Integrated land development in the Tisza valley

Ecosystem approach based methods and approaches to support landscape protection

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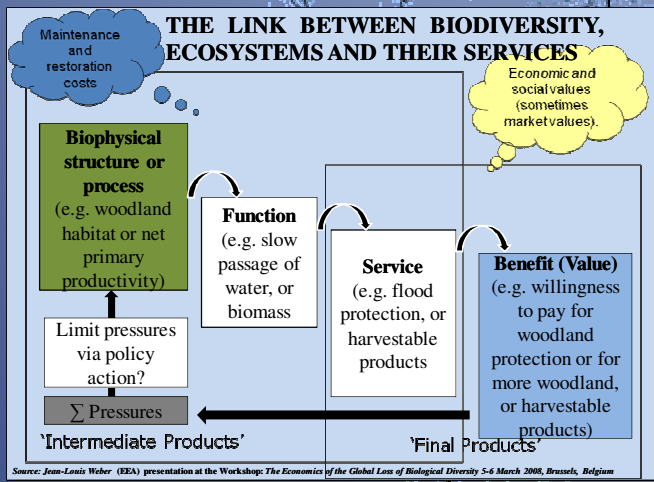
PROBLEMS

- Result of the Millenium Assessment (UN, 2005): in the past 50 years ecosystems of the Earth have been changed dramatically by mankind
  - WHY?
  - POPULATION GROWING
    - claim of increasing food, water, wood and fuel
      - continuous decrease of biodiversity: natural habitat loss, species extinction (5 000-20 000 species/year)
        - increased vulnerability: resilience is decreasing
- benefits and services produced by nature are limited
- regional development, spatial planning and structural policies do not take notice of these limitations
- special areas such as floodplains (e.g. Tisza valley) have high potential to increase these services (e.g. ecological network, improved food-web) but under high pressure by intensive agriculture and urbans sprawl

Ecosystem services: *provisioning* (e.g. photosynthesis), *regulating* (e.g. pollination), *supporting* (e.g. food), *cultural* (e.g. ecotourism)

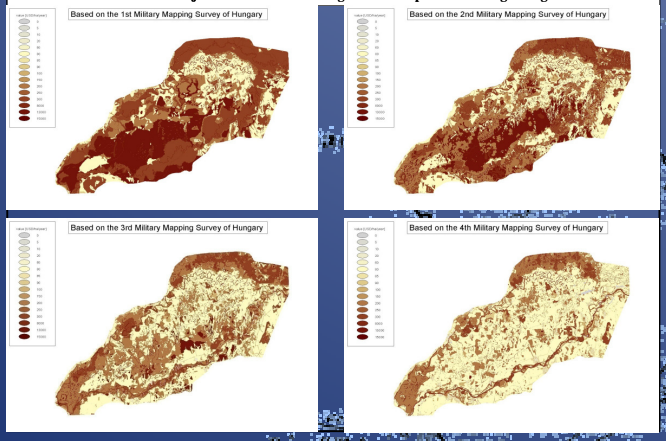
THE LINK BETWEEN BIODIVERSITY, ECOSYSTEMS AND THEIR SERVICES



Source: Jean-Louis Weber (EEA) presentation at the Workshop: The Economics of the Global Loss of Biological Diversity 5-6 March 2008, Brussels, Belgium

Regional ecosystem service assessment for land use change

Evaulation of a join land and water management concept in the Bodrogköz region



SOLUTION

Establishment of integrated land and water management (ILD project ICPDR-UNDP-SZÖVET, 2009)

- detailed assessment of natural and environmental processes
  - land use change in light of social and economic development
    - multidisciplinary integration of findings
      - need for ecosystem assessment
- to enrich the policy / project assessment methodologies
  - main goal: identify existence and measure of possible environmental problems and solution of these problems

METHODOLOGY: calculate ecosystem services in project assessment from very small (parcel based) to large scale (region catchment)

- to formalize principle thesis and criteria system for spatial policy

EXPLANATION

- the human well-being considerably depends on provisions of the ecosystems (e.g. food, freshwater, fiber)
  - almost all of the benefits that people derive from ecosystems depend to some extent on the biodiversity
    - while the human welfare is increasing, well-being is declining
      - damaged ecosystems have not been provided those provisions which vital for mankind
- the natural functions are resources, they are become ecosystem services by their usage: explicitly in our study area at floodplains

- floodrisk reduction - groundwater recharge - soil formation and renew processes - drought reduction	- water purification - fish biodiversity increasing - waterbirds poplation increasing - increases fertility - increase biomass growth

- the maintenance and restoration costs of the different ecosystems return provisions of the ecosystems

STATEMENTS

- main goal: establishment of integrated landscape and water management in the Bodrogköz microregion, which central element is the water retention
- the Bodrogköz microregion ecosystem services has been analysed utilizing the historical landuse mapping
- large proportion of croplands; fragmented grasslands and forests; lack of buffer-zones → low benefits by human community
  - habitat management: flooding

high benefits by human community: landscape management, revitalization of wetlands (e.g. recreation activity), decrease drought and water-logging danger, ecological corridors between fragmented habitats; sustainable agriculture

FURTHER PROBLEMS

- lack of long-term monitoring activity supporting the functional analyses of the habitats, especially fragmented and degradated landscapes
- willingness of farmers to take part of landscape management

FURTHER STEPS – ILD (ICPDR-UNDP-SZÖVET, 2009)

- several flood polders have been created, still huge gap in landscape management
  - LACK: examination of ploughlands and grasslands, fragmented and degradated landscapes, and especially transition plant-zones (e.g. marshy meadows, scrubs)
- METHODS: improved ecosystem services assessment
  1) ecological studies of communities (structural and behavior of species and populations)
  2) whole ecosystem studies: the flux of energy and matter through the ecosystem

examination of food-chains and food-webs

- start-up: soil → root of Earth life, it provide for plants (hereby animals and people, too) with water and nutrients as well as bind and transform the substances
- finishing: birds → the best indicators in landscape-scale and long-term

Example of food-chain