



Ulster Grassland Society

Environmental sustainability in Agriculture Challenges to 2030

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Some unfortunate and inconvenient truths

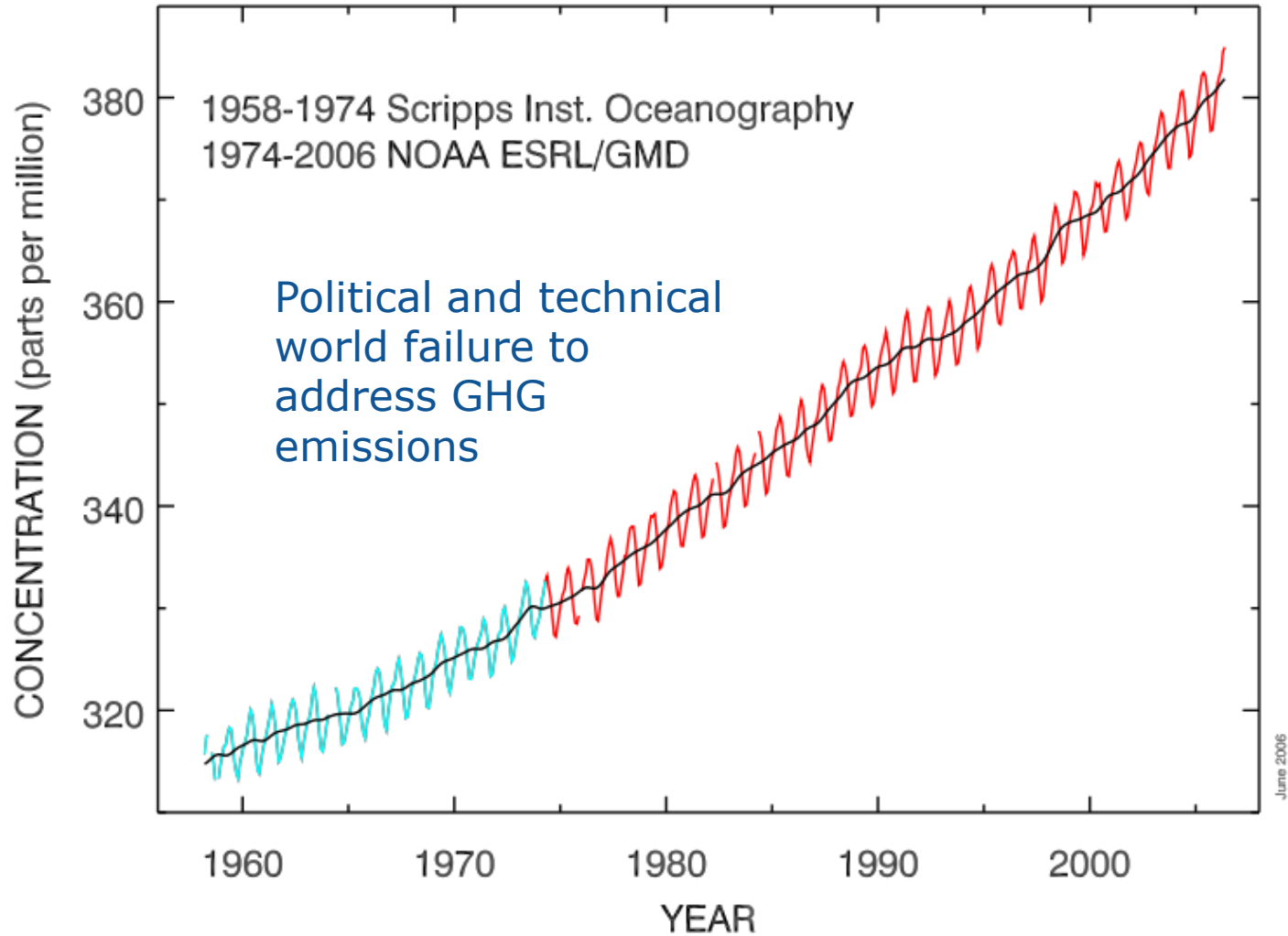
- Climate change – heading to 4 degree temperature increase by 2050?
 - LUC still a contributor! How much land will be lost to flooding/drought?
 - Mitigation cheapest but expensive adaptation almost inevitable now
- A new scramble for land – bio-economy, bio-energy, urbanisation, recreation
 - A new drive to intensification
 - A new environmental marginalisation
 - Commission land use communication in 2014/15
- Feeding the world – 10 billion people/expanding middle class tastes and WAISTS
 - Too much waste
 - Nitrogen cycle effects globally, potentially very damaging
- Resource depletion/renewal/efficiency
 - A brand new set of concerns - we squander resources
 - Commission communication on sustainable production and consumption in 2013

It's not JUST the economy that needs fixing and the economy is part of the problem



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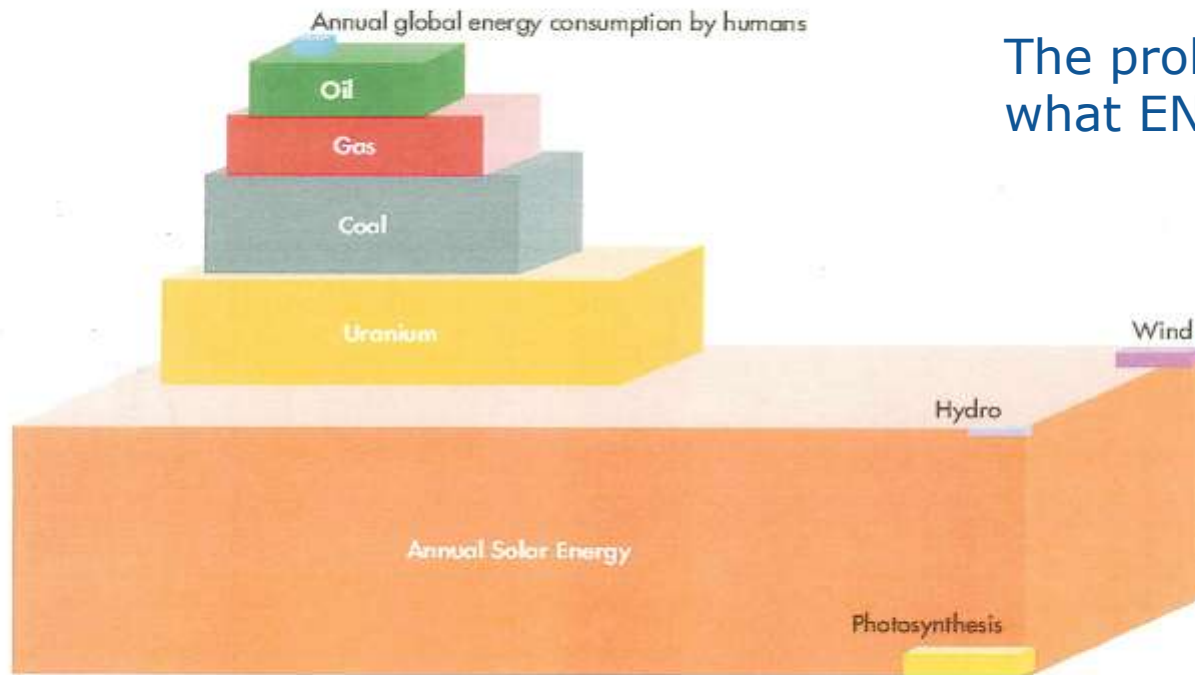
Atmospheric CO₂ at Mauna Loa Observatory





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Total energy resources



The problem is
what ENERGY

Source: National Petroleum Council, 2007 after Craig, Cunningham and Saigo.

More than 60 years of changing farm practice

- Bigger fields, less field margins
- More specialisation – less mixed farming
- More winter crops – less spring crops and less rotation
- Heavier machinery and greater use throughout season
- Greater mineral fertilizer and plant protection product use
- More specialised grass production, earlier grass harvests, less diverse meadows
- More concentrated regions of animal production and maize surplus
- More slurry, less farmyard manure

has enormously increased environmental pressures and challenges for biodiversity, soil, landscape, water and air.



EU Agricultural/Environmental policy comparison

- The CAP has EU funding – ENV policy doesn't
- CAP legislation generally is regulatory which means application rules are essentially established by the Commission and Member States together
- Environmental legislation is in form of directives which gives greater flexibility to Member States
- CAP legislation is often time limited; environmental legislation has traditionally played catch-up on agricultural pollution problems
- Environmental integration is a TREATY obligation and aspects such as cross-compliance and agri-environment are part of the agricultural policy response.

Environmental realities today

In EU, sustainable agriculture is work in progress, indications on

Water: water framework directive – river basin management plans show

- water use issues – over abstraction a continuing problem
- water pollution from nutrients and pesticides still common

Nitrates – progress made, more necessary

Pesticides – continued high level use and mayor issues for quality of drinking water and biodiversity

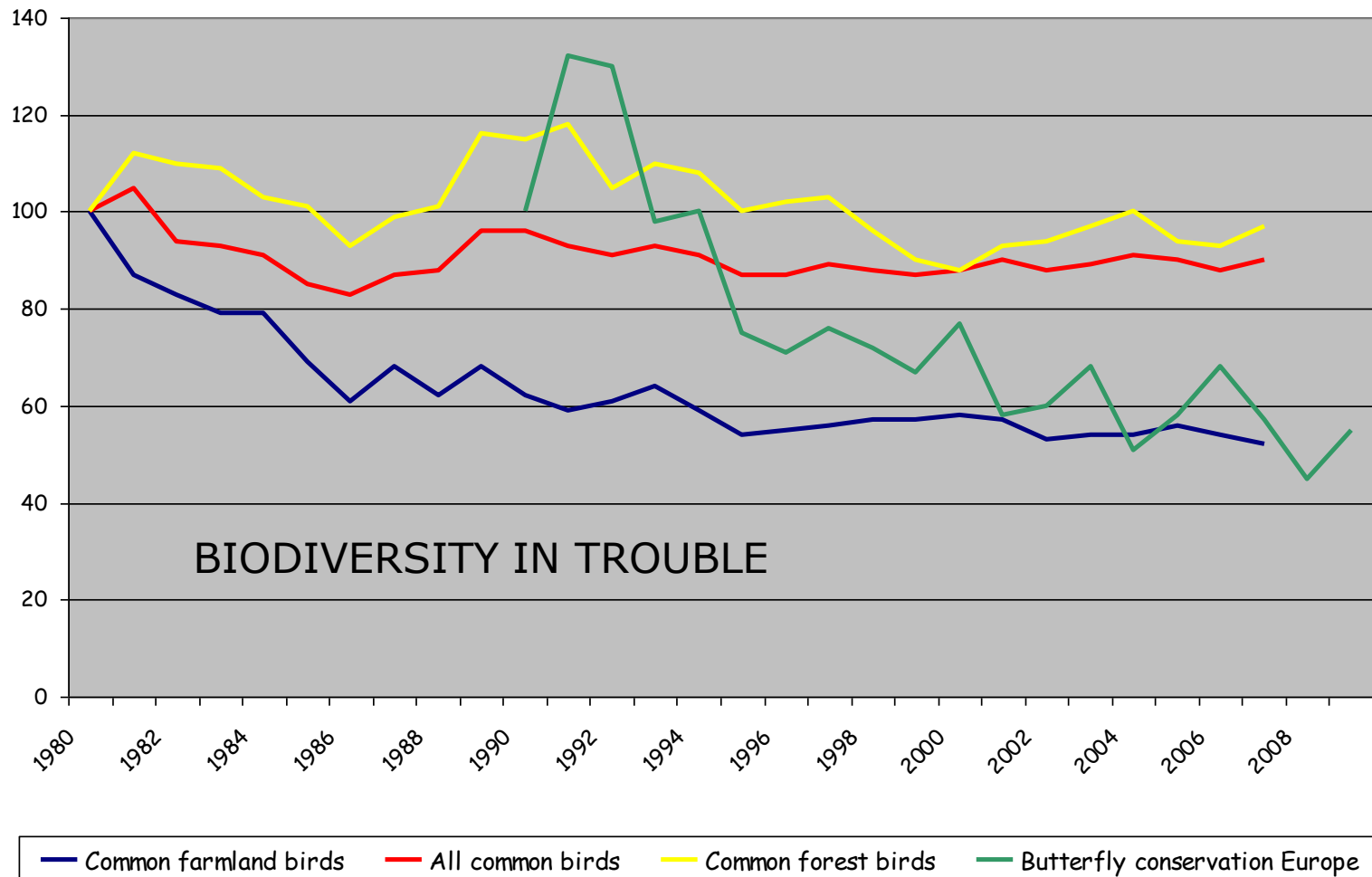
Biodiversity: report on biodiversity habitat status 2009

- limited favorable status at about 25% for forests, <20% grassland and 20% for bogs, wires and fens
- 2010 EU and world targets not met: New targets with greater emphasis on ecosystem services for 2020



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Birds - Butterflies



- **Soil:** Thematic strategy and Corine
 - low organic and high erosion rates in some areas
 - significant land take from agriculture (NB – UK expectations 33% more built up land)
 - limited enthusiasm to clean up contaminated sites
 - Soil directive proposal awaiting adoption

- **Air:** Process of review of EU air quality policy and EEA assessments:
 - Agriculture responsible for more than 90% NH₃ emissions in EU. Emissions have declined since 1990, but more progress is necessary.
 - Almost 10% of EU GHG emissions are related to the agricultural sector (CH₄, N₂O)
 - Arable farming, a significant contributor to PM 2,5 and PM 10 levels in EU
 - More comprehensive regulation?
 - EU GHG targets will increase to reach "low carbon economy"

Despite some progress – our environment is very fragile; progress best where legislation is driving it.

7th Environmental Action Programme will spell put further challenges in all these areas.

Water Scarcity & Droughts

- State of play

- **How big is the problem?**
- **2012: Water stress in 26 basins (all year)/43 basins (summer)**
- **2030: Water stress in 47 basins (all year)/63 basins (summer)**
- **Not only a Southern issue – 31 of 63 water stressed river basins are expected to be in the North**

What is being done about it?

- *Some measures from the 2007 communication are being implemented*

BUT

- *Responses are NOT reverting the trend in water scarcity in the near future.*

Huge implications for EU (and world) agricultural production

Impact of the Nitrates Directive on water and air

- Nitrates report 2008-11 due by mid 2013
- 2004-07 report
 - Progress on ground and surface water but some hotspots without improvement
 - Limited knowledge on eutrophication notably of marine areas and insufficient progress
- Agricultural NH₃, N₂O, and NO_x emissions in EU-27 decreased in the period 2000-2008, also due to the implementation of the ND, mainly due to reduced use of fertilizers
- Impact of the ND implementation in 2008:
 - on NH₃: 3.4% (up to 15.8% in the NL and 11.7% in IR)
 - on N₂O: 6.3% (Netherlands - 19.9%, UK - 12.0% and Denmark - 12.3%)
 - on NO_x: 8.8 %
- Adequate storage and continuous revision of manure production are ongoing tasks

Manure Issues (1)

- 1) Manure processing particularly for biogas is presenting new challenges as well as potential benefits
 - Leading to some increased manure concentration as farm produced feed is replaced by bought in feed. Thus more manure at regional level in areas with problems today!
 - Leading to efforts to improve market opportunities for processed N and drier solid manure with a high P content.
 - Stretching polluter pays boundaries as farmers seek EU/National support for processing. Biogas may not be long term economic!
 - Most processing does not change the N and P content. It makes no contribution to reducing pollution pressure except when processed manure replaces inorganic fertilizer or is exported from the region.
 - Bioethanol from maize (with grain by-products) capable of causing serious extra environmental problems for water use, PPP use and water pollution.

Manure issues (2)

2) Efficiency and spreading techniques

- DK/NL lead way with up to 70% N efficiency for pig and poultry slurries and 50-60% for cattle manure
- Spreading techniques need to move to low ammonia emissions to respect future reductions in limits. RD programmes should support only trailing shoe/injection systems
- If MS don't insist on high N efficiency – farmers will continue to misuse manure
- APs count chemical N as being 100% efficient and MS need to continuously review yield realities

3) Controls on manure movement off farm

- Essential to avoid malpractice
- GPS or administrative plus spot checks
- Real need for effective control notably in highly intensive livestock regions for sustainable farming.
- Realistic in future to require GPS systems for all farms with a significant manure export.

Nitrates directive

- **Future approaches**
 - The monitoring results for 2008-2011 and their comparison to previous periods must determine amendments/improvements to AP's
 - Article 5.5 of directive requires additional measures of the AP if specified measures are not sufficient to achieve the directive's objectives
 - Twenty one years (5 AP in EU15, 3 in EU10 and 2 in EU2) should be sufficient to begin to deliver improved water quality. Therefore MS need to use art. 5.5 in regions where there is little or non-improvement.
 - For certain regions of various MS such as sandy, karstic, peat
 - implementation of the directive will need reinforced measures
 - derogations will be more difficult in these regions
 - Derogations will continue to depend on fully conforming APs

Biodiversity and ecosystem services

Birds and Habitats Directives (1979 and 1992)

- Solid progress EU wide on designation
- Limited progress on development of management plans
- Need now to concentrate on priority actives

But biodiversity not confined to NATURA areas.

Total agri-environment spending in EU for 1992-2013 about € 100 billion from public purse.

Reasonable to question if best value for money is obtained.

Why continue to support if we don't achieve biodiversity aims?

→ the perfect economic question!!

CAP – environmental aspects

- Pillar II – Agri-environment since 1992
 - Why? Pay farmers for delivery of public environmental goods going beyond good farm practice
- Rural development since 2000
 - Active support for competitive farming, land management and environment and quality of life
 - Why? Need to support sustainable farming inside and outside farm gate
- Rural development post 2014
 - Added emphasis also on:
 - Knowledge transfer and innovation
 - Resource efficiency and climate change
 - Why? - huge new challenges so need to speed up research and innovation transfer to farm practice
 - achieving more for less in a resource scarce world

CAP environmental concepts

Pillar I - cross compliance since 2005

why? Farmers should respect relevant legislation and GAEC as a condition for direct payments.

- 2014-20 reform

- extension of CC to WFD and sustainable use of pesticides directive when implemented fully and obligations on farmers known

Why? Key legislation directly related to farming activities

- "Greening" of 30% of direct payments

why? Delivery of some public goods by all farmers as a condition for public support – CAP credibility



Roadmap to resource efficiency

1. Commission communication 26 January 2011

→ framework for long-term strategies on energy, climate, research and innovation, agriculture, environment, etc.

- list of initiatives
- ensuring they deliver results

2. Roadmap for a resource-efficient Europe – publication summer/autumn 2011

- increasing resource efficiency
- decouple economic growth from resource use
- decouple economic growth from environmental impact

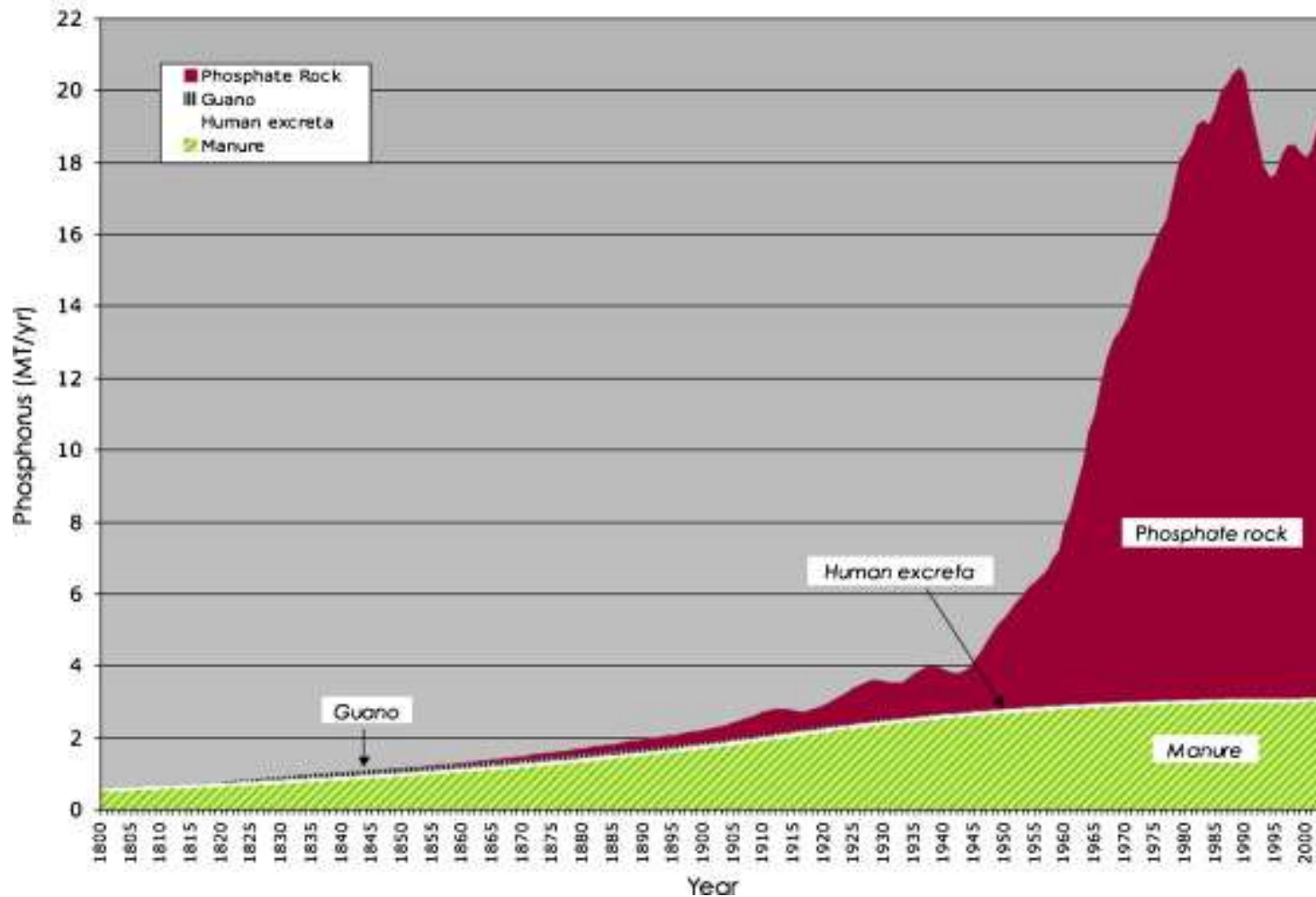
What does “efficient” mean? Difficult question! How does it relate to multifunction? eg. Greatly reduced harvest losses for grain – less feed supply for birds.

The example of Phosphorus – a green paper in 2012 but issues concerning trace minerals on horizon.



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Historical global sources of phosphorus fertilizers (1800-2000)



Suggestions for the farm sector

In its future development it needs to:

- Reduce its GHG and ammonia emissions
- Improve its relationship with water
- Address biodiversity issues
- Buy into resource efficiency
- Develop innovative approaches eg. in dairy sector

A proactive approach gives a better opportunity to protect and enhance its image . Ignoring problems will eventually lead to tougher restrictions.

Choice at this stage with the sector itself. But failure to deliver will raise huge economic questions and eventual demands for much higher standards if farmers want to retain public support.