Expert Group Meeting on Promoting Best Practices
On sustainable Rural Livelihoods in the ESCWA Region
Beirut, 24-25 November 2010

SUSTAINABLE LIVELIHOOD APPROACH AND CLIMATE CHANGE

by

Mr. Tarek SADEK

UNITED NATIONS
Economic and Social Commission for Western Asia

UN-ESCWA

Sustainable Livelihood Approach and Climate Change

By: Tarek Sadek
Climate Change Officer
Sustainable Development
& Productivity Division-ESCWA

Presentation Outline

I. Potential CC impacts on natural resources and livelihoods

II. Linkages between CC adaptation and Livelihoods (vulnerability context)

III. Considerations and measures for developing livelihood strategies to adapt to CC

I. Potential CC Impacts on Natural Resources

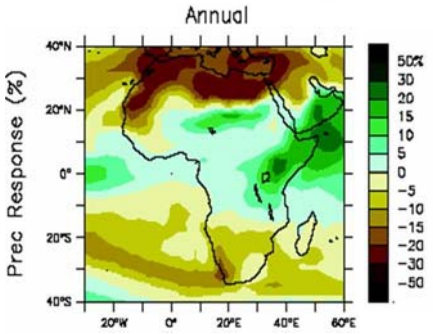
Despite its low contribution to GHG's emissions, the region will highly suffer from climate change which might undermine national and regional development plans including:

1. Temperature increase:

- An increase in drought cycles thus affecting groundwater quantity and quality (e.g. estimated 50% and 15% reduction in freshwater in Syria and Lebanon);
- A decreased agricultural productivity and an increase in the area of semi-arid lands;

I. Potential CC Impacts on Natural Resources

- An increase in desertification and land degradation, and the associated effects on biodiversity;
- 30-50% expected reduction in runoff of the Euphrates and Tigris and fluctuation in the Nile of +30 to -70%;
- CC might affect production capacity of desalination plants.



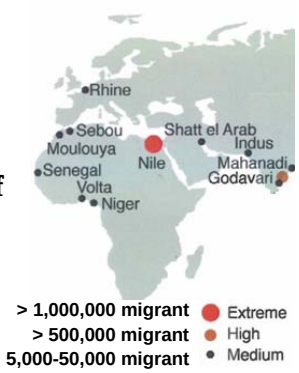
Depreciation changes over Africa from the MMD-A1B simulations.

Annual mean fractional change in precipitation between 1980 to 1999 and 2080 to 2099, averaged over 21 models.

I. Potential CC Impacts on Natural Resources

2. <u>Sea level rise:</u> Leading to drowning of coastal areas and:

- **Loss of agricultural lands**: Qatar, Egypt, UAE, Kuwait and Iraq are estimated to lose 12-15% of their fertile Delta lands;
- Potential increase in the **occurrence of natural disasters**, "floods and hurricanes" (Hugo Hurricane in Oman);
- **Seawater intrusion** to coastal groundwater resources might pose a threat to Egypt, Lebanon, Syria and Gulf States.



A. Potential Social Impacts

Impacts on Livelihood Assets: Human, Social, Physical and Natural Capital:

- **<u>Increased political conflicts</u>** due to competition over varying and increased natural resources degradation, mainly water and land;
- **<u>Population displacement and mass immigration</u>** from flooded or drought affected regions in Egypt, Qatar, United Arab Emirates, Kuwait and Iraq;
- **<u>Increase in unemployment</u>** and decrease in wages due to agricultural lands loss, and to halting of tourism and fishing activities…etc;
- **<u>Effect on human security</u>** and livelihoods
- **<u>Increase in poverty and health problem levels</u>** among potential natural disaster victims and poor marginalized groups.
- **<u>Spread of health problems</u>**

B. Potential Economic Impacts

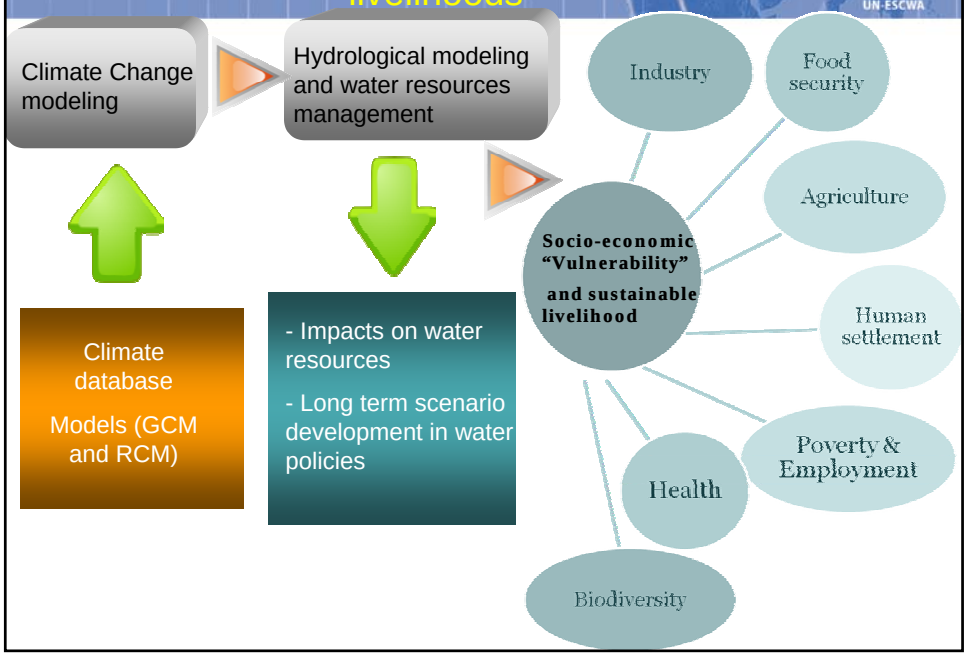
Impacts on Livelihood Assets: Financial Capital:

- Negative impacts on the major economic sectors, especially:
  - Tourism facilities in coastal areas;
  - Agricultural productivity and food costs;
  - Industry and power systems;
- Imapcts on the Nile Delta, Shatt El Arab and the Gulf could lead to huge economic losses in:
  - The infrastructure (roads, bridges, power and telecommunication systems);
  - Housing and building sectors.

II. Linkages between CC adaptation and Livelihoods (vulnerability context)

- There is a need to assess vulnerability in view of better understanding of the effects of the CC on sustainable livelihoods to develop adaptation strategies in the region.
- We need to integrate the climate change modeling methodologies with the vulnerability and impact assessment approaches in a multidisciplinary manner to study impacts on livelihoods and affected sectors.

Process to assess CC vulnerability and impacts on livelihoods



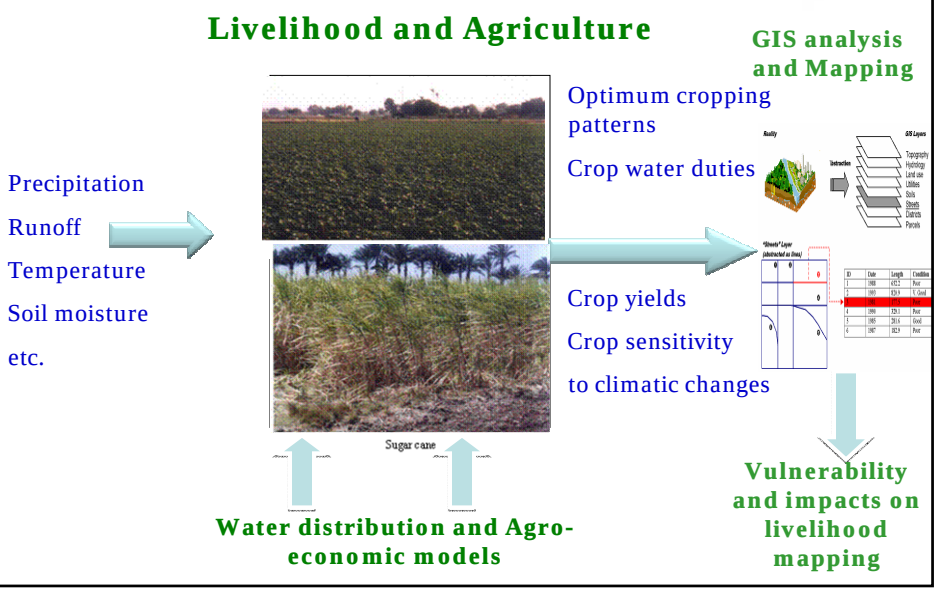
Process to assess CC vulnerability and impacts on livelihoods

- These impacts need to be identified in order to measure the effects of climate change within a sustainable development context.
- This can be done by analyzing impacts and mapping hotspots of affected sub-regions based on key issues of regional concerns.
- e.g. agricultural models can be used to estimate vulnerability indicators related to cropping patterns, water distribution and irrigation efficiency.

Process to assess CC vulnerability and impacts on livelihoods

- Other aspects such as human settlement and food security would rely less on formal models and more on experts' subjective estimates of indicators of vulnerability.
- Economic variables are also important to determine vulnerability and the adaptive capacity of communities in terms of services costs, GDP, dependency on agriculture and unemployment.

Process to assess CC vulnerability and impacts on livelihoods



Development of Socio-economic Vulnerability Indicators

- Vulnerability is a function of exposure to hazard, sensitivity to hazard and adaptive capacity.
- e.g. water related hazards such as floods, rainfall events, droughts, conflicts, water borne epidemics are represented by indicators to measure their intensity, extent and frequency .
- This approach does not aim to conduct a quantitative climate change risk assessment.

Examples of vulnerability indictors

Category	Factor	Measure
Water resources planning and management	Application of IWRM	Level of application
	Efficiency of water demand management	% cost recovered from water fees
	Water network losses	% water network losses
	Water storage capacity	% water storage to total water resources
	Status of strategic water reserves	% abstraction to total strategic water resources
Economy	General state of economy	Gross national income
		Gross domestic product
		Gross savings (% of GNI)
		Total reserves (% of total external debt)
		Total debt services (% of GNI)
		Lending interest rate (%)
	Population relative wealth	GNI per capita
		GDP per capita
		Unemployment (% of total workforce)
	Poverty	% of population earning less than $1.25 per day
	Economic diversification	Value added – industry (%of GDP)
		Value added – services (%of GDP)
	Energy consumption	Electric power consumption (kWh per capita)
	Energy cost	Diesel fuel price

Examples of vulnerability indictors (Cont'd)

Category	Factor	Measure
Demography/socio-economic	Size of population	Total population
	Population growth	Population growth
	Population-female	% female of total population
	Population density	People per km2
	High concentration of people in urban areas	Population in the largest city (% of total population)
		Population in urban agglomerations of more than 1 million (% of total population)
	Economically dependent population	% of young and old to working-age population
Agriculture	Dependency on agriculture	% of agricultural land to total
		% of workforce in agriculture
		% of rural population
	Dependency on rain-fed agriculture	% of rain-fed land
	Level of land degradation	% of degraded lands
Food security	Reliance on single or few crops	% of product of top three strategic crops
	Reliance on locally produced food	% Food produced locally
	Food productivity	Cereal yield in kg per hectare

Socio-economic Vulnerability Indicators – Sea Water Rise –

- People affected (people live in hazard zones and affected by rising seawater levels).
- Capital (market) value of infrastructures that could be lost (e.g. coastal power and oil installations, tourism resorts, building, etc.)
- Areas of fertile agricultural land that would be inundated.
- Area of wetlands that would be lost due to sea water rise
- People at risk and potential adaptation costs for protection.
- Etc.

Socio-economic Vulnerability indicators – Drought –

- Rural community and farmers affected
- Agricultural land area affected
- Crop loss
- Yield reduction
- Income loss
- Higher consumer prices
- Etc.

Development of cc adaptation strategies (e.g. Water Resources Sector)

In developing a water resources adaptation strategy, water resources managers need to consider activities that actually assist in alleviating and/or avoiding adverse impacts of CC on the water sector.

Examples of Adaptation of Water Management Components to CC

Vulnerable Water management	Adaptation at supply side	Adaptation at Demand Side
Municipal water supplies	•Increase reservoir capacity •Desalinate •Inter-basin transfer •Rain harvest	•Use Grey water •Improve water efficiency •Reduce leakages •Conserve •Use economic instruments •Enforce water legislations
Pollution protection (Degradation of Water Quality)	•Enhance treatment works •Reuse and reclaim •Upgrade water protection	•Reduce effluent volume of waste •Promote alternatives to chemicals
Agriculture •Rain fed •Irrigated	•Improve soil conservation •Supplement from other sources as needed •Develop bio-saline agriculture technology	•Use drought tolerant crops.
	•Improve tilling practices. •Harvest rainwater •Reuse adequately treated domestic wastewater	•Increase irrigation efficiency •Empower local water users associations •Activate economic instruments
Flood Management	•Build reservoirs and levees •Protect and restore wetlands	•Upgrade flood warnings •Reduce floodplain development

III. Considerations and measures for developing livelihood strategies to adapt to CC

- Building resilient water and sanitation supply systems and infrastructure (i.e. to achieve MDG 7).
- Implement Integrated Water Resources Management (IWRM) to protect vulnerable water users and basic and environmental needs.
- Insure strong focus on joint water and land management in National Adaptation Programmes of Actions (NAPAs).

III. Considerations and measures for developing livelihood strategies to adapt to CC

- Generate and share information and have access to relevant technologies to enhance resilience of communities to adverse climate change impacts.
- Implement ecosystem based adaptation and maintain minimum environmental flows to protect the public health.
- Promote integration of energy and water sectors (i.e. water-energy nexus) and management of water demand as a key component of enhancing energy efficiency in the sector.