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Embargoed until 2:15 PM, 5 November 2010

Soil for a resource efficient society

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Session 7, Workshop 7.1: „Adaptation Strategies I: Sustainable Use of Natural Resources“
Our Common Future, Essen, November 5th, 2010

Our Common Future, Hannover/Essen, 2-6 November 2010 (www.ourcommonfuture.de)



Our Common Future

Session 7 – Climate Change and Energy II



Workshop 7.1

Adaptation Strategies I: Sustainable Use of Natural Resources

Essen, 5 November 2010

Soil for a resource efficient society

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The context

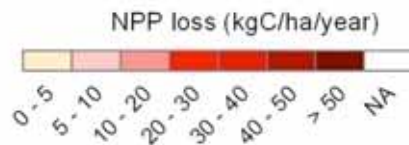
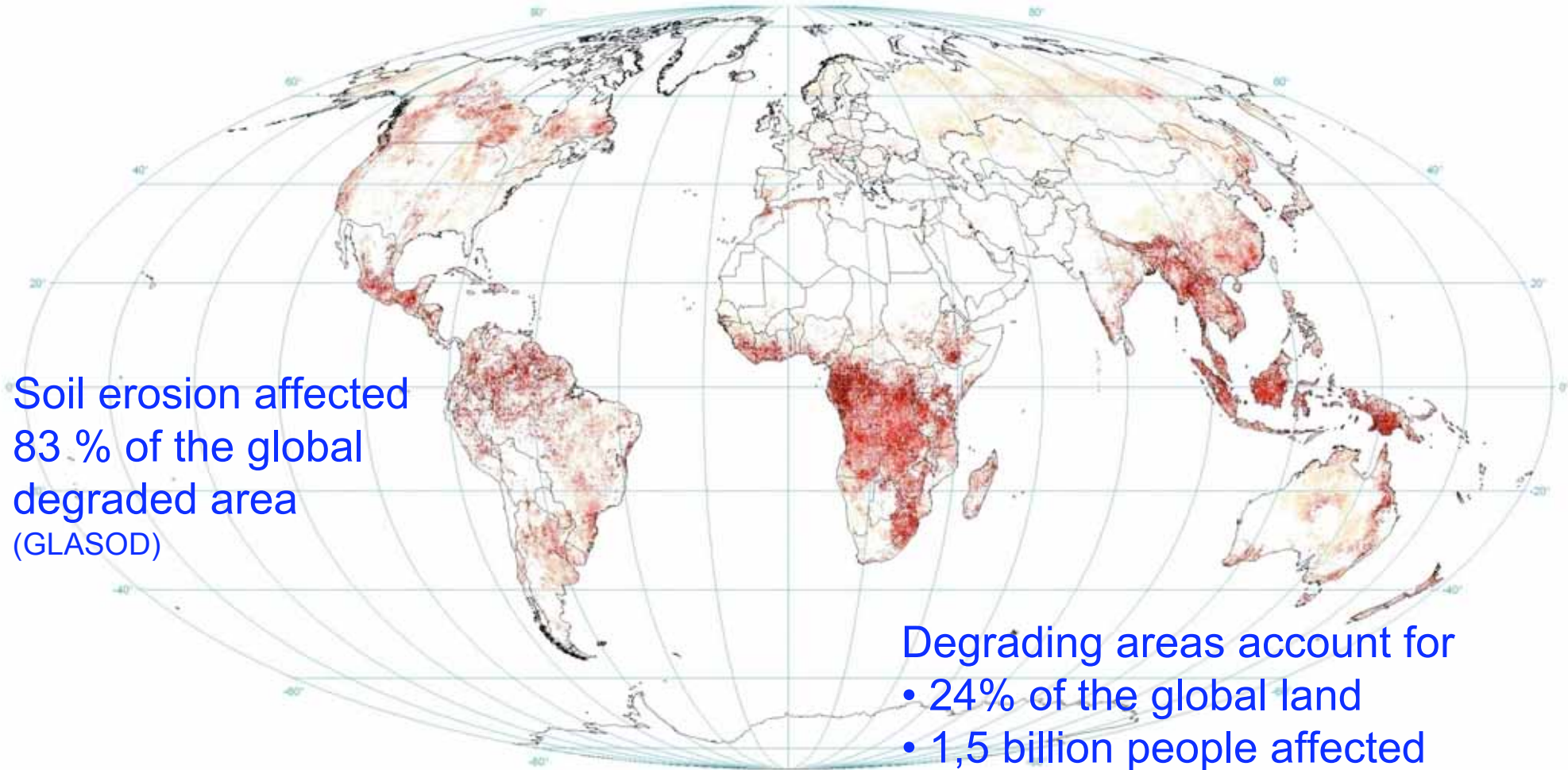


Soil is at the heart of resource efficiency:

- ❖ Food production
- ❖ Water management
- ❖ Biodiversity
- ❖ Energy
- ❖ Climate change



Global loss of Net Primary Productivity, 1981-2006



Source: ISRIC - World Soil Information
Mollweide Projection
Central Meridian: 0.00



World Soil Information

Source: L. Gnacadja, 2009



Water



- ❖ World water withdrawals increased 8 fold during the 20th century with very substantial increases expected up to 2025
- ❖ World water consumption increased 6 fold during the 20th century with further very substantial increases by 2025
- ❖ World irrigation area has increased from 100 Mha to about 280 Mha in the past 50 years
- ❖ Agriculture often accounts for 70-80% of water use



Biodiversity



- ❖ Species extinction now happening at up to 1,000 times background levels
- ❖ Species homogenisation due to extinction and introduction of species to new ranges for trade and transportation reasons
- ❖ Worldwide 12% of bird species, 23% of mammals and 25% of conifers threatened with extinction
- ❖ In Europe, 43% of bird species and 45% of butterflies under threat
- ❖ Only 17% of EU habitats are in good condition



Biofuels



- ❖ 20% of energy in final gross energy consumption to come from renewable energy by 2020
- ❖ 10% of energy for transport to come from renewable energy (**biofuels** included) by 2020
- ❖ Bonus of 29 g CO_{2-eq}/MJ if biofuel feedstock grown on **severely degraded land** (salinised, eroded, very low organic matter) or **heavily contaminated land**
- ❖ Land **competition** between food vs energy production



Climate change



- ❖ CO₂ content of the atmosphere has risen by 30% since the Industrial Revolution
- ❖ This rise can be attributed to:
 - use of fossil fuels: 60%
 - **land use change and cultivation: 40%**
- ❖ LUC emissions vs. fossil fuel emissions: a tale of two worlds:
 - 80% from LUC: Brazil, Indonesia, Malaysia...
 - 90% from energy: EU, US, Russia, China...



The role of soil



- ❖ Soil can store some 3,700 m³ of water per ha -> fundamental for **resilience to droughts**
- ❖ Soil water retention is between 100 and 300 mm of rain -> fundamental for **flooding prevention**
- ❖ EU soils store ~70 billion tonnes of carbon (particularly in peatlands) -> we need to keep carbon there to avoid aggravation of **climate change**
- ❖ FAO has recently estimated that **89% of the mitigation potential** in agriculture worldwide is in soil -> crucial that LULUCF is properly accounted for
- ❖ At least one quarter of **biodiversity** is in soil -> we cannot achieve our protection targets by ignoring it



Soil pressures



- ❖ Natural soil formation is very slow => soil losses over 1-2 t/ha/y are in practice **irreversible**
- ❖ **Erosion** on 17.5 % of EU land is estimated by the PESERA model to exceed 1 t/ha/y
- ❖ Urban land in the EU **increased** by 6% (about 10,000 km²) in the period 1990-2000
- ❖ Most of the land “consumed” came from **agricultural land (84%)**, generally the most productive soils
- ❖ There is evidence that arable land in the EU has been **losing carbon**: 0.2% (6 Mt) per year in France (1990-2004), 0.6% (13 Mt) per year in the UK (1978-2003) and 1% per year in Sweden (1950-2000)

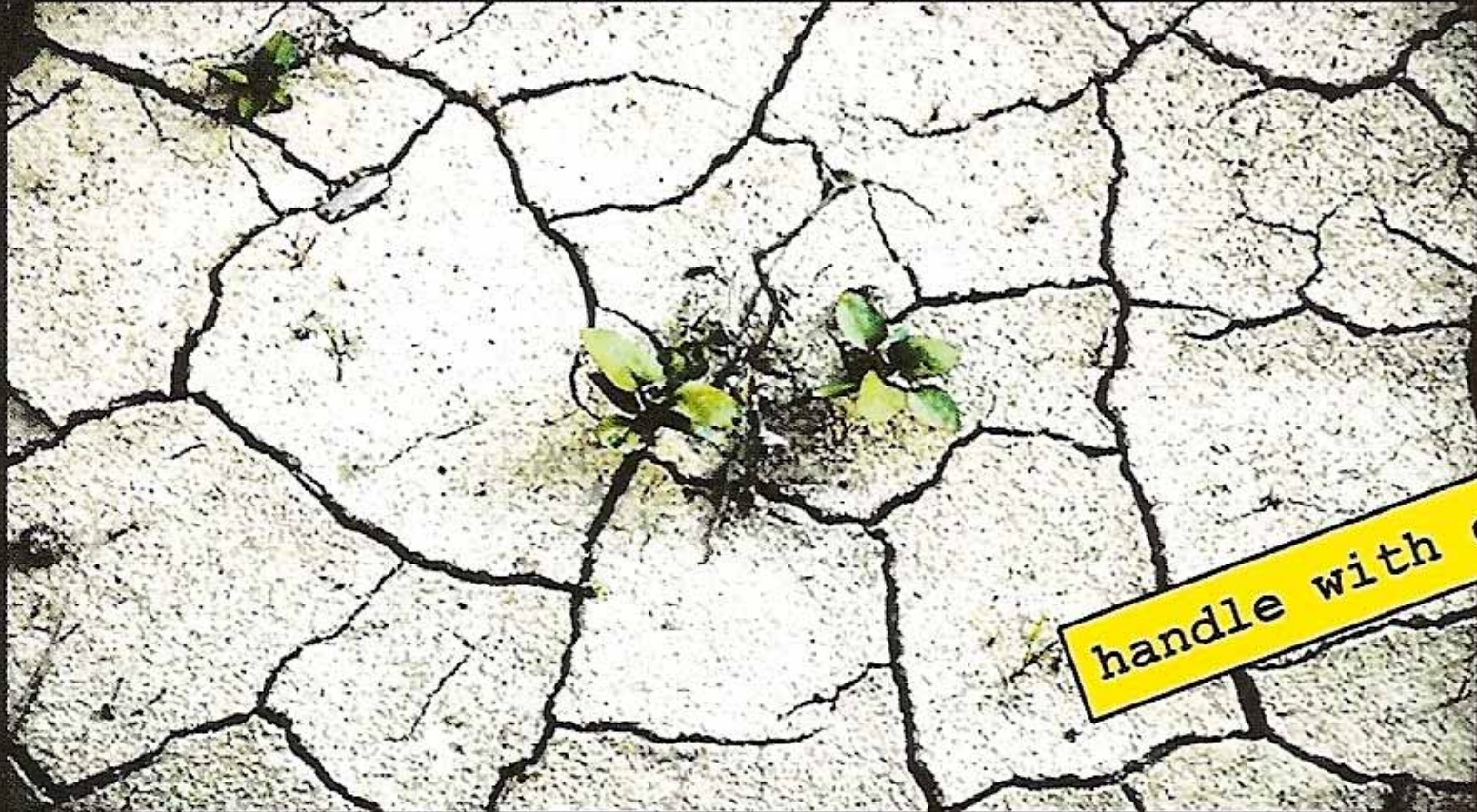


Some take-home messages



- ❖ Resources are not infinite and there is abundant evidence they are **under pressure**
- ❖ The pressures on soil and land are **mounting**
- ❖ Business as usual is not an option if we wish to **feed the world** and provide other services
- ❖ Policy makers and land managers have to **improve resource management**
- ❖ **Farming's role** in environmental maintenance and enhancement needs to be further stimulated
- ❖ Measures for maintaining soil fertility, protecting water, halting biodiversity loss, curbing climate change are fundamental for a resource efficient society and **pass through soil**

Feed Me to Feed You



World Day to Combat Desertification
17 June



Thank you for your attention!



<http://ec.europa.eu/environment/soil/index.htm>