Centro Italiano per la Riqualificazione Fluviale

Autorità di bacino distrettuale del fiume Po

Wetlands International

Il Regolamento sul ripristino della natura: recuperare la connettività fluviale per migliorare la qualità del territorio e adattarsi ai cambiamenti climatici

Torino, 22 novembre 2024

Achieving Free-Flowing Rivers: *Lessons from the MERLIN Project*

Sebastian Birk

University of Duisburg-Essen, Germany

Con il patrocino e la cooperazione di

Ordine Geologi Piemonte

Regione Piemonte

Città di Torino

Ordine degli Ingegneri della Provincia di Torino

Evento cofinanziato dall'Unione Europea tramite il programma LIFE

Nature Restoration Law

- Just old wine in new bottles?

Innovative aspects

→ **Integration of different Nature Directives**

→ **Despite thematic goal-setting: Promoting a landscape-scale approach**

→ **In line with "River Basin Management" approach**

Barriers to restoration in Europe

Expert perspectives

(Cortina-Segarra et al. 2021, Restor. Ecol. 29)

Barriers to restoration in Europe

Expert perspectives

(Cortina-Segarra et al. 2021, Restor. Ecol. 29)

Insufficient funding

Barriers to restoration in Europe

Expert perspectives

(Cortina-Segarra et al. 2021, Restor. Ecol. 29)

Insufficient funding

Conflicting interests

Barriers to restoration in Europe

Expert perspectives

(Cortina-Segarra et al. 2021, Restor. Ecol. 29)

Insufficient funding

Conflicting interests

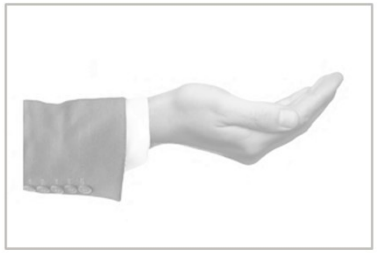
Low political priority

Barriers to restoration in Europe

Financial, socio-cultural and political

Expert perspectives

(Cortina-Segarra et al. 2021, Restor. Ecol. 29)



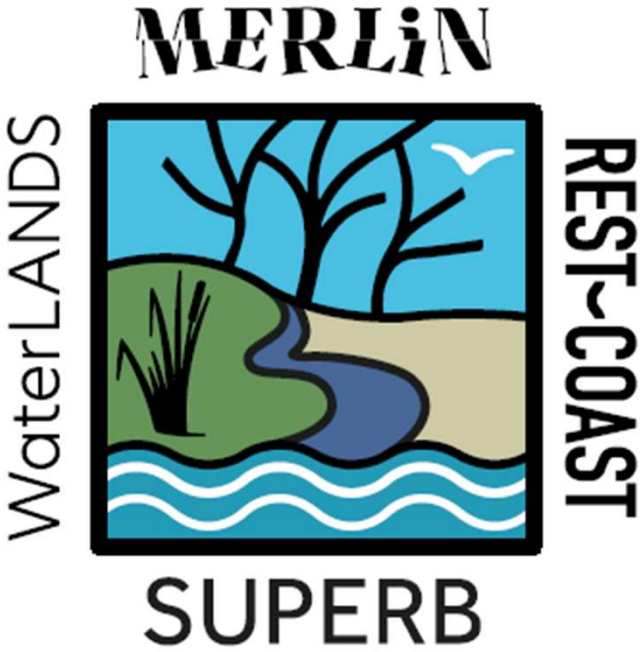
Insufficient funding

Conflicting interests

Low political priority

Restoring ecosystems and biodiversity

H2020 ‘Green Deal’ Restoration Cluster



SUPERB	Forest restoration
WaterLANDS	Wetland restoration
MERLIN	River and wetland restoration
REST-COAST	Coastal and transitional waters restoration

H2020 ‘Green Deal’ Restoration Cluster

→ **Four projects** under the H2020 “Green Deal” call

→ **More than 150 partner institutions** from academia, NGOs, SMEs, agencies and public administrations

→ **More than 80 mio. Euro** (large share into actual restoration)

→ Duration: **2021-2026**

→ *Ambition:* **Scaling** nature restoration

Learning from best-practice

Location of the cluster's restoration pilots

Learning from best-practice

‘Room for the Rhine branches’

The Netherlands

Floodplain reconnection

Learning from best-practice

‘Danube Auen-Nationalpark’

Austria

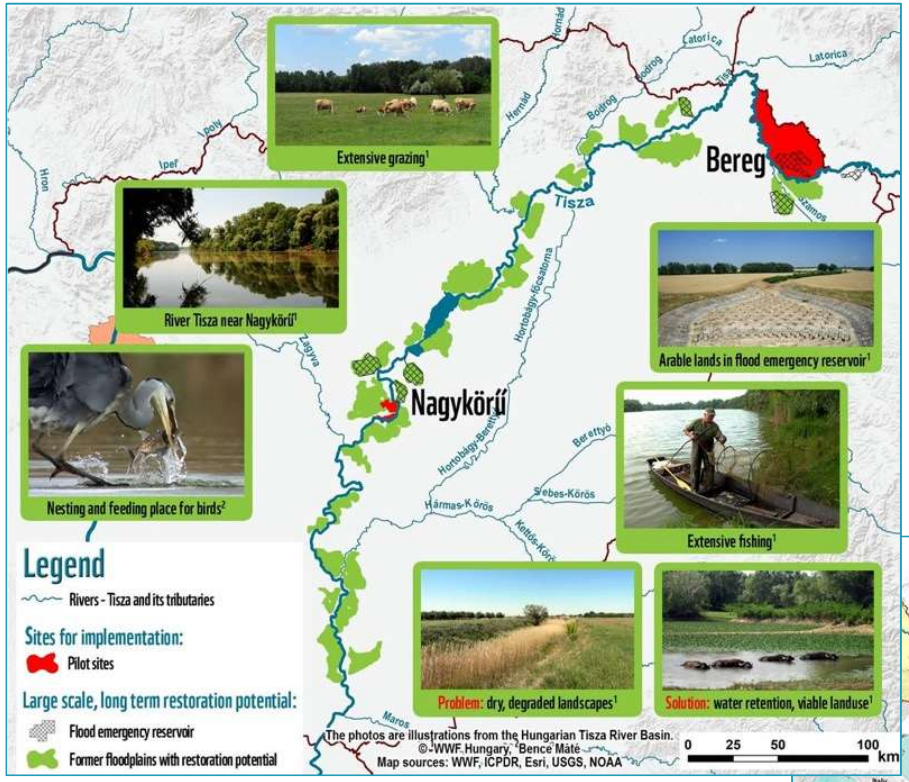
Floodplain reconnection

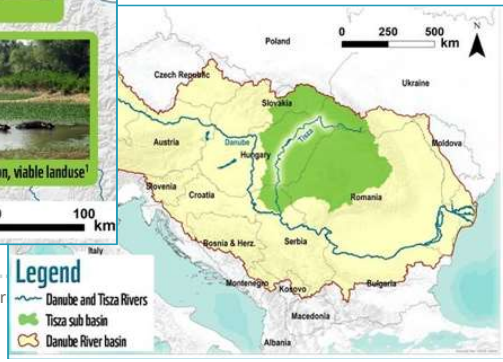
Learning from best-practice

‘Tisza River floodplains’

Hungary

Floodplain reconnection





Learning from best-practice

‘Emscher River basin’

Germany

Floodplain reconnection

Learning from best-practice

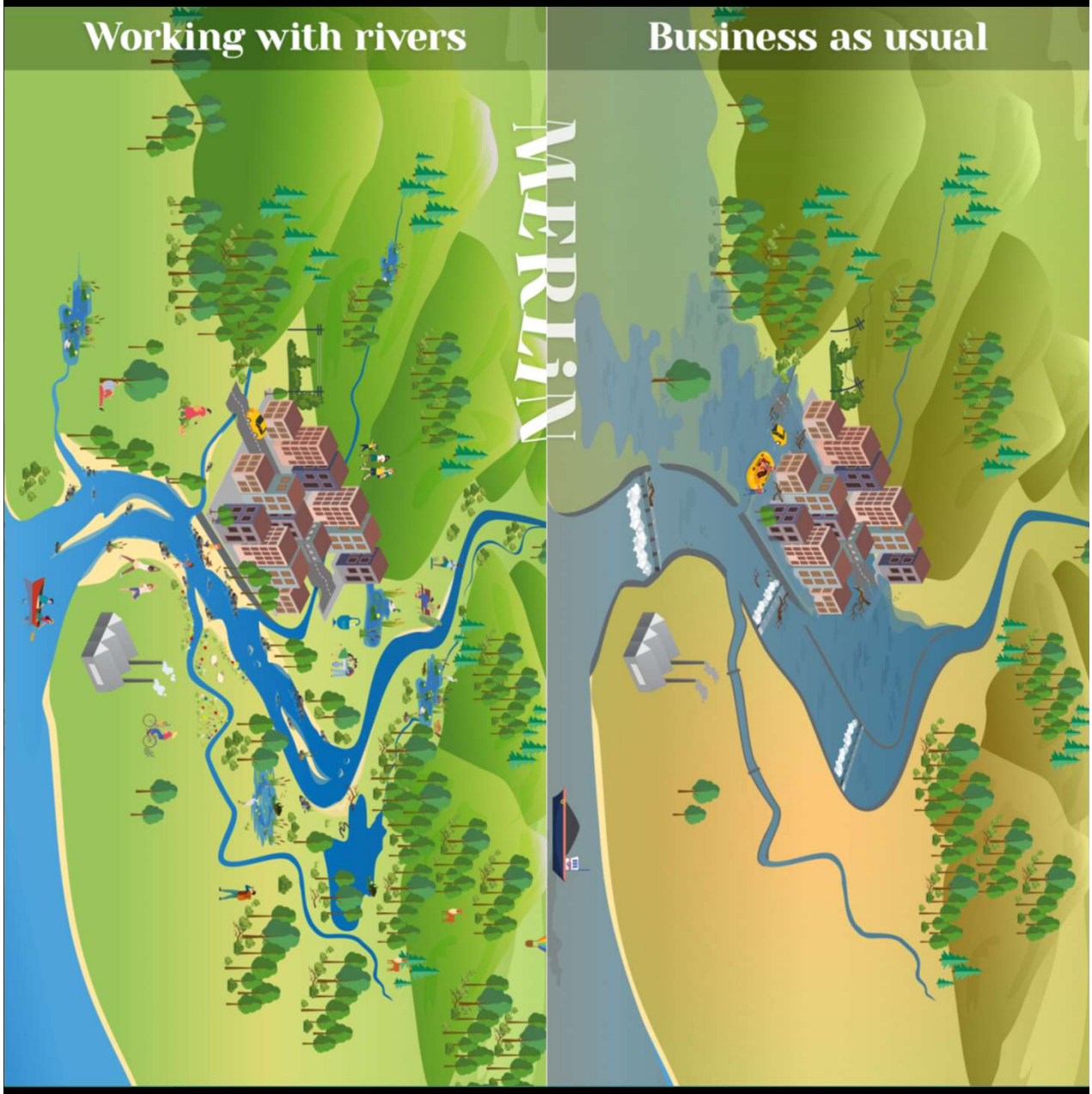
‘Deba River basin’

Spain

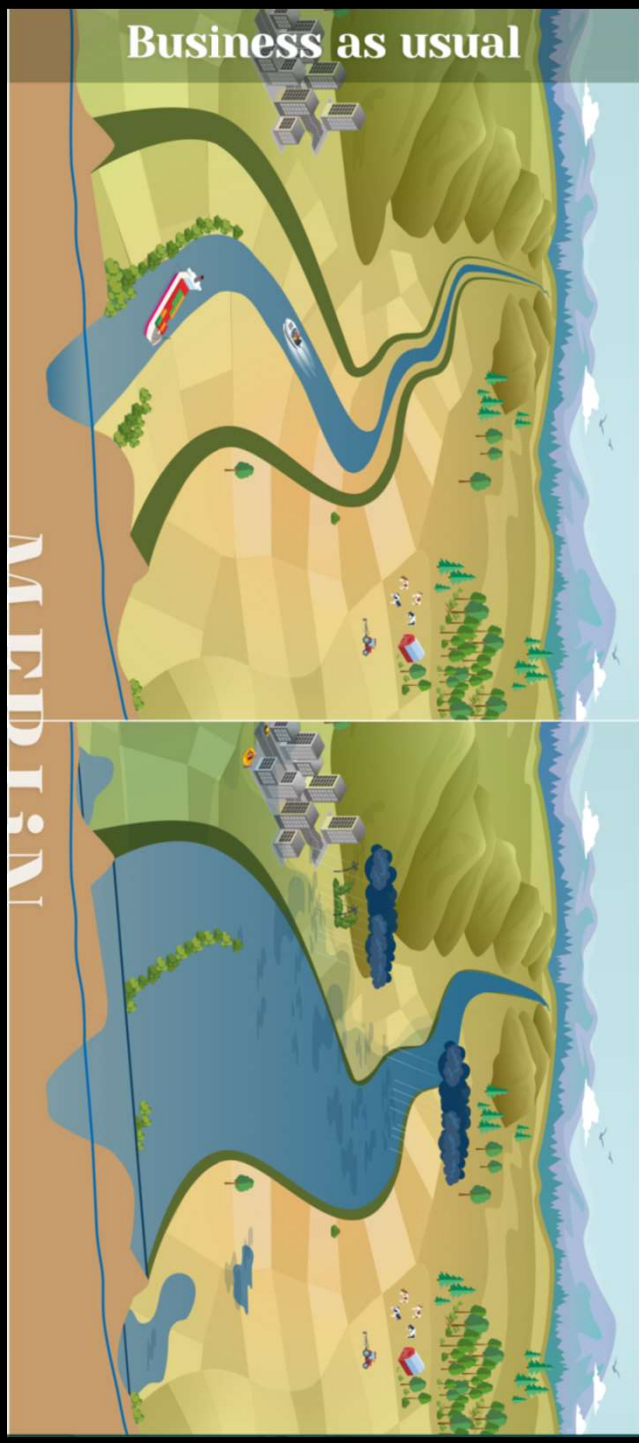
Barrier removal

Vision for European Rivers

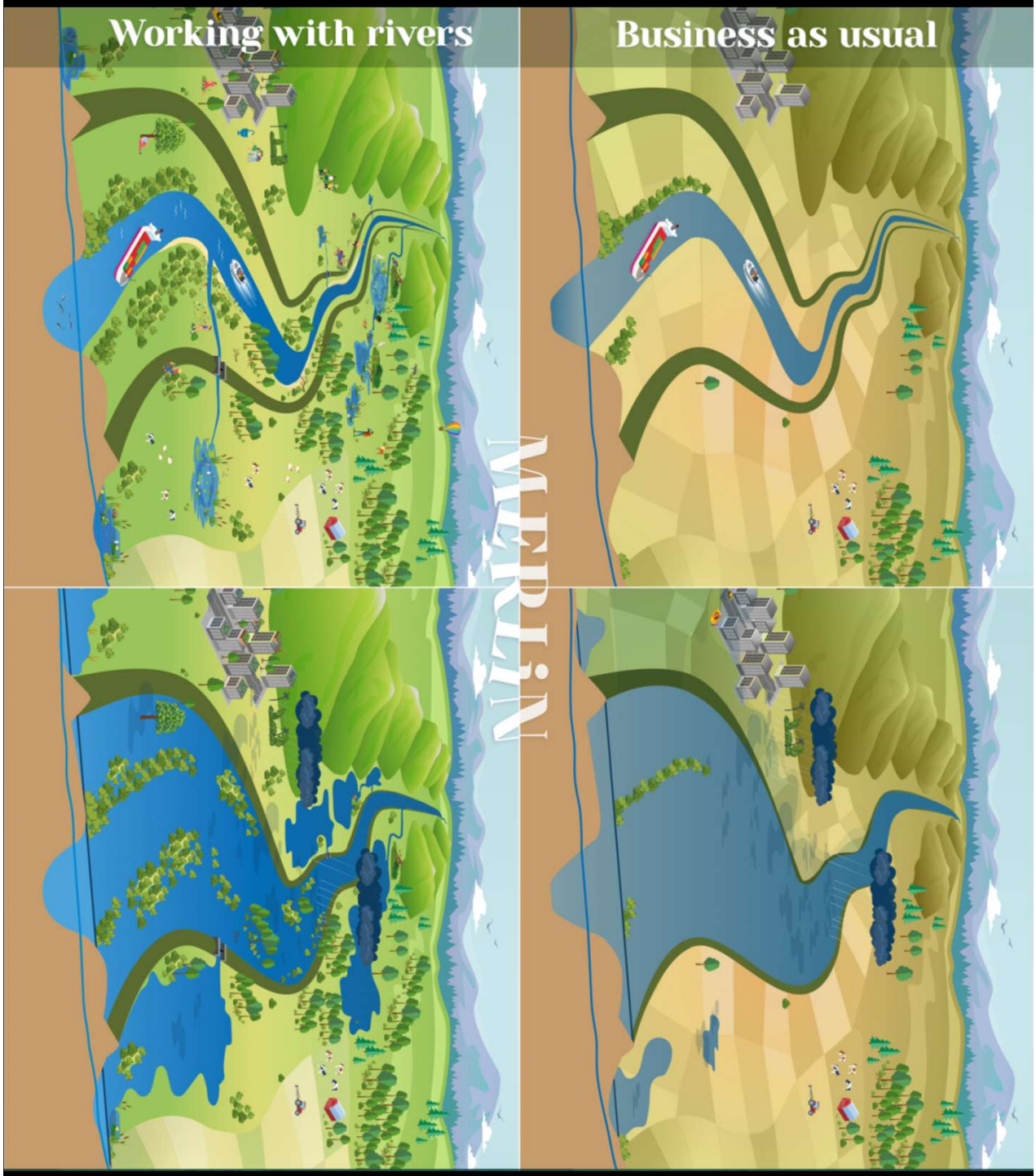
Vision for European Rivers



Vision for European Rivers



Vision for European Rivers



Stakeholder engagement

Conflicting interests

"Narratives of the Future"

Expectation management

→ Theory of Change

→ Realistic benefit projections (e.g., flood retention, GHG reduction)

→ Implement monitoring for follow-up

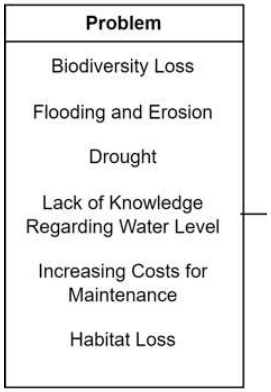
Theory of Change

‘Emscher River basin’

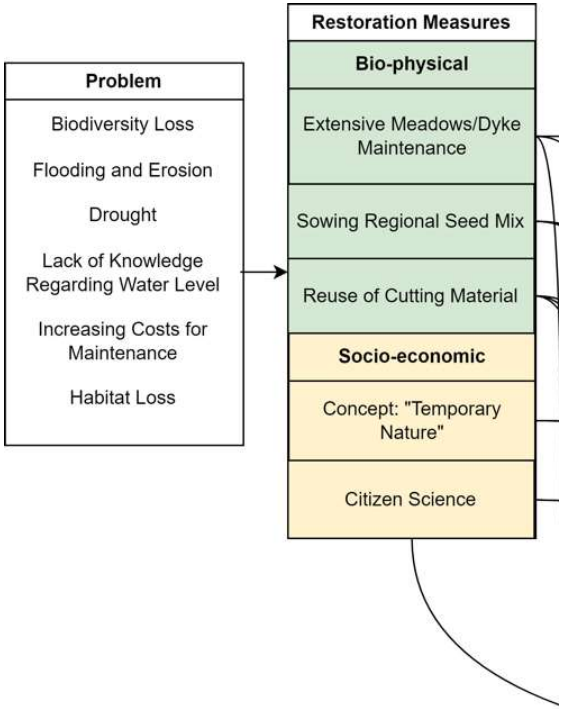
Germany

Flower meadow instalment

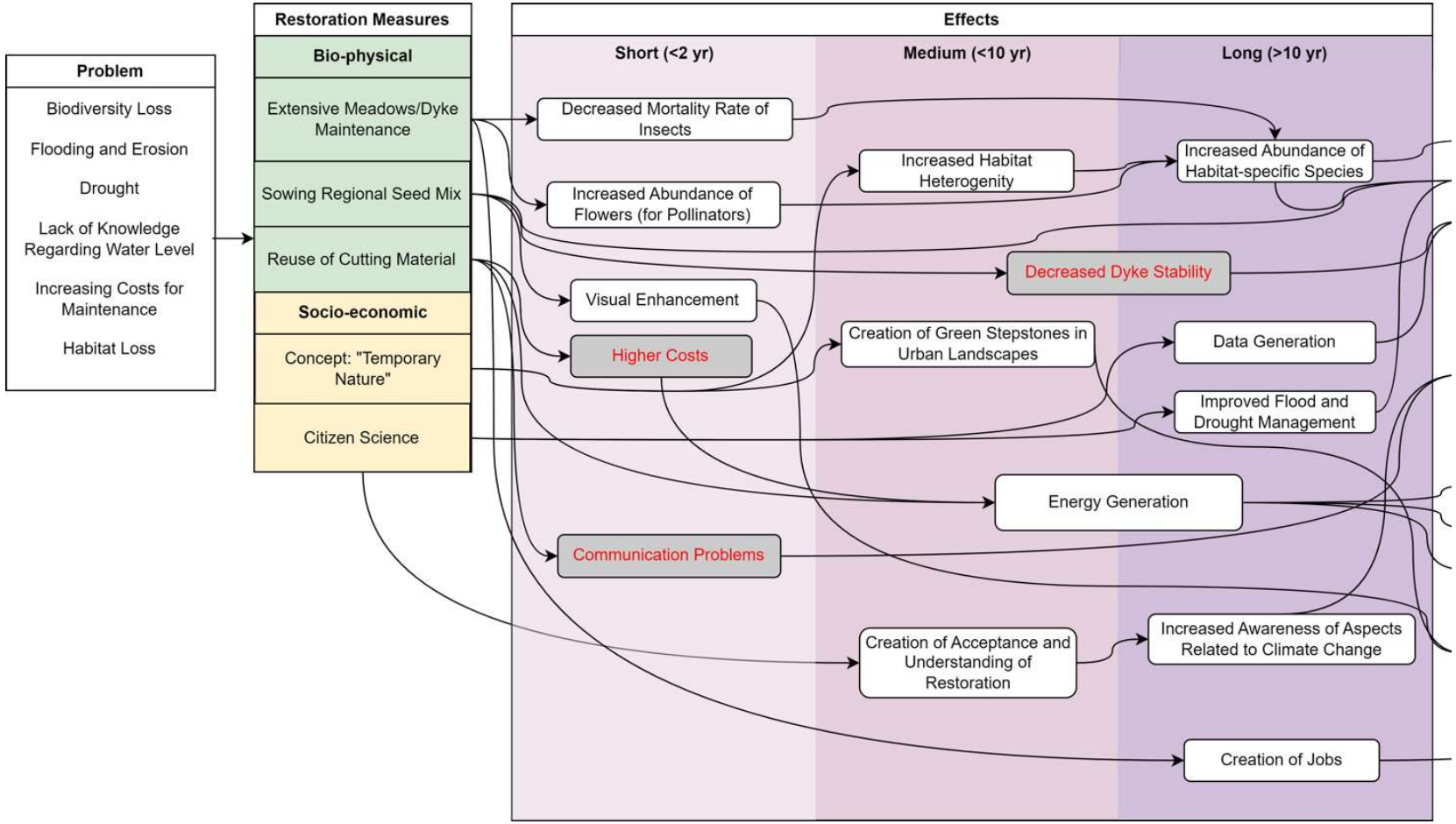
Theory of Change



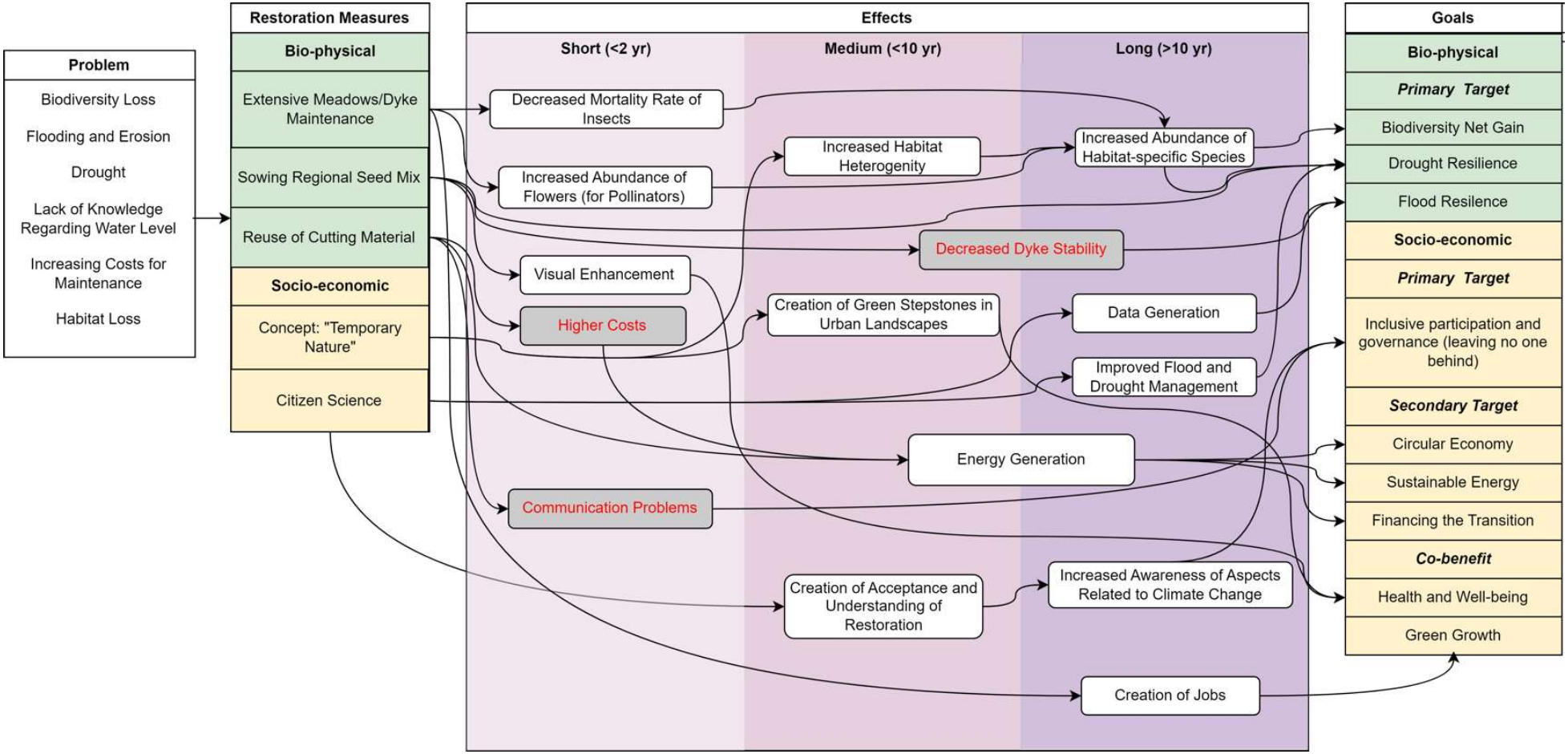
Theory of Change



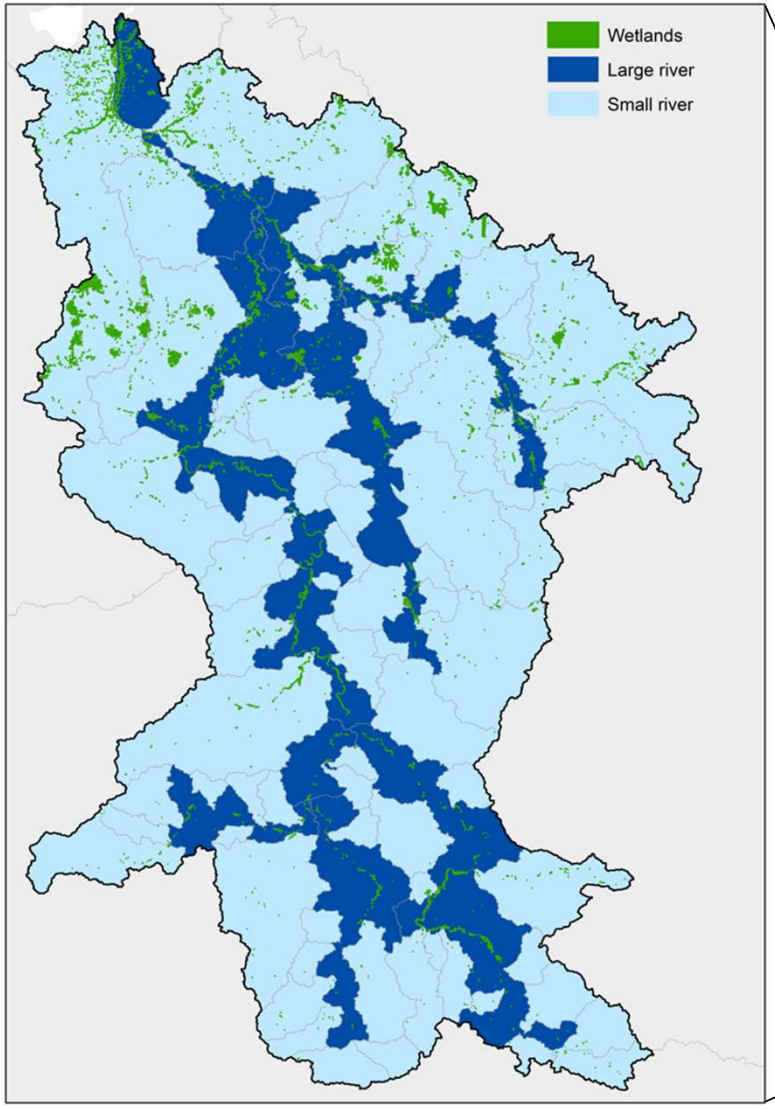
Theory of Change

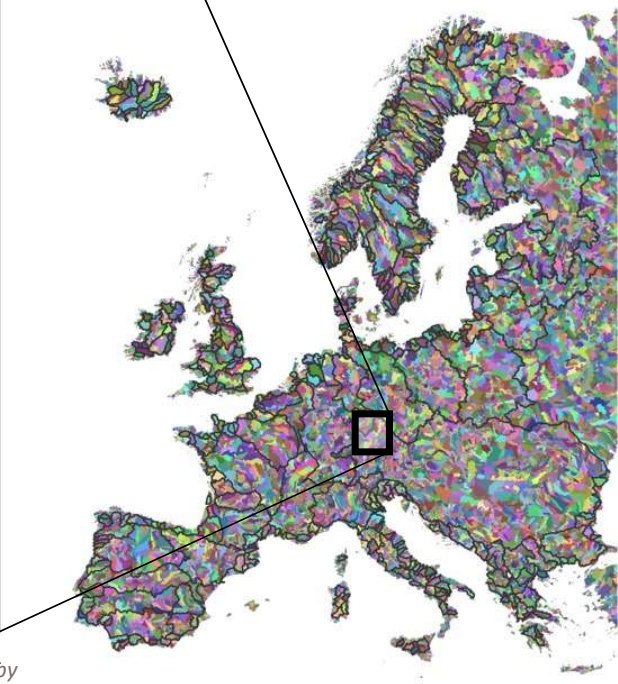


Theory of Change



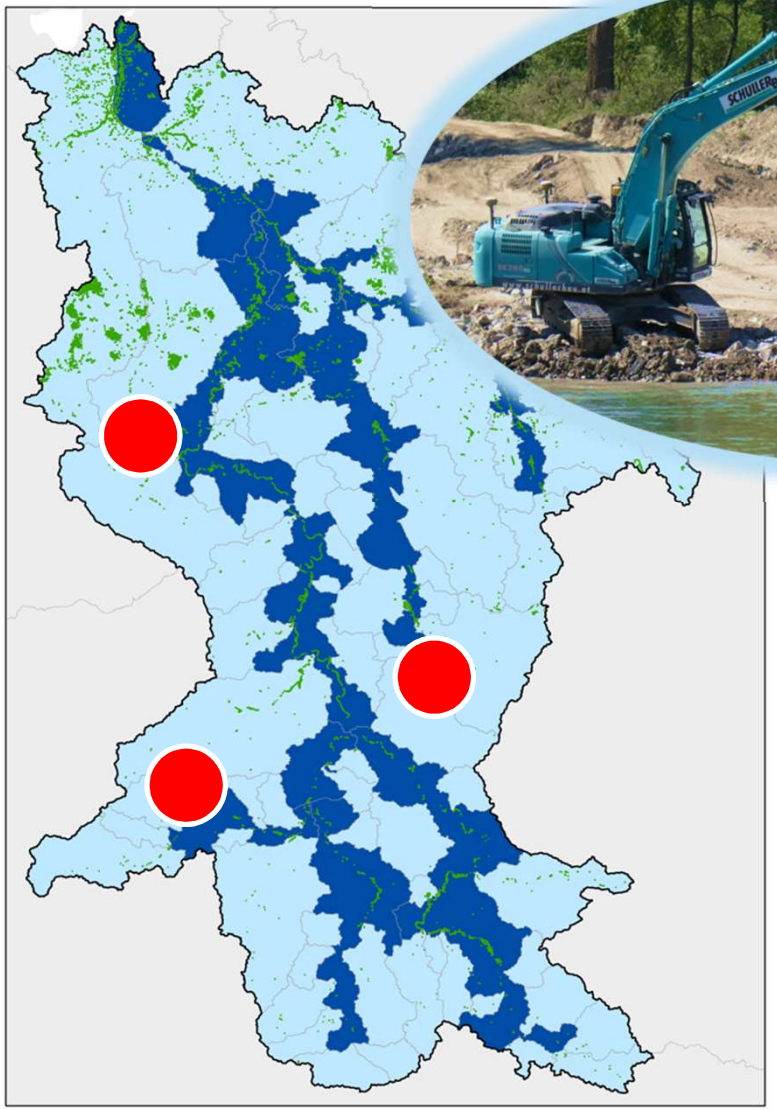
Catchment-scale modelling





work by
Paulo Branco, Gonçalo Duarte, Teresa Ferreira (ULisboa)

Catchment-scale modelling



MERLiN

Social Cost-Benefit Analysis

‘Room for the Rhine branches’

The Netherlands

Social Cost-Benefit Analysis

Alternatives			**S1: *Room for the River – droughts and floods***	**S2: *Room for Living Rivers***	**S3: *Room for Living Rivers+***
Intervention	Discharge capacity	Dike relocation			
		Side channels			
		Floodplain lowering			
	Erosion management				
	Floodplain land use				
Results	Costs (M€)				
	Benefits (M€)				
	Benefit-Cost Ratio *narrow*[1]				
	Benefit-Cost Ratio *broad*[2]				

[1] including only direct benefits: Agricultural yields, flood protection, navigation.

[2] including all benefits: *Above* plus carbon sequestration, nutrient retention, recreation, amenity, bequest and existence.

Social Cost-Benefit Analysis

Alternatives			**S1: *Room for the River – droughts and floods***	**S2: *Room for Living Rivers***	**S3: *Room for Living Rivers+***
Intervention	Discharge capacity	Dike relocation	22 km; +2700 ha		
		Side channels	36 km		
		Floodplain lowering	65 km		
	Erosion management		Maintain current riverbed level		
	Floodplain land use		59% Agri (+7%)		
Results	Costs (M€)		-4,383		
	Benefits (M€)				
	Benefit-Cost Ratio *narrow*[1]				
	Benefit-Cost Ratio *broad*[2]				

[1] including only direct benefits: Agricultural yields, flood protection, navigation.

[2] including all benefits: *Above* plus carbon sequestration, nutrient retention, recreation, amenity, bequest and existence.

Social Cost-Benefit Analysis

Alternatives			**S1: *Room for the River – droughts and floods***	**S2: *Room for Living Rivers***	**S3: *Room for Living Rivers+***
Intervention	Discharge capacity	Dike relocation	22 km; +2700 ha		
		Side channels	36 km		
		Floodplain lowering	65 km		
	Erosion management		Maintain current riverbed level		
	Floodplain land use		59% Agri (+7%)		
Results	Costs (M€)		-4,383		
	Benefits (M€)		1,071		
	Benefit-Cost Ratio *narrow*[1]		**0.10**		
	Benefit-Cost Ratio *broad*[2]		**0.24**		

[1] including only direct benefits: Agricultural yields, flood protection, navigation.

[2] including all benefits: *Above* plus carbon sequestration, nutrient retention, recreation, amenity, bequest and existence.

Social Cost-Benefit Analysis

Alternatives			**S1: *Room for the River – droughts and floods***	**S2: *Room for Living Rivers***	**S3: *Room for Living Rivers+***
Intervention	Discharge capacity	Dike relocation	22 km; +2700 ha	74 km; +4100 ha	
		Side channels	36 km	118 km	
		Floodplain lowering	65 km	-	
	Erosion management		Maintain current riverbed level	Restore bed level of year 2000	
	Floodplain land use		59% Agri (+7%)	29% Agri (-23%)	
Results	Costs (M€)		-4,383	-5,343	
	Benefits (M€)		1,071		
	Benefit-Cost Ratio *narrow*[1]		**0.10**		
	Benefit-Cost Ratio *broad*[2]		**0.24**		

[1] including only direct benefits: Agricultural yields, flood protection, navigation.

[2] including all benefits: *Above* plus carbon sequestration, nutrient retention, recreation, amenity, bequest and existence.

Social Cost-Benefit Analysis

Alternatives			**S1: *Room for the River – droughts and floods***	**S2: *Room for Living Rivers***	**S3: *Room for Living Rivers+***
Intervention	Discharge capacity	Dike relocation	22 km; +2700 ha	74 km; +4100 ha	
		Side channels	36 km	118 km	
		Floodplain lowering	65 km	-	
	Erosion management		Maintain current riverbed level	Restore bed level of year 2000	
	Floodplain land use		59% Agri (+7%)	29% Agri (-23%)	
Results	Costs (M€)		-4,383	-5,343	
	Benefits (M€)		1,071	4,667	
	Benefit-Cost Ratio *narrow*[1]		**0.10**	**0.03**	
	Benefit-Cost Ratio *broad*[2]		**0.24**	**0.87**	

[1] including only direct benefits: Agricultural yields, flood protection, navigation.

[2] including all benefits: *Above* plus carbon sequestration, nutrient retention, recreation, amenity, bequest and existence.

Social Cost-Benefit Analysis

Alternatives			**S1: *Room for the River – droughts and floods***	**S2: *Room for Living Rivers***	**S3: *Room for Living Rivers+***
Intervention	Discharge capacity	Dike relocation	22 km; +2700 ha	74 km; +4100 ha	74 km; +4100 ha
		Side channels	36 km	118 km	118 km
		Floodplain lowering	65 km	-	-
	Erosion management		Maintain current riverbed level	Restore bed level of year 2000	Restore bed level of year 2000
	Floodplain land use		59% Agri (+7%)	29% Agri (-23%)	0% Agri (-52%)
Results	Costs (M€)		-4,383	-5,343	-5,932
	Benefits (M€)		1,071	4,667	
	Benefit-Cost Ratio *narrow*[1]		**0.10**	**0.03**	
	Benefit-Cost Ratio *broad*[2]		**0.24**	**0.87**	

[1] including only direct benefits: Agricultural yields, flood protection, navigation.

[2] including all benefits: *Above* plus carbon sequestration, nutrient retention, recreation, amenity, bequest and existence.

Social Cost-Benefit Analysis

Alternatives			**S1: *Room for the River – droughts and floods***	**S2: *Room for Living Rivers***	**S3: *Room for Living Rivers+***
Intervention	Discharge capacity	Dike relocation	22 km; +2700 ha	74 km; +4100 ha	74 km; +4100 ha
		Side channels	36 km	118 km	118 km
		Floodplain lowering	65 km	-	-
	Erosion management		Maintain current riverbed level	Restore bed level of year 2000	Restore bed level of year 2000
	Floodplain land use		59% Agri (+7%)	29% Agri (-23%)	0% Agri (-52%)
Results	Costs (M€)		-4,383	-5,343	-5,932
	Benefits (M€)		1,071	4,667	7,682
	Benefit-Cost Ratio *narrow*[1]		**0.10**	**0.03**	**0.03**
	Benefit-Cost Ratio *broad*[2]		**0.24**	**0.87**	**1.30**

[1] including only direct benefits: Agricultural yields, flood protection, navigation.

[2] including all benefits: *Above* plus carbon sequestration, nutrient retention, recreation, amenity, bequest and existence.

Capacity Building

Insufficient funding

MERLiN

Financial Planning Workflow

Capacity Building

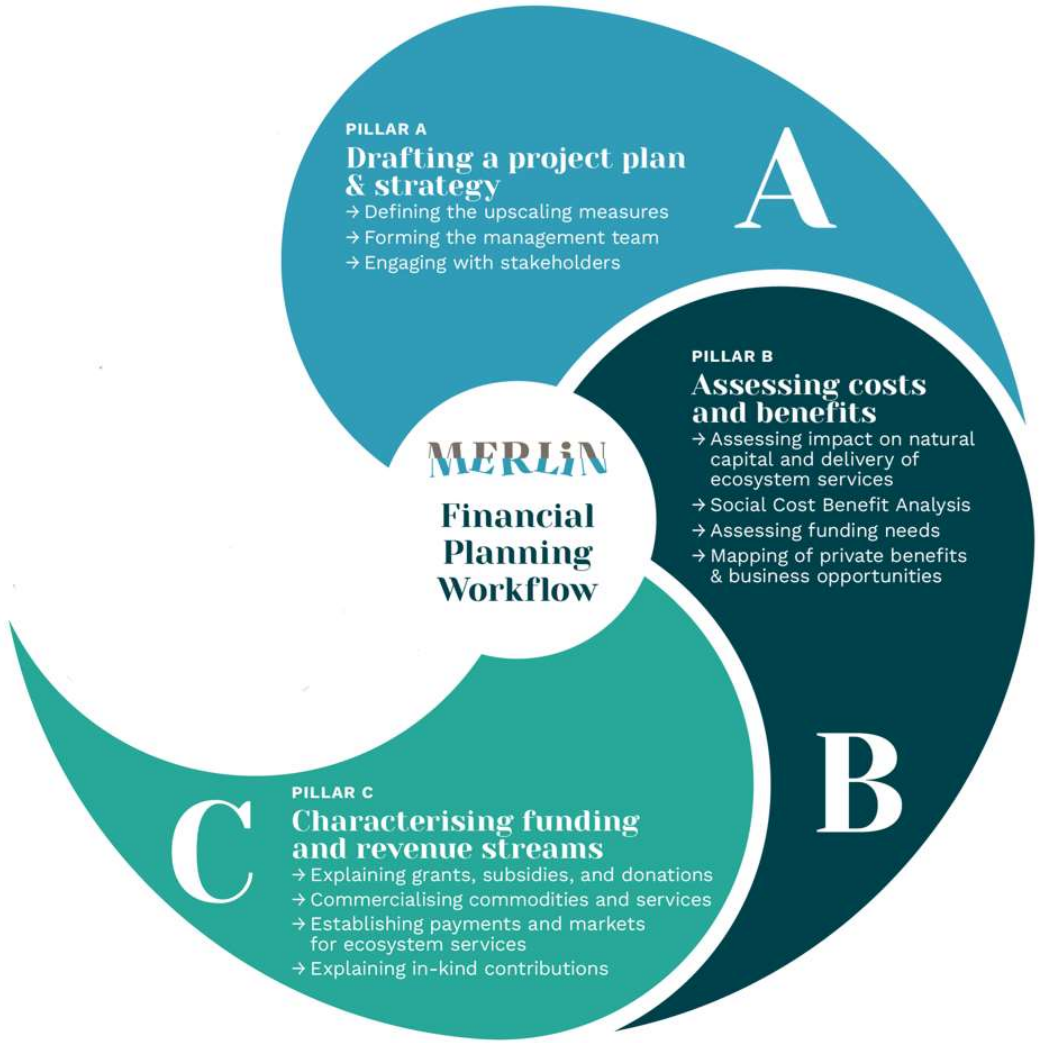
Insufficient funding

Capacity Building

Insufficient funding

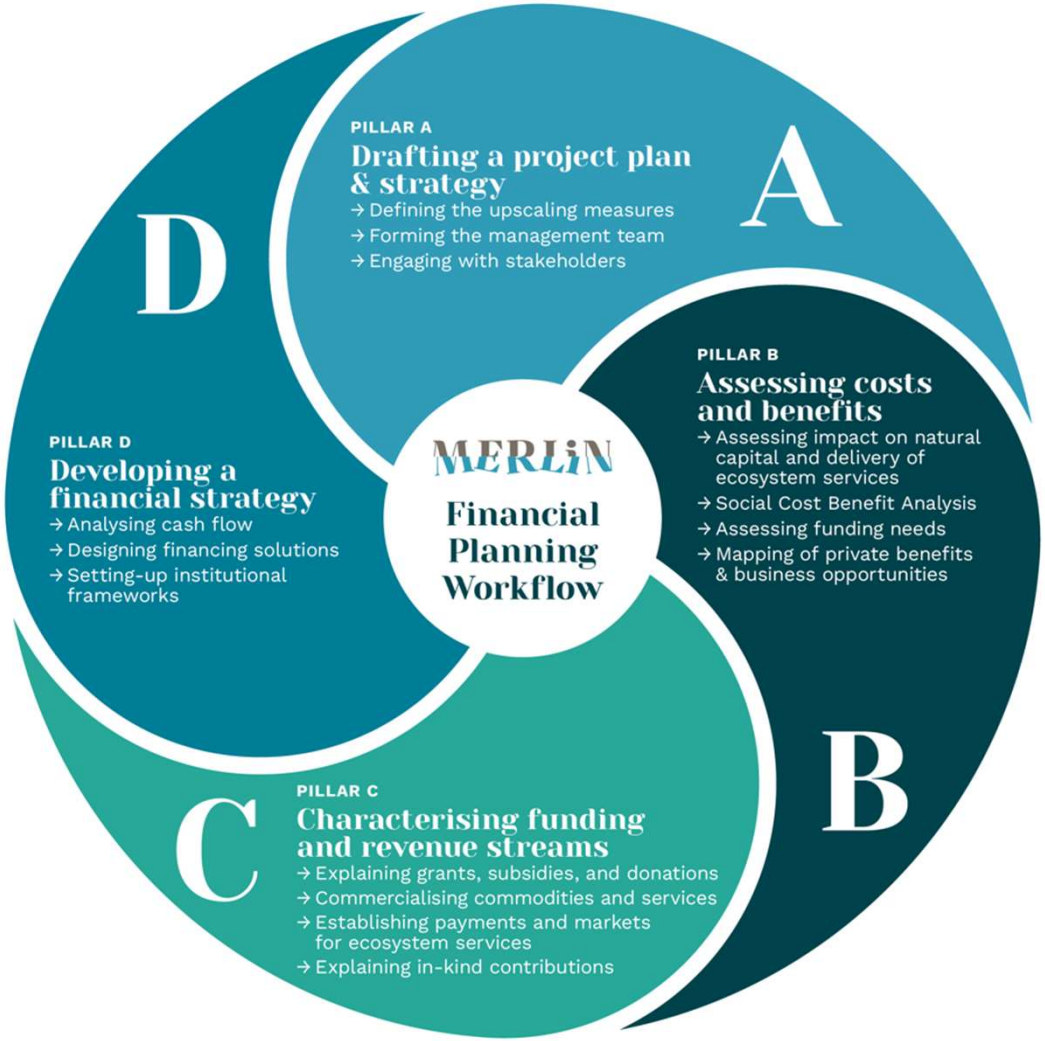
Capacity Building

Insufficient funding



Capacity Building

Insufficient funding



Financial ‘off-the-shelf’ instruments

#1: Donation-based crowdfunding

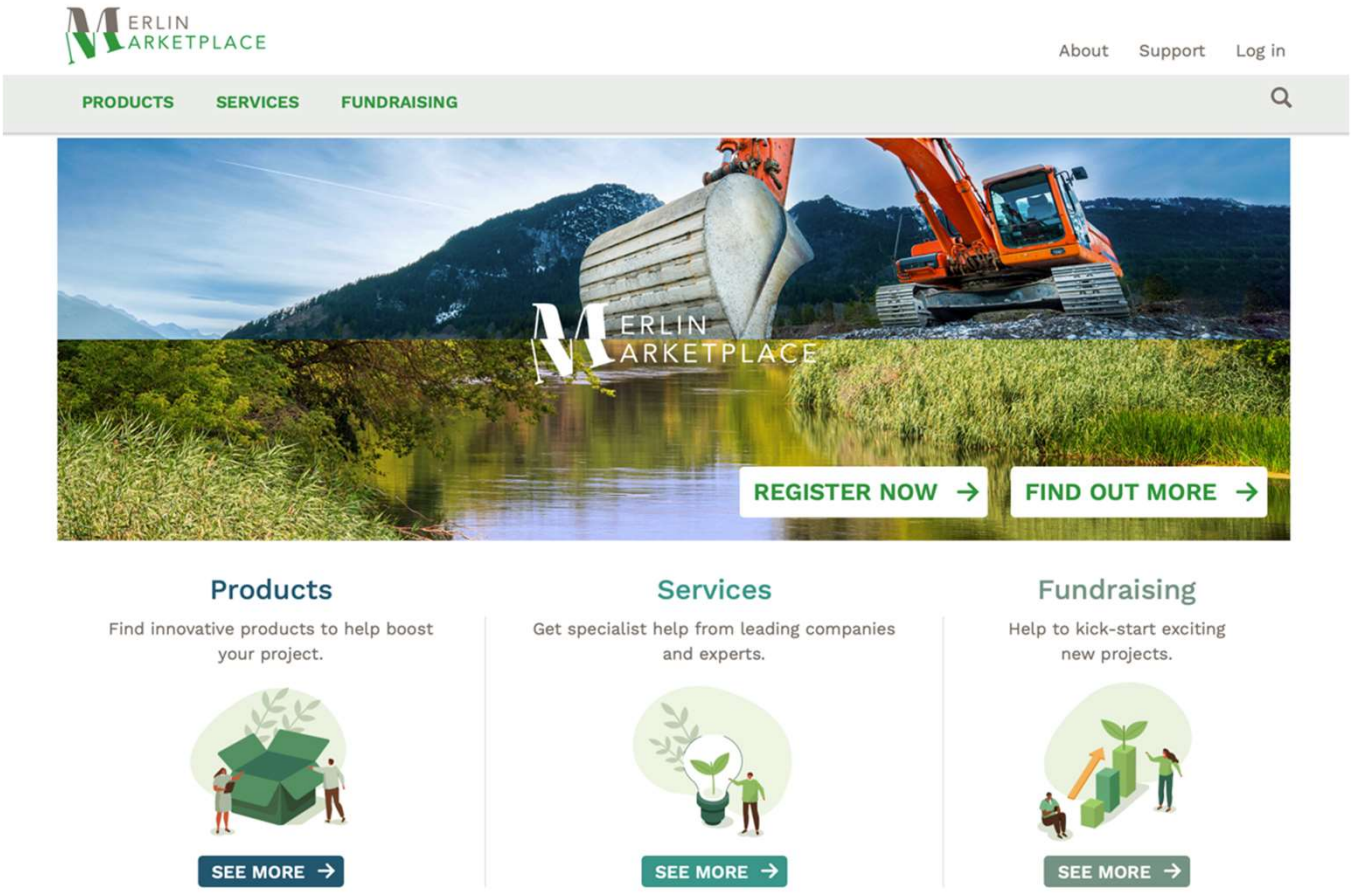
#2: Corporate donations

#3: Tourism and agriculture activities

More to come

https://project-merlin.eu/outcomes/off-the-shelf-instruments.html

www.merlin.market



"Connect the community of practice through a virtual marketplace, which can be used by any interested party to find partners, investors or service providers or to advertise restoration products and services."

Marketplace Phase 2

Building “Community of Practice”

Building "Community of Practice"

"How to mainstream freshwater NbS so that working with nature is for your benefit?"

→ 146 organisations participated from 308 organisations approached

→ ***"Community of Practice" – roles***

- Collaborative action development
- Ongoing knowledge sharing
- Funding application support
- Prominent freshwater involvement
- Broader policy influence

Building "Community of Practice"

Interim key messages

→ Transformation needs **time and political will**.

→ Success comes from **government vision and courage**.

→ Restoration community and sectors must **stay committed**.

→ **Evidence** is built through ongoing projects.

→ Efforts often rely on a **few dedicated individuals**.

Conclusions

→ Scaling Nature-based Solutions / Restoration is a **multi-faceted endeavour**.

→ "**Landscape-scale Restoration**" as a guiding vision sets the direction.

→ Role of innovation projects:
Inspire through best practices.

The MERLIN project (https://project-merlin.eu) has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 101036337.