Net zero emission targets, activities and opportunities in the beef and livestock sector in Vietnam

Le Thi Thanh Huyen, Tran Thi Bich Ngoc, Chu Manh Thang, Nguyen Thanh Trung, Pham Doan Lan

[1]*National Institute of Animal science, Vietnam*

November 2023

Overview

1. Overview livestock production and GHG emissions

2. National emission targets and reduction strategies

3. Supporting projects and programs

4. Opportunities for technical collaboration

1. Overview livestock production and GHG emissions

Livestock population in Vietnam

| Species	2018	2019	2020	2021	2022
Dairy cattle	294,382	317,729	331,368	325,154	325,154
Beef cattle	5,508,525	5,742,295	5,994,259	5,977,342	6,014,250
Buffalo	2,425,105	2,387,887	2,332,754	2,231,632	2,231,632
Sheep	150,022	121,416	114,165	108,393	108,393
Goat	2,683,942	2,609,198	2,654,573	2,677,470	2,808,166
Horse	53,473	50,692	50,941	49,232	48,550
Pig	39,956,374	31,446,804	34,800,825	36,140,654	38,171,540
Chicken	234,147,156	271,543,612	331,334,325	343,224,916	356,365,558
Ducks	21,689,459	24,705,228	28,107,391	28,152,774	28,920,943

Source: GSO (2018- 2023)

GHG emissions from livestock production in Vietnam

The estimated amount of GHG emissions from livestock production in period 1994-2020 (mill. tons CO2)
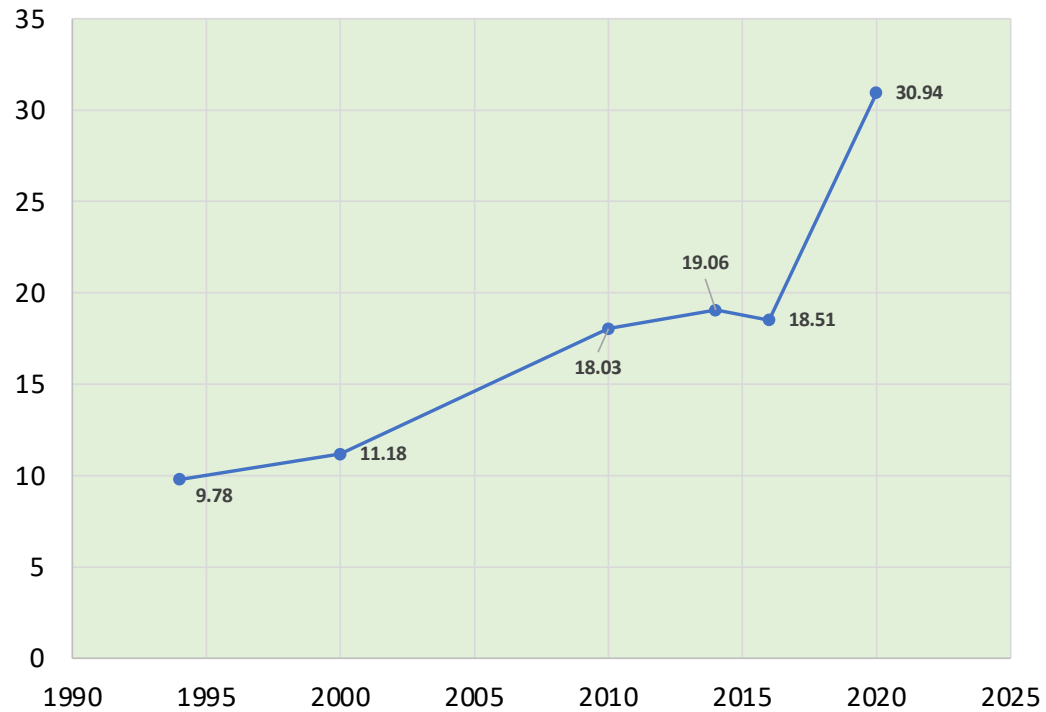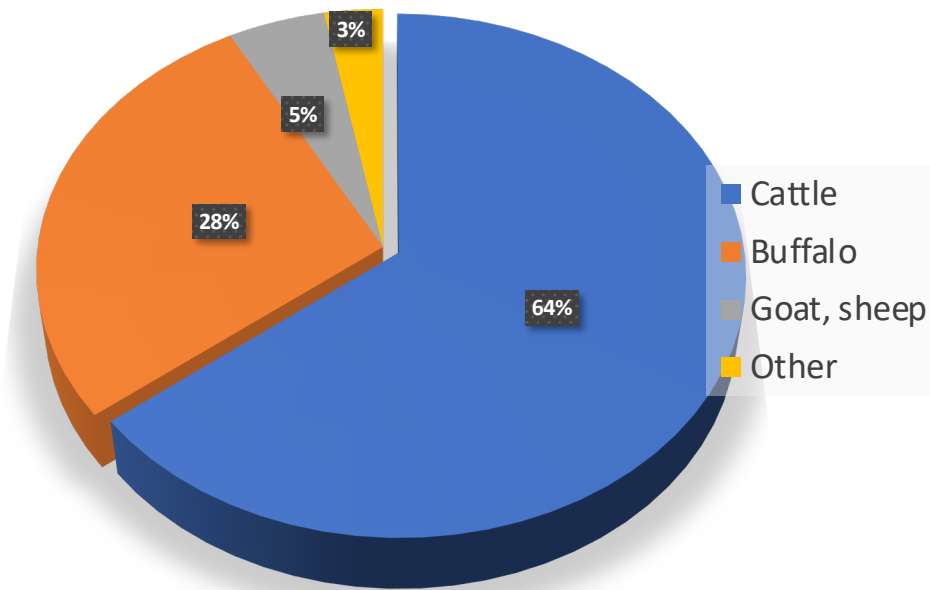
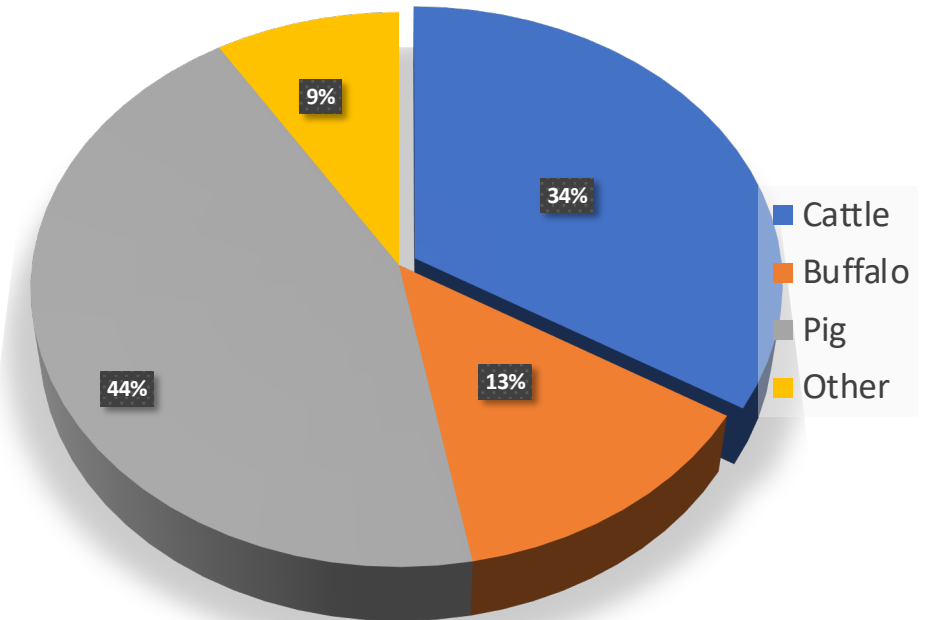**GHG emission sources from livestock production**

- Enteric fermentation
- Manure management

26%

74%
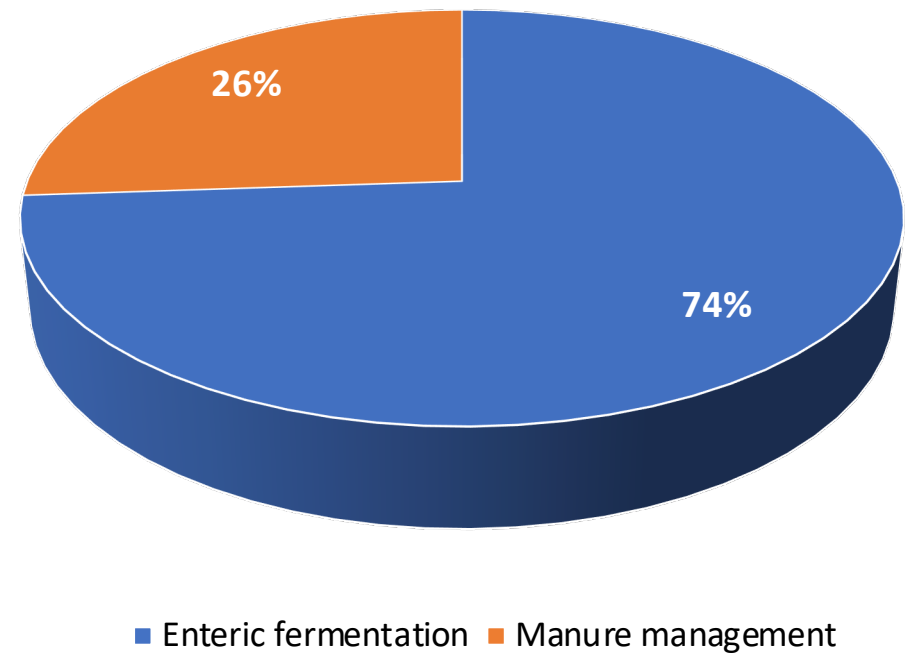
Source: NDC report (2020)

Enteric fermentation GHG emission in different livestock

64% Cattle
28% Buffalo
5% Goat, sheep
3% Other

Source: DCC (2020)

Manure GHG emission in different livestock
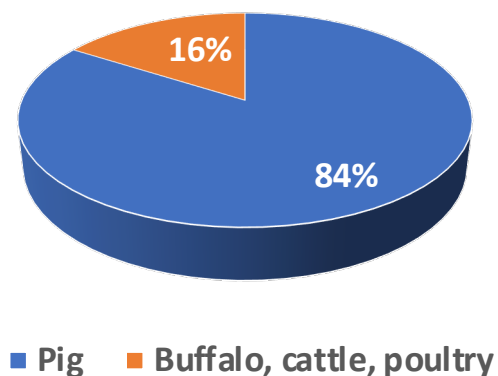
34% Cattle
13% Buffalo
44% Pig
9% Other

Source: NIAS and CAAS (2023)

GHG emissions from livestock production in Vietnam

Sources of livestock waste in Vietnam

The estimated amount of livestock waste (mill. tons)	
Solid waste	62.2
Liquid waste	303.5

Sources of liquid waste from main livestock

- Pig
- Buffalo, cattle, poultry

Sources of solid waste from main livestock

- Buffalo
- Cattle
- Pig
- Poultry
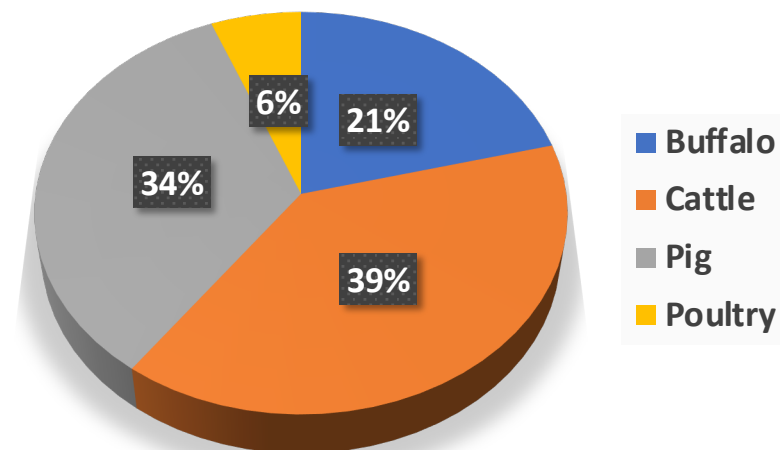
Source: DLP (2022)

Estimated livestock populations by 2030

Livestock development strategy for the period 2021-2030, with vision to 2045
(Decision 152-QĐ-TTg dated June 10, 2020)

Year	Estimated 2030
Pig (mill. head)	29-30
Buffalo (mill. head)	2.4-2.6
Cattle (mill. head)	7.15-7.30 (0.65-0.70)
Poultry (mill. head)	600-670

2. National emission targets and reduction strategies

National strategy on climate change to 2050
(Decision 896-QD-TTg dated July 26, 2022)

> **2030: Reduce greenhouse gas emissions (to net zero by 2050):** decreased by 43% in agriculture, not exceeding 64 million. tons CO2 eq.
>
> **2050:** decreased by 63.1% in agriculture, not exceeding 56 million. tons CO2 eq.

❖ **Responsibilities:**

- **Reduce methane (CH4) emissions**

  2030: reduce 30% CH4 compared to 2020

  2050: reduce 40% CH4 compared to 2030

- **Develop and periodically update national-specific GHG emission coefficients for major emission sources (occupy 0.1% of total national GHG emissions)**

- **Conduct GHG inventory and reduce GHG emissions at the facility: 3000 tons CO2eq/year (by 2030) - 2000 tons CO2eq/year (by 2050)**

The GHG Emission Mitigation Plan (including a CH4 emission reduction plan) for Agriculture, forestry and land use to 2030, with a vision to 2050
(Decision 1693/QĐ-BNN-KHCN dated 28/4/2023)

By 2025, total GHG emission reduction is 53.57 mill. tons CO_2eq (excluding GHG emission reduction from energy use in production), of which, the agricultural sector (crop, livestock) reduces a minimum of 14.26 mill. tons CO_2eq, the forestry sector and land use reduce by a minimum of 39.31 mill. tons CO_2eq; Total methane emissions do not exceed 59 mill. tons CO_2eq.

By 2030, total GHG emission reduction is 121.9 mill. tons CO_2eq (excluding GHG emission reductions from energy use in production), of which, the agricultural sector (crop, livestock) reduces a minimum of 42.85 mill. tons CO_2eq, the forestry sector and land use reduce by a minimum of 79.1 mill. tons CO_2eq; Total methane emissions do not exceed 45.9 mill. tons CO_2eq, **a decrease of 30% compared to 2020**.

GHG inventory and monitoring, reporting and verification (MRV) systems

- Decree 06/2022/ND-CP:
  - **Measurement, reporting, and verification system for greenhouse gas (GHG) emissions reduction** refers to a system that collects, processes, manages, stores, provides, checks, and verifies information on implementation results of GHG reduction *to ensure transparency, accuracy, and verifiability*.
  - Information about GHG inventory results at national and sector level shall be published on the website of state management agencies on climate change and other relevant sectors.

➢From 2022, the GHG inventory carried out by the sector management ministry.

➢*Therefore, strengthening the capacity of MARD and other stakeholders to conduct GHG inventories and develop a system for MRV in the agricultural sector including livestock is necessary*
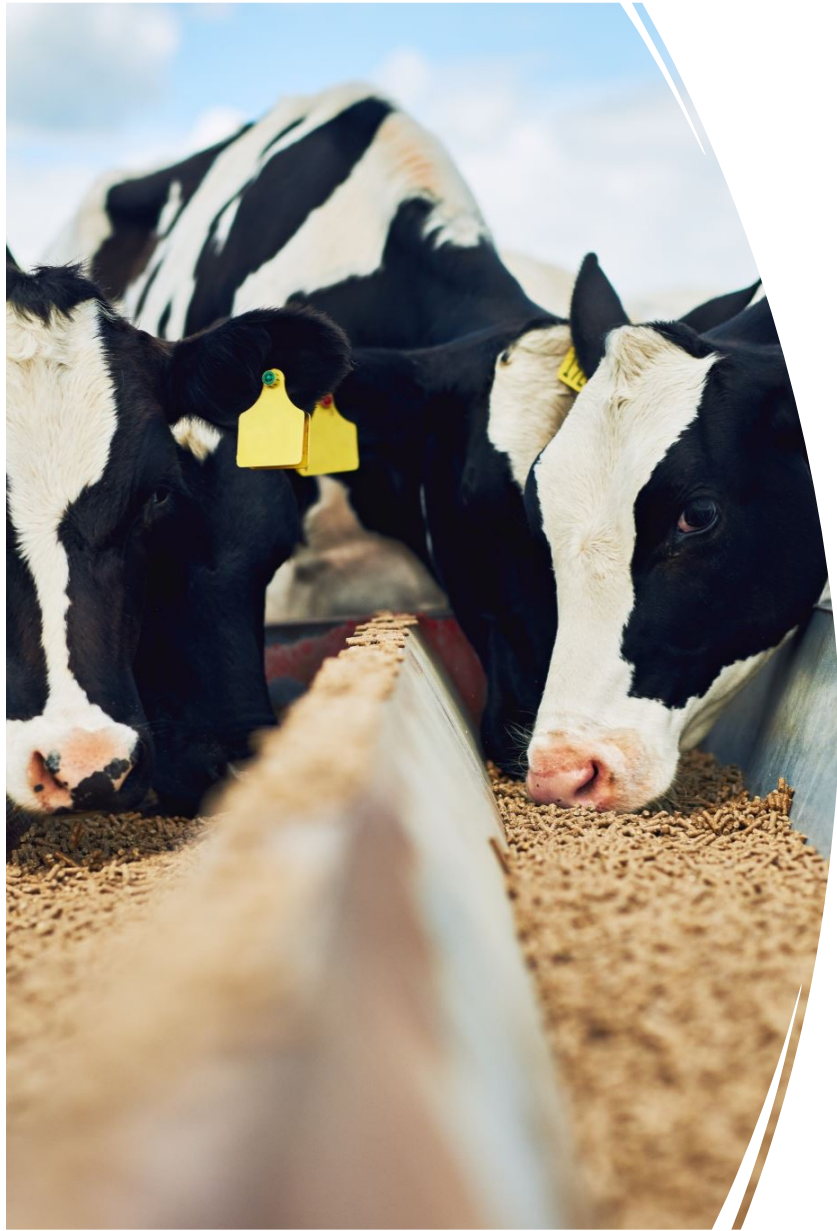
The GHG mitigation measures in livestock sector
(Decision 1693/QĐ-BNN-KHCN dated 28/4/2023)

➢ Improving diets for dairy and beef cattle (A5, A6):

    ✓ Using forage silage in diets to reduce CH_4 emissions and improve productivity in dairy and beef cattle at farm and household scale.

    ✓ Applying software (PC Dairy) to build rations for dairy and beef cattle (meets nutritional requirements and has low emissions - prioritize combining legumes in the balanced diets)

    ✓ Use feed additives that inhibit methane synthesis or absorption (3NOP, activated carbon, Zeolite) and roughage with high tannin content in the diets for dairy and beef cattle (farm and household scale).

The GHG mitigation measures in livestock sector *(Decision 1693/QĐ-BNN-KHCN dated 28/4/2023)*

Improving the quality of diets for buffaloes and goats (A7): Using Zeolite products in the diets for buffaloes and goats (farm and household scale)

Improving technology to reuse livestock waste as organic fertilizer (A15): Applying microbiological technology in composting, and technology in the separation of faeces and urine in pig farms to improve livestock waste treatment efficiency and organic fertilizer production.

3. Supporting projects and programs

- The **"ASEAN and Africa Climate Smart Agriculture Program"** seeks to

  - support 6 ASEAN countries to improve their Tier 1 inventories for livestock and upgrade these to Tier 2 for some sources.

  - Support national partners in identifying mitigation opportunities and informing policy design (e.g. NDC)

    - By establishing at least 2 emission measurement hubs in the region to validate and/or support development of local emission factors

Vietnam (NIAS and MARD)

• Working to develop a regionalized Livestock GHG inventory with MARD & NIAS & statistical expertise. NIAS to be a pivotal measurement hub for the region.

• Support with equipment for enteric emission measurements and manure emission.

• View as a future 'central laboratory' for manure and soil emissions.

• Engages New Zealand and Chinese (CAAS) experts to facilitate Hub establishment.

Goals of the cooperation project - VN

- The longer-term purpose: to enable MARD's technical members and other sector stakeholders to identify, plan and implement measures that meet national objectives for livestock development and GHG mitigation in line with Viet Nam's NDC.
- The specific objective: to strengthen the capacity technical members of MARD and other sector stakeholders to implement their responsibilities for GHG inventory, measurement, reporting and verification (MRV) in the livestock sector.

Project activity areas and expected outcomes

GHG inventory	Measurement capacities	Systems for MRV in the livestock sector	Informing policy and planning
• **Targeted outcome:** MARD has the capacities to compile, manage and report a livestock GHG inventory on a sustainable basis, including Tier 2 inventories for cattle and pigs.	• Vietnamese research institutes have the capacities to produce country-specific enteric methane emission factors and manure management EFs for use in the inventory and for quantifying the effects of mitigation measures.	• At least one system for reporting GHG emission and/or emission reductions in the livestock sector has been piloted and guidelines for MRV documented.	• The implications of Tier 2 livestock GHG quantification for national policies and plans have been assessed and communicated with policy makers.

Activities

1. Livestock sub-sector GHG inventory

• Strengthened capacities of MARD to compile, manage and report Tier 1 inventories for livestock

• Tier 2 cattle and pig inventories compiled

• Strengthened capacities to manage, report and continuously improve Tier 2 GHG inventory

2. Measurement

• Development of regionally relevant enteric methane conversion factors (Y_m)

• and manure management CH_4 and N_2O EFs,

• and training to confirm independent in-country technical capability

3. Systems for MRV in the livestock sector

• At least one system for MRV of a livestock mitigation measure has been piloted and guidelines for MRV developed

4. Policy & planning

• Implications of Tier 2 livestock GHG quantification for national policies and plans have been communicated with policy makers

NIAS - the focal point of the MARD on livestock has sufficient necessary facilities and a staff of appropriate professional qualifications to receive, access and learn GHG inventory related technical support from NZAGRC and national experts.

Experience gained in Vietnam could inform related work in other countries in the region

4. Opportunities for technical collaboration with Australia

- Developing, evaluating and implementing emission reduction technologies and approaches also for co-benefits - a key gap and opportunity
  - Nutrition and feed additives
  - Manure management
  - Breeding and genetics
  - Off-sets and carbon sequestration

Thank you for you attention!