ClimaEast

Support to Climate Change Mitigation and Adaptation in Russia and ENP East countries

Agriculture and forestry adaptation challenges of EU Eastern Partnership countries in the South Caucasus under the auspices of the Clima East project

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HTSPE International Programme Management

This project is funded by the European Union

Content of presentation

1. **Clima East brief intro – policy & pilots**
2. **Context**
3. **National crop, livestock and forestry impacts – Armenia, Azerbaijan & Georgia**
4. **Contacts**

This project is funded by the European Union

1) CLIMA EAST BACKGROUND INFORMATION

Beneficiary countries: Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russian Federation and Ukraine

Project time frame: October 2012 – October 2016

Project budget: approx. EUR 7 million*

Funding authority: The European Commission (EC), DEVCO

* Part of a larger 'Clima East project' package, containing pilot projects on ecosystems based approaches to climate change (EUR 11 million) implemented by UNDP

Pilot projects on ecosystems based approaches to climate change implemented by UNDP (11 million EUR) - The aim:

To show through pilot projects the feasibility of ecosystem-based approaches to climate change, meaning that intact ecosystems such as peatlands, permafrost landscapes, boreal forests and pasture land can have a strong and cost-efficient positive effect both on climate change mitigation and adaptation

Component 1: **Conservation & SM of peatlands** in Russia, Ukraine, and Belarus to minimize carbon emissions and help ecosystems to adapt to CC, while contributing to the overall mitigation and adaptation effort

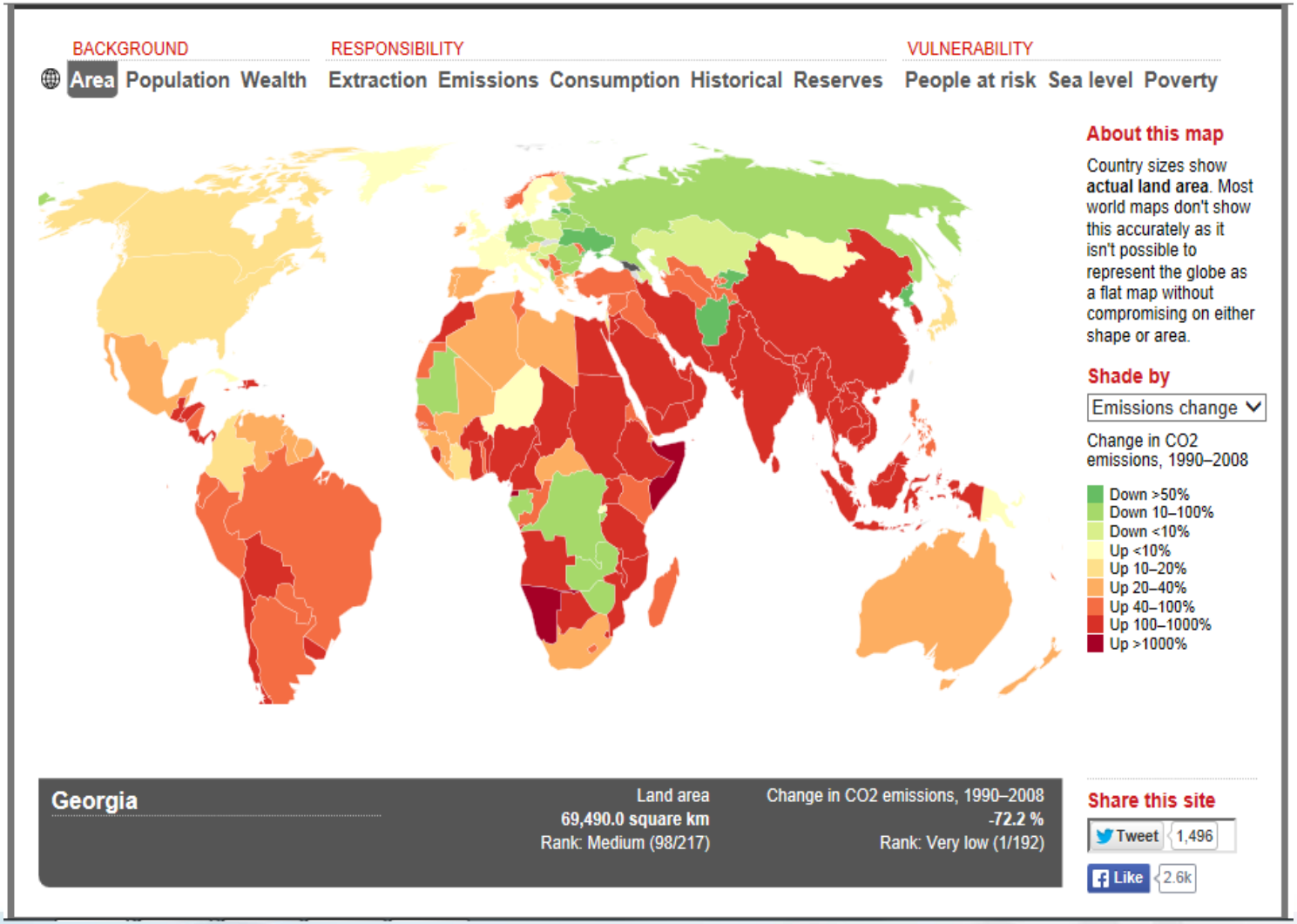
Component 2: **Protection & restoration of forest and peatland permafrost carbon pools** in Komi Republic and Nenetsky Autonomous Okrug

Component 3: **SM of pastures** in the Caucasus (Armenia, Azerbaijan, Georgia) to demonstrate CC mitigation and adaptation benefits and dividends for local communities

Component 4: **SM of pastures & community forests** in Moldova's first National Park Orhei to demonstrate climate change mitigation and adaptation benefits and dividends for local communities

Global coordination , management and knowledge sharing component

2) Context



Source, a KILN project : http://www.theguardian.com/news/datablog/interactive/2012/mar/29/carbon-map-infographic-world

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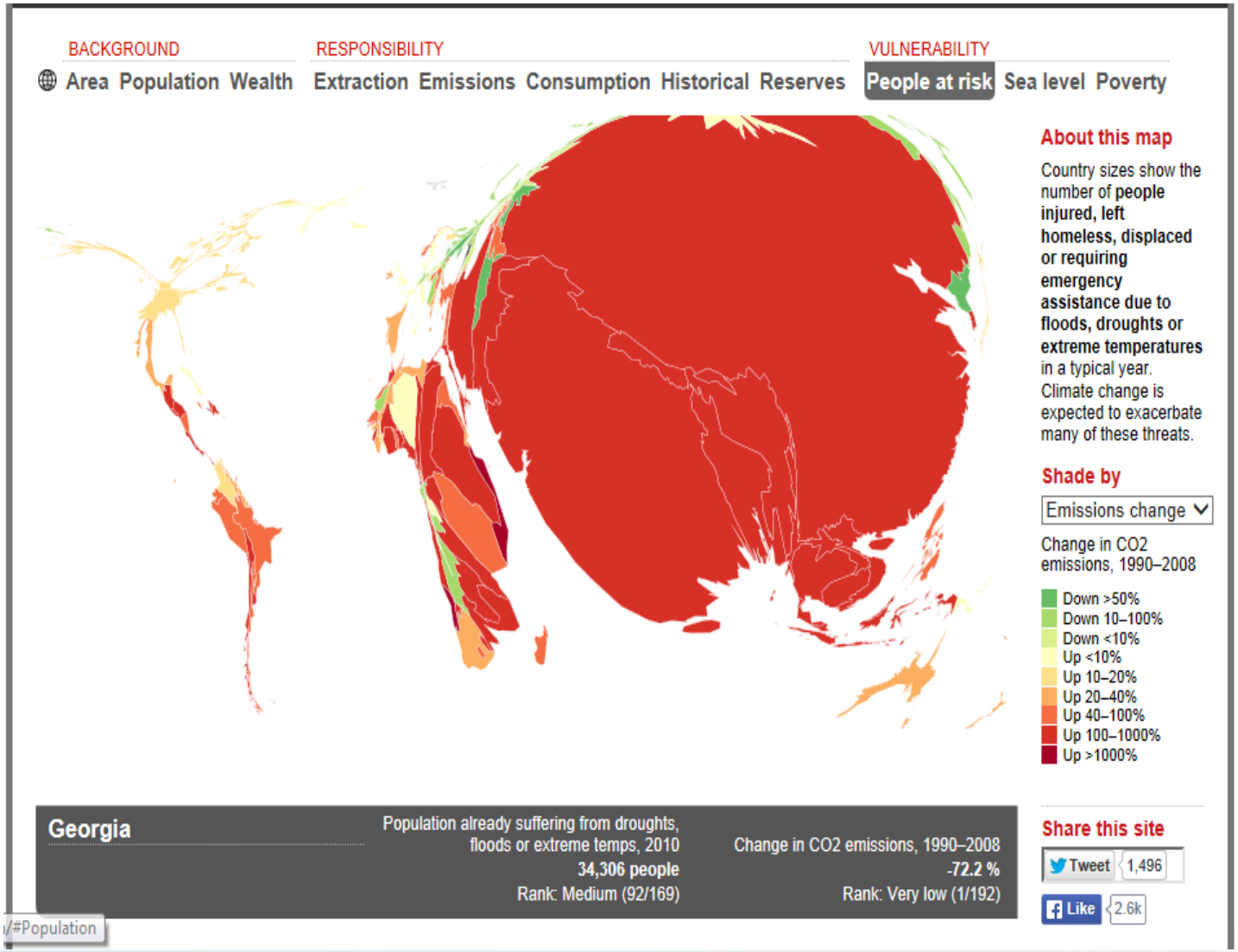
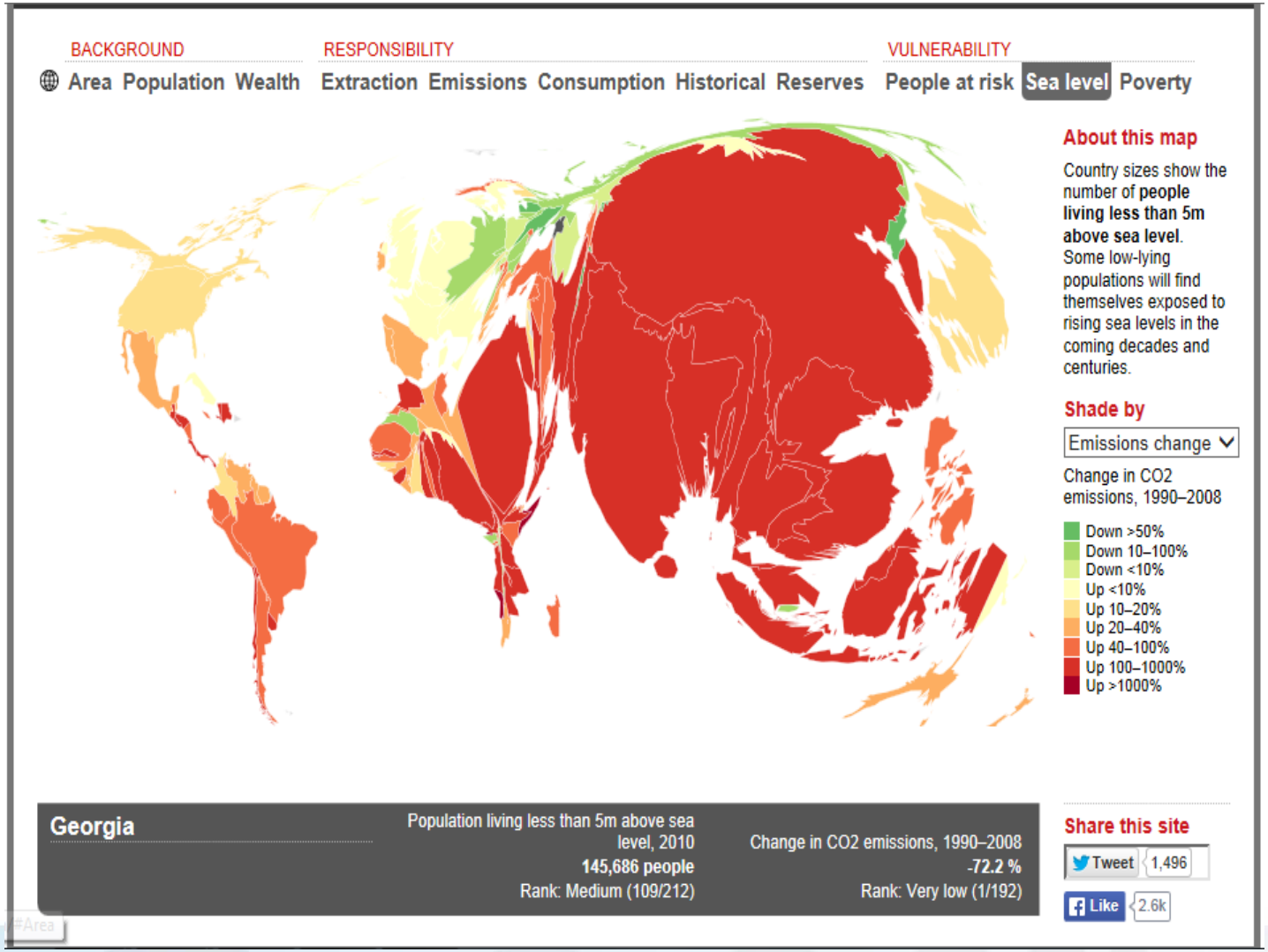
2) Context


BACKGROUND
Area Population Wealth
RESPONSIBILITY
Extraction Emissions Consumption Historical Reserves
VULNERABILITY
People at risk Sea level Poverty
About this map
Country sizes show the number of people injured, left homeless, displaced or requiring emergency assistance due to floods, droughts or extreme temperatures in a typical year. Climate change is expected to exacerbate many of these threats.
Shade by
Emissions change
Change in CO2 emissions, 1990–2008
Down >50%
Down 10–100%
Down <10%
Up <10%
Up 10–20%
Up 20–40%
Up 40–100%
Up 100–1000%
Up >1000%
Georgia
Population already suffering from droughts, floods or extreme temps, 2010
34,306 people
Rank: Medium (92/169)
Change in CO2 emissions, 1990–2008
-72.2 %
Rank: Very low (1/192)
Share this site
Tweet 1,496
Like 2.6k
/#Population

2) Context


BACKGROUND
RESPONSIBILITY
VULNERABILITY
Area Population Wealth
Extraction Emissions Consumption Historical Reserves
People at risk Sea level Poverty
About this map
Country sizes show the number of people living less than 5m above sea level. Some low-lying populations will find themselves exposed to rising sea levels in the coming decades and centuries.
Shade by
Emissions change
Change in CO2 emissions, 1990–2008
Down >50%
Down 10–100%
Down <10%
Up <10%
Up 10–20%
Up 20–40%
Up 40–100%
Up 100–1000%
Up >1000%
Georgia
Population living less than 5m above sea level, 2010
145,686 people
Rank: Medium (109/212)
Change in CO2 emissions, 1990–2008
-72.2 %
Rank: Very low (1/192)
Share this site
Tweet 1,496
Like 2.6k

Climate Change in the South Caucasus: key findings, trends and projections

INDICATORS	Armenia	Azerbaijan	Georgia
Air temperature (last half century)	↑	↑	↑
Precipitation and snow (last half century)	↓	↓	↑
Desertification	↑	↑	↑
Extreme weather events and climate-related hazards (1990–2009)	↑	↑	↑
Melting ice (last half century)		↑	↑
Water resources availability in the future (2050–2100)	↓	↓	↓
Health Infectious and vector-borne diseases	↑	↑	↑
Greenhouse gas emissions 1990–2005	↓	↓	↓
Greenhouse gas emissions 2000–2005	↑	↑	↑
Policy instruments, actions and awareness	↑	↑	↑
Climate observation and weather services (1990–2009)	↓	↓	↓

↑ Increase, enchancement ↓ decrease, reduction ↑ Increase in some areas

Sources: Second National Communications of Armenia, 2010; Azerbaijan, 2010; Georgia, 2009.

Source: UNFCCC National Communications; ZOI Environmental Network graphics

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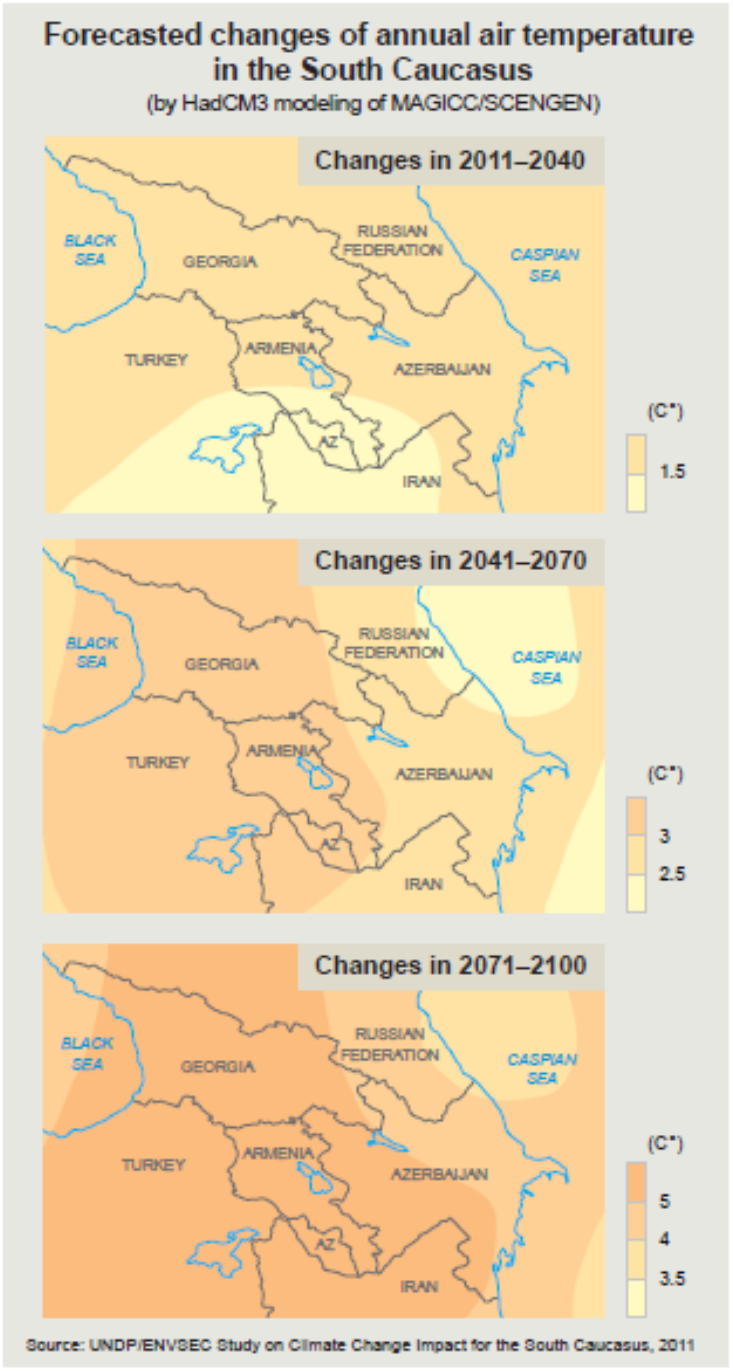

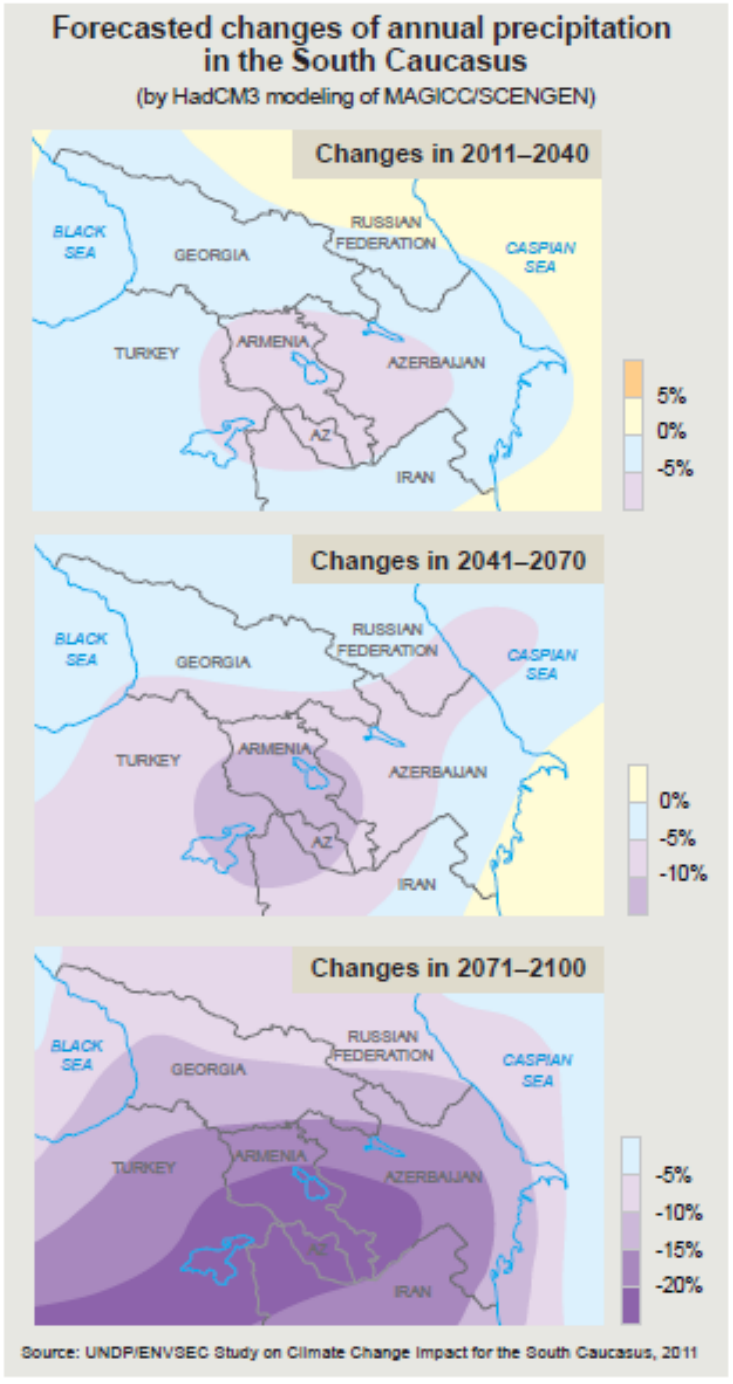

Source: UNDP/ENV SEC Study on Climate Change Impact for the South Caucasus, 2011

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3) National key issues - Armenia

General - "Increased evaporation from the soil will result in the **secondary salination of land plots**, heavy rains and floods will further worsen **water induced erosion**, and droughts and hot dry winds will further aggravate **wind erosion** of lands" (Ministry of Nature Protection, Yerevan, 2010).

Crops - "The appropriate **zone** for growing each crop will likely **move upwards** in altitude 100 m by 2030 and 200-400 m by 2100. For the most part this should represent an expansion of zones; there do not appear to be any important crops grown in Armenia for which a 3-5ºC increase in average temperature will make cultivation in the lower end of the current zone untenable. In general, more lands at higher elevations will become appropriate for growing crops, which may create some competition for higher elevation lands now used for pasture or hayfields. In most cases, sub-alpine pasture and hayfields cannot move further upward into the rocky mountainous outcroppings in response to this competition" (UNDP & SEI, 2009).

Due to the higher temperature, more evaporation and decreased precipitation, more land will need irrigation (present irrigation @ 50%; 70% of crops) but **less river water will be available** (UNDP & SEI, 2009).

"By 2030, **a decline of 8-14% in the yields** of the main agriculture crops is forecasted (9-13% for cereals, 7-14% for vegetables, 8-10% for potato and 5-8% for fruits)" (Ministry of Nature Protection, Yerevan, 2010)

3) National key issues - Armenia

Livestock – ""According to climate change scenarios, the **total surface and yields of pastures in Armenia will reduce by 4-10% by 2030**, including 19-22% in more valuable pastures of sub-alpine and alpine zones (Ministry of Nature Protection, Yerevan, 2010)."

"In terms of total productivity, pastures are **projected to produce 5 percent less livestock feed** in total across Armenia, but only if the remaining pastures maintain the same level of productivity as in the past (UNDP & SEI, 2009)".

However, "a 7-10% decrease in the yields of grasslands is possible, which, in its turn, will result in lower levels of fodder production. […] Because of the inadequate availability of fodder in wintertime, the forced shifts in timeframes for animal grazing (early start and late end of grazing season) will result in intensified degradation of natural pastures (Ministry of Nature Protection, Yerevan, 2010)".

Forestry- "Armenia's forests will shrink in size and deteriorate in biodiversity with climate change. Higher temperatures will cause an upward shift in the zones appropriate to each species (UNDP & SEI, 2009)."

"While total potential losses in forest area from climate change – including damages from changing climatic zones (a 5 percent loss of total forests), beetle infestation (21 percent), and forest fires (8 percent) – cannot be estimated with any precision given existing data, the potential territory at risk from climate change lies somewhere between 21 and 34 percent of the nation's forested lands (UNDP & SEI, 2009)."

3) National key issues - Azerbaijan

General – "The yearly mean temperature increase from 2021 to 2050 is projected at 1.50°C-1.60°C, or approximately 0.30°C every 10 years." "By 2050, precipitation is anticipated to increase 10-20% compared to its level during the baseline period of 1961 to 1990. "Between 2071 and 2100 the temperature is projected to increase by 5°C in most parts of the country. An increase in precipitation of 20% to 80% from West to East, respectively, is forecast, while in Nakhchivan, precipitation will likely decrease by 20%." (Ministry of Ecology and Natural Resources Republic of Azerbaijan, 2010)

Crops - "[According to future climate scenarios] there will be favorable conditions for the present borders of areas where **cereals are grown to move towards mountains** […]. However, due to a **shortage of favorable soil** resources in these areas, the expansion will be limited. Despite the fact that the duration of plant's potential vegetation in conventional areas of cereals growing will extend due to global warming, the actual plants' vegetation will shorten by 10-15 or 20-25 days. This will make it possible to grow cereals in wider areas. In addition, early harvest of wheat followed by sowing of forage, melons, greens, etc. will make it possible to harvest two and three times a year, raising overall productivity. However, this will be greatly **dependent on water supply. "**(Ministry of Ecology and Natural Resources Republic of Azerbaijan, 2010)

3) National key issues - Azerbaijan

Livestock – ""In spite of the increasingly favorable climate for winter pastures, their area might diminish due to soil erosion and an increased crops growing. [...] The increased precipitation might cause a rise in the productivity of winter pastures both in winter and spring."

Regarding summer pastures, the future climate conditions could be favourable for their expansion, but this will be limited by the availability of suitable lands. Moreover, the increased precipitation is not considered to have a significant impact on the productivity of summer pastures, on the contrary, it will have negative effects by intensifying soil erosion. (Ministry of Ecology and Natural Resources Republic of Azerbaijan, 2010)

Forestry- Forest cover almost doubled since 1990 to 11.6%. "Their majority grow on steep slopes where logging poses a threat of erosion." (Ministry of Ecology and Natural Resources Republic of Azerbaijan, 2010)

Significant degradation of forests has taken place by overharvesting of fuel wood. (FAO, 2010) On the other hand, forests could have an important role in the improvement of the quality of soil, air and water. (Ministry of Ecology and Natural Resources Republic of Azerbaijan, 2010) .

"We can expect that the acreage of valuable oak and beech forests will diminish; the acreage of hornbeam forests will increase. Across the country, especially in the piedmont zone, the proportion of drought-resistant tree and shrub species will increase." (FAO, 2010)

3) National key issues - Georgia

General - "In **semi-arid regions** climate change has **increased temperatures, precipitation, the frequency and severity of droughts and strong winds** (Ministry of Environment Protection and Natural Resources of Georgia, 2010)

"In **highlands and mountainous areas**, the average annual air temperature and precipitation have increased by 0.4°C and 106 mm (8%) respectively in the last half century. (Ministry of Environment Protection and Natural Resources and United Nation Development Programme, 2009) (FAO, 2009b) Due to the temperature rise, glaciers are expected to disappear by 2050 (Ministry of Environment Protection and Natural Resources of Georgia, 2010) (Ministry of Environment Protection and Natural Resources and United Nation Development Programme, 2009)

"In the Black Sea coastal zone, an **increase in air temperature by 1.2 °C and a decrease of precipitation of 8-10% are forecast** "(FAO, 2009).

Crops – "In case of temperature increase by 1-2 °C, changes in **vine harvest** are expected, both positive and negative. In addition, the sugar content will be increased. In main **wheat** growing areas of the same region **decrease of the harvest by 30-60% is possible** [and] maize productivity may be decreased by 20-30%." (FAO, 2009)

"Given the predicted climate changes for this region due to global warming, the creation of better conditions for the production of oranges and lemons is anticipated, ." "The increase of the vegetation period for vegetables from the current average of 224 days to 290 days could make it possible to supply the coastal resorts with fresh vegetables all year round." (Ministry of Environment Protection and Natural Resources and United Nation Development Programme, 2009)

3) National key issues – Georgia

Livestock – "Regarding winter pastures, the most important risk factor is that overgrazing has damaged the grass cover and left the soil to face strong winds and rainfalls, which leads to further erosion. This trend negatively affects livestock production. (Ministry of Environment Protection and Natural Resources of Georgia, 2010)

Fisheries - "In 1960, 26 commercial fish species were registered in the Black Sea and today there are only 3 to 4. Due to over fishing in the early 1970s and 1980s, the structure of catches has shifted significantly. Overfishing, invasion of alien species and degradation of the aquatic environment are the primary causes of this decline." (Ministry of Environment Protection and Natural Resources of Georgia, 2010)

Forestry- "The main risks on forests resulting from climate change are more frequent and intense flash floods, landslides and mudflows." (Ministry of Environment Protection and Natural Resources of Georgia, 2010)

"During the last two decades, the growing spread of pests and diseases has been observed." (FAO, 2010) (Ministry of Environment Protection and Natural Resources and United Nation Development Programme, 2009)

4) Conlcusions

- Impact assessment/modelling remains a challenge (sectors, scales, economic models)
- Impact uncertainty treatment
- Use of integrated assessment models
- Evidence based policy making for adaptation

Learning from your Cyprus experience

This project is funded by the European Union

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