BASE BOTTOM-UP CLIMATE ADAPTATION STRATEGIES TOWARDS A SUSTAINABLE EUROPE

Water availability: Climate change adaptation in the agricultural sector in the Czech Republic

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Content of the presentation

- Agricultural BASE case study
- Preliminary evaluation of questionnaire
- Forward looking – assessing climate change impacts on ecosystem services

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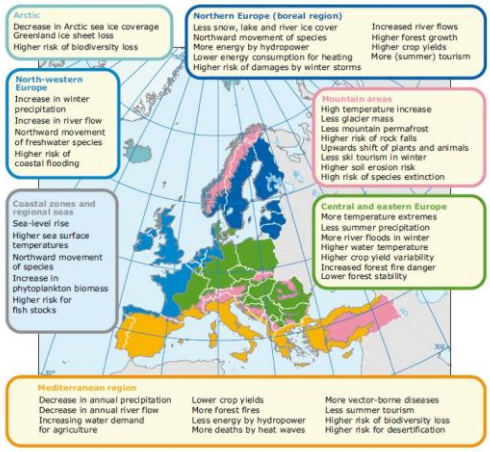
Climate change impacts in Europe



Source: EEA-JRC-WHO, 2008

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BASE case studies

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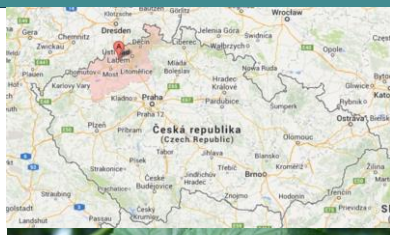
Agricultural CS – Ústí Region



- Densely populated region, industrial
- Traditional agricultural – hop cultivation
- 73 % of total hop area in CZ
- Hop gardens in the region 6,115 ha

- One the driest areas in CZ
- Yearly precipitation approx. 450 mm
- Projections based on climate scenarios

2051-2100 hop yield decline 7-10% , quality determinant by 13-32% (Možný et al., 2009)

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Main climate change related challenges:

- Declining/changes in precipitation
- Water scarcity
- Drought (recent events 2000, 2003, 2012, 2013)
- Extreme weather events

Case study objective:

➢ To investigate perceptions of local stakeholders towards climate change (in particular drought) as well as preferences towards suitable adaptation measures and strategies in the agricultural sector

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CC perception, attitude towards adaptation actions

- Perception of CC has substantial impact on attitude, adaptation actions and behaviour
- Farmers response important to understand adaptation process, assess economic impacts and design appropriate policies

Questionnaire - local farmers

- Developed within BASE consortium (led by Aarhus Un.)
- Focus on perceptions towards climate change, extreme events, potential adaptation measures, willingness and barriers to adaptation
- Distributed among hop growers in Ústí Region (50 responses recieved)

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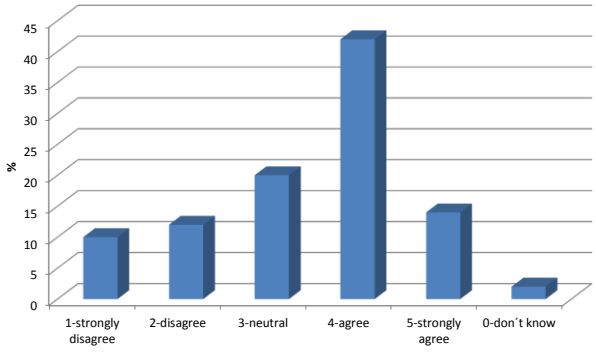
Questionnaire - preliminary results

a. To which degree do you agree or disagree with statement „Global climate change is occurring“?



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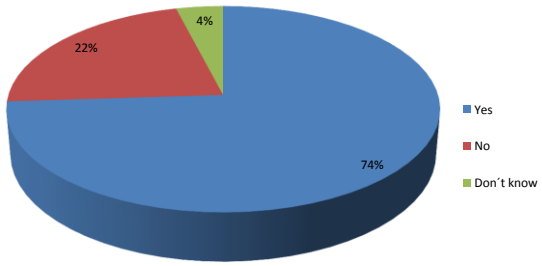
b. Have you observed more frequent extreme weather events (e.g. drought, storms, hails, heavy rains) on your farm within the years you are working?



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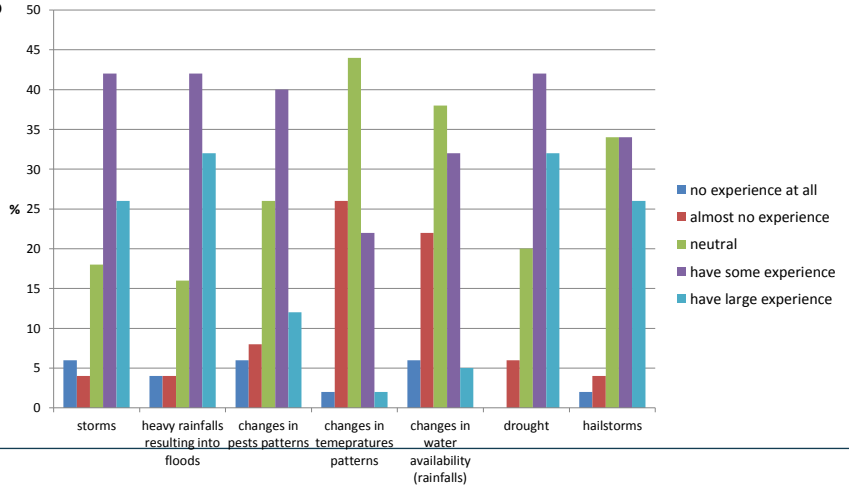
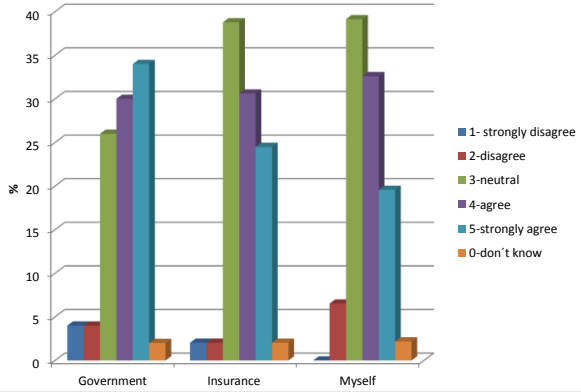
c. Have you on your farm experienced following extreme weather events (e.g. drought, storms, hails) within the years you are working there?



d. Who should be responsible for initiating steps to protect your farm from the potential negative impacts of climate change (e.g. drought, floods, storms)?



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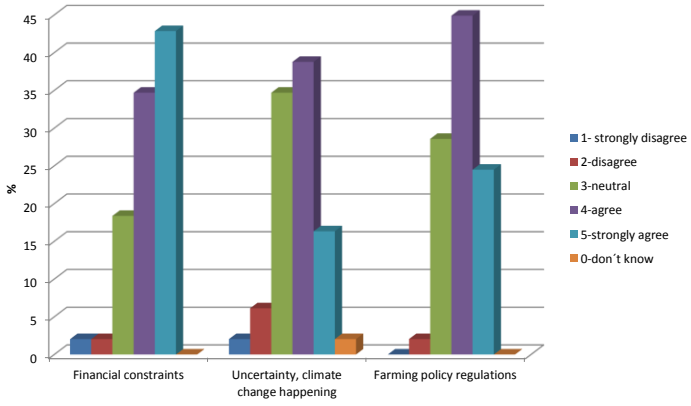
e. The following statements might be barriers for adaptation measures, do you agree/disagree?



Assessing CC impacts on ecosystem services

- Forward looking - modelling ecosystem services based on ALARM scenarios
- InVEST modelling tool
- Selected regulating ES – carbon sequestration, erosion control (relevant for agriculture)

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Modelling ES: ALARM scenarios

Scenario	Based on IPCC SRES scenarios	Scenario description
BAMBU	A2	*Business as might be usual* - Policy driven scenario, extrapolates expected trends in EU policies and includes both, climate mitigation and adaptation measures as well as biodiversity protection policies. Moreover, environmental policy is perceived as another technological challenge.
GRAS	A1FI	*Growth applied strategy* - A liberal, free-trade, globalization and deregulation scenario that focus mainly on adaptation. Environmental policies focus on damage repair, with limited prevention based on cost benefit-calculations. Biodiversity protection occurs only when the problem emerges.
SEDG	B1	*Sustainable European development goal* - A backcasting normative scenario, designed to meet specific sustainable development goals and deriving the necessary policy measures to achieve them. A normative scenario with stabilisation of GHG emissions, which aims for a competitive economy, healthy environment, gender equity and international cooperation.

based on Spangenberg, 2007

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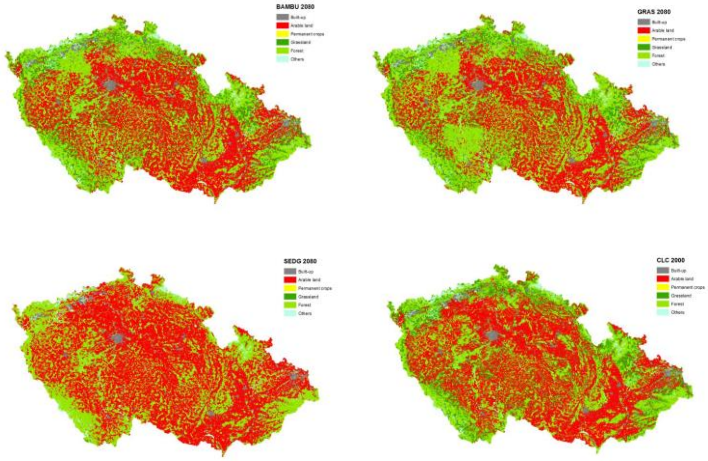
Baseline and 2080 scenarios



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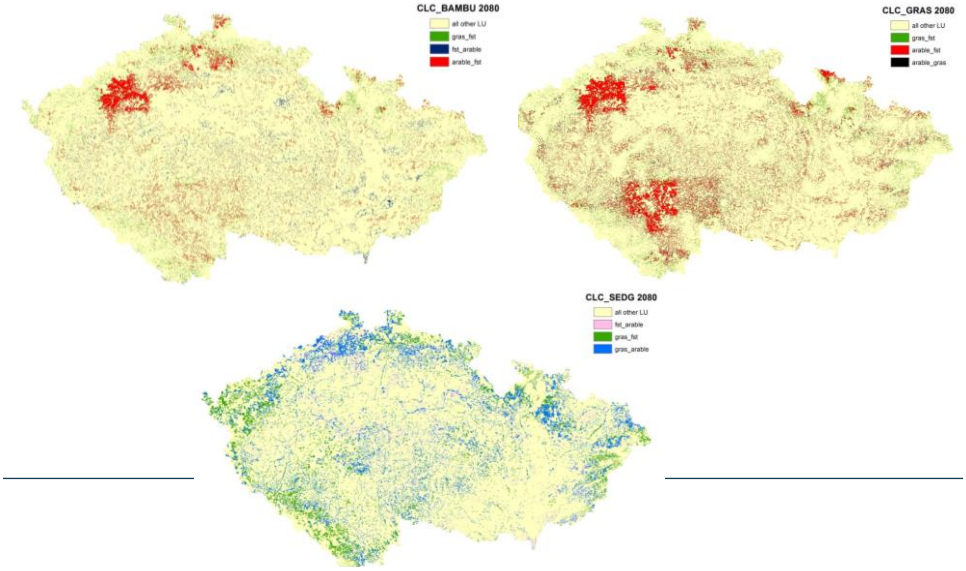
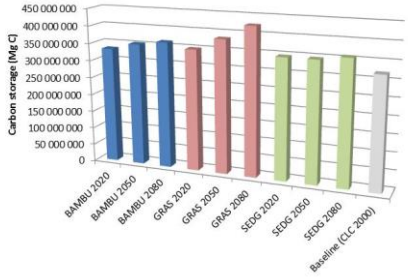
Land use changes: 2080 scenarios compared to baseline

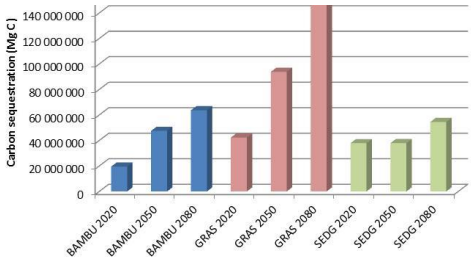


Carbon storage and sequestration InVEST modelling

Carbon storage:
in 2080 GRAS highest 424,736 Gg C

Carbon sequestration:
ranges from 463 (SEDG) to 1,303 (GRAS) Gg C yr-1





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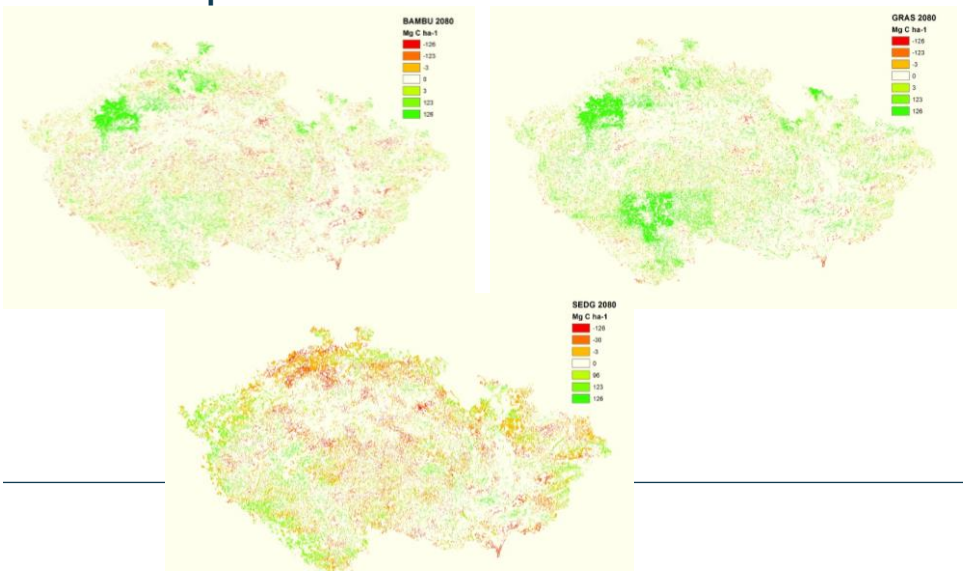
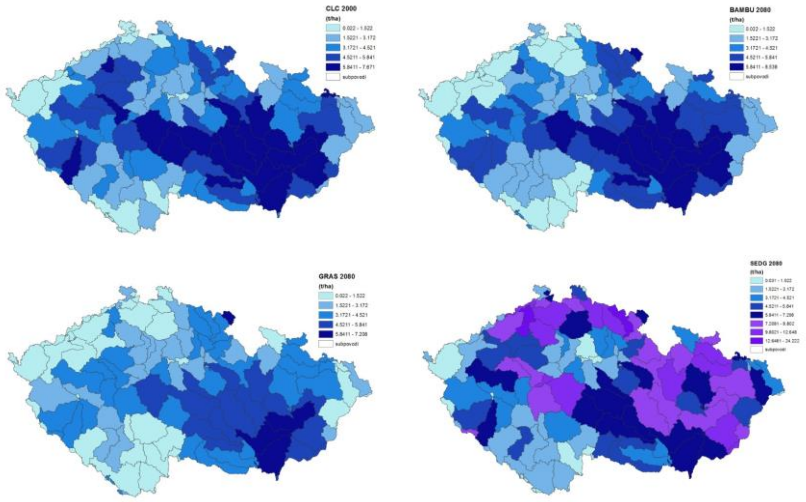
Carbon sequestration 2000-2080



Erosion control (soil loss t/ha/yr)



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Conclusions

- A combination of approaches (scenarios/modeling) allows spatially specific analysis of LULC long-term development and supply of ecosystem services in the Czech Republic
- The scenarios show a wide range of possible future LULC developments
- Analyzed ES - carbon sequestration, erosion control closely associated with these LULC changes
- Need to take into account the uncertainties, therefore the value of ES rather indicative

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Thank you for you attention!

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