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The Benefits of Climate Finance for Sustainable Livestock Systems in Low- and Middle-Income Countries

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Introduction: Why livestock matters

The current climate finance architecture is grossly misaligned with the practical realities of sustainable livestock systems in low- and middle-income countries (LMICs). This is despite the overwhelming evidence pointing to livestock systems as multifunctional assets offering solutions for both climate change adaptation and mitigation. Reframing the narrative to recognise livestock's inherent versatility and its capacity to deliver the climate 'triple wins' (climate mitigation, climate adaptation and socio-economic benefits) is crucial for unlocking targeted, impactful and climate funding as a strategic financial instrument in climate action.

Livestock systems in LMICs are important in food production and instrumental in the transition toward circular and sustainable bio-economies. Livestock play a key role in nutrient cycling, material and draught power resources for production, landscape management and sustaining rural livelihoods. The sector's contributions cover multiple dimensions:

- **Nutrition and food security**: Animal products are a source of essential proteins and bioavailable micronutrients that are crucial for vulnerable populations in LMICs. Ruminant livestock also upcycle inedible biomass such as forage, food waste and crop residues into high-quality food and thus reduce food waste and feed-food competition.

- **Agriculture support, soil health and environmental conservation**: In many developing economies, livestock provide essential draught power for agricultural activities, as well as manure. Manure is an organic fertiliser, reducing the need for synthetic fertilisers and enhancing soil organic matter content, water retention, biological activity and long-term productivity. In grasslands, grazing animals help control invasive plant species and reduce wildfire risk.

- **Economic assets and livelihood support**: Livestock are capital assets that serve as informal savings and insurance for households. The livestock sector supports 1.3 billion people globally,[1] predominantly in LMICs, contributing approximately 40% of agricultural GDP[2] and creating jobs throughout value chains while offering empowerment opportunities for women, youth and marginalised groups.

- **Material value:** Beyond food and energy, livestock produce a wide range of by-products used in construction, textiles, pharmaceuticals, cosmetics and bioplastics that reduce waste and provide renewable, biodegradable alternatives to synthetic materials.

- **Cultural heritage**: Livestock are deeply embedded in cultural heritage and rural identity. They foster community cohesion, sustain small farms and local economies and enhance human well-being through companionship, therapy and education.

Growing calls to cut down on meat consumption, the number of livestock and agricultural greenhouse gas (GHG) emissions fail to consider the importance of livestock keeping in LMICs. In most cases, decision makers and advocacy groups look at the livestock sector through the narrow lens of contribution to GHG emissions. This single-lens framing of the livestock sector fails to comprehensively capture its wider value to society.

[1] Philip Thornton et al., *Livestock and Climate Change: Outlook for a More Sustainable and Equitable Future*, Report (CGIAR Initiative on Livestock and Climate, 2024).
[2] Robyn G. Alders et al., "Livestock Across the World: Diverse Animal Species with Complex Roles in Human Societies and Ecosystem Services", *Animal Frontiers* 11, no. 5 (2021): 20–29.

Climate change and livestock sector interactions

Livestock production in LMICs is particularly susceptible to extreme and frequent climate change risks. The sector is projected to be negatively impacted by climate change through increased extreme weather event variability and progressive global warming. For instance, a 2°C increase in temperature will negatively affect the agricultural landscape, causing a reduction in both crop and livestock productivity in many low-elevation and low-latitude areas. Production in the grasslands will be negatively impacted, leading to negative impacts on the livelihoods of more than 180 million people in Africa.[3] Animals will experience increased heat stress, resulting in lower feed intake and productivity, lower fertility and increased susceptibility to disease. This will also lead to a decline in water for livestock due to reduced groundwater – a result of prolonged and more frequent droughts and floods. All these factors will have detrimental effects on herd stability and restocking ability.

At the same time, the livestock sector is a major source of GHG emissions, responsible for about 12% of anthropogenic GHG emissions worldwide, according to the FAO.[4] Methane from enteric fermentation in ruminants is the largest source of these emissions, and cattle alone contribute 77% of total livestock emissions.[5] The overlooked hotspots (abandoned cattle corrals or bomas) in the drylands of sub-Saharan Africa account for ~5% of Africa's anthropogenic nitrous oxide (N2O) emissions.[6] Addressing productivity efficiency and manure management in sustainable ways can lower the emissions of GHG per unit of meat or milk produced, helping countries meet their climate targets under the Paris Agreement.

Not nearly enough climate financing is reaching the livestock sector in LMICs

Addressing productivity and climate change challenges requires substantial financing, yet climate finance flows currently are misaligned with the realities and needs of livestock production systems in LMICs. Despite the livestock sector's immense socio-economic importance and its potential for integrated climate solutions, it remains significantly underrepresented in global climate finance allocations. Less than 10% of the total climate finance for agriculture (approximately $28.5 billion annually) is allocated to the livestock sector.[7] Major agriculture and climate change donors typically have fewer than two livestock projects in their climate programmes, accounting for under 10% of their available finance. Private sector investment also exhibits a bias, tending to favour companies involved in sustainable sourcing further down the supply chain rather than direct investment in livestock producers. Investments in land use, and specifically in the livestock sector, are widely perceived by private investors as undervalued. This is partly due to the lack of data and indicators in the field of livestock and climate change, which hinders the development of climate finance for the sector.[8]

The challenge of inadequate climate financing reaching the livestock sector in LMICs is compounded by significant gaps in current climate accounting and reporting. This absence of timely and important information limits the prioritisation of investment options and the effective formulation and implementation of policies in the livestock sector. It also hampers the monitoring of its performance across livelihoods and the environment. The complexities of measurement, reporting and verification (MRV) procedures for the livestock sector present a further obstacle, complicating baseline setting, driving up costs and deterring investment. These data deficiencies contribute to unsuited risk assessment frameworks, where traditional lenders often perceive investments in the livestock sector in LMICs as high risk, with limited potential for

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[3] Thornton et al., *Livestock and Climate Change*.
[4] Food and Agriculture Organization, *Pathways Towards Lower Emissions – A Global Assessment of the Greenhouse Gas Emissions and Mitigation Options from Livestock Agrifood Systems* (FAO, 2023).
[5] Mario Herrero et al., "Biomass Use, Production, Feed Efficiencies, and Greenhouse Gas Emissions from Global Livestock Systems", *Proceedings of the National Academy of Sciences* 110, no. 52 (2013): 20888–20893.
[6] Klaus Butterbach-Bahl et al. "Livestock Enclosures in Drylands of Sub-Saharan Africa Are Overlooked Hotspots of N2O Emissions", *Nature Communications* 11, no. 4644 (2020).
[7] Thornton et al., *Livestock and Climate Change*.
[8] World Bank, *Opportunities for Climate Finance in the Livestock Sector: Removing Obstacles and Realizing Potential* (World Bank, 2021).

significant returns, thus rendering it unattractive. Local intermediaries, crucial for bridging finance gaps, frequently have limited capacity to assess, implement and monitor mitigation activities within livestock systems.

Lack of coordination between environmental and agricultural ministries is another factor that significantly hinders access to climate finance for the livestock sector. This fragmentation means that environmental objectives are often not adequately tied to agricultural strategies, despite the urgent need for their alignment. The absence of dedicated platforms to drive concerted action within the livestock sector also limits overall progress. Another barrier also arises from how project funding is tied to specific activities by multilateral organisations. This often limits outreach and the prioritisation of livestock-related climate mitigation projects, as they are frequently overlooked or not prioritised compared to other sectors, even when countries themselves explicitly prioritise livestock climate action.

Driving more climate finance into the livestock sector in LMICs can bring triple wins

The livestock sector in LMICs presents a unique triple win, simultaneously offering climate mitigation, climate adaptation and socio-economic benefits. These integrated climate solutions are important in delivering win–win scenarios of mitigation and adaptation while protecting the livelihoods of vulnerable populations in developing economies. This reframes the narrative around sustainable livestock systems from being solely a source of emissions to being multifunctional assets that offer integrated climate solutions.

Table 1: The adaptation, socio-economic and mitigation benefits of livestock sector interventions in LMICs

Improved feeding practices, animal health and herd management	
Adaptation & socio-economic benefits: Better nutrition leads to increased animal productivity (eg, higher milk or meat yields), which in turn enhances food security, improves farmer livelihoods and provides more stable income streams. Providing animal health services such as vaccinations helps reduce losses through disease and improve the earnings for farmers.	Mitigation: Enhancing feed digestibility and nutritional levels through improved feeding practices significantly reduces enteric methane emissions from ruminants. Herd composition management and improvements in reproductive rates can also help reduce emission intensities. Livestock that are free of diseases and parasites have lower emission intensities.
Sustainable pasture and land management	
Adaptation & socio-economic benefits: Healthy and well-managed grasslands are more productive and resilient to climate shocks like droughts, ensuring better feed availability for livestock. These practices also enhance biodiversity, improve soil fertility and support various ecosystem services like water retention, which are vital for long-term environmental and livelihood sustainability.	Mitigation: Practices such as rotational grazing, optimising grazing intensity and sowing legumes can significantly increase soil carbon stocks, leading to carbon sequestration and removal of CO2 from the atmosphere. Avoiding the burning of grasslands and crop residues also contributes to carbon retention.
Integrated landscape management	
Adaptation & socio-economic benefits: The integration of trees with pasture and	Mitigation: Integrating trees with pastures and livestock (silvopastoralism) provides

livestock in silvopastoral systems provides shade and improves microclimates for livestock, directly aiding in heat stress management and overall system resilience. Mixed crop–livestock farms tend to be more resilient to price shocks and climate variability, offering greater opportunities for innovation, diversification and value-added production. Integrating livestock with forestry, crop and aquaculture production systems also strengthens overall farm resilience.	carbon sequestration benefits both above (trees) and below ground (soil carbon). Promoting intensified livestock production with fewer, more productive animals can reduce the land footprint and GHG emissions per unit of product, helping to prevent deforestation by reducing the need for pasture expansion into forests and ensuring sustainably sourced feed.
Improved manure management	
Adaptation & socio-economic benefits: Biogas provides a source of renewable energy for cooking or electricity, reducing reliance on fossil fuels and offering economic co-benefits for farmers. The remaining digestate (slurry) can be used as organic fertiliser, improving soil fertility and crop production while reducing nutrient pollution and pathogen release into the environment.	Mitigation: Technologies like biogas digesters can capture up to 60-80% of methane (CH4) from manure that would otherwise be emitted, converting it into cleaner energy. Matching manure application to crop nutrient requirements also helps reduce N2O emissions.[9]
Diversification of livestock species and breed improvements	
Adaptation & socio-economic benefits: Diversifying livestock species and breeds can increase resilience to climate shocks. For example, introducing more stress-tolerant breeds or shifting from cattle to camels in expanding shrubland areas can be an effective adaptation strategy. More resilient breeds can also be chosen to adapt to challenging climatic or disease conditions.	Mitigation: Diversification can indirectly support mitigation by promoting more appropriate and resilient breeds that may have lower emissions or reduce pressure on overstressed resources that might otherwise lead to higher emissions. Breeding for ruminants that are naturally lower emitting due to their genetics can help reduce emissions.

[9] World Bank, *Opportunities for Climate Finance*.

Policy recommendations

The challenges faced by the livestock sector in LMICs, including climate change impacts and significant GHG emissions, policy fragmentation and financial barriers, demand a concerted and strategic policy response. Recognising the multifunctionality of livestock systems that offer integrated climate solutions is important for unlocking targeted and impactful climate funding. The following policy recommendations address these issues, promoting financial innovation, institutional reform and robust data and knowledge systems.

Develop blended finance instruments for livestock systems

The G20 should ask financial institutions offering climate finance to work with countries and the private sector to design and implement financial products that combine concessional public finance (grants, low-interest loans) with private capital. This directly addresses the problem of unsuitable risk assessment frameworks and the lack of collateral among smallholder farmers, making investments in both extensive and smallholder-dominated livestock systems more attractive. Blended finance can de-risk projects, providing different risk-return profiles appropriate for various investors. These instruments should offer flexible repayment schedules and leverage existing local financial institutions with rural outreach to overcome the 'missing middle' in finance.

Scale out carbon credit standards for rangelands and methane reductions

Standards for selling carbon credits from rangelands and emission reduction from smallholder dairy systems are in limited use. The G20 can encourage countries and project developers to use these standards more widely as a way of providing new revenue streams and incentives for improved rangeland management and more efficient dairy production. This will help overcome the current lack of cost-effective MRV approaches for soil carbon and other biogenic processes, enhancing the bankability of such projects.

Update climate fund eligibility criteria and risk frameworks

Finance institutions, in response to a request from the G20, should adjust existing climate finance taxonomies and risk assessment models to better accommodate the unique characteristics and multifunctional benefits of livestock systems in LMICs. Current criteria often limit eligible livestock projects to a narrow set of activities like manure management, overlooking broader benefits and innovative approaches. This reform is key to ensuring that the triple wins of livestock interventions are fully captured and incentivised. It means moving beyond a narrow focus on emissions per product to a holistic view that includes the sector's contribution to food security, livelihoods and ecosystem services.

Develop climate-smart livestock indicators and metrics

The G20 should encourage research and other technical organisations to standardise and promote the use of robust, science-based indicators and MRV systems that accurately capture the triple outcomes of livestock interventions at various scales. Current MRV procedures are costly, inconsistent and often lack the detail needed for effective monitoring, particularly for complex biogenic processes and soil carbon sequestration. There is a need for simple, small sets of science-based indicators for resilience, adaptation and mitigation, as well as checklists for investment specialists. Investment in R&D and prize-based

programmes can accelerate the development of cost-efficient MRV systems, addressing the current challenge of proving and monetising climate benefits, especially for private investors.

Conclusion

By 2030, this strategic approach should contribute to a significant increase in climate finance directed to the livestock sector in LMICs, leading to enhanced resilience against climate hazards, substantial reductions in net GHG emissions and improved food and nutritional security, alongside broader economic and social development across the continent.

The G20 has previously emphasised the importance of addressing such issues as antimicrobial resistance as related to the livestock sector. It is now time for the G20 to recognise the critical role that livestock production plays in achieving climate action in the agriculture sector. Making an explicit call for more climate finance to reach the sector in LMICs will ensure improved animal health, empowered smallholder farmers and more resilient food systems.

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