Reduction of GHG from smallholder dairy farms in Asian countries

Experiences with reducing GHG in dairy sector Sri Lanka

Joined IDF/WUR/CGIAR Webinar

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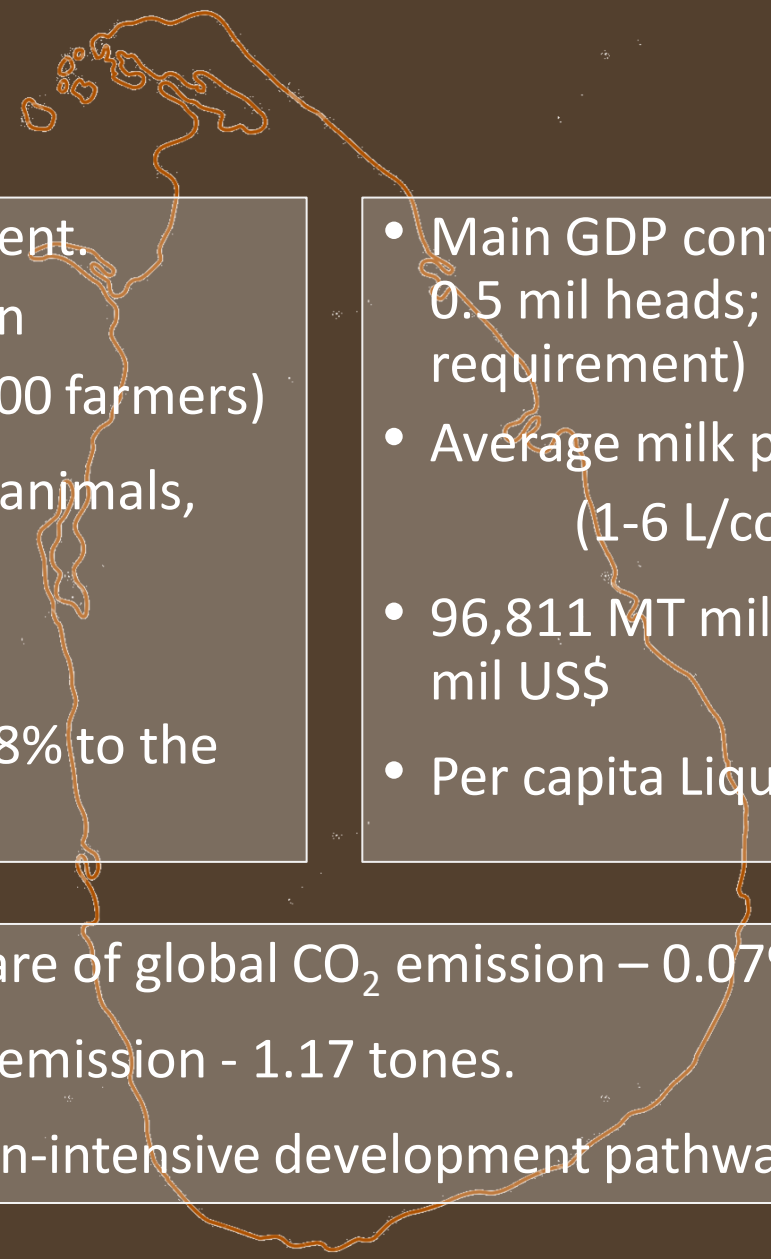
The country context

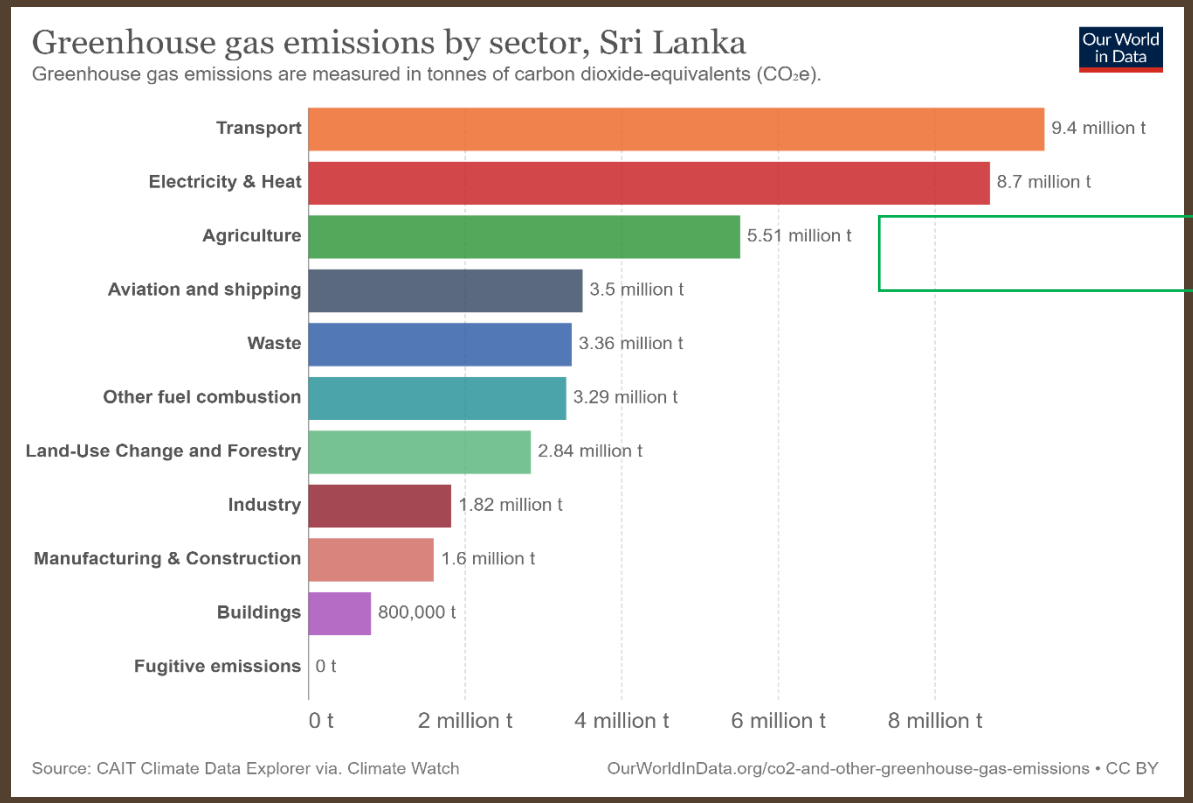


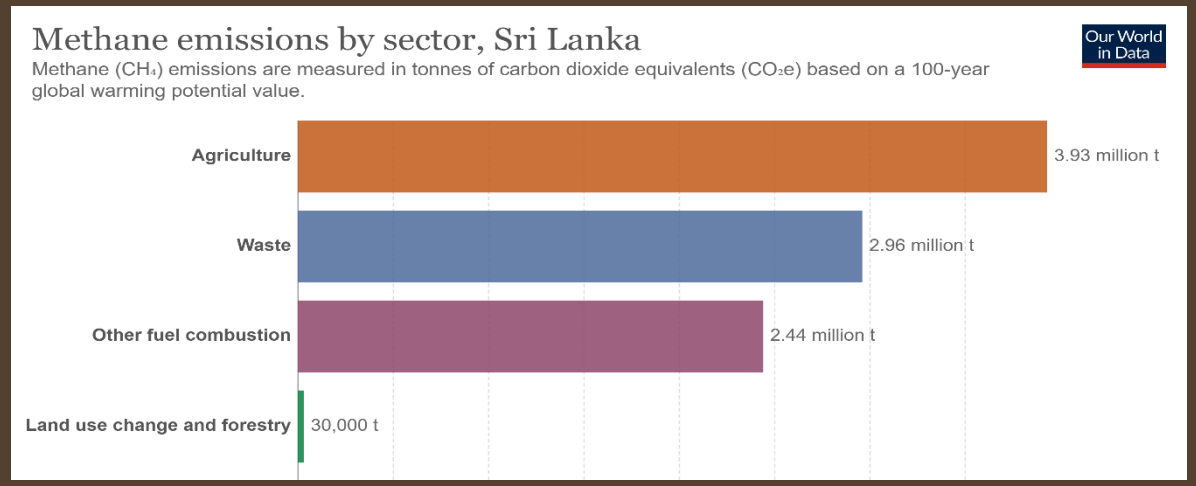
- Diverse Argo-climatic environment.
- Agric sector – 28% of population
  – 30% in Livestock (400,000 farmers)
- Smallholder farmers, 1-3 dairy animals, 70% milk production.
- Milk as a 'cash crop'
- 7.5% to agricultural GDP and 0.8% to the total GDP.

- Main GDP contributor – Cattle + Buffalo (1.6 + 0.5 mil heads; 414 mil L milk; 38% of requirement)
- Average milk production 3.35 L/cow/day
  (1-6 L/cow/day), 2 L/Buffalo/day)
- 96,811 MT milk powder imported spending 300 mil US$
- Per capita Liquid $milk_{eq}$ consumption 63.3 L

- Annual share of global CO_2 emission – 0.07%.
- Per capita emission - 1.17 tones.
- Low-carbon-intensive development pathway.

The country's position



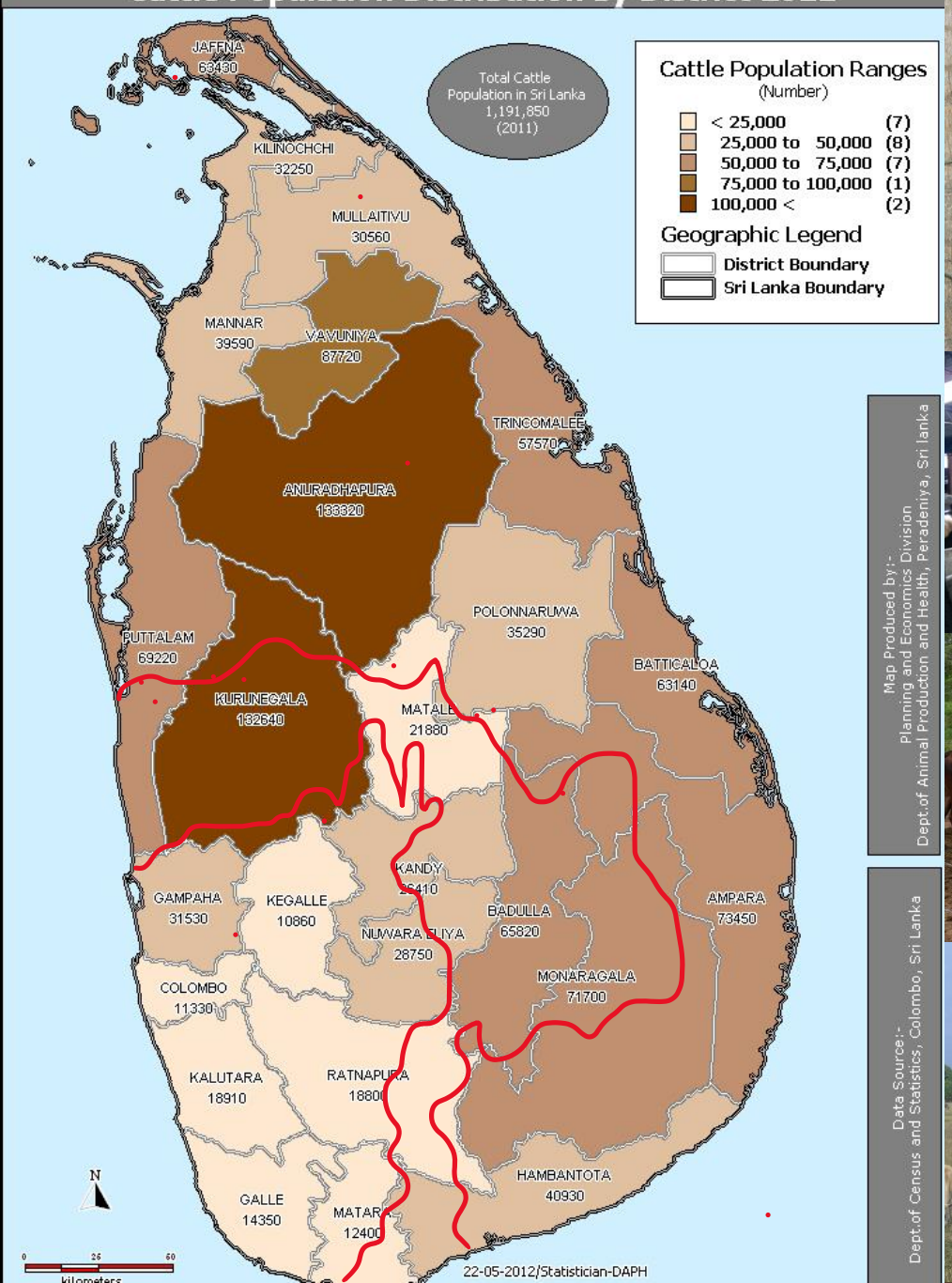


30.5% from livestock

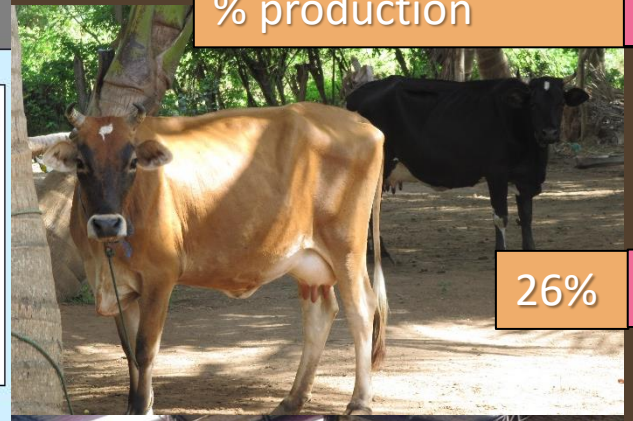
2.3 MT CO_{2e} from dairy sector
93.2% methane
5.2% CO_2
1.6 N_2O

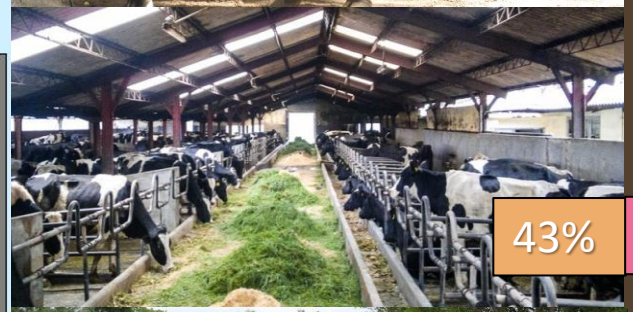
88% ruminant
5% manure
5% transport

SRI LANKA
Cattle Population Distribution by District 2011

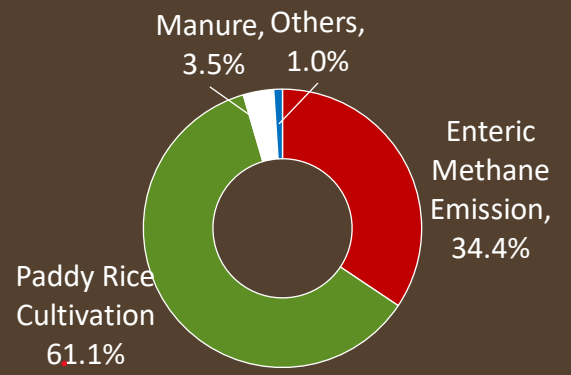


% production	Emission intensity
26%	5.8
43%	2.3
31%	13.8

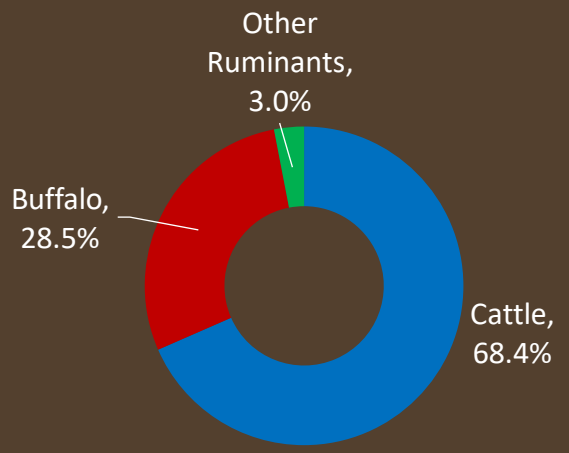




Agricultural Methane Emission Sources in Sri Lanka



Sources of Enteric Methane Emission in Sri Lanka



Source: FAO, 2019

Experiences with mitigation options

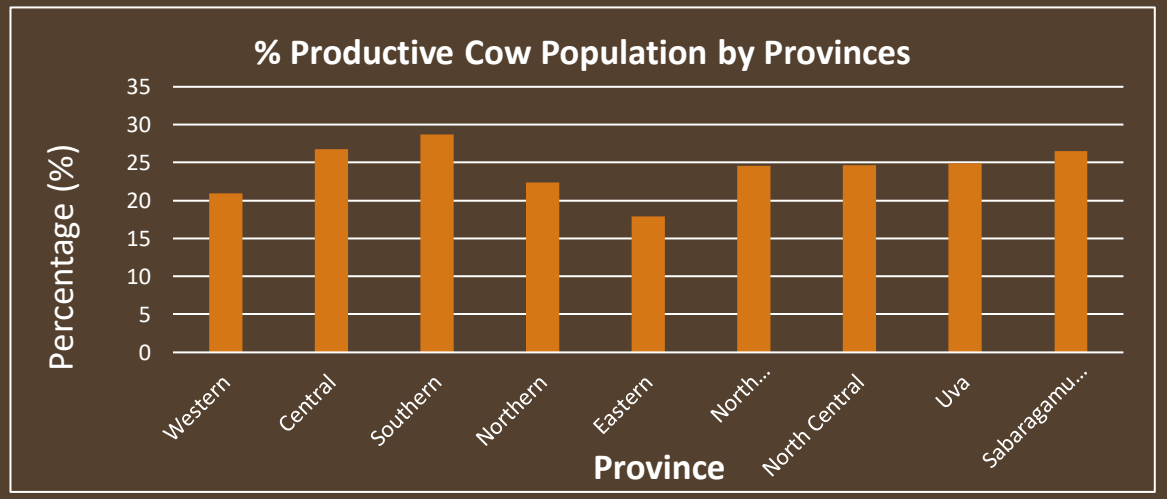
Feeding options

- Adaptation of balanced ration
- Advanced feeding methods: Total mixed ration (TMR)
- Supplementary feeds: Tree fodder
  Low-cost concentrate
  UMMB
- Feed conservation and preservation (silage, hey etc.)
- Use of ICT in awareness attempts

FAO & New Zealand Agricultural Greenhouse Gas Research Centre. 2017

Breeding options

- Breeding policy recommendations
- THI guided breed recommendations
- Increase productive milking cow % in the national herd



Management options

- herd health (Disease diagnosis. Vaccination)
- animal comfort (housing, flooring, Fog-ventilation)
- energy utilization/ options (solar power, biogas)

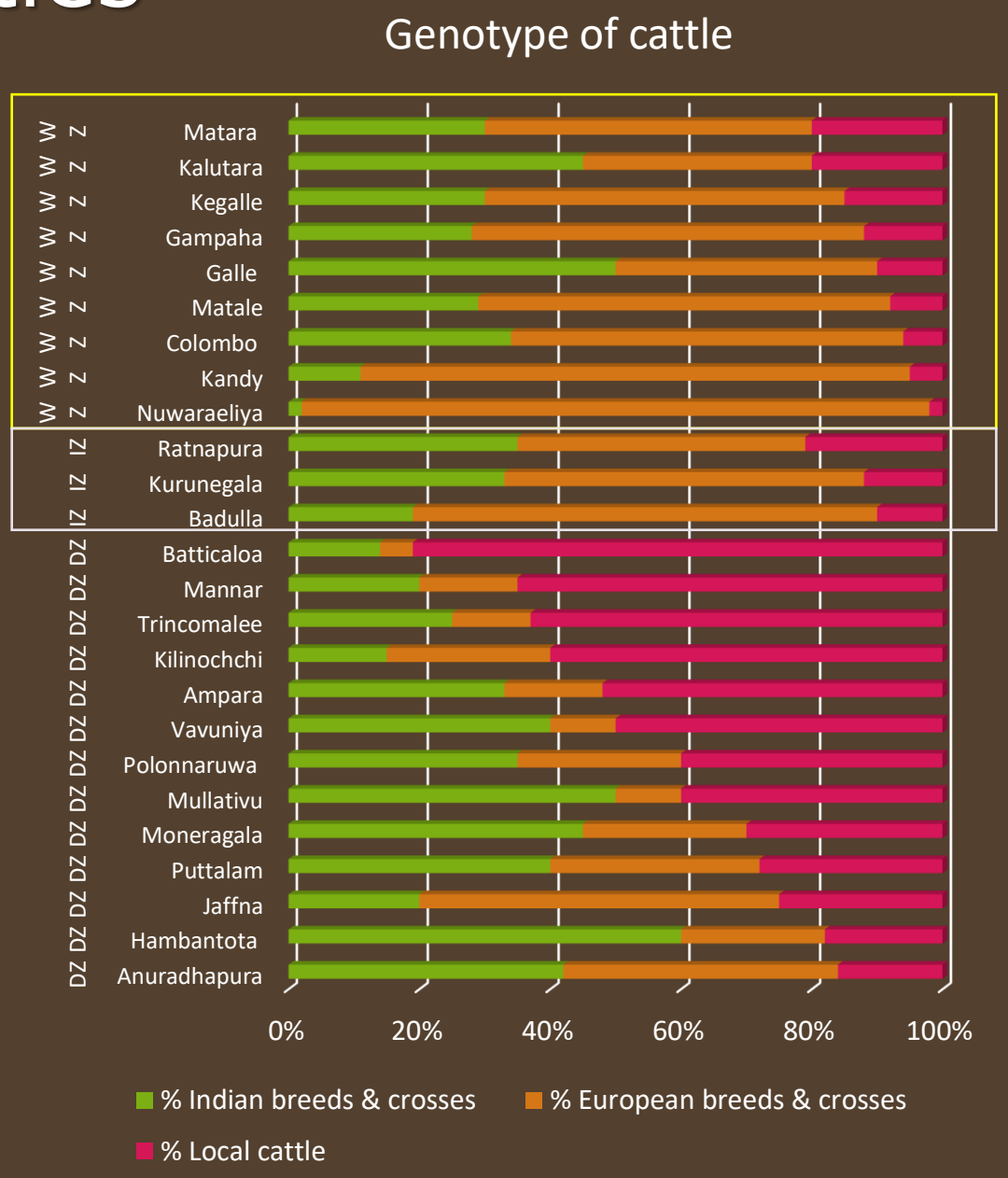
Bottlenecks and opportunities

Opportunities

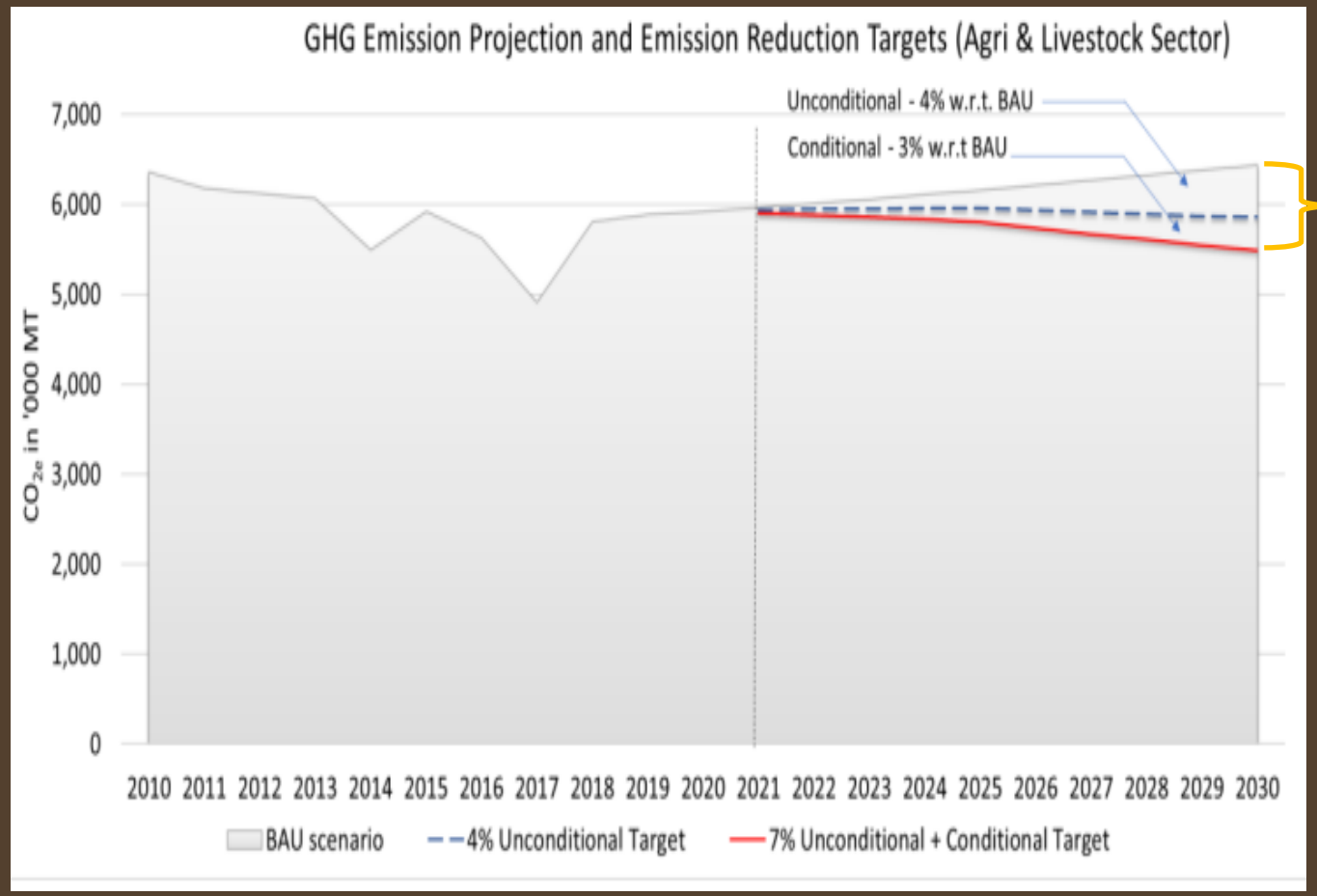
- Increasing demand for milk –
  40% ⟶ 100% self-sufficiency
- Per cow/ per herd productivity enhancement
- Emission reduction by waste management options/ manure treatment
- Adoption of technology
- Under-utilized feed resources
- Integrated/mixed farming practices

Bottlenecks

- Lack of dedicated/ sustainable policies and strategies
- Lack of financial and technical capacities
- Substandard selection/ breeding practices
- Diverse production systems with low adoption of technology
- Lack of grazing lands and high feed costs.
- Unproductive, feral cattle/buffalo population
- Poor feeding systems,
- Poor animal welfare.



National or local strategies/ commitments to reduce GHG from dairy farming

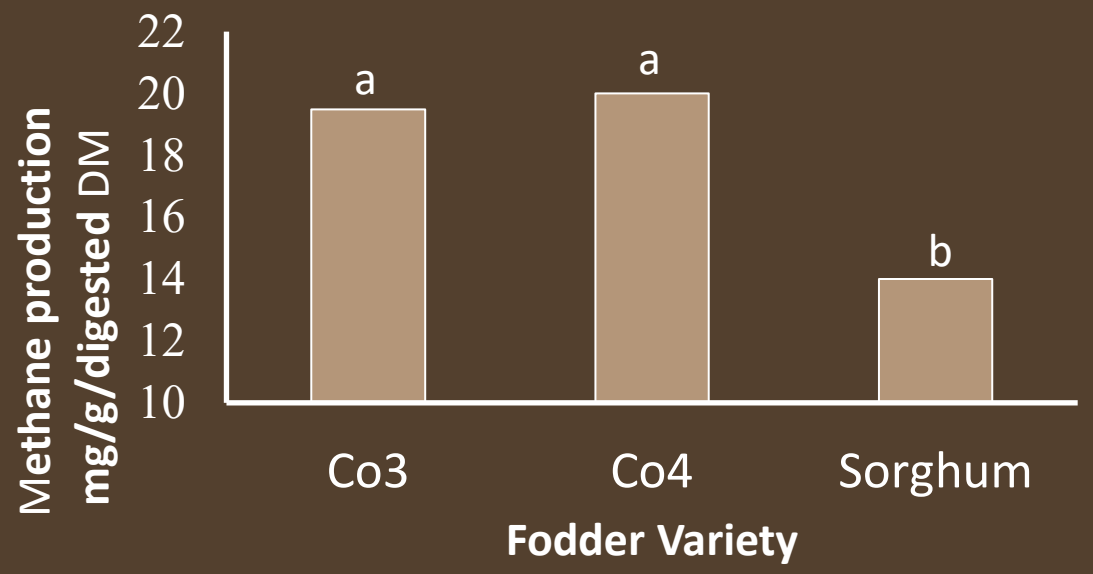


- 2021 to 2030 commitment to reduce GHG emissions by 7% (against BAU)
  - i.e. 2,477,400 MT CO_{2e} u/cond., 1,858,000 MT CO_{2e} cond.

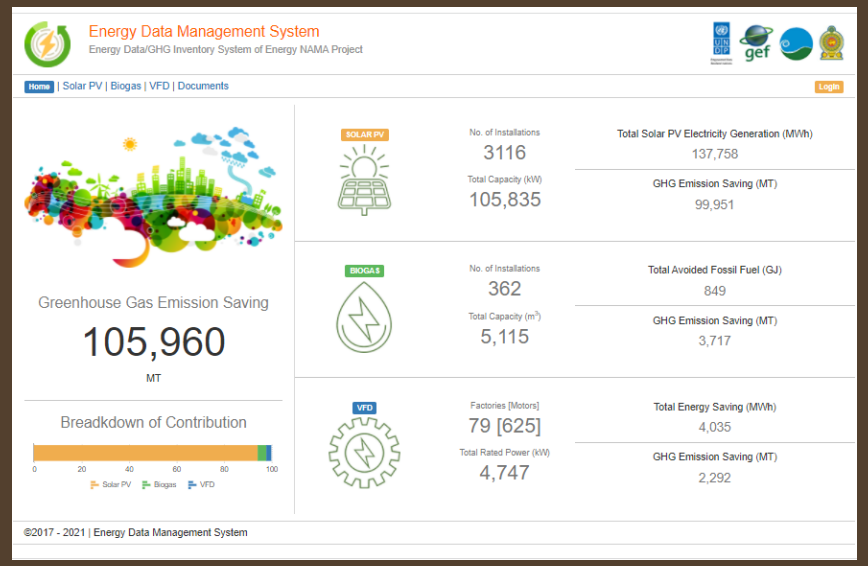
How to get there?

- Improve dairy sector productivity (40% ; 55% increase by 2030)
  - Herd management (40% productive cow)
  - Herd health management
  - Feed strategies
  - Improve animal comfort and welfare
- Use renewable energy for livestock applications
  - Small-scale solar-powered milk storage facility
  - Solar-powered can-coolers
  - Solar energy for farm operation and processing
  - Biogas digesters for dairy operations/processing
- Promote appropriate crop-livestock integrated farming systems in climate vulnerable regions

Country's actions on GHG reduction from dairy



In-vitro methane production of three fodder varieties harvested at 8th week of maturity



Energy data management system by Energy Data/GHG Inventory System of Energy - Nationally Appropriate Mitigation Actions (NAMA) Project

- Mitigation action on energy use - Technology Application Priorities developed
  - under Biogas, Biomass and Solar Trilateral Cooperation Transitioning to Sustainable Energy Uses in the Agro-Industry Project Sri Lanka - China – Ethiopia; United Nations Development Programme, Sri Lanka.
- Estimation of country-specific emission factors for methane emission from enteric fermentation

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Thank you