



Commission européenne  
Agriculture et développement rural



# Climate change impacts on EU agriculture - the adaptation challenge

**Hilkka SUMMA**

**DG Agriculture and Rural Development**

**Unit H4- Bioenergies, forest and climate change**



## Outline



Commission européenne  
Agriculture et développement rural

- 1) Climate change – Impacts on agriculture**
- 2) The CAP – contributing to adaptation**
- 3) How to further help preparing agriculture for climatic changes**



**Climate change is happening - EU agriculture will also be affected...**

# Observed temperature changes over Europe 1976-2006

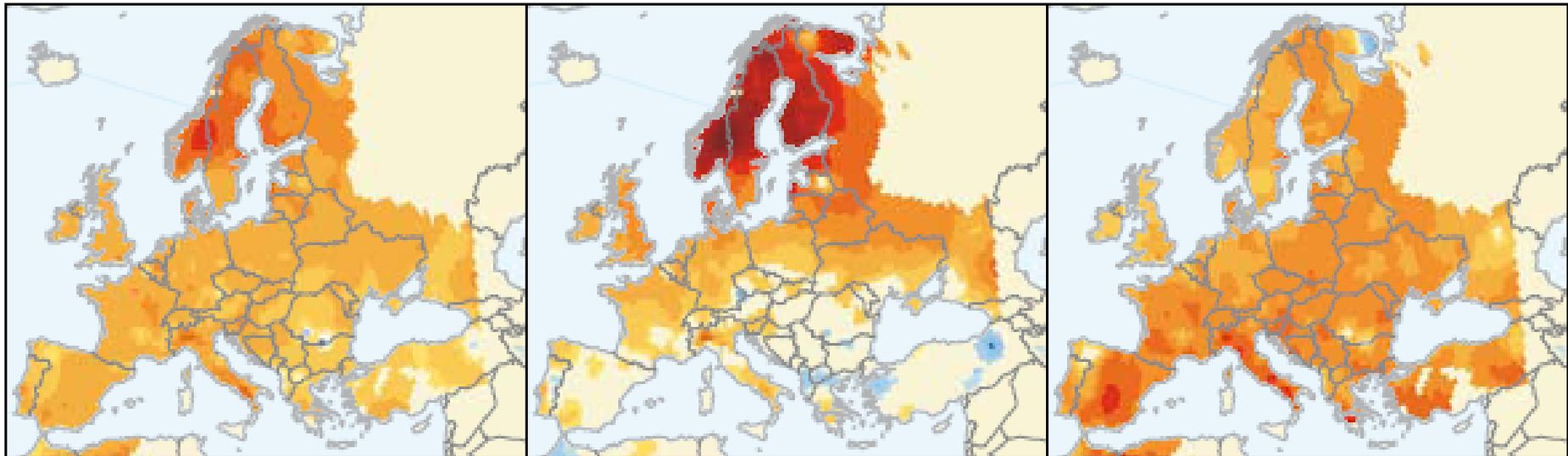


Commission européenne  
Agriculture et développement rural

Annual mean

Winter (DJF)

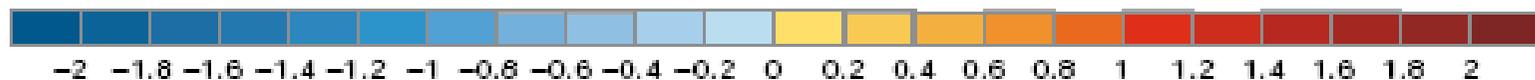
Summer (JJA)



Observed temperature change over Europe during the period 1976-2006

Left: annual mean; middle: winter (DJF); right: summer (JJA)

°C per decade

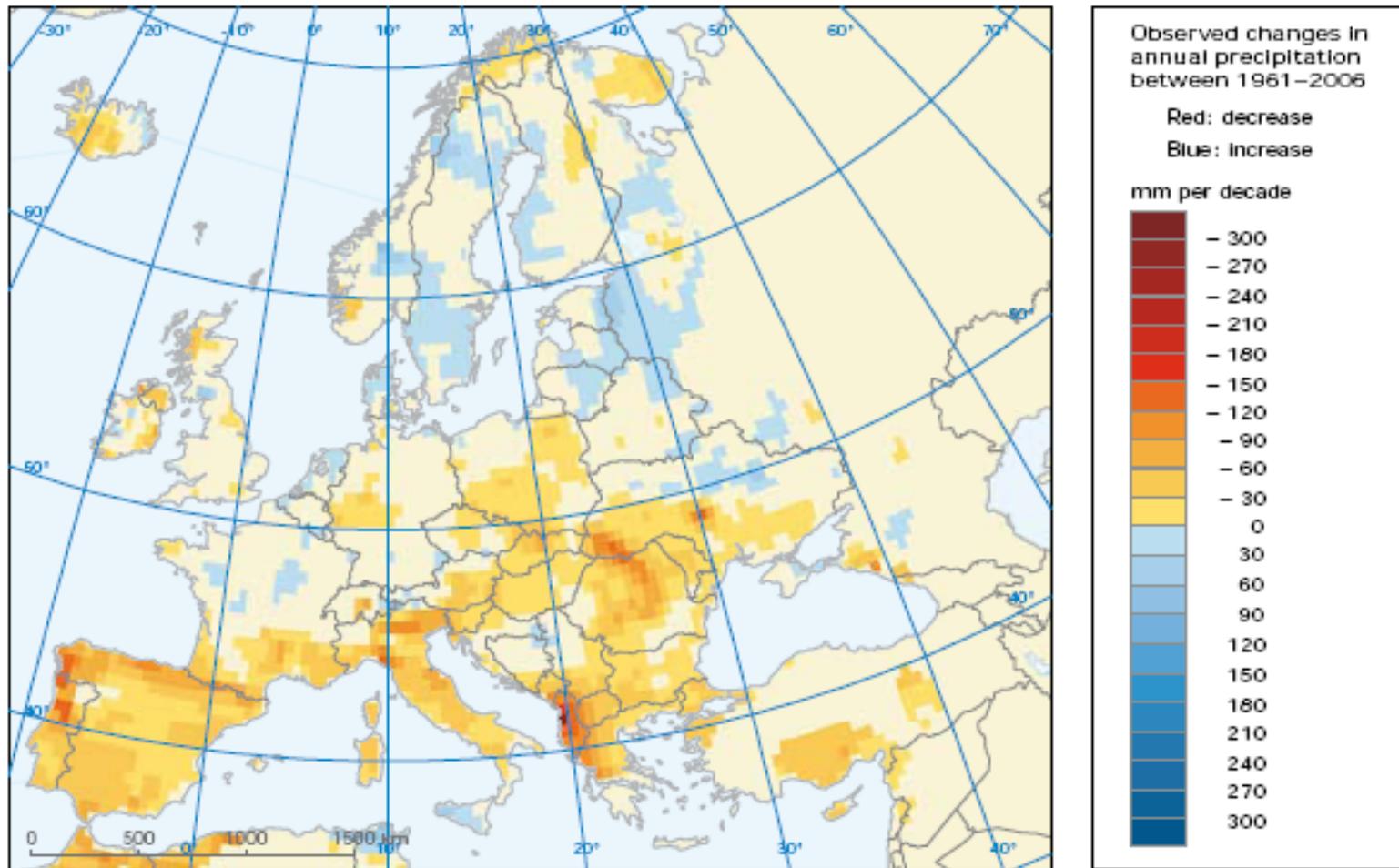




# Observed changes in annual rainfall 1961-2006



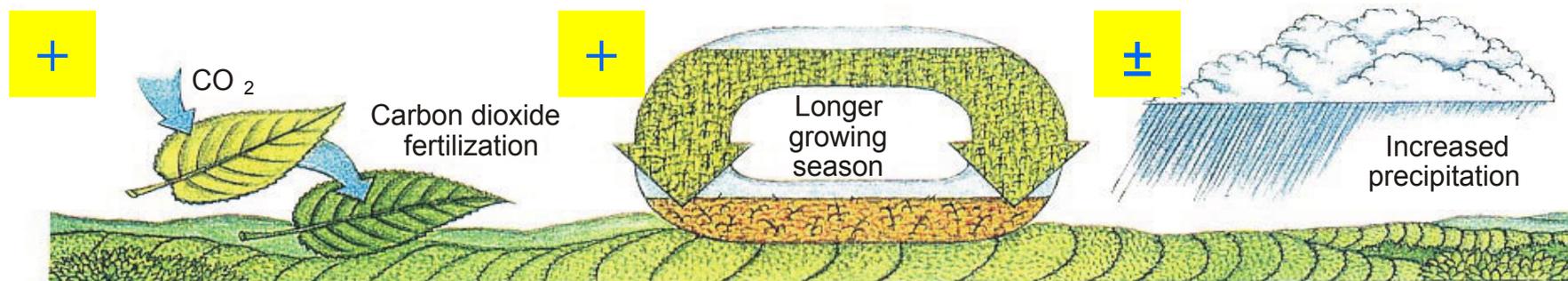
Commission européenne  
Agriculture et développement rural



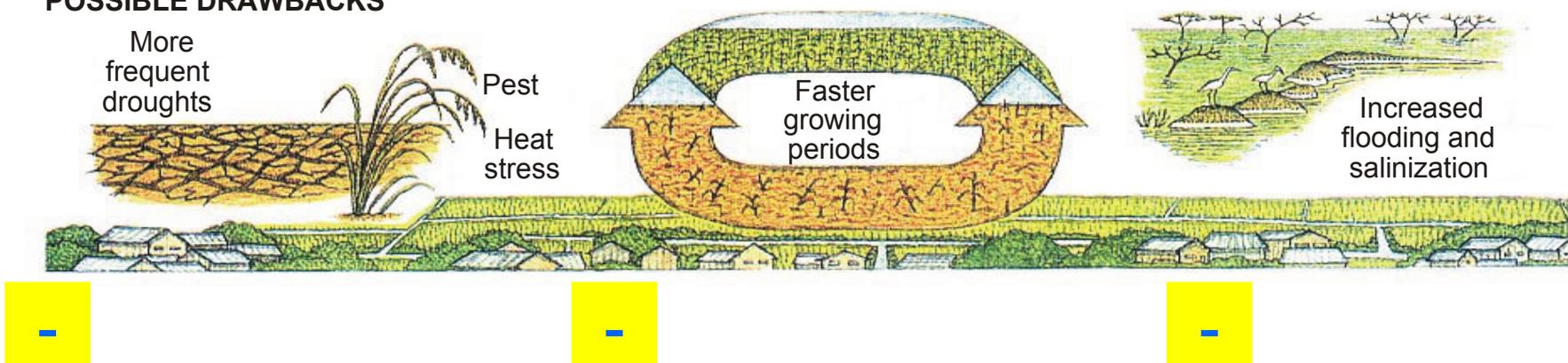
# Impacts on agriculture are complex



Commission européenne  
Agriculture et développement rural



## POSSIBLE DRAWBACKS



From Tubiello, IIASA, 2007



## Main climate change impacts on agriculture



Commission européenne  
Agriculture et développement rural

- ▶ Agriculture is highly **exposed** to climatic changes
- ▶ Some **positive** effects (north), but mostly **adverse** impacts (south);
- ▶ The most **critical** trends:
  - *Future **precipitation** patterns (risk water stress)*
  - *Incidence of **extreme weather** events*
- ▶ In the **medium term** (around 2030), significant impacts from increased frequency and severity of **extreme weather events** (droughts, heat waves, storms, floods)
- ▶ Indirect effects through impacts on physical and biological systems:
  - ***soil** conditions (organic matter, erosion risk),*
  - *likely adverse impacts from **pest and disease** patterns*
- ▶ Progressively **negative** impacts after 2050 as temperature rises



## Socio-economic impacts



Commission européenne  
Agriculture et développement rural

- ▶ The projected climatic changes will affect:
  - **crop yields** (level, stability),
  - Likely increased **price** volatility
  - **livestock** health, growth, production
  - in the medium term, **shifts** in crop locations
- ▶ Diverse **territorial** impacts:
  - risks of farm income **variability**
  - higher economic pressures for **rural areas**
  - exacerbate **disparities** between EU rural areas
  - land **abandonment** risk
- ▶ **Vulnerability** to climate change increased by:
  - International **competition**
  - **Socio- economic** challenges

# Trends of cereals yields– no apparent climate impact yet

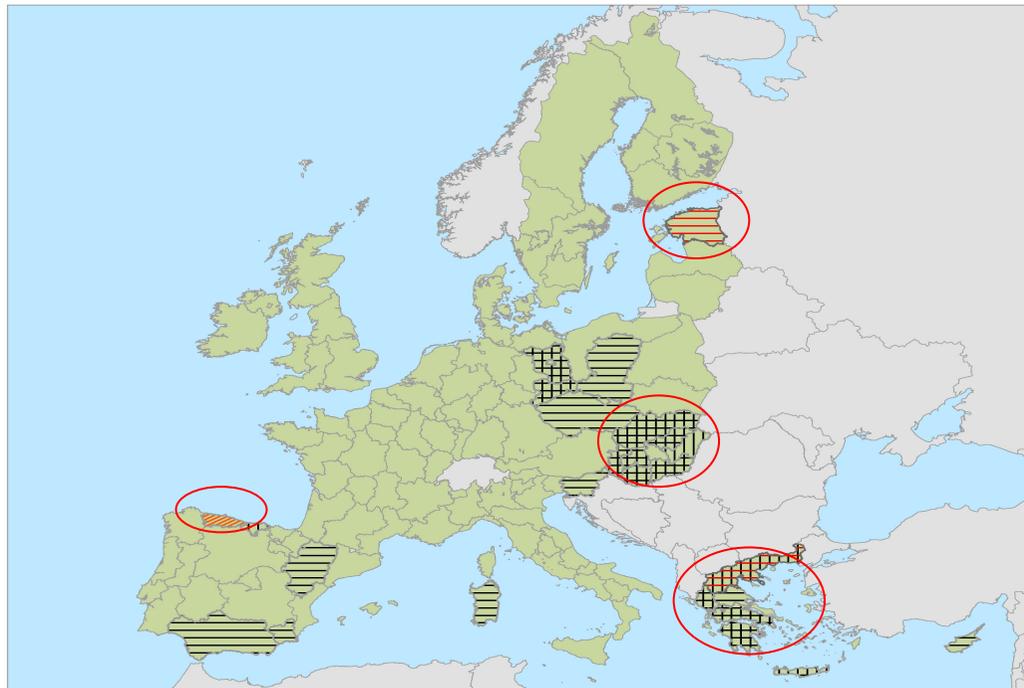


Commission européenne  
Agriculture et développement rural

## Trends in observed yields 1998-2005



### Total wheat and grain maize



#### Legend

Trends in yields for total Wheat  
and Grain Maize

- increasing for wheat and maize
- increasing for maize, constant for wheat
- constant for wheat and maize
- decreasing for wheat
- decreasing for maize
- decreasing for wheat, constant for maize

Data source: FADN data DG AGRI G3 Data elaboration: AGR14CAST, IPSC, JRC

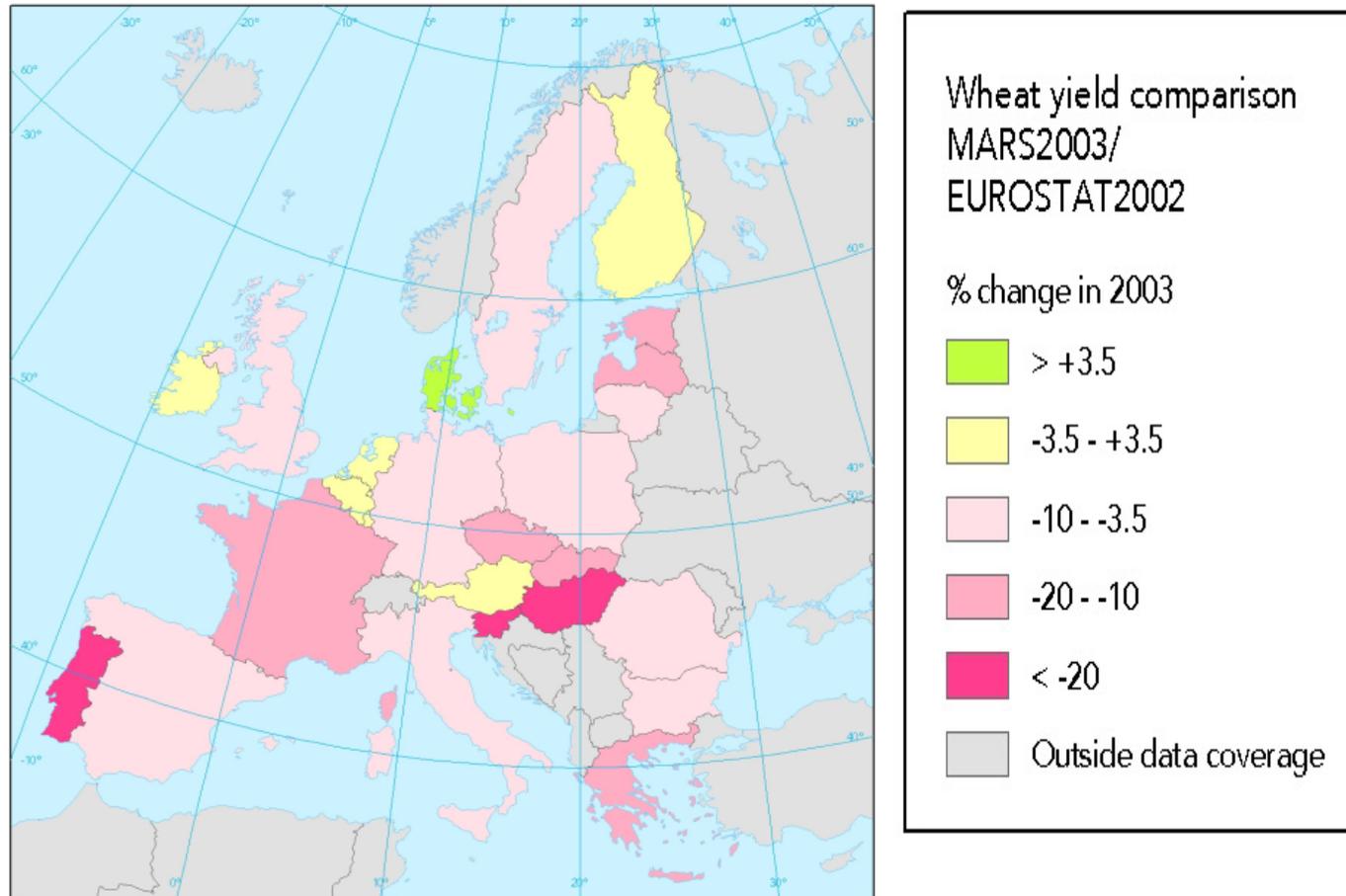
- Yields have **increased** in the last 40 years
- Over most of the EU, the trend in yields mainly shows **technological** improvements, and **continuous adaptation** to weather variability

# Effects 2003 heat wave and drought on wheat yields



Commission européenne  
Agriculture et développement rural

- Impacts of **extreme events** more obvious at national and local levels





**Adaptation - the role of  
the CAP and further  
actions**

# The adaptation challenge



Commission européenne  
Agriculture et développement rural

- ▶ Farmers have long proved their **capacity** to adapt to new challenges
- ▶ Autonomous **farm-level** adaptation already happening
- ▶ Over the coming years, adaptation may require changes in:
  - **Production** patterns and methods (e.g., plant protection)
  - **Land use**
  - **Farm structures** and strategies, with
  - **Investments** and **costs**
- ▶ The **challenge** is to guarantee **sustainability** of European agriculture and rural areas
  - **Resilience** to climate change;
  - **Economic and social viability**
  - **Coherence** with **environmental** objectives

# CAP and adaptation



Commission européenne  
Agriculture et développement rural

- ▶ Recent **CAP reforms** characterised by:
  - a **shift** from market intervention to direct producer support (decoupled from production)
  - increased support for **rural development**
- ▶ This should **facilitate** the adaptation of the agricultural sector and rural areas by:
  - giving greater **flexibility** in the production decisions – market and agronomic factors
  - **securing** farm income
  - **facilitating** the adjustment of **farm sector** – structures and production methods
- ▶ Recent **Health Check** :
  - emphasis on climate change **mitigation** and **adaptation**
  - further rural development **funding** agreed

# Rural development – relevant framework for adaptation



Commission européenne  
Agriculture et développement rural

Climate  
change one of  
the priorities  
2007-2013

Options for  
adaptation  
support in all  
axes

## Axis 1

- Farm modernization
- Restoring & prevention
- Improvement & development infrastructure
- Farm advisory services
- Training

## Axis 2

- Agri-environmental measures
- Conservation genetic resources
- Afforestation

## Axis 3

- Diversification into non-agricultural activities

## Leader



## Ideas for further helping agriculture to adapt



Commission européenne  
Agriculture et développement rural

- ▶ Prioritise "**no regret**" measures as the main short-term actions
- ▶ Strengthening and recognizing the role of agriculture as a provider of **ecosystem** services
- ▶ Enhancing resilience of agricultural **infrastructure**
- ▶ Improving **adaptive capacity** of farmers
- ▶ Facilitating **co-operation** between Member States -
- ▶ Strengthening the capacity of **regions** to cope with climatic changes
- ▶ Enhancing **climate and agricultural research**
- ▶ Developing **indicators**: adaptive capacity, vulnerability

## Wider considerations...



Commission européenne  
Agriculture et développement rural

- ▶ Farming is exposed to climate change, increased by **socio-economic** pressures
- ▶ **Global** warming, but **local** impacts – **adaptive potential** of farmers and rural areas very different across the EU
- ▶ Adaptation has to deal not only with changing temperature and rainfall, but also with **increasing variability**, more extreme events
- ▶ Adaptation **planning** is challenging – uncertainties, complex interactions climate / agronomic factors, long planning horizon, + and – effects in the same area
- ▶ Adaptation is a **long-term** process – it will continue and improve over the coming decades
- ▶ Future developments of the **CAP** will need to **integrate climate adaptation** concerns



Commission européenne  
Agriculture et développement rural



**Thank you for your  
attention!**

[http://ec.europa.eu/agriculture/climate\\_change/index\\_en.htm](http://ec.europa.eu/agriculture/climate_change/index_en.htm)