# Examples of Ecosystem Accounts and Policy Applications

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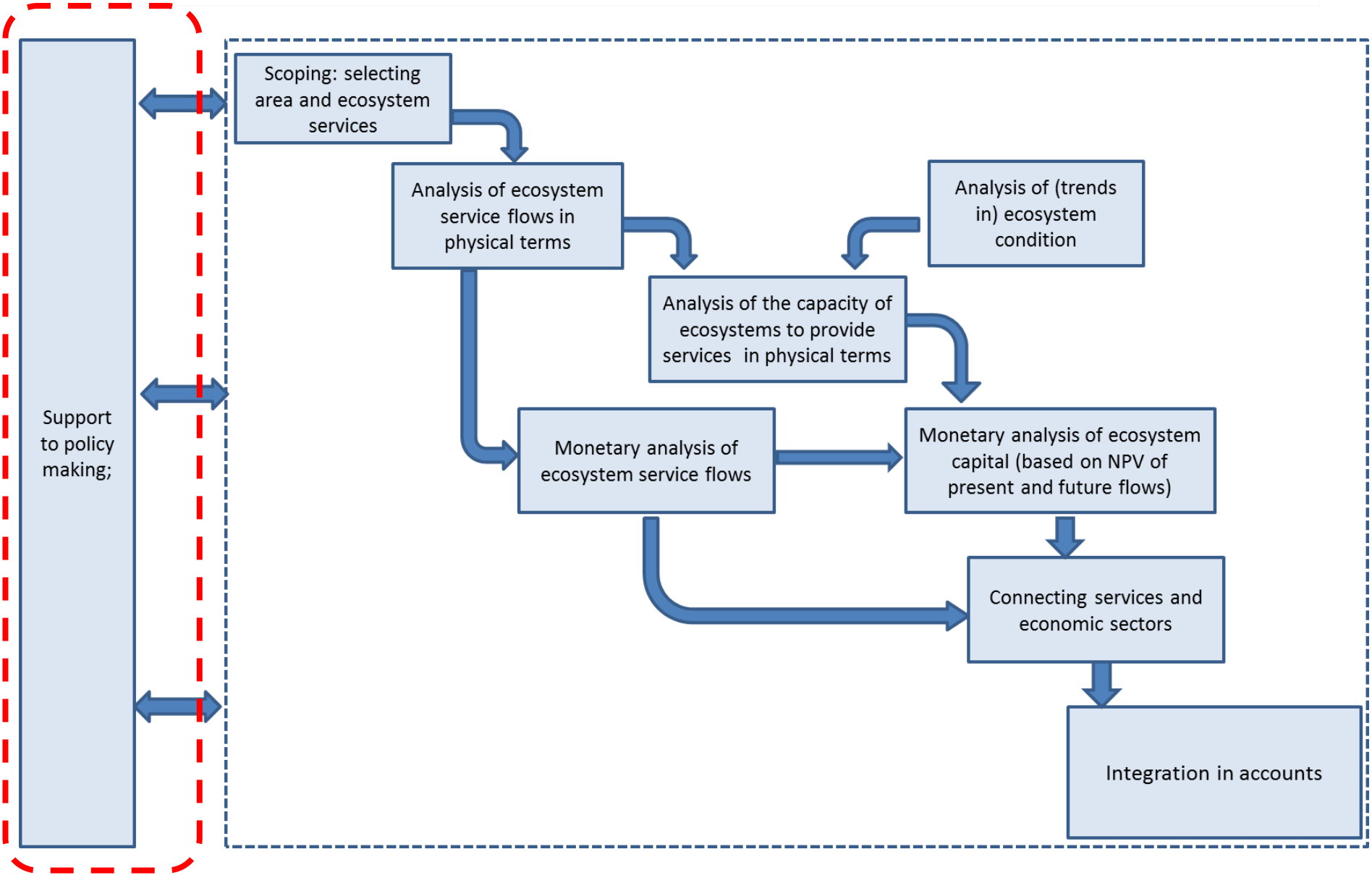
# ES in ecosystem accounts



# Scoping of Ecosystem Accounts

- Which areas, which ecosystems, which services to include ?
- Driven by policy needs, for instance:
  - Indications of rapid land use change of changes in natural resource use
  - Conflicts in natural resource use
  - Sustainability concerns or ambitions
  - Interest in 'greening' the economy and in identifying flows of funds and potential investment opportunities including PES
- Driven by capacities, resources and data (will differ per service)
  - GIS modelling, production statistics

# Ecosystem accounting and the GDP/NDP

- Note that many ecosystem services are already included in national accounts – directly or indirectly
  - Provisioning services (including home consumption)
  - Most of the regulating services (exception: carbon sequestration)
- Ecosystem accounting makes the contribution of ecosystems clear (also spatially) and shows implications of degradation and rehabilitation
- Ecosystem accounting allows monitoring capacity and thereby sustainability

# Ecosystem accounting versus the Central Framework

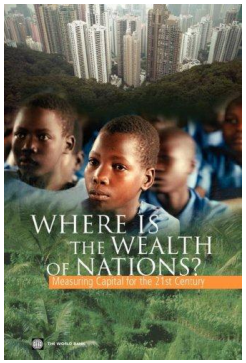
- Central Framework has been adopted as a standard
- Compartmental approach simpler, but leads to exclusion of many types of ecosystem services
- Central framework does not require spatial analysis
- Ecosystem accounting allows for more comprehensive understanding of sustainability trends

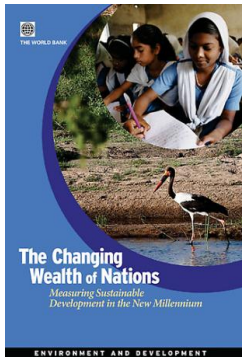
# Ecosystem accounting versus (Inclusive or Comprehensive) Wealth accounting

- Ecosystem accounting does not include the Consumer surplus
- Ecosystem accounting allows linking to national accounts, and builds on concepts and definitions defined in SNA (2008)
- Ecosystem accounting does not require the use of shadow prices as in wealth accounting

# Further reading on wealth accounting

- Inclusive and Comprehensive Wealth accounting studies, using shadow prices for all types of capital.
  - UNU/IHDP Inclusive Wealth Accounting Report 2012, Barbier et al., 2012.
  - World Bank Comprehensive Wealth Accounting program:

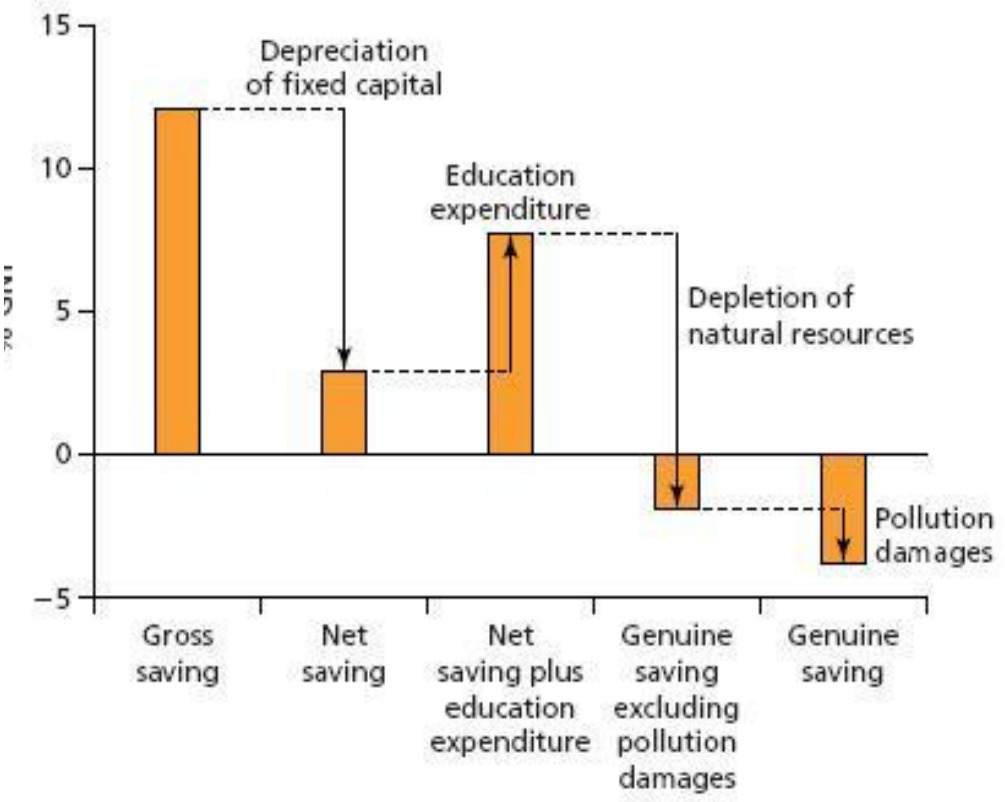



- *Where is the Wealth of Nations?*
  *Measuring Capital for the 21st Century (2006)*
- *The Changing Wealth of Nations*
  *Measuring Sustainable Development in the New Millennium (2011)*

# Adjusted net savings

- Adjusted net savings (also: genuine savings) measure the true rate of savings in an economy.
  - Expenditures on education are added to net domestic savings (investment in human capital)
  - Pollution damages include health damages from urban air pollution and costs of CO2 emissions.




Source: World Bank

# Challenges: Analysing ecosystem services

- Data availability, both physical and monetary
- Understanding uncertainties, in particular when there is a lack of data and only one suitable modelling approach that can be applied.
- Modelling the hydrological service
- Linking deposition of particulate matter to reduced concentrations of air pollutants

- Integration in accounts: to whom should we attribute public goods provided by ecosystems ? Are they produced by the ecosystem manager or land owner or ??

# Challenges: calculating capacity provisioning services

- There are thresholds that may be passed in ecosystem condition under current management
- There is unpredictability moderated by ecosystem **resilience**, e.g. as a function of rainfall or fire
- What time frame to consider ?

# Challenges: valuing ecosystem services

- Valuation of provisioning services: Valuation of open-access common pool provisioning services, where the resource rent approaches 0 ?
- Valuation of regulating services, for example
  - Wide price ranges for carbon
  - Values for hydrological service dependent on overall land cover in a watershed.
- Valuation of cultural services
  - Recreation
  - Comparison with biodiversity accounts
- Consideration of future price changes
- Selection of discount rate

# Policy applications

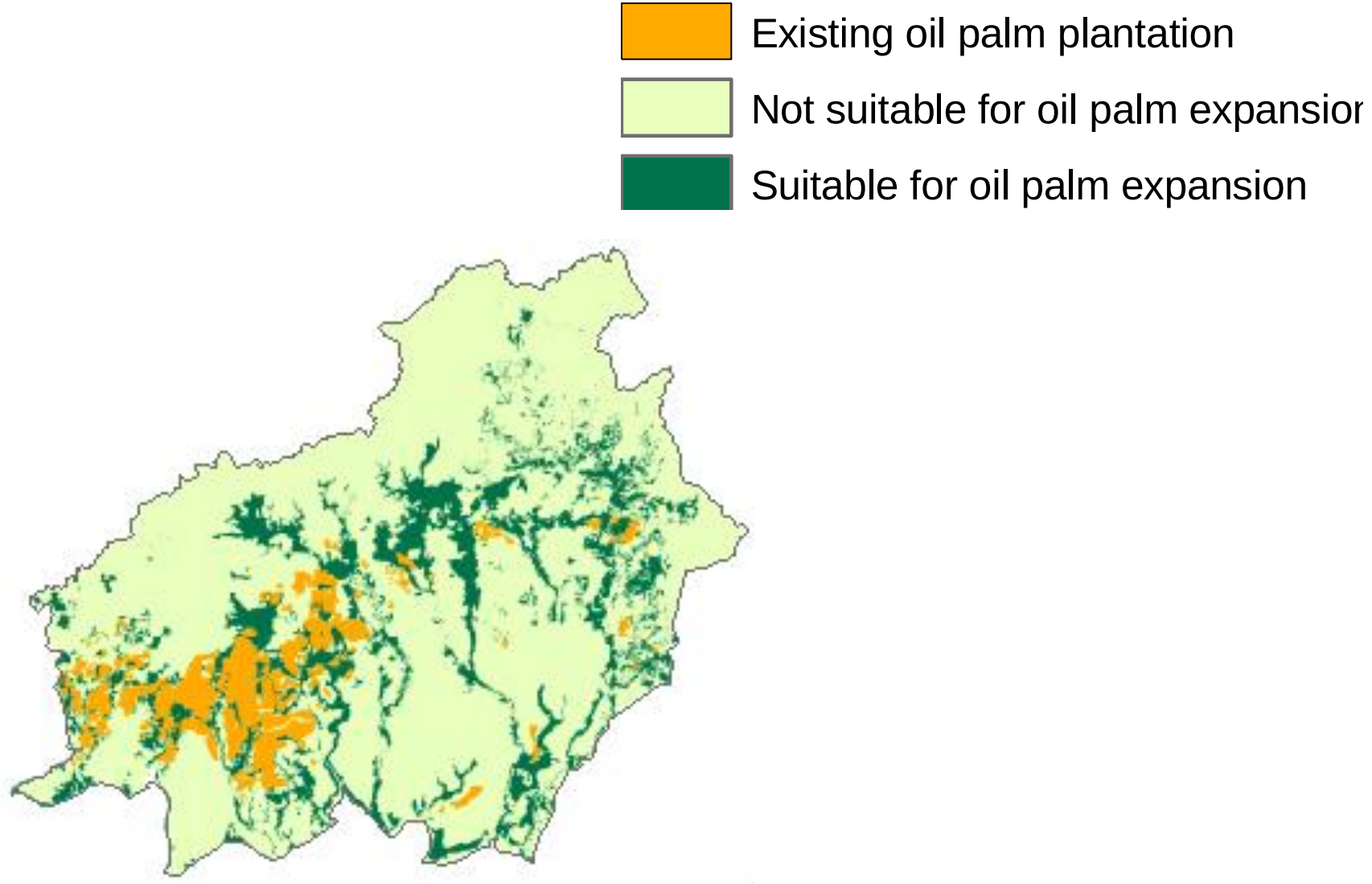
- Ecosystem accounting for Land Use Planning (Central Kalimantan)
- Ecosystem accounting to monitor sustainability (Norway)
- Ecosystem accounting to analyse the benefits of new protected areas (Netherlands)

# Stakeholders' development scenarios

**Environmentally sustainable scenario**

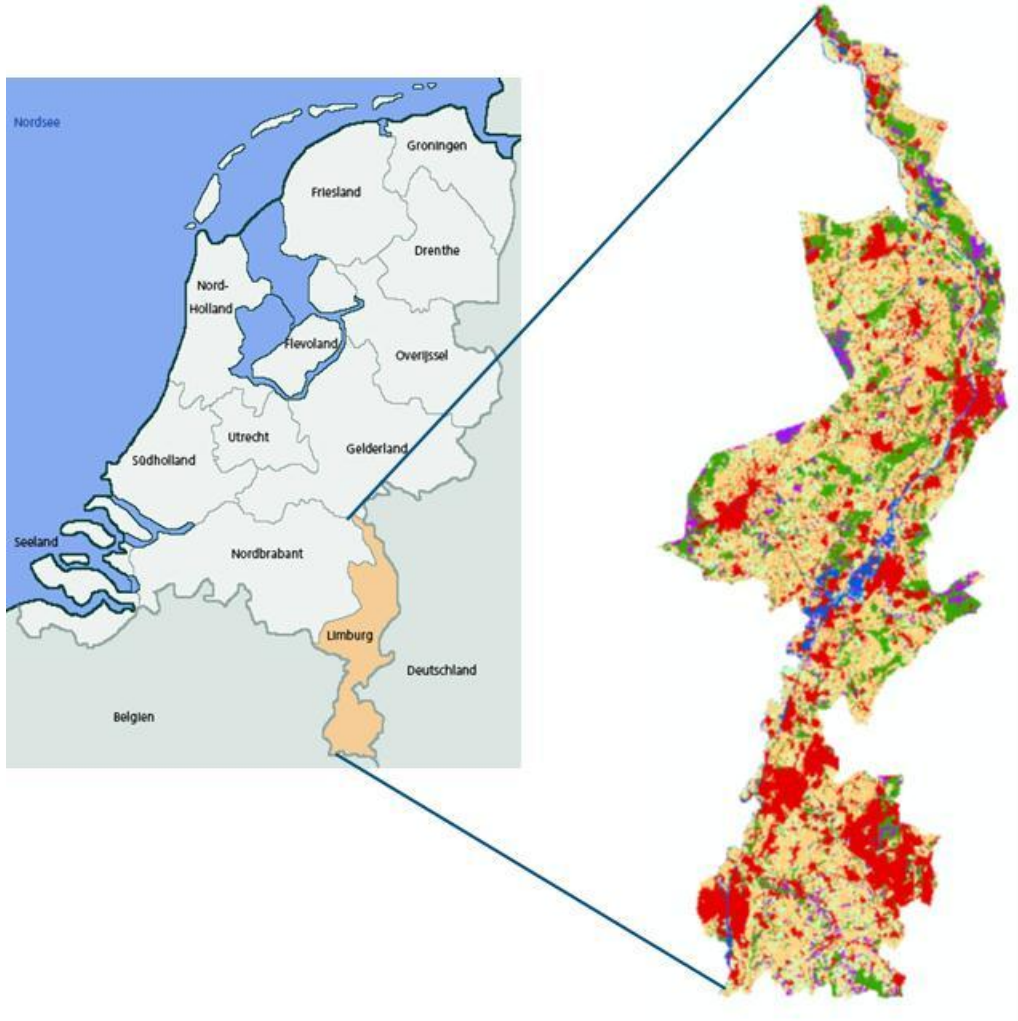
- Exclusion of orangutan habitat (suitability > 50%).
- Excluding areas where the current carbon storage in the vegetation exceeds the carbon storage in a mature oil palm plantation.
- Excluding peatlands. Exclusion of areas with high potential for nature recreation.
- Maintaining the supply of areas important for timber, rattan and paddy rice production.

# ES mapping for Land Use Planning



# Case 3. Limburg

- Analyse ecosystem services flows and ecosystem capital
- 8 ecosystem services
- Specific attention for biodiversity
- Analyse two management options



# Policy application: comparing costs and co-benefits of new nature

Areas considered for expansion of protected area network

- Costs may include loss of crop production, costs of reduced space for urban expansion.
- Co-benefits may include increase in water supply, recreation, flood control.

# Conclusions

- Ecosystem accounting is a potentially highly useful new tool in support of policy making on natural resources
- It allows evaluation and comparison of economic and sustainability criteria (and can be extended with tools focussing on stakeholder impacts)
- Economic criteria can be comprehensively covered, including a wide range of economic benefits provided by a wide range of ecosystems (land cover units)
- It can support a broad range of decision making processes
- It is grounded in SNA, but further conceptual work needed
- Ecosystem accounting requires significant resources and data (GIS, ecology, economics).
- And it is no panacea: e.g. long-term effects difficult to include