

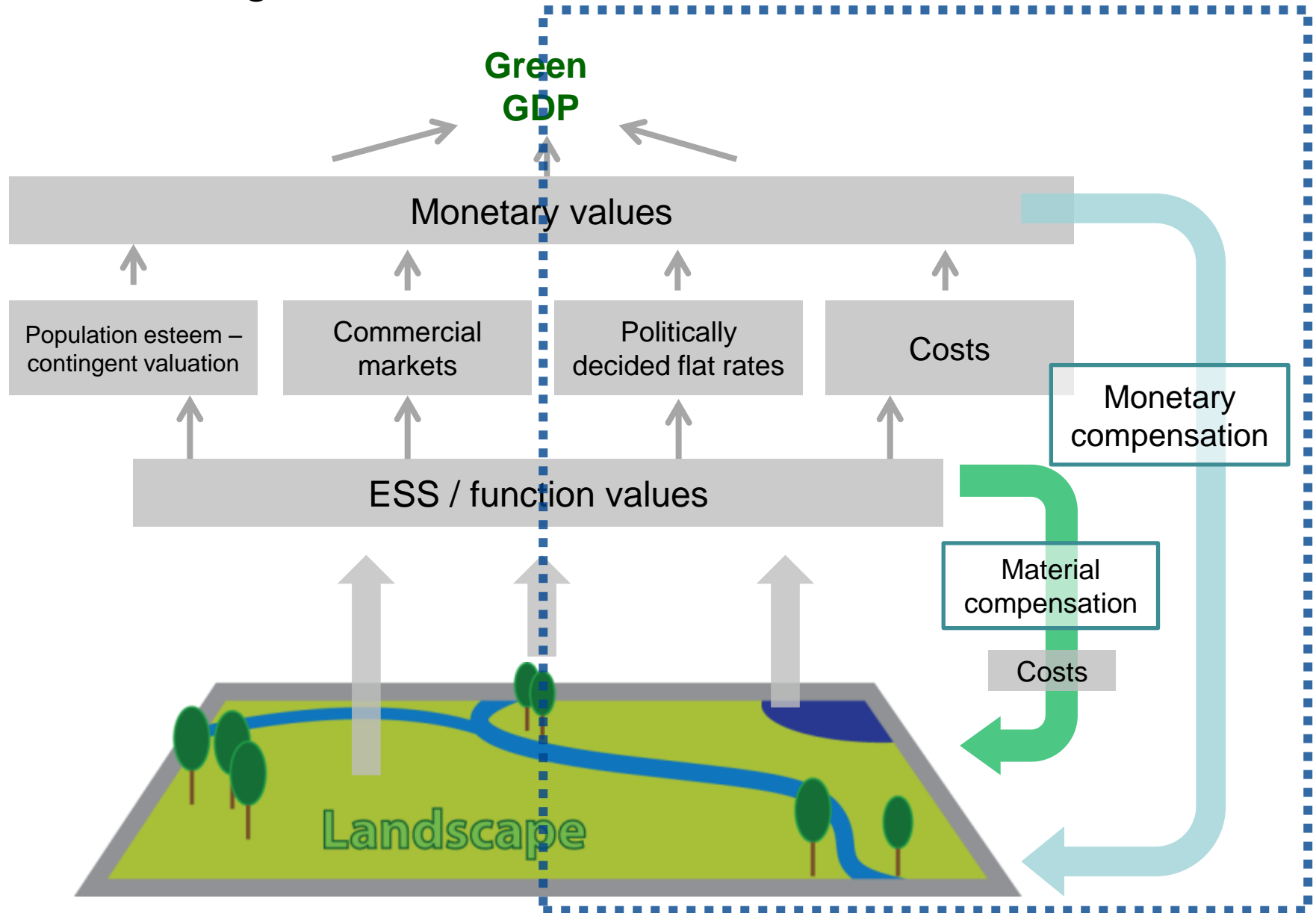
# **Paths and pitfalls of (monetary) compensation for ecosystem services:**

**A comparison of monetary and non-  
monetary compensation approaches in**

## **German Environmental Intervention Regulation**

Dipl.-Ing. Janita Volkers

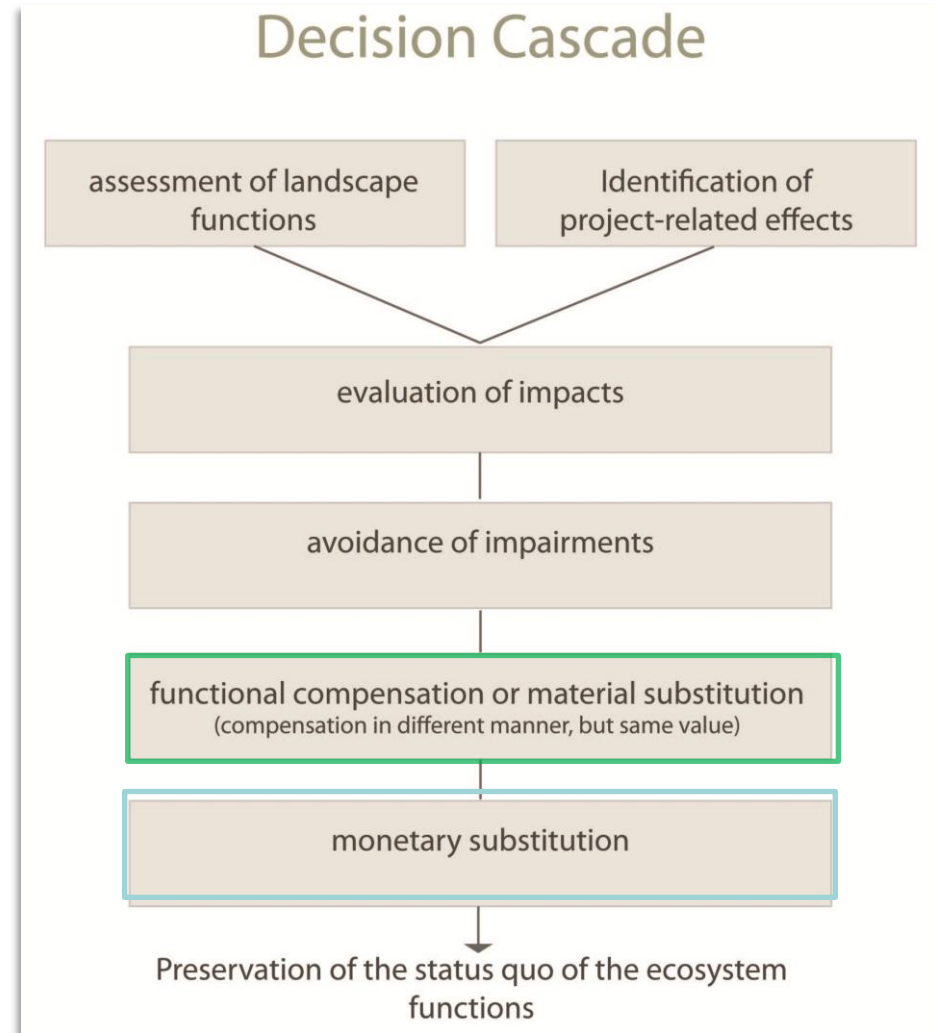
# Positioning German EIR in context of ESS monetization



# Environmental intervention regulation (EIR)

(under the Federal Nature Conservation Act 2010 art 13 – 17)

- is a certain kind of PES: it assesses present and lost ecosystem services, but not potential provisions
- provides much empirical data because of its use in practice since 1976
- legislation in the Bundesländer has taken different forms → extensive database that can be used to analyze or compare the practicality of different methods.



# General paths and pitfalls of monetary substitution in German EIR

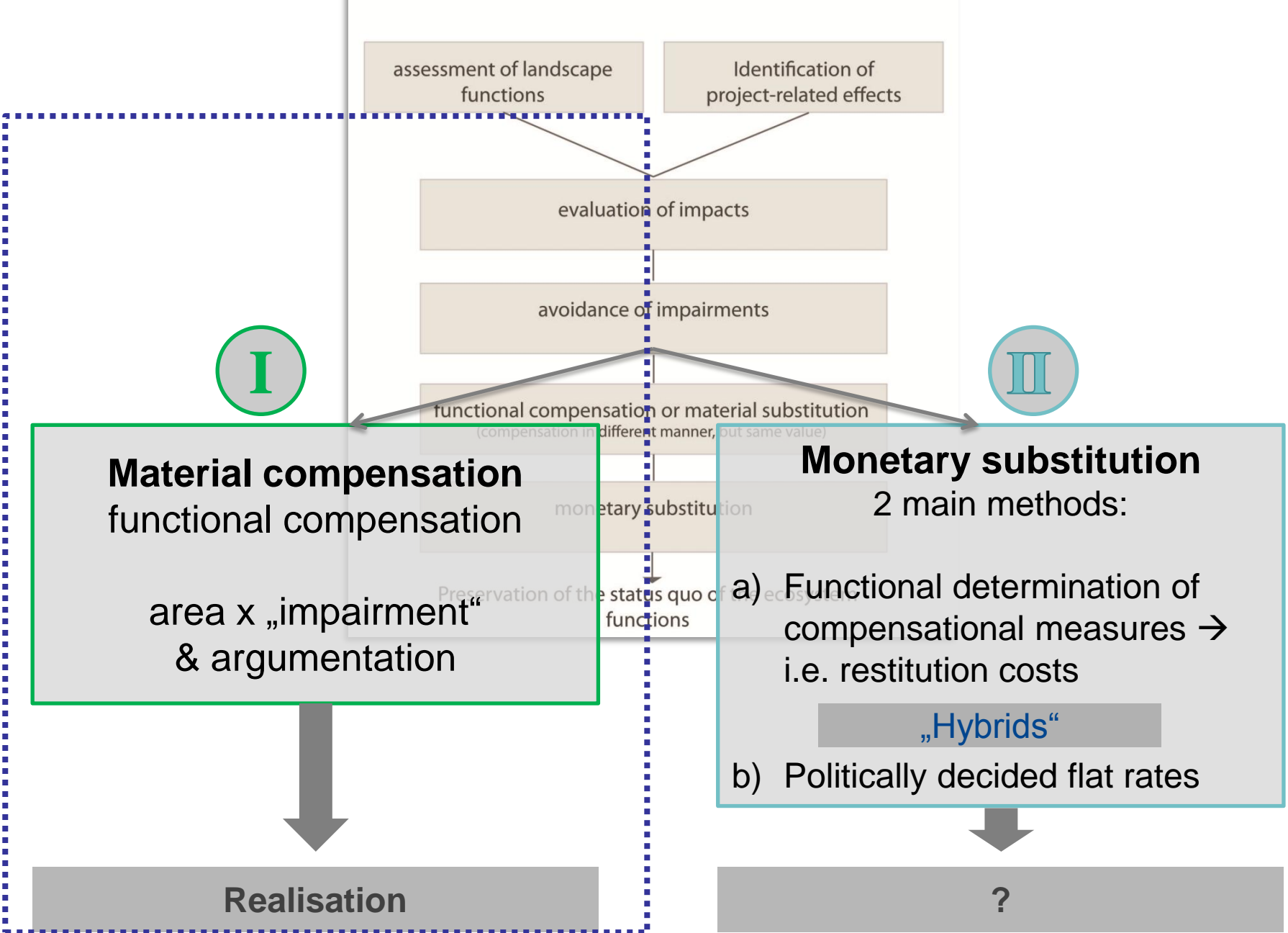
## Paths

- Flexibility
- Efficiency

## Pitfalls

- less teeth in realization of spatial functional compensation
- Compensation may be delayed
- long re-establishment times for some ecosystem services might not be considered adequately

What would be the outcome if compensation were be possible through both approaches equally?



**I**

**Material compensation**  
functional compensation

area x „impairment“  
& argumentation

Realisation

**II**

**Monetary substitution**  
2 main methods:

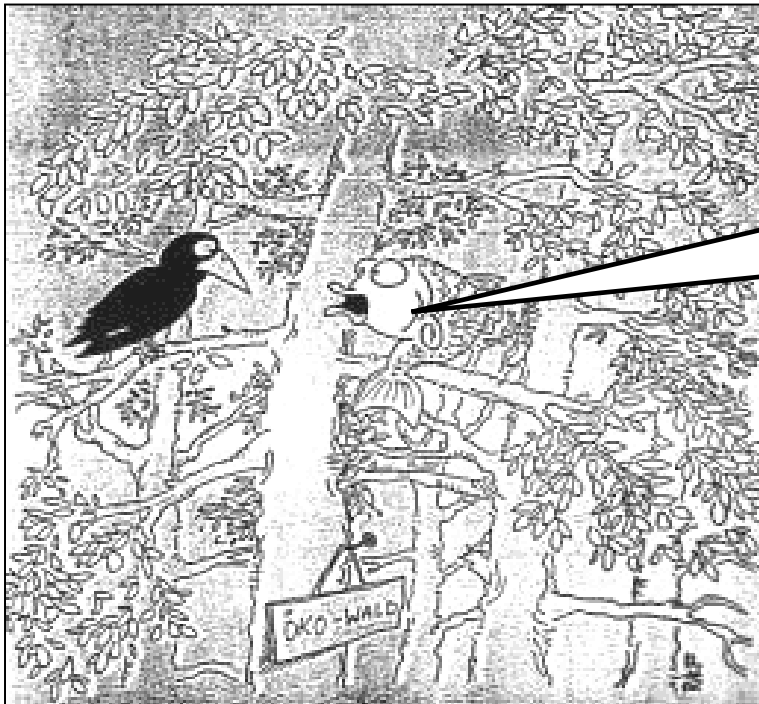
a) Functional determination of compensational measures → i.e. restitution costs

„Hybrids“

b) Politically decided flat rates

?

- The main objective of the EIR is to keep up the status quo of landscape functions.
- Changes are allowed
- Deterioration is not



Source: unknown

*Considering the values it is an equal compensation for the tarn.*

# Methods to assess the extend of the demanded compensation

biotope value method	Verbally argumentative approach	Restoration cost approach
Referring to...		
<ul style="list-style-type: none"> <li>• the assessment basis</li> <li>• the equivalent value underlying the accounting</li> <li>• balancing based on numerical values</li> </ul>	<ul style="list-style-type: none"> <li>• The form of the statement of facts (and descriptive) and / or the expression for value for ratings as well as the procedure or form of the derivative and / or</li> </ul>	<ul style="list-style-type: none"> <li>• the formation of an equivalent for the determination of the scope and of compensation based on accounting costs of measures</li> </ul>

Value of habitat before the impact

Value of habitat after the impact

↓ ↓

difference = extent of compensation

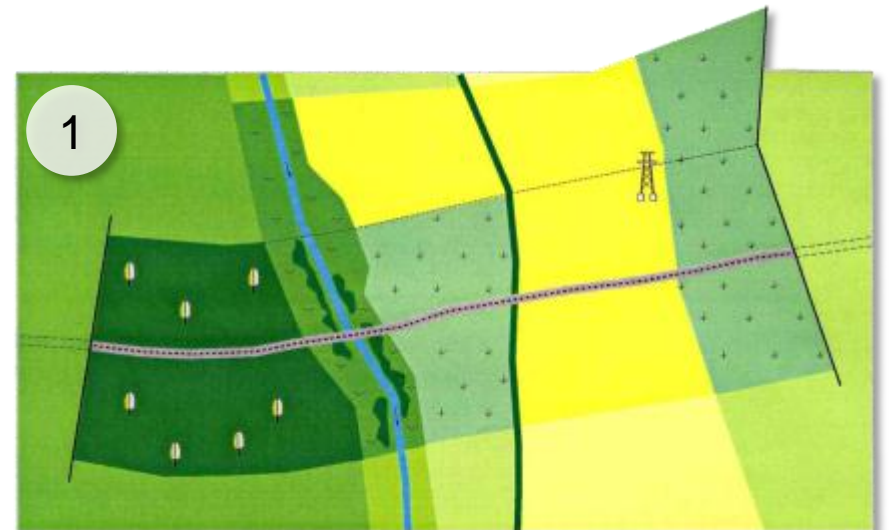
# Steps towards an adequate compensation of biotope functions

## Derivation of the compensation demand

Example of a street development project



1. delimitation of the study area based on the forecast of effects

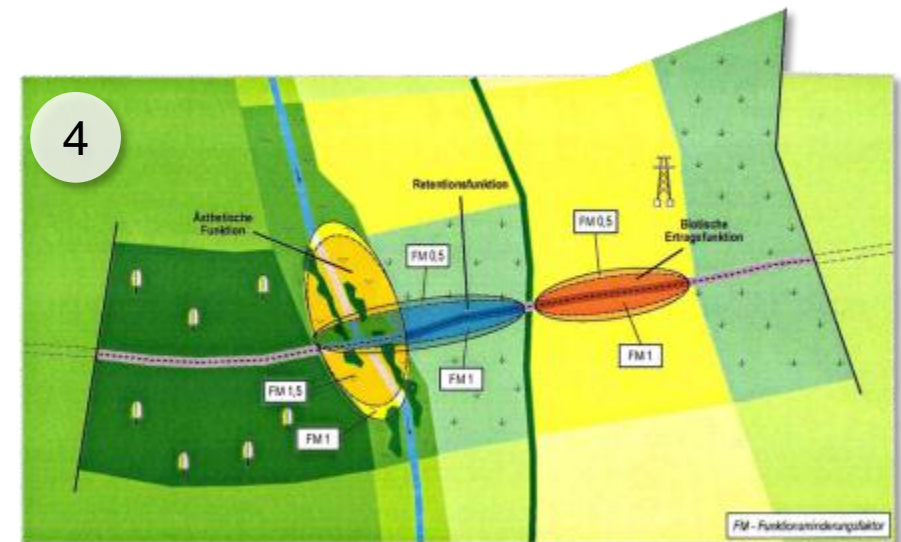
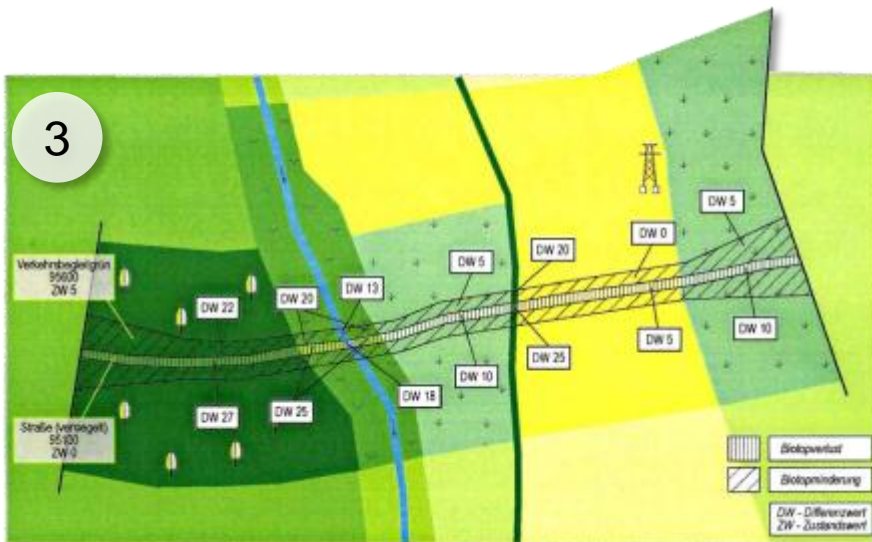
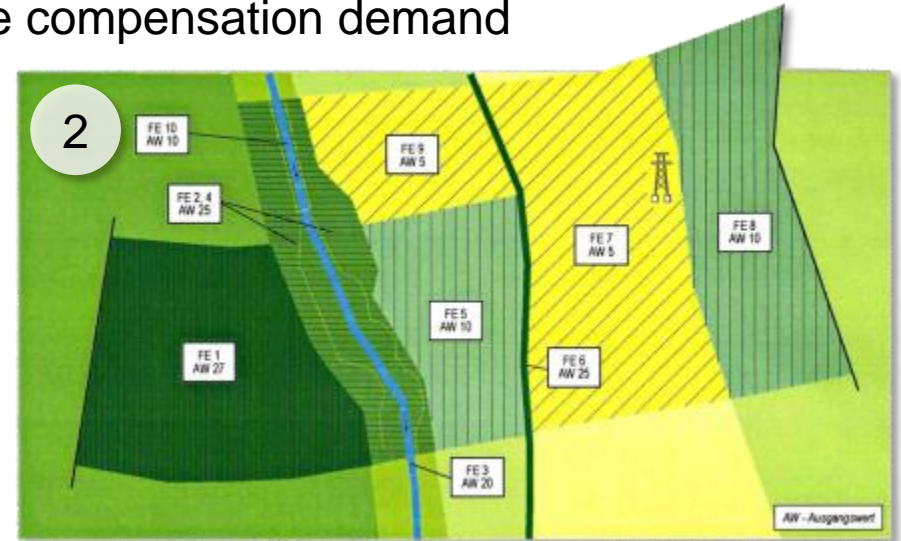


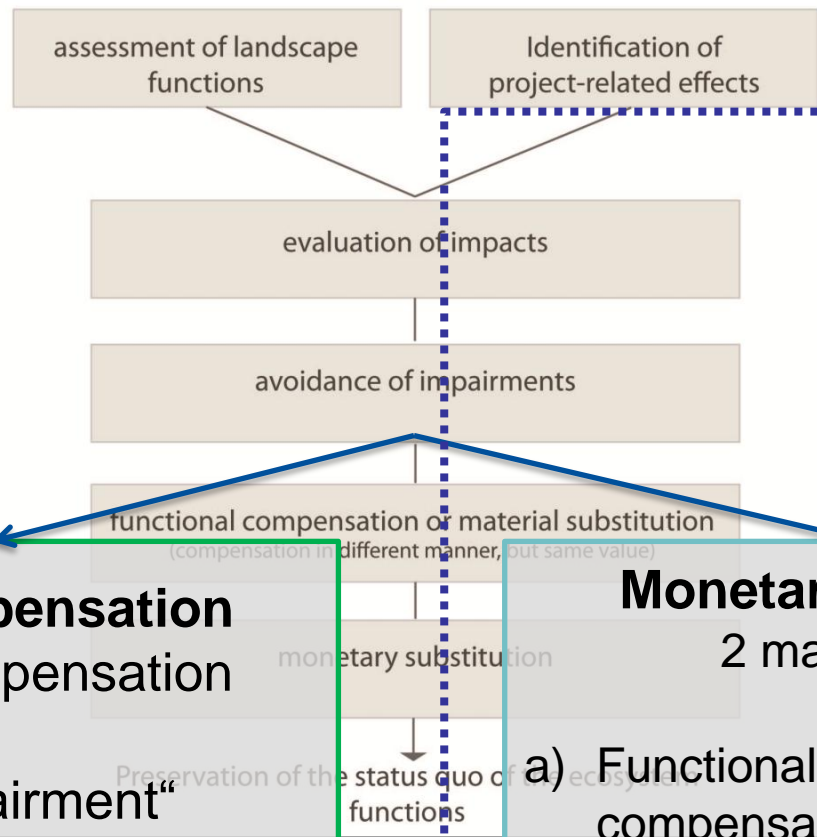


# Steps towards an adequate compensation of biotope functions

## Derivation of the compensation demand

2. habitats in the analyzed landscape before the impact
3. habitats in the analyzed landscape after the impact
4. impaired functions





I

II

**Material compensation**  
functional compensation

area x „impairment“  
& argumentation

**Monetary substitution**  
2 main methods:

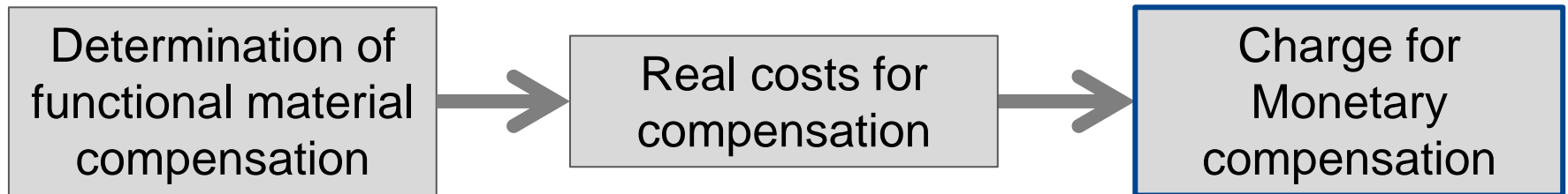
- a) Functional determination of compensational measures → i.e. restitution costs
- b) . „Hybrids“
- c) Politically decided flat rates

Realisation

?



# Assessment of the monetary Substitution by using the Restoration cost approach





# Methodological approaches for monetary compensation

	“Hybrid”	II b)	II b)	“Hybrid”	II a)
	Skeleton rates substantiated in individual cases according to duration and severity of the project	Habitat value points in connection with specified sets of cost per value point	Offsetting the cost of intervention when material compensation is not possible	Skeleton rates in connection with habitat value points	Restoration cost approach
Bundesländer	Baden-Württemberg*, Rhineland-Palatinate*, Saarland*	Hesse*	Lower Saxony**	Saxony*	Thuringia*, Bavaria, Mecklenburg-Western Pomerania, Bremen, Schleswig-Holstein, Hamburg, Brandenburg, Saxony-Anhalt, Lower Saxony**
* Method specified in an legal ordinance					
Determination of costs	Depending on the project	0,35€ per m <sup>2</sup>	Maximum 7 % of the project costs	Range of 0,51 € and 2,65€ per m <sup>2</sup>	Depending on the adequate compensation

\*\* Lower Saxony distinguishes two types of interventions where monetary compensation is necessary

# Case study – accounting of natural compensation impaired habitats

Impaired habitat types																	
Before the impact	After the impact	area [ha]	Value before impact	Value after impact	Difference-value	Area x Diff.value	Σ = necessary compensation	compensation measure A = initial habitat Z = target habitat	Value before	Value after	Difference	area [ha]	Value Offset	Difference	Average costs for compensational measures		
Other wet grassland (species-rich) (occurrences of endangered plant species, eg, <i>Orchis mascula</i> )	Road (sealed)	0,55	59/q m	3	56	308000	Σ 423000	A Intensively used arable land	16	43	1,10	473000	+ 50000	Development costs Sowing of grassland: 230,08 – 332,34€/ha* Σ 184,06 – 265,87€			
	Landscaped area next to road	0,25		13	46	115000		Z Other wet grassland (species-rich)	59					Maintenance costs: Wet meadow mowing times: 2 450,00 €/ha* Σ 495€ X25 Years =12375€			
Intensively used arable land	Road (sealed)	1,25	16/q m	3	13	162500	Σ 174500	A Intensively used grassland	21	21	0,5	105000	- 69500	Maintenance costs: „Arrhenatheretum" grasslands mowing times: 2 412 €/ha* Σ 206€ X 25Years =5150€			
	Landscaped area next to road	0,4		13	3	12000		Z Extensively used Grassland	42								
Total units for compensation demand							Σ 597500	Total value of units of not compensated impairments					Σ -578000	Σ = 17790 €			
12.470 € average costs per ha of arable land in Hesse								1,6 ha x 12.470 €					Σ 19952	Total = 37742 €			

\* Source: Schäfer, A. 2010: Kosten und Finanzierung von Naturschutzmaßnahmen in der Agrarlandschaft

# Case study - monetary compensation

- compensation money using the derivation approach of Hesse
- politically determined price index per square meter: 0,35€

Impaired habitat types							
Before the impact	After the impact	area [ha]	Value before	Value after	Differenc	Area x Diff. value	$\Sigma$ = necessary compensation
Other wet grassland (species-rich) (occurrences of endangered plant species, eg, Orchis mascula)	Road (sealed)	0,55	59/ qm	3	56	30800 0	$\Sigma$ <b>423000</b>
	Landscaped area next to road	0,25		13	46	11500 0	
Intensively used arable land	Road (sealed)	1,25	16/ qm	3	13	16250 0	$\Sigma$ <b>174500</b>
	Landscaped area next to road	0,4		13	3	12000	
<b>Total units for compensation demand</b>							$\Sigma$ <b>597500</b>
<b>Politically determined charge per m2 = 0,35€ per value unit</b>							<b>20.912 €</b>



Material

Costs for compensation measures  
+  
Average costs for arable land

37.742 €



Monetary

Cost index **X** area values

20.912 €

# Juxtaposition



Material



Monetary

	Habitat value method + argumentative determination		Politically decided monetary compensation costs
Standardization	++		++
Public acceptance	~		~
Security for initiator	++		++
Flexibility	--		--
Consideration of functions	~		--
Transparency, tangibility	--		-
Effort	++		++
Consideration of Transaction costs	?		?

++

high level of consideration

--

low level of consideration

~

depends on elaboration



# Pitfalls concerning monetization relating to the EIR

- Key principles that are linked to the EIR would be affected adversely, such as the prohibition of deterioration
- General weakening of the spatial-functional compensation
  - Due to this, the possibility of expropriation would no longer be given, as the legal basis would lack to claim spatial and functional compensation needs for a particular area
- Strengthening of existing enforcement deficits
- Weakening of the avoidance principle
  - If monetary compensation causes less strain on the initiator than natural compensation, it will cause negative effects on the prioritized set of measures for prevention
- Weakening of the stocking of compensation measures that are set up in advance for instance in Eco-accounts

# Lessons learned

- EIR holds a lot of experience in terms of information on the implementation practice of PES; regarding for example:
  - inclusion of different actors
  - Institutional dimensions
  - Eco accounting
  - Trusts and foundations as agents between public authorities and private investors
- On the contrary PES-schemes bring experiences and examples for concepts within the EIR to learn from
- A certain amount of standardization is necessary in terms of fairness
- Politically decided flat rates bare risk of over or under financing
- Derivation of costs from material compensation is not without risks

Thank you for your attention!



[volkers@umwelt.uni-hannover.de](mailto:volkers@umwelt.uni-hannover.de)