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Climate change impacts on EU agriculture - the adaptation challenge

Hilkka SUMMA

DG Agriculture and Rural Development

Unit H4- Bioenergies, forest and climate change



Outline



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- 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

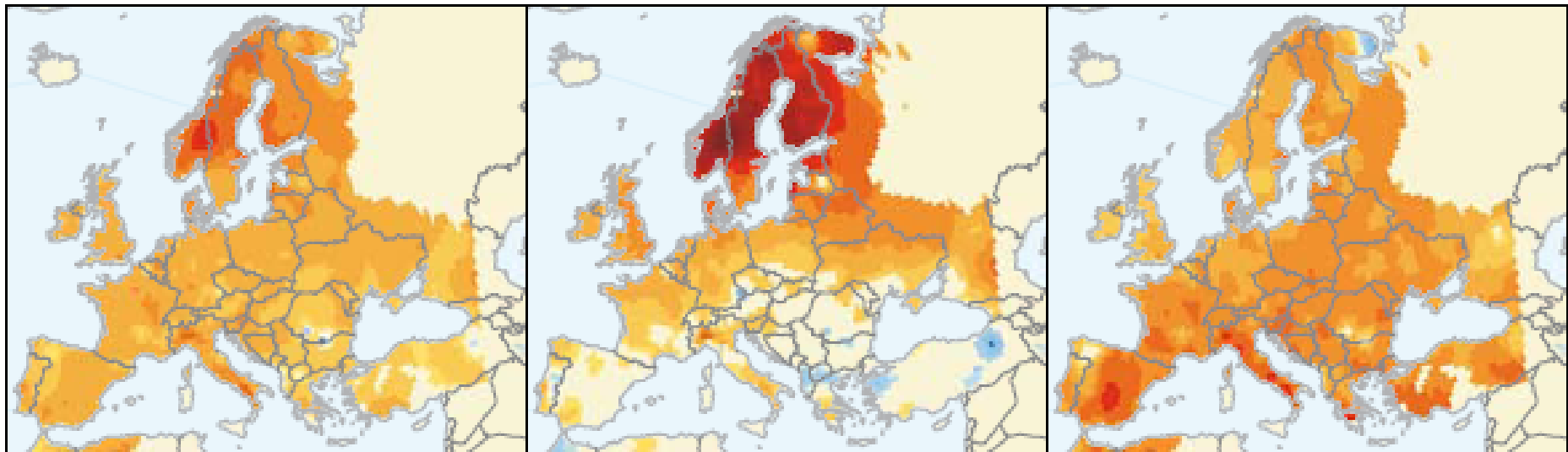


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Annual mean

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

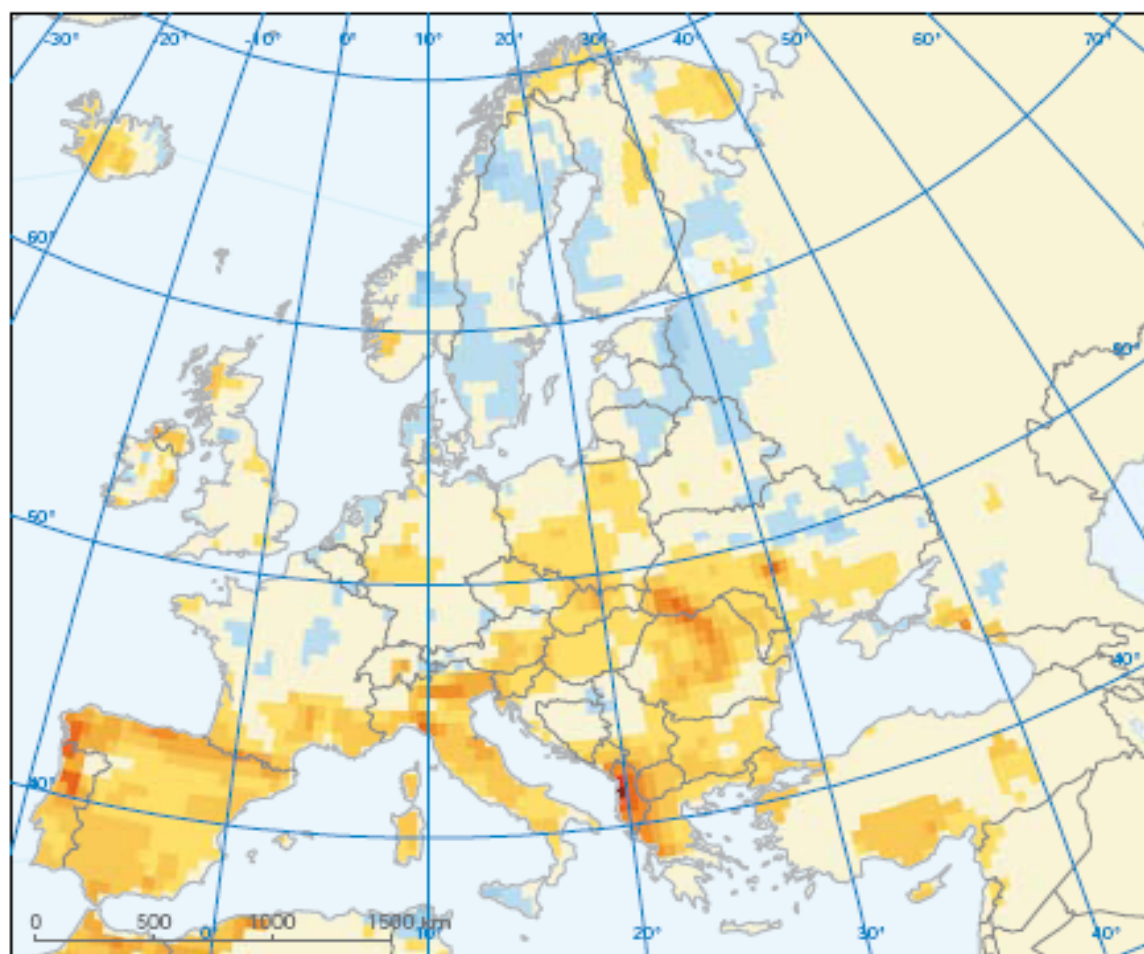




Observed changes in annual rainfall 1961-2006



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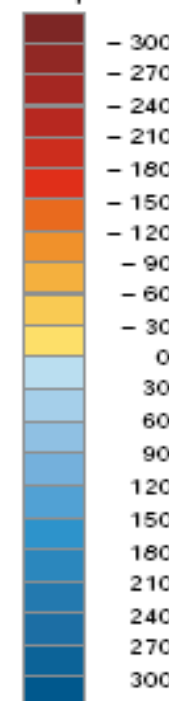


Observed changes in
annual precipitation
between 1961–2006

Red: decrease

Blue: increase

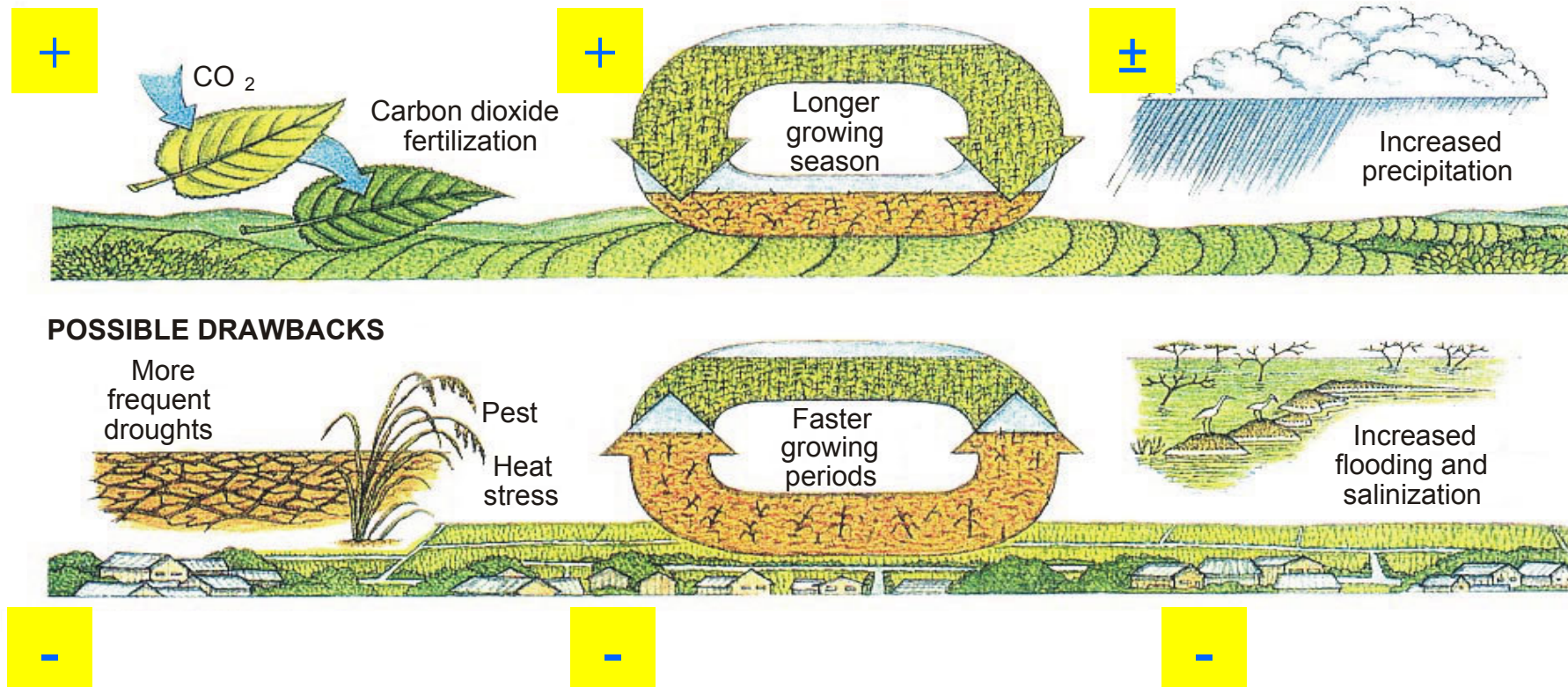
mm per decade



Impacts on agriculture are complex



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From Tubiello, IIASA, 2007



Main climate change impacts on agriculture



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- ▶ 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



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- ▶ 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

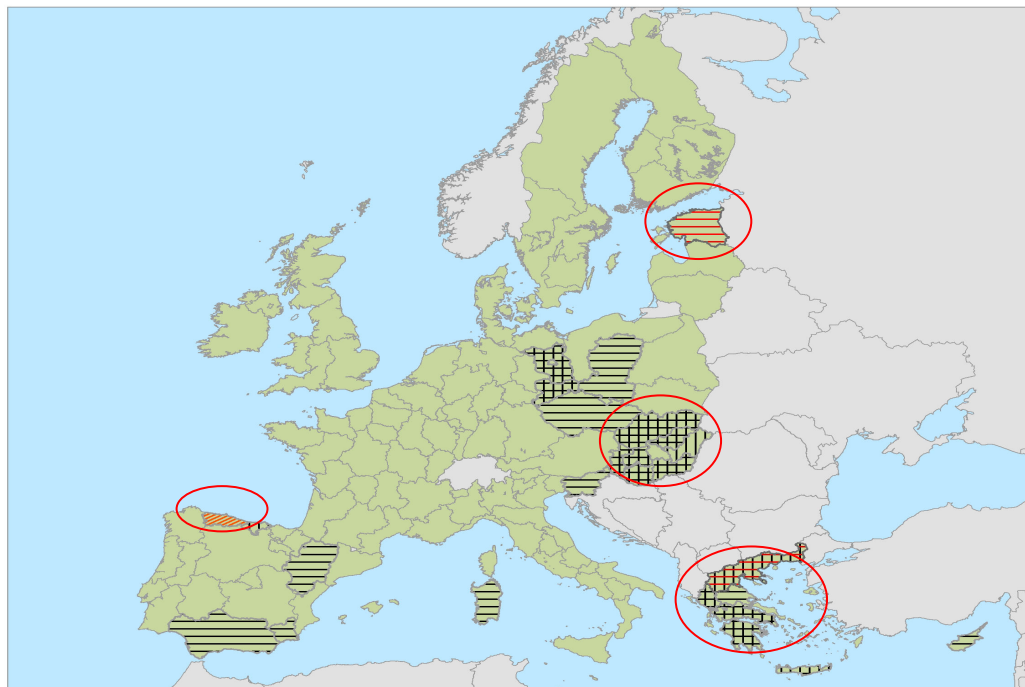


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Trends in observed yields 1998-2005



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

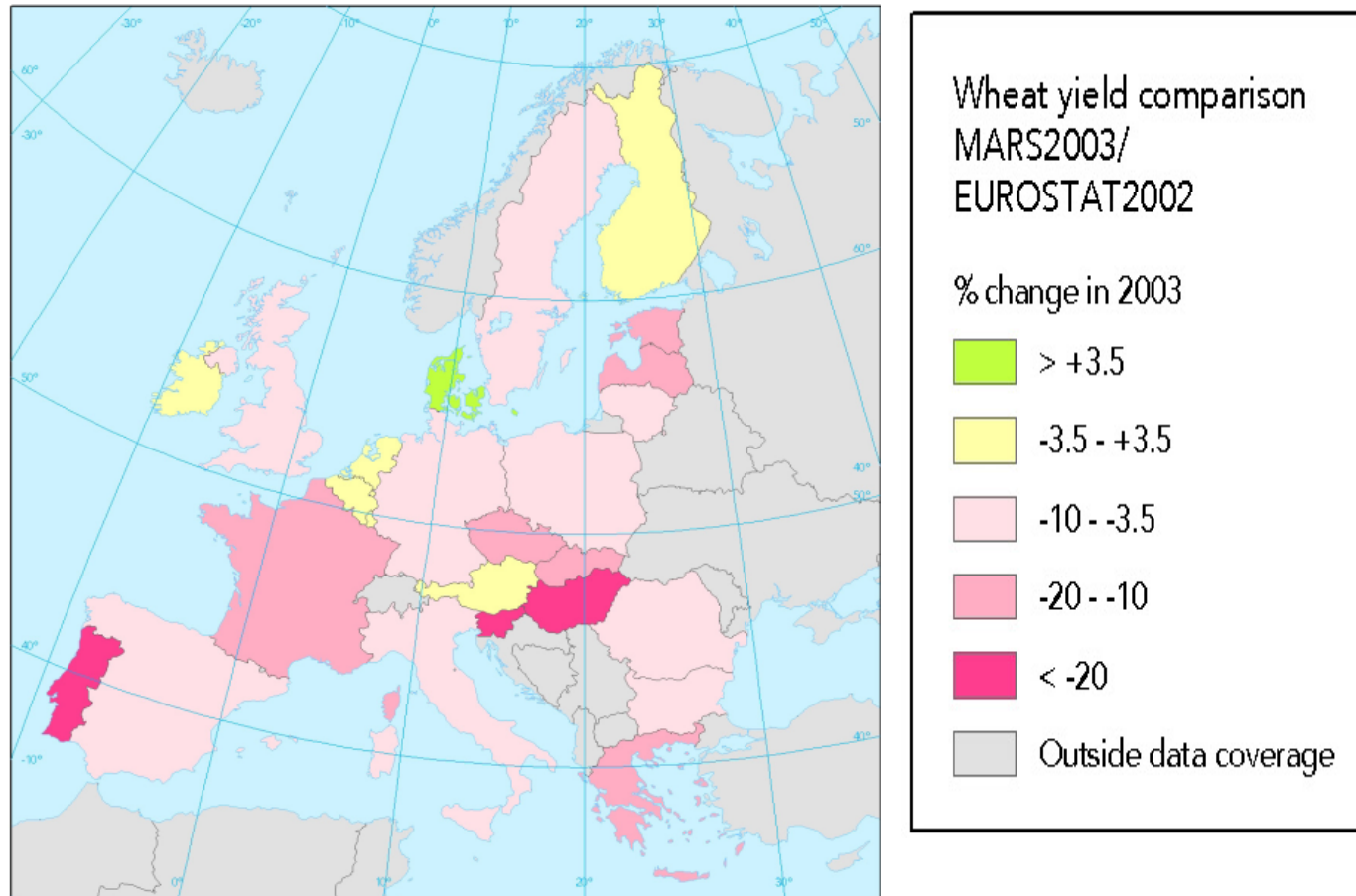
- Yields have **increased** in the last 40 years
- Over most of the EU, the trend in yields mainly shows **technological** improvements, and **continuous adaptation** to weather variability

Effects 2003 heat wave and drought on wheat yields



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





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



The adaptation challenge



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- ▶ 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



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- ▶ 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



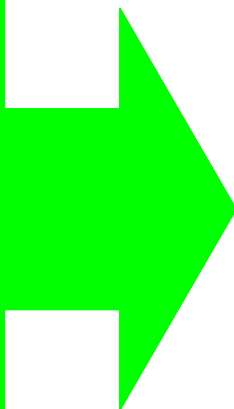
Rural development – relevant framework for adaptation



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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



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- ▶ 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...



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- ▶ 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



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**Thank you for your
attention!**

http://ec.europa.eu/agriculture/climate_change/index_en.htm