Meeting the dual demand for animal products and climate change mitigation by narrowing yield gaps

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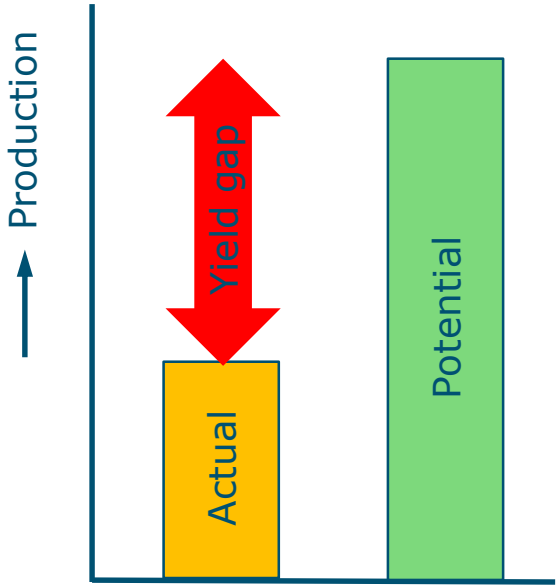
100years 1918 — 2018

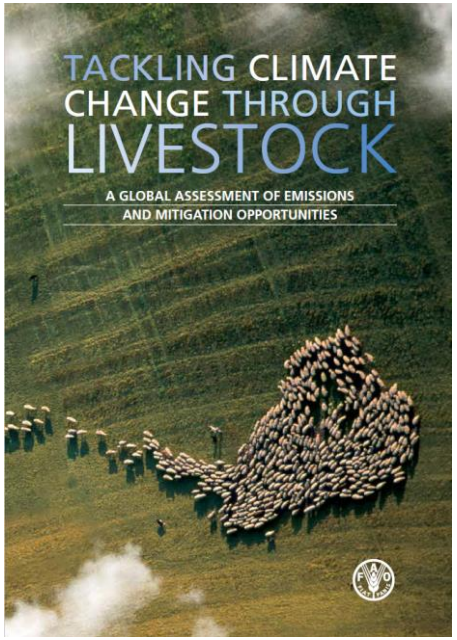
FAO FIAT PANIS

THE WORLD BANK

Introduction



‘Dual demand’



How to meet the dual demand?

Gerber *et al*. (2013), van der Linden *et al.* (2018)

Introduction

- Project: Investing in Sustainable Livestock

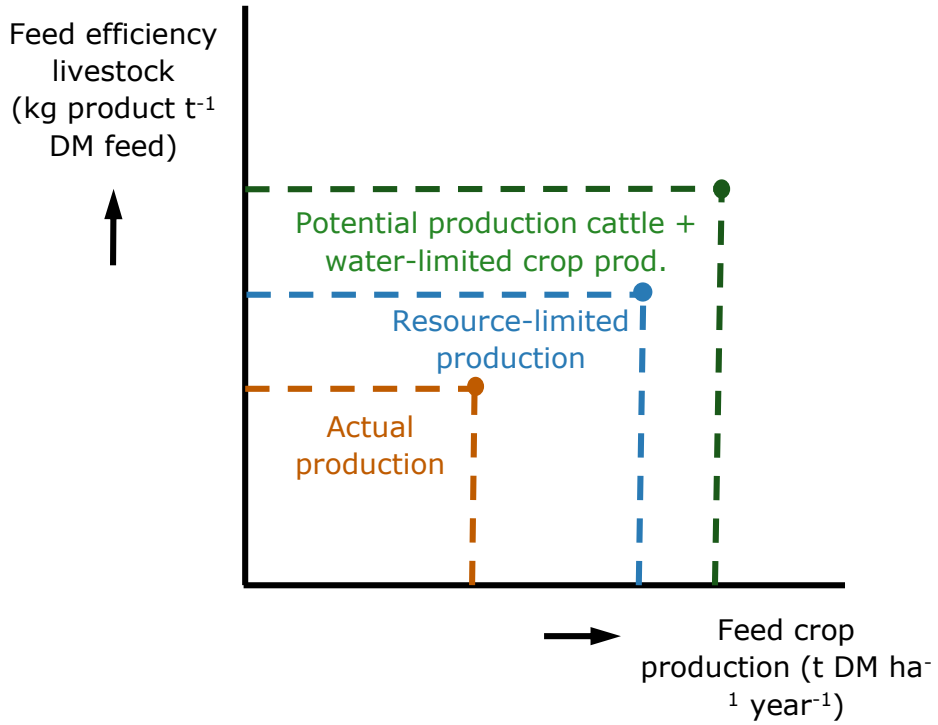
- Support governments and NGOs in meeting the dual demand

Aim: assess relations between yield gap mitigation and emission intensity for beef cattle in Uruguay, and for dairy cattle in Ethiopia and Bangladesh

Materials and methods

Dual demand: production (kg product ha^{-1} $year^{-1}$)

- Actual production
  - Ideal management
  - Crops:
    - nutrient limitation
    - pest, diseases, weeds
  - Cattle:
    - diseases and stress
- Resource-limited production
  - feed-limitation, high-quality diet
- Potential cattle production + water-limited crop production ("Potential production")

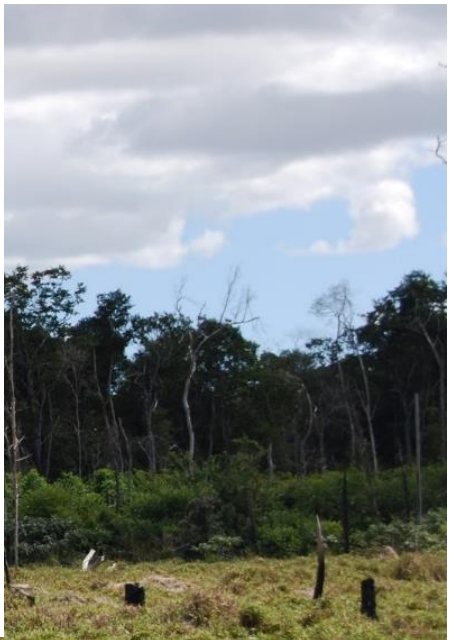


FAO and NZAGGRC (2017a,b,c), Van der Linden et al. (2015), Van der Linden *et al*. (2018a,b), www.yieldgap.org

Materials and methods

Dual demand: GHG emissions

- Production levels combined with IPCC equations (2006)
- GHG for feed → economic allocation



Different farm types in each country.

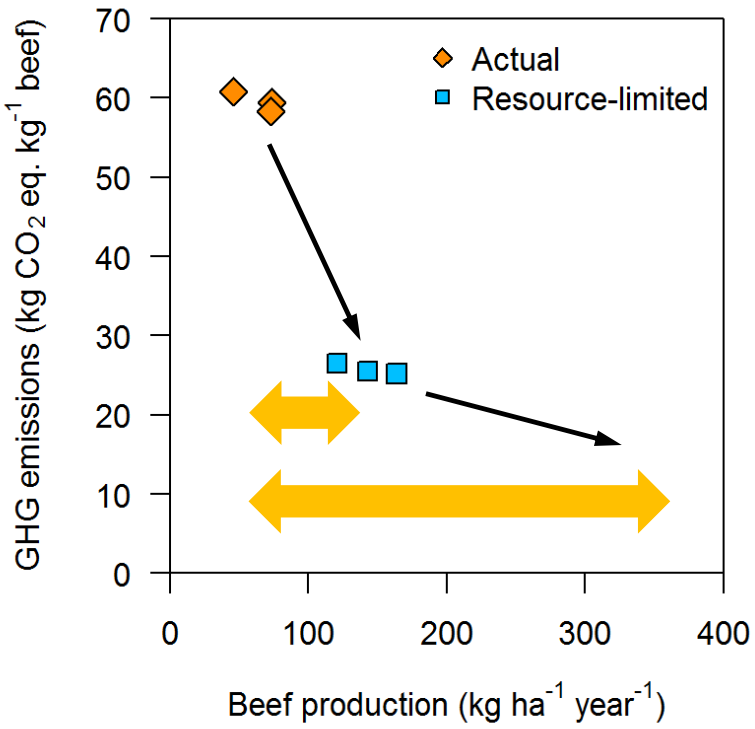
IPCC (2006)

Results and discussion

Beef cattle Uruguay

Finishing calves:

- Natural pasture
- Improved pasture
- Feedlots



Synergy

GHG ←→ Prod.

Relative yield gap

Resource-limited: 49-62%

Potential: 80-87%

Results and discussion

Beef cattle Uruguay

Finishing calves:

- Natural pasture
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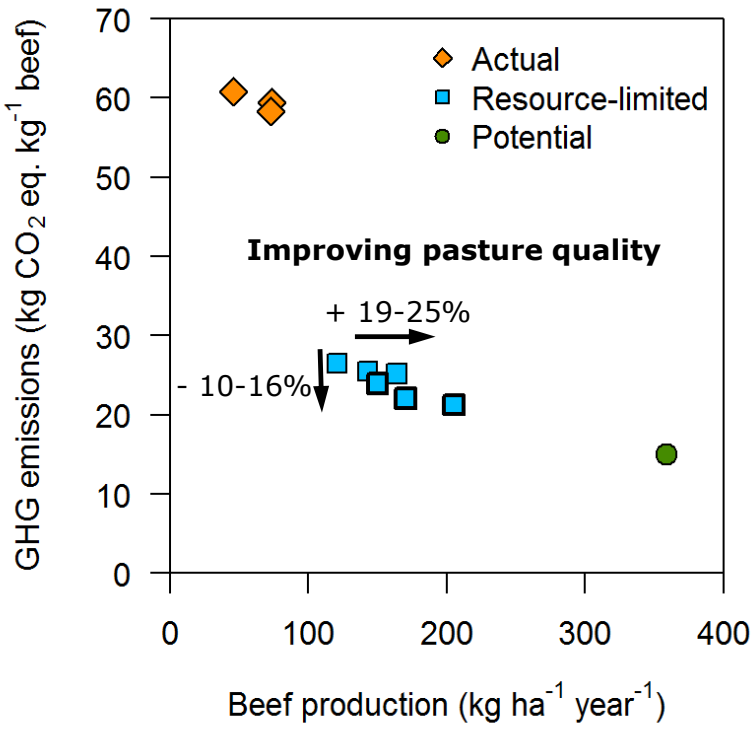


Synergy

GHG ←→ Prod.

Relative yield gap

Resource-limited: 49-62%

Potential: 80-87%

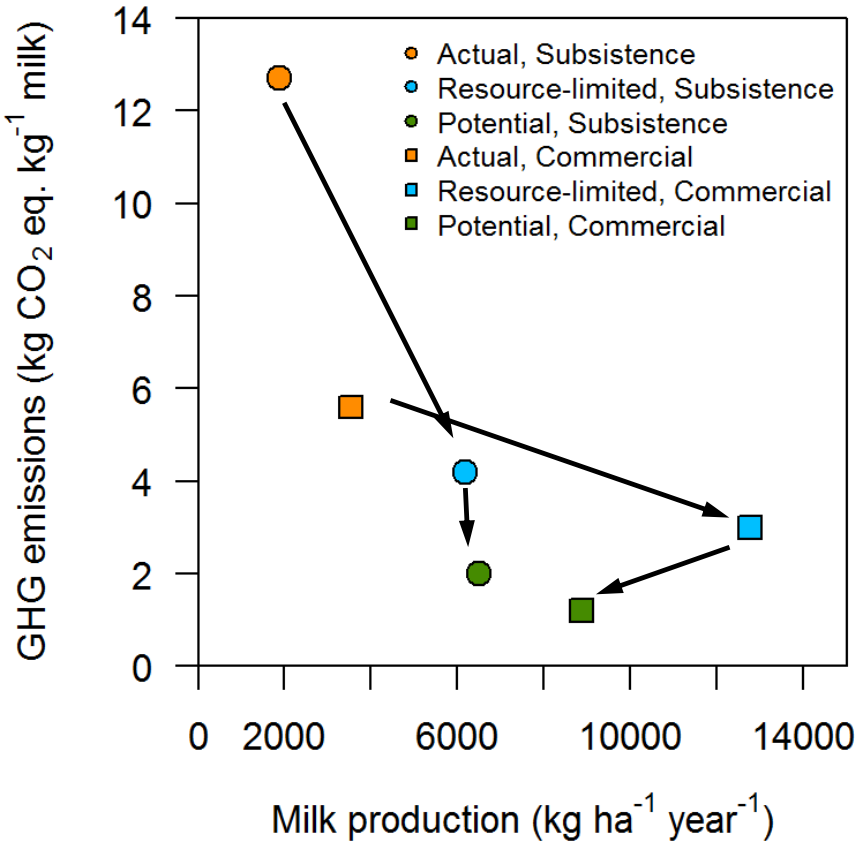
Feasibility intervention options

Results and discussion

Dairy cattle Bangladesh

Farm types:

- Subsistence
- Commercial



- Synergies and trade-offs!
- Food-feed competition
- Multi-functionality of livestock

Conclusions

- Considerable scope to increase beef and milk production.
- Synergies exist between narrowing yield gaps and decreasing emission intensities.
- If crop residues are available, avoid food-feed competition.

Thank you for your attention

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