Environmental integration in EC development co-operation
Regional seminar for Delegations and partners
Almaty 6 – 9 July 2009

''EXPLORING CLIMATE CHANGE ISSUES IN CENTRAL ASIA''

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SESSION D1 – DAY 4

Testing practical climate change tools and methods

1. Choose 1 topic from the 2 listed below:

- Climate change in mountainous areas
- Climate change in arid and semi arid areas.

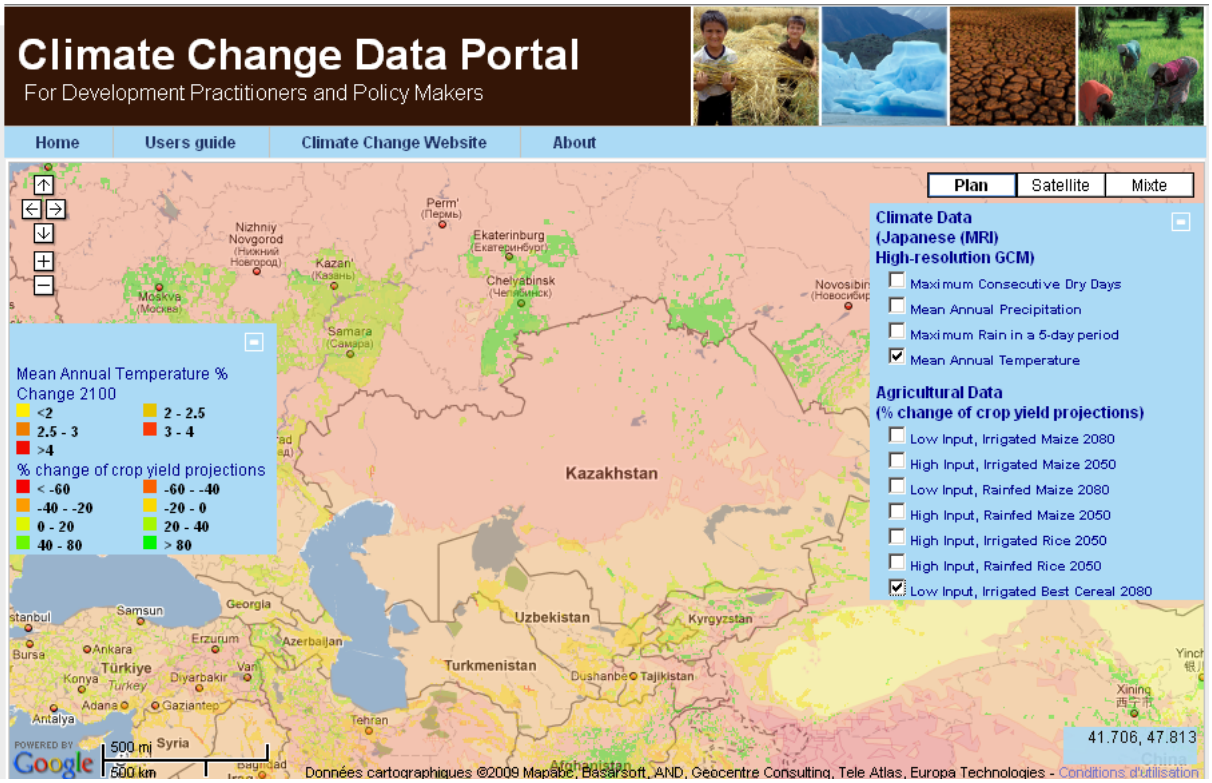
2. Answer to the 3 questions below (3 sub-groups):

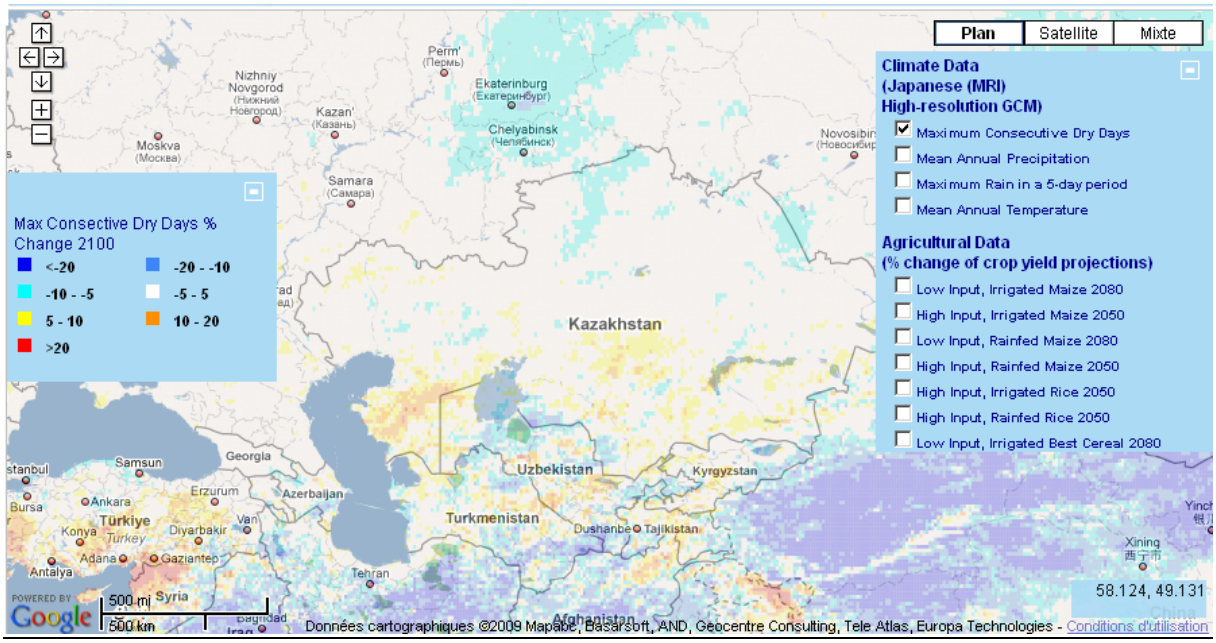
- **Data:** Does the information provided correspond to your knowledge and understanding of the situation in the country/region?
- **Impacts:** Based on key climate changes highlighted, what kind of impacts due to precipitation changes, temperature increase and natural disasters can you identify?
- **Vulnerable groups:** Identify vulnerable groups and vulnerable economic activities

3. **Debriefing in plenary followed by a brainstorming on**
- National strategies?
- Regional strategies?
- Issues to address in priorities?

Data and Information from the Climate Change Data Portal - World Bank
http://sdwebx.worldbank.org/climateportal/home.cfm?page=globlemap

- Mean Annual Temperature increase changes by 2100 combined with Low Input, Irrigated best cereals by 2080;
- Maximum consecutive dry days % changes by 2100.





Source: Japanese High resolution Global Circulation Model;

Other data provided

- Climate data (Japanese General Circulation Models) for temperature and precipitation changes 2091-2100, 2031-2050 for the 5 Republics with comments
- Natural disaster data for several locations (flood, drought, landslide)
- For Kazakhstan, 3 maps showing change in Average historical June precipitation (1951 – 2001), change in Average Temperature and Precipitation by 2100 from the Nature Conservancy Climate Wizard (http://www.climatewizard.org/)

1. Climate Survey for Kazakhstan

By mid-century, the coarser-resolution global climate models project that this site will become warmer, with more frequent heatwaves and fewer frost days. They project that this site will become wetter. Rainfall intensity is expected to increase. Runoff (precipitation minus evapotranspiration), a measure of water availability, is projected to increase. The maximum amount of rain that falls in any 5-day period (a surrogate for an extreme storm event) is expected to increase.

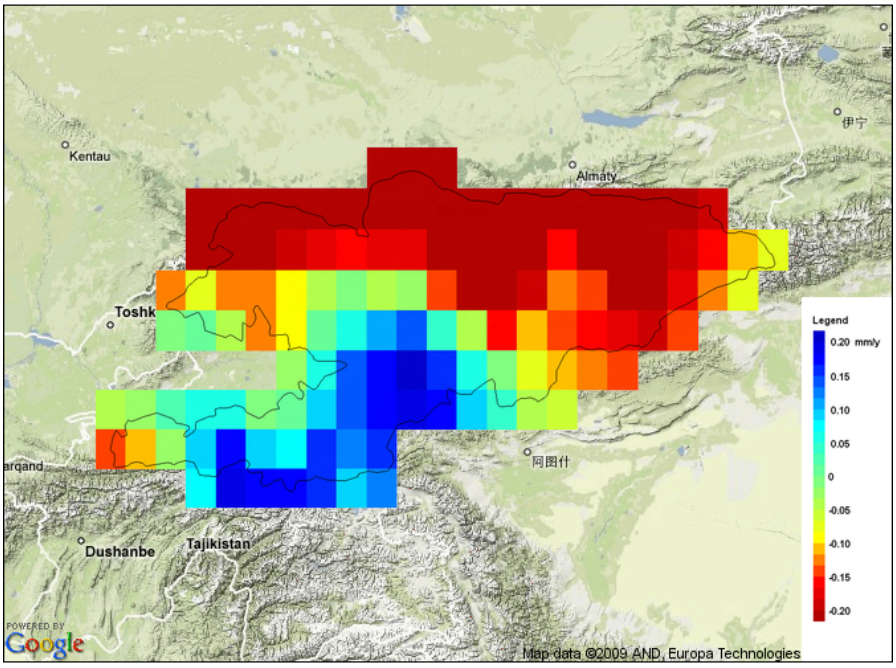
One particular higher-resolution (finer spatial scale) climate model projects that this site will become wetter by the end of the century. The maximum amount of rain that falls in any 5-day period (a surrogate for an extreme storm event) is projected to increase. The maximum period between rainy days is expected to decrease. Sometimes this higher-resolution model can be in conflict with the ensemble of coarser-resolution models, underscoring the need to consider many different climate models.

Climate Data

	Japanese High Resolution GCM (20 km.)	IPCC GCMs		Country Average Values
	Change (2091 - 2100 vs. 1981- 1990)	Change (2030 - 2049 vs. 1980-1999)	# Models Projecting Same Change	
Mean Annual Precipitation:	0%	2%	13 out of 20	4%
DJF Precipitation:	--	1%	11 out of 20	9%
MAM Precipitation:	--	-1%	11 out of 20	5%
JJA Precipitation:	--	3%	13 out of 20	6
SON Precipitation:	--	4%	12 out of 20	4%
Runoff:	--	-6%	4 out of 12	3%
Mean Annual Temperature:	3 (°C)	2 (°C)	--	2 (°C)
DJF Temperature:	--	2 (°C)	--	2 (°C)
JJA Temperature:	--	2 (°C)	--	2 (°C)
Sea Surface Temperature:	--	--	--	--
Maximum 5-day Precipitation Total:	12%	3%	6 out of 8	7%
Daily Precipitation Intensity:	--	6%	8 out of 8	5%
Consecutive Dry Days:	4 day(s)	1 day(s)	4 out of 8	1 day(s)
Frost Days:	--	-21 day(s)	8 out of 8	-22 day(s)
Heatwave Duration Index:	--	28 day(s)	8 out of 8	29 day(s)
Wildfire Frequency:	NA			--
Biome Change:	NA			--

- No significant change in mean annual rainfall (-15 to +15%) is projected for your site.
- No significant change (-10 to + 10) in consecutive dry days is projected for your site
- A moderate increase in temperature (1 - 2.5º C) is projected for your site.
- **A significant increase in runoff (>35%) is estimated for your site. A significant increase can lead to some shifts in biodiversity and ecosystems. Increase of agricultural land will intensify land use changes. However, lack of soil cover and water holding capacity can promote floods, excess runoff, and siltation in surrounding areas.**
- No significant change (± 25 mm) in the maximum 5-day precipitation (rainfall extreme events) is projected for your site.

Change in Average June Precipitation 1951 - 2001



Data Source: Climatic Research Unit and the Tyndall Centre. Mitchell et. al.
http://cru.csi.cgiar.org/PDF/mitchelljones.pdf

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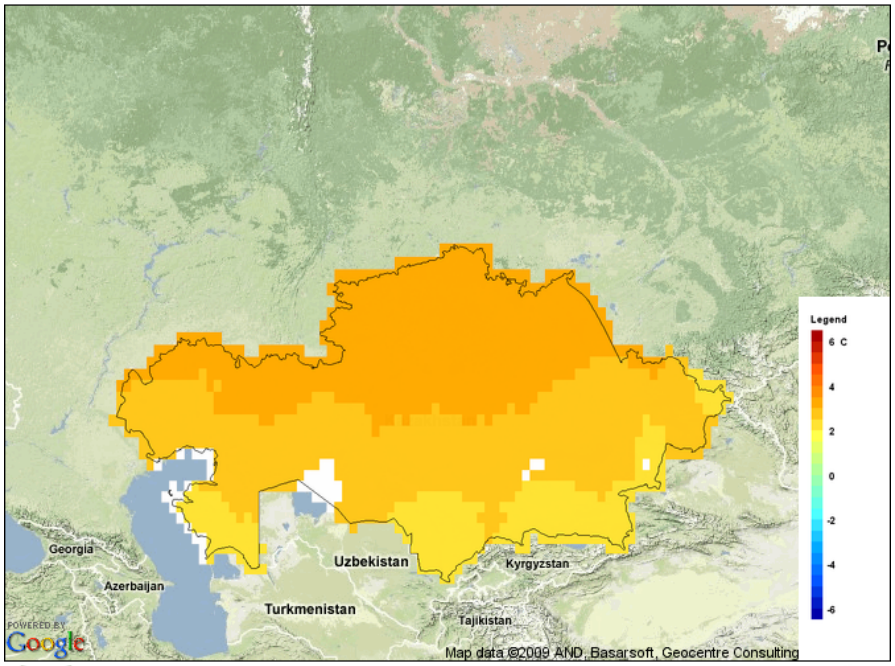
Change in Average Annual Temperature by 2100

Model: Ensemble Average, SRES emission scenario: A2



Data Source: The World Climate Research Programme's Coupled Model Intercomparison Project phase 3 multi-model dataset. Anomalies calculated and interpolated by:
US Forest Service - Mapped Atmosphere-Plant-Soil System Study, Neilson et.al.

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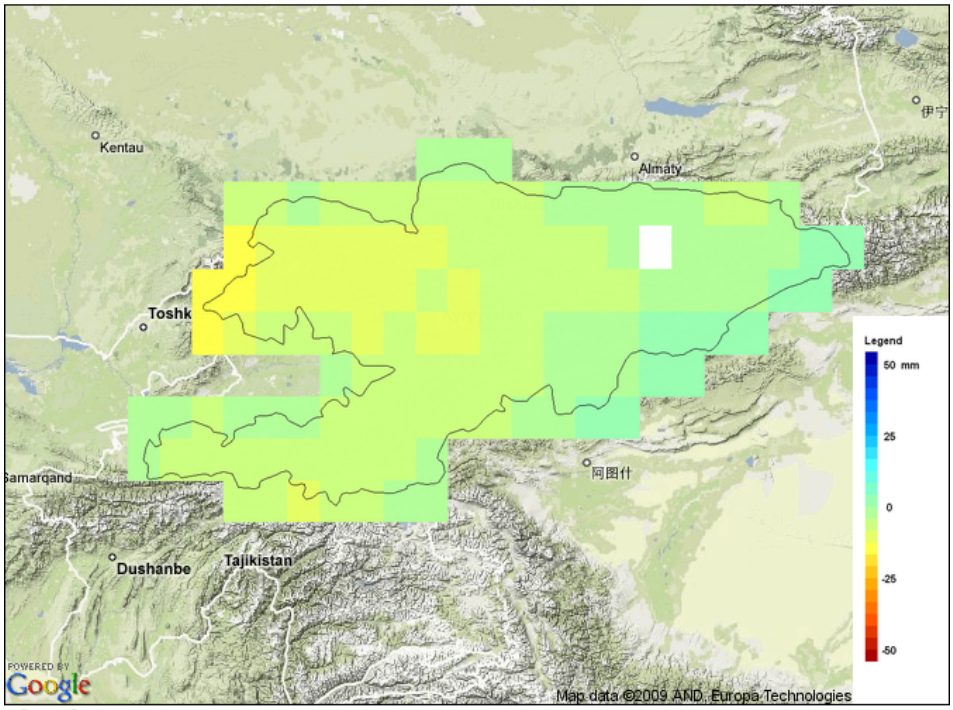

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Climate Data | Adaptation Screening Tool | Historical Data | **Natural Disaster Data** | Socioeconomic Indicators | Agricultural Data | **Download Data & Resources for selected country**

Natural Disaster - Relative Risk

	Frequency	Mortality	Economic Loss	Economic Loss/ GDP
Flood:	1	1	4	9
Drought:	0	0	3	0
Landslide:	0	0	0	0
Cyclone:	0	0	0	0

The number refers to the decile of the global distribution for each variable. The higher the value, the higher the relative risk. The value is for this particular location, not the country as a whole.

Source:
Dilley, M., R.S. Chen, U. Deichmann, A.L. Lerner-Lam, M. Arnold, J. Agwe, P. Buys, O. Kjekstad, B. Lyon, and G. Yetman. 2005. Natural Disaster Hotspots: A Global Risk Analysis. Disaster Risk Management Series, Issue No. 5. The World Bank, Washington, D.C.

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Natural Disaster - Relative Risk

	Frequency	Mortality	Economic Loss	Economic Loss/ GDP
Flood:	0	0	0	0
Drought:	0	0	3	5
Landslide:	0	0	0	0
Cyclone:	0	0	0	0

The number refers to the decile of the global distribution for each variable. The higher the value, the higher the relative risk. The value is for this particular location, not the country as a whole.

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