



GLOBAL RESEARCH ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

ITALY



Summary of relevant activities, future priorities and capability needs.

Input to 2025 Livestock Research Group Meeting
Nairobi, Kenya

Relevant activities

- *Focus: Strengthening national and international collaboration to accelerate the adoption of climate-smart livestock practices, particularly through joint research and pilot initiatives with FAO and LRG partners.*
- *Involved Institutions:*
 - *Consiglio Nazionale delle Ricerche (CNR); Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA); Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile (ENEA); Istituto Superiore per la Protezione e Ricerca Ambientale (ISPRA), within the Memorandum of Understanding (MOU) with FAO.*
 - *Academia*
- *Main round tables/councils/boards: FAO_MOU, The objective is to contribute, through joint activities between FAO and the Italian Research Institutions (IRI), to the achievement of the Sustainable Development Goals of the United Nations 2030 Agenda; Global Methane Pledge; FAO-LEAP Partnership (observer status)*
- *Main projects and activities: LRG Feed Additives Flagship Project; FAO LEAP guidelines on Circular Bioeconomy and Ecosystem Service; The "Agridigit" project, PLF4 milk sub-project: Precision livestock farming as a pathway to more sustainable and animal welfare-conscious dairy farms; The Climate Farm Demo project: Adapting agricultural production systems to climate change by adoption of Climate Smart Farming practices and solutions across Europe; On farm carbon footprint calculation and carbon sequestration initiatives; Research on GHG and NH₃ from livestock reduction: i.e., biochar, additives, strategies (nutritional/genetic/managerial); Rapid and/or non-invasive methods for individual enteric methane emission estimation (Laser Methane Detector, Sniffer, Proxies, GreenFeed)*

Future priorities

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- *Scaling up precision livestock farming (PLF) technologies for animal welfare, productivity, and environmental impact.*
- *Enhancing circular bioeconomy approaches in livestock systems, integrating nutrient recycling, renewable energy, and ecosystem services, mainly by valorizing agri-food by-products and organic residues as alternative feed resources, reducing waste and reliance on conventional raw materials*
- *Expanding carbon footprint assessment tools to include more farm types and regions and linking them to incentive schemes for carbon sequestration.*
- *Further developing of robust mitigation strategies for enteric and manure emissions*
- *Promoting farmer engagement and knowledge transfer through demonstration farms and participatory innovation platforms.*
- *Developing integrated biorefinery models within livestock and mixed farming systems, enabling the production of bioenergy, bioproducts, and organic fertilizers, and contributing to sector-wide decarbonization.*
- *Reducing dependency on imported protein sources by promoting locally available and novel protein sources*
- *Improving resilience of livestock systems to climate change and market volatility through diversification of feed sources, adaptive management practices, and integrated risk assessment frameworks.*

Capability needs

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- *Technical and infrastructural capacity for the safe management and processing of by-products used in animal feed, ensuring nutritional quality and food safety.*
- *Design and implementation expertise for agricultural biorefineries, with modular technologies adaptable to various production scales.*
- *Advanced measurement technologies for enteric methane emissions, adapted to diverse farm conditions.*
- *Integrated data platforms to support decision-making in PLF, combining animal-level data with environmental and economic indicators.*
- *Policy and economic analysis expertise to evaluate the cost-effectiveness and scalability of mitigation strategies and climate-smart interventions.*
- *Support for long-term monitoring frameworks to assess the impact of interventions on GHG emissions, biodiversity, and socio-economic outcomes, including analyses and validation of new metrics on short lived greenhouse gases.*
- *Regulatory and policy support to facilitate the adoption of innovative bioeconomy models in livestock systems.*
- *Alternative protein sources exploitation into livestock diets, ensuring nutritional adequacy and safety.*