Hemeroby
– linked with **biodiversity and soil quality** –
as an impact category indicator
for the integration of **land use** into the Life Cycle
(Impact) Assessment

Conceptual and Methodical Basics

- **safeguard subject:**

promotion of **natural characteristics** in general **as favourable**

Soil quality

Naturalness

Biodiversity

Ecosystem services
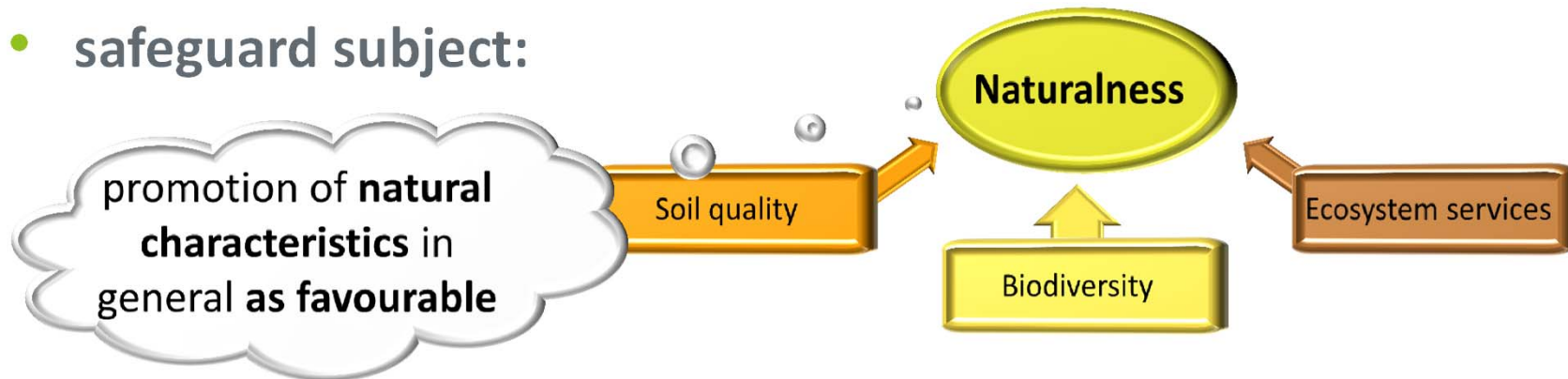
→ the negative impact = loss of naturalness

- appropriate approach for quantification: **hemeroby concept**

    - Midpoint metric, close to the level of LCI results
    - Focus on occupation impact
    - With the option to apply Characterization Factors

Mirjam Busch ● 15.03.2016

Indicative typology

Hemeroby class	
I	Natural
II	Close-to-nature
III	Partially close-to-nature
IV	Semi-natural
V	Partially distant to nature
VI	Distant-to-nature
VII	Non-natural

...ale of

...by classes

...licable for

...-use type

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Indicative typology

Hemeroby class		Indicative examples		
I	Natural			
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VI	Distant-to-nature			
VII	Non-natural			

Indicative typology

Hemeroby class	Indicative Exempels for forested area	for agricultural land	for other land type
I Natural	-	-	Undisturbed ecosystem, pristine forest, no utilisation Isle of Vilm (DE)
II Close-to-nature	Close-to-nature forest manage-ment,	-	-
III Partially close-to-nature	Intermediate forest management	Highly diversified agroforestry systems	-
IV Semi-natural	Semi-natural forest management	Close-to-nature agric. land use, extensive grassland, orchards etc.	-
V Partially distant to nature	Mono-cultural forest	Intermediate agric. Moderate intensity, SRC, fertilized grassland	-
VI Distant-to-nature	-	Large-area, highly intensified arable land in cleared landscape	Solar fields, wind parks
VII Non-natural	-	-	Long-term sealed, mining lands, landfills

Determination of the classes based on indicators

ifeu

Criterion 1		
Indicator 1	→	**Value 1 - 5**
Indicator 2	→	**Value 1 - 5**
Indicator 3	→	**Value 1 - 5**
Indicator …	→	**Value 1 - 5**

Average by criterion

Average of criteria → **Final score**

Criterion 2	
Indicator 1	

Hemeroby class II IV
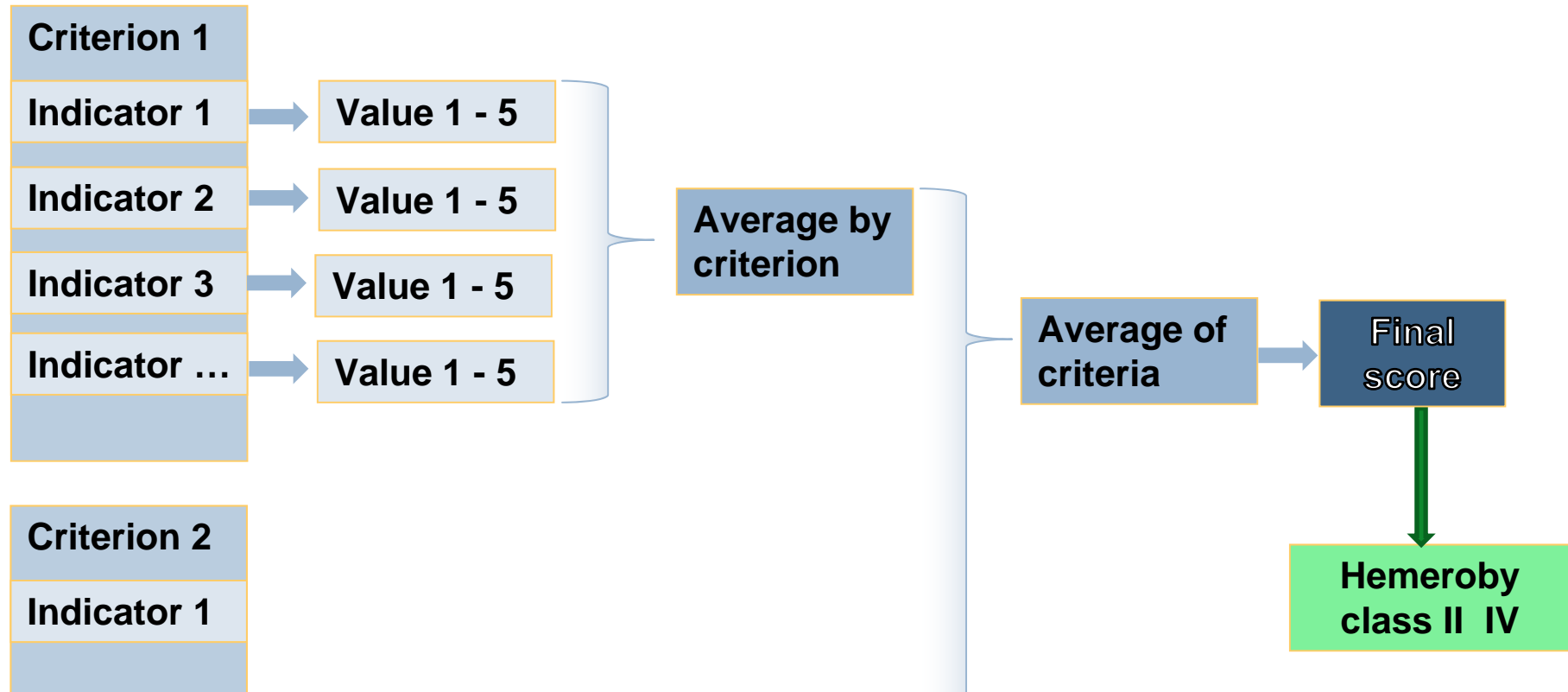
Criteria for agricultural and forest area

Agricultural systems	Forst systems
► **Diversity of weeds** e.g. Existence of rarer species	► **Natural character of the soil** e.g. Continuity of soil development
► **Diversity of structures** e.g. Elements of structure in the area	► **Natural character of the forest vegetation** e.g. Relative tree species diversity
► **Soil conservation** e.g. Intensity of ground moving	► **Natural character of the development conditions** e.g. Intensity of management interventions
► **Material input** e.g. Manuring techniques	

→ **The hemeroby approach is linked with biodiversity and soil quality.**

→ **Minimisation of human intervention in ecosystems is likely to have a positive influence on this protection targets.**

Characterization factors (CF)

Aggregation of different classes into a single indicator value can be useful for certain applications.

INVENTORY RESULT:

in m²*1a/(funct. unit)

| Class IV: 98 |

| Class VI: 145 |

| Class VII: 52 |

Aggregation to one LCIA value
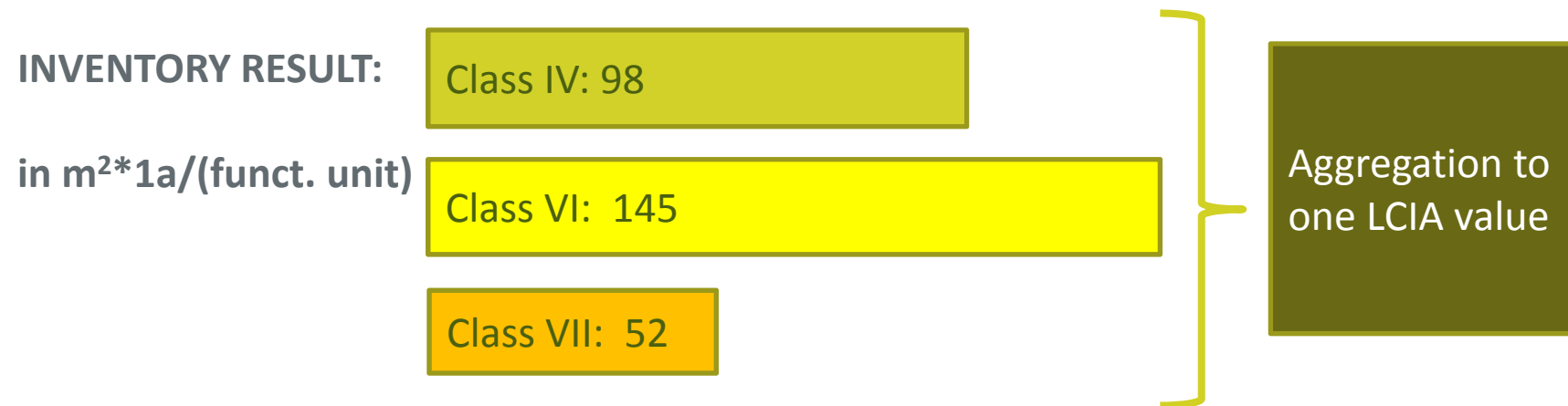
ISO 14044, clause 4.4.2.4 and 4.4.5: characterization factors must use *"a distinct identifiable environmental mechanism and/or reproducible empirical observation"*.

→ Empirical approach

Characterization factors (CF)

- simple doubling or halving of intervals results in a ratio of 1:32

→ very close to the ratio of 1:33 acting as the reference value derived from the global proportion of class VII area.
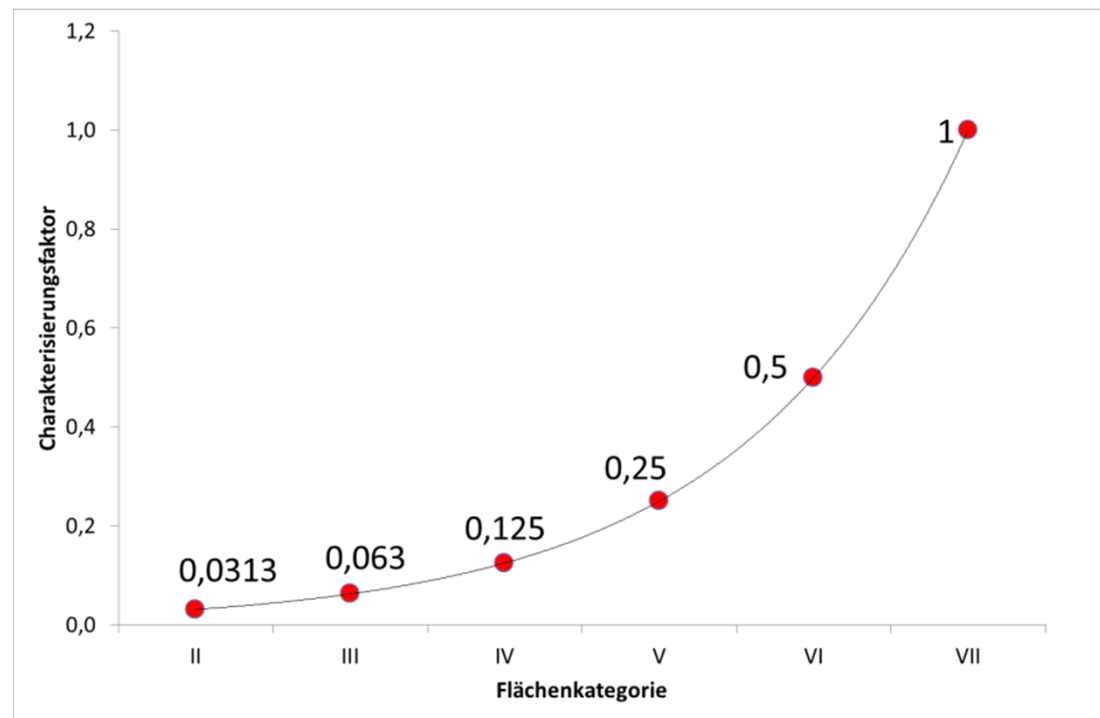
Outlook

The concept is ready for application to almost any form of land use in central and northern Europe.
However solutions for other regions around the globe need to be advanced.

Data need to be enhanced to provide generic default values for the most common products with land-use relevance.

We deem joint research comparing this approach with other land-use-related LCIA approaches by case studies extremely promising .

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Thank you for listening!

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