

Linking Sustainability to the Realm of Built Environment:

**CENTRAL
PARADIGMS
IN
SUSTAINABILITY
RESEARCH**

Central Paradigms in Sustainability Research

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Increasing knowledge with an information tool

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Example of Austrian landscape research

Developed on the basis of the Austrian National Research Programme
“Kulturlandschaftsforschung” (500 Austrian researchers, 5 years research).

“Von der Information zum Wissen (From information to knowledge)” combines the
statistical analysis (BibTechMon) with a qualitative social approach (Objective
hermeneutics).

The contents of the research reports (40 scientific reports, 20489 words) were
analysed with the bibliometric method BibTechMon.

Aims of the Research

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1. Task: To analyse the results of the new research of sustainability in the Austrian National Research Programme “Kulturlandschaftsforschung”
With the methods of
 - Qualitative Theses
 - Key Terms
 - Dynamic Networkpictures
2. Task: To establish a tool of reflexion to evaluate the impact of scientific programs and the management of knowledge

Methods

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Combining quantitative and qualitative analysis

Qualitative Methods of Social Sciences

Analysis of artefacts (Artefaktanalyse)

Objective Hermeneutic

Linguistics

Bibliometrical and statistical procedures

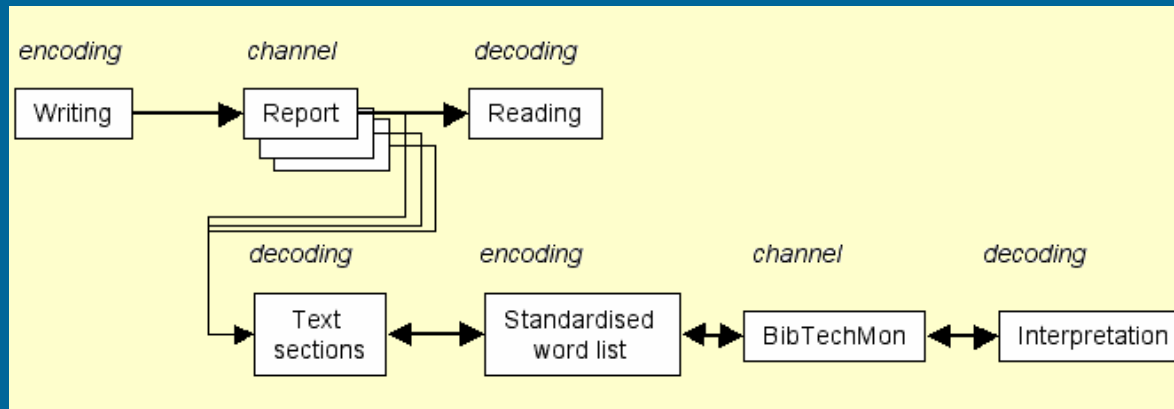
co-Wort Analysis

Clusteranalysis

Horizontal analysis

Bib Tech Mon

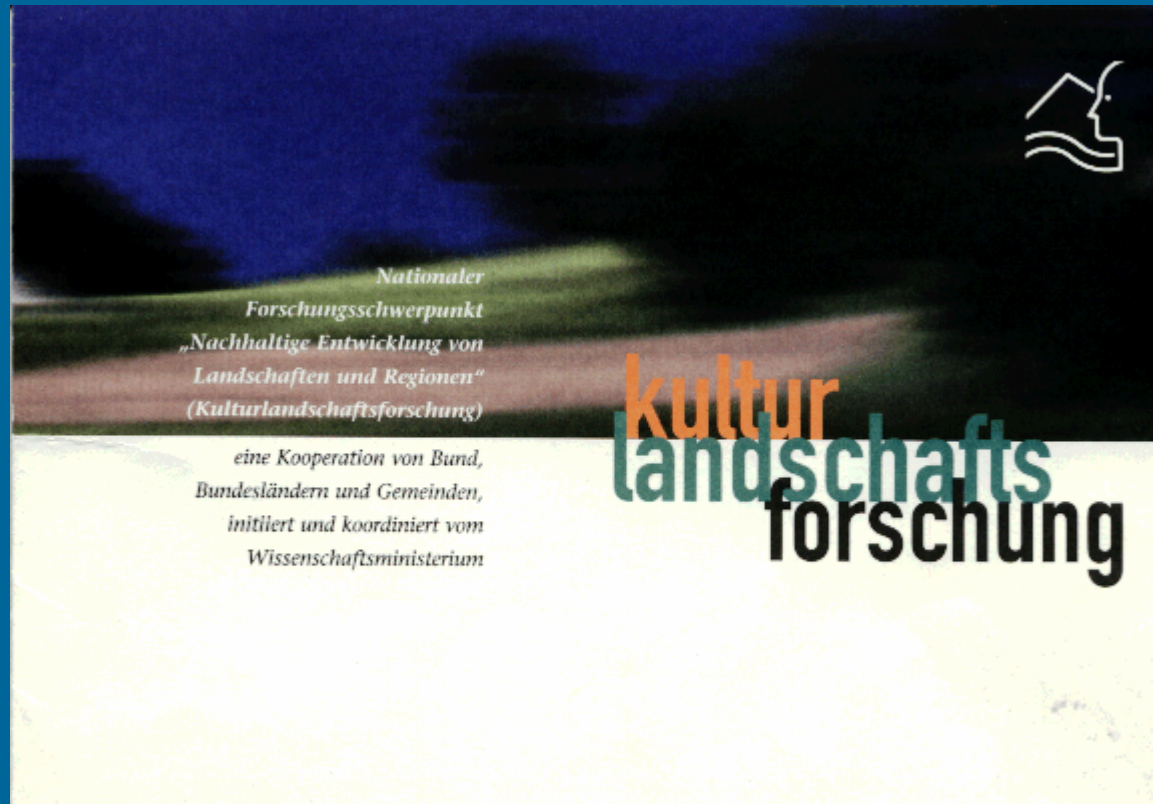
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Impacts of the BibTechMon application on the transfer of information (Reza 1994).

The Artefact

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Dr. HEIDI DUMREICHER

**OIKO
DROM**

THE VIENNA
INSTITUTE FOR
URBAN SUSTAINABILITY

Paradigms of Austrian Sustainability Research

CENTRAL PARADIGMS IN SUSTAINABILITY RESEARCH

The following theses are the results of the **qualitative approach of social science.**

Our empirical material is

an artefact – the folder presentation of the scientific community - and
interviews (six experts)

Our Method of Analysing is

the technique of objective hermeneutics (Oevermann)

Thesis 1 - 3

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Thesis 1: Future

Sustainability research deals with the perspective of future ways of life and considers “to protect and to maintain” as basic values.

Thesis 2: Causality

Sustainability research has a larger view than the cause-effect-theorem of natural sciences and sets the context of a more complex notion of reality based on understanding.

Thesis 3: Idyllic Nature, Demiurgical Man:

The concept of nature as whole is an underlying concept in sustainability research as well as a concept of “man as creating individual”.

Thesis 4 - 5

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Thesis 4: Spaces of Possibilities (“Möglichkeitenräume”)

Sustainability research is based on the idea that man/woman disposes of spaces of possibilities for his or her actions; but it tends to overestimate and overrate the possibilities of decision making by the singular individual and underestimates the societal context and the constraints of value systems, of culture and politics.

Thesis 5: Relocalisation (“Verortung”)

Sustainability is related to place and space and shows conflicts of usage at the example of common living places.

Thesis 6 - 7

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Thesis 6: Complexitiy

The integrative approach of sustainability research creates a compatible research methodology: interdisciplinary, transdisciplinarity and thereby team research.

Thesis 7: New Research Questions.

Sustainability research takes up new research fields: this research reveals latent aspects that are not yet fully thought and are therefore a challenge for science.

The 86 most frequent keywords in ALR with high horizontal presence (Querschnittspräsenz):

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entwicklung	169	entwickeln	66	hilfe	48	ermöglicht	30
unterschiedlich	163	theoretisch	65	einsatz	48	detailliert	30
wesentlich	141	zukunft	62	erfahrungen	48	gesamt*	29
österreich	127	ergeben	62	zeitlich	46	rasch	26
ökologisch	123	gesamt	62	viele	46	europa	25
beispiel	115	veränderung	61	praxis	44	unbedingt	24
ökonomisch	105	haupt*	58	trotz	44	änderung	24
sinn	103	wenig	57	vielfzahl	44	regelmäßig	23
ziel	99	intensiv	56	erfassung	42	pflge	22
bereits	98	system	56	reihe	41	dauer	21
zeit	93	struktur	55	bewertung	40	beobachten	19
grund	84	definition	55	verwendet	40	beobachtung	18
daten	84	boden	54	pflanzen	40	eignen	18
basis	78	gruppe	54	relativ	40	erlauben	18
ressourcen	78	möglichst	53	zeitraum	39	institut	17
grundlage	78	kein	53	erhebung	36	verbessert	17
konzept	77	weg	52	wegen	35	zusammengefasst	16
schritt	77	methode	50	ansätze	34	digital	15
wasser	76	auswahl	50	bericht	34	flüsse	14
notwendig	71	anzahl	49	erkennen	32	universität	14
komplex	68	qualität	49	wiesen	32		
sollte	67	komplexität	49	zielsetzung	31		

Thesis 1: Future

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For the ARL programme, future orientation is a relevant factor considering it as the point of encounter between research and societal development. In the sustainability research, this aspect influences the focus of studies and research questions.

Bridge words:(in decending order):

Entwicklung (development), Ziel (target), Konzept (concept), Schritt (step), entwickeln (develop), Zukunft (future), Veränderung (change), Weg (pathway), Änderung (change).

Entwicklung -development is one of the most frequent words: suggests that the researchers, when thinking of the future, think of change and not of a continuous extended present. Researchers have concepts, targets and objectives, they think in concrete terms of steps to do or pathways to show.

Thesis two: Causality

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The ARL research focuses on societal as well as on natural processes research offers a paradigm that considers systemic interrelations. The sustainability research tends to understand the present situation in its complexity as a basis for acting in society.

In opposition to the **concept of causality**, sustainability moves towards a process oriented approach which is exemplified through the following horizontally frequent words: **Sinn (meaning), komplex (complex), Komplexität (complexity)**.

Notwithstanding these hints that the ARL-researchers consider the cause-effect-theorem as obsolete, in their day-to day business they still use sets of words relating to linear processes:

Grund (cause), Grundlage (basis), notwendig (necessary), ergeben (produce), Hilfe (help), Erfahrungen (experiences), trotz (notwithstanding), wegen (because), verbessert (ameliorated).

Thesis tree: Idyllic Nature, Demiurgical Man

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The ARL program was developed out of the research of natural scientists observing the harmful ecological change of the natural landscape.

Thus, the scientific community starts to **consider the landscape as a cultural setting** and as an aesthetic product of the human being.

An **idyllic connotation of nature** shows up in some natural scientists approaches, especially when presenting strategies to protect nature in an innocent state (“as it is”).

But the human being – including the researcher - acts as “**man as a creating individual**”. The self-conception of the sustainability researcher as a demiurg heading towards a changing world is supported by different terms – for instance “help”(Hilfe).

Thesis three: Idyllic Nature, Demiurgical Man

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Words: Forschungslirik (lyric of research): Agrarromantik (romance of agriculture), Alpenherrlichkeit (delightfulness of the alps), jungfräuliche Erde (maiden earth). These words are examples and out of the context of the reports, but they show the interpretation of nature in its lyric appearance.

Bauernherrlichkeit (glorious farmership), charmantes Misstrauen (charming suspiciousness), chice Aufgeregtheit (chique excitement), heroische Erhabenheit (heroic sublimity), intakte Dörfer (villages in good order), intakte Natur (nature in good order), übersinnlich wunderbar (transcendentally wonderful), lieblicher Dorfcharakter (mellifluous village character), sich in der melancholischen Unendlichkeit verlieren (to get lost in a melancholic unboundedness), romantisches Refugium (romantic refuge), rosig leuchtende Almkuppeln (pink luminescent mountain pasture domes).

Thesis four: Spaces of possibility

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The notion of spaces of possibilities was developed in previous theoretical work of the authors and proved to be helpful even in the context of the huge amount of texts that this study is interpreting (Dumreicher, Kolb 2003).

Sustainability research is based on the idea that human beings dispose of spaces of action and that, by trying out their possibilities, they can further develop their radius of influence.

In order to do this, they need **examples** (Beispiel), they make **things possible** (ermöglichen), and these **actions will allow** (erlauben) for new expansion of activities.

Thesis four: Spaces of possibility

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Words:These spaces of possibilities have a target (Zielsetzung), have facilitated (ermöglicht) actions and change and are necessary without fail (unbedingt).

We would certainly be curious to know what the individual researchers thought that these spaces of possibilities might allow (erlauben), and the data base “from information to knowledge” would help identifying every single original text and wording.

Thesis five: Relocalisation “Verortung”

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ARL shows **different kinds of spaces** – local, terrestrial space and space in the sense of universe. It shows the **space for local action** and space for local and global pollution: act locally, think globally. ARL deals, from the very beginning, with concrete political spaces like towns, regions and other space-related, localised case studies.

Bridge words that concern the spatial aspects of sustainability show that relocalisation, a topic counterbalancing the global aspects of change, show up with high frequency in the horizontal words.

They are mostly related to ecosystems: Wasser (water), Pflanzen (plants), Wiesen (meadow), Flüsse (rivers).

Thesis six: Complexity

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Sustainability cannot be subdivided and constantly **follows a stream of complex, integrative issues**. This reverberates in the methodological approaches like inter- or transdisciplinarity; it is also mirrored by the fact that most research in sustainability is done as teamwork.

The data base shows the theoretical acknowledgement of complexity with words like komplex (complex), gesamt (overall), System (system), Struktur (structure), Komplexität (complexity), Vielzahl (big number of).

These words, too, follow the order of horizontal presence and show a high rate of studies that use the word.

Thesis seven: New Research Questions

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Sustainability is often seen as a concept that is in narrow linkage with the concept of modernity and of development. This leads to a new research question: **is sustainability the last outcome of the modernity theorem – or is it already an emerging post-modern era subject?**

The new topic leads to uncertainty in the speech and to a series of **new word creations not be found in dictionaries.**

We see an emerging specific scientific jargon with its own internal code, shifting between factuality and norms. The decoding works within the discipline even with words that are newly created – the longest word we found was

„Düngemittelbeschränkungs(jahr)response“

(literary translation: yearly limitation response for fertilizer).

Von der Information zum Wissen- ein Beitrag zur Theorie der Nachhaltigkeit From Information to Knowledge – a contribution to the theory of sustainability

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A cooperation of
Oikodrom Institute for Urban Sustainability
and
ARC Seibersdorf research



seibersdorf research
Ein Unternehmen der Austrian Research Centers.

Further information CD available (german)

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From Information to knowledge – a contribution to the
theory of sustainability

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Cooperation of
Oikodrom Institute for Urban Sustainability
ARC Seibersdorf research
Sponsored by the Austrian Ministry of Science


seibersdorf research
Ein Unternehmen der Austrian Research Centers

More details about the project

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- Material of the Bibliometric Analyses
- Qualitative research: Interviews
- Steps of analyzing
- Bibliometrie: Walk through

Material of the Bibliometric Analyses

**CENTRAL
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Material of the Bibliometric Analyses

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Material of the Bibliometric Analyses

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Qualitative reserach: Interviews

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Expertinterviews with the

- Two managers of the programme (men/ female)
- Scientists related to the issue: Linguist + Biologist, Philosopher
- Social Scientists outside of the program
- Natural Scientist outside of the program
- Expert for Scientific Language

Steps of Analysing

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- Transcription of the interview material
- First systematic analyses
- Interpretation circles with different experts
- Hypothesis building
- Verification/ Falsification of the theses with new material

Bibliometrie: Walk through

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The data walk-through shows how the developed data base has a possibility to manage the huge amount of information of the scientific reports even in relation to one selected word.

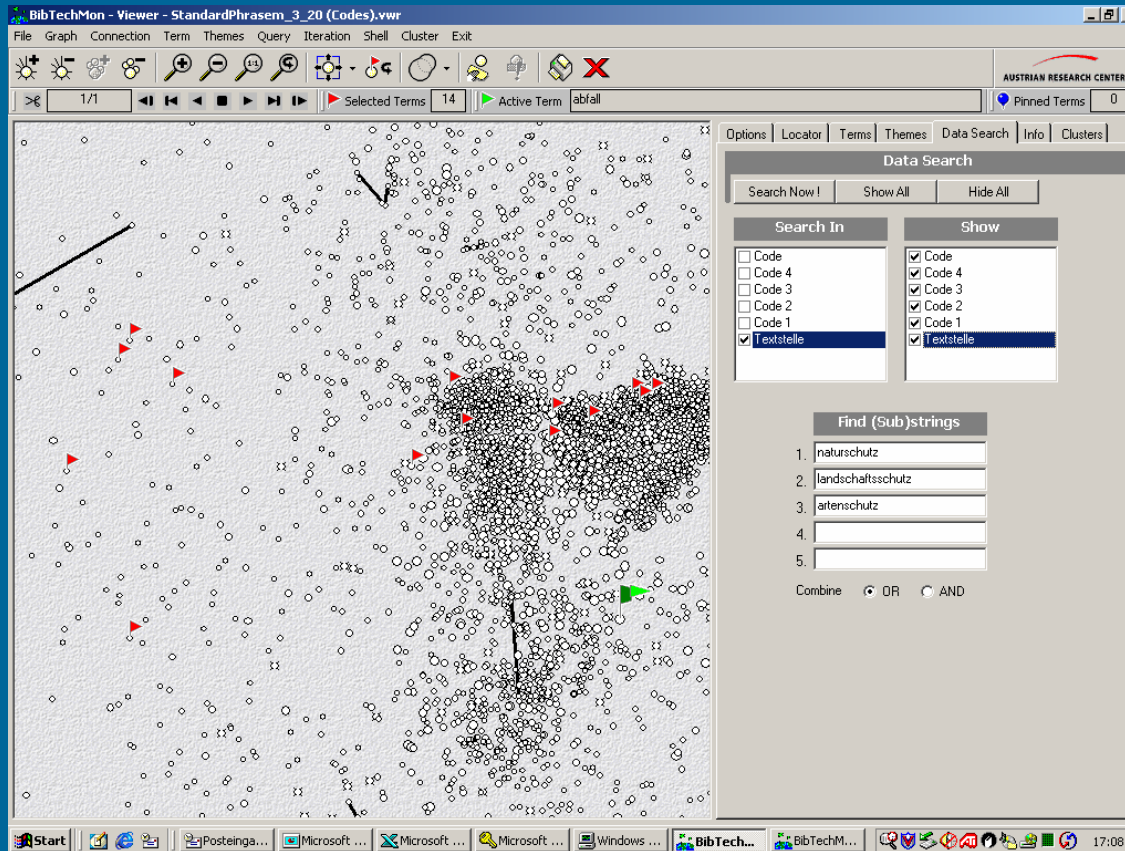
Example: Walkthrough along the word *protection*/ step one

Protection, as shown above, is a typical notion in sustainability research; the list of items that need protection can be extended endlessly.

The data walk through starts with discovering the contextually of words containing the particle *protection* (Schutz). The table shows the word protection in its combination with other notions. The fact that “protecting” has the lowest variance shows that indeed, a high percentage of all the reports contain the notion of protection as a horizontal bridge word.

Networkpictures – visual information system

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Walkthrough: words containing the word *protection*.

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wort	Häufigkeit (code)	Varianz														
			BMA	IN2	IN4	IN5	KG2	KIK	LQ1	MP1	MU1	MU2	MU7	ÖR7	SU1	SU2
schützenswert	6 0,11		0	0	0	0	0	0,2	0,3	0,17	0	0	0,17	0,17	0	0
schützen	8 0,12		0	0	0	0	0,13	0,4	0,1	0	0	0	0,25	0	0,1	0
geschützt	11 0,12		0	0	0	0	0	0,3	0	0	0	0	0,36	0,09	0,2	0,1
naturschutzfachlich	12 0,12		0	0	0	0,3	0,08	0	0	0,17	0	0	0,33	0,08	0	0
landschaftsschutz	6 0,13		0	0	0	0	0	0,3	0	0,17	0	0	0,17	0,33	0	0
naturschutzgebiet	6 0,13		0	0	0	0	0	0	0,2	0,33	0	0	0,17	0	0	0,3
schutzwürdig	5 0,13		0	0	0	0,2	0,2	0,2	0	0	0	0	0,4	0	0	0
bodenschutz	4 0,15		0	0	0	0	0	0	0,3	0,25	0	0	0	0	0,5	0
schützend	4 0,15		0	0	0	0	0	0,5	0,3	0,25	0	0	0	0	0	0
landschaftsschutzgebiet	7 0,16		0	0	0	0	0	0,1	0	0	0	0	0,43	0	0	0,4
schutzgebiet	7 0,16		0	0	0,1	0	0	0	0,1	0,57	0	0	0	0	0	0,1
klimaschutzpolitik	10 0,16		0	0	0	0	0	0	0,1	0	0,1	0	0	0	0,6	0,2
vertragsnaturschutz	10 0,16		0	0	0	0	0,1	0	0,1	0,6	0	0	0	0	0,2	0
naturschutzgesetz	8 0,18		0	0	0	0	0	0	0	0,5	0	0	0	0	0,5	0
artenschutz	6 0,18		0	0	0	0	0	0	0	0,5	0	0	0	0,5	0	0
denkmalschutz	4 0,21		0	0	0	0	0	0,3	0	0	0	0	0,75	0	0	0
naturschutzfachliche bedeutung	4 0,21		0	0	0	0	0,25	0	0	0	0	0	0,75	0	0	0
schutzgut	4 0,21		0	0	0	0	0	0	0,3	0	0	0	0	0	0,8	0
naturschutzfachliche bewertung	5 0,22		0	0	0	0,2	0	0	0	0	0	0	0,8	0	0	0
schutzfunktion	6 0,22		0	0	0	0	0	0	0,2	0	0	0,83	0	0	0	0
naturschutzrecht	7 0,23		0	0	0	0	0	0	0	0	0	0	0	0	0,9	0,1
gefahrenschutz	8 0,27		0	0	0	0	0	0	0	1	0	0	0	0	0	0
donauschutzübereinkommen	5 0,27		0	0	0	0	0	0	0	0	0	0	0	0	1	0
landschaftsschutzrecht	4 0,27		0	0	0	0	0	0	0	0	0	0	0	0	1	0

Walkthrough along *protection

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“How do you imagine the Mühlviertel in 20 Years? .I expect the Mühlviertel to look more or less like in 1999 and 2000. The farmers are working actively and are proud of their landscape. This is how it should be: one is proud of nature. The learning process is that what we called “care for Landscape” was often unfortunate for the protection of nature, for the protection of landscape and for the protection of species. Often what is given priority is “to make everything proper and clean” or “this needs mowing and three times mowing”. ... the fact that something can grow where it wants to grow is slowly getting in the consciousness of people.

Conclusion

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In the emerging scientific landscape of sustainability, a theoretical approach accompanying the published research can give a picture about the interdisciplinary qualities of the reports and about the topics dealt with.

The tool can be useful in the building realm where different sources of information are necessary for housing, land use and urban town planning.

It leads to a reciprocal inspiration for understanding the complexity of the approaches to urban design under a sustainability regime.

Thank you

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From Information to knowledge – a contribution to the
theory of sustainability

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