Balancing Alpine renewable energy production and nature conservation

recharge.green

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Land Locked Developing Country Seminar - Session On Energy and its Nexus to key SDGs
Aim:

To provide the basis for balancing Alpine renewable energy production and nature conservation

- Interreg IVB transnational cooperation project co-funded by ERDF in the framework of the Alpine Space Programme
  (Total budget: 2,7 mio €)
- Duration: October 2012 – June 2015
A multi-country collaboration

• 15 partners in 6 Alpine countries

• 5 project pilot areas:
  • Bavaria (Germany),
  • Belluno Province, Veneto (Italy),
  • Northern French Alps (France),
  • Triglav National Park (Slovenia), and
  • Vorarlberg (Austria).
For „ground-truthing“: different emphases in pilot areas

Woodland biomass vs. biodiversity (Triglav)

Hydropower vs. biodiversity (Bavaria, Belluno)

All forms of RE vs. ecosystem services (Vorarlberg)

Hydropower & integrated spatial decision support systems on water resource management (Belluno; Alpi Maritimi)
Why this project?

- One of the largest natural spaces in Europe
- European Biodiversity hotspot
- Home and workplace for 14 million people
- Holiday and recreation destination for 100 million +
Why this project?

- Demands for expansion of renewable energy
- Biodiversity conservation needs
- Regional development opportunities
Context

Environmental, social & economic issues

Demand for:
• sustainable sources of energy (climate change mitigation)
• economic development in the region

Questions
• impact of development of renewable energy on the habitats of animals and plants?
• how does it affect land use and soil quality?
• how much renewable energy can reasonably be produced / used?

Conservation of:
• ecological connectivity
• biodiversity (species, ecosystems)
• ecosystem services

7 May 2015 Bruxelles
Introduction to ESS

Renewable energies and ecosystem service impacts

Richard Hastik, Stefano Basso, Clemens Geitner, Christin Haida, Aleš Poljanec, Borut Vošnjak, Chris Walzer

Abstract

Expansion of renewable energies (RE) is a key measure in climate change mitigation. For this expansion, mountainous areas are regarded as technologically and politically suitable because of their high-energy potentials. However, land use change and cultural value also provide high-energy potential. The concept of Ecosystem Services can help to reconcile expansion with the preservation of natural and cultural values and thus minimizing environmental constraints. For this, interdisciplinary research on RE and environmental constraints is needed. The literature review scrutinizes RE resources which are relevant in the Alps and their effects on the environment by applying the Ecosystem Service approach. Thereby, we identified potential environmental constraints (e.g., by forest, natural hazards protection) that RE expansion highly the strong need for interdisciplinary research on RE and environmental constraints. Interdisciplinary approaches such as the concept of Ecosystem Services can help to cover the wide range of impacts associated with future RE expansion.
Why care about biodiversity?

- Intrinsic value (of species, landscapes)
- Ecosystem services
- Legal obligations to conserve (e.g. Global convention on biodiversity, EU Directives)
Why care about biodiversity?

Since the 1980s it has been shown that organisms will influence:

- formation of habitats – ecosystem engineering
- fluxes in biogeochemical cycles
- productivity of ecosystems

Cardinale et al. Nature 2012
Present-day consensus

Biodiversity loss reduces:
- efficiency by which biological communities decompose and recycle essential nutrients
- produce biomass and essential resources
- decompose and recycle resources
- biologically essential communities capture essential nutrients

Mounting evidence indicates biodiversity increases ES functions over

Environment and health: 7. Species loss and ecosystem disruption — the implications for human health

Eric Chivian

There is abundant evidence that human beings are beginning to alter some of the planet's basic physical, chemical and biological systems, endangering other species and disrupting ecosystems in the process and ultimately threatening human health. When Homo sapiens evolved some 120,000 years ago, the number of species on Earth was the largest ever, but human activity has resulted in species extinction rates that are currently 100 to 1000 times the pre-human rate. Although the record demonstrates that humans hunted to extinction scores of large mammals and birds as early as tens of thousands of years ago, it is only in recent times that these extinctions have spread to virtually every part of the planet and to almost every phy...
Present-day consensus

Impact of biodiversity on any single ES process is non-linear and saturating – change accelerates as biodiversity loss increases

Cardinale et al. Nature 2012
But – there are tradeoffs.

Source: Richard Hastik, Uni Innsbruck
project results
www.recharge-green.eu

Sustainable Renewable Energy Planning in the Alps
A handbook for experts & decision makers
ESS

- missing policy and finance mechanisms for incorporating natural capital into actual land- and resource-use decisions.
- ESS narrowing down the complexity of ecosystems to a single service
- serious ethical implications on the way we perceive and interact with nature.
However useful “green accounting” mechanisms would be, we must also be mindful that reducing nature to a stock that provides a flow of services is insufficient in addressing the global predicament we face today.

Re-examining and potentially redefining the prevalent economic concept of continuous “Growth”
A context-less use of the poorly defined ecosystem service model could blind us to the ecological, economic and political complexities we face and potentially obfuscate the necessary major institutional changes we must make to secure the future of humanity.
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Alpine Nature 2030
Creating [ecological] connectivity for generations to come