



The Economics of catchment management; linking science and farmer behavior in the ACP



Outline

- Introduction
- The current state in relation to water quality
- Different types of goods
- Public goods
- Agri-Environmental public goods
- Difficulties
- Possible solutions

But first, not a new problem

1798: This natural inequality of the two powers, of population, and of production of the earth, and that great law of our nature which must constantly keep their effects equal, form the great difficulty that appears to me insurmountable in the way to the perfectibility of society

(Malthus, T. R. (1798). An essay on the principle of population, as it affects the future improvement of society, J. Johnson.)

2018: Humanity faces the challenge of how to achieve a high quality of life for over 7 billion people without destabilizing critical planetary processes

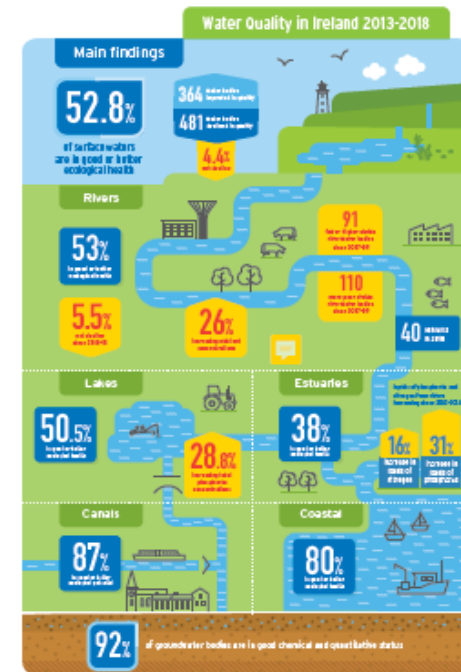
(O'Neill, D. W., et al. (2018). "A good life for all within planetary boundaries." Nature Sustainability 1(2): 88-95)

Credit where its due

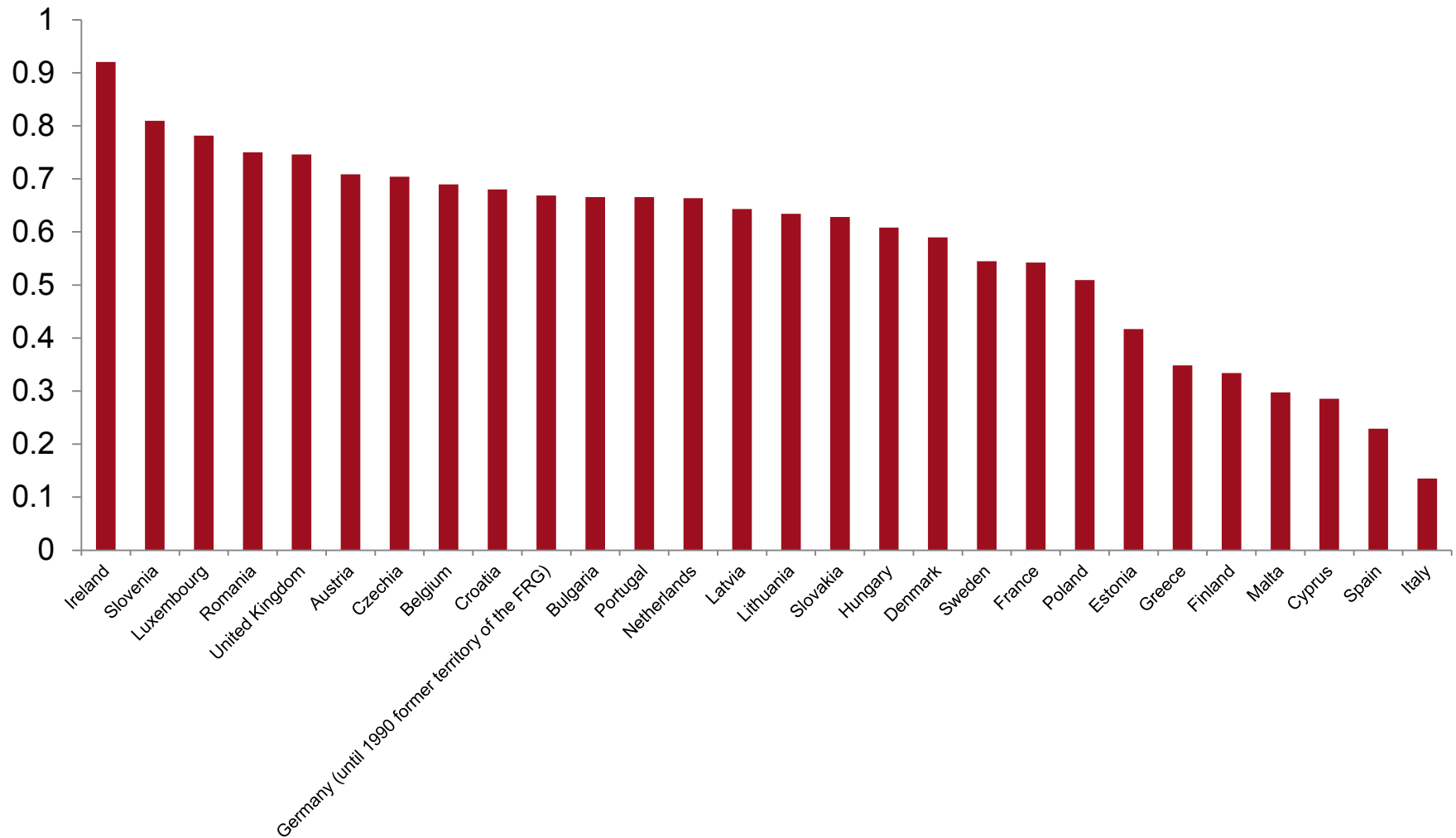
- Since Malthus agriculture has successfully produced enough food to feed a global population that has increased **eight fold by:**
 - **1. Increasing** the amount of land
 - **2. Productivity growth**, efficiently converting inputs into output
- Unique relationship with the environment
- Environmental conditions determine “**what**” can be produced, “**when**” it can be produced and “**how much**” of it is produced
- Reduction in the amount of **labour** required, releasing labour to other sectors of the economy

The current situation

- Water quality in rivers and lakes is worsening
- Range of mitigation measures – based on scientific research (often context specific)
- Farming practices and land management decisions are important
- Understanding farmer attitudes and behavioural drivers is key
- But we need a correct diagnosis of the problem before we can offer advice about how to address it



Percentage of farms with livestock production in the European Union




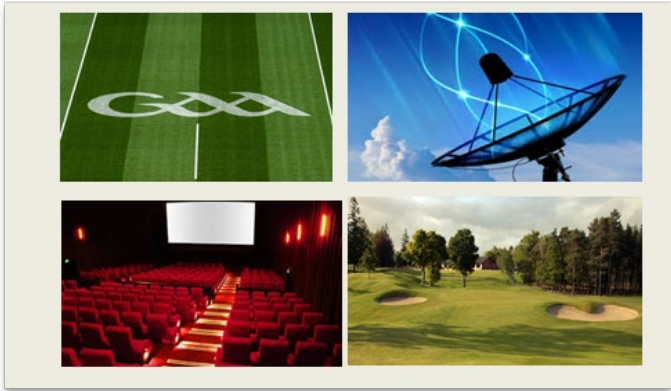
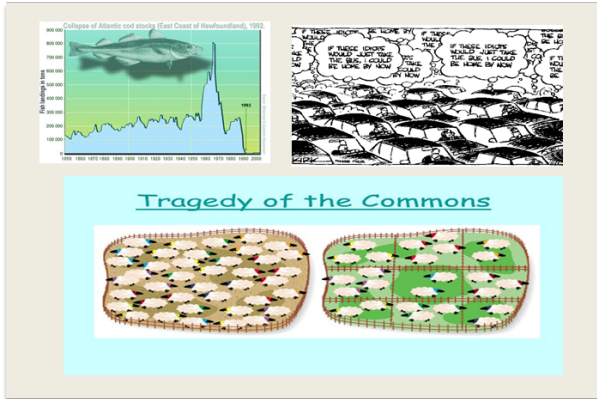

What can we do?

“Public money for public goods”

- What are “public goods”
- What “public goods” can agriculture provide?
- How do we pay for them?

Different types of Goods

- **Two Properties provide a benchmark:**
- **Excludability** – if the good is supplied can you exclude people from consuming it
- **Rivalry** – If I consume the good is there less for others to consume
- The type of good influences how it is supplied
- So lets have a look at some examples of different types of goods

	Rival	Non Rival
Excludable	Private Goods 	Club Goods 
Non Excludable	Common Goods 	Public Goods 

	Rival	Non Rival
Excludable		
Non Excludable		

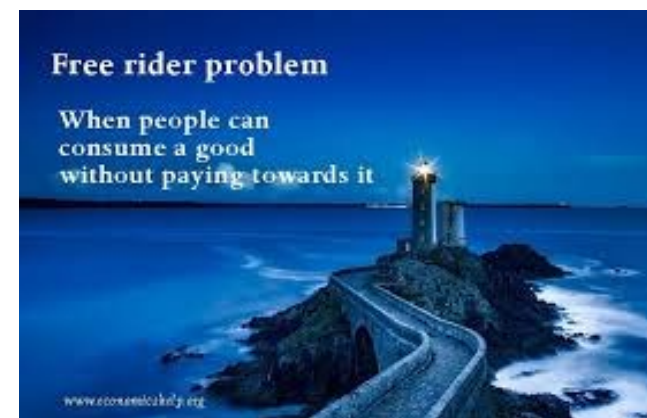
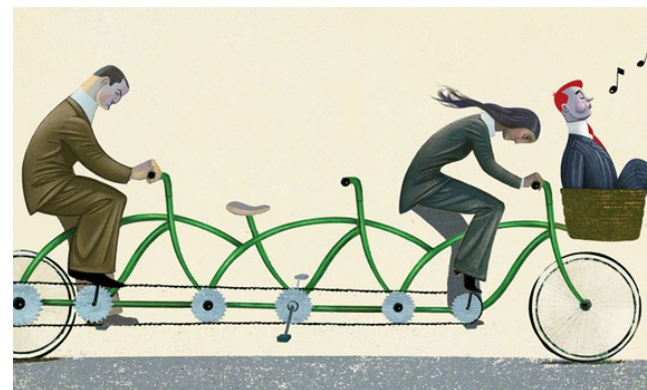
spectrum of ownership & consumption possibilities - Property Rights

Public Goods – what's the problem?

- Type of Market Failure - no prices no quantities
- Very often trying to measure things that are difficult to measure – sense of security
- Require different techniques and methodologies
- Typically use survey methods and willingness to pay/accept
- Economic rational for Governments
- Create a “Free rider” problem

#1. The “Free Rider” problem

- This is a situation where individuals are able to **consume a good without paying**
- Flip side – Chump problem, no one wants to be taken advantage of by always providing the good without getting paid, so the good won't be provided
- Because of the free-rider problem – **public goods** are often under-provided or not provided at all



Agri Environmental Public Goods! What exactly are they?

- Public Goods Plus
- 2 forms of market failure- **public goods** and **externalities**
- Externalities – unintended consequences on third parties both good and bad or sometimes even mixed!!!



Public goods from Agriculture

- Farmland biodiversity
- Water quality and availability
- Soil quality and functionality
- Climate stability – carbon storage and reducing GHG emissions
- Rural vitality
- Food security
- Landscapes



Solutions to public good provision

■ Economic solutions for traditional Public goods

- Taxes or subsidies – Government Provision

- Donations- Wikipedia

- Make the good private – Tolls

■ Altruistic solutions

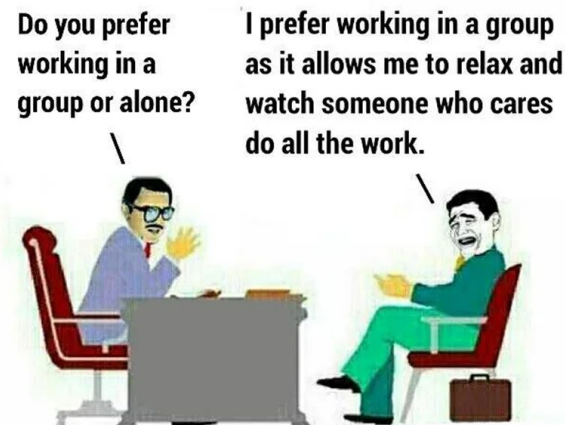
- Social norms - peer pressure

- Social sanctions – punishment, hate losses more than we love gains

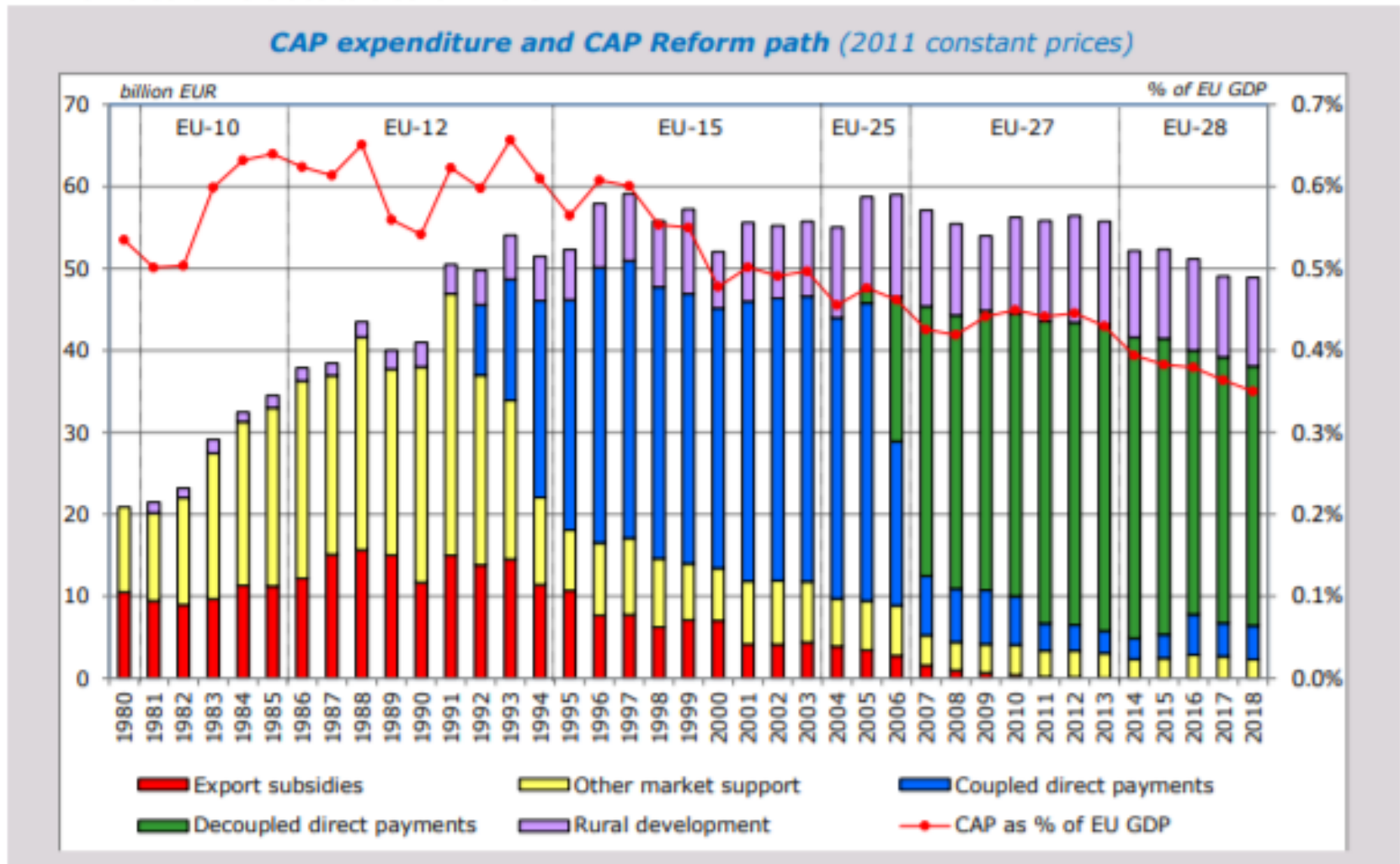
- Voluntary Organisations – Tidy towns

■ Agri-environmental solutions

- Agri-environmental schemes



Where does the money come from?



Sources: CAP expenditure: European Commission, DG Agriculture and Rural Development (Financial Report). GDP: Eurostat. Annual expenditure in 2011 constant prices by applying a 2% yearly constant deflator/inflator.

CAP Pillar I proposals 2021-2027

Current Direct Payments Elements 2015 – 2020	Proposed Direct Payments Elements 2021 – 2027
Basic Payment Scheme (BPS) and Greening Payment	<p>Basic Income Support for Sustainability (BISS) Based on Payment Entitlements and will require increased conditionality including additional SMRs/GAECs.</p> <p>ECO Schemes Mandatory for Member States to set up. Voluntary for farmers to participate. Annual environmental schemes. Compliance with a specific set of green obligations.</p> <p>Sectoral allocations for producer groups / producer organisations in “other sectors”. Up to 3% of the direct payment envelope.</p>
<p>Capping (Reduction of Payments) Member States must reduce BPS Payments over €150,000 by at least 5%. Ireland applied a 100% capping limit on all BPS payments in excess of €150,000. Capping didn't apply to other Direct Payments.</p>	<p>Capping (Reduction of Payments) Capping proposed to apply to all Direct Payments. The cap is set at €100,000 with degressivity from €60,000.</p>
<p>Young Farmers Scheme Additional payment for eligible young farmers.</p>	<p>Complementary Income Support for Young Farmers (CISYF) Additional payment for eligible young farmers. Minimum 2% overall target for young farmer support.</p>
<p>Voluntary Coupled Support Maximum 13% of ceiling plus 2% for protein crops Ireland currently allocates < 1% to the Aid for Protein Crops Scheme.</p>	<p>Voluntary Coupled Support Maximum 10% of ceiling plus 2% for protein crops.</p>
<p>Redistributive Payment Voluntary for Member States to transfer funds from large to small or medium farms.</p>	<p>Complementary Redistributive Income Support for Sustainability (CRISS) Mandatory for Member States to transfer funds from large to small or medium sized farms to improve sustainability.</p>
<p>Small Farmers Scheme Voluntary for Member States to establish a payment for small farms to replace Direct Payments. Voluntary participation for eligible farmers.</p>	<p>Round Sum Payment for Small Farmers Voluntary for Member States to establish a payment for small farms to replace Direct Payments. Voluntary participation for eligible farmers.</p>

Lessons from Behavioural Economics

- Rule 1. Prospect Theory – We hate losses more than we love gains
- Rule 2. Discounting – We like certainty more than we like uncertainty
- Rule 3. Framing – We view economic losses or gains in context
- Rule 4. Endowment Effect – We overestimate our chances of success
- Rule 5. Optimism – We overestimate our chances of success
- Rule 6. Fairness – We abhor anything that seems unfair
- Rule 7. Availability – We are more motivated by stories than by statistics

Conclusions

- Public good provision is not easy
- Particularly difficult in relation to water quality
- Many actors
- Improvements may take time
- Issues of fairness
- Farmer behaviour and land management decisions are only one part
- Agri environmental schemes need to be targeted and context specific

Other Signpost seminars from the ACP

- Dr Per-Erik Mellander:
 - What impacts water quality in the Agricultural Catchments Programme
 - <https://www.teagasc.ie/publications/2020/the-signpost-series-what-impacts-the-quality-of-water-in-agricultural-catchments-programme-acp.php>
- David Ryan:
 - An overview of the equipment and methods undertaken by the ACP in six agricultural catchments
- Edward Burgess:
 - The Agricultural Catchments Programme assessment of the Nitrates Derogation

Thank you!



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