Agriculture and Biodiversity

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Land Utilisation:

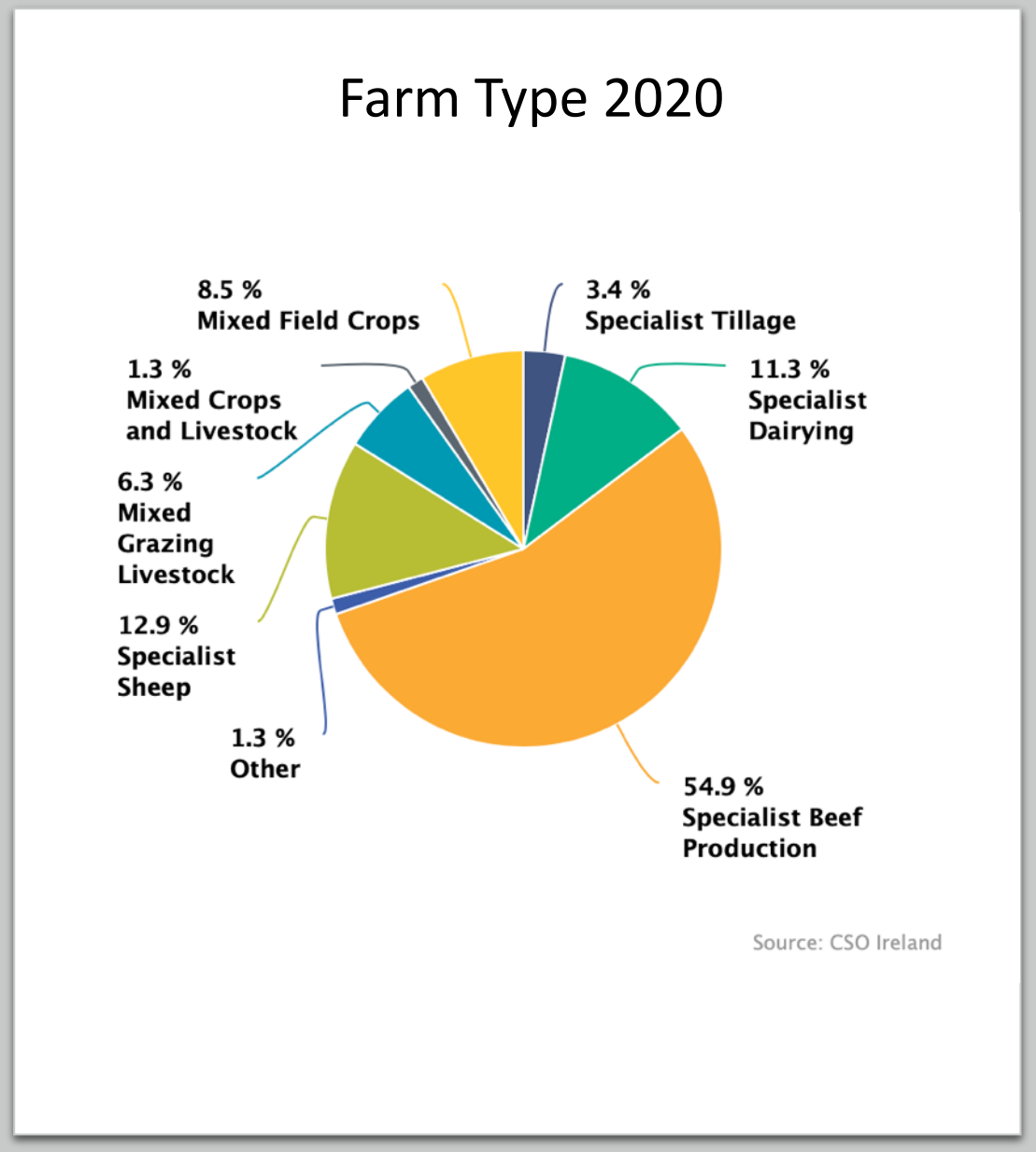
- >135,000 farms
- Accounts for ≈68% of land area (CORINE, 2018)
  - 82% grassland
  - 10% rough grazing
  - 6% cereals
  - 2% horticulture and other crops
- National average farm size 33.4ha
- 7.3 million cattle
- 5.5 million sheep

CSO, 2020

Agri-food sector:

- 163,600 people employed 2020 (7.1% of total employment)
- Beef, dairy and sheep ∽80% farms
- Accounts for 9% of exports in value terms
- 38% of total indigenous exports

DAFM, 2021



Creamer et al., 2016

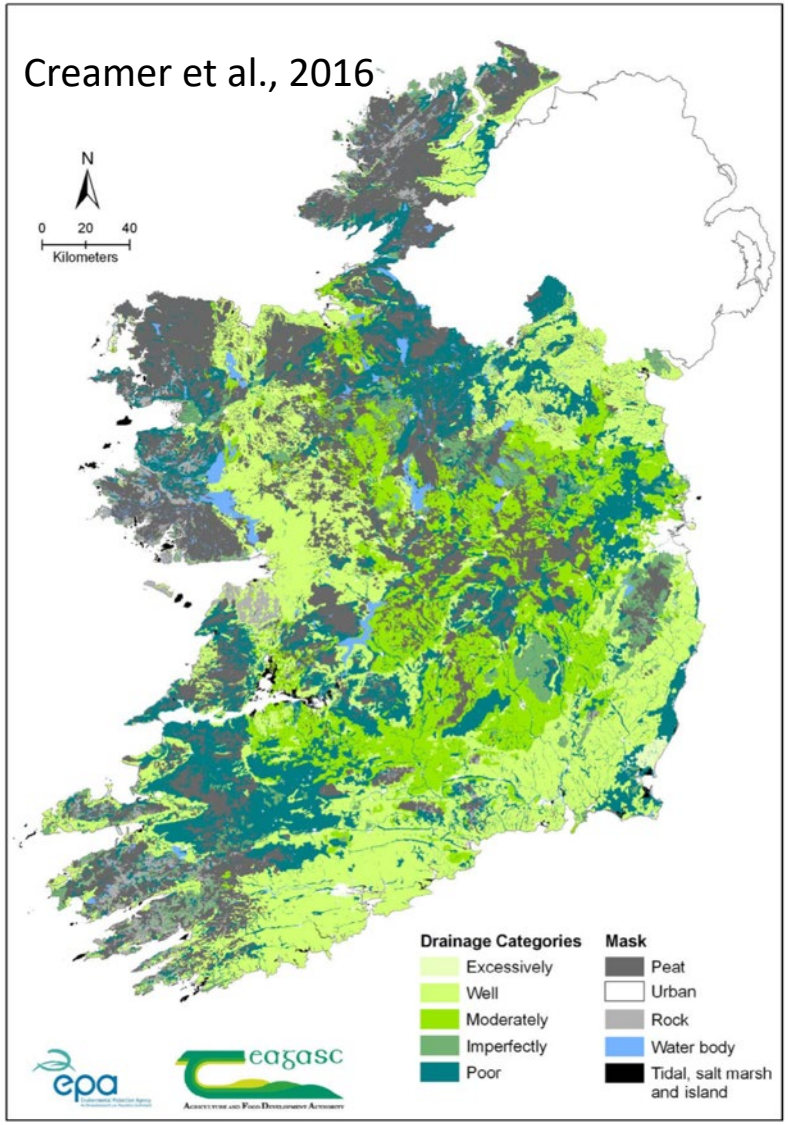
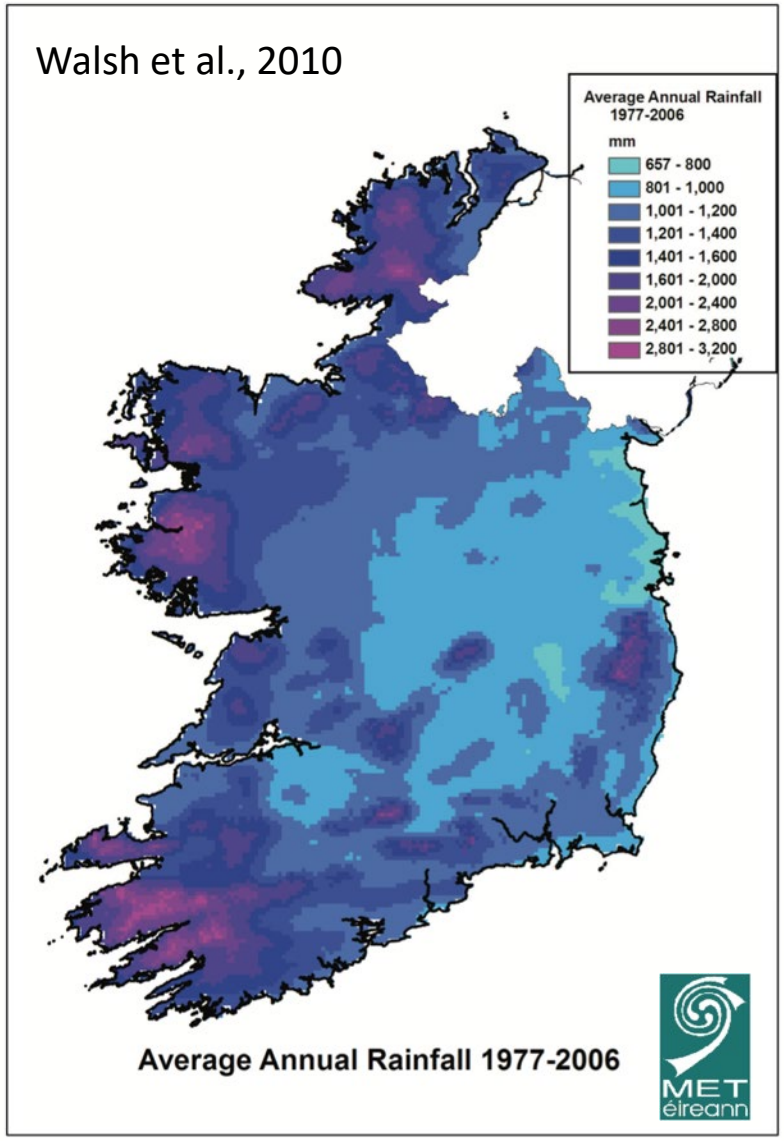


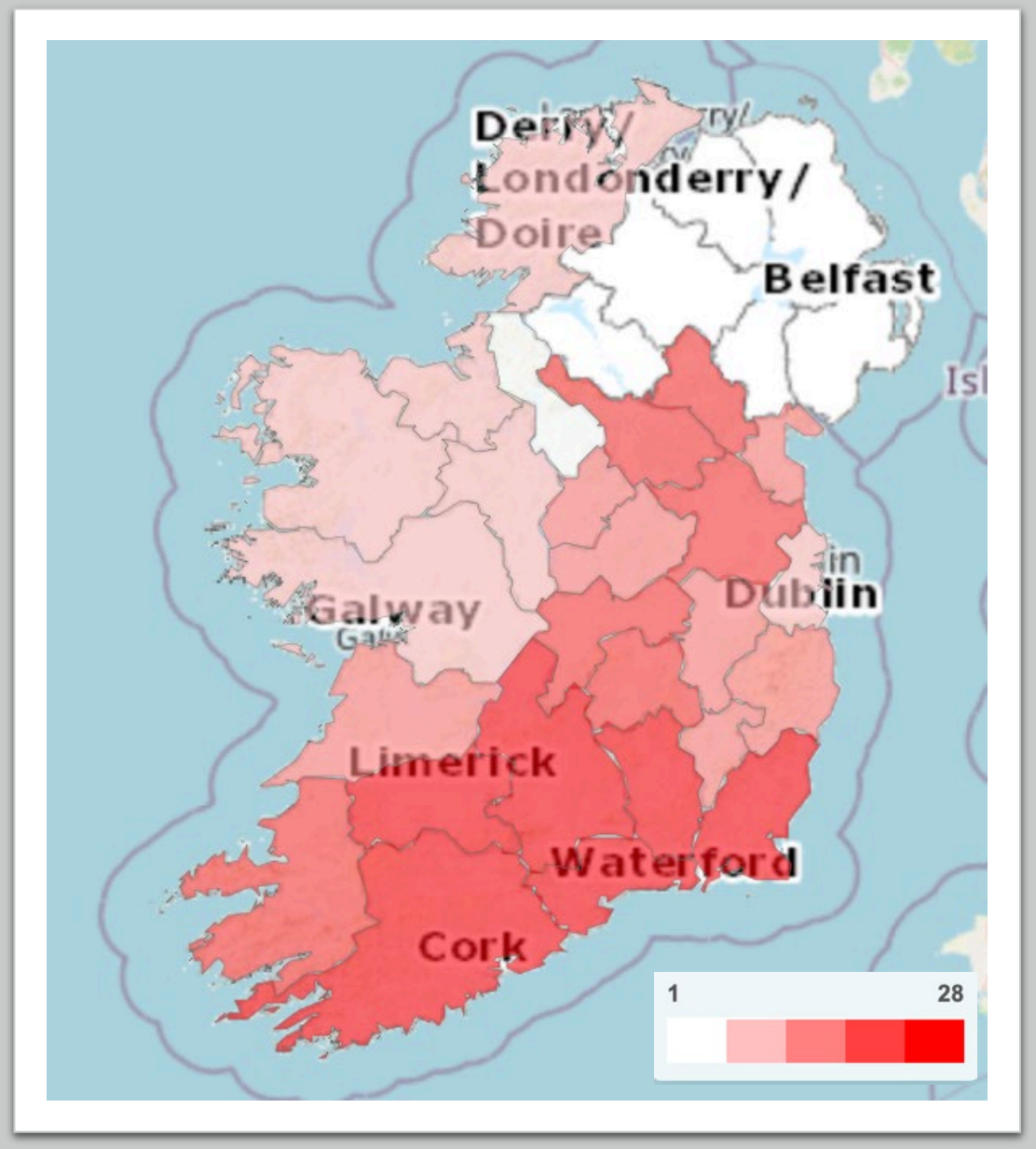
Figure 2.1. Indicative soil drainage map of agricultural soils in Ireland.

Walsh et al., 2010



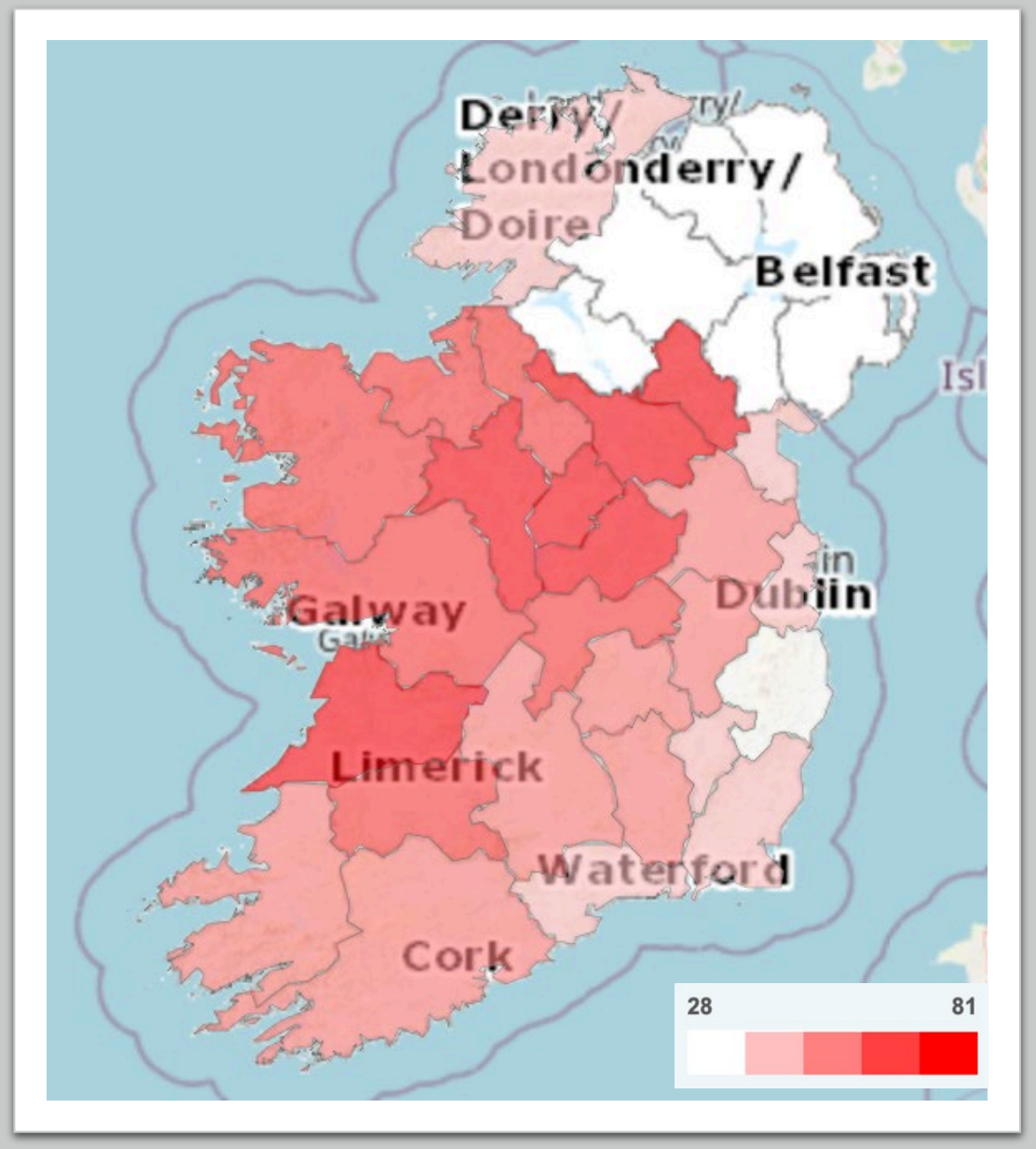
Dairy farming:

- ∽15,300 specialist dairy farms
- 70% located in southern region
- National herd = 1.6m
- Average farm size 65 ha
- Average herd size 90 (CSO, 2020)
- In 2020, dairy exports accounted for 36% or €5.1 billion of all agri-food products exported (DAFM, 2021).



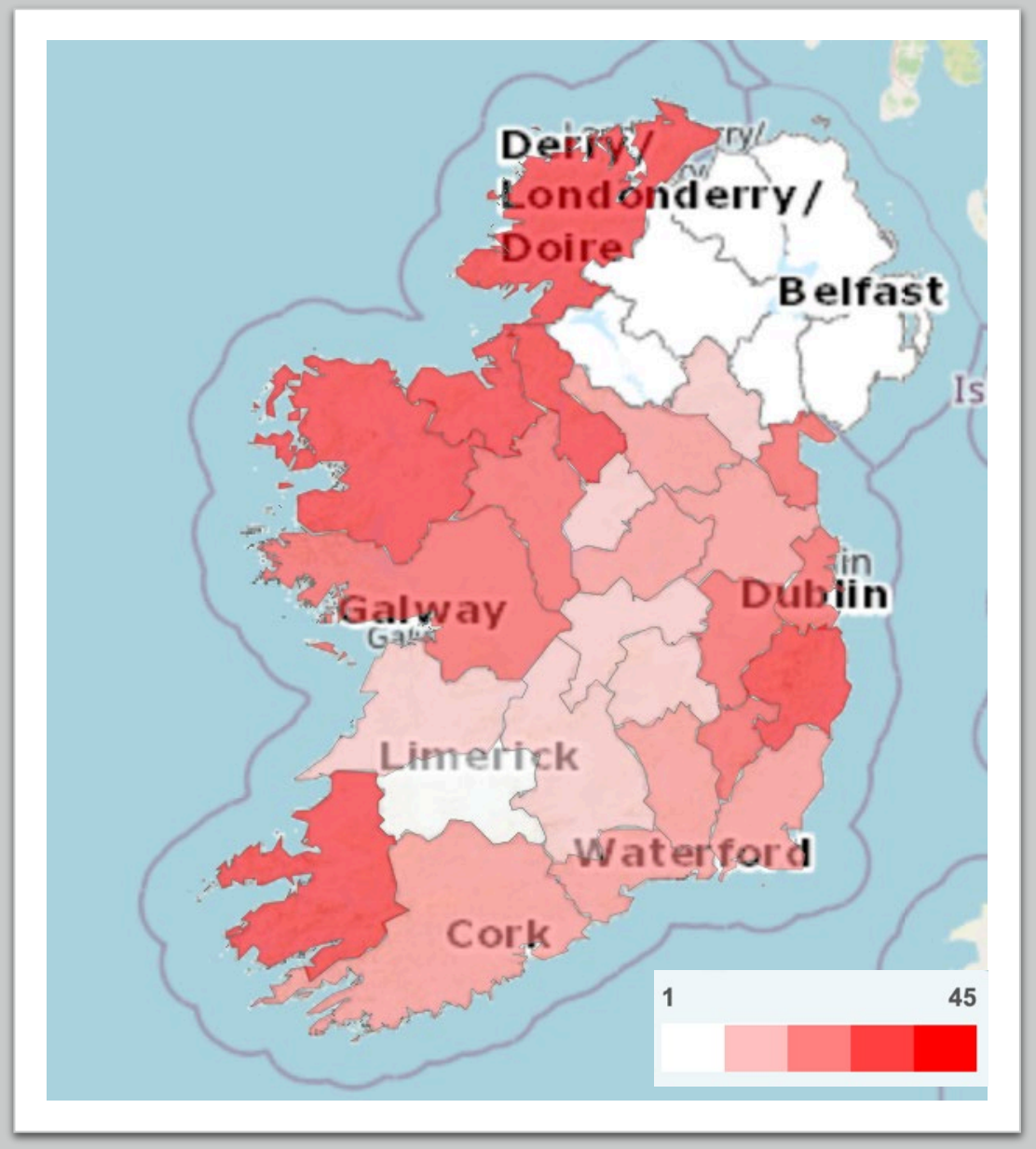
Beef farming:

- ∽74,000 specialist beef farms
- 60% of beef farms in BMW region
- Average farm size 27ha
- Average suckler herd = 15 (CSO, 2020)
- Beef exports of €2.3 billion in 2020 (DAFM, 2021)



Sheep farming:

- ∽17,500 specialist sheep farms
- 64% in northern and western region
- National flock ∽5.5million
- Average farm size 29ha (CSO, 2020)
- Exports worth approx. €356 million in 2020 (DAFM, 2021)

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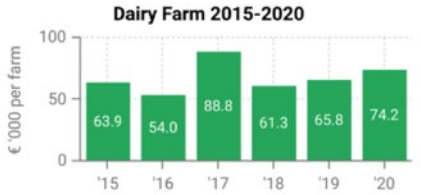
Farm income by system 2020:

Dairy Farm Average 2020

€74,249

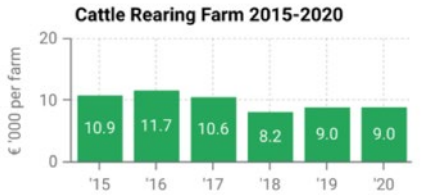
Farm Size 60 ha



Cattle Rearing Farm Average 2020

€9,043

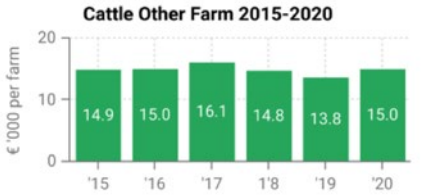
Farm Size 31 ha



Cattle Other Farm Average 2020

€15,023

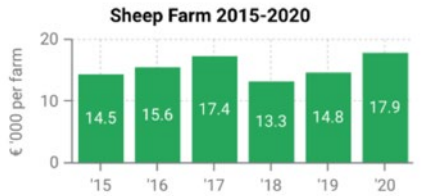
Farm Size 37 ha



Sheep Farm Average 2020

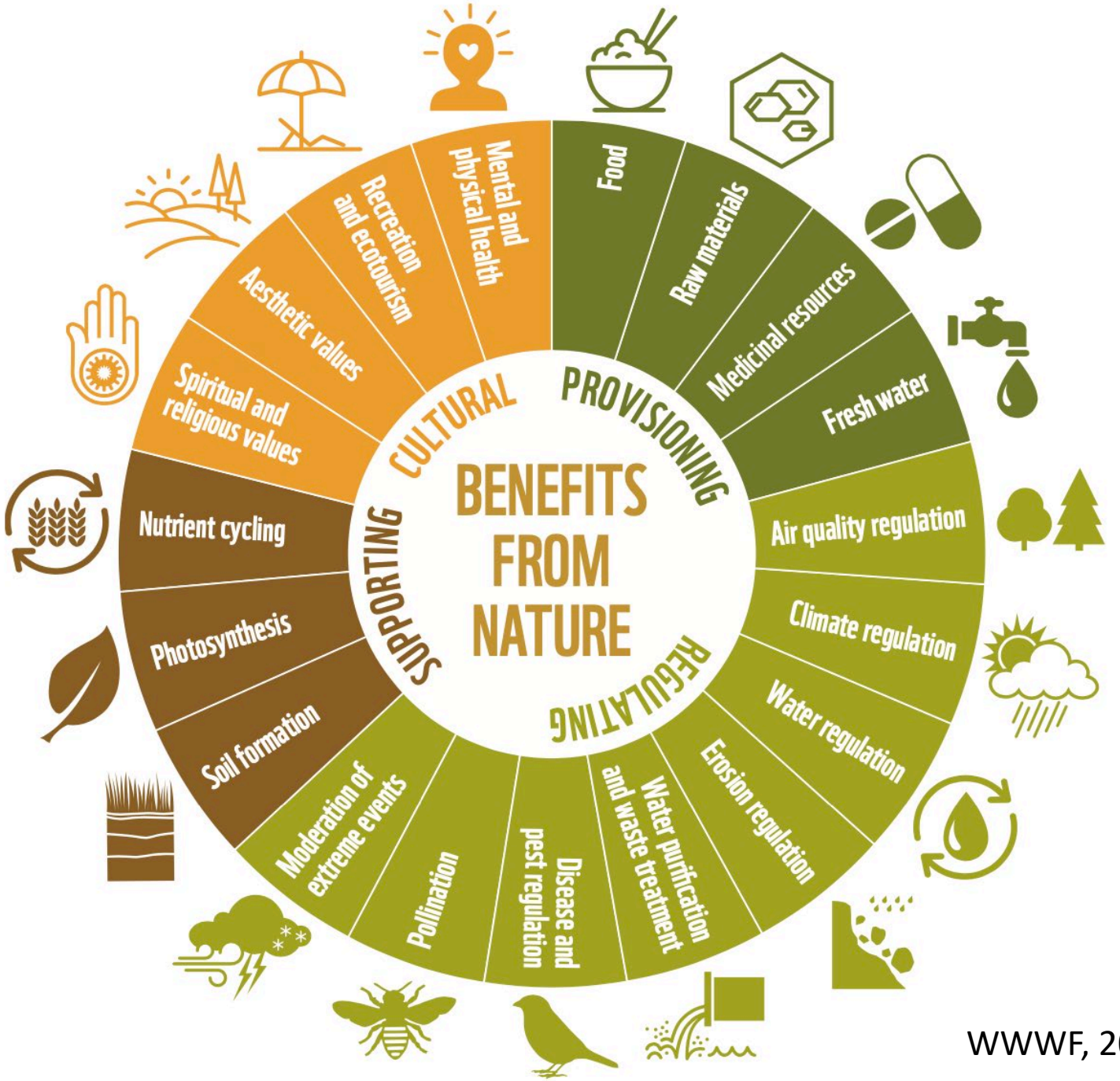
€17,913

Farm Size 44 ha

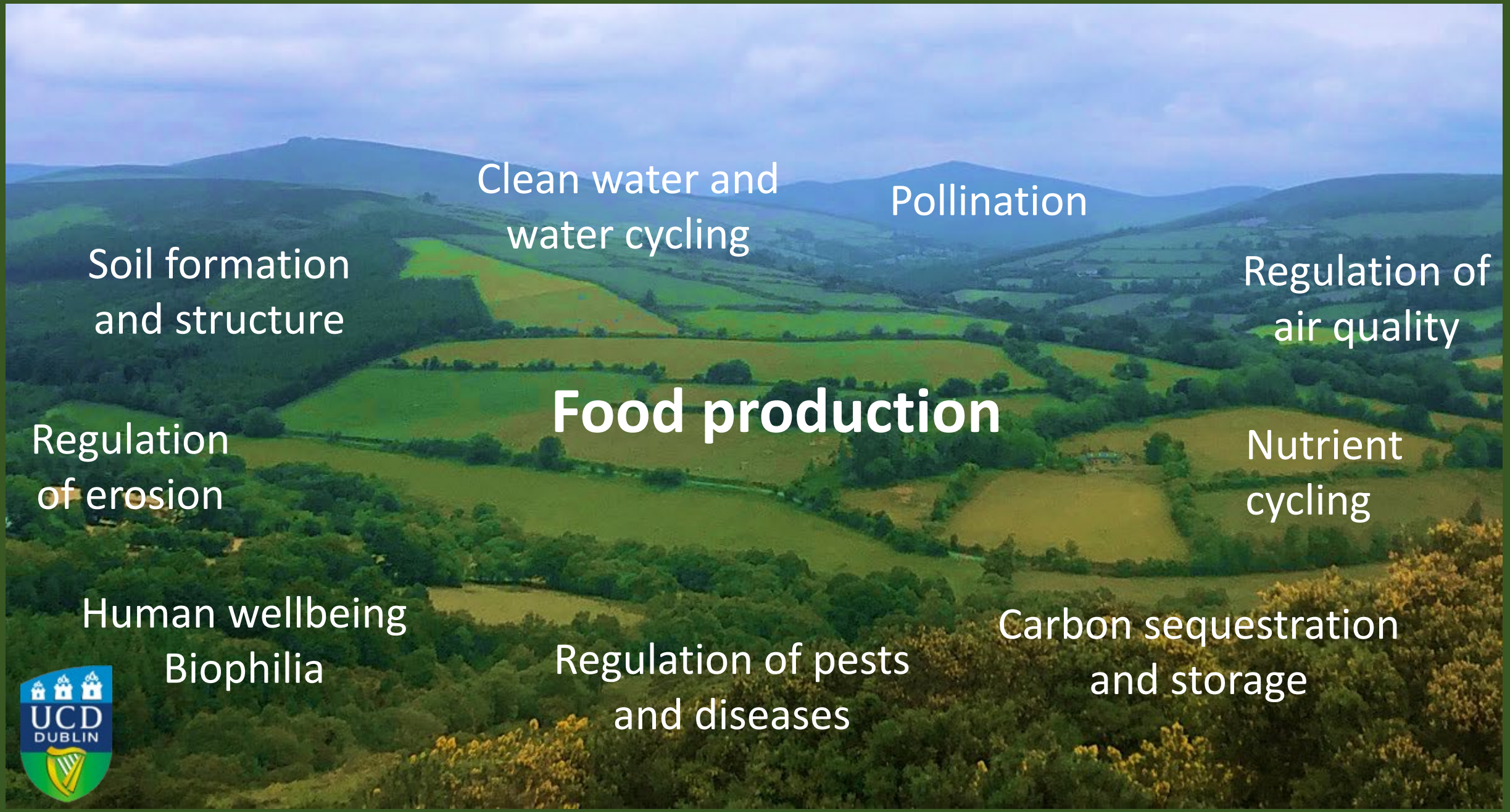


Not just nice to have!

- Biodiversity and the ecosystem services that it facilitates the delivery of, fundamentally underpin the sustainability of our agricultural production systems



WWWF, 2018


Clean water and water cycling
Pollination
Soil formation and structure
Regulation of air quality
Food production
Regulation of erosion
Nutrient cycling
Human wellbeing Biophilia
Carbon sequestration and storage
Regulation of pests and diseases
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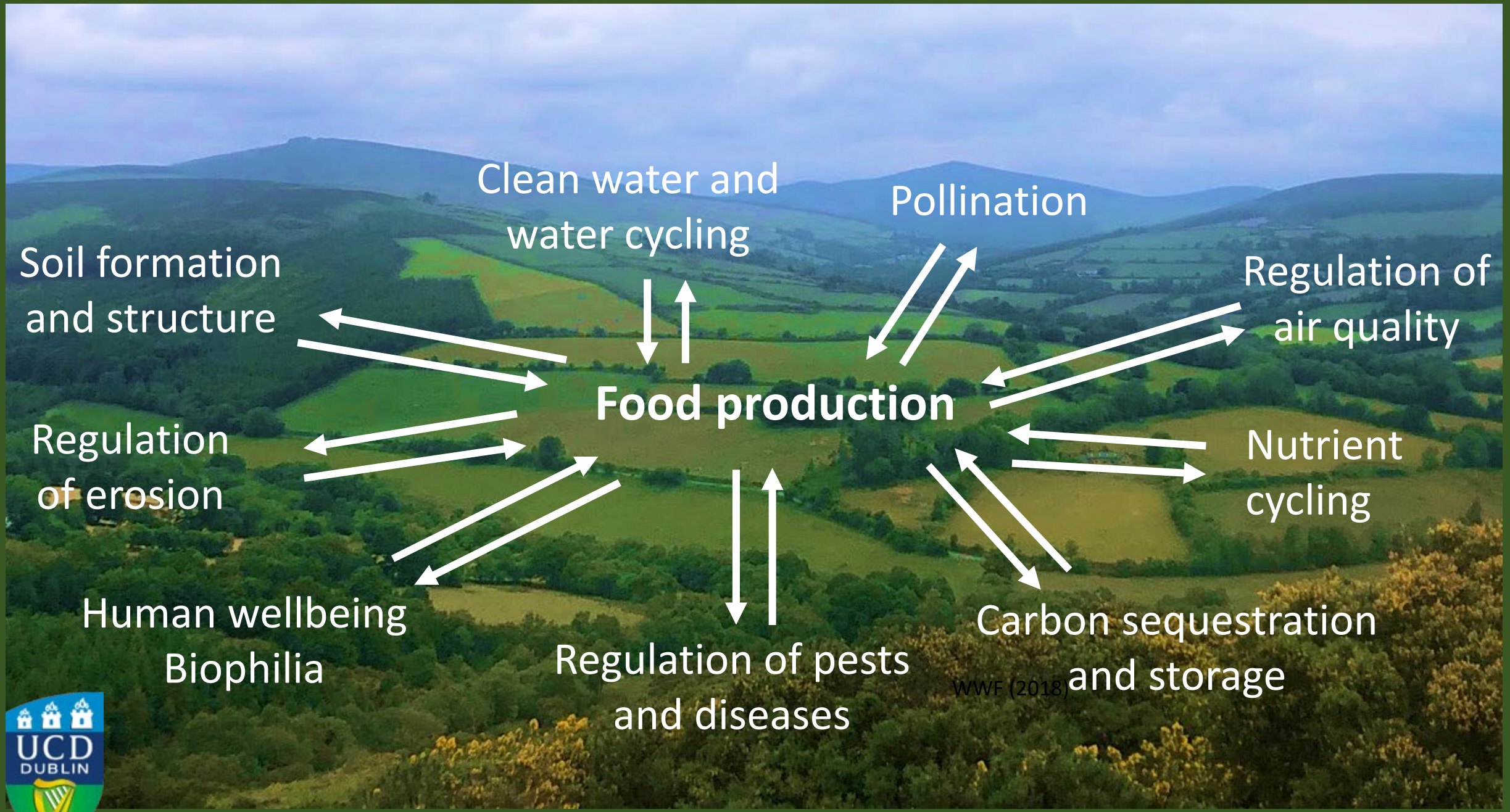
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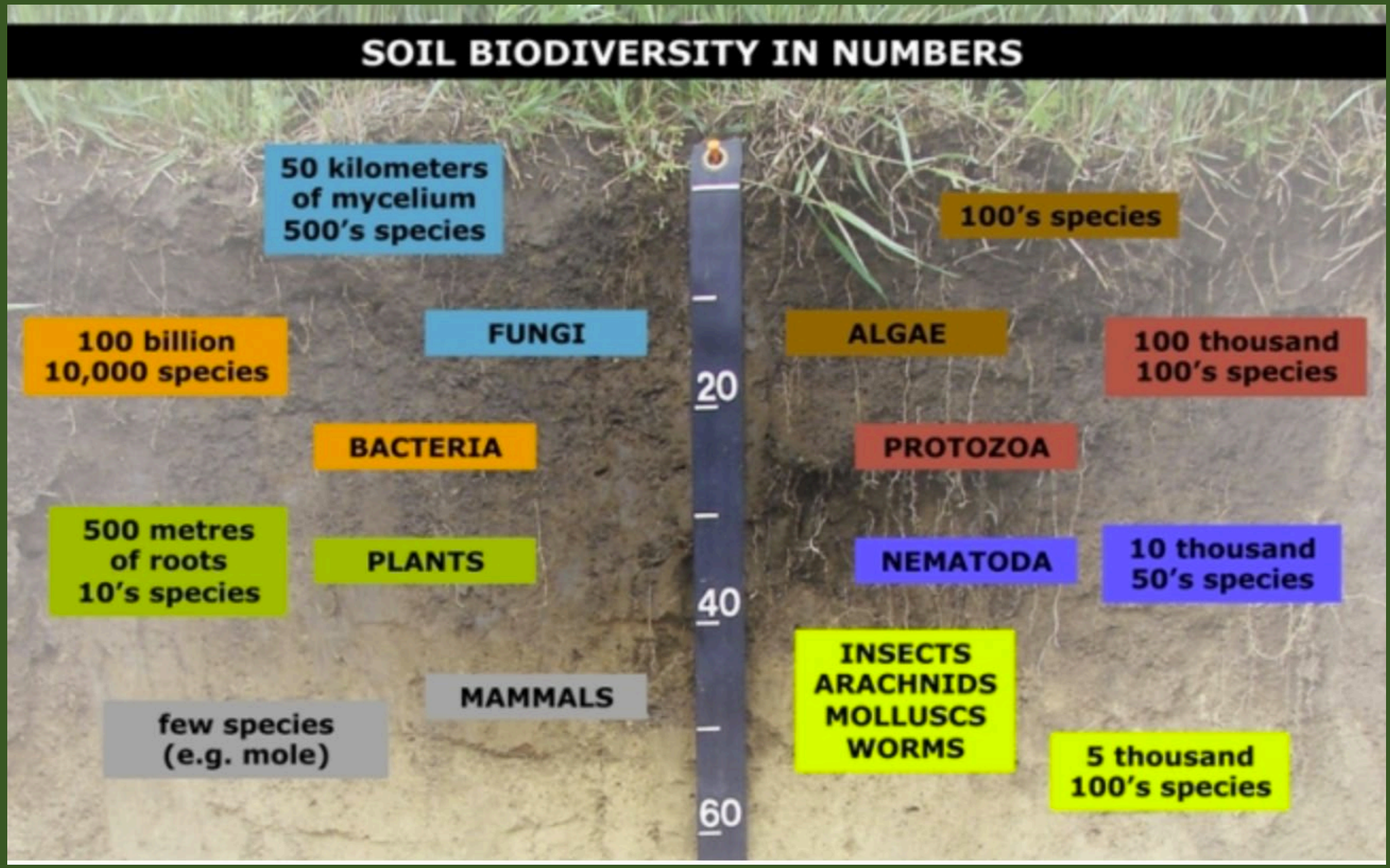
Carbon sequestration and storage
WWF (2018)



https://esdac.jrc.ec.europa.eu/themes/soil-biodiversity

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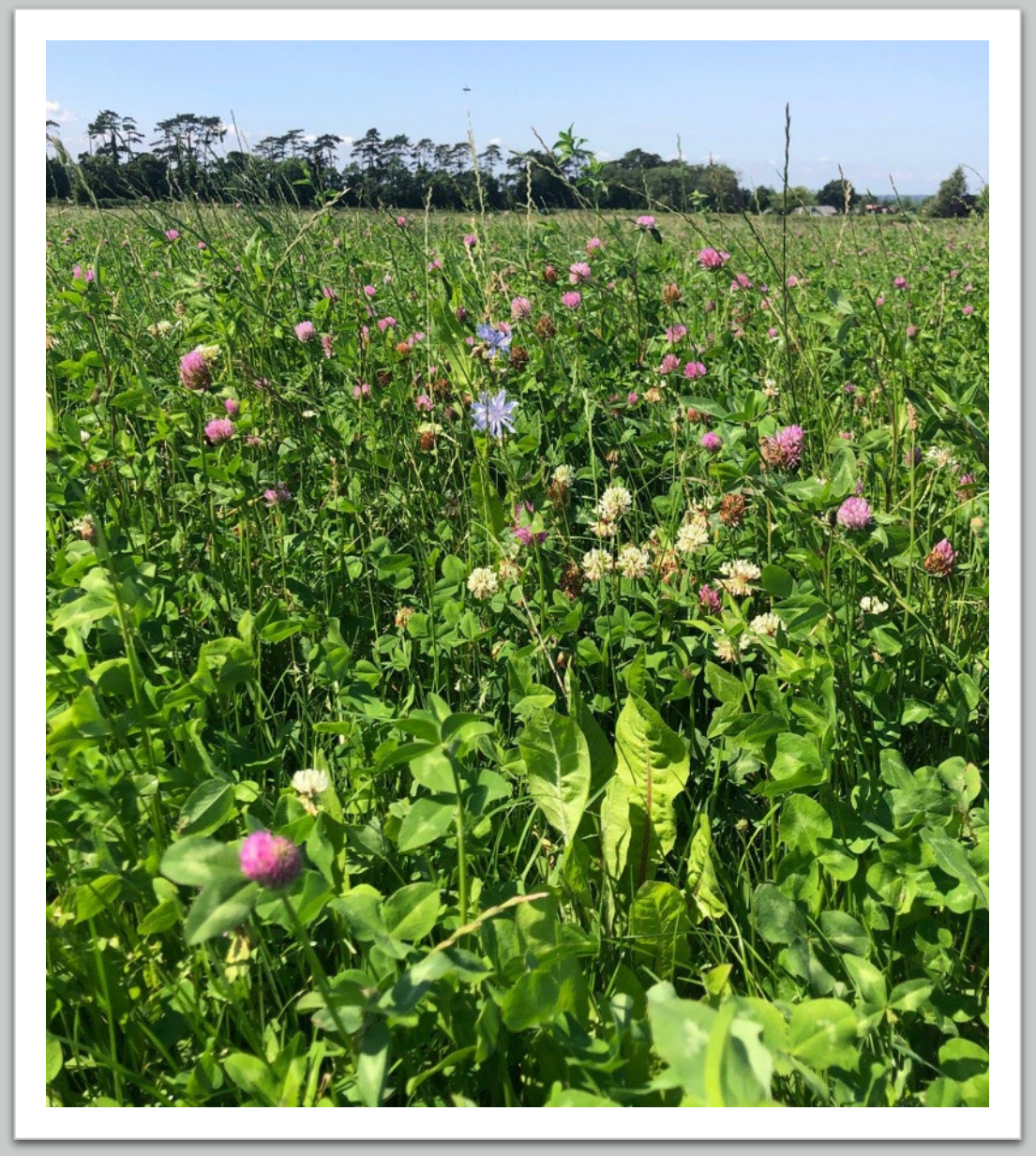
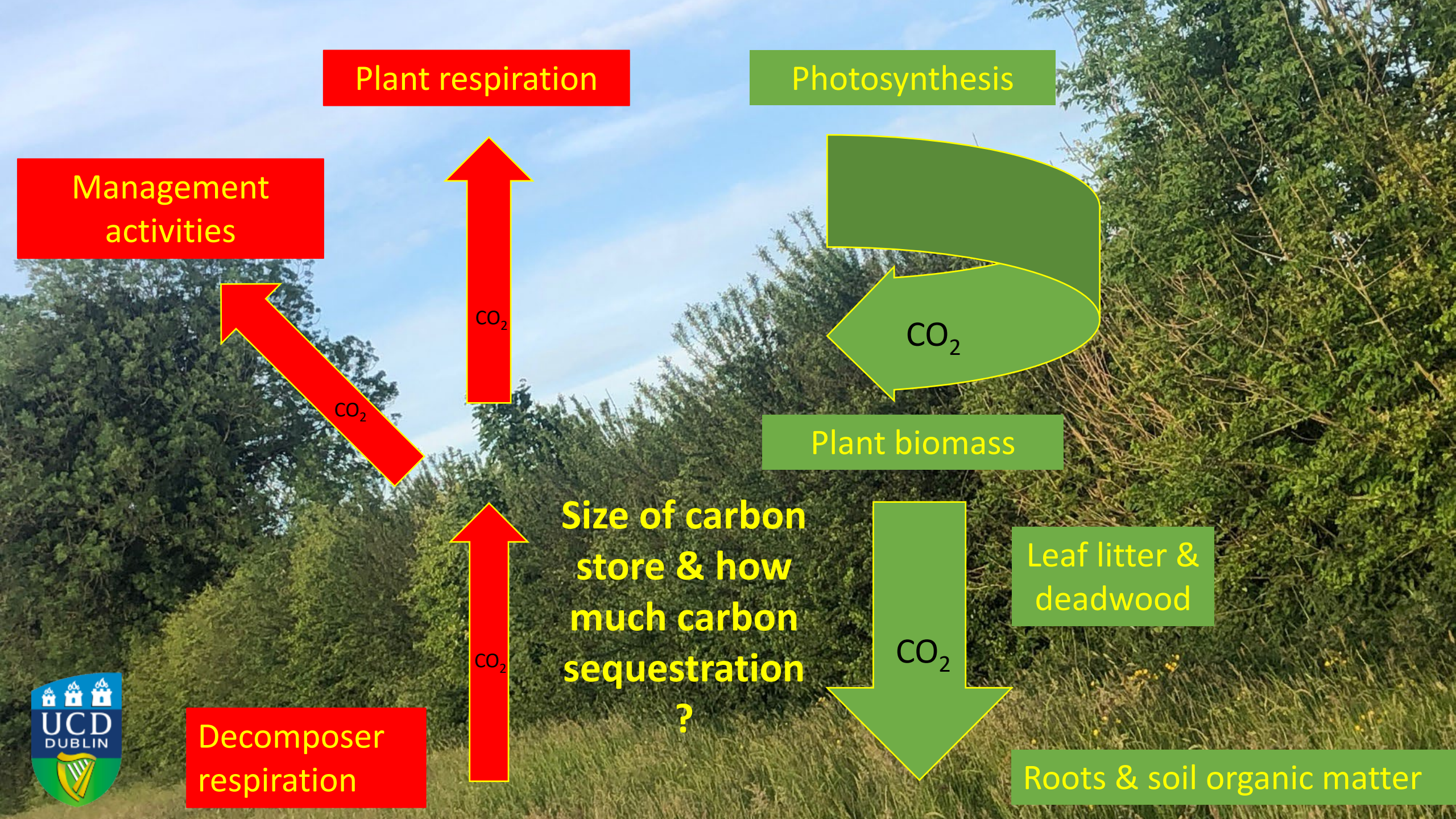
Examples of services facilitated through soil biodiversity

- Nutrient and carbon cycling
- Regulation of water movement
- Soil formation, structure and maintenance
- Regulation of pests
- Climate regulation



Multispecies v's monoculture swards

- Reduce fertilizer N inputs
- Increase grass production
- Increase animal performance and accelerate slaughter date
- Reduce anthelmintic inputs
- Enhance biodiversity
- Reduce carbon footprint
- Enhance resilience


Plant respiration
Photosynthesis
Management activities
CO_2
CO_2
CO_2
Plant biomass
Size of carbon store & how much carbon sequestration ?
CO_2
Leaf litter & deadwood
CO_2
Decomposer respiration
Roots & soil organic matter
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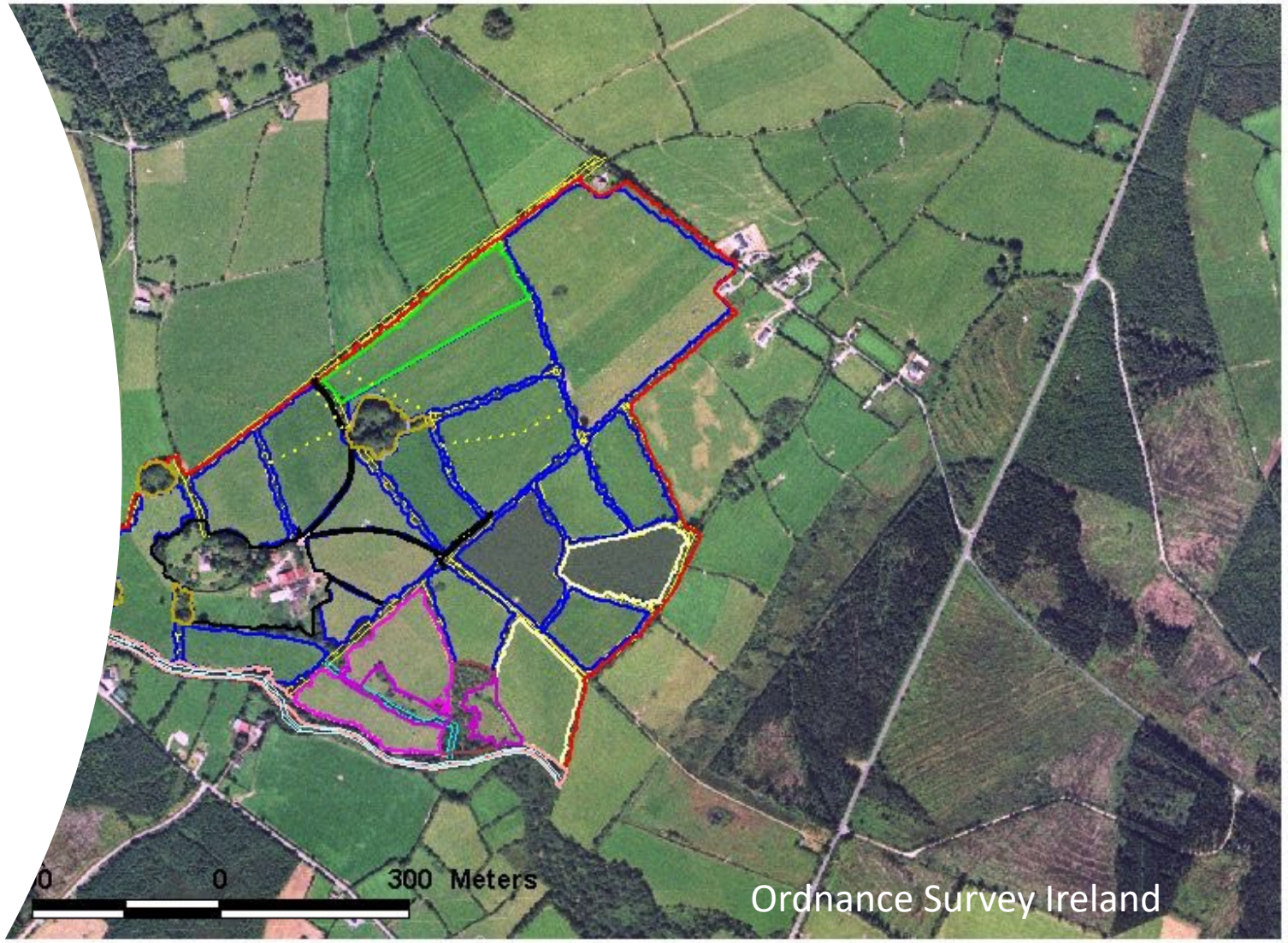
Hedgerow capacity to sequester carbon:

- 1 tonne Carbon ≈ 3.67 tonnes CO_2 equivalent
- Carbon store
  - Above ground - between 32.2 and 40 t C/ha
  - Below ground – 38.2 t C/ha (Axe et al., 2017)

- Carbon sequestration
  - Hedgerow and non-forest woodland can potentially sequester 0.66-3.3 t CO_2/ha/yr (Black et al., 2014).

Farm Habitat Surveys

- **AgBiota** (EPA) – 50 pastoral farms (East and south-east)
- **Agri-Baseline** (DAFM) – 118 pastoral farms (Sligo-Leitrim, Offaly-Laois, N. Cork)
- Total land area = 6265 ha



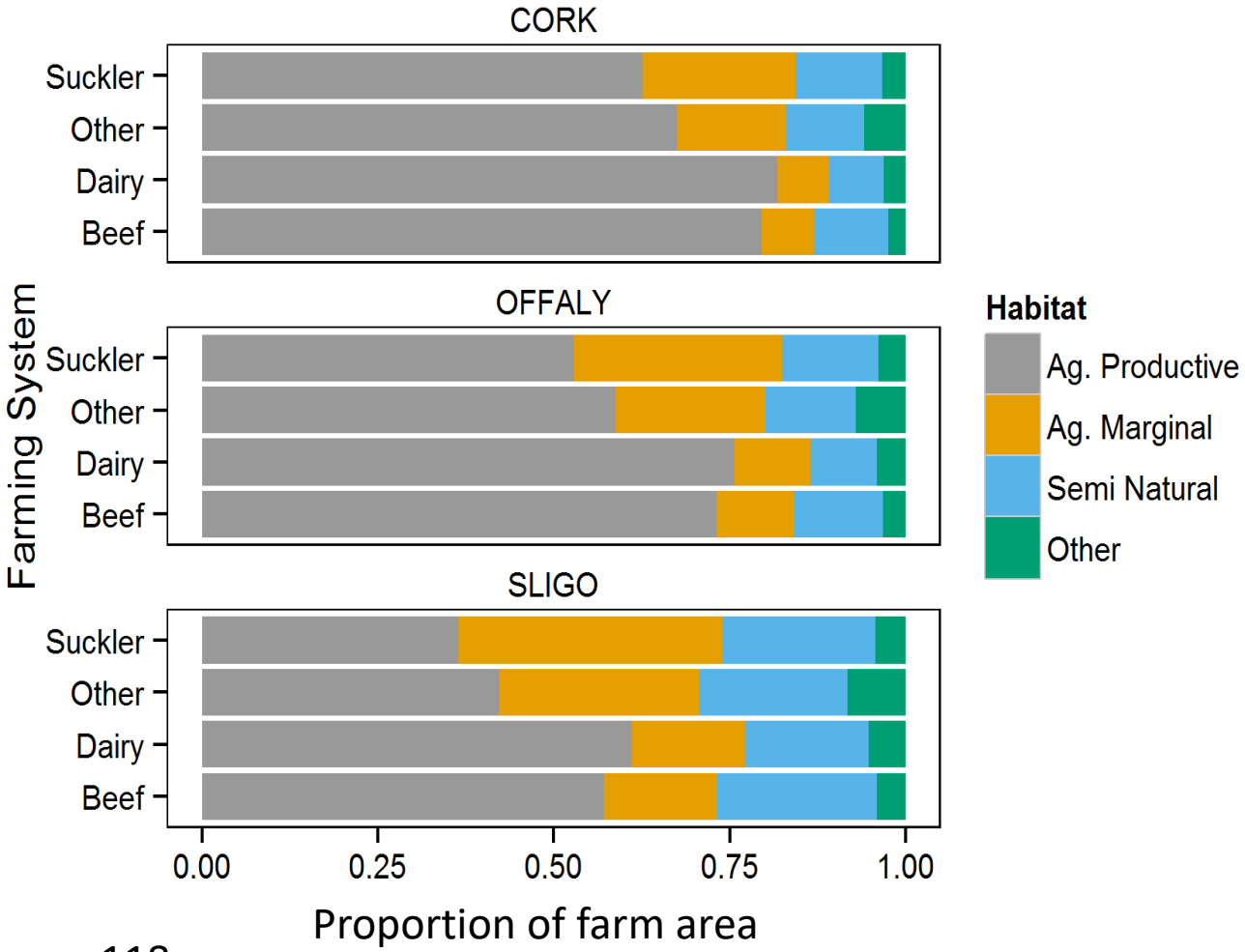
Semi-natural farm habitat area:

- Average farm area under semi-natural habitat area ~ 13% (Sheridan *et al*., 2011, 2017)
- East Galway – semi-natural habitat area ~ 15% (Sullivan *et al*., 2011)
- On more intensively managed farms (including tillage) ~ 10% (Larkin *et al*., 2019)
- Compares favourably with some other countries:
  - Netherlands 2.1 -5% (Manhoudt and de Snoo, 2003)
  - France 2-12% (Vereijken, 1995)
  - Poland 1-4% (Vereijken, 1995)

Structural condition of hedgerows:

Project	No. of farms	Area surveyed (ha)	Length of hedgerow (km)	Stockproof %	Escaped %	Relict %	Citation
AgBiota (EPA)	50	2577	231	49	31	20	Sheridan et al., 2011
Agri-Baseline (DAFM)	118	3688	338	38	49	13	Sheridan et al., 2017. Purvis et al., 2012

Farmland habitat type



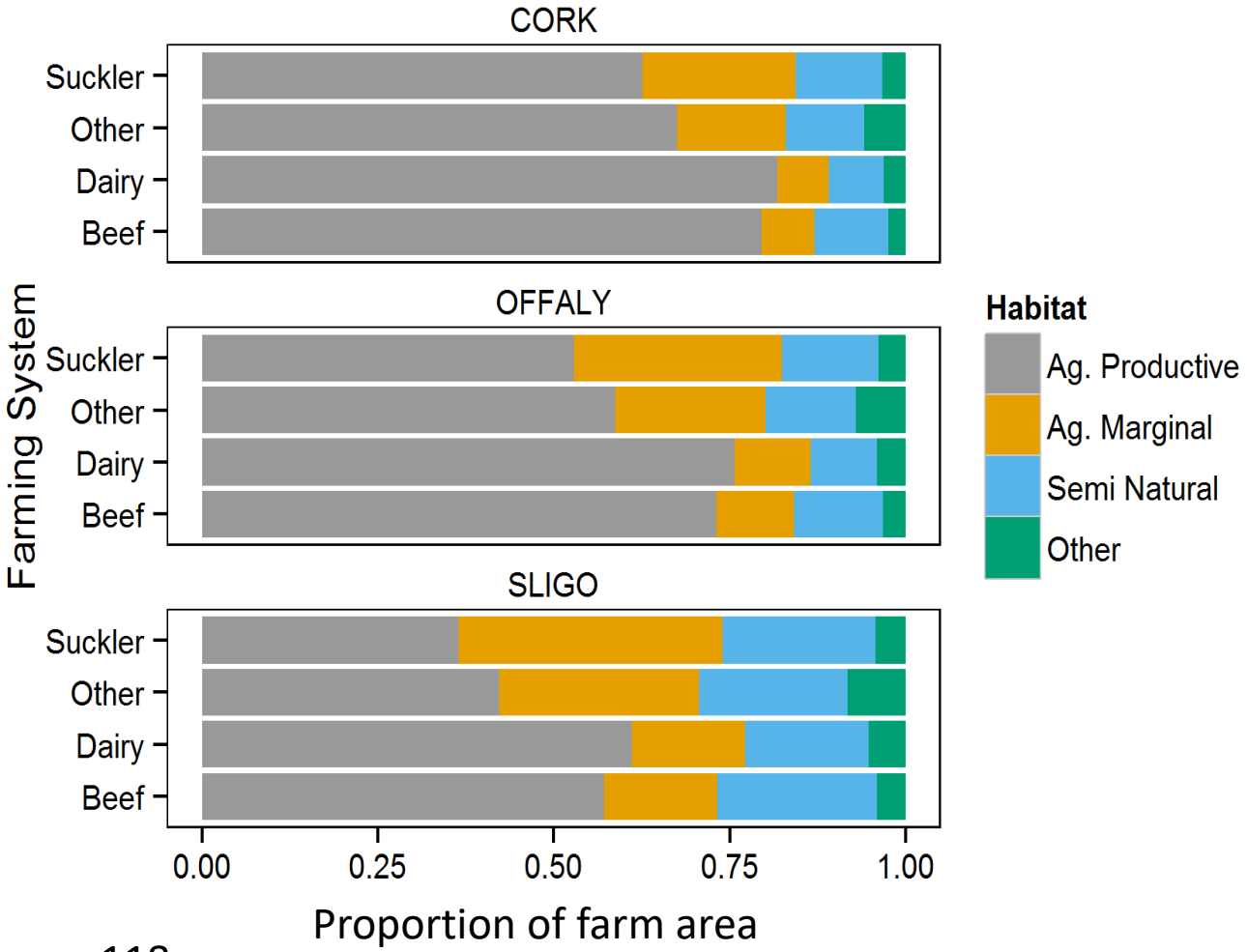
n = 118

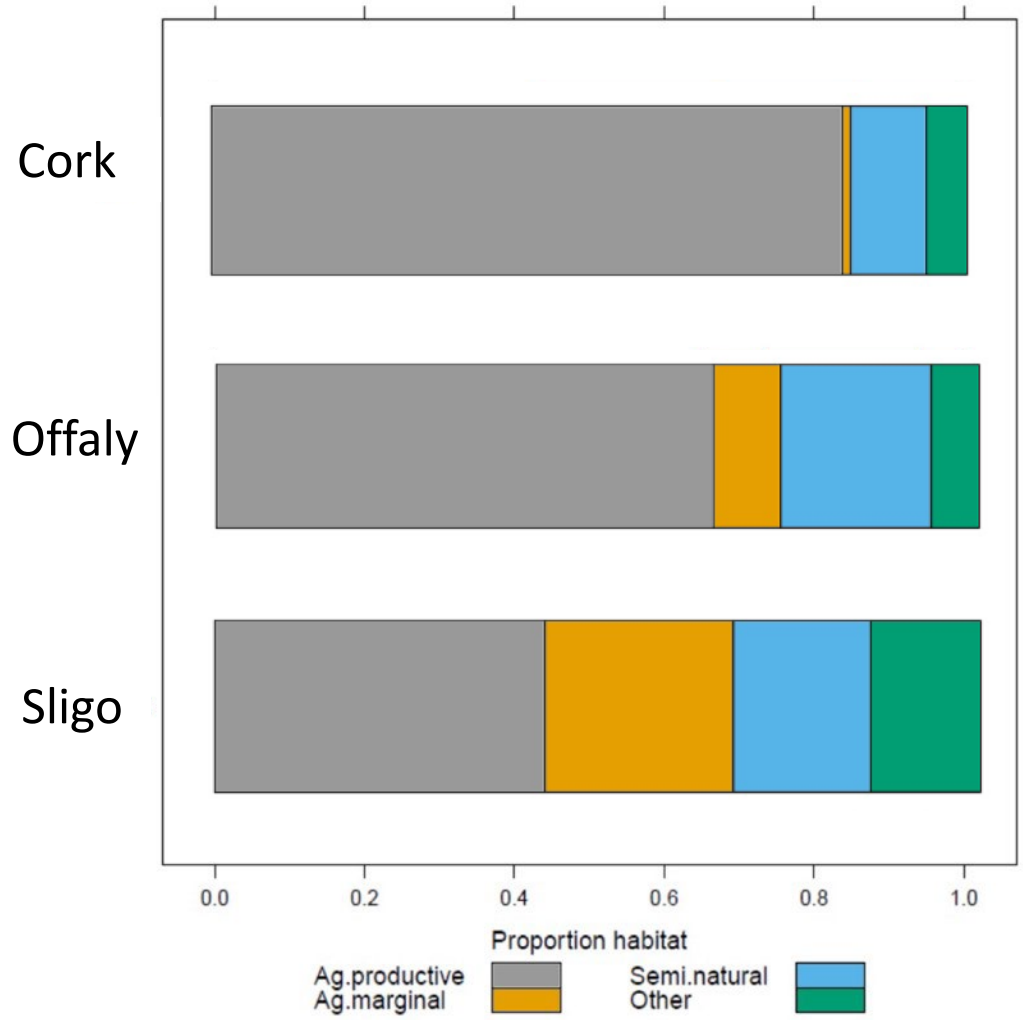
Region $p < 0.001$

System $p = 0.002$

Sheridan et al. (2017)

Farmland habitat type





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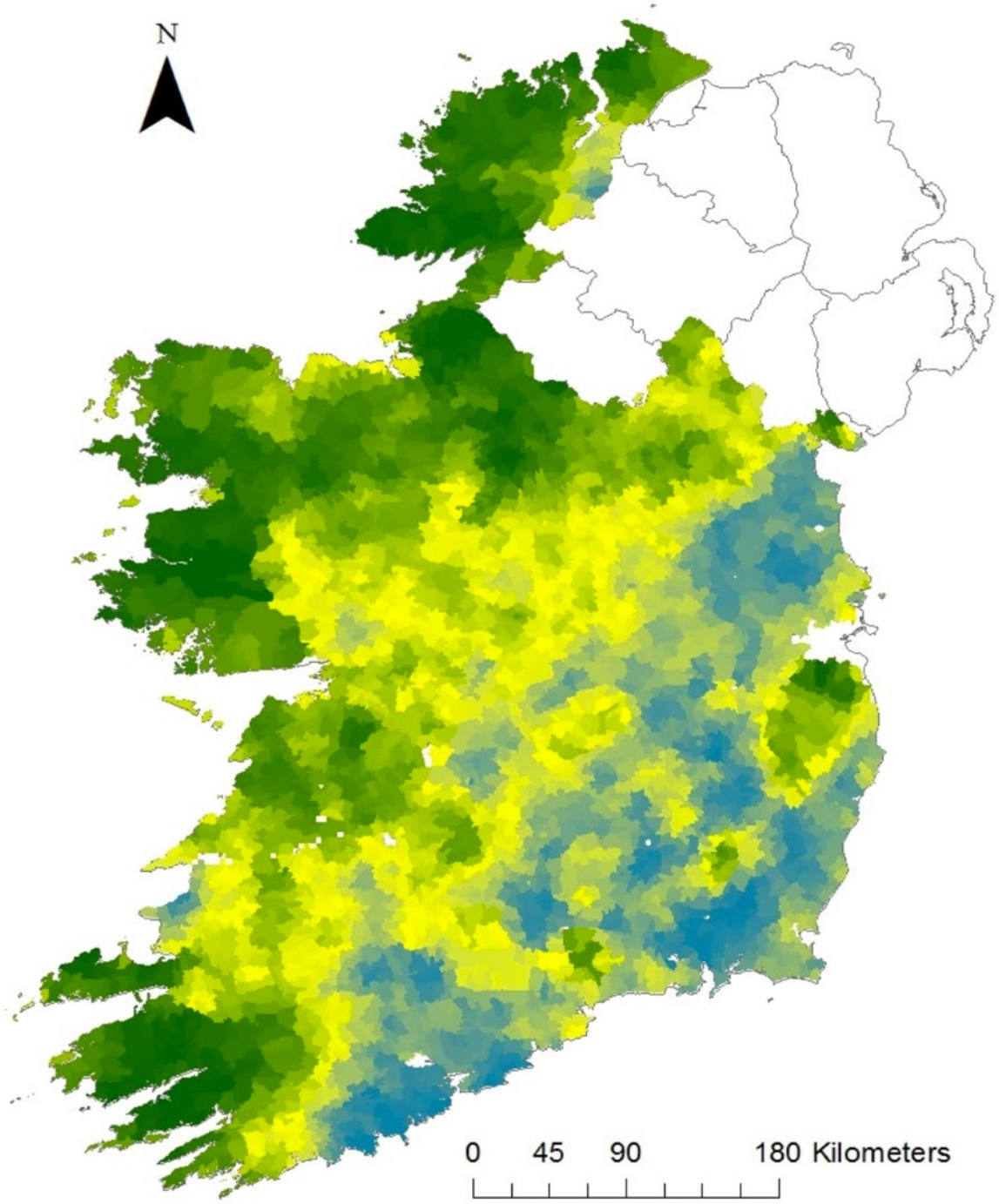

Predicted distribution of High Nature Value farmland in the Republic of Ireland

Matin, S., Sullivan, C.A., O' hUallachain, D., Meredith, D., Moran, J., Finn, J.A., Green, S (2016) *Journal of Maps* Vol 12.

- Predicted location of HNV largely coincides with the location of drystock systems
- Financially vulnerable

Take home messages:

- Agriculture – range of systems and practices
- Significant proportion of semi-natural habitat
- Focus on **Retention**, **Enhancement** and **Scale**
- Greater emphasis on the positive contributions biodiversity can make through the delivery of ecosystem services
- Appropriately recognise and reward biodiversity as an output from agriculture
- Singular focus on one problem e.g. GHG's could potentially exacerbate another e.g. biodiversity