

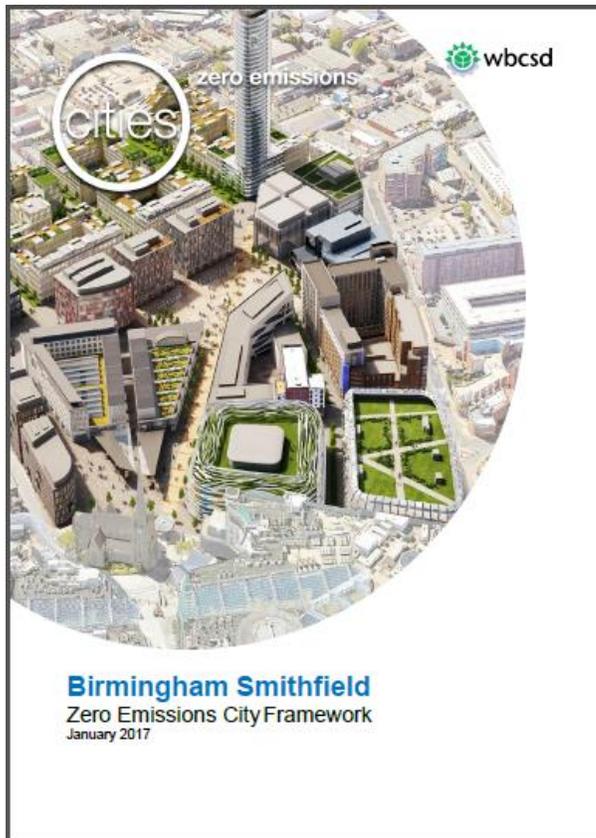
THE BUSINESS CASE FOR NATURAL CAPITAL

ESMERALDA final conference

Gregor Pecnik

Brussels, 12th June 2018

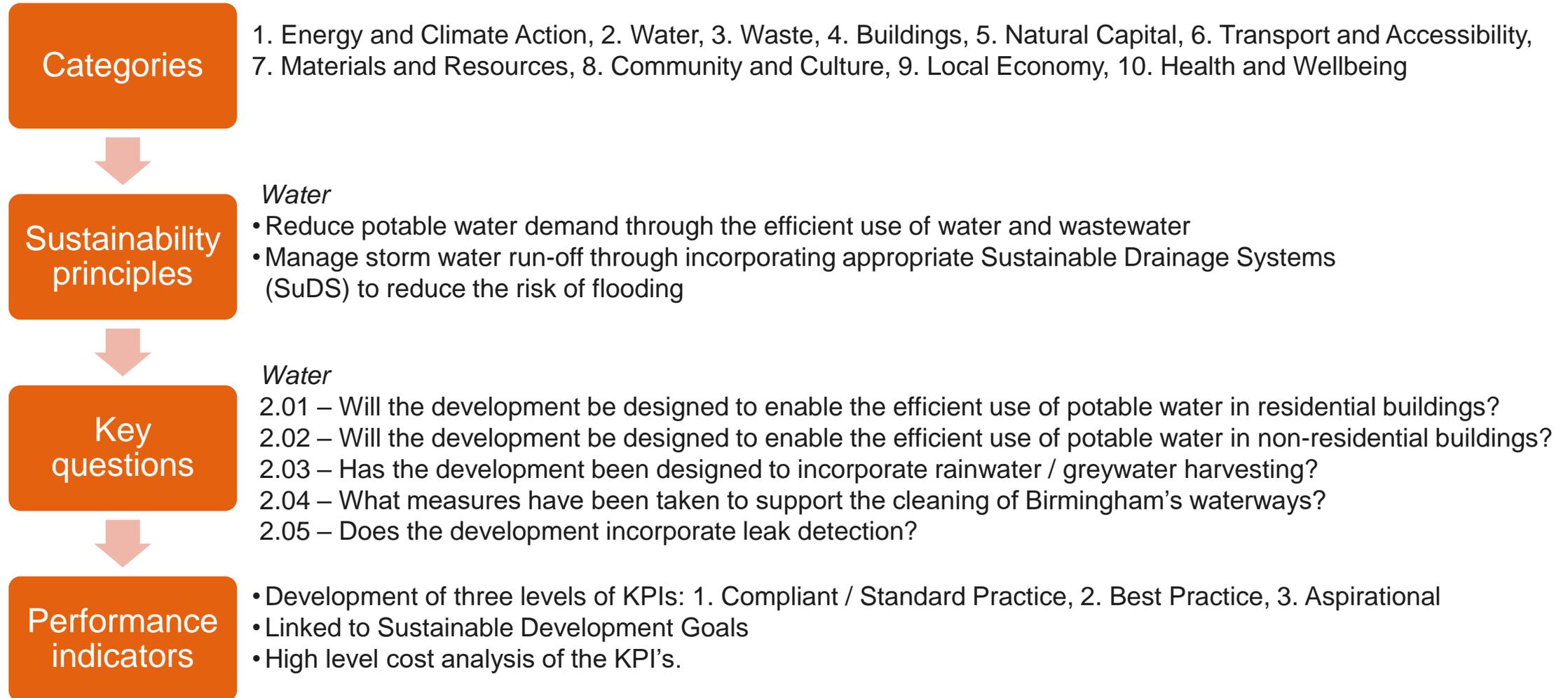
Zero Emission Cities (ZEC) Birmingham Smithfield Development



- Birmingham to position itself as an exemplar sustainable city
- The Smithfield visioning document outlines the requirement for the development to *'meet high standards of sustainable design and construction that will be essential in creating an adaptable environment that will stand the test of time'*
- Development of a sustainability framework for holistic assessment of the Smithfield development and to achieve the aspirations of the scheme and of Birmingham City Council
- Embedding Natural Capital into all of the core sustainability principles
- Identify key interventions to demonstrate their financial viability
- Cost/benefit analysis of green infrastructure solutions

<http://www.wbcSD.org/Projects/Zero-Emissions-Cities>

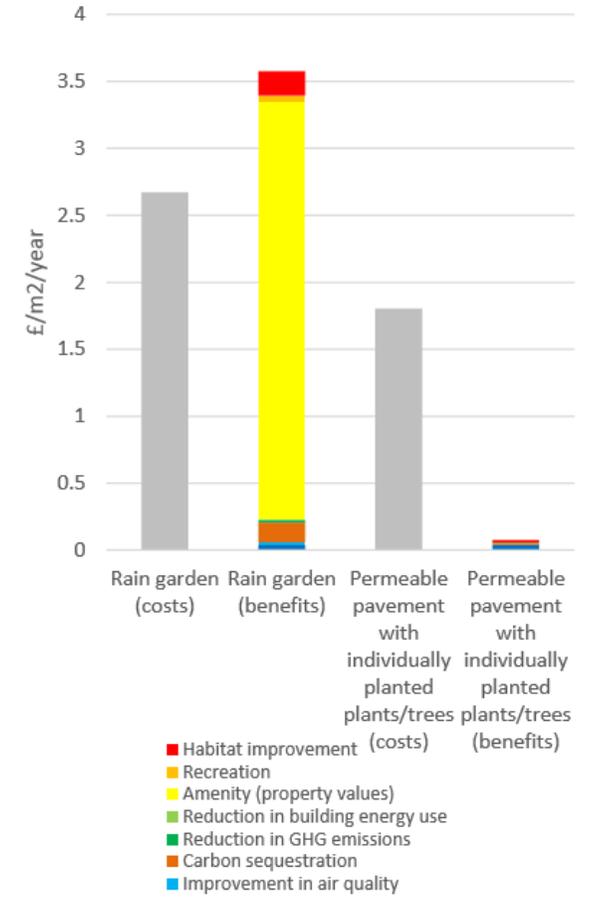
ZEC framework



Integrating Natural Capital into ZEC framework

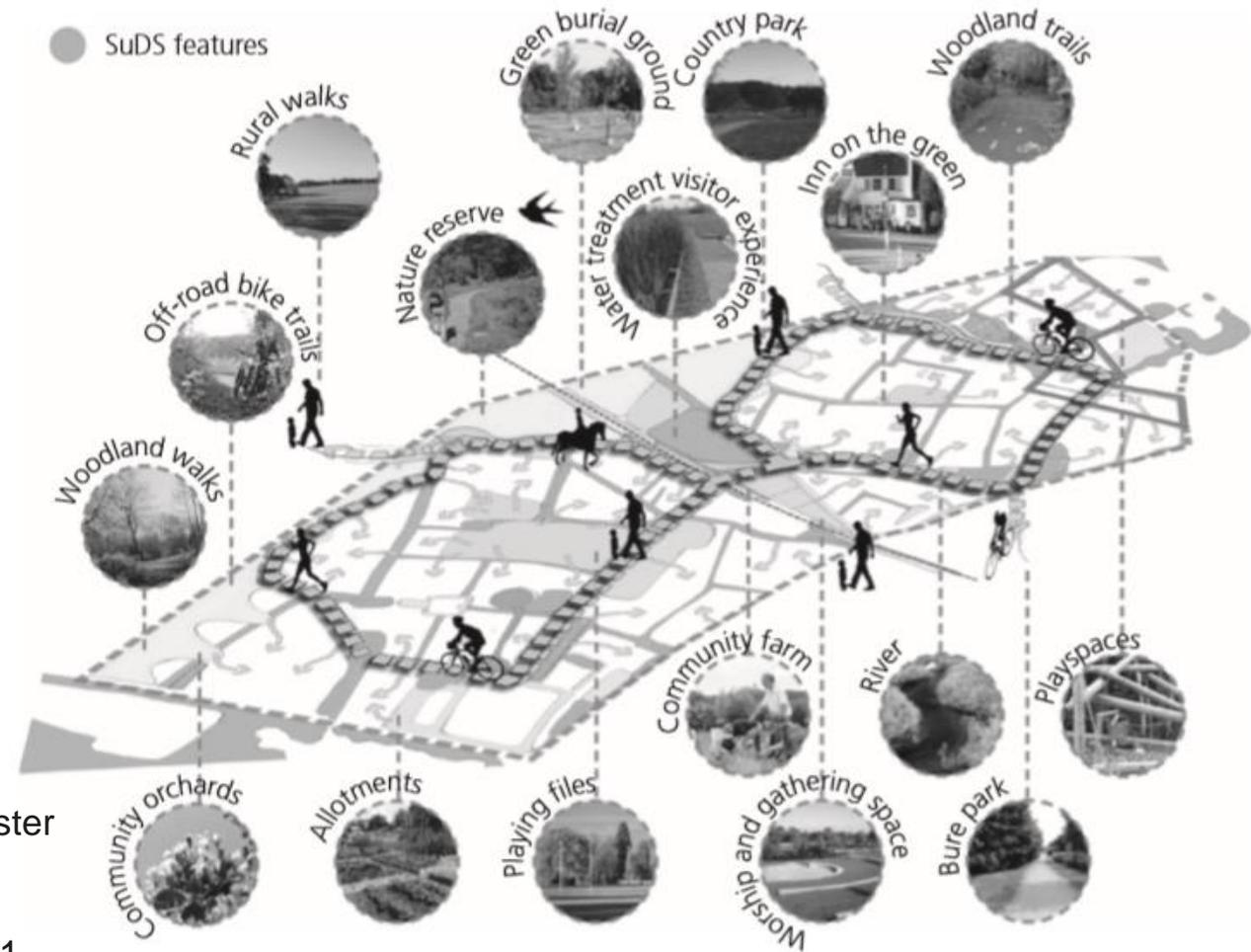
Table 1: Natural capital design benefits supporting the ZEC framework

No.	Framework Principles	NC Design Options		
		Green roof	Rain garden	Pocket park
Energy and Climate Action				
1.02	Has the masterplan been designed to reduce energy consumption?	Yes		
1.05	Will the design of the development consider and respond to the predicted impacts of climate change?	Yes		
1.06	Will the development incorporate measures to avoid overheating and reduce the urban heat island effect?	Yes	Yes	Yes
1.07	Will the development result in an increase in urban greening?	Yes	Yes	Yes
Water				
2.03	Has the development been designed to incorporate rainwater / greywater harvesting?		Yes	
2.05	What measures have been taken to support the cleaning of Birmingham's waterways?	Yes	Yes	
2.07	To what extent has the development been designed to attenuate surface water runoff?	Yes	Yes	
Buildings				
4.02	Will the non-residential buildings within the masterplan deliver high levels of sustainability?	Yes		
4.03	Will the residential buildings within the masterplan deliver high levels of sustainability?	Yes		
Natural Capital				
5.01	Will the development deliver an increase in natural capital and habitat connectivity?			Yes



Natural capital benefits of implementing Sustainable Drainage Systems

- Assessment of the natural capital benefits of sustainable drainage systems (SuDS), for a major eco-town in Oxfordshire.
- 406 ha, 6000 new homes and associated social, commercial and environmental infrastructure.
- The key aims of the project are to respond to climate change, create enjoyable and liveable cities, promote healthy lifestyles, design multi-functional and interconnected green infrastructure, reduce flood risk and maximise multiple benefits.
- Common barriers to the uptake of SuDS include limited evidence in quantification of economic benefits along with maintenance concerns.
- Assessment focusing on the initial 17.5 ha (393 homes)



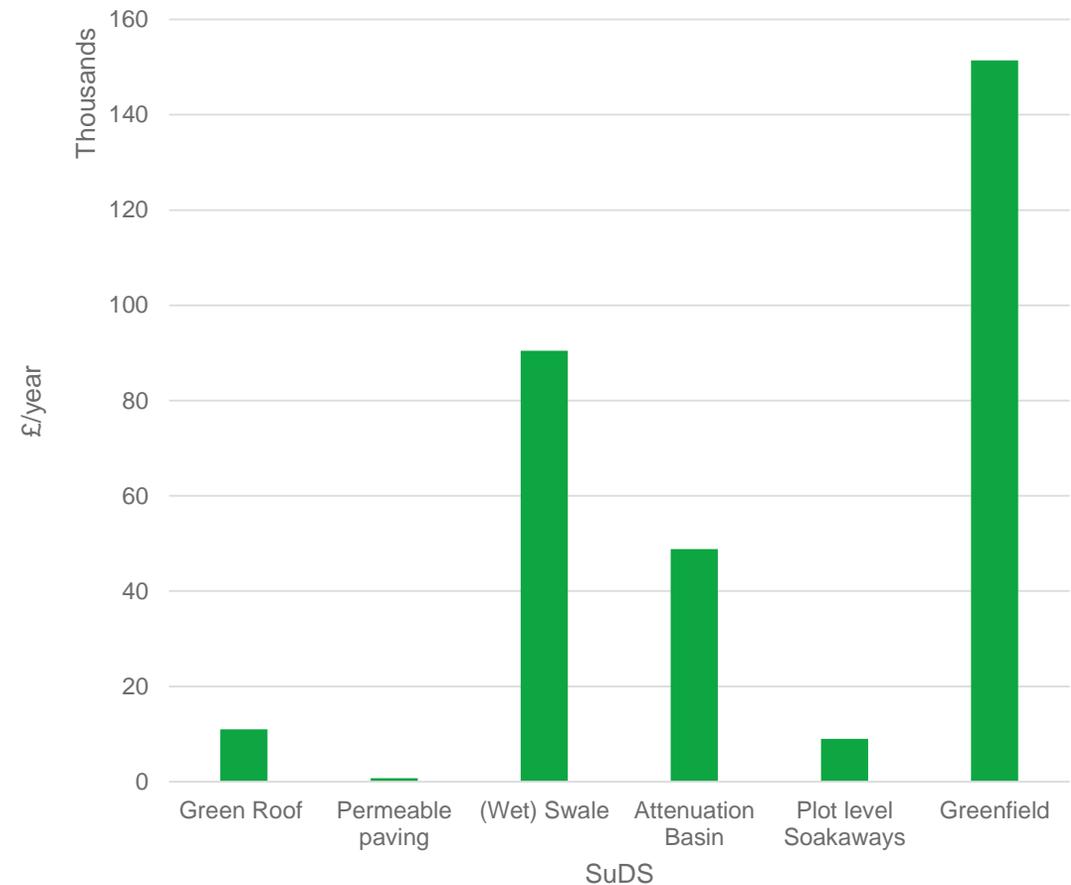
Delivering integrated water management benefits: the North West Bicester development, UK
Gunasekara, Pecnik, Girvan and de la Rosa
Proceedings of the Institution of Civil Engineers Water Management 171
April 2018 Issue WM2 Pages 110–121 Published online 19/02/2018

Overview of NC benefits of SuDS

Table 3. Overview of the NC benefits of SuDS and how they were estimated. While not exhaustive, the table indicates some of the most important benefits provided by SuDS

NC benefit	Qualification	Quantification	Monetisation
Regulating services			
Reduction in flooding	✓		
Reduction of water treatment needs	✓	✓	✓
Improvement in water quality	✓		
Increase in groundwater recharge	✓	✓	
Reduction in noise pollution	✓		
Improvement in air quality	✓	✓	✓
Reduction in energy use	✓	✓	✓
Reduction in GHG emissions	✓	✓	✓
Carbon dioxide sequestration	✓	✓	✓
Reduction in urban heat island effect	✓		
Cultural services			
Health and wellbeing	✓		
Improvement in aesthetics/amenity	✓	✓	✓
Increase in recreational opportunities	✓	✓	✓
Provision of educational opportunities	✓		
Supporting services			
Improvement in habitat (biodiversity)	✓	✓	✓
Other benefits			
Traffic calming	✓		
No delays in the planning application process	✓		
Functional resilience of SuDS	✓		
Increased brand value	✓		

Total benefits provided by different SuDS used (in £ per annum) for NW Bicester Exemplar Site



NB: the results take into account the overall area of each feature.

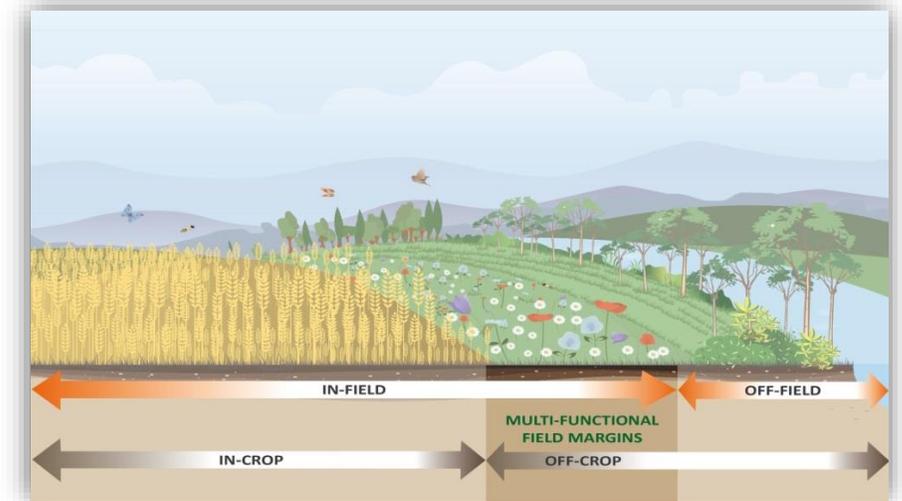
Design and Planning: Silvertown Tunnel Crossing EIA

- Nationally Significant Infrastructure Project linking the Greenwich Peninsula and Silvertown in London
- Urban brownfield habitat is undervalued in terms of biodiversity and Natural Capital.
- Brownfield sites are prime development target in London and provide a unique habitat for rare and notable species
- Calculated Natural Capital value of affected habitats
- Capital sum negotiated for offsetting to be spent as directed in the Biodiversity Action Plan.



Functional Agro-biodiversity Multi-Functional Field Margins (MFFMs)

- Improving agricultural biodiversity (ABD) is critical for sustainable land management
- ABD can be boosted through MFFMs where less productive and marginal farmland is used to
 - provide habitat and wildlife corridors that facilitate the movement of seeds and animal species, reduce soil erosion, and attract pollinators and predatory invertebrates as natural pest control.
 - provide benefits to the society (e.g. amenity value)
 - without sacrificing agricultural productivity.
- The whole landscape approach delivers social benefits and business value.
- Promoting MFFM requires multi-stakeholders support and scientific evidence.

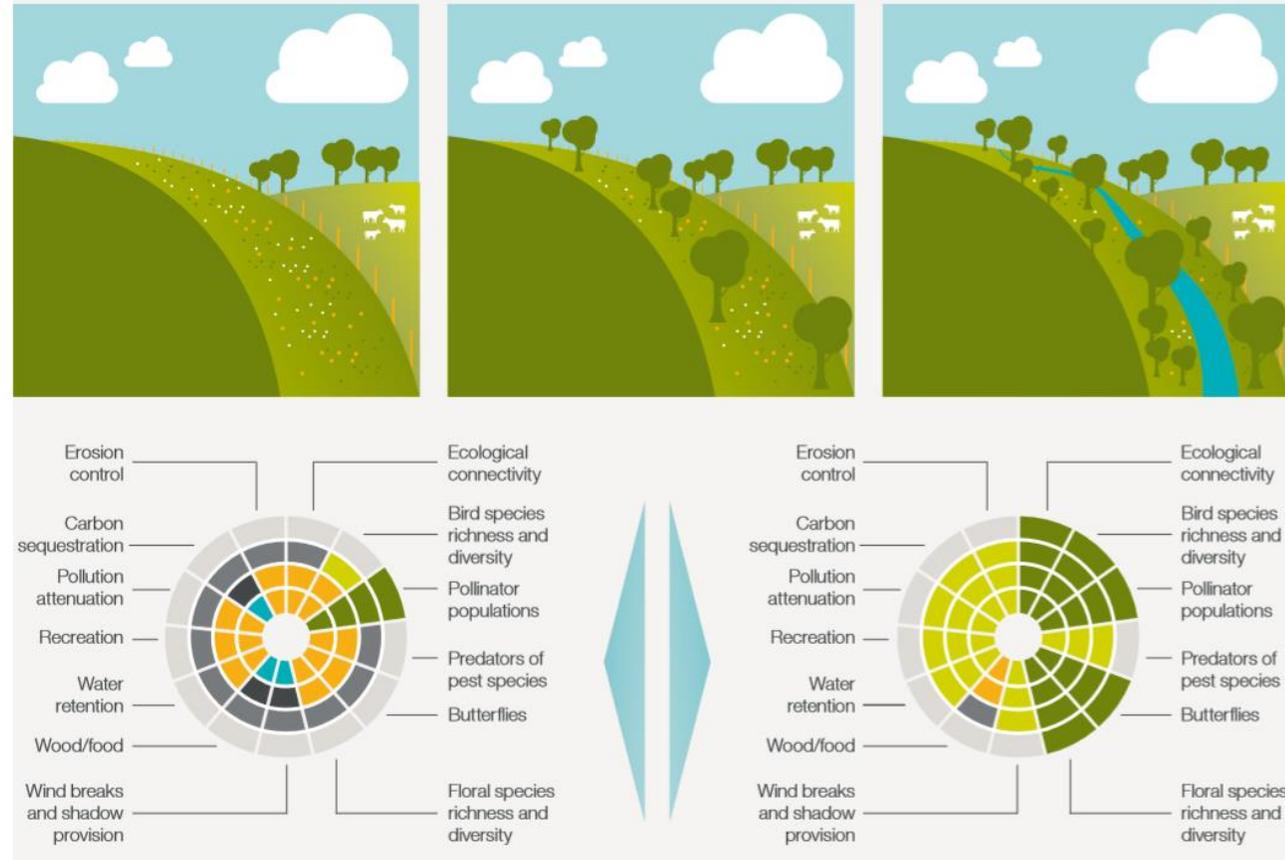


How to measure the contribution of MFFMs to natural and social capital benefits?

- Marginal lands are valuable for habitat and food provision
- We have:
 - examined the implementation protocols of MFFM,
 - carried out wide-ranging discussions and interviews with various stakeholders
 - reviewed the extensive scientific literature available.
- The project resulted in:
 - Development of new guidelines on the design, implementation, monitoring and management of MFFMs (e.g. how should MFFMS be designed to enhance certain NC benefits),
 - Development of the global MFFM protocol
 - Showing which approaches are likely to achieve highest business value for farmers while enhancing biodiversity and providing broader societal benefits.

Figure 2

Graph showing relative biodiversity density of MFFMs and associated benefits²³



CONTACTS



Martina Girvan

Technical Director Ecology, Global Natural Capital
Community of Practice Leader
Martina.Girvan@arcadis.com



Johan Lammerant

Lead Natural Capital and Biodiversity Expert
Johan.Lammerant@arcadis.com



Gregor Pecnik

Environmental Economist
Gregor.Pecnik@arcadis.com

<https://www.arcadis.com/en/global/our-perspectives/making-natural-capital-count/>