

# Livestock systems and environment program



Since the 2006 FAO report *Livestock's Long Shadow*, the International Livestock Research Institute (ILRI) has been acutely aware of global concerns around the environmental footprint of livestock. Environmental “bads” include greenhouse gas (GHG) emissions from ruminant digestion, nutrient leaching and emissions from manure, and land use change and degradation. However livestock also provide important environmental “goods”, such as biodiversity, and they are a critical livelihood asset in the face of climatic and economic shocks.

Rapid environmental changes have profound impacts on livestock production. Climate change brings increased temperatures and more variable precipitation, leading to changes in vegetation, pests and diseases. Other social and economic changes alter land tenure, access to and availability of resources, and markets. The risks facing livestock producers constantly change, requiring them to be highly adaptive.

The Livestock Systems and Environment (LSE) research agenda seeks to:

- Provide accurate and relevant information about the impact of livestock on the environment
- Place this impact in a context that gives adequate recognition to the important benefits of livestock, and
- Mitigate the impact of current and future environmental change on livestock production systems.

The outcome we seek is the uptake of strategies for the sustainable intensification of livestock production. We recognize that these strategies must be “future proof” and that trade-offs among aims are inevitable. We argue that such trade-offs can be strategically resolved with scientific evidence.

LSE research takes an integrated systems approach, analysing interactions among livestock systems and the environment at global to local scales. A cornerstone of the program’s research is combining quantitative with qualitative approaches, spanning the biophysical and social sciences.

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LSE research is organized into four areas:

**1. Adaptation and Resilience** aims to build capacity for adaptation to environmental change as well as resilient development processes that integrate the management of risk with the pursuit of prosperity, primarily in pastoral and agro-pastoral dryland environments. This agenda includes institutional and governance dimensions as well as adaptation interventions such as livestock insurance and early warning systems.

**2. Understanding and managing the Environmental Footprint of livestock** aims to provide accurate and context-specific information on the environmental impacts of intensifying livestock production systems, particularly on nutrient cycles and GHG emissions. We combine empirical field measurements with modelling and spatial analysis to inform decision makers. The Mazingira lab is at the heart of this research.

**3. Ecosystem Services and Natural Resource Management** aims to identify gaps, options, approaches and institutional mechanisms to enhance the delivery of ecosystem services in livestock systems. Cost-benefit and trade-off analysis along with participatory approaches help promote rational resource allocation and better targeting of investments and interventions. Spatial analysis is a core tool for mapping and quantifying ecosystem services.

**4. Drivers and interactions for sustainable Food Security** uses experimental, participatory action research, analysis and modelling approaches to identify test and evaluate livestock interventions that improve the food security status of smallholders. This research provides information on livestock current and future contributions to household food security under different user-defined scenarios across diverse livestock system types.

LSE research contributes to six CGIAR research programs: Dryland Systems; Humid Tropics; Livestock and Fish; Agriculture for Nutrition and Health; Water, Land and Ecosystems; and Climate Change, Agriculture and Food Security (CCAFS). The program has 60 staff members; it hosts the CCAFS East Africa Regional Program as well as the CCAFS Theme on Data and Tools.

The International Livestock Research Institute (ILRI) works with partners worldwide to enhance the roles that livestock play in food security and poverty alleviation, principally in Africa and Asia. The outcomes of these research partnerships help people in developing countries keep their farm animals alive and productive, increase and sustain their livestock and farm productivity, find profitable markets for their animal products, and reduce the risk of livestock-related diseases.

ILRI's mission is to improve food and nutritional security and to reduce poverty in developing countries through research for efficient, safe and sustainable use of livestock—ensuring better lives through livestock. Working closely with its partners, ILRI's three strategic objectives are:

- develop, test, adapt and promote science-based practices that—being sustainable and scalable—achieve better lives through livestock.
- provide compelling scientific evidence in ways that persuade decision-makers—from farms to boardrooms and parliaments—that smarter policies and bigger livestock investments can deliver significant socioeconomic, health and environmental dividends to both poor nations and households.
- increase capacity among ILRI's key stakeholders and the institute itself so that they can make better use of livestock science and investments for better lives through livestock.

ILRI's skills and expertise include our three main pillars for animal production—animal health, feeds and genetics—as well as, and more specifically: biology, molecular biology, microbiology, epidemiology, biotechnology, diagnostics and vaccine development; ecology, agricultural systems and agricultural value chains; sociology, gender and poverty analysis, participatory research and impact assessment; market economics; and development communications and knowledge sharing.

ILRI is a not-for-profit institution with a staff of about 700 and, in 2013, an operating budget of about USD 74 million. A member of the CGIAR Consortium working for a food-secure future, ILRI has its headquarters in Nairobi, Kenya, a principal campus in Addis Ababa, Ethiopia, and offices in other countries in East, West and Southern Africa and in South, Southeast and East Asia.

ILRI leads the CGIAR Research Program on Livestock and Fish, leads a component of a CGIAR Research Program on Agriculture for Nutrition and Health on the prevention and control of agriculture-associated diseases, and contributes to seven other CGIAR research programs. Staff members work in integrated sciences and biosciences programs that develop and deliver science-based practices, provide scientific evidence for decision-making and develop capacities of livestock-sector stakeholders. With the African Union/New Partnership for Africa's Development Planning and Coordination Agency, ILRI also hosts and manages the Biosciences eastern and central Africa (BeCA)-ILRI Hub.



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*better lives through livestock*  
 ILRI is a member of the CGIAR Consortium

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