain: Employment rate for the agricultural sector

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)

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)*

ADAPTIVE CAPACITY (0.50)
- POTENTIAL IMPACT (0.50)
- VULNERABILITY ASSESSMENT

- 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)
- EQUITY (0.08)
  - Female-to-male unemployment rate (0.32)
  - Female-to-male literacy ratio (0.31)
  - Migrants/refugees index (0.37)

Adaptive Capacity indicators

23 adaptive capacity indicators
### 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

### Percentage of study area

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Low PI</th>
<th>Moderate PI</th>
<th>High PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP 4.5 Mid-century</td>
<td>0%</td>
<td>86%</td>
<td>14%</td>
</tr>
<tr>
<td>RCP 8.5 Mid-century</td>
<td>0%</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>RCP 4.5 End-century</td>
<td>0%</td>
<td>71%</td>
<td>29%</td>
</tr>
<tr>
<td>RCP 8.5 End-century</td>
<td>0%</td>
<td>54%</td>
<td>46%</td>
</tr>
</tbody>
</table>
### Areas with lowest adaptive capacity:
- Horn of Africa
- Western Sahel
- SW Arabian Peninsula

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**Scenario** | **Percentage of study area**
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All climate scenarios | 45% Low AC | 54% Moderate AC | 1% High AC
<table>
<thead>
<tr>
<th>Scenario</th>
<th>Low Vul</th>
<th>Moderate Vul</th>
<th>High Vul</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP 4.5 Mid-century</td>
<td>0%</td>
<td>39%</td>
<td>61%</td>
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<tr>
<td>RCP 8.5 Mid-century</td>
<td>0%</td>
<td>28%</td>
<td>72%</td>
</tr>
<tr>
<td>RCP 4.5 End-century</td>
<td>0%</td>
<td>36%</td>
<td>65%</td>
</tr>
<tr>
<td>RCP 8.5 End-century</td>
<td>0%</td>
<td>23%</td>
<td>77%</td>
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</table>
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

<table>
<thead>
<tr>
<th>Sensitivity indicator</th>
<th>Units</th>
<th>Climate scenario</th>
<th>Average vulnerability classification for subsector</th>
<th>Average all agricultural areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per cent rainfed cropland area</td>
<td>%</td>
<td></td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mid-Century RCP 4.5</td>
<td>14.5</td>
<td>5.4</td>
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<tr>
<td></td>
<td></td>
<td>Mid-Century RCP 8.5</td>
<td>17.3</td>
<td>5.7</td>
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<tr>
<td></td>
<td></td>
<td>End-Century RCP 4.5</td>
<td>15.9</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>End-Century RCP 8.5</td>
<td>17.8</td>
<td>6.3</td>
</tr>
<tr>
<td>Per cent irrigated cropland area</td>
<td>%</td>
<td></td>
<td>Moderate</td>
<td>High</td>
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<tr>
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<td>Mid-Century RCP 4.5</td>
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<td>Mid-Century RCP 8.5</td>
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<td>0.6</td>
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<td>End-Century RCP 4.5</td>
<td>6.0</td>
<td>0.6</td>
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<tr>
<td></td>
<td></td>
<td>End-Century RCP 8.5</td>
<td>8.4</td>
<td>0.6</td>
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<tr>
<td>Average livestock density</td>
<td>heads/km²</td>
<td></td>
<td>Moderate</td>
<td>High</td>
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<tr>
<td></td>
<td></td>
<td>Mid-Century RCP 4.5</td>
<td>17</td>
<td>35</td>
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<tr>
<td></td>
<td></td>
<td>Mid-Century RCP 8.5</td>
<td>18</td>
<td>32</td>
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<tr>
<td></td>
<td></td>
<td>End-Century RCP 4.5</td>
<td>18</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>End-Century RCP 8.5</td>
<td>18</td>
<td>31</td>
</tr>
</tbody>
</table>
Vulnerability hotspots:

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

People

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