COMPARABILITY OF MONETARY VALUED ECOSYSTEM SERVICES AND INFLUENCE OF SOCIO-ECOLOGICAL CONDITIONS

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Case studies of ES  
1975-1980
Case studies of ES 1975-1985
Case studies of ES 1975-1990
Case studies of ES 1975-1995
Case studies of ES 1975-2000
Case studies of ES 1975-2005
Case studies of ES 1975-2010
Case studies of ES 1975-2010
Valuation of case studies

- three main thesis for monetary valuation

1) What is not valued get lost
2) Money is an easy understandable indicator for ES around the world
3) Powerful indicator for decision making, especially in low developed countries

!!! Variability of monetary values on international scale

? How robust are the monetary values as an indicator for ES?
? Which ecological & socio-economic variables effect monetary valuation of specific ES?
Methods

- databases

- Absolute frequency

- Entries in total

- Case studies in total

ZEN (Seppelt et al. 2011)
Methods

- Value transformation

  "paper value" in different units, e.g. £/acre

  conversion into annual value of local currency per hectare & year, e.g. £/ha/yr

  adjusting to reference year 2007 with World Bank deflator, e.g. £/ha/2007

  conversion to internat. Dollar with World Bank PPP, e.g. Int-$/ha/2007
Methods

- Georeference with GIS
Methods

- Intersection with other spatio-explicit datasets

179 ecological, socio-economic variables
Results

179 ecological, socio-economic variables

- **Location** (Ready et al. 2002)
  - Ecosystem
  - Market mechanism
  - Pop structure & governance institution

- **Aim of valuation** (Sutton 2003)

- **ES type & definition** (Nahlik et al. 2012)

- **Scale** (Hein et al. 2006)

- **Methods** (Oteros-Rozas et al. 2009)
Results

Range of monetary valued ES
Preliminary results of food provisioning

Parsimonious means: Akaike information criterion (AIC)

|                          | Estimate | Std. Error | t value | Pr(>|t|) |
|--------------------------|----------|------------|---------|----------|
| (Intercept)              |          |            |         |          |
| Agriculture Production Index |          |            |         |          |
| Extent of crop           |          |            |         |          |
| IGBP MODIS biomes        |          |            |         |          |
| Anthromes                |          |            |         |          |
| Market access            |          |            |         |          |
| Urban population         |          |            |         |          |
| Rural population         |          |            |         |          |
| Labor force (active population) |          |            |         |          |
| Human Development Index  |          |            |         |          |

**Supply the lower natural areas the higher is food**
**the higher the amount of production the higher the value**

**Demand the higher the market access the higher the value**
**the higher pop density the higher food**

**Education the higher the education and income the higher is food provisioning**
Preliminary results of food provisioning

- **Parsimonious means: Akaike information criterion (AIC)**

|                          | Estimate | Std. Error | t value | Pr(>|t|) |
|--------------------------|----------|------------|---------|----------|
| Fertilizer (sum nutrients consumption) | depletion | --> as stronger the depletion as lower the value of food provision |
| Ecological footprint of consumption | governance | the higher the political stability & absence of violence/terrorism the higher the value |
| Reactive conservation | | | | |
| Political stability | | | | |
| bio01 | | | | |
| bio12 | | | | |
| bio21 | | | | |
| Area | | | | |

Beneficiaries are more aware of the value on local scales
Summary & discussion

- Variability of monetary valued ES
- Biophysical and social context of monetary valued ES

NOTE:

- not checked for interdependences between predictors
- statistical shortcomings
  - Small sample size
  - high data heterogeneity
- Challenge to integrate discrete variables in model
- Stocks and flows, isolation of natural capital from manufactured and build capital
Next steps

- Further statistical analysis of ES
- Spatial explicit cluster with similarly ecological and socio economic characteristics
- Prediction of ES values in certain regions
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