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USE OF ECOSYSTEM SERVICES IN CROATIA - CURRENT STATE AND POSSIBILITIES

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Introduction

- = services that ecosystems provide
- all benefits that people and economies receive from nature (direct or indirect)
- financially valued, but mostly they represent non-measurable values that are difficult to evaluate (e.g. importance to nature protection, importance to human health, etc.)
- 4 groups of ES: **provisioning**, **regulating**, **supporting**, **cultural**

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FIGURE 1. Example of provisioning ecosystem services - Harvest in Slavonija (AgroKlub.com)

Provisioning - the raw materials and energy produced by ecosystems – including food, water, medicinal resources, and fuels such as wood

FIGURE 2. Example of regulating ecosystem services - Forests in Gorski Kotar (matica.hr)

Regulating - the ecosystem functions that help to preserve the equilibrium and normal functioning – e.g. control of storms, floods; air quality preservation; regulation of global climate and disease; pollination

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FIGURE 3. Example of supporting ecosystem services - Coral reef Mljet (dubrovniknet.hr)

Supporting - the services that make all other ecosystem services possible – such as primary soil formation, production of atmospheric oxygen and provisioning of habitats

FIGURE 4. Example of cultural ecosystem services - Lukina jama, Velebit (web.studenti.math.pmf.unizg.hr)

Cultural - the non-material services that ecosystems provide – including spiritual benefits, recreational experiences, tourism, mental and physical health

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Legislative basis

- **EU biodiversity strategy to 2020**

In 2011, the EU adopted strategy setting out **6 targets** and 20 actions to halt the loss of biodiversity and ecosystem services in the EU by 2020.

Target 1. – Protect species and habitats

Target 2. – Maintain and restore ecosystems

Target 3. – Achive more sustainable agriculture and forestry

Target 4. – Make fishing more sustainable and seas healthier

Target 5. – Combat invasive alien species

Target 6. – Help stop the loss of global biodiversity

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Legislative basis

- **Strategy and Action plan for nature protection of Republic of Croatia for period 2017. – 2025. (OG 72/2017)**

„Ecosystem services concept has great **potential as add value for current nature protection approach**, and it is not yet quite recognized throughout different sectors. Goals are, among others, to make **natural values more visible** as to ensure that with use of the latest approaches and scientific findings, quality strategic decisions are brought at national and local level in accordance with sustainable use of natural goods."

Koncept usluge ekosustava ima veliki potencijal kao dodana vrijednost sadašnjem pristupu zaštite prirode, koji do sada nije dovoljno prepoznat među različitim sektorima. Ciljevi su, između ostalog, učiniti prirodne vrijednosti vidljivijima kako bi se uz korištenje najnovijih pristupa i znanstvenih spoznaja osiguralo donošenje kvalitetnih strateških odluka na lokalnoj i nacionalnoj razini koje su u skladu s održivim korištenjem prirodnih dobara.

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Legislative basis

Strategic goal 4: Increase the knowledge and availability of data regarding nature

- 4.1 Increase the knowledge about state of nature

  Activity 4.1.8 Conduct valorization and determine the level of vulnerability of certain habitats and/or ecosystems

- 4.3 Evaluate and map ecosystem services in order to estimate their current state and possible imporvement

  Activity 4.3.1 Map ecosystem services and and prepare analysis of ecosystems state
  Activity 4.3.2 In pilot areas evaluate the economic values of ecosystem services
  Activity 4.3.3 Encourage national intersector interdisciplinary cooperation regarding ecosystem services
  Activity 4.3.4 Improve the status if ecosystems and their services
  Activity 4.3.5 Increase the level of knowledge within nature protection sector, and other sectors as well, about ecosystem services

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Legislative basis

Strategic goal 5: Increase the level of knowledge, understanding and public support for nature protection

- Ecosystems services – one of priority theme

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Economic valuation of ecosystem services

- Six major methods for valuing ecosystem services in monetary terms are (*Farber, S.C., R. Costanza and M.A. Wilson. 2002. Economic and ecological concepts for valuing ecosystem services. Ecological Economics 41: 375-392*)

Avoided cost: Services allow society to avoid costs that would have been incurred in the absence of those services
Replacement cost: Services could be replaced with man-made systems
Factor income: Services provide for the enhancement of incomes
Travel cost: Service demand may require travel, whose costs can reflect the implied value of the service
Hedonic pricing: Service demand may be reflected in the prices people will pay for associated goods
Contingent valuation: Service demand may be elicited by posing hypothetical scenarios that involve some valuation of alternatives (most controversial of the non-market valuation methods)

Economic valuation of ecosystem services

- Accounting of nature capital
- Accounting of ecosystems

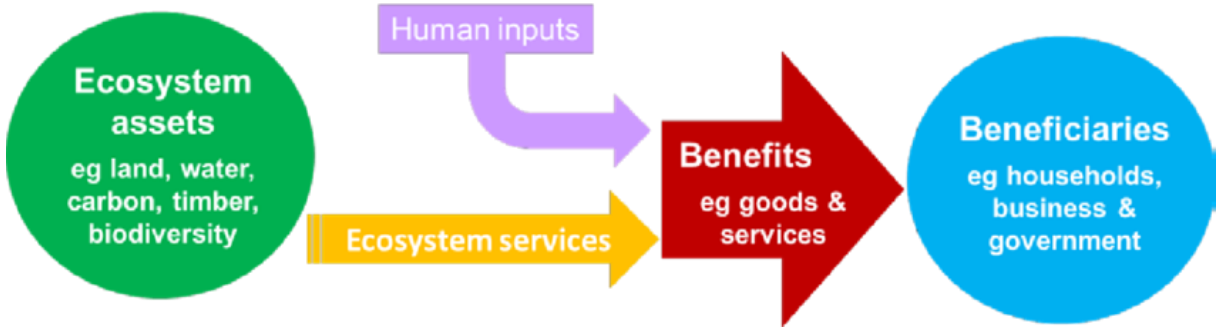

FIGURE 5. Model of ecosystem accounting (researchgate.net)

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What was/is done in Croatia?

- Law on Forests (OG . 140/05., 82/06., 129/08., 80/10., 124/10., 24/12., 68/12., 148/13., 94/14.) – general-useful forest functions
- Report on the state of the nature in Croatia for period 2008. to 2012.
- Ecosystem National Park Sjeverni Velebit and Nature Park Velebit benefits to economic development and righteous division (Flores M., Ivičić I., 2011.)
- Assessment of ecosystem services of Nature park Vransko Jezero (2013.)
- Assessment Study on valorization of freshwater ecosystem services (DZZP, 2014.)
- Mapping and assessment of ecosystems and their services in Croatia - Study and Publication (AZO, 2015.)
- Mapping and assessment of ecosystems and their services in Croatia – Data base (HAOP, 2017.)

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What was/is done in Croatia?

- Member of Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) - an independent intergovernmental body, established by member States in 2012.

  provides policymakers with objective scientific assessments about the state of knowledge regarding the planet's biodiversity, ecosystems and the benefits they provide to people, as well as the tools and methods to protect and sustainably use these vital natural assets

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Possibilities

- Economy benefits
- Add value to nature protection policy
- Intersectoral collaboration – development and protection
- Remediation of degradeted ecosystem

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Conclusions

- Some of the preconditions for use of ecosystem services have already started: systematical mapping of habitat types and their current state, determination of their potential – ecosystem map
- Need to determine economic potential of ecosystems
- Strategic approach – taking into consideration value of ecosystem services when planning new interventions
- Defining approach for degradeted ecosystems recovery
- Defining methodology for ecosystem accounting

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Thank you for your attention!