



Conférence Européenne
des Directeurs des Routes

Conference of European
Directors of Roads

Road impacts on soil functions

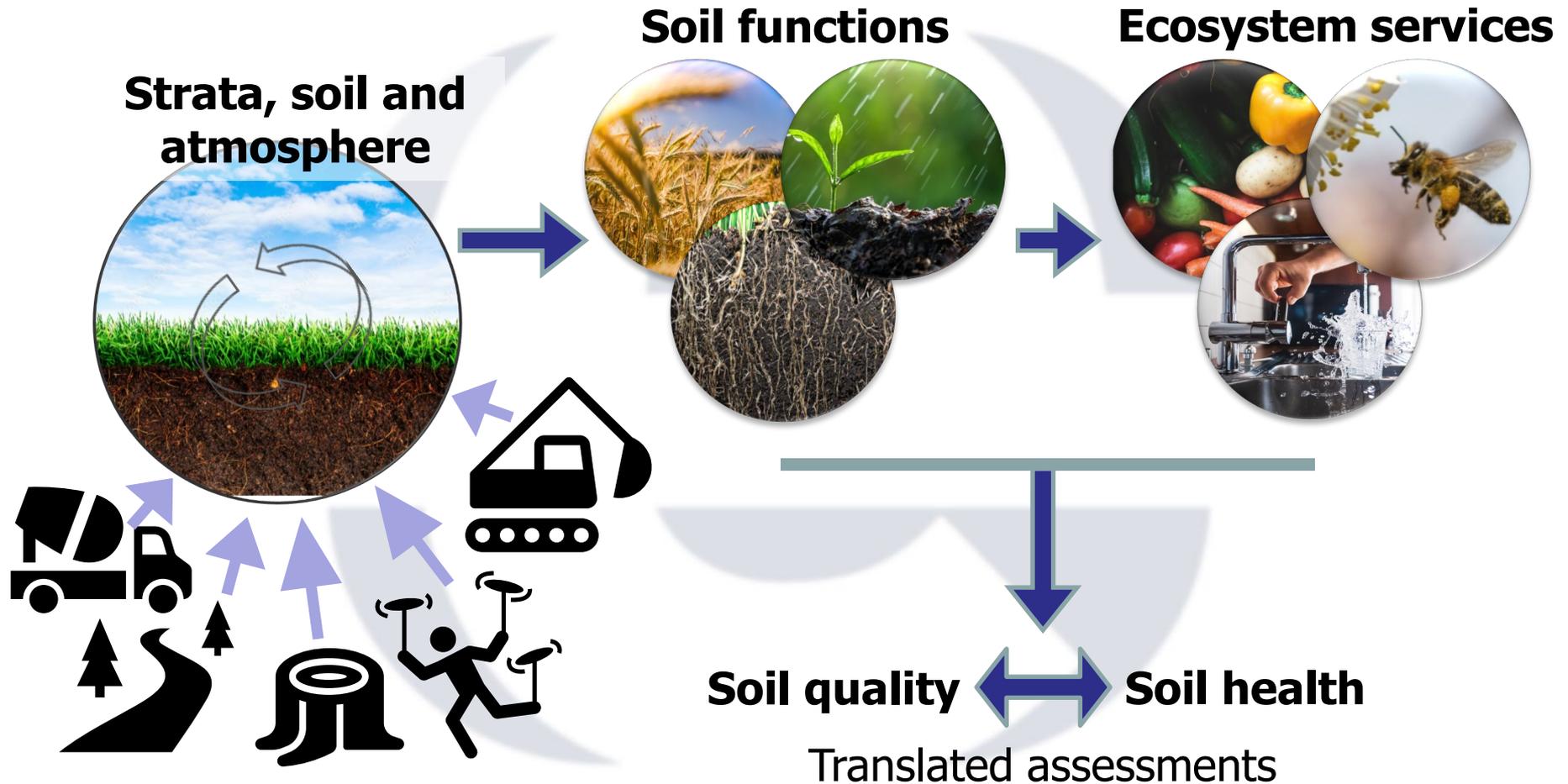
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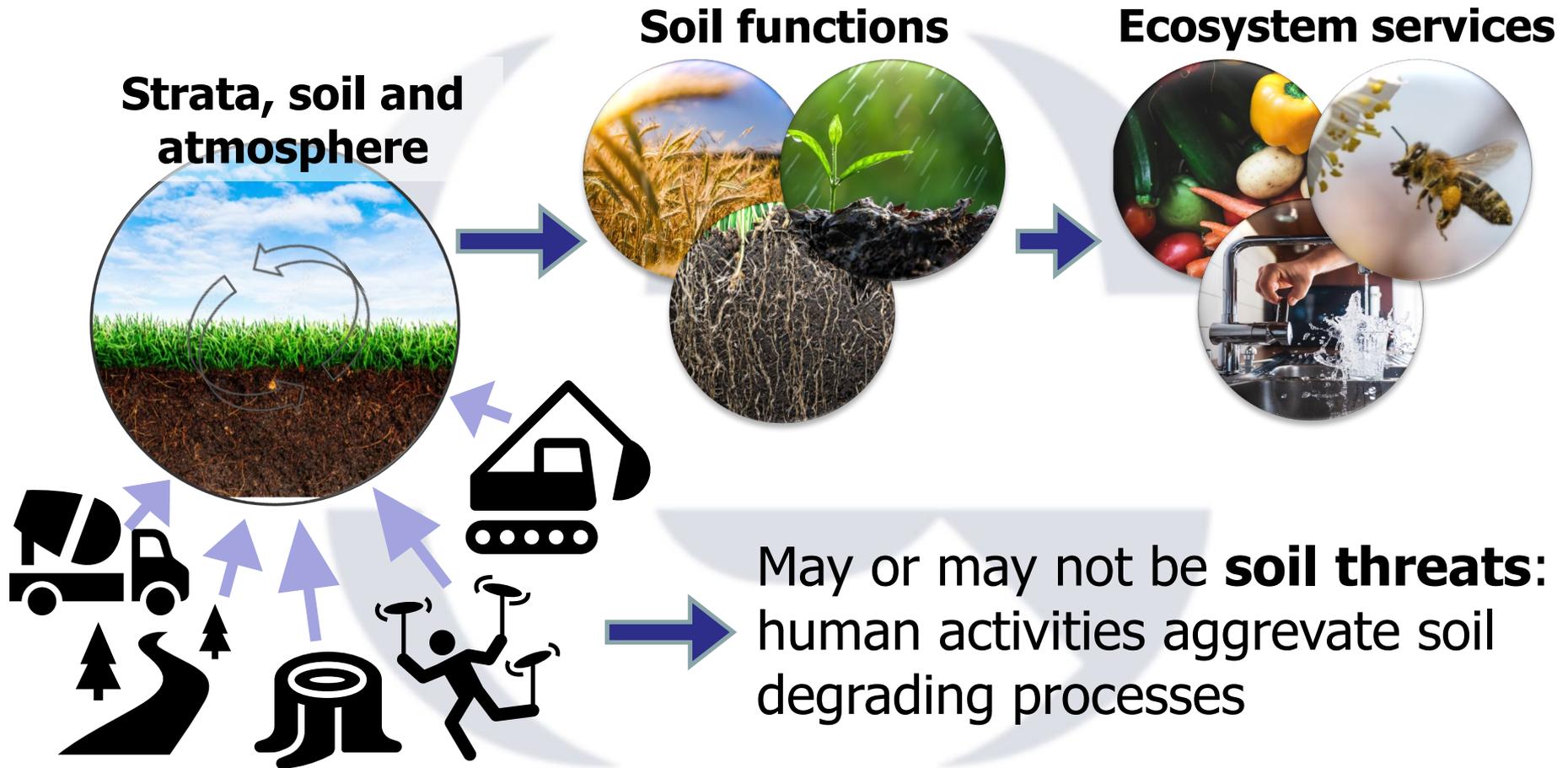
**Based on: Loraine ten Damme and
Thomas Keller 2022**



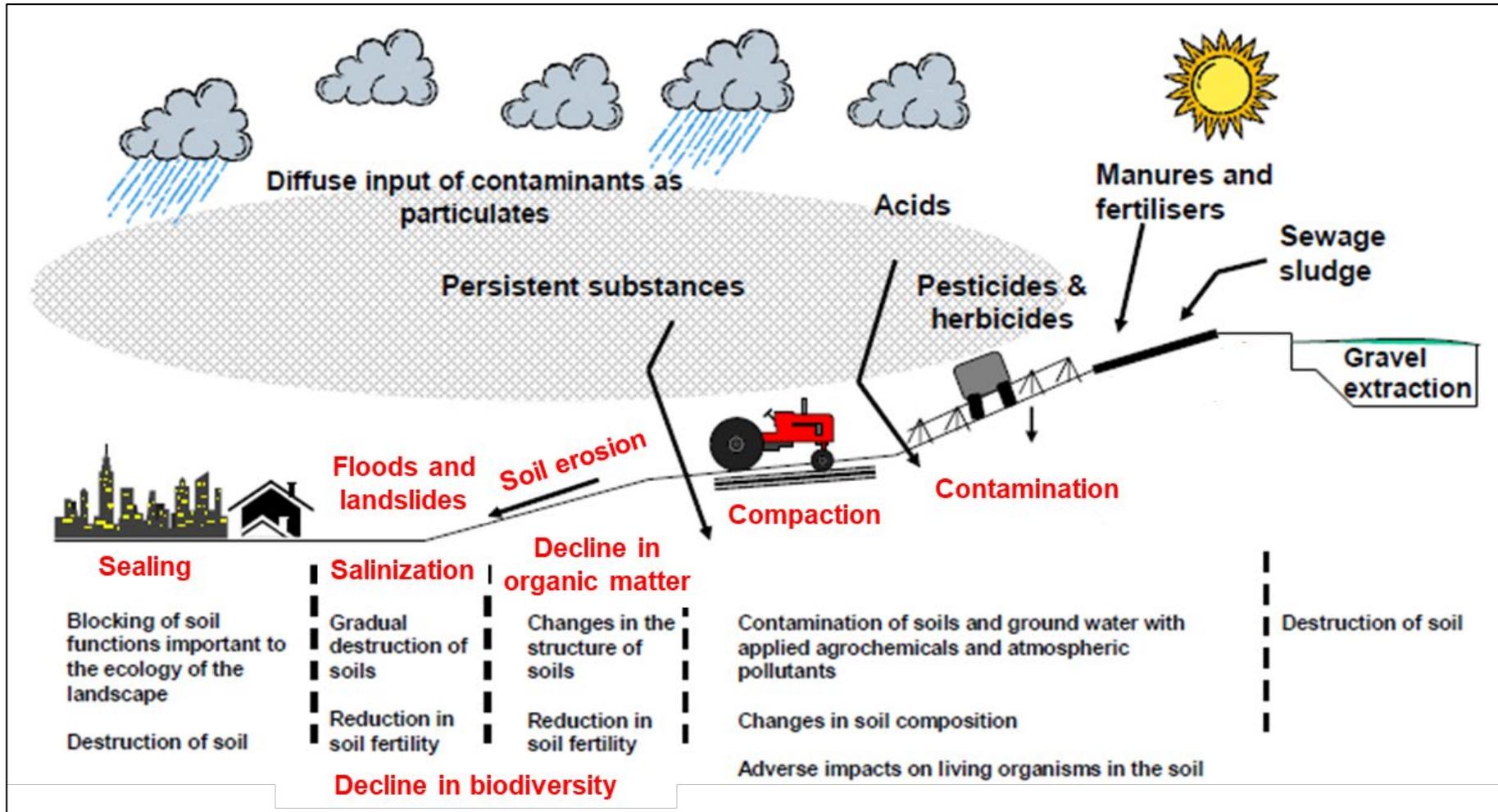
Road projects effects on soils



Road projects effects on soils



Soil threats



Main-differences

Soil functions



Ecosystem services



Initial aim: achieve spatial and temporal sustainable use of soils.

Assessment:

1. Measurable soil properties
2. Environmental characteristics and/or
3. Soil management.

Status: somewhat successful

Initial aim: value environmental services to add weight in decision-making.

Assessment:

1. Identification
2. Quantification (many levels)
3. Valuation

Status: not successful

Two major pathways

1. Road corridor: balance soil functions
2. 'Temporal' construction sites: minimize impacts to maintain/improve soil characteristics

In general: minimise impact, optimise compensation

Optimal scenario, select based on:

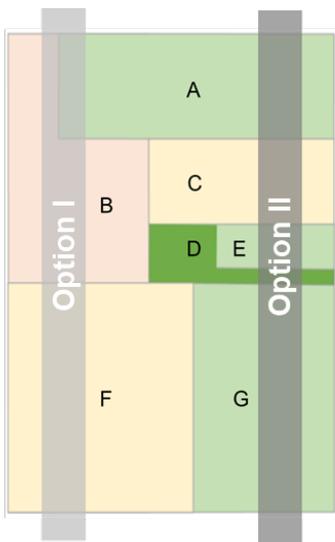
1. Estimate current level of soil functions
2. Assess expected balance supply-demand of soil function
3. Assess need and possibility of compensating for the loss of soil functions

Optimal scenario, select based on:

1. Likelihood and impact of soil threats, per activity
 1. Characterize sites of potential corridors
 2. Estimate current level of soil functions
 3. Assess the importance of the soil functions
 4. Assessment of potential compensation

- The proposed conceptual framework for the assessment of the impact of the planning of new roads on soils. Four stages are outlined, which allow deciding on the corridor for which the impact of the loss of soil functions is least (supply equals or exceeds the demand), or most compensable.

1) Characterize sites of potential corridors



2) Estimate current level of soil functions per site

Site	ha	Prioritised soil functions					
		Primary production	Water purification	Carbon sequestration	Habitat accommodat.	Recycling of ext. nutrients	...
A1	0.7	M	H	H	M	H	
A2	0.4	M	H	M	M	H	
B	0.9	L	M	L	L	L	
C	0.5	H	L	M	L	M	
D	0.1	H	H	H	H	M	
E	0.3	M	M	L	M	H	
F	1.4	M	M	L	M	H	
G	1.4	L	L	M	H	M	

L, Low; M, Medium; H, High performance

3) Assess the importance of soil functions regionally

	Soil function	Soil function					
		Primary production	Water purification	Carbon sequestration	Habitat accommodat.	Recycling of ext. nutrients	...
Supply	H	[Bar chart showing supply levels for high performance]					
	M	[Bar chart showing supply levels for medium performance]					
	L	[Bar chart showing supply levels for low performance]					
Demand	L	[Bar chart showing demand levels for low performance]					
	M	[Bar chart showing demand levels for medium performance]					
	H	[Bar chart showing demand levels for high performance]					

L, Low; M, Medium; H, High performance

4) Assessment of potential compensation regionally

	Soil function	Soil function					
		Primary production	Water purification	Carbon sequestration	Habitat accommodat.	Recycling of ext. nutrients	...
Need	H	[Bar chart showing need levels for high performance]					
	M	[Bar chart showing need levels for medium performance]					
	L	[Bar chart showing need levels for low performance]					
Possibility	L	[Bar chart showing possibility levels for low performance]					
	M	[Bar chart showing possibility levels for medium performance]					
	H	[Bar chart showing possibility levels for high performance]					

Option I; Option II