GI Fachausschuss Umweltinformatik
Arbeitskreis Umweltinformationssysteme

Workshop Wilhelmshaven
11. - 13. Mai 2022

„Vielfalt - Offenheit – Komplexität“

Partizipative Governance bei der Ökonomisierung von Natur
- Herausforderungen für das Informationsmanagement -

Horst Kremers
CODATA-Germany Secretary General
Engineering Management and Information Sciences, Berlin (Germany)

Gliederung

1. Monitoring/Überwachung von Komplexität
2. Beurteilung
3. Accounting
4. Bewertung, Preisbildung
5. Handelbare Werte definieren / generieren
6. Natur an die Börse bringen
7. Geld verdienen
8. Governance / Steuerung

Herausforderungen der Komplexität (1)

- Komplexität und Dynamik der **Fakten**
- Komplexität und Dynamik der **Kontexte**
- Komplexität und Dynamik der **Akteure**
- Komplexität und Dynamik der **Organisationen**

Herausforderungen der Komplexität (2)

- Datenerfassung, Dokumentation und Datenanalyse
- Datengesteuertes Verständnis unserer Welt
- Entscheidungsunterstützung und Kontrolle
- Schwellenwerte, Signale, Auslöser
- Warnungen
- (Re-)Aktion
- Prozesse, Arbeitsabläufe
- Kontrolle der Zielerreichung
- Konsequenzen

Beispiel: Umweltverträglichkeitsprüfung

Gesetz über die Umweltverträglichkeitsprüfung

Das **Gesetz über die Umweltverträglichkeitsprüfung** (UVPG) ist ein Gesetz in der Bundesrepublik Deutschland. Es regelt die Prüfung der Umweltverträglichkeit bei Vorhaben, die aufgrund ihrer Art, ihrer Größe oder ihres Standortes erhebliche Auswirkungen auf die Umwelt haben können.

Zweck dieses Gesetzes ist es sicherzustellen, dass bei bestimmten öffentlichen und privaten Vorhaben sowie bei bestimmten Plänen und Programmen zur wirksamen Umweltvorsorge nach einheitlichen Grundsätzen,

- die Auswirkungen auf die Umwelt im Rahmen von Umweltprüfungen (Umweltverträglichkeitsprüfung und Strategische Umweltprüfung) frühzeitig und umfassend ermittelt, beschrieben und bewertet werden,
- die Ergebnisse der durchgeführten Umweltprüfungen bei allen behördlichen Entscheidungen über die Zulässigkeit von Vorhaben und bei der Aufstellung oder Änderung von Plänen und Programmen so früh wie möglich berücksichtigt werden.

Das Gesetz dient in erster Linie der Umsetzung der europarechtlichen Richtlinie über die Umweltverträglichkeitsprüfung bei bestimmten öffentlichen und privaten Projekten in deutsches Recht:

- *Richtlinie 85/337/EWG des Rates vom 27. Juni 1985 über die Umweltverträglichkeitsprüfung bei bestimmten öffentlichen und privaten Projekten* (nicht mehr in Kraft)
- *Richtlinie 2001/42/EG des Europäischen Parlaments und des Rates vom 27. Juni 2001 über die Prüfung der Umweltauswirkungen bestimmter Pläne und Programme*
- *Richtlinie 2011/92/EU in der konsolidierten Fassung vom 15. Mai 2014 des Europäischen Parlaments und des Rates vom 13. Dezember 2011 über die Umweltverträglichkeitsprüfung bei bestimmten öffentlichen und privaten Projekten* (Kodifizierter Text)

Literatur [Bearbeiten | Quelltext bearbeiten]

- Hoppe / Beckmann: *UVPG. Gesetz über die Umweltverträglichkeitsprüfung. Kommentar*, 4. Auflage 2012, Verlag Carl Heymanns, ISBN 978-3-452-27505-9

Weblinks [Bearbeiten | Quelltext bearbeiten]

- Text des Gesetzes über die Umweltverträglichkeitsprüfung

Teil 3

Strategische Umweltprüfung

Abschnitt 1

Voraussetzungen für eine Strategische Umweltprüfung

- § 33 Strategische Umweltprüfung
- § 34 Feststellung der SUP-Pflicht
- § 35 SUP-Pflicht in bestimmten Plan- oder Programmbereichen und im Einzelfall
- § 36 SUP-Pflicht aufgrund einer Verträglichkeitsprüfung
- § 37 Ausnahmen von der SUP-Pflicht

Abschnitt 2

Verfahrensschritte der Strategischen Umweltprüfung

- § 38 Vorrang anderer Rechtsvorschriften bei der SUP
- § 39 Festlegung des Untersuchungsrahmens
- § 40 Umweltbericht
- § 41 Beteiligung anderer Behörden
- § 42 Beteiligung der Öffentlichkeit
- § 43 Abschließende Bewertung und Berücksichtigung
- § 44 Bekanntgabe der Entscheidung über die Annahme oder Ablehnung des Plans oder Programms
- § 45 Überwachung
- § 46 Verbundene Prüfverfahren

Beispiel:
INSPIRE Metadatenkatalog

- Atmospheric conditions 4
- Administrative units 2
- Environmental monitoring facilities 115
- Geology 3
- Habitats and biotopes 161
- Land cover 1
- Oceanographic geographical features 133
- Protected sites 3
- Statistical units 98
- Agricultural and aquaculture facilities 11
- Bio-geographical regions 72
- Elevation 3
- Geographical grid systems 1
- Human health and safety 8
- Land use 3
- Population distribution — demography 1
- Species distribution 200
- Transport networks 144
- Area management/restriction/regulatio... 2
- Buildings 1
- Energy resources 1
- Geographical names 1
- Hydrography 10
- Meteorological geographical features 5
- Production and industrial facilities 10
- Sea regions 132
- Utility and governmental services 13
- Dataset 997
- Service 24
- service-OGC:WMS 8
- service-ArcGIS REST map service 8
- service-Web application - database 8

HELCOM Metadata Catalog:
https://metadata.helcom.fi/geonetwork/srv/eng/catalog.search#/home

KEY RISKS FROM BIODIVERSITY LOSS

Biodiversity and ecosystem service loss is already impacting on businesses as a result of transition, physical, litigation and regulatory, and systemic risks, which have the potential to affect investment value in the short, medium and long term (*see Figures 3 and 4*).[14]

Companies impact and depend upon biodiversity. Risk exposure to biodiversity loss varies and depends on the following factors, among others:

- sector;
- geography;
- regulatory frameworks;
- market-capitalisation;
- operational arrangements;
- value chain position (upstream versus downstream);
- extent of dependence and impact on biodiversity; and
- ability to substitute raw materials.

PRI Association (Principles for Responsible Investment), Investor Action on Biodiversity: Discussion Paper, *https://www.unpri.org/download?ac=11357*

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European Commission

EN English

Environment

Home > Publications > Methodology for assessing the impacts of trade agreements on biodiversity and ecosystems

GENERAL PUBLICATIONS

Methodology for assessing the impacts of trade agreements on biodiversity and ecosystems

This document provides a methodological framework for assessing the impact of EU Free Trade Agreements (FTAs) on biodiversity and ecosystems.

Details

Publication date 19 May 2021

Related department Directorate-General for Environment

https://ec.europa.eu/environment/publications/methodology-assessing-impacts-trade-agreements-biodiversity-and-ecosystems_en

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Accounting for ecosystems and their services in the European Union

(INCA)

2021 edition

Final report from phase II of the INCA project aiming to develop a pilot for an integrated system of ecosystem accounts for the EU

https://ec.europa.eu/eurostat/documents/7870049/12943935/KS-FT-20-002-EN-N.pdf

- **Ecosystem extent accounts – record the extent or size of different types of ecosystems and how they change over time, such as forests, grassland, or wetland.**
- **Ecosystem condition accounts** – record data on various abiotic, biotic and landscape characteristics of ecosystems, such as pH or the concentration of nutrients in rivers and lakes; the stocks of organic carbon in grassland soils; the diversity of species present; the amount of deadwood in forests or degree of fragmentation.
- **Ecosystem services accounts** – record the supply of various ecosystem services, such as providing recreational opportunities in nature or protection of human property from floods, by ecosystems to the society and how the society benefits from their use. These accounts may be produced in two forms – measuring the flow of service from ecosystems to society in physical units (e.g. number of visits to nature per year, thousand ha of land protected from flood per year) and measuring the value of these flows using a range of valuation methods

https://ec.europa.eu/eurostat/documents/7870049/12943935/KS-FT-20-002-EN-N.pdf/ p. 11

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https://ec.europa.eu/eurostat/documents/7870049/12943935/KS-FT-20-002-EN-N.pdf/ p. 11

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https://ec.europa.eu/eurostat/documents/7870049/12943935/KS-FT-20-002-EN-N.pdf/ p. 11

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Valuing

Ecosystem services accounts: Valuing the actual flow of nature-based recreation from ecosystems to people[(a)]

https://www.sciencedirect.com/science/article/pii/S030438001830320X#fig0025

Hedonic Pricing

Hedonic pricing captures a consumer's willingness to pay for what they perceive are environmental differences that add or detract from the intrinsic value of an asset or property.

https://www.investopedia.com/terms/h/hedonicpricing.asp

Table E1 Supply table for year 2000.

Type of economic unit					Type of ecosystem unit								
Primary sector	Secondary sector	Tertiary sector	Households	Rest of the world – exports	Green urban areas	Cropland	Grassland	Heathland and shrub	Woodland and forest	Sparsely vegetated land	Wetlands	Rivers and lakes	Coastal and inter-tidal areas
Nature-based recreation													
EUR million, year 2000													
AT					0.74	24.22	67.86	25.72	333.34	76.96	5.75	4.64	–
BE					2.65	71.15	64.91	23.30	401.22	2.70	17.90	4.60	3.10
BG					0.19	5.55	23.87	10.01	177.08	10.06	1.73	2.58	0.14
CY					0.22	0.44	0.22	3.71	34.43	1.10	0.12	0.45	0.38
CZ					0.48	78.16	60.40	0.84	489.06	0.14	4.30	1.76	–
DE					37.08	1024.8	1956.62	87.11	8949.42	31.97	124.77	110.52	25.51
DK					12.21	126.12	92.67	106.75	459.38	17.73	135.17	6.05	44.71
EE					0.29	2.00	8.56	1.44	83.44	1.08	37.91	2.48	0.47
EL					0.07	75.87	128.68	211.90	549.10	39.71	9.79	6.32	13.81
ES					0.68	230.90	268.43	499.24	1221.61	93.88	14.81	16.56	21.23
FI					0.02	1.31	2.43	86.86	432.82	20.71	126.08	11.70	0.69
FR					1.36	367.80	706.41	130.42	2270.17	180.88	36.81	46.83	31.14
HR					0.30	11.52	19.03	5.85	152.70	3.00	7.72	6.79	0.24
HU					0.87	50.02	195.41	–	657.06	2.27	64.73	32.26	–
IE					0.08	3.46	12.93	8.08	13.88	9.76	87.55	3.06	2.50
IT					2.51	259.63	420.53	257.45	2518.40	285.50	13.11	21.80	11.99
LT					0.30	20.04	5.50	0.43	111.60	0.35	7.65	3.21	0.01
LU					0.09	3.73	3.56	–	92.03	–	–	0.34	–
LV					0.25	11.38	6.90	–	86.80	0.21	10.31	1.81	0.01
MT					0.26	2.25	–	3.82	0.34	0.49	–	–	0.16
NL					6.00	19.55	197.74	104.10	537.72	32.70	129.84	825.23	24.73
PL					1.50	382.53	355.95	1.92	3503.96	5.83	57.42	49.71	0.02
PT					0.27	254.93	52.07	199.39	744.65	40.61	1.50	10.96	41.87
RO					0.20	9.86	32.35	8.16	204.08	4.31	90.67	13.88	1.49
SE					0.97	2.94	21.58	241.32	611.41	83.31	134.65	33.02	0.34
SI					0.12	7.79	3.29	6.70	69.08	8.89	0.21	0.83	0.39
SK					0.15	56.47	58.38	9.13	851.81	7.63	2.79	4.89	–
UK					7.84	318.97	1257.08	486.54	715.71	152.10	777.52	7.19	42.71
EU					77.68	3423.4	6023.36	2520.19	26,272.29	1113.9	1900.83	1229.49	267.63

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The Opportunity

Traditional Economy

Nature's Economy

1. World Bank; 2. Asset Value: Arcadis, McKinsey; 3. Robert Constanza et. al. 2014

In partnership with the New York Stock Exchange, IEG (Intrinsic Exchange Group) is providing a platform to list "Natural Asset Companies" (NACs) to take them public and enable the conversion of natural wealth into financial wealth.
Source: https://www.intrinsicexchange.com/solution

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Natural Asset Companies, NACs

“NACs are sustainable enterprises that hold the rights to ecosystem services produced by natural, working, or hybrid lands.

NACs enable natural asset owners
to convert nature’s value into financial capital,
providing additional resources necessary to power a sustainable future. “

Inter-American Development Bank Sept. 14, 2021
https://www.iadb.org/en/news/nyse-and-intrinsic-exchange-group-announce-new-asset-class-power-sustainable-future

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Natural Asset Companies, NACs

"On a global basis, natural assets produce an estimated $125 trillion annually in ecosystem services, such as carbon sequestration, biodiversity, and clean water."

125 x 1.000.000.000.000.000.000 = 125 x 10^{18}

Inter-American Development Bank Sept. 14, 2021
https://www.iadb.org/en/news/nyse-and-intrinsic-exchange-group-announce-new-asset-class-power-sustainable-future

Elements of Sustainability Information Governance (1)

- economic and business management issues,
- financing,
- economic instruments,
- sustainability in finance,
- recording and valuation of ecosystem services,
- environmental-economic accounting
- dialogue with companies/business associations

Elements of Sustainability Information Governance (2)

- methods,
- techniques,
- operations,
- control,
- accountability,
- ethics,
- risk management,
- compliance,
- administration,
- “all-of-society” participative Governance

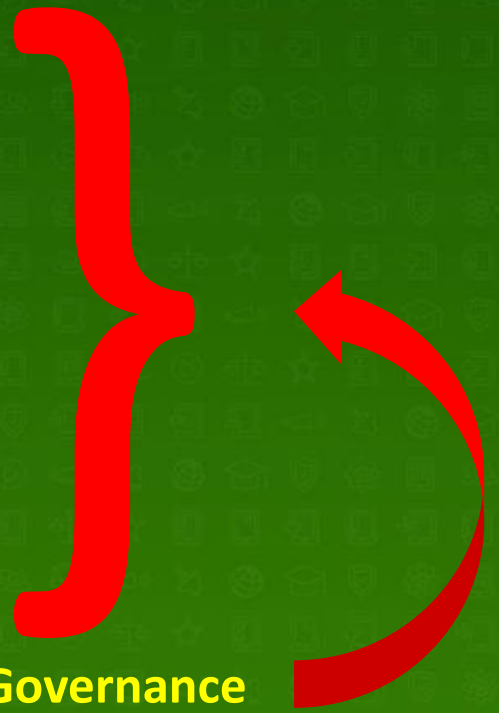

Table 1
Possible interpretations of the modal aspects across the pillars of stakeholders, systems or processes, and modes of human valuing. The terms in the cells of the table are examples rather than definitive interpretations, and further work may lead to revision. For longer lists of terms, see Table 2.

Aspect	Examples of stakeholder functional groups	Examples of system processes	Examples of positive (negative) value attributed
Ultimate	Religious /ideological groups	Ideology; Worldview	Inspiring, Sacred (Unreliable, Sacrilegious*)
Moral	Volunteer groups; NGOs; Children	Public morality	Generous, Cherished (Mean)
Jural	Government; Campaigners	Legislation	Just, Equitable (Inappropriate)
Aesthetic	Arts groups; Tourists	Fashion	Harmonious, Enjoyable (Ugly)
Economic	Businesses	The economy	Efficient, Sustainable (Wasted)
Social	Communities	Social dynamics	Sociable, Welcoming (Inhospitable)
Symbolic	Journalists	Discourses	Informative, Significant (Misleading)
Formative	Historians; Educators	History; Technology	Developed, Innovative (Degraded)
Analytical	Scientists	Sciences	Distinctive, Diverse (Mixed-up)
Sensory	Mental healthcare providers	Emotional life	Stimulating, Comfortable (Unpleasant)
Biotic	Farmers; Foresters	Ecosystems	Health-giving (Toxic)
Physical	Resource managers	Hydrology; Climate	n/a
Kinetic	Residents /Commuters	n/a	n/a
Spatial	Local /Dispersed	n/a	n/a
Numerical	Individuals /Groups	n/a	n/a

* The meanings of the ultimate aspect range from religious to mundane, encompassing the concept of trust at all levels of human life.

Gunton, Richard M et al.: Valuing beyond economics: A pluralistic evaluation framework for participatory policymaking.
Ecological Economics 196 (2022) 107420 p.5, Elsevier, ISSN 0921-8009 *https://www.sciencedirect.com/science/article/pii/S0921800922000829*

United Nations Instruments

Declarations, Conventions, Treaties, Frameworks and Directives

UN HABITAT Human Settlements Programme,
UN Sustainable Development Goals SDGs,

UN DRR Disaster Risk Reduction (SENDAI Framework),

UN FCCC Framework Convention on Climate Change,

Intergov. Platform on Biodiversity and Ecosystem Services IPBES,

Universal Declaration of Human Rights,

UN Declaration on the Rights of Indigenous Peoples *>>> Escazú Agreement*

UN Convention on the Rights of the Child,

Doha Declaration on Disability and Development

and many others

The United Nations System

Funds and Programmes

UNDP United Nations Development Programme
- **UNCDF** United Nations Capital Development Fund
- **UNV** United Nations Volunteers

UNEP United Nations Environment Programme

UNFPA United Nations Population Fund

UN-HABITAT United Nations Human Settlements Programme

UNICEF United Nations Children's Fund

WFP World Food Programme (UN/FAO)

Research and Training

UNIDIR United Nations Institute for Disarmament Research

UNITAR United Nations Institute for Training and Research

UNSSC United Nations System Staff College

UNU United Nations University

Related Organizations

CTBTO Preparatory Commission Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization

IAEA International Atomic Energy Agency

ICC International Criminal Court

ISA International Seabed Authority

ITLOS International Tribunal for the Law of the Sea

OPCW Organisation for the Prohibition of Chemical Weapons

WTO World Trade Organization

Other Entities

ITC International Trade Centre (UN/WTO)

UNCTAD United Nations Conference on Trade and Development

UNHCR Office of the United Nations High Commissioner for Refugees

UNOPS United Nations Office for Project Services

UNRWA United Nations Relief and Works Agency for Palestine Refugees in the Near East

UN-Women United Nations Entity for Gender Equality and the Empowerment of Women

Herausforderungen für die Umweltinformatik

Zusätzlich zu den derzeitigen grundlegenden Bemühungen um eine instrumentenübergreifende Informationskohärenz, müssen zukünftige technische Umsetzungen die Entscheidungen über die Wahl und den möglichen Wechsel von Innovationsstufen sowie entsprechende Managementmethoden und -techniken in den Bereichen

- Cloud Computing und Hosting
- Situationsdokumentation
- Clearinghouses, Observatorien, Testbeds
- Probabilistik, Fuzzy Knowledge, Fehlerfortpflanzung,
- Qualitätsmanagement von Information (syntaktisch, semantisch, pragmatisch)
- Multiple Repräsentation, Generalisierung
- Formale Modelle, Implementierungen, Laufzeitumgebungen
- Synergieeffekte

Komplexe bereichsübergreifende Informationsmodelle umfassen typischerweise eine große Anzahl von Variablen und komplexe Abhängigkeiten von funktionalen, analytischen und operativen Randbedingungen (Ressourcen, Zeit, Raum, Aktionen)

Embalse de Valdecañas desde el aire, 2018

Marostegui CC BY-SA 4.0
https://commons.wikimedia.org/wiki/File:Embalse_de_Valdeca%C3%B1as.jpg

Luxusresort bei Madrid vor dem Aus

Die Insel der Unseligen

Mitten in ein spanisches Naturschutzgebiet ließ ein Investor eine Luxusanlage bauen – mit Unterstützung der Politik. Nun haben Richter den Abriss verfügt. Die mächtige Tourismuslobby ist entsetzt.

Von **Nils Klawitter**
01.04.2022, 13.00 Uhr • aus **DER SPIEGEL 14/2022**

https://www.spiegel.de/wirtschaft/luxusresort-bei-madrid-vor-dem-aus-die-insel-der-unseligen-a-e1f939a3-dac7-42a1-b2f9-a7345a6fd0ec

LOSING THE SERENGETI

THE MAASAI LAND THAT WAS TO RUN FOREVER

This report exposes the hardships faced by the Maasai in the Loliondo region of Tanzania. It weaves together the travails of the communities most impacted by recent events with a history of land laws, unpacks various legal challenges, and exposes how these forces are leading to starvation, outbreaks of disease, and the destruction of a way of life. The report also explores various ways forward, including immediate actions that must be taken, such as the restoration of the rights to graze and practice subsistence agriculture in Game Controlled Areas and the need for clear security of land tenure for the Maasai; various legal and policy remedies via the right to food and international case law; the role of non-state actors, including an exploration of the UN's Guiding Principles for businesses on human rights; and local grassroots innovations such as Certificates of Customary Right of Occupancy (CCROs).

While this report focuses on the plight of the Maasai in Northern Tanzania, it is a reality that is all too familiar to indigenous communities around the world. In too many places, national governments, private corporations, and large conservation groups collude in the name of conservation, not just to force indigenous groups off their land – but to force them out of existence.

This colonization of indigenous land in the name of conservation must end.

Mittal, Anuradha; Fraser, Elizabeth: Losing the Serengeti - The Maasai Land that was ro Run Forever. (2018) 46 p. The Oakland Institute
https://www.oaklandinstitute.org/sites/oaklandinstitute.org/files/losing-the-serengeti.pdf

Thank You for Your Attention !

For further information, communication and cooperation please contact:

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----------End-of-Presentation----------

additional material for your information

selected References (1)

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Biodiversity System for Europe: Ecosystem Accounting., *https://biodiversity.europa.eu/ecosystems/ecosystem-accounting*

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Dempsey, Jessica: Enterprising Nature: Economics, Markets, and Finance in Global Biodiversity Politics. (2016) 312 p. Wiley, ISBN 9781118640609

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