BOOK OF ABSTRACTS

I. SESSION DESCRIPTION

ID: T1b

The ES concept in science, policy and practice – a constructive reflection on its use, potential and challenges

Hosts:

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Host:	Carsten Mann	Eberswalde University for Sustainable Development (HNEE);	carsten.mann@hnee.de
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Abstract:

The concept of ecosystem services (ES) made its way from an initial communication concept with the intention to reconnect society with nature towards a widely accepted- yet contested – and applied concept in science, policy and practice in the past decades. Dedicated exchange platforms such as the ESP conference series as well as its mounting uptake into scientific publications, books and policy reports are just some signs of its successful development from niche into mainstream debate. In this session, we take the 5th ESP Europe conference as an occasion to

constructively reflect on the current status of the ES concept and the potential and challenges it bears for science, policy and practice now and in the future.

In this session, we seek to stimulate reflections, learnings and debate around the application of the ES concept in policy and practice and to elaborate pathways for bridging the gap between theory and practice. We start by looking back into the early times of the emergence of the ES concepts, its rationale, and the chances it brought to conceptualize social-ecological systems and their interdependencies with ecosystem goods and services. This view begins with a reconstruction of the ES development history and ends with its successors such as the IPBES work on NBPs, NCPs and the latest values assessment. From there, we continue with a reflection on the integration of the ES concept into environmental governance and policy. Based on input presentations, we illustrate how the ES concept is used in policy strategies and instruments, its impact on institutional landscapes and governance, and assess respective policy performance and outcomes. In addition, we will focus on particular issues of uncertainties and underrepresentation. Finally, building on the conceptual and application-oriented perspectives, we enter into a moderated dialogue. We discuss the concept's chances and challenges, and, moreover, to identify its ongoing relevance and pathways for bridging the gap between theory and practice for its future use.

Perspectives and questions we seek to cover in our session are:

- Insights into the ES concepts, rationales and further adjustment needs
- Translation of the ES concept into environmental governance and policy objectives across governance levels
- Performance of ES-oriented policy design and policy mixes
- Debating the ES use potentials, achievements and challenges for its future use, conceptualization and integration into practice

Throughout the session, an overview of perspectives on the ES concepts and its use shall be gained. Based on conceptual ideas, empirical findings and experiences on governance, policy and management practice, current and future chances and challenges of the ES concept shall become visible for debate.

Inputs by invited speakers and the mosaic of papers from an open call thus stimulate a constructive debate across disciplines and stakeholder groups on the ES concept in Europe and beyond. These insights serve as the basis for further conceptual development and practical applications to address the societal needs to ensure a healthy environment and more sustainable ecosystem uses.

Goals and objectives of the session:

The goal of the session is to stimulate reflections, learnings and a constructive debate around the current and future use of the ES concept. We seek to provide an insightful view of past to present conceptual developments, the uptake and integration of the ES into governance and policy, and a debate to derive implications for future use of the ES concept.

Planned output / Deliverables:

The outcome might be a Special Issue on perspectives and insights into ES concept, uptake and ways ahead based on the presentations and discussions

Session format:

This three-hour session is structured into two interlinked sub-sessions:

Part I: The ES concept in science, policy and practice (90 min)

In the first sub-session, we start with an input from invited speakers from science and policy to remind us on the early days of the ES concept, the underlying ideas and its successful mainstreaming, up to recent conceptual developments and uses.

This is followed by presentations of empirical findings on the integration of the ES concept in environmental governance and policy in different contexts. Central questions are (i) how is the ES concept used/integrated in policy instrument and strategy design, (ii) how did this integration lead to institutional and governance shifts, (iii) how do these policies perform in distinct contexts of natural resources management, and (iv) how are policy outcomes assessed.

Part II: Uncertainty and underrepresentation: Bridging the gap between theory and practice (90 min)

The second sub-session focuses on issues of uncertainty and underrepresentation as particular governance challenges and potential pathways for bridging the gap between theory and practice, based on few empirical findings.

Afterwards, we will have a final moderated science-policy-practice dialogue with participants from both sub-sessions to discuss their perception on the practicability, current relevance, chances and challenges of the ES concept in use. In combination of these perspectives, we hope for indications of future ES concept use in science, policy and practices and pathways ahead.

II. SESSION PROGRAM

Room: Expert Street 7

Date of session: 19th of November 2024
Time of session: 11:00 – 12:30 & 14:00 – 15:30

Timetable Speakers

Part I: The ES concept in science, policy and practice

Time	First name	Surname	Organization	Title of presentation
11:00 – 11:15	Alexander Jelle	Oudenhoven Vandenberghe		Introduction to the topic: a critical reflection on use and usability of ES from different angles.
11:15 – 11:25	Luis	Inostroza	Mendel University Brno, Czech Republic	The philosophical and conceptual ground of ecosystem services. A conversation about paradigms, analytical distinctions, pitfalls and misunderstandings in ecosystem services science.
11.25 – 11:35	Ewert	Aukes	Governance and Technology for Sustainability, Faculty of Behavioural, Management, and Social Sciences, University of Twente	The science diplomatic character of the ES concept
11:35 – 11:45	Simone	Martino	Social, Economic and Geographical Sciences Department, the James Hutton Institute, Aberdeen	Where is Natural Capital being used in Policy-Making? Results from an international review
11:45 – 11:55	Roxanne Suzette	Lorilla	Department of Geography, Harokopio University of Athens	ES as a cross-sectoral approach to account for pluricentric values of nature within the new EU Green Deal
11:55 – 12:05	Jan	Daněk	Global Change Research Institute of the Czech Academy of Sciences	National platform for ES and its role in facilitating implementation of the ES framework in the Czech Republic

Time	First name	Surname	Organization	Title of presentation
12:05 – 12:15	Michael	Leon	Research Institute for Nature and Forest (INBO)	Ecosystem Services as (Co-)performative Practice: Experiences from Integrated Water Management in Flanders
12:15 – 12:25	Connie	López-Gómez	Department of Geosciences and Environment. National University of Colombia, Medellín-Colombia	Rural and afro-descendant women narratives on ES in conservation planning and policy: a Colombian case study.
12:25 – 12:30	Q&A			Remaining q&a

Coffee Break: 12:30 – 14:00

Part II: Uncertainty and underrepresentation: Bridging the gap between theory and practice

Time	First name	Surname	Organization	Title of presentation
14:00 – 14:05	Roberto	Pastén	Universidad San Sebastián	Introduction to sub session on challenges
14:05 – 14:15	Chantal	Blom	Statistics Netherlands	well-being, SDGs and Natural Capital
14:15 – 14:25	Ernesto	López Morales	Universidad San Sebastian	Land and Property Valuation Informed by Ecosystem Services
14:25 – 14:35	Ilse	Nijensteen	Vrije Universiteit Amsterdam	The concept of novel lans uses in Europe: data collection and linkages with ecosystem services well-being and biodiversity
14:35 – 14:45	Roberto	Pastén		EConomic valuation of sediment retention and the impact of forest conservation
14:45 – 15.30	all			Final and joint debate: A constructive reflection on the use, potentials and challenges of the ES concept in science, policy and practice Session conclusion

III. ABSTRACTS

The first author is the presenting author unless indicated otherwise.

1. The science diplomatic character of the ecosystem services concept

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The notion of ecosystem services and ecosystem knowledge in general have gained a foothold in environmental governance in the past few decades. Although various domestic policy levels apply (eco-)systems thinking sometimes explicitly, sometimes more implicitly, the pervasiveness of ecosystem knowledge in and its value for international relations and transboundary governance processes and an ecosystem service perspective is not well-explored. Other than for single-issue treaties existing for water, energy or agriculture, ecosystem services are harder to address with international legal treaties due to their holistic nature. Thus, this contribution intends to explore the question: What role does ecosystem knowledge and an ecosystem service perspective play in transboundary environmental governance? We approach this issue with a perspective of science diplomacy. On the one hand, the science diplomacy perspective allows us to conceptualize ecosystem services as a specific form of knowledge that can mediate in understanding transboundary ecological contexts, requiring specific experts in corresponding governance contexts. On the other hand, ecosystem services may support diplomatic interactions relating to transboundary environmental issues. Thus, we do not take a vertical multi-level governance approach, but rather focus on a horizontal, cross-jurisdictional perspective, in which ecosystem services may play a role in escalation or de-escalation of conflict. This includes implications for what could be called an ecosystem justice approach. We address the research question by exploring two cases of transboundary environmental governance collaboration in which we focus on the implicit or explicit role of ecosystem services. These cases involve (a) a transboundary research project involving various lower-level governmental organizations on the border between the Netherlands and Germany, as well as (b) the transboundary water resources shared between Central Asian countries based on the Almaty treaty and other agreements.

Keywords: Ecosystem services, science diplomacy, international relations, cross-jurisdictional perspective, Exploratory comparative case study

2. Well-being, Sustainable Development Goals and Natural Capital

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The availability of Natural Capital (NC) resources is an important component of both well-being and Sustainable Development Goals (SDGs) indicator frameworks. Statistics Netherlands compiles Ecosystem Accounts using the SEEA standard, and analyzed the suitability of the resulting data to inform the well-being and SDG frameworks. This resulted in five NC indicators to be used in this context.

There are however differences between the frameworks which bring some challenges.

First: directionality. The SDG indicators puts humans at the center. It is therefore important that the interpretation of indicators in terms of positive or negative effects on well-being is straightforward and unambiguous. For the case of Ecosystem services this is not always the case. For example, the annual flow of ecosystem services may decline because supply decreases (e.g. less capacity of ecosystems for air filtration) or because demand decreases (e.g. cleaner air). Subsequently, changes in the flow of ecosystem services cannot be unambiguously related to changes in well-being, and are therefore less suitable for monitoring well-being following the current framework of de SDGs.

Second, the valuation of ecosystem services is less suitable within our monitoring framework, because an increased use of an ecosystem service does not necessarily improve well-being. In contrast, ecosystem condition indicators are better suitable to measure well-being, because of their clear directionality.

Intertwining different frameworks is important but challenging.

For example: different definitions used by different frameworks and multiple organizations deliver data for the SDG indicators. As an example, for monitoring 'forest', the EU Green Deal Dashboard (LUCAS), SDG Portal (UNSTATS), NC, FAO-FRA and others all use different methods and definitions. In our experience, even after following the standardized method and definitions of the System of Environmental Economic Accounting (SEEA) framework and Eurostat as much as possible, maintaining consistency remains challenging. Therefore, staying in contact with other stakeholders is of most importance.

Keywords: Natural Capital, Sustainable Development Goals, Well-being, Ecosystem services, System of Environmental Economic Accounting

3. National Platform for Ecosystem Services and its role in facilitating implementation of the ecosystem services framework in the Czech Republic

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Although the ecosystem services (ES) framework is already implemented in key national environmental policies in the Czech Republic, its application in decision-making has so far been rather scarce. In this contribution, we reflect on the role of the existing national science-policy interface which was formed through participatory approaches and how it supports the implementation of ES in policy and decision-making in the Czech Republic.

The National Platform for Ecosystem Services (NPES) was established in 2022 as a result of a stakeholder consultation process with a broad range of actors. The platform aims to enable the effective integration of scientific knowledge in the policy-making and decision-making process, in order to minimise the existing gap between science and practice and to further develop the science-policy interface in and beyond the nature protection sector. After three successful meetings during the last three years (and the next one being planned in 2025), we suggest that the NPES has created an important and unique space for the ES agenda on the national level. Participatory elements are part of the meetings of NPES, e.g. in the form of round table discussions, presentations of platform members and evaluation surveys. Stakeholder engagement also provides further insights into implementation of the ES framework, reflecting pertaining barriers and challenges, but also positive visions for the future use of ES.

Continuous involvement of a wide range of actors confirms the need for a well-functioning science-policy interface to facilitate knowledge exchange and implementation of ES across various policies, sectors and institutions (and to overcome traditional “silo” boundaries). We conclude by suggesting the future role of NPES within upcoming national environmental policies.

Keywords: ecosystem services, implementation, science-policy interface, national platform, stakeholder participation

4. The philosophical and conceptual ground of ecosystem services. A conversation about paradigms, analytical distinctions, pitfalls and misunderstandings in ecosystem services science.

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The ecosystem services (ES) concept has become a consolidated research field with a consistent knowledge structure. ES was first used as such in 1984 by Ellis and Ellis, however, the conceptual ground is to be found in systems ecology, the discipline that shaped the foundational ground of what we know today as ES science. From early uses of related concepts such as landscape and ecosystem functions, nature services, and the like, ES has become a powerful tool for understanding the extent to which humans depend on nature. The ES community iterates around two predominant paradigms that possesses clear differences in the conceptualisation of the benefits humans receive from ecosystems and how these benefits are produced. The concept is also crossed by the transdisciplinary contradictions emerging from the interbreeding of economics – i.e. demand & supply – with conservation biology – intrinsic values, etc. resulting in unclear operationalizations of the concept on the ground. Being an intuitive concept that seems to be understood at first sight, it also shows the signs of buzzwords, where pitfalls and misunderstandings of the ecological foundations are frequent, inside and outside the ES research community. In recent years, several articulations with societal problems like climate change have broadened the horizon of ES science, reaching an undeniable global relevance crossed with regional and local meanings and flavours. As with any science, ES is an evolving field that remains compromised with the core mission set in the early days. This spirit of ES science keeps the capacity to inspire new generations in the pursuit of not only solving our striking societal problems led by the current socioecological crises but mostly to provide the conceptual apparatus to advance towards a profound change in the philosophical ground of our daily assumptions. Mostly by reallocating humans inside ecosystems, as co-producers of the ES we benefit from, a kind of awareness exercise that can reveal our place in the web of life including the myriad of intricated connections, we have with every living form and environmental compartment on this planet. Humans are nature and this is mostly a philosophical proposition that calls for a humble recognition of our limited capacity for

stewardship (rejection of moral tuition) and understanding of non-human-person needs. Nature does not need humans.

Keywords: human-nature, ecosystem services science, knowledge production

5. Ecosystem Services as (Co-)performative Practice: Experiences from Integrated Water Management in Flanders

First authors(s): Ann van Herzele

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Environmental concepts are performative in that they help create the environment they describe. We explore the performativity of the ecosystem services concept in the field of integrated water management in Flanders (northern Belgium). The data was collected from 23 in-depth interviews with professionals in the field, conducted in two rounds with a five-year interval (2013 and 2018) and complemented with on-site observations of practices applying the concept. Results indicate that ecosystem services was only marginally performative on its own, and rather was seen as a 'co-performative concept' that – in conjunction with existing concepts – could accelerate the envisioned integration process through promoting initiatives, mobilising stakeholders, shaping orientation, creating win-win situations, and more. Yet, despite these aspirations, the concept has in general failed to perform as expected. Many perceived ecosystem services as an academic concept, too complex for practical application. Common strategies were either to adapt the concept to fit one's professional context or to create a new practical context (a stakeholder workshop, for example) where the concept could function. We end with a discussion on the more general implications of the (pseudo-)malleability and context-dependence of the ecosystem services concept.

Keywords: Performativity, ecosystem services, integrated water policy and management, environmental concepts, malleability

6. Rural and Afro-Descendant Women narratives on ecosystem services in Conservation Planning and Policy: A Colombian Case Study.

First authors(s): Connie López-Gómez

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This study explores the divergences and convergences between the perceptions and narratives of women leaders from peasant organizations and Afro-descendant community councils regarding the concept of ecosystem services and processes of conservation in their territories through planning instruments and payment for ecosystem services schemes. The central research question of the ESP conference is: What visions do women leaders express in response to the dominant discourses of planning - conservation versus production-deforestation-economic growth in implementing the ecosystem services approach? Using a qualitative methodology, the study involved 42 interviews, of which 66.7% were with female leaders and 33.3% with male leaders. The interviewees are representative of cultural groups, including farmers (31%), Afro-descendants (38%) and individuals not belonging to any particular cultural group (31%). This research identifies how ethnic self-identification, age and territorial political roles influence acceptance or opposition to institutional conservation processes and understanding of the ecosystem services approach. This approach challenges the dominant narrative that portrays women as naturally aligned with environmental interests due to perceived feminine and altruistic principles. The results show that cultural background and political roles significantly shape leaders' perspectives on conservation and ecosystem services, highlighting that women's environmental engagement cannot be attributed solely to inherent altruism, but is influenced by complex socio-cultural dynamics. This study provides insights into how gender, ethnicity and political identity intersect with environmental conservation efforts and offers a more informed understanding of the role of women leaders in these processes.

Keywords: Ecosystem services, conservation planning, gender perspective, latin america, qualitative research

7. Ecosystem Services as a cross-sectoral approach to account for pluricentric values of nature within the new EU Green Deal

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The new EU Green Deal (EGD) outlines a multifaceted strategy encompassing, among others, climate neutrality, clean energy, circular economy, biodiversity preservation, and pollution mitigation. Due to the EGD's diverse goals policymakers and stakeholders need to follow a multidisciplinary approach to address all policy priorities, and minimise cross-sectoral challenges while ensuring that biodiversity remains at its best state. Within the GUARDEN project, we develop an operational framework that integrates the Ecosystem Services (ES) and Nature's Contributions to People (NCPs) frameworks into policy formulation and decision-making. The ultimate goal is to reveal alternative pathways for harmonized actions within the EGD's broader context of a more sustainable future. Through a text-mining approach, we identified the key topics and ES within the EGD policy documents and revealed potential synergies and trade-offs among them. Through an analysis of co-occurrence matrices, we identified the direct and indirect links between policy areas, suggesting that addressing specific policy targets can either fulfil or inhibit another target. We further assessed the relationships among EGD objectives considering the values that each policy integrates in their specific targets. We assigned IPBES' values types to each target and identified the distribution of intrinsic, instrumental and relational values across the EGD objectives. We then carried out the analysis at a local level, through focus group discussions with established multi-stakeholder partnerships. These allowed us to identify the diverse values, views and priorities that stakeholders attribute to these policies in France, Greece, Spain and Cyprus. Then the outcomes from the EU to the local level were qualitatively analyzed to highlight the ES applicability to provide decision support. The concept of ES/NCPs served as a bridging concept which allowed us to integrate different local/regional management and governance priorities while demonstrating the cross-scale challenges when applying European-wide policy agendas. We conclude that in order to achieve socially equitable, pluricentric and environmentally sustainable outcomes, one has to consider nature's multiple values.

Keywords: European Green Deal, IPBES, plural values, stakeholder partnerships, text-mining

8. Where is Natural Capital being used in Policy-Making? Results from an international review

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The term 'Natural Capital' (NC) is attracting interest both within and beyond academia. One area where NC may be useful is in public policymaking. Although efforts have been made to track the influence or use of these initiatives (for example by the WAVES programme of the World Bank in the Global South or the INCA project in Europe) there is still limited knowledge of how NC is influencing policymaking.

We searched for case studies of NC being linked to policy development anywhere in world, at a national and subnational level, based on both academic and grey (non-peer-reviewed) literature. We found that 30 countries (half were in the Global South) had implemented one or more initiatives by or for the public sector, mainly based on NC accounting at national level, while approaches using the concept of Ecosystem Services (ES) were more dominant in the Global North. The most common types of NC accounts reported as achieving use or influence are focused on water, forestry, timber, minerals, energy, and biodiversity. These accounts were used to inform the corresponding policy areas and plans. We have also found that 30% of the database (168 case studies) reports cases claiming "instrumental" impact, such as making tangible changes to the design of economic and regulatory approaches such as changing resource use permits, refining fiscal regimes, or reviewing conservation easement.

These results suggest that there have been considerable efforts worldwide to develop NC approaches within national or regional level policymaking. However, it was often hard to discern specific changes in policy or its outcomes. Challenges to mainstreaming NC approaches remain, including the lack of national and regional policy drivers, the presence of sectoral divisions within environmental governance, and insufficient resources and a lack of skilled intermediaries at the science and policy interface.

Keywords: natural capital, ecosystem services, policymaking, policy impact, science-policy interface

9. Land and Property Valuation Informed by Ecosystem Services

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The monetary valuation of ecosystem services (ES) can help improve fairness in land price distribution. Land appreciation is widely acknowledged as unearned because external factors influence it, including natural goods and benefits. However, property tax regimes barely consider these factors, as there is a limited understanding of how different types of ES, primarily regulating and cultural ES, impact property prices during urbanization. This study aims to address this knowledge gap.

This study is particularly relevant as it centers on the Northern Patagonia region in southern Chile. This ecologically sensitive area, experiencing an increase in population from urban to rural areas with low-density residential development and significant rises in land and property values, is an ideal location to study the impact of urbanization on property prices.

The research involves several steps. First, it conducts identification, mapping, and matrix-based ES valuation. Free-source land use and satellite-assisted land cover maps create a map of urban structural types (UST). Ecosystem services are then assessed using Burkhard's matrix land cover-based approach and a Delphi panel, with input from a 12-local expert pool from diverse environmentally related disciplines.

Second, a GIS creates a geodatabase for analyzing property factors such as price, size, and materiality. Around 400,000 observations are available from 2000 to 2023. To measure accessibility to ES, the study uses distances based on Euclidean, Manhattan, and network methods criteria to ascertain real versus virtual accessibility. We aim to show that accessibility to specific ES affects property value. Hedonic pricing analysis estimates the marginal willingness to pay for proximity to every ES in every UST.

This study's method and expected results have the potential to significantly impact property tax appraisal mechanisms in southern Chile and elsewhere, providing valuable insights that could lead to improvements in these systems.

Keywords: Property valuation, Ecosystem services, Urbanization, Northern Patagonia

10. Quantifying carbon reserves in tropical forests: Allometric equations for neotropical palms

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Accurate estimation of biomass in tropical forests is essential for understanding and mitigating the effects of climate change. Biomass is directly related to carbon reserves, making it a crucial component in environmental analyses and ecosystem services. Palms, as significant components of many tropical ecosystems, require specific allometric equations due to their unique growth forms. This study compiles and systematizes reported biomass allometric equations for various palm species in Neotropical countries. We analyzed 46 allometric equations from 18 studies, covering a range of species and ecological zones. The majority of these studies were focused on tropical and subtropical moist forests, with 80% of the equations derived from this biome. The underrepresentation of palms in biomass research is highlighted, despite their ecological importance and abundance in these regions. The analysis involved both linear and non-linear regression models, with palm height being the most commonly used variable. Findings suggest that generic allometric equations may not accurately reflect palm biomass, underscoring the necessity for species-specific equations. Additionally, this study tested the applicability of fractal geometry theory (WBE theory) to these equations and found that empirical values often provide better biomass estimates than theoretical predictions. The results have significant implications for ecosystem services, particularly in carbon sequestration and climate change mitigation. Accurate biomass estimation through species-specific allometric equations is essential for effective forest management, conservation strategies, and enhancing ecosystem services in palm-dominated ecosystems. By improving the precision of carbon stock assessments, this research supports the sustainable management of natural resources and contributes to global efforts in nature conservation and ecosystem restoration.

Keywords: Allometry, biomass, carbon sequestration, neotropical palms, ecosystem services

11. The concept of novel land uses in Europe: data collection and linkages with ecosystem services, well-being and biodiversity

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Research on land use change traditionally emphasizes spatial patterns of land use type conversions and shifts in management intensity and their drivers. Current methodologies often generalize these changes, overlooking novel land uses—unprecedented or emerging types within a region. Novel land uses involve transformations resulting in different ecosystem services or fundamentally altered operations, with significant ecological and emotional impacts. Categories include recreation, energy, new dietary trends, climate adaptation and rewilding. This study examines synergies and differences among novel land uses and their impacts on ecosystem services, biodiversity and human wellbeing.

Novel land uses such as holiday villages, golf courses and recreational horse keeping reflect shifting lifestyle preferences and economic developments, yet they present environmental challenges like habitat fragmentation and resource overuse. Renewable energy projects, also an example of novel land uses, introduce visual and ecological disruptions, necessitating a balance between development and conservation. Another example of novel land use is the rapid expansion of greenhouses, particularly in the region Almería, Spain.

Social acceptance and temporal impacts of novel land uses vary, with immediate economic benefits often juxtaposed against long-term ecological changes.

This study emphasizes the need for a comprehensive understanding of the mechanisms driving novel land uses, their spatial and temporal patterns, and their impacts on ecosystem services and human well-being. It discusses the synergies and differences among various novel land uses, from enhancing recreational opportunities and local economies to creating environmental pressures.

Lastly, integrated landscape planning, sustainable resource management and community engagement are promoted. Encouraging multifunctional land use and balancing economic development with environmental conservation are crucial to optimizing land resources for biodiversity, ecosystem services and human well-being. This research contributes to filling the

gap in knowledge about novel land uses, offering insights into their potential benefits and challenges for sustainable land use management.

Keywords: land use, ecosystem services, human well-being, biodiversity, novel

12. Economic Valuation of Sediment Retention and the Impact of Forest Conservation Policies

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This study examines the economic valuation of sediment retention as an ecosystem service, its relationship to forest coverage, and the impact of public policies aimed at increasing conservation. We analyze how forests contribute to soil stability and reduce erosion, quantifying the economic benefits of avoided sedimentation in waterways and reservoirs. Using a combination of remote sensing data, hydrological modeling, and economic analysis, we demonstrate a positive correlation between forest cover and sediment retention value. Furthermore, we evaluate the effectiveness of various public policies designed to promote forest conservation, including payment for ecosystem services programs and regulatory measures. Our findings suggest that targeted conservation policies can significantly enhance sediment retention services, yielding substantial economic benefits while contributing to broader environmental goals.

Keywords: sediments retention, forest conservation, ecosystem services, economic valuation, public policy