

Impacts of RD programmes in Germany on the reduction of greenhouse gas and ammonia emissions and associated mitigation costs

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Outline

- 1. Background of study**
- 2. Study regions and period**
- 3. Methods and data**
- 4. Empirical results**
 - GHG emissions
 - Ammonia emission
 - GHG mitigation costs
- 5. Discussion**

1 Background of study

- Rural development **(RD) programmes** are a major instrument to **promote environmental & climate objectives in the CAP**
 - comprise up to 50 different RD measures
 - EU-cofinance through European Fund for Rural Development (EFRD)
- **Evaluation is compulsory** according to European law
 - ex-ante, mid-term and ex-post evaluation
 - focus is on impacts (mid-term, ex-post)
- 13 RD programmes 2014-2022 on the level of federal states

Focus here

- Impact on **green house gas (GHG) & ammonia emissions**
- Mitigation costs

2 Study regions and period

Study regions

- Schleswig-Holstein, Lower Saxony & Bremen, North-Rhine Westfalia and Hesse
- 35% of UAA in Germany

Subject of evaluation

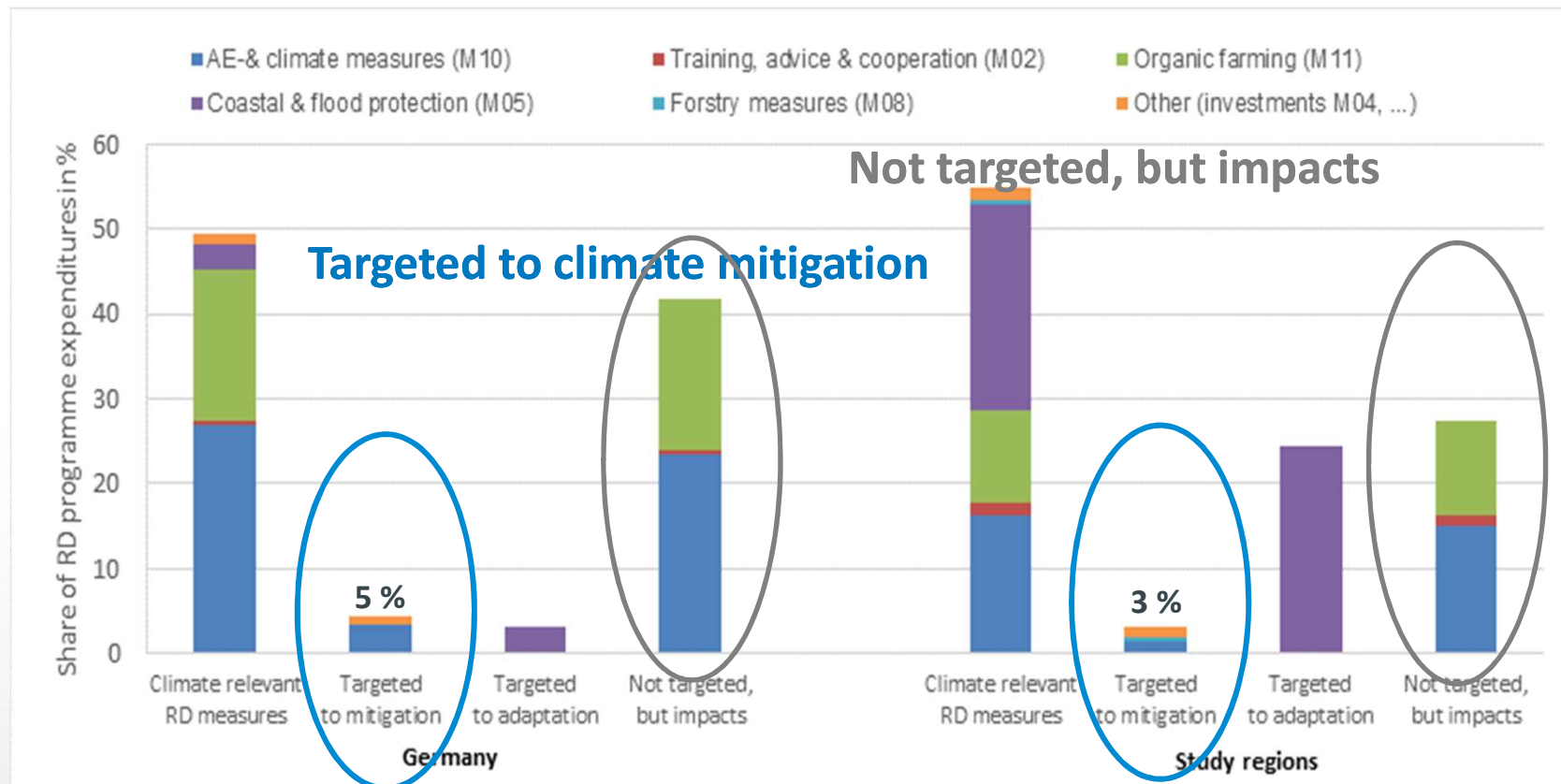
- Impacts (mid-term): 2015-2018/2019
- Mitigation costs (ex-post): 2007-2014

Not included

- nationally financed measures (without EU-cofinance) in agriculture for climate mitigation



2 Climate relevant RD expenditure shares (2015-2018) - broken down by measures



sources: own estimations based upon EU-COM (2019) Financial Dashboard, monitoring data 2015-2018

3 Methods and data

Methods

- Impact = **Difference** between the **observed situation** with support and the **potential situation without support**
- **Common Monitoring and Evaluation Framework (CMEF)** defines impact indicators and methods to be used
- CMEF-method similar to those of the **emission inventory from agriculture** (Haenel et al., 2020)
- **Impact of single RD measures** on nitrogene input
 - control group comparison
 - literature

CMEF Impact indicator GHG emissions from agriculture (I.07)

GHG emissions agricultural sector (I.07.1a)

GHG emissions LULUCF sector (I.07.1b)

Ammonia emissions from agriculture (I.07.2)

source: EU-COM (2014)

3 Methods and data

Data

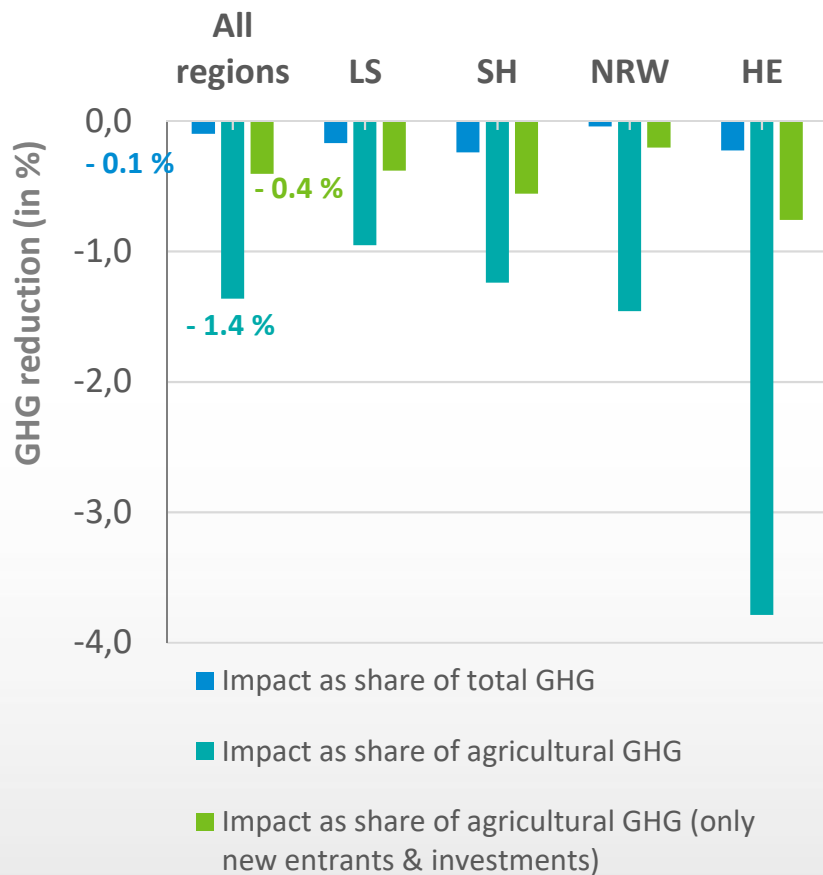
- **Individual project level data:** Information about type of measure, characteristics of projects & beneficiaries
 - Project application forms: Pre-treatment management of slurry
 - Lists of participants to training and advisory
- **Nutrient comparison records** of treated and non-treated farms according to the German Fertiliser Regulation (not specific for RD programmes)
- **IACS data:** Farm- & site information on CAP support about land use, geo-referenced location & farm characteristics

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4 Impact on GHG emission reduction (2015-2018) - as assessed by emissions in 2013/2015

Reduction of GHG emission



Set targets

- RD programmes: no target
- Germany: GHG total -65% (by 2030)
GHG agriculture -20% (by 2030)
- EU: GHG total -55% (by 2030)

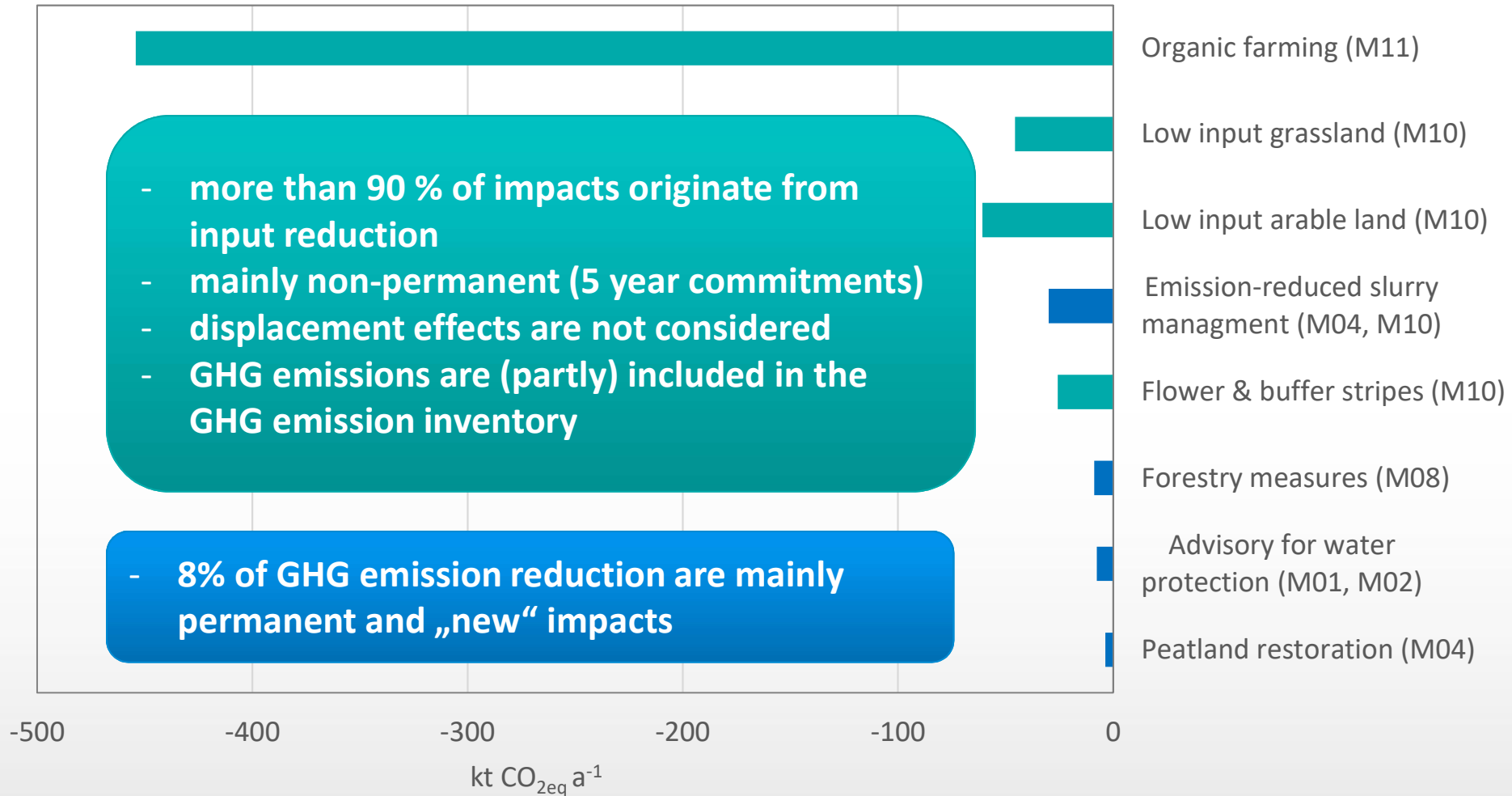
Impact

- GHG total -0.1%
- GHG agriculture -1.4 %
- „First time reduction“ -0.4 % (new entrants, investments)
- large variation by study region
- 65% of reduced GHG emission originate from the sector agricultural

Impact is low compared to targets

4 Impact on GHG emission reduction (2025-2018)

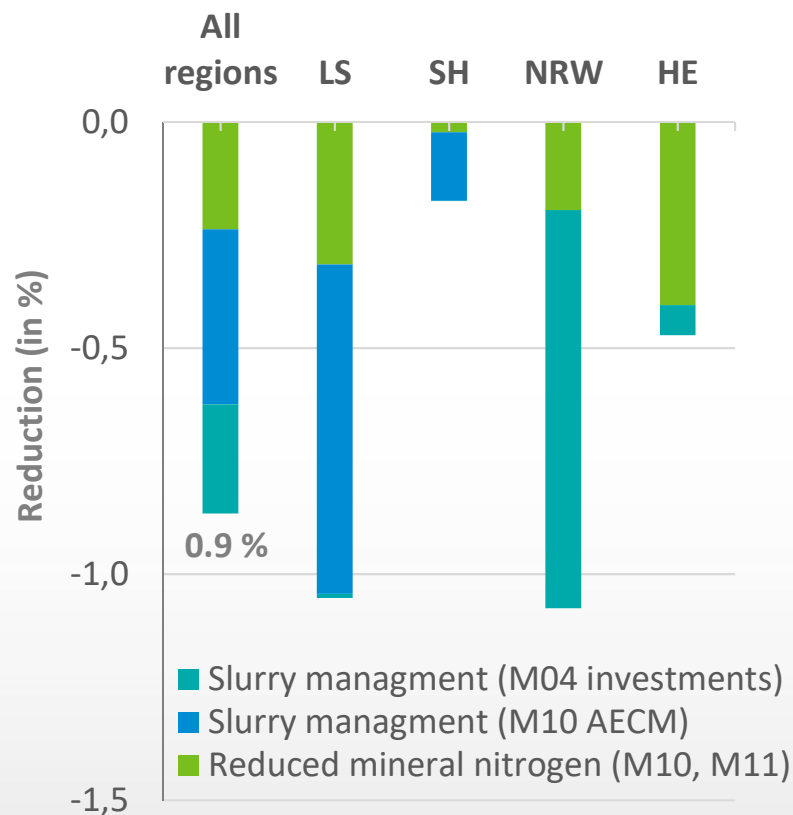
- by RD measures



4 Impact on ammonia emission reduction (2015-2019)

- by RD measures, assessed by emissions in 2015

Reduction of ammonia emission



Set targets

- RD programmes: no target
- Germany: - 29 % NH₃ (by 2030) acc. to NEC-Guideline 2016

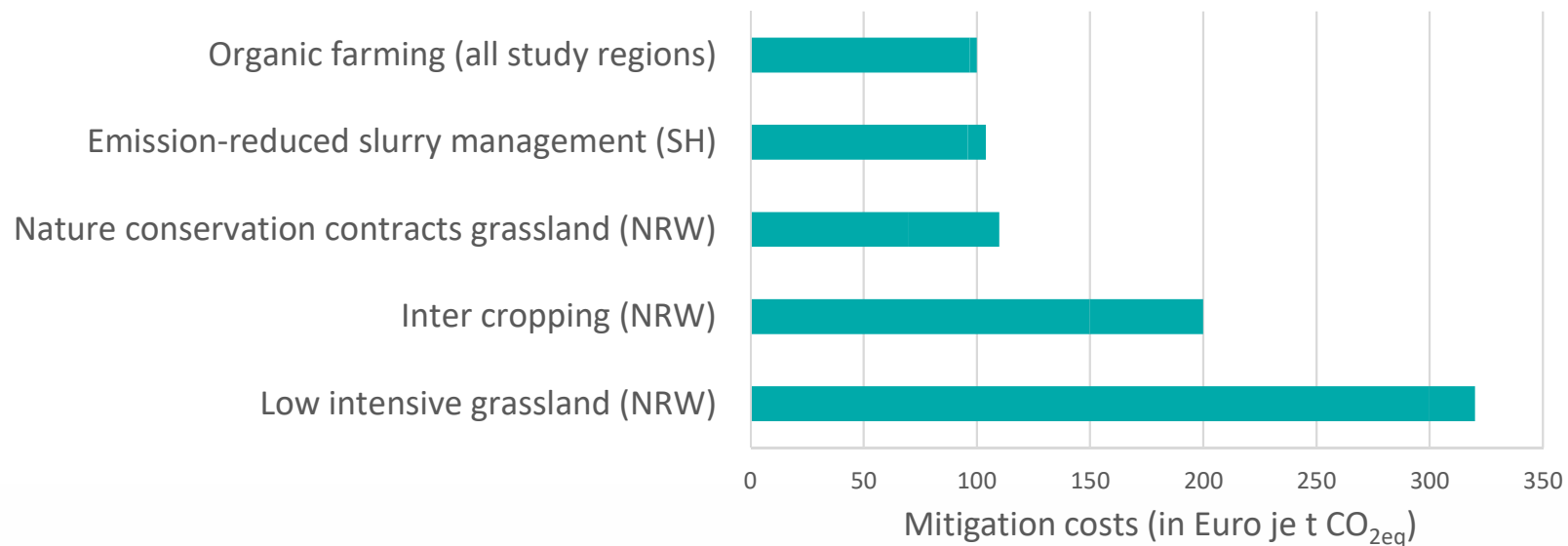
Impact

- Federal state ammonia emission -0.9 %

Impact is low compared to targets

- 75% of impacts are permanent and „new“
- e.g. emission reduced slurry management via Investments (M04) or agri-environment/climate schemes (M10)

4 Mitigation costs for GHG emissions (2007-2013)



- Figure only includes area-based AE & climate measures + organic farming with lowest mitigation costs
- But, costs are incurred every year!
- Mitigation costs do **not** take account to **multifunctional impacts**

5 Discussion

- Less than **5 % of RD expenditures** are targeted to **climate mitigation**
- Most impacts originate from measures not targeted to emission reduction

Sector agriculture

- Impact on **GHG** emission reduction: **Low & mainly non-permanent**
- Impact on **ammonia emission** reduction: **Low & mainly permanent**
- More effective/targeted measures with mainly permanent impacts, e.g. support for **technology adaptation & farm advisory**

Evaluation of GAP Strategic Plans 2023-2027 (pillar I & II)

- Which sites would be abandoned in a situation without support?
- What would be the climate impact of no use of these sites (esp. organic & marginal soils) ?

Thank you for your attention!

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