Assessing Economic Impacts of Soil Degradation

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Content

- Project Background
- Approach & Methods
- Results: empirical estimation
- Conclusions

Background: Context of the Project

- Project ”Assessing economic impacts of soil degradation” carried out by Ecologic & BRGM
- Study commissioned by DG Environment
  - Results are preliminary
  - Views do not necessarily represent the position of DG Environment
- First study of this type in Europe - scoping of what can be assessed

Background: Motivation

- **Motivation for the current study**
  - **Soil has an economic value - soil degradation imposes real costs**
  - **Healthy soils have public good aspects - impacts extend beyond direct users**
- **Assess costs of non-action imposed by current soil degradation trends in Europe**

Background: Parts of the Project

Three main components of the project

- **Literature Survey**
- **Case Studies**
  - **Erosion (France, UK)**
  - **Contamination (France)**
  - **Salinisation (Spain)**
  - **Organic Matter Loss (Sweden)**
- **Empirical Estimation of the Impacts**

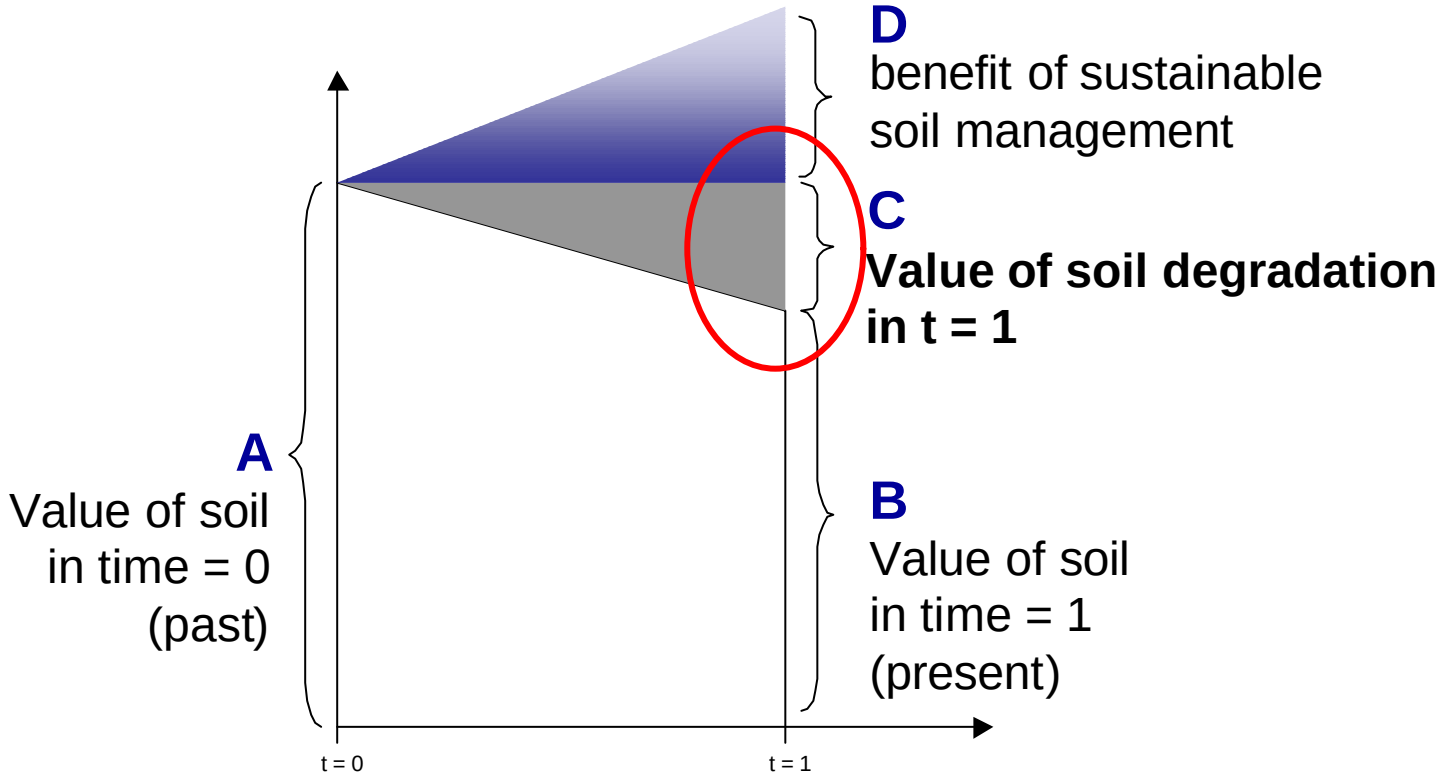
Approach: Literature survey

- Survey of the empirical literature that has quantified economic costs of soil degradation
- Survey covers 60 empirical economic studies
- Evidence often from agronomic studies
- Majority from North America and Australia, fewer European studies (EU: mainly UK)
- Erosion covered most extensively, little on compaction, sealing, biodiversity and OM loss

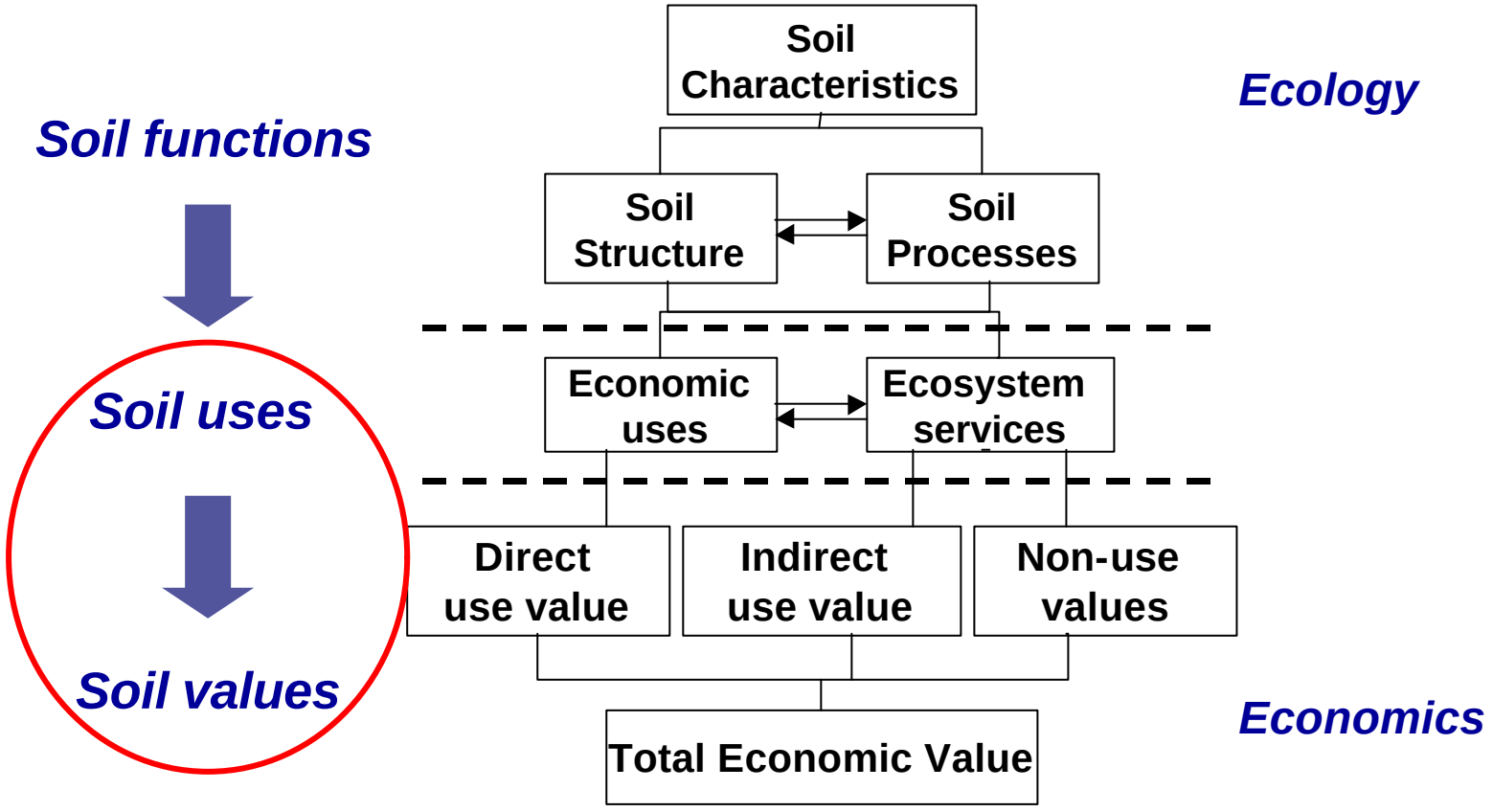
Approach: empirical estimation

- Estimate as many impacts for as many countries as possible
- Detailed calculations on erosion, contamination and salinisation
- Results of the literature (soil and economics) applied to affected area in Europe
- Focus on costs of soil degradation (benefits not assessed)
- Focus on current, annual cost (no intertemporal extrapolation)

Background: Focus on current Costs



Methods: functions, uses & values



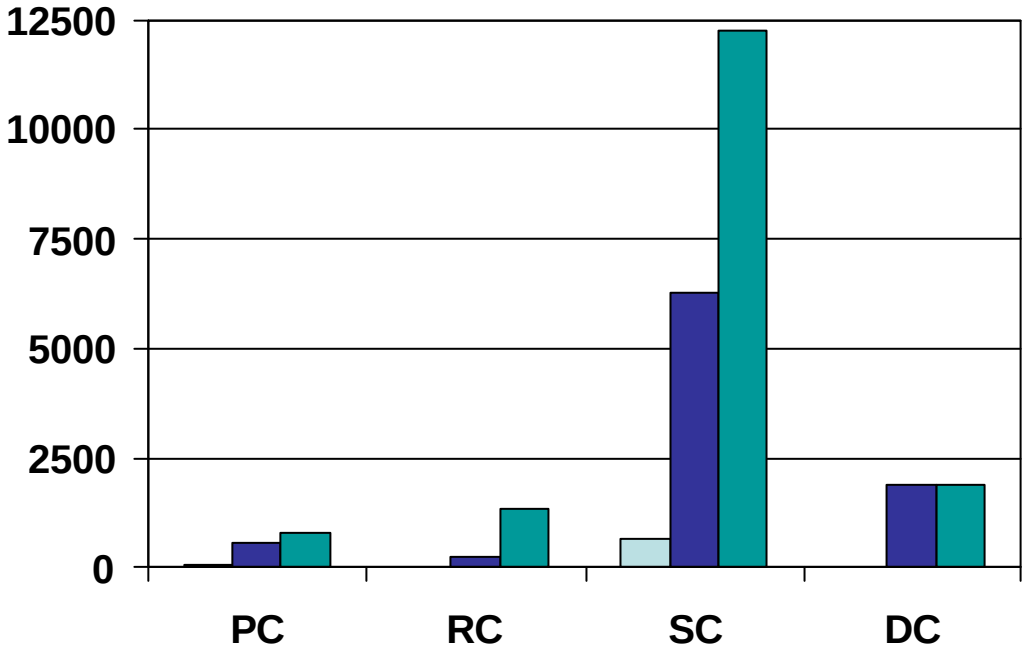
Methods: categorisation of impacts

Different ways to categorise impacts:

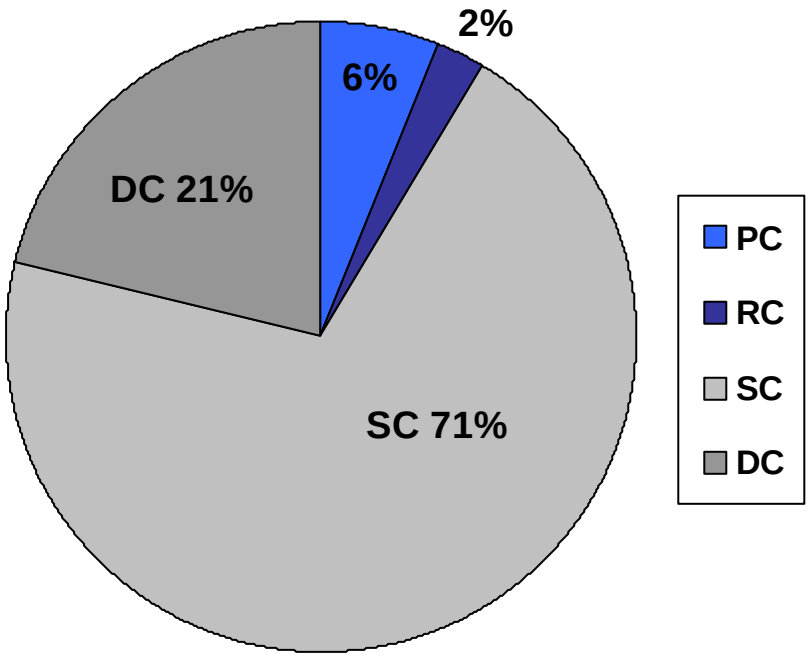
- **On-site and off-site**
- **Cost of suffered damage and damage avoidance cost**
- **Direct & indirect use values**
- **non-use values (not quantified)**
- **5 cost categories:**
  - **PC, RC – on-site costs**
  - **SC, DC – off-site costs**
  - **NC – non-use costs (not assessed)**

Empirical estimation: erosion

- Based on BRGM plot database: 13 countries, five land use categories
- Three estimates:
  - lower bound
  - intermediate
  - upper bound
- Intermediate est.:
  - PC: 550 m Eur
  - SC: 6.2 bn Eur



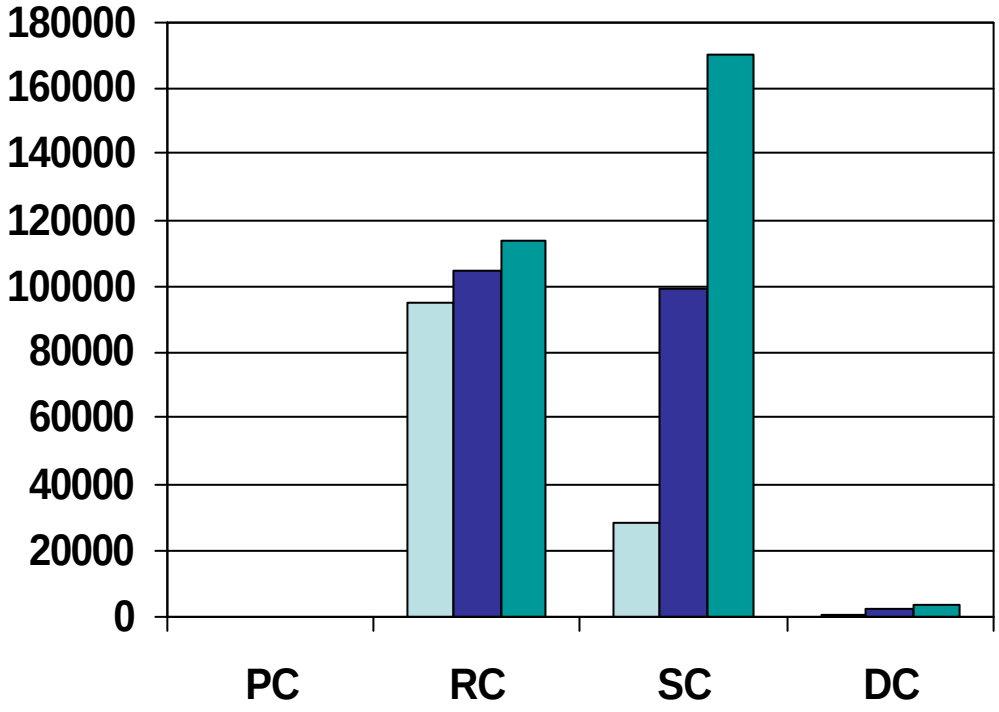
Empirical estimation: erosion II



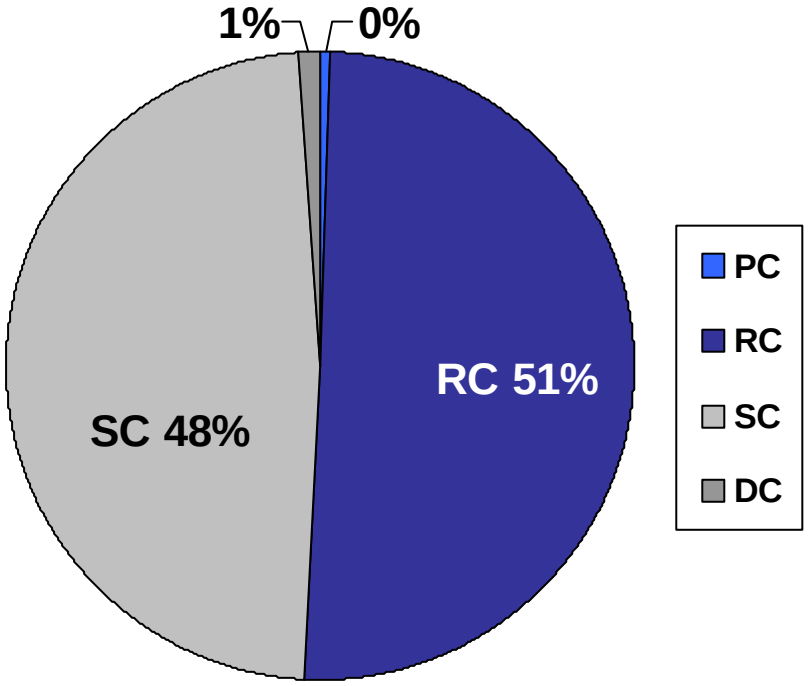
- **Distribution of costs: Off-site costs (SC+DC) exceed on-site costs (PC+RC) by 12:1**
- **Cost of suffered damage (PC+SC) higher than damage avoidance cost (RC+DC)**

Empirical estimation: contamination

- Estimation based on EEA data, French case study (basis: number of sites)
- Intermediate est.:
  - RC: 104 bn Eur
  - SC: 99.5 bn Eur

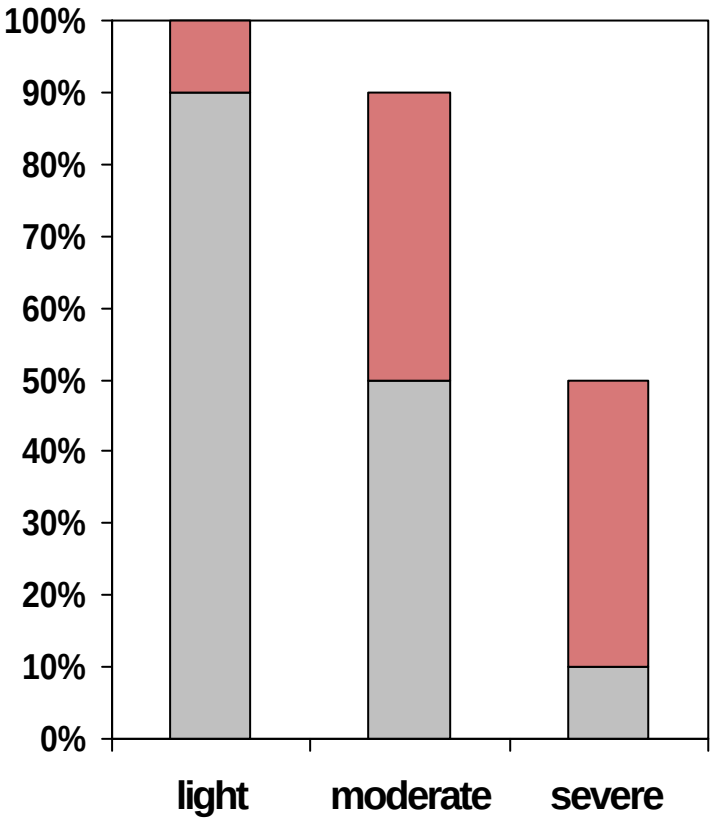


Empirical estimation: contamination II



- Distribution of cost: on-site and off-site cost approx. equal
- Bulk of the cost: restoration (RC) and social cost (SC)

Empirical estimation: Salinisation



- EEA data for Spain, Hungary, Bulgaria
- Yield loss estimate based on Spanish case study
  - Spain: Eur 41-132 m/a
  - Hungary: Eur 67-128 m/a
  - Bulgaria: Eur 1-5 m/a
- environmental & infra-structure cost: EUR 22/ha, Eur 2m (Bulg.) - 23m (Hun)

Conclusions

- Economic methods are there - but limited data
- Multifunctionality difficult to capture adequately
- Two aspects in particular merit attention:
  - Ecosystem services - Interaction between soil and other ecosystems: little economic evidence, but costs could be substantial
  - Non-use values of soil: virtually no evidence
- The further from the direct users, the bigger the damage, the less evidence there is?

Conclusions II

- Impacts difficult to assess precisely at this stage, but dimension becomes clear
- Much remains to be quantified, but still:
  - Cost of soil degradation can be substantial, certainly in affected regions
  - Private, on-site costs (country average and per year) are within bounds – but effects are cumulative
  - Off-site impacts exceed on-site impacts in most cases, calling for policy responses

Thank you for your attention.

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