

Green Economy and Environment- Water and Climate change

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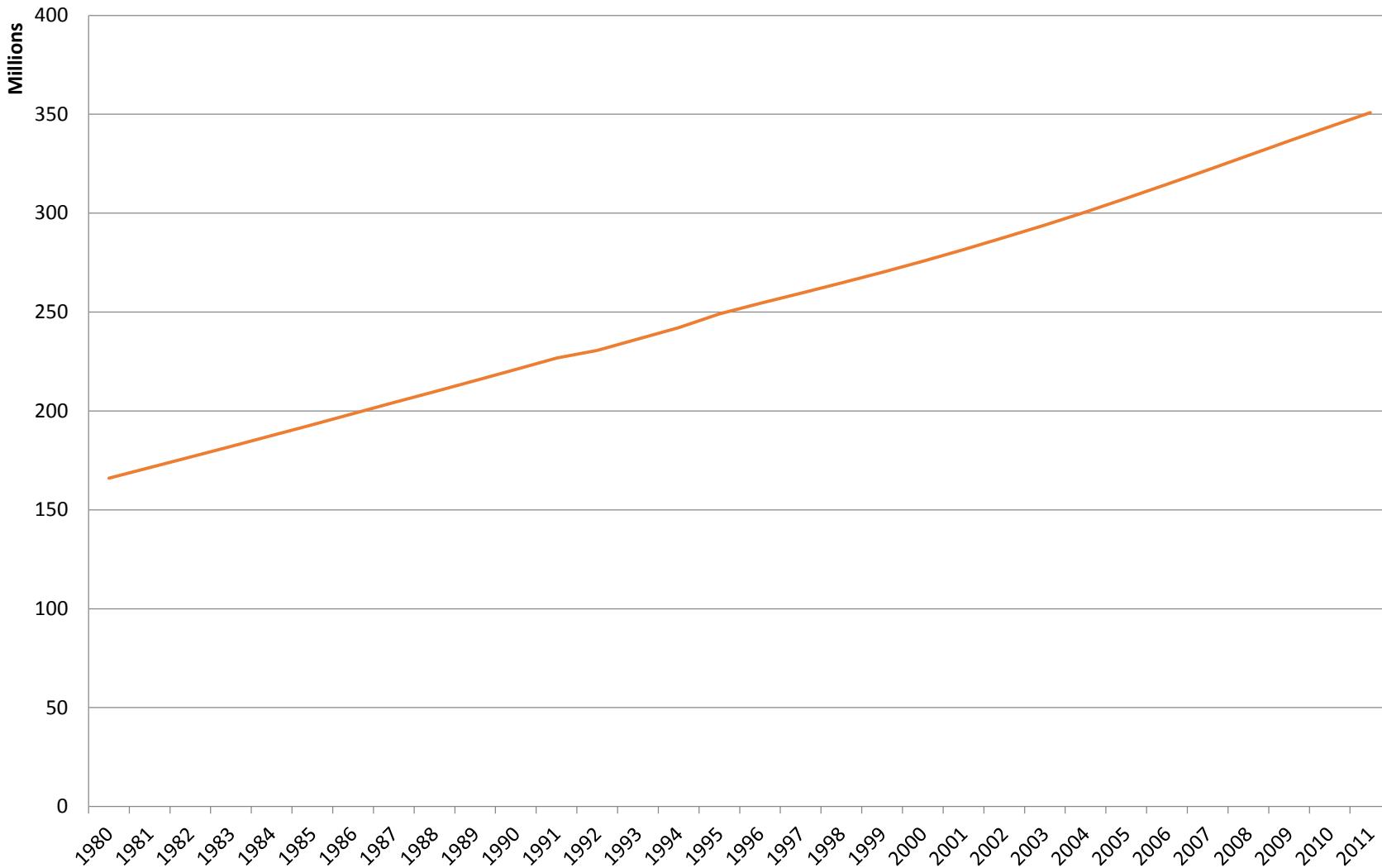
GIZ

Outline

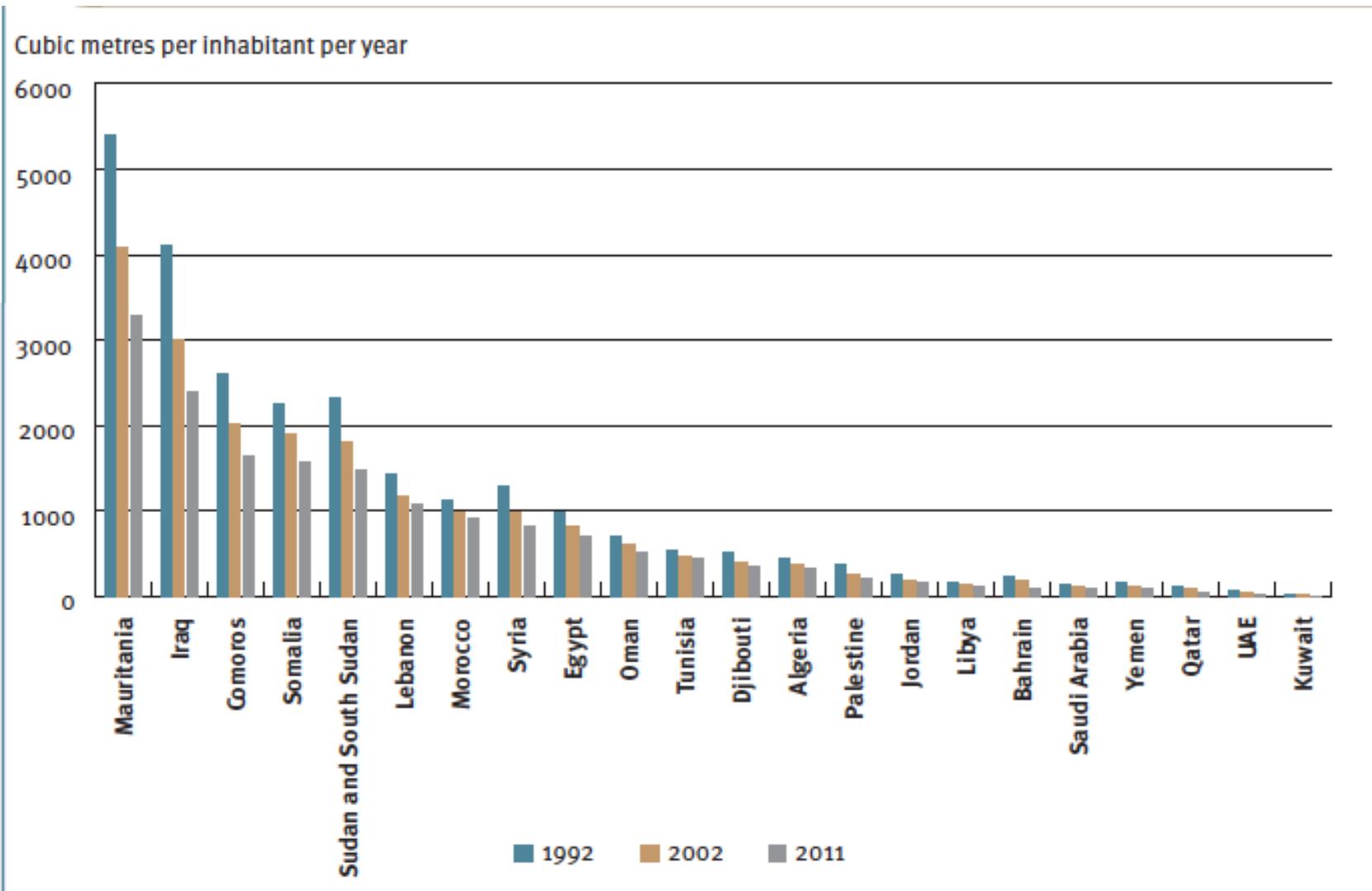
- Current status and trends in Water and Climate change
- Green economy as a response to the challenges of unsustainable use of the resources
- Way forward and concluding remarks

Pressures

Population growth



Renewable water resources, Per capita



Source: FAO 2013.

Losses in the water supply distribution system

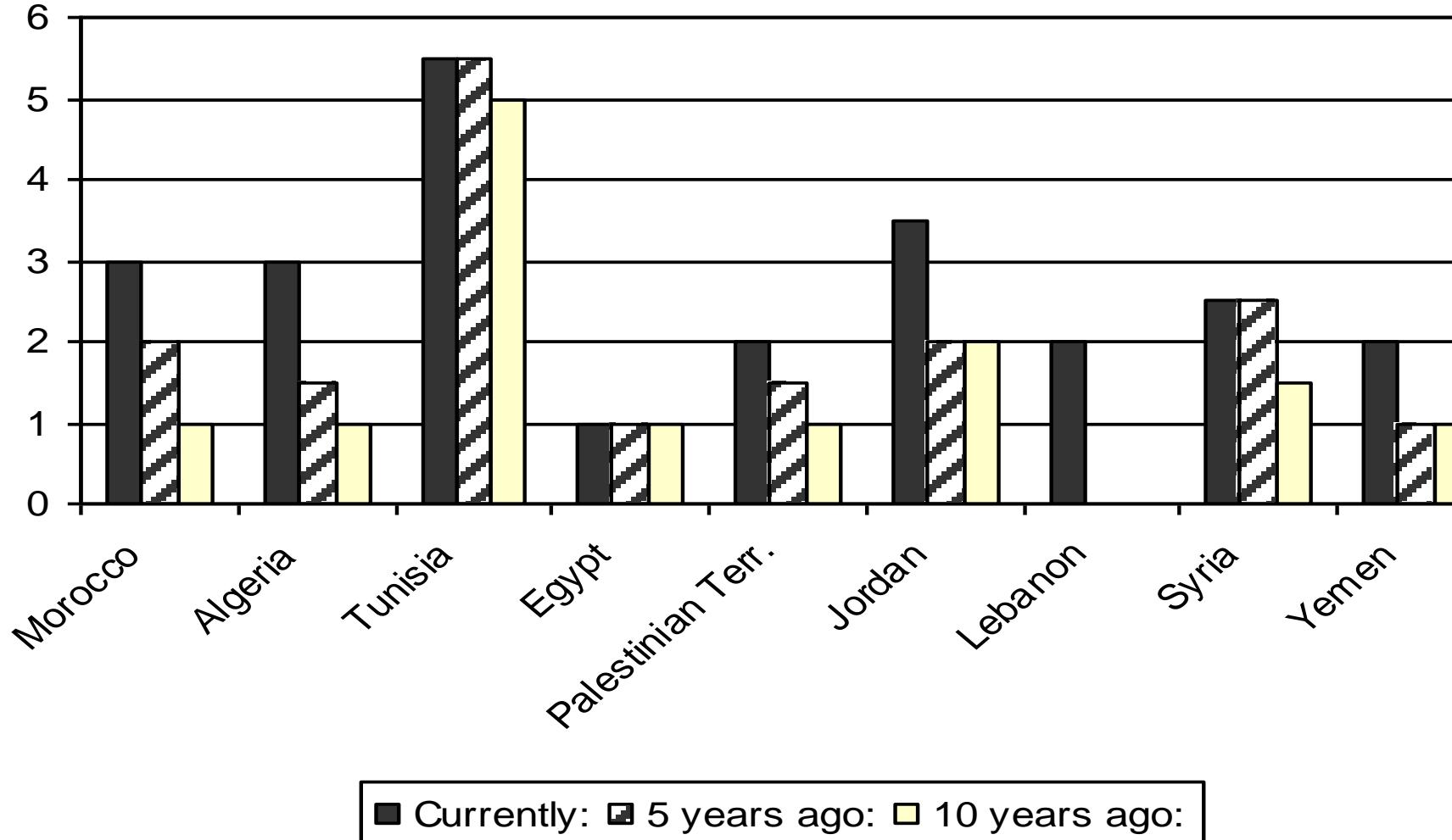
Country	% of loss
Egypt	50
Palestine	40
Jordan	50
Lebanon	50
Syria	48
Iraq	50
Saudi Arabia	25-40
Kuwait	8-10
Bahrain	15
Oman	23
Yemen	30

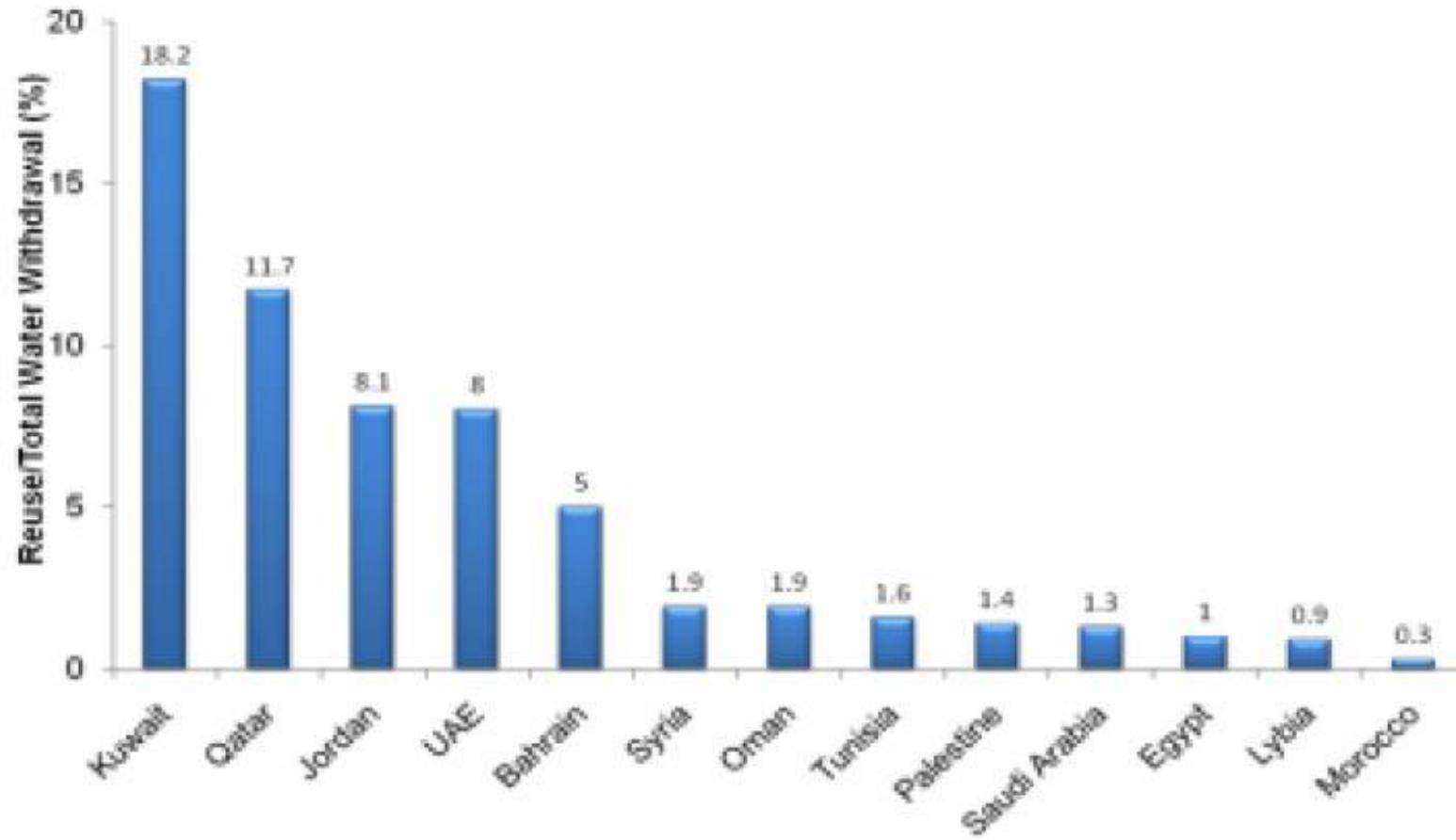
- GCC experience one of the lowest average *per capita* share of renewable water in the world (as low as **177 m³/year**)
- The average consumption of a citizen in some large cities in GCC has gone as high as **450 l /capita/ day**, with a range of 300-750 l/capita/day (the highest in world)
- Biggest desalination and fast growing market while *per capita* consumption going up and up
- Incentives and tradeoffs for WDM, water saving, efficient use and productive use are insufficiently known
- Nonrevenue water remains high and amounts to 50% in cities like Algiers and Alexandria for example (*water loss, including apparent loss from unauthorized consumption and metering inaccuracies, and real loss from leakage on transmission or distribution at utilities or leakage on service connections up to point of consumer metering.*)
- The kind of research that talks/appealing to policy makers is yet to be encouraged
- Changes require the highest policy and political backup

Country	1990			2005		
	Desalination production (mcm)	Domestic demand (mcm)	Desalination-to-demand ratio (%)	Desalination production (mcm)	Domestic demand (mcm)	Desalination-to-demand ratio (%)
Bahrain	56	103	54	123	133	92
Kuwait	240	303	80	589	610	97
Oman	32	86	37	68	170	40
Qatar	83	85	98	250	252	99
Saudi Arabia	795	1,700	47	1,063	2,458	43
UAE	342	540	63	813	951	85
Total	1,548	2,817	55	2,906	4,574	64

Note: mcm = million cubic meters.

Is environmental protection with regard to water adequately addressed?





Morocco as an example

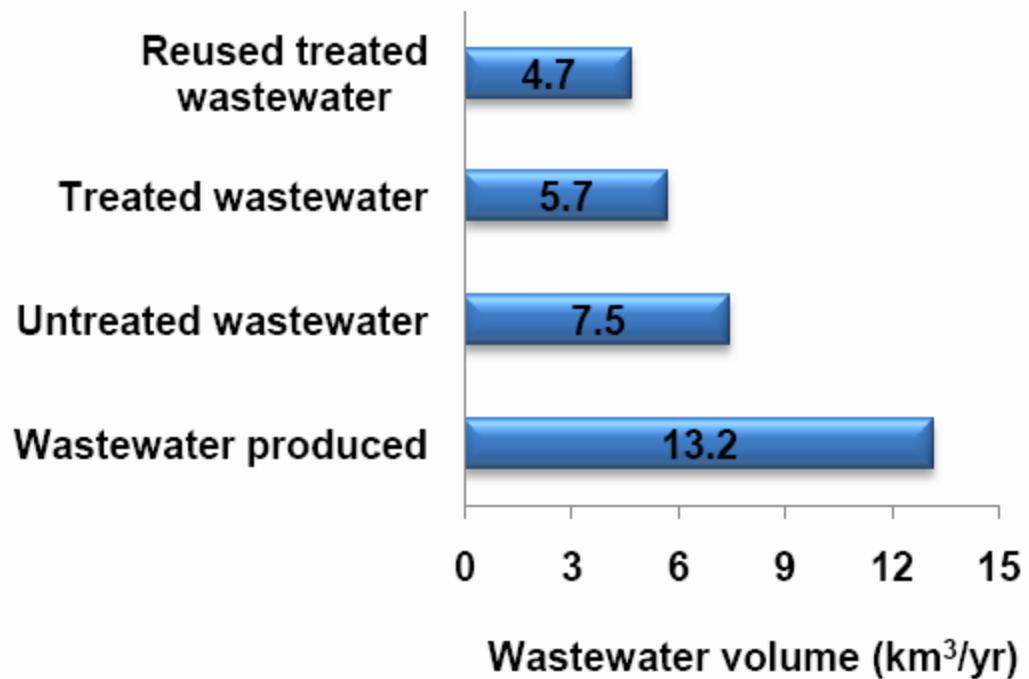
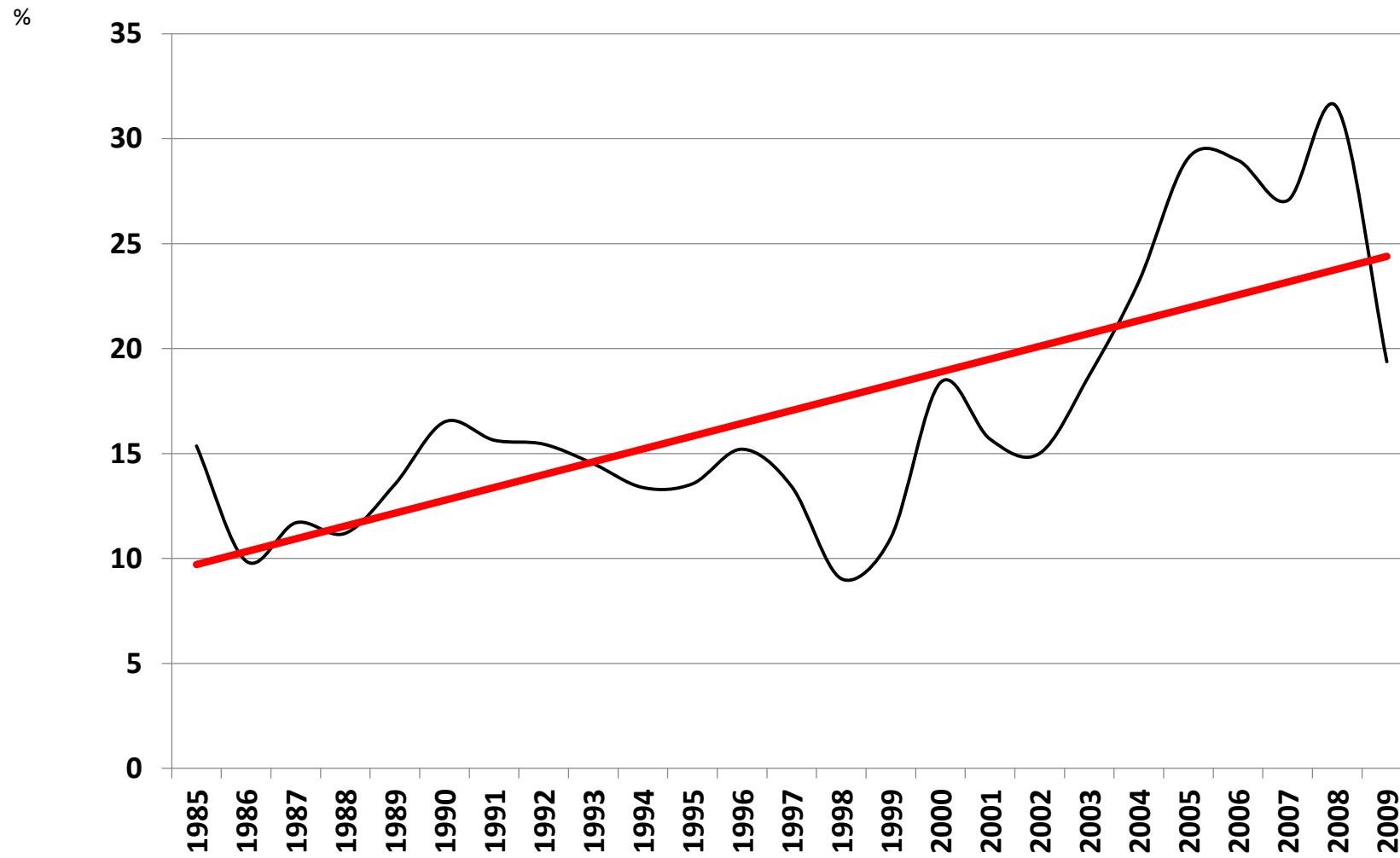
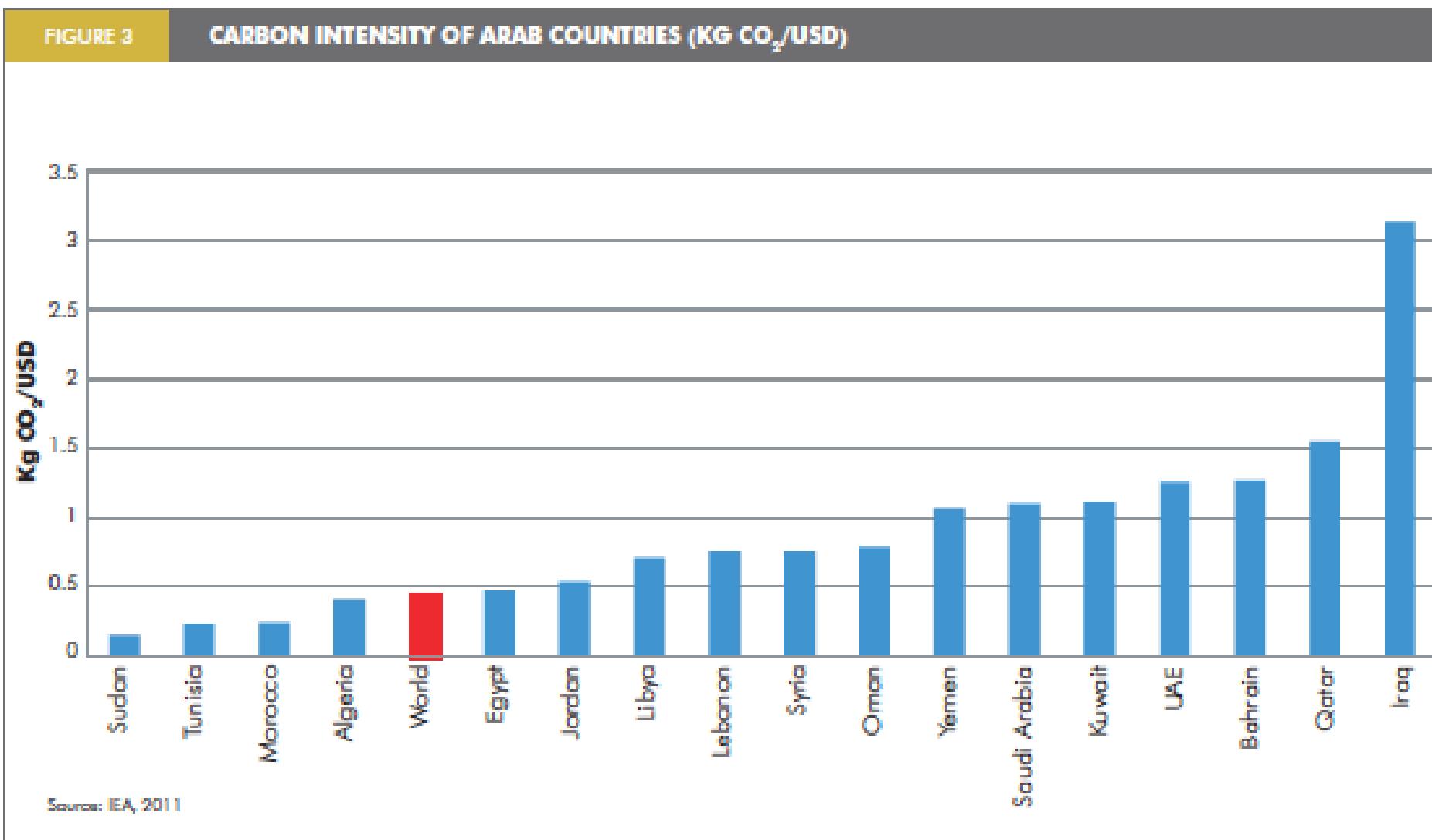


Figure 1. Volume of wastewater produced, treated, disposed of or reused for irrigation in the MENA region (Qadir *et al.*, under press)

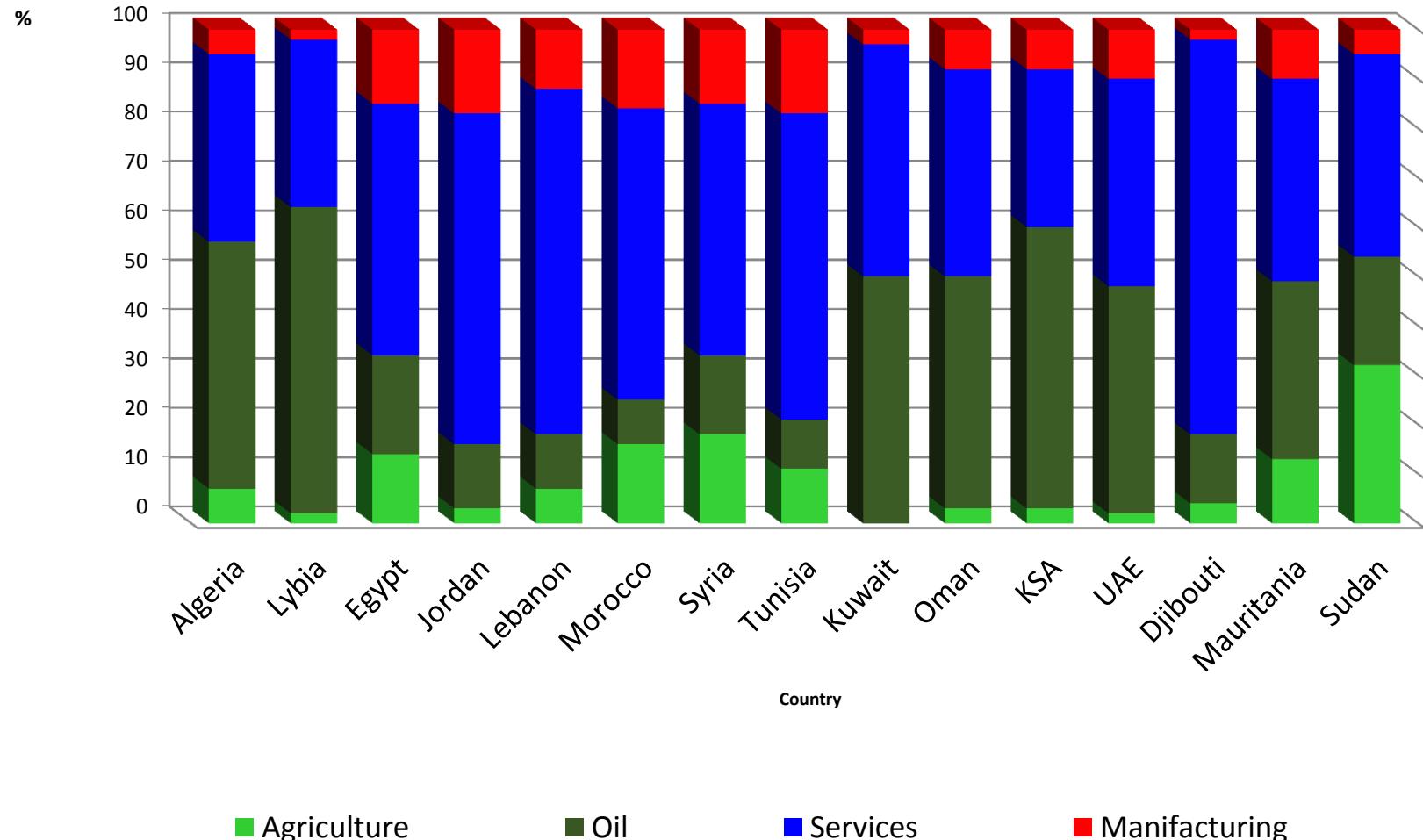
Percentage of natural resources depletion of GNI



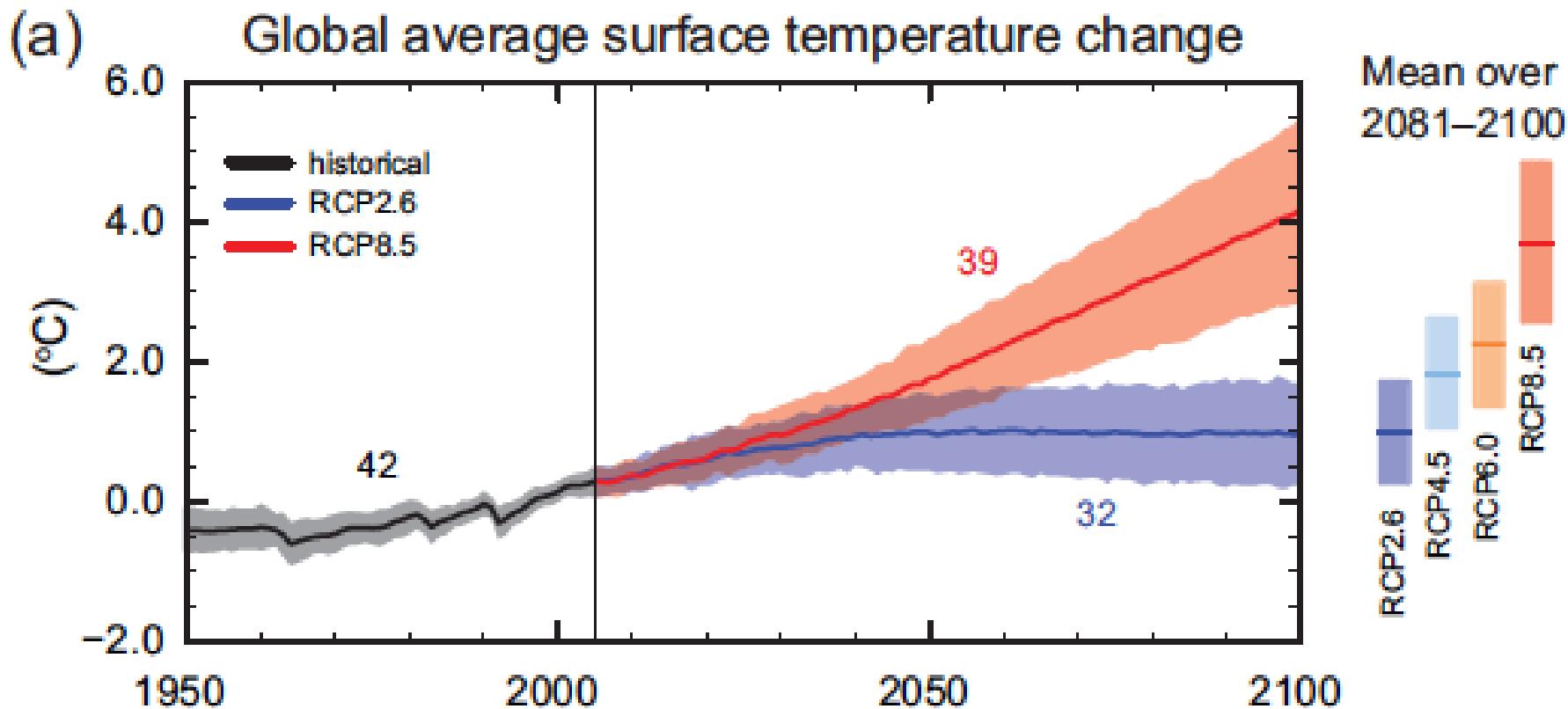
Carbon intensity (KG CO²/US\$)



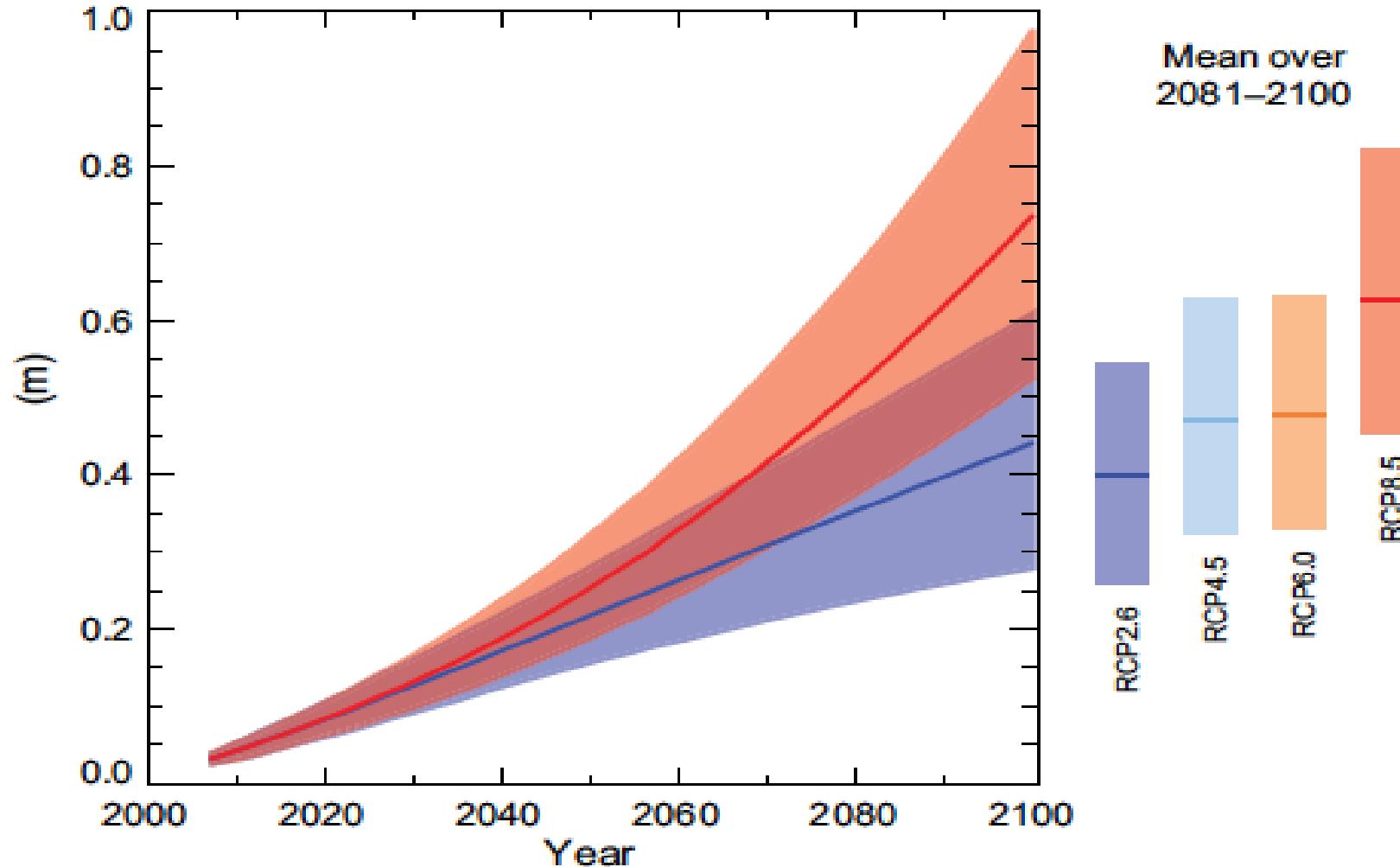
Economic structure (sectoral contribution to GDP)



Projected temperature rise

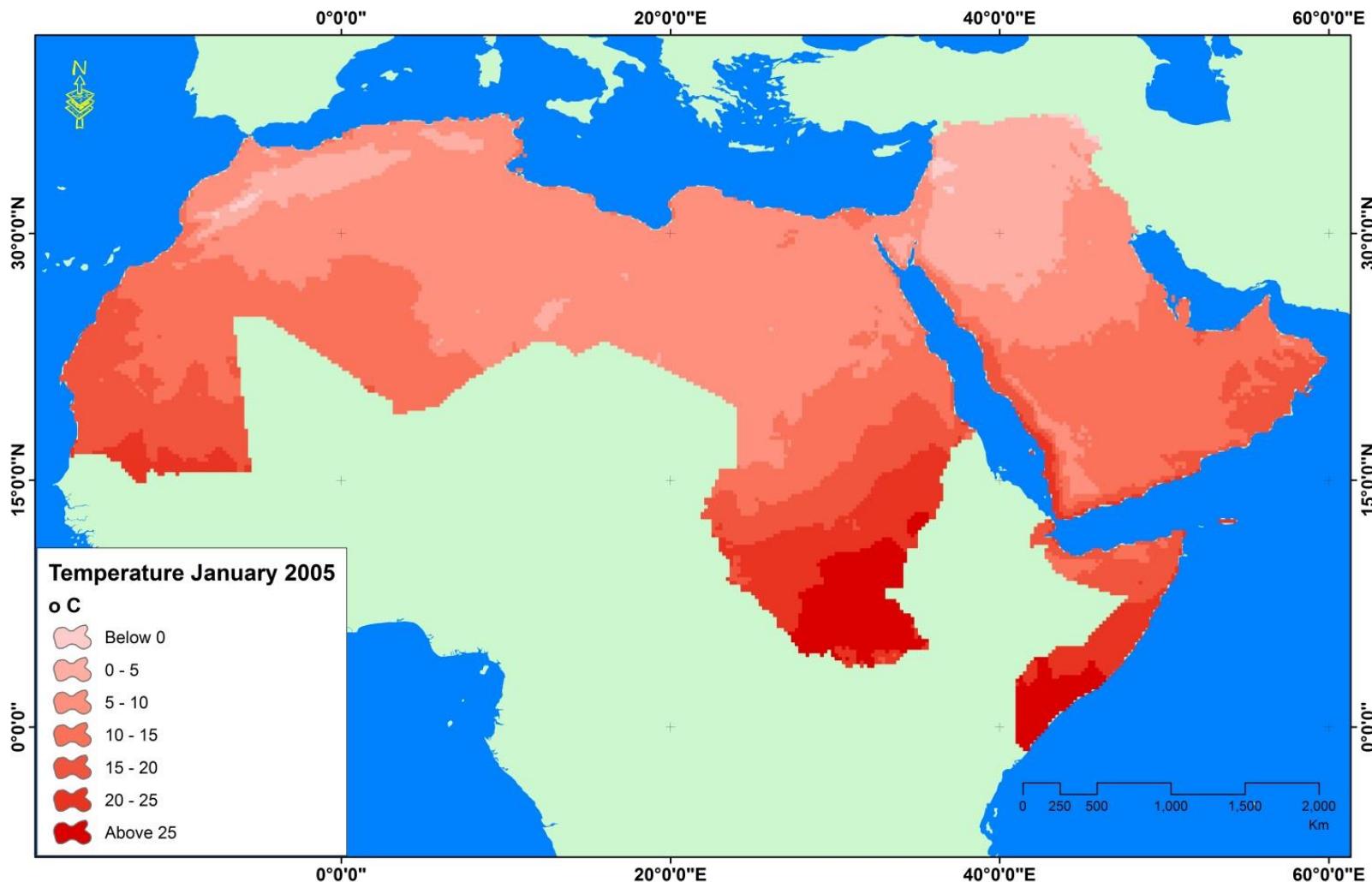


Global mean sea level rise



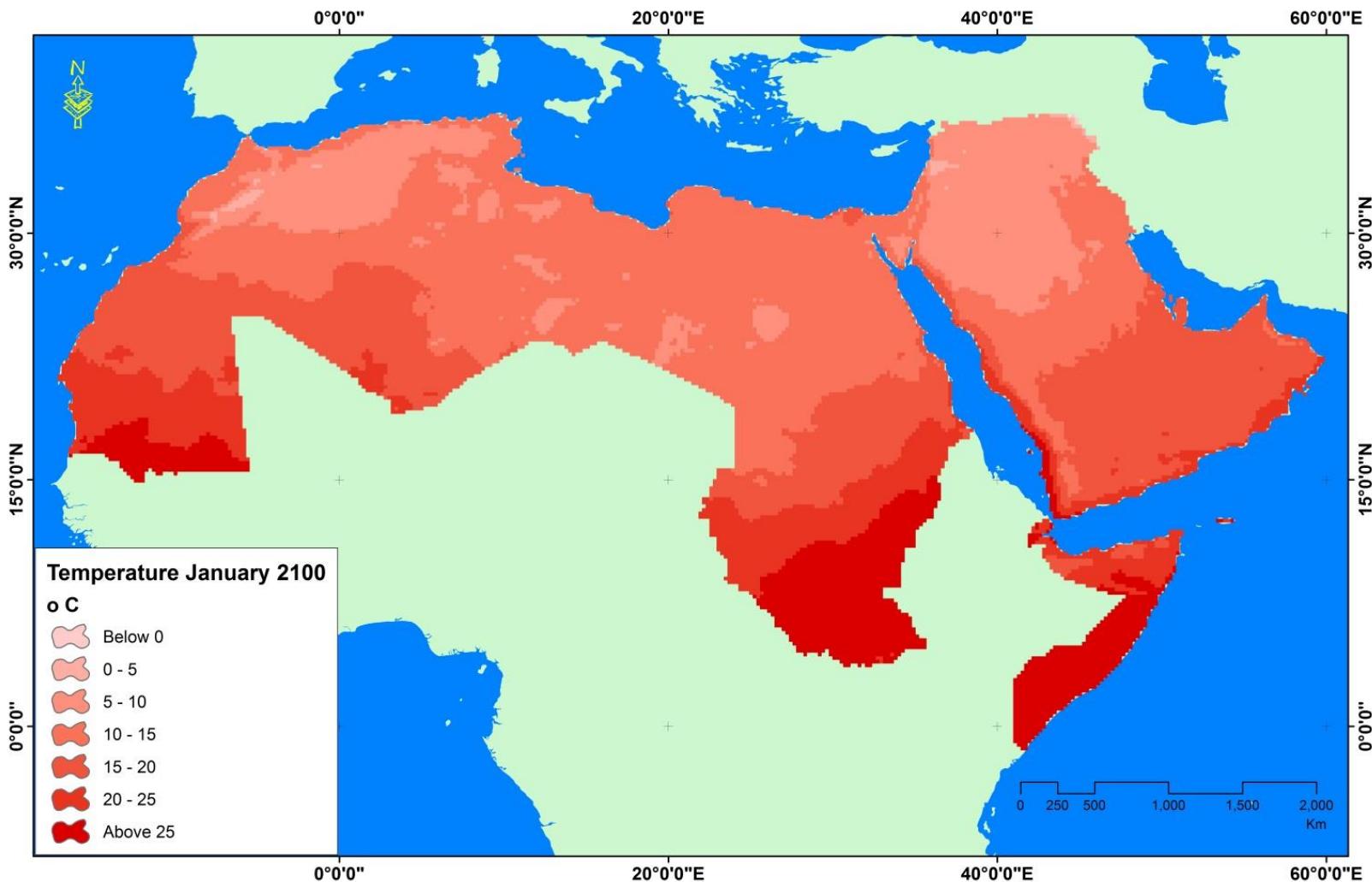
Climate change (temperature)

Temperature January (2005)



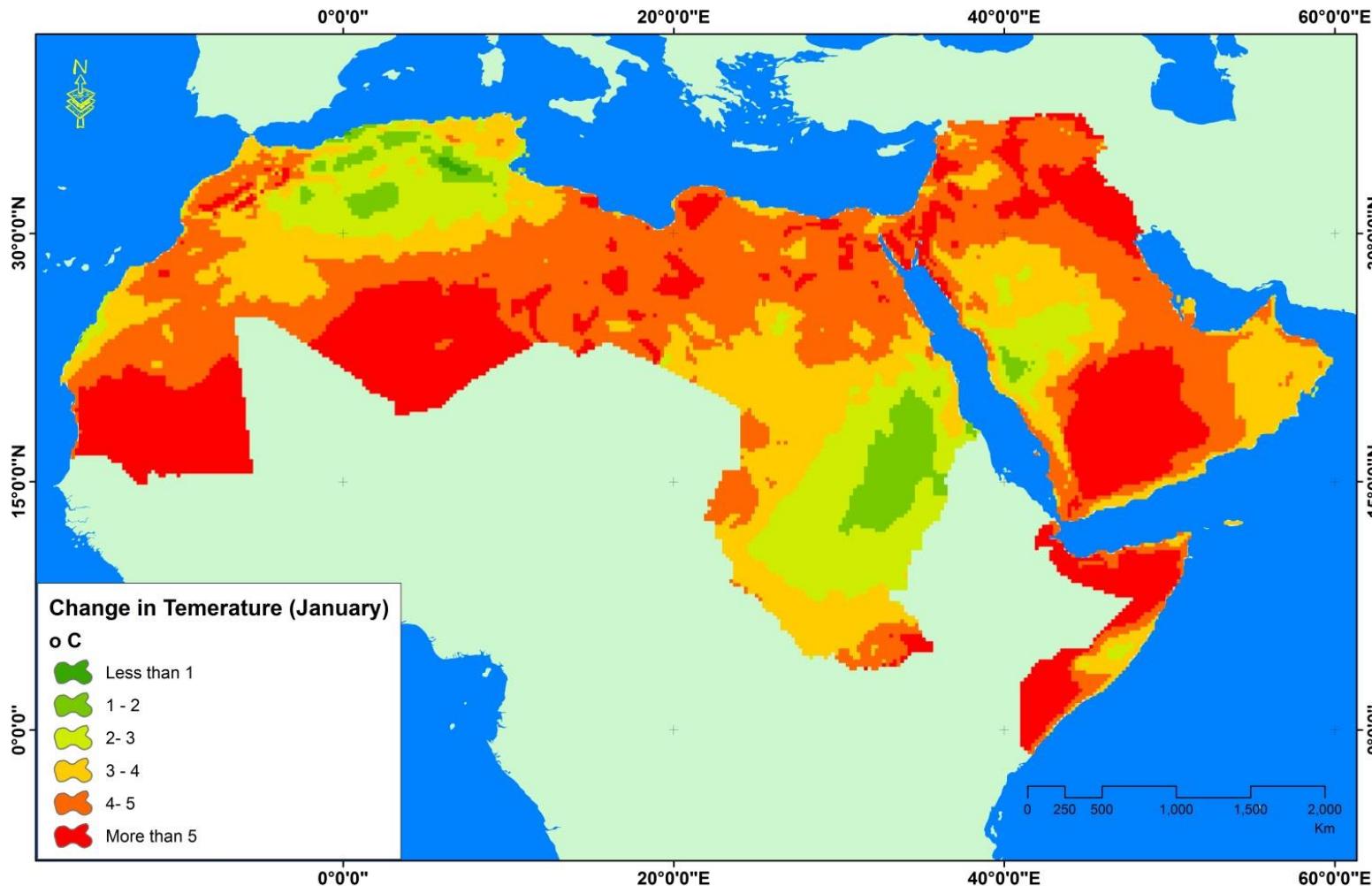
Source: Earth System Grid Federation (EGSF) <http://esg-dn1.nsc.liu.se/esgf-web-fe/>;jsessionid=A2CD5CDF9899C0590ECAAF43E2F143B9

Temperature (January 2100)



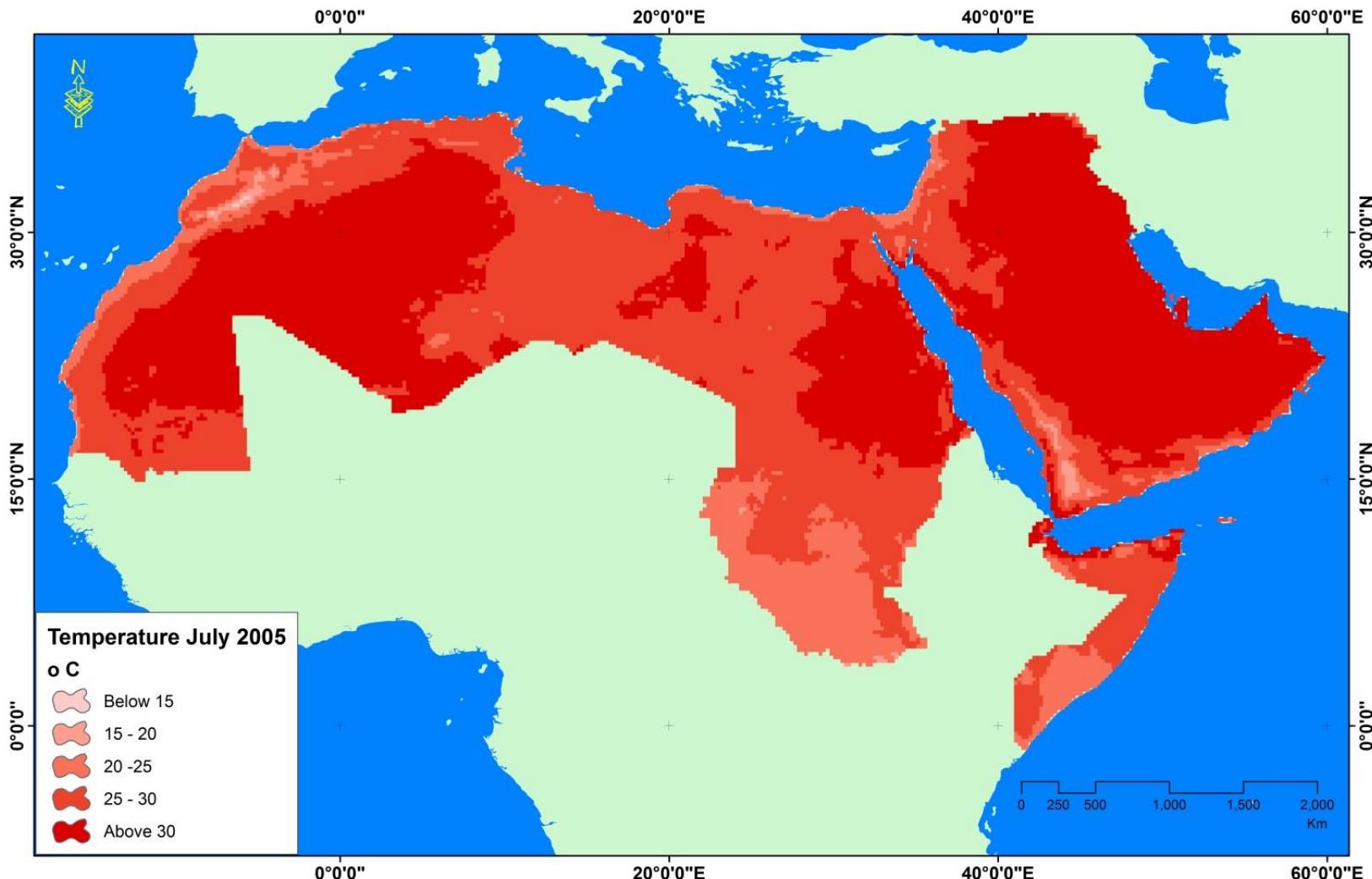
Source: Earth System Grid Federation (ESGF) <http://esg-dn1.nsc.liu.se/esgf-web-fe/>;jsessionid=A2CD5CDF9899C0590ECAAF43E2F143B9

Change in temperature (January)



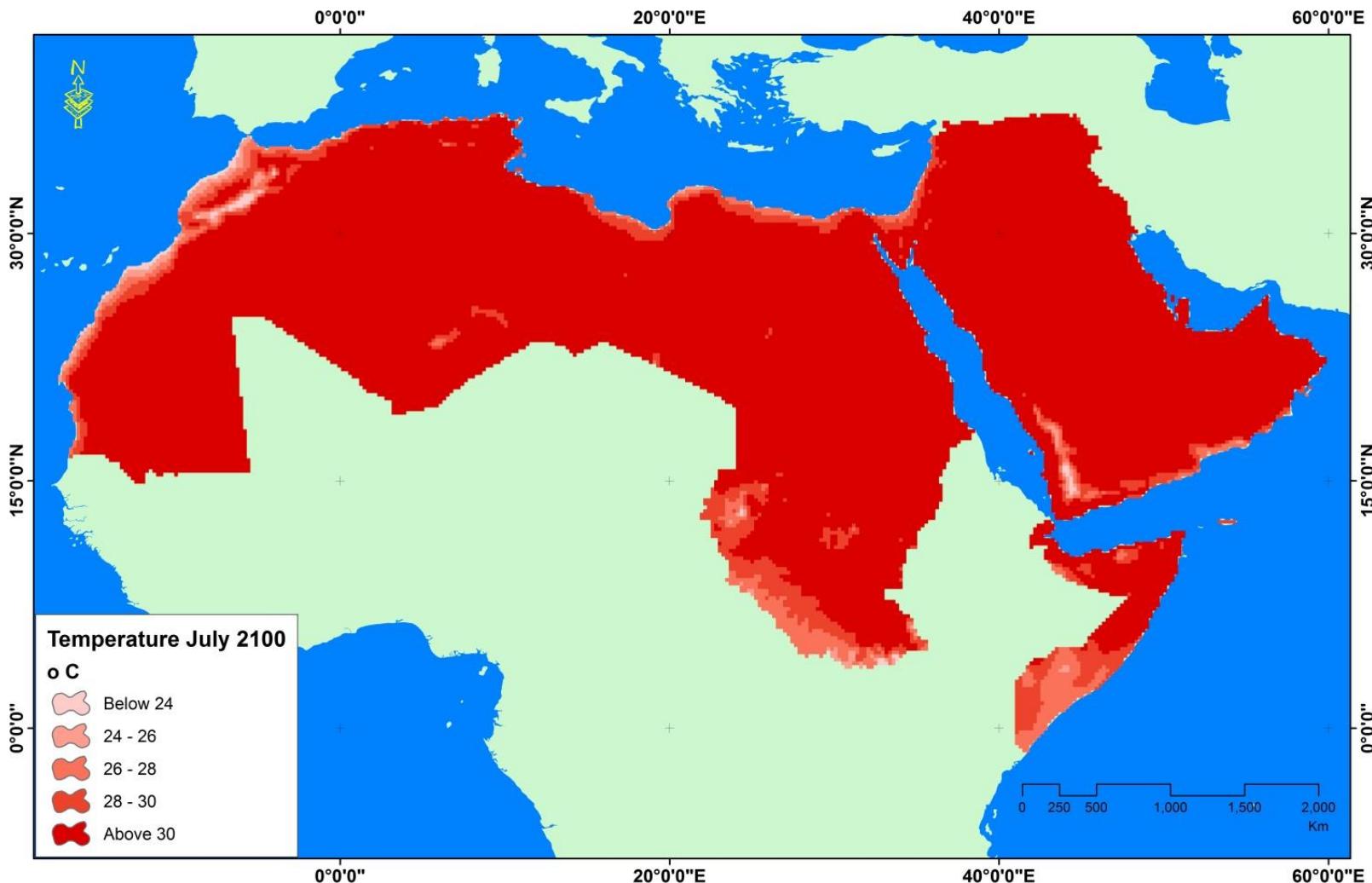
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Temperature July (2005)



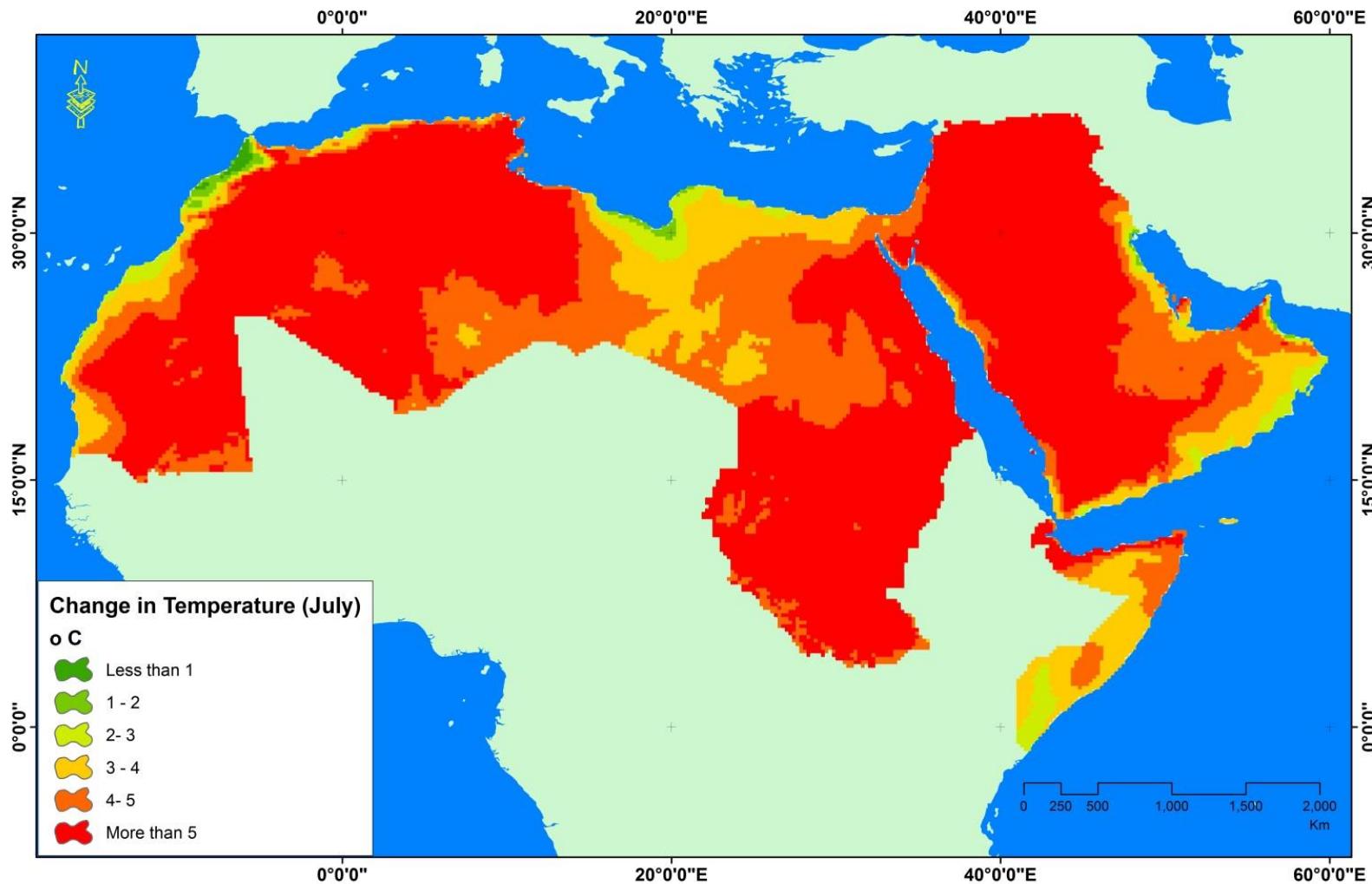
Source: Earth System Grid Federation (EGSF) <http://esg-dn1.nsc.liu.se/esgf-web-fe/>;jsessionid=A2CD5CDF9899C0590ECAAF43E2F143B9

Temperature July (2100)



Source: Earth System Grid Federation (EGSF) <http://esg-dn1.nsc.liu.se/esgf-web-fe/;jsessionid=A2CD5CDF9899C0590ECAF43E2F143B9>

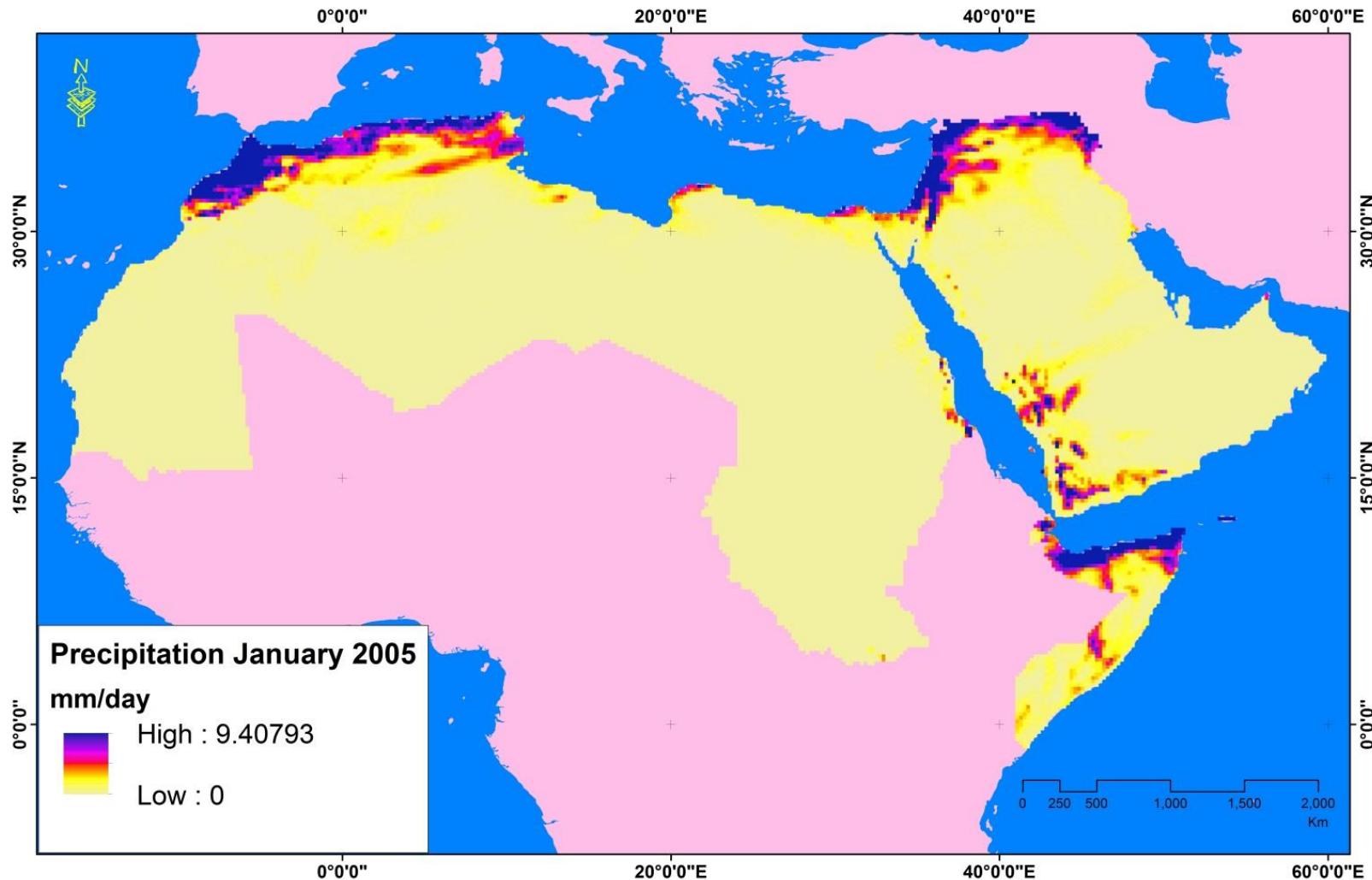
Change in temperature (July)



Source: Earth System Grid Federation (EGSF) <http://esg-dn1.nsc.liu.se/esgf-web-fe/>;jsessionid=A2CD5CDF9899C0590ECAAF43E2F143B9

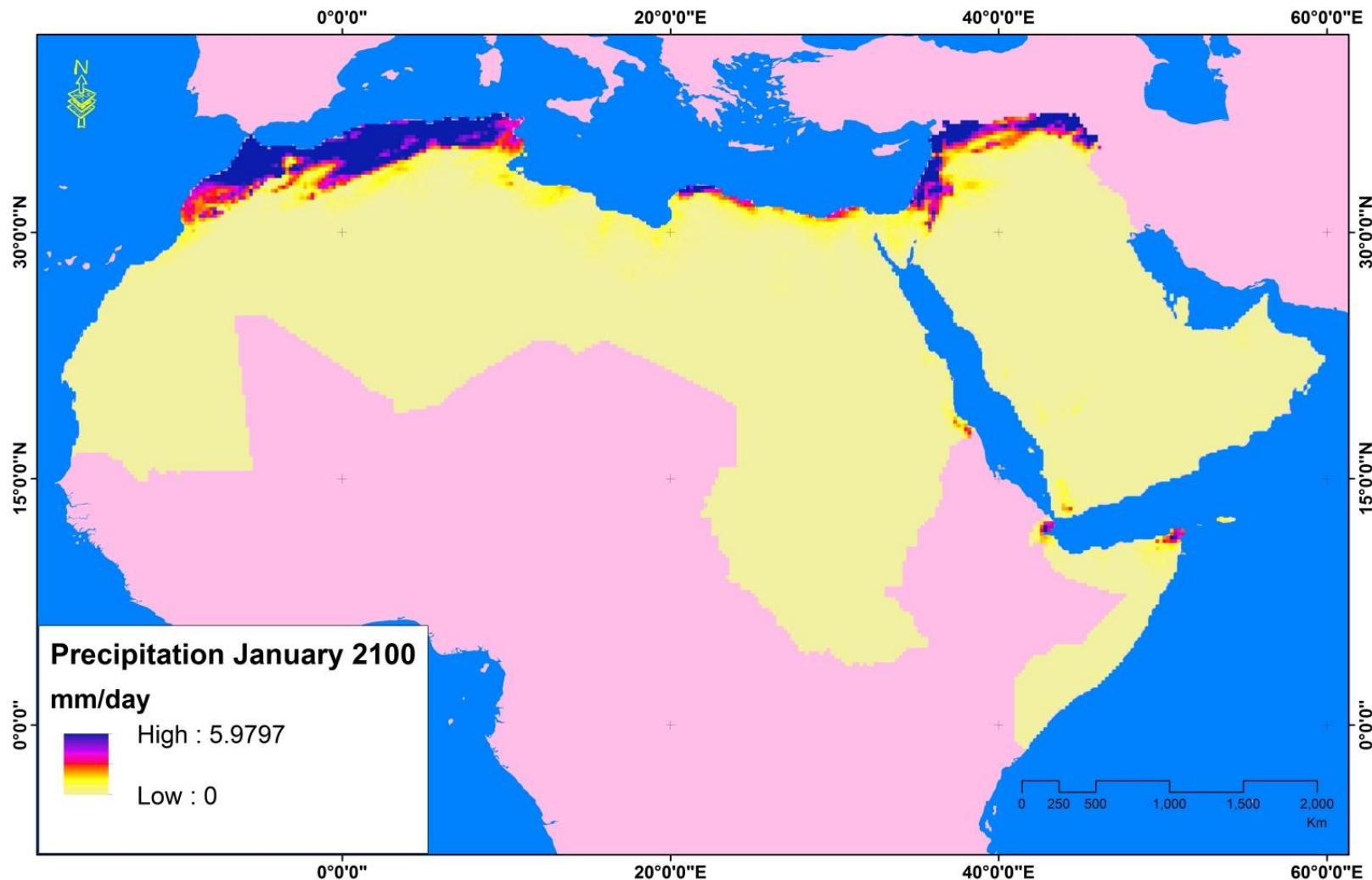
Climate change (Precipitation)

Precipitation January (2005)



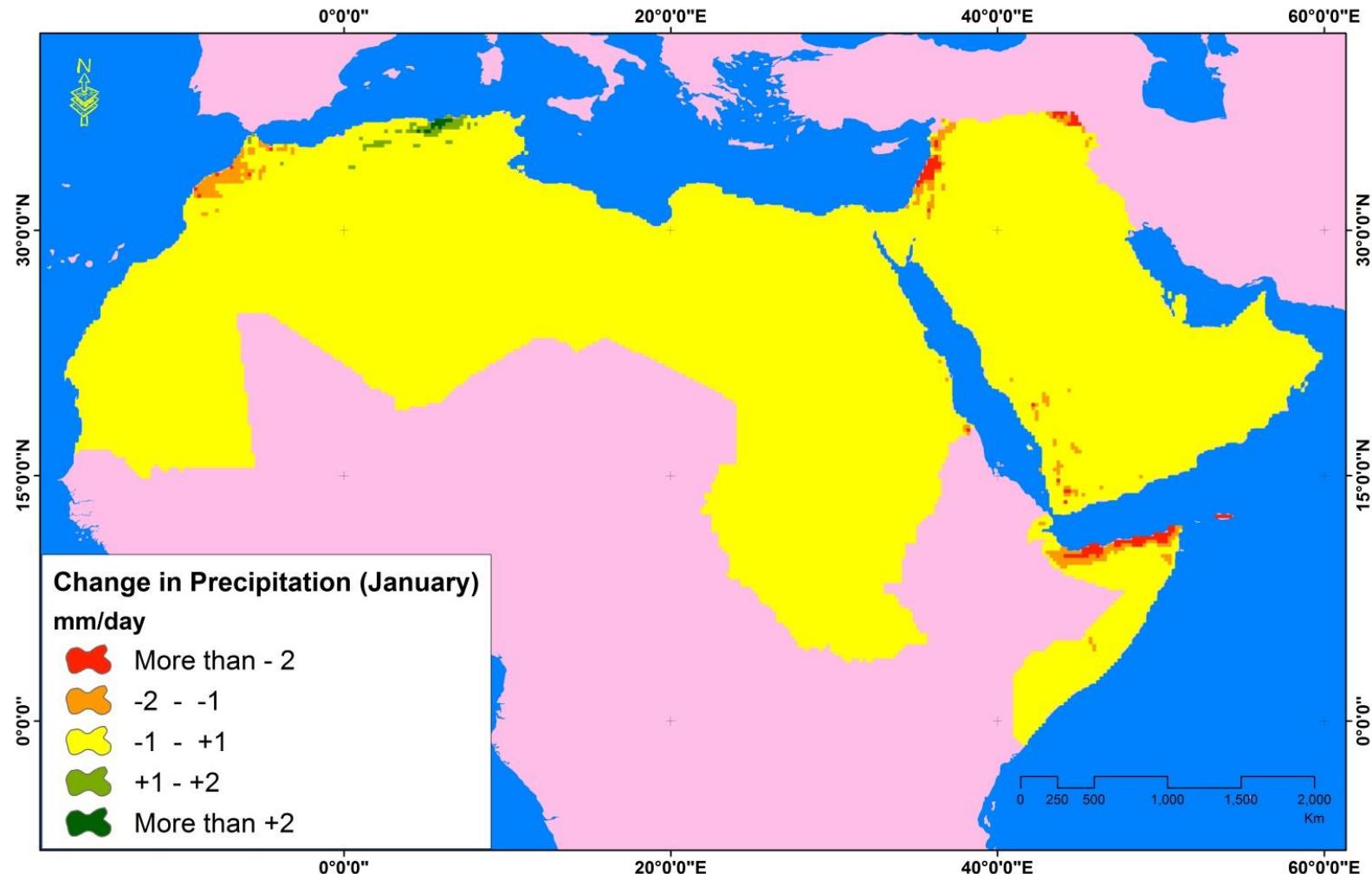
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Precipitation January (2100)



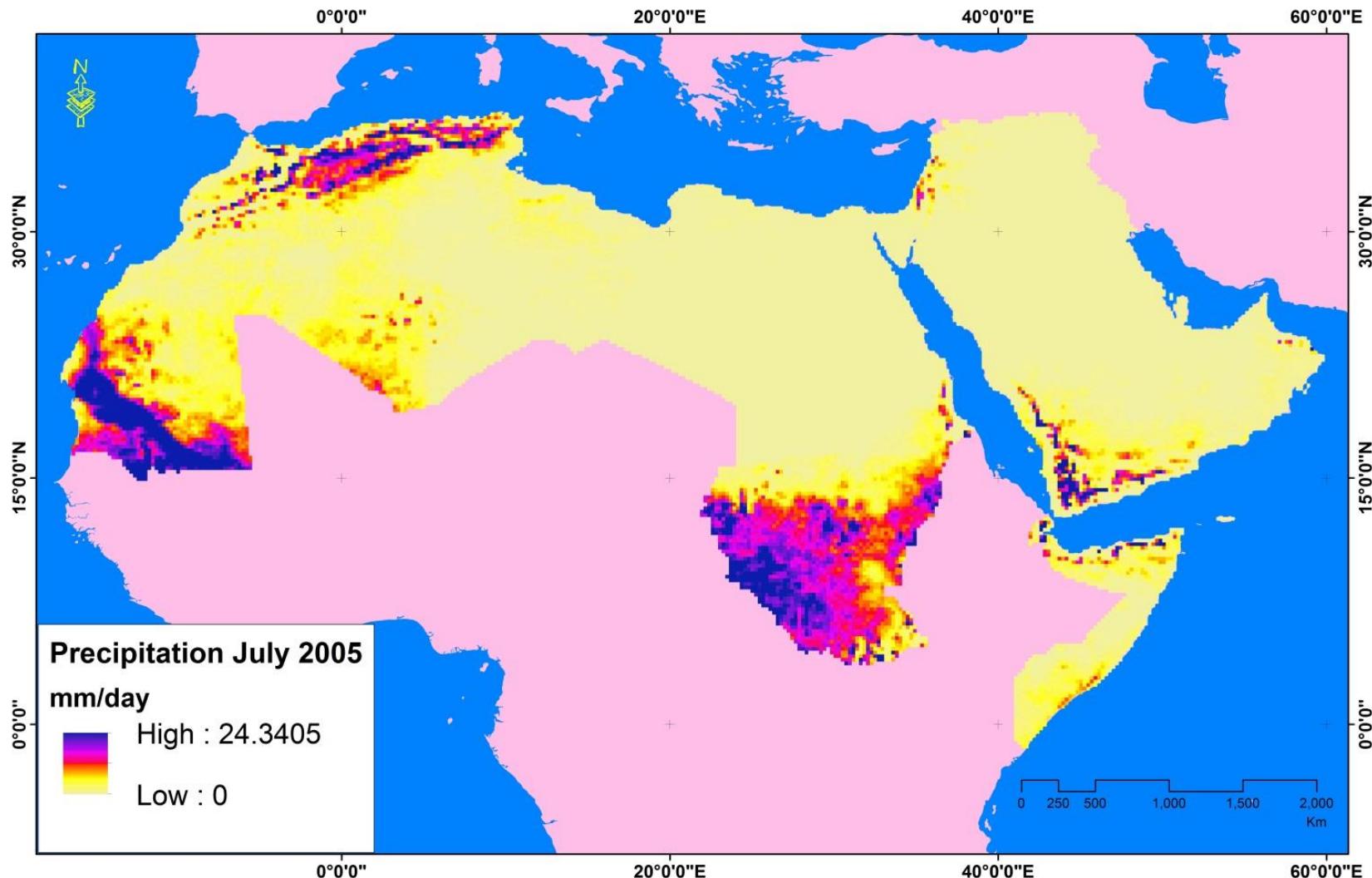
Source: Earth System Grid Federation (EGSF) <http://esg-dn1.nsc.liu.se/esgf-web-fe/>;jsessionid=A2CD5CDF9899C0590ECAAF43E2F143B9

Change in Precipitation (January)



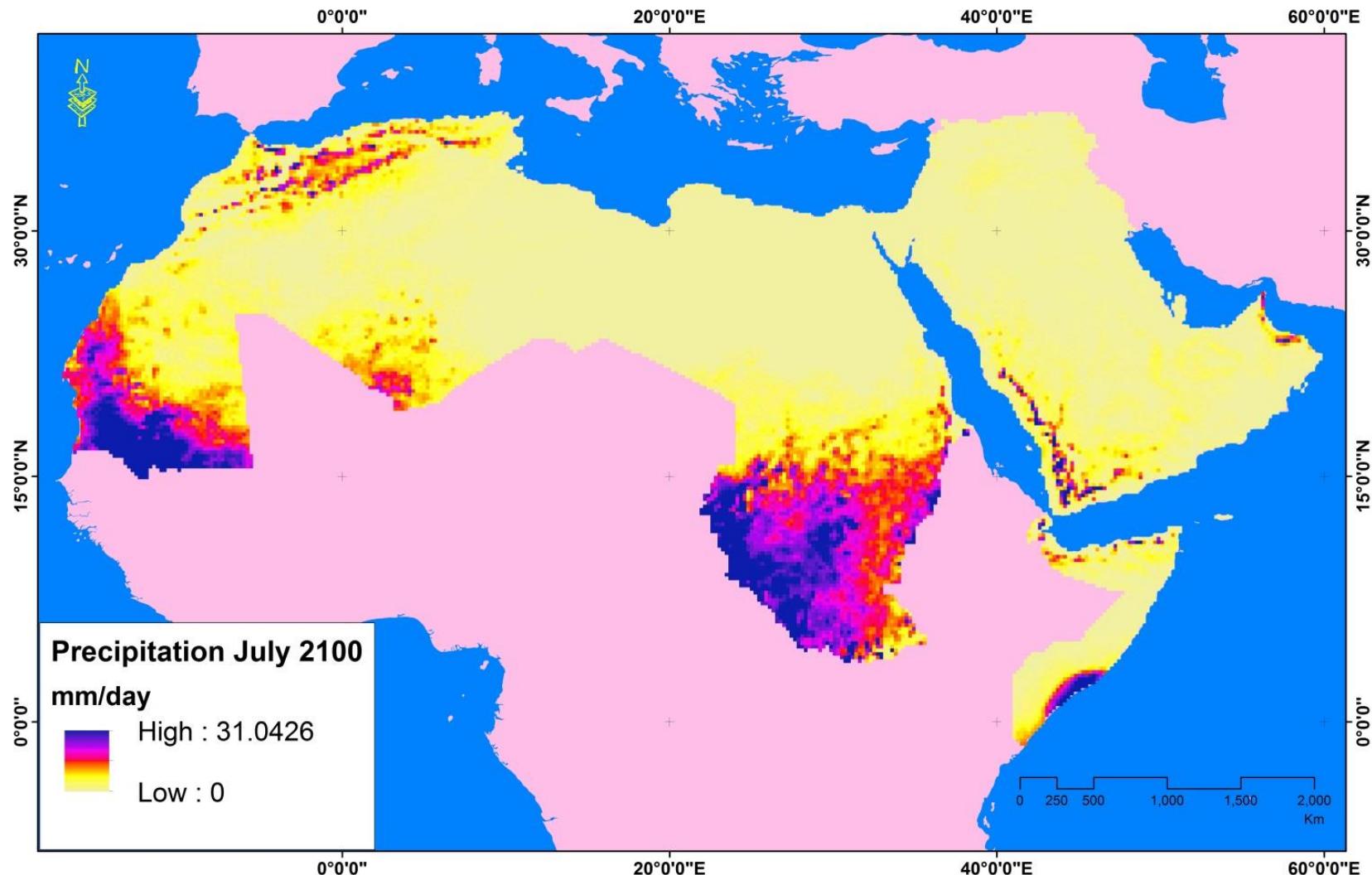
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Precipitation July (2100)



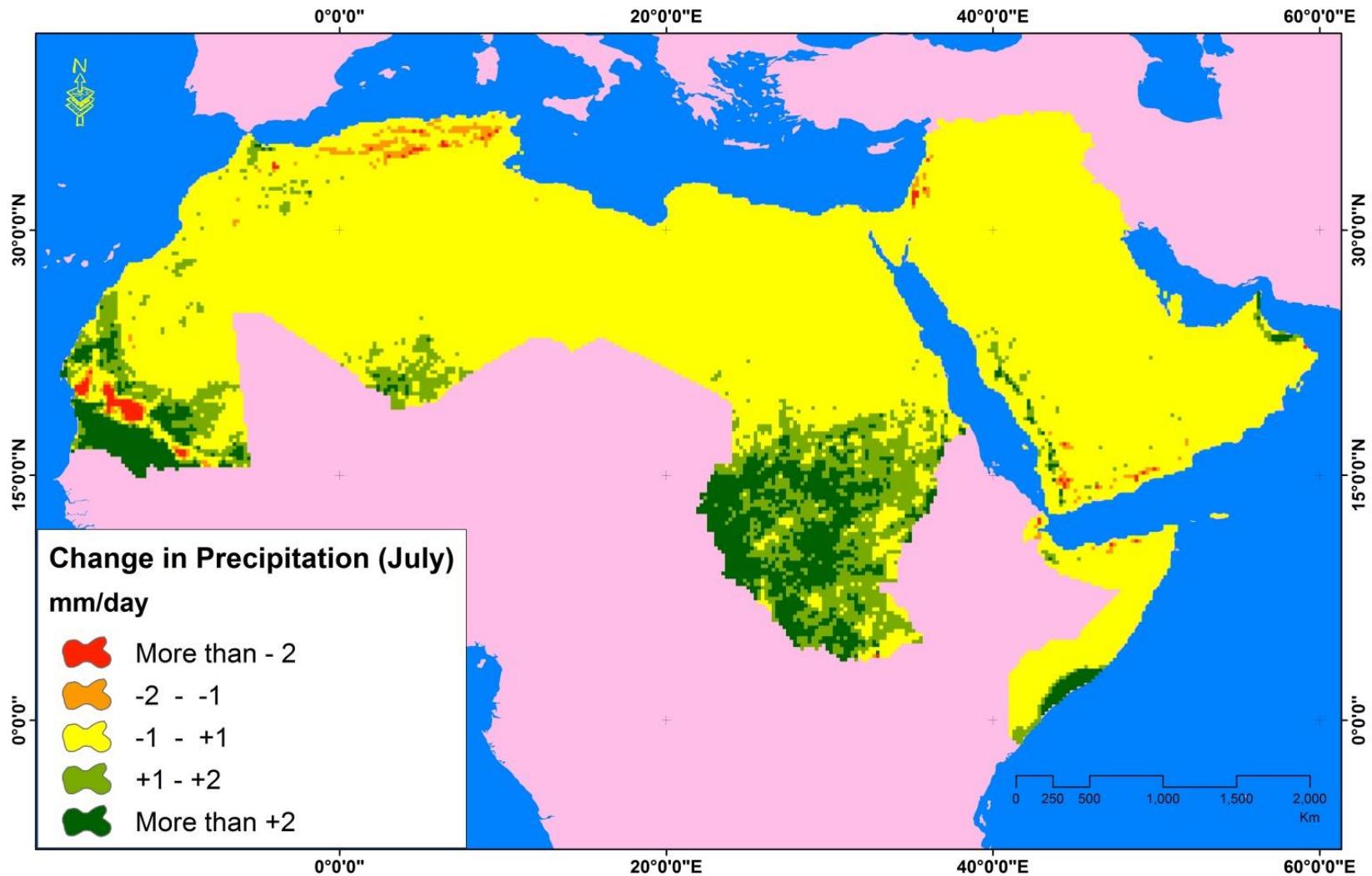
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Arab Region multiple deficits in transition to GE

- Uncertainty
- Desalination with no grounding of technologies
- Renewable Energy with no strategic position on Innovation, localizing technology
- Food security and the role of agriculture requires strategic shifts
- The services and IT will shape the economies and require long term and visionary political choices

Green economy water and CC growth with jobs versus jobless growth

- GE is about resource efficiency, decoupling development and carbon emission and social inclusiveness
- Is a way to achieve both **Mitigation and adaptation**
- **4 Million jobs** in Europe today in renewable energy alone

Forsight Cantor (2015)

- **70% of the jobs in 2025 are not yet known** (robotics, nanotechnology, 3D printing)
- Smart Machines will design, manage and service 40% of all global businesses by 2025: expect energy, commerce, finance and manufacturing without humans. By 2020 the Mobile Internet will transform business and society, connecting all products, industries, people and markets on the planet.
- New launches from Google, IBM, Twitter, Amazon, Facebook. Like what's next for Apple: an iHealthWatch that will run DNA gene sequencing to predict medical problems rather than react to them.
- Regenerative medicine will predict and prevent illness, rebuild brains and bodies, and extend the human lifespan.

Transition to green economy requires investments: Where do we get them from

- Revising the subsidy system to make it targeted and ensure social equity: put the subsidy in the right place, saving, efficiency and reduction of loss
- Example: Saving through efficiency in use of resources: an example:
 - water loss up to 50% in several cities up to 60% in irrigation
 - Energy loss up to 30%
 - Food loss up to 30 %
- The 2nd example below:
- Cost of environmental degradation: up to 2% of the
- Ecotax (Morocco) “Economie verte au Maroc”

Problems beyond policies and strategies

- Enforcing regulations and laws: User pays and polluter-pays principles
- Eco-benefits not factored in the equation

An example of steady progress: Case of Morocco

- Renewable Energy: New sector for growth and employment
- Ambitious program: 42% of energy (Solar, Wind) by 2020
- Waste (water) treatment and reuse, forest, aquaculture, medicinal and aromatic plants

Institutional reforms

- Competence Development Strategy in Green Jobs ready.
- Socio-Economic and Environmental Council (CSEC 2012) identified 4 key sectors for GE : Energy efficiency, Renewable energy, solid waste management
- **Projection 20 B euro by 2020 90,000 jobs**

Role of Private Sector

- Private sector set a green economy commission of entrepreneurs
- Coach and support enterprises to operate in environment friendly and engage into GE
- Labelled enterprise ISO 26000 has increased from 13 in 2010 to 60 in 2013

Global indicators show progress

- 81ème place/ 178 pays de l'Indice de performance environnementale (EPI, 2014) ;
- 5ème rang des pays d'Afrique, après la Tunisie (3ème rang) et l'Algérie (4ème) et avant l'Egypte (7ème) et la Libye (10ème) de l'Index de Performance de l'Architecture énergétique mondiale 2014 ;
- Leader dans la région arabe (71 points), suivi par l'Egypte (53 points), la Tunisie (47 points), l'Algérie (45 points), le Soudan (25 points) et la Libye (20 points), en matière de développement des énergies renouvelables, selon l'Index AFEX-2013 (Arab Future Energy Index) ;
- Leader de la lutte contre le réchauffement climatique en Afrique et dans le monde arabe, avec la 15e place sur 58, soit un gain de quinze places par rapport au classement de 2013 ;
- La ville de Rabat a été choisie comme ville verte en 2010, parmi 15 villes dans le monde, dans le cadre de « l'initiative 100 villes » de l'ONU-Habitat et inscrite au patrimoine mondial de l'UNESCO en 2012.

Innovation

- Le Maroc est classé 84ème/143 pays selon l'indice mondial de l'innovation 2014, derrière la Tunisie (78ème) et devant l'Egypte (99ème) et l'Algérie (133ème). Si des progrès sont à noter en termes d'infrastructures et de capital humain, les performances du système national d'innovation restent limitées, notamment en termes d'innovation dans le milieu des affaires et de sophistication du marché.
- On note aussi une coordination inefficace des efforts, un financement insuffisant et un manque de collaboration entre l'université et les entreprises (faible valorisation des résultats de la recherche et manque d'adaptation des projets aux besoins de l'économie).
- Les financements affectés à la recherche scientifique et technique, essentiellement publics, ne dépassaient pas 0,8% du PIB en 2010 (vs 2,26% en France et 3,4% au Japon)²¹.
- Les PME font face à un manque de crédits pour financer la recherche ; Près de 80% des entreprises ont recours à l'autofinancement pour développer leurs projets de recherche. Afin d'impulser l'innovation technologique et de renforcer la recherche et la formation dans les nouvelles filières, un certain nombre de mesures ont été prises comme « L'initiative Maroc Innovation » qui vise une augmentation du financement de la recherche (2% du PIB d'ici 2020 dont 25% privé),
- la création d'un Fonds de soutien à l'innovation (380 millions de Dirhams), la mise en place d'une politique de construction de cités de l'innovation, le développement de technopôles et la création d'instituts spécialisés de recherche et de formation.
- L'OCP a lancé en 2011 l'Innovation Fund For Agriculture pour promouvoir l'innovation et l'entreprenariat dans l'agriculture et l'agro-industrie.

Energy is a key driver for the transition to GE

- Le programme de développement des Energies Renouvelables (ER)
- Objectif : Produire 6000 MW (solaire, éolien et hydroélectricité) pour atteindre 42% du mix énergétique (2020).
- Investissement : plus de 100 milliards de Dirhams
- Economie : 2,5 Millions de Tep
- Emission évitées : 9,5 millions de T CO2/ an.
- Importantes réformes institutionnelles et règlementaires dont la Loi 13-09 qui permet la production d'électricité verte par des entreprises privées avec intégration au réseau et interconnexion
- Maximisation du taux d'intégration industrielle

Concluding remarks

- **Green economy has a potential to secure jobs create wealth and achieve sustainability in the Arab region**
- **Requires aggressive political will, policy and institutional reforms**
- **New generation of competences needs a strategic plan**
- **A way to regional integration**
- **Nexus Water Energy and food is a step towards green economy**
- **Need a strong foresight and anticipation in the existing education system, research for development, innovation and technology**