UNEP WCMC

Netherlands Environmental Assessment Agency

Scenarios and models for exploring future trends of biodiversity and ecosystem services changes

Key Findings from Task 1

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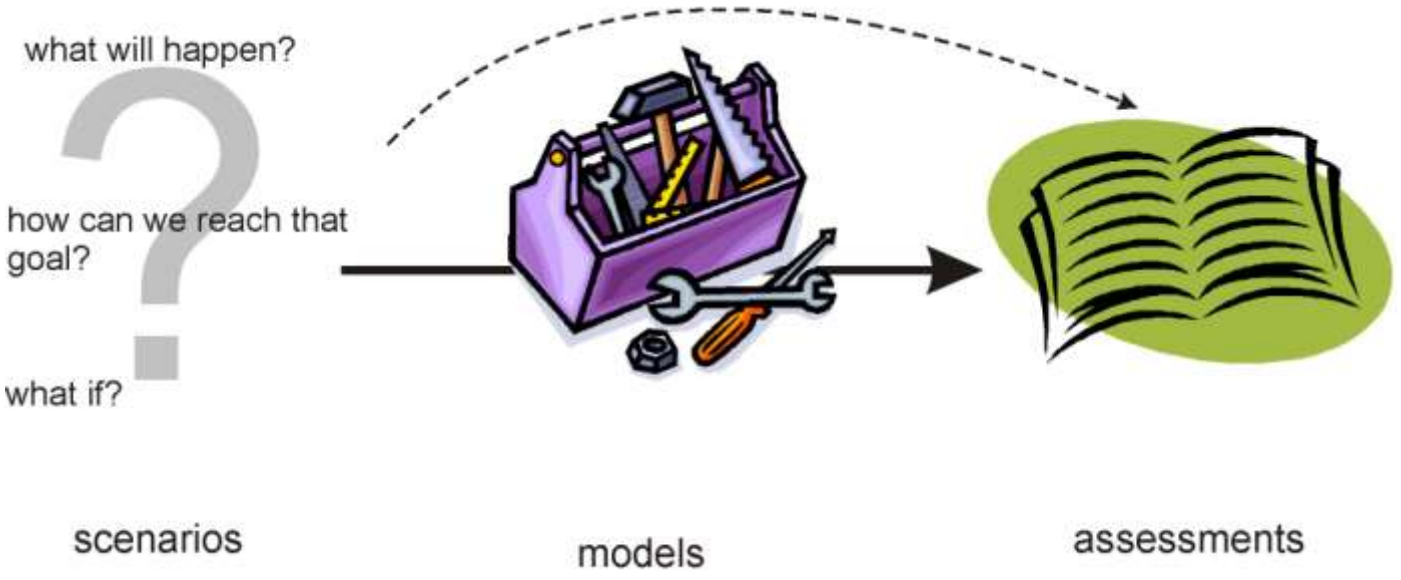
Understanding of Task 1

- From perspective of TEEB
  - *State of the art forward-looking, large area modelling*
  - *Strategic gaps*
  - *Link to poverty*
  - *Options for post 2010 action*
  - *Strengthening economics*
- Outputs
  - *Judgemental description + inventory for other tasks*
  - *Standard design requirements*
  - *Key gaps*
- ‘Tools’ are:
  - *Models + Scenarios + Assessments*

Scenarios, models and assessments



What did we do?

- Inventory of assessments, scenarios and models
- Which ecosystem services were quantified?
- What are the gaps?
- Conclusions/recommendations
- Selection of models/studies for task 2 and 3

Reviews & overviews to build on

- draft MA manual
- MA scenarios report Ch4, Ch10
- articles of MA authors
- Bakkes et al., 2000 [for UNEP, OECD, UN] & 2002 [for EEA]
- Westhoek et al. 2006 [for Eururalis]
- Background reports of GEO-3 and OECD EO
- EEA 2008
- Sustainability Advanced Test

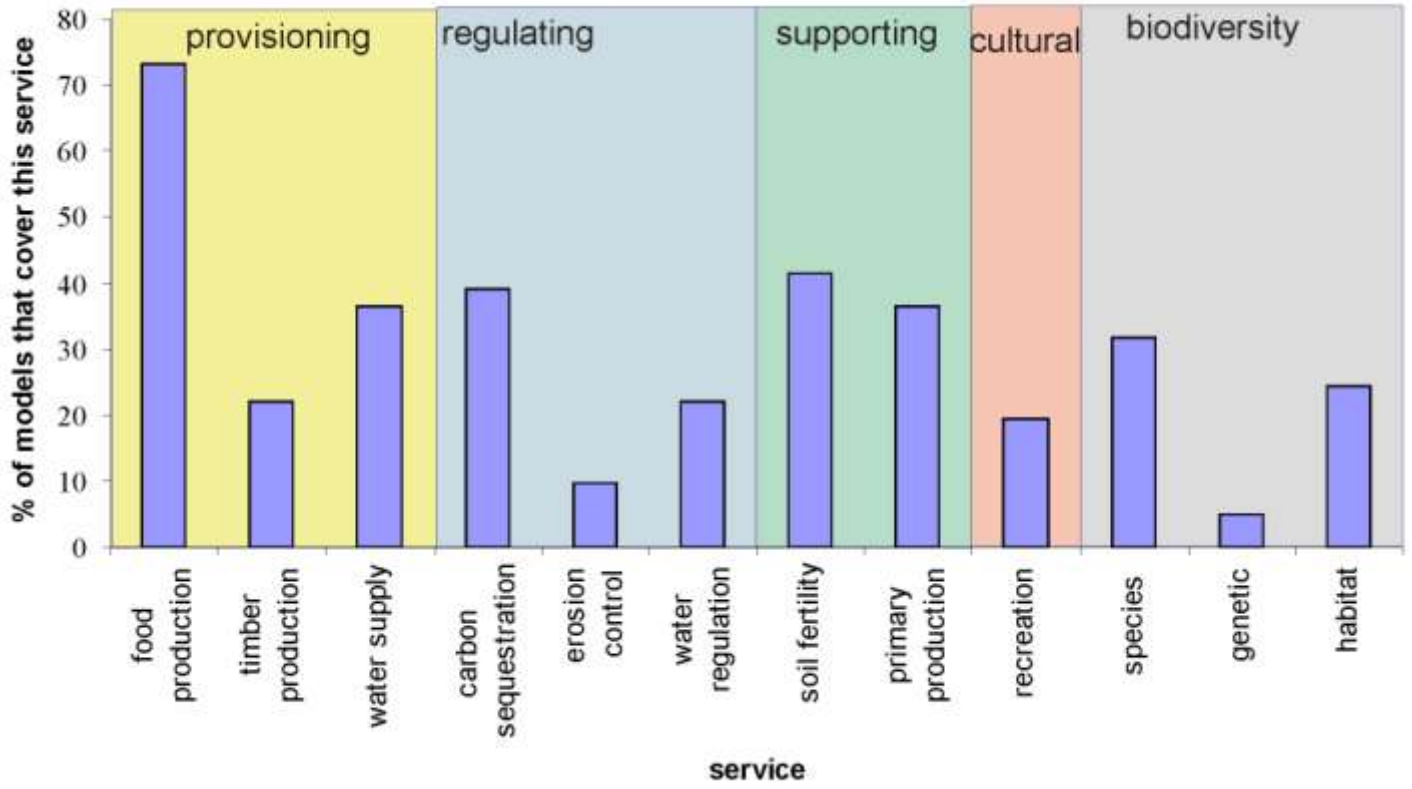
Model selection process

- Large list based on expert judgement, assessments, literature/internet search
- Categorization of models
- Reduction of model list to a couple of models per category based on use in assessments, coverage of services, spectrum of drivers

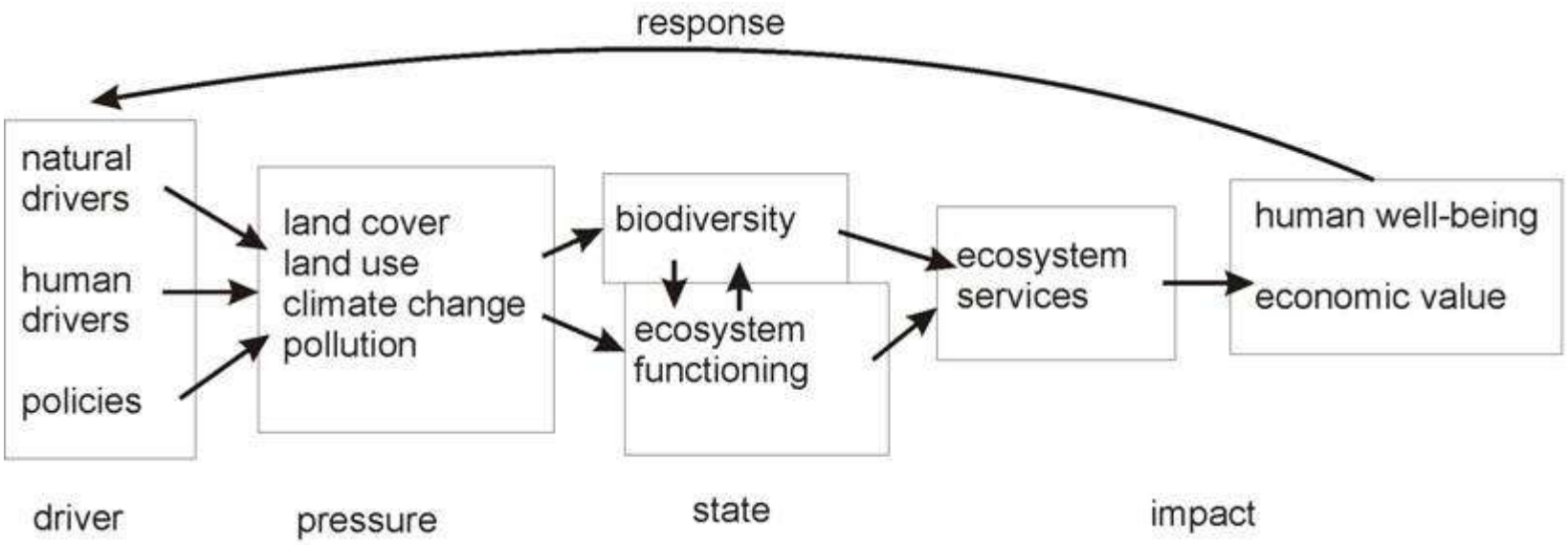
Ecosystem services

Source: MEA, 2005

Ecosystem services in global models



Modelling of ecosystem services and biodiversity: DPSIR



Overview classes of models

integrated assessment models

AIM, MIMES/GUMBO, IMAGE, IGSM, IFs, IIASA models

economic models
GTAP, EnvLinkages, IMPACT-Water

land use models

CLUE

biophysical models

Agro-IBIS, LPJmL, CENTURY
ASSETS, GEEM, ICTHYOP, ERSEM II
AusConnie, EwE/EcoOcean,
PICUS, Savanna
WaterGAP, WBM, SWAT

scenario-building tools

PoleStar, Threshold-21

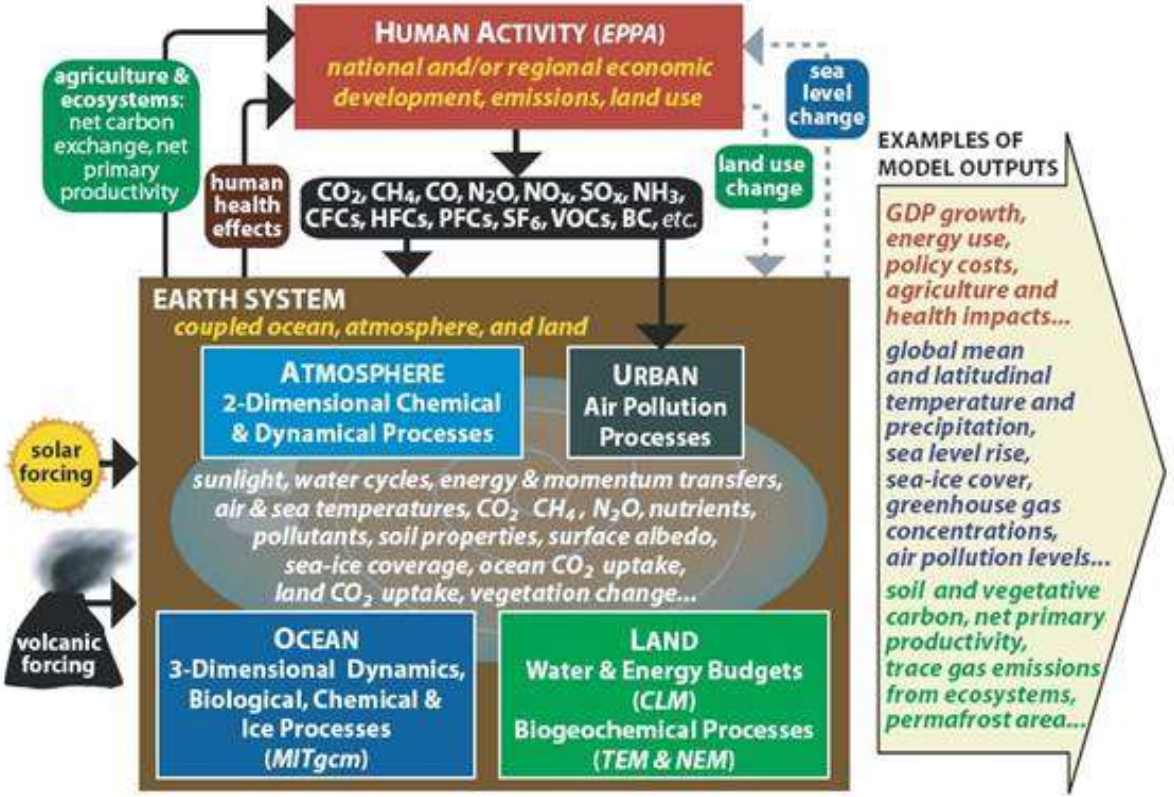
biodiversity modelling

GLOBIO, BII, SAR, MIRABEL
Cummulative Thread model, RamCO
Reefs at Risk,
GARP models, EUROMOVE,
Impacts of climate change

regional assessments
ATEAM, InVEST,

Integrated assessment models

- Incorporate socio- economics, land use and biophysics
- Example: IGSM (MIT, USA)



Classes of scenarios / 1

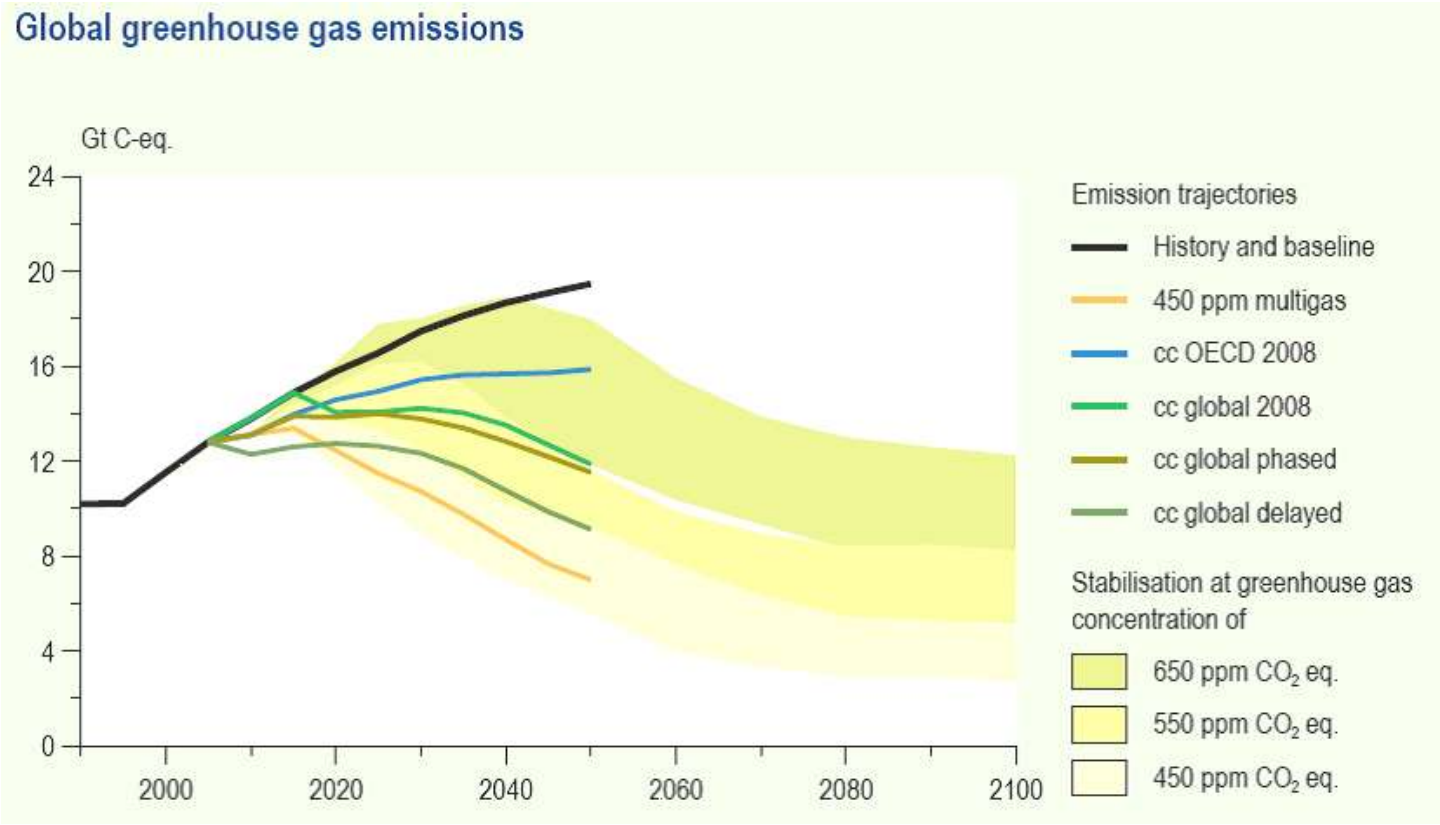
Explorative, multiple scenarios (examples MA, GEO-3, SRES, GSG)

Source: Busch, 2006

Classes of scenarios / 2

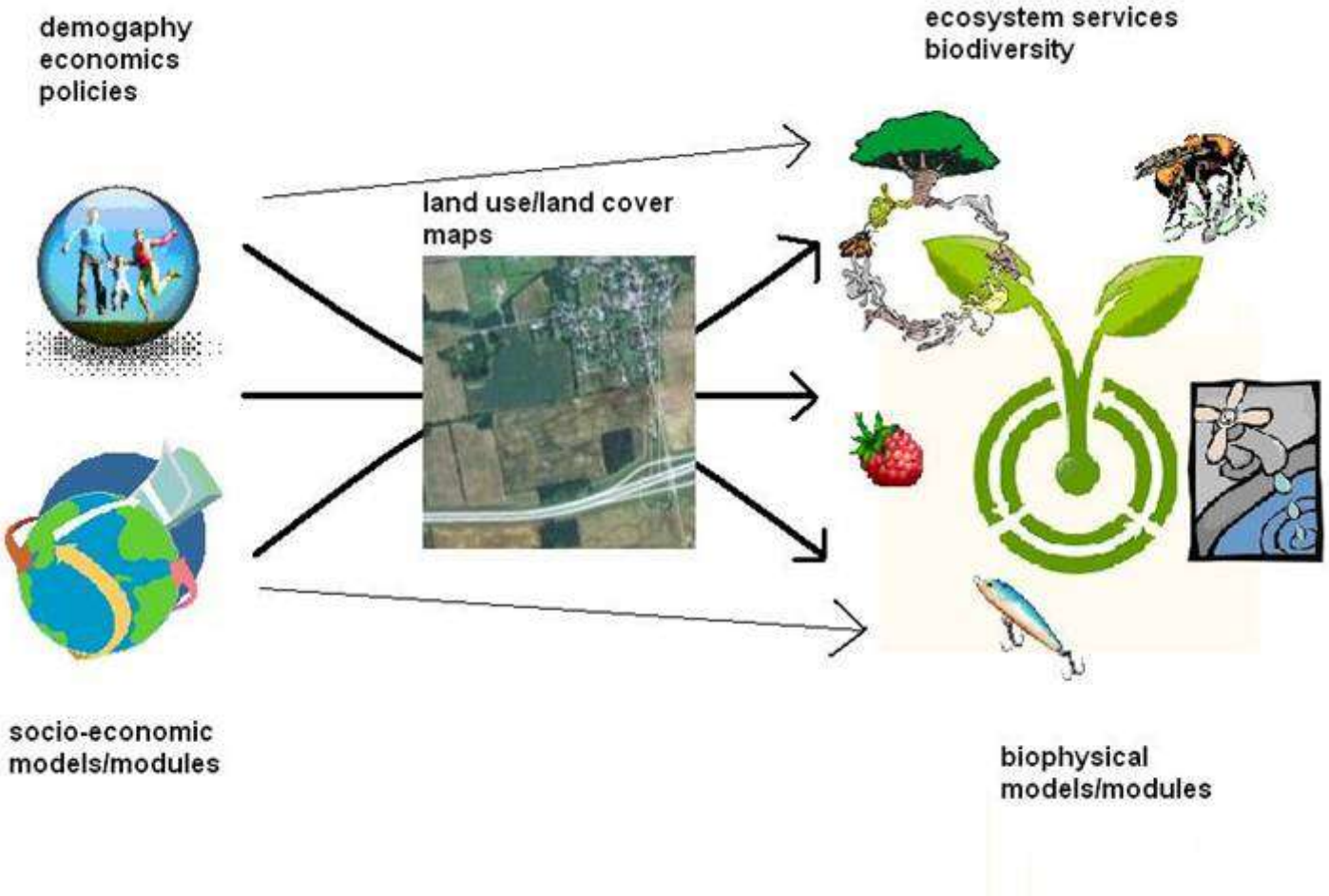
Trend scenarios: baseline with policy options

(examples: OECD, IAASTD):

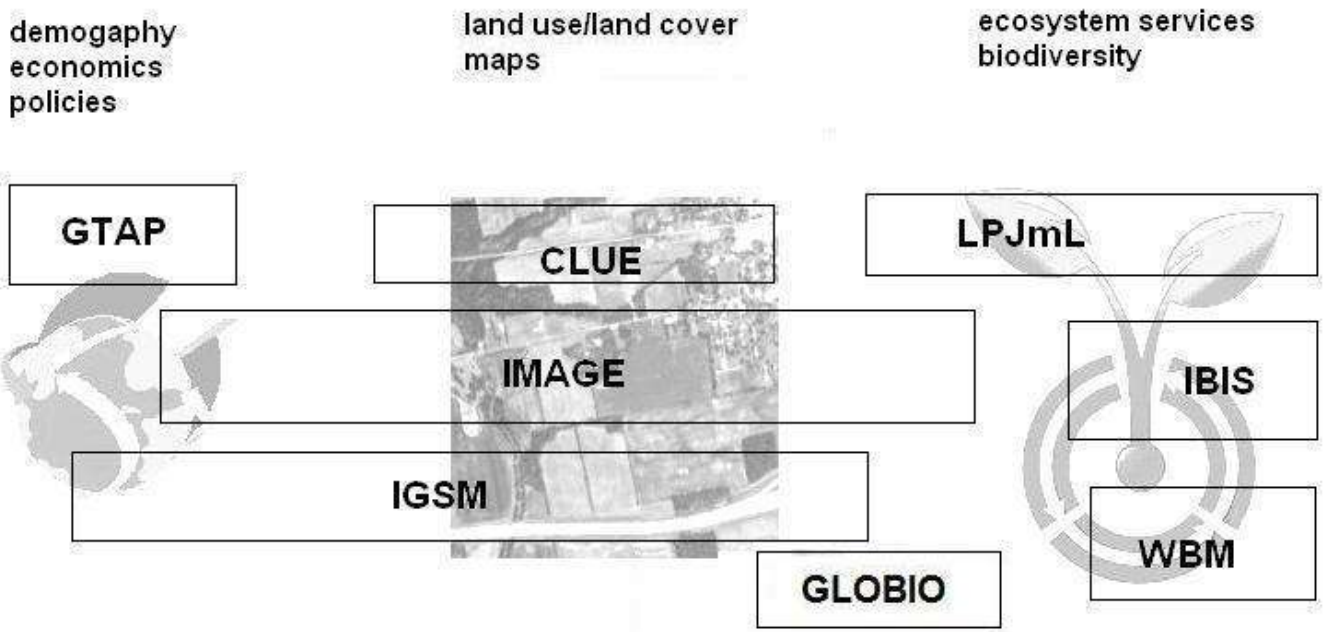


Source: Bakkes et al., 2008

Link between socio-economics and ecosystem services via land use



Coverage of the different types of models



Main conclusions models

- Land-use is the central link between drivers and services
- No model can cover it all (policy-economy-biodiversity-ecosystem services): a combination of models is needed
- Integrated assessment models should have central role in assessment, as they cover a broad range consistently
- A large range of ecosystem services is covered by existing models – cultural services the weakest
- Marine models cover fisheries, biodiversity and recreation, but links to socio-economic drivers are weak
- Biodiversity as indicator is an explanatory factor for some, but not all ecosystem services
- Feedback from changes in ecosystem services and biodiversity to economy missing