

UK Experience

Mitigation – An integrated approach?



D Chadwick

L Cardenas

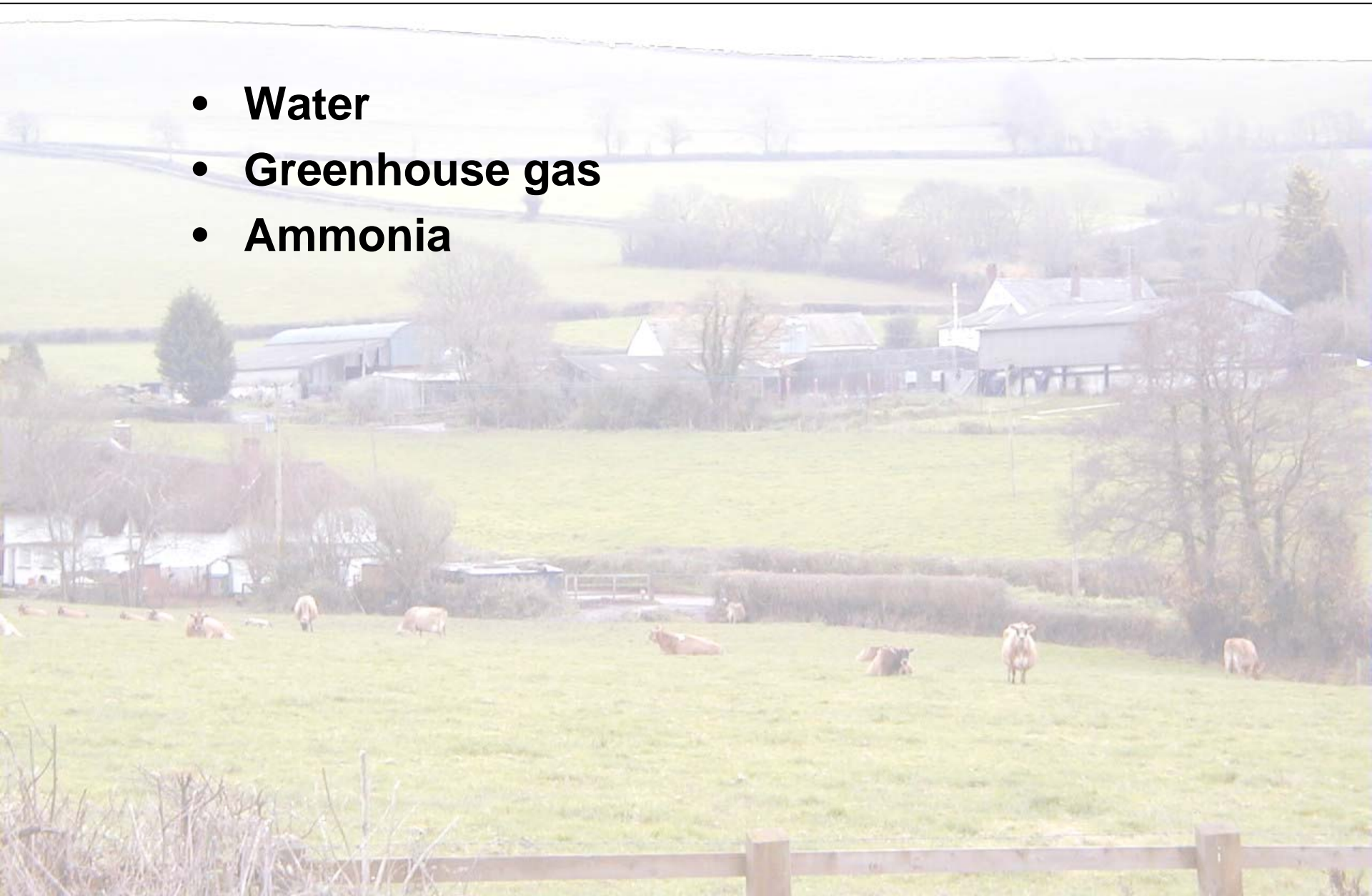
T Misselbrook et al



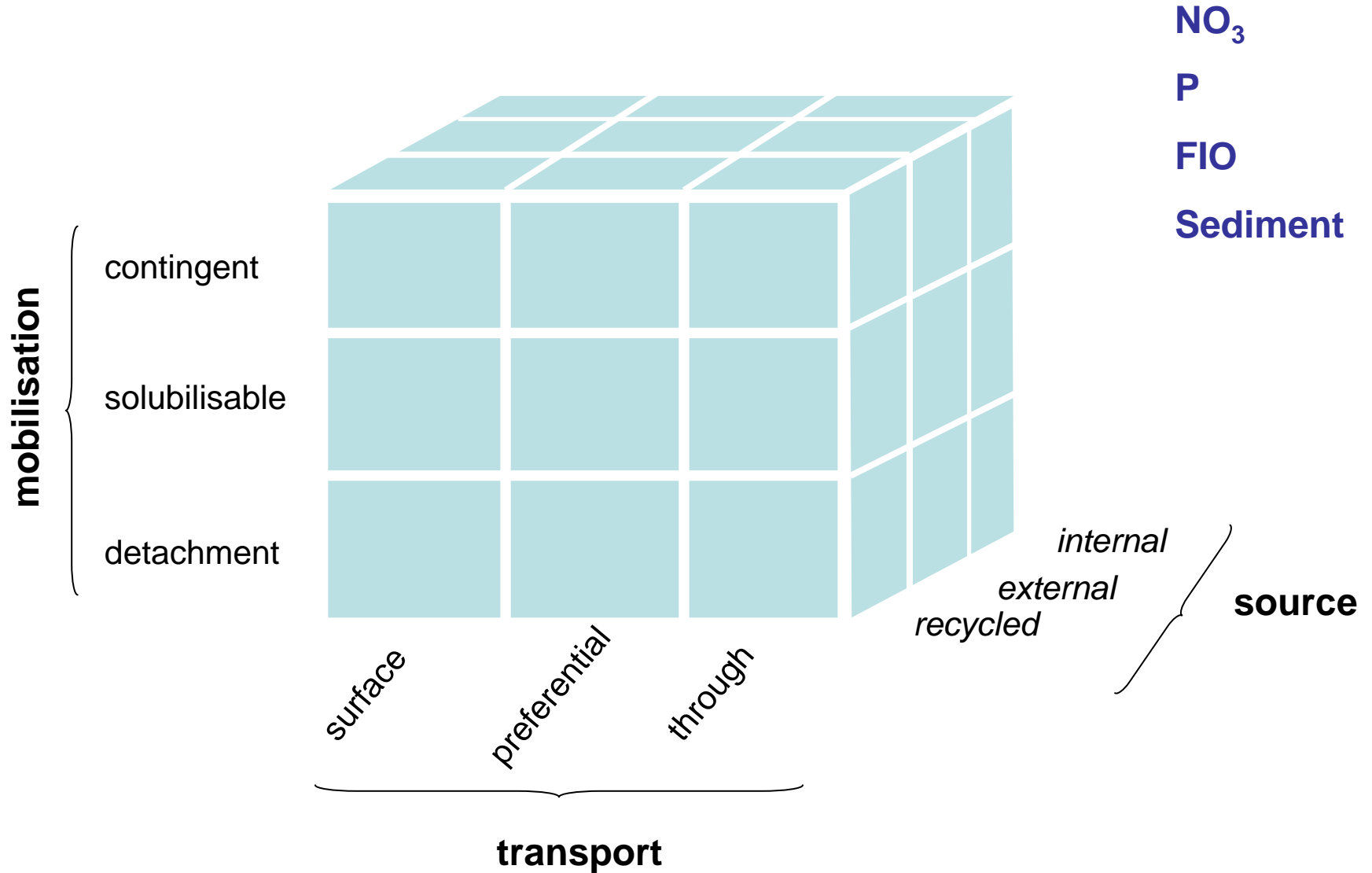
S Anthony et al

Policy framework to mitigate pollution

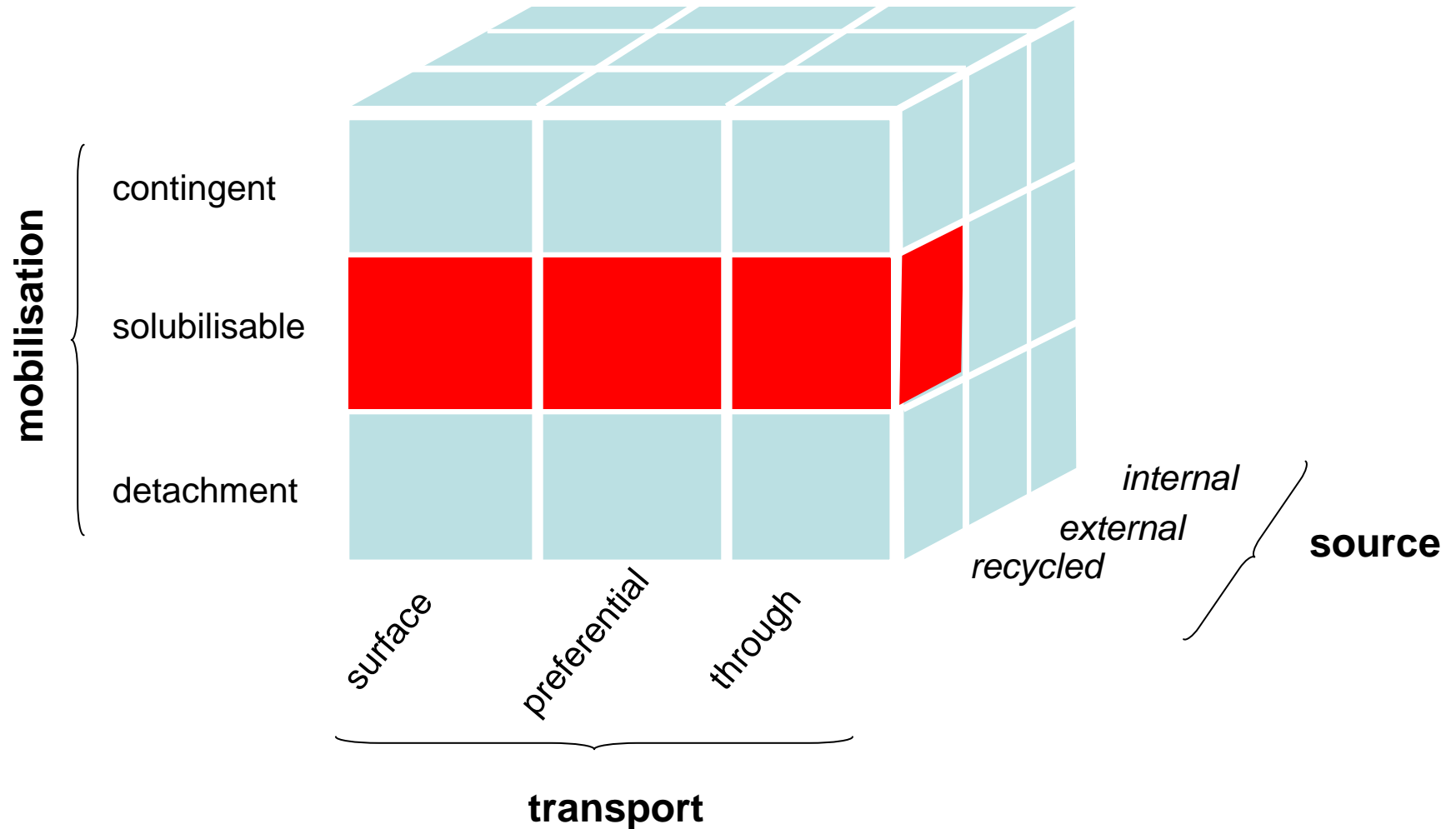
- **Water**
- **Greenhouse gas**
- **Ammonia**



WATER – the cost-cube model



Mitigation – e.g. shorten grazing season



WATER – Farm-scale models

Farm typologies - 6 farm types

Climate zones – 3 (wet, medium, dry)

Soil zones – 2 (clay loam, sandy loam)

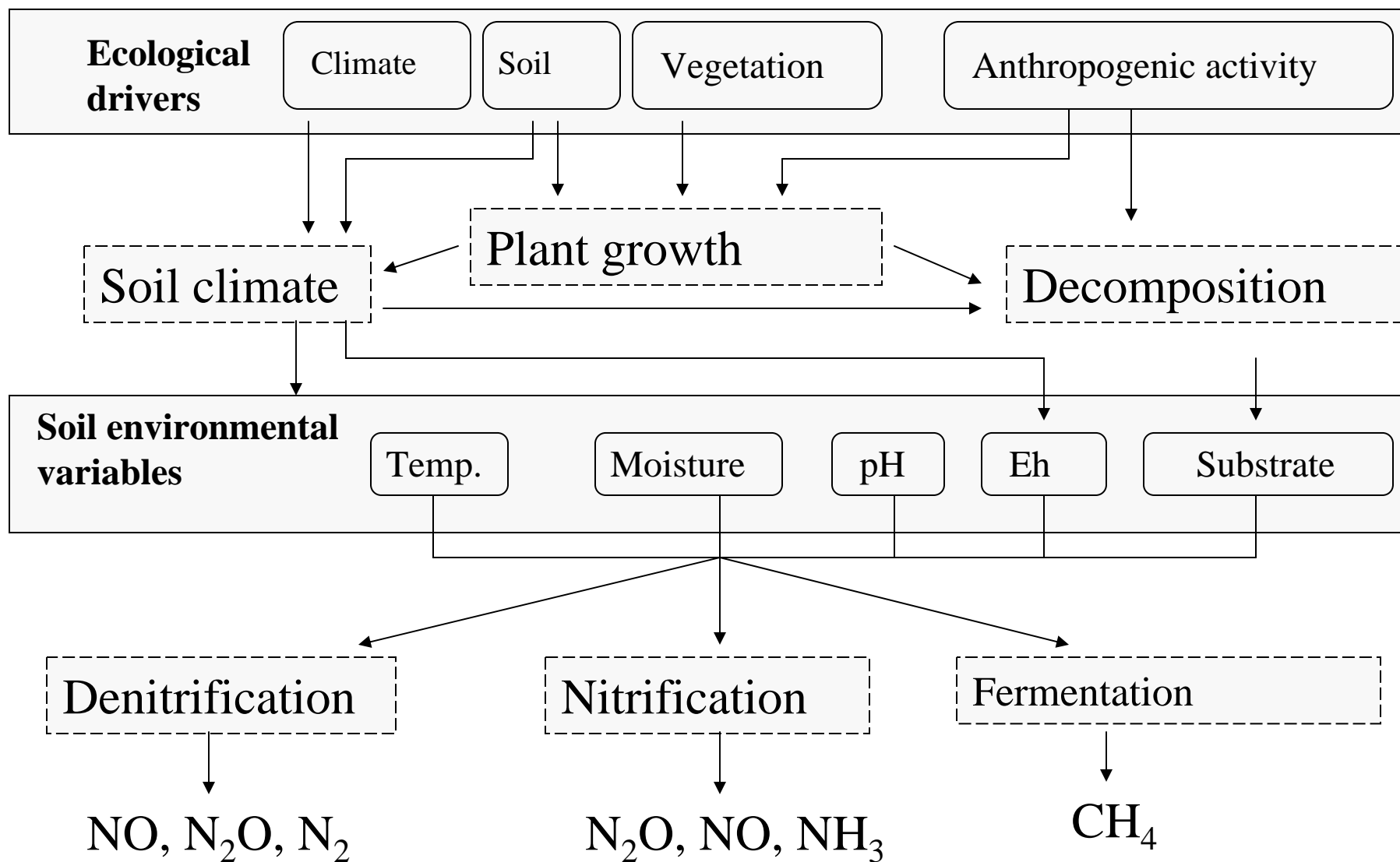
Scaled nationally on an area basis

GHG – N₂O inventory

UK inventory:

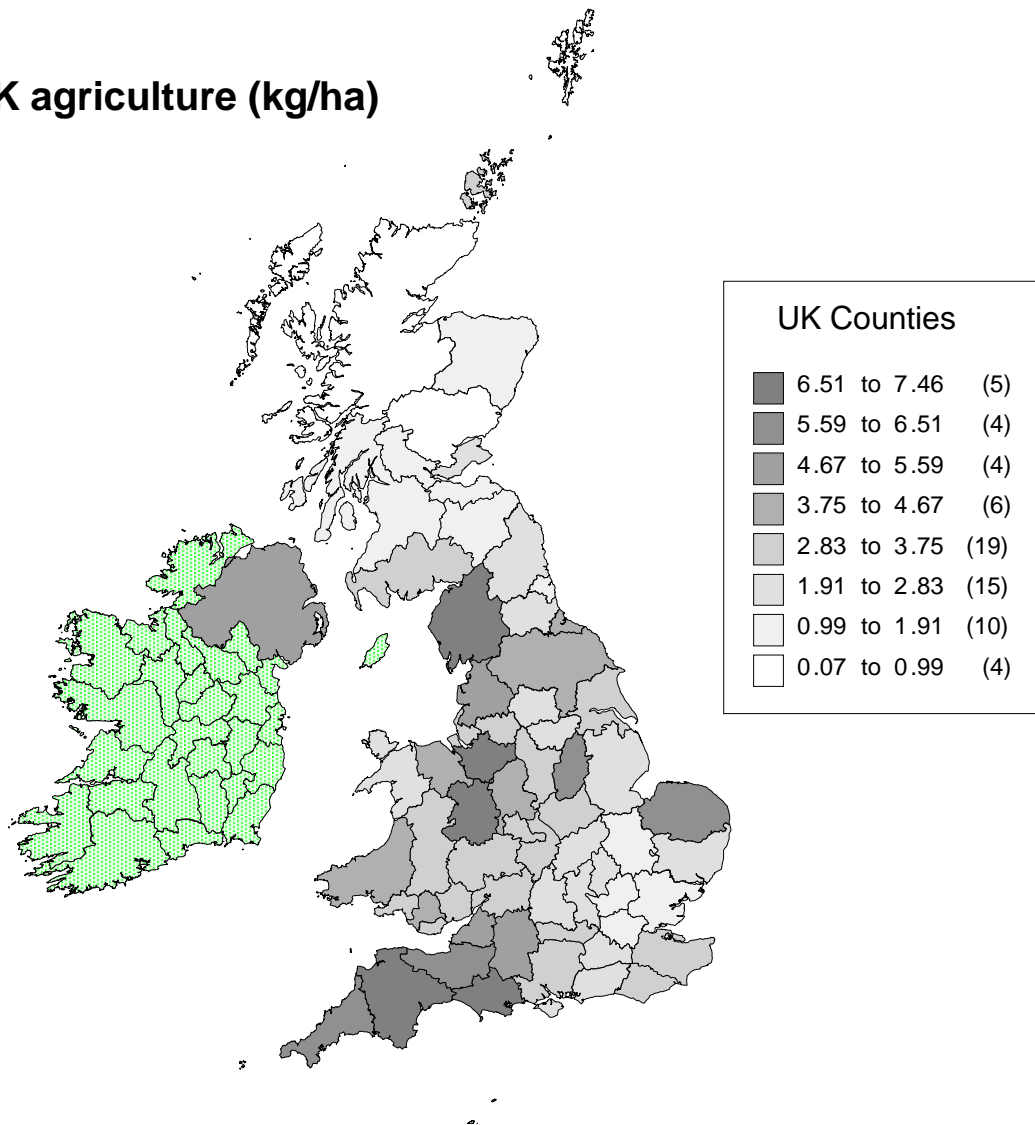
- Largely IPCC Tier 1
- Driven by livestock numbers and fertiliser N use
- Little scope for reflecting mitigation

GHG – UK_DNDC



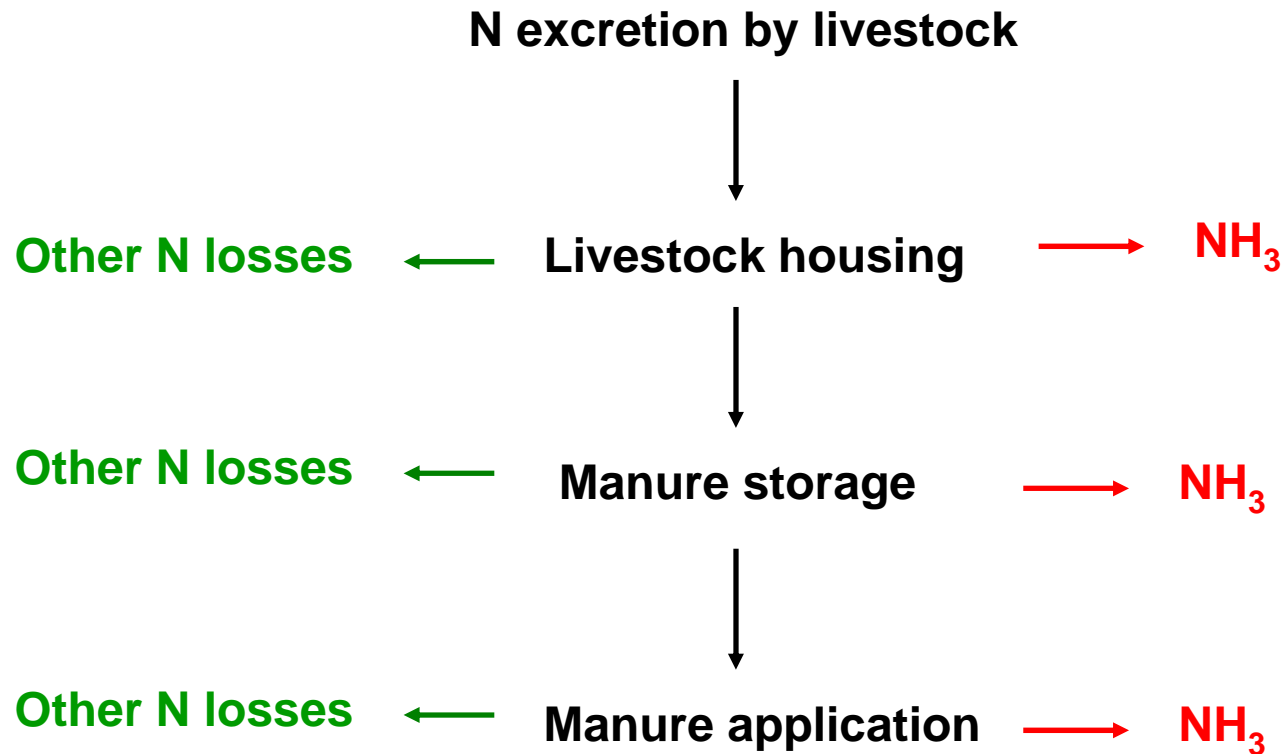
GHG – UK_DNDC

N₂O-N emission from UK agriculture (kg/ha)



AMMONIA - NARSES

Nitrogen flow, mass balance model



Detailed partial emission factors combined with activity data

MITIGATION METHODS – User Manuals

- Diffuse water pollution – Cuttle et al 2006
- GHG – Report to Defra (AC0206), Moorby et al 2007
- Ammonia – Misselbrook et al 2007/08

For each method:

Description, rationale, mechanism, applicability, cost, effectiveness, secondary impacts

INTEGRATED MODELLING – the way forward

SCALE

National totals vs. spatial detail

COMPLEXITY

Capable of showing mitigation; availability of parameters; ease of use; transparency

APPROACH

Linking existing models; creating new models

IMPACTS

Wider than just N

Need to link with impact assessment models (e.g. FRAME – UKIAM links)

COSTS, OPTIMISATION