

Tackling climate change through livestock

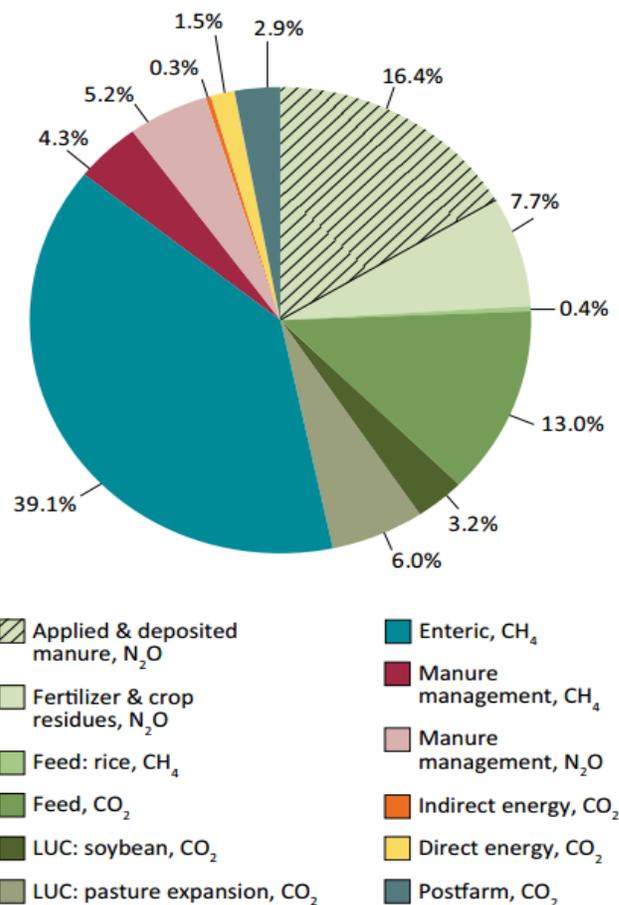
Online learning event summary

In October 2013, an online learning event gathered experts and over 250 participants to learn and discuss how to reduce greenhouse gas (GHG) emissions from the livestock sector. Two multi-stakeholder initiatives: the Livestock Environmental Assessment Performance (LEAP) Partnership and Global Agenda for Sustainable Livestock, working on reducing the sector’s environmental impact, presented their activities. The Food and Agriculture Organization of the United Nations (FAO) organized [the event](#) within the [Community of Practice](#) for Climate Change Mitigation in Agriculture under the MICCA Programme.

Greenhouse gas emissions from the livestock sector

FAO’s recent publication [Tackling climate change through livestock](#) estimates that the livestock sector contributes 7.1 gigatonnes of GHG emissions into the atmosphere. This represents 14.5 percent of all human-induced GHG emissions making it a significant contributor to climate change as well as an important potential to reduce its emissions. The main sources of emissions are: feed production and processing, enteric fermentation from ruminants, and manure decomposition.

Figure: Global emissions from livestock supply chains by category of emissions



Beef and cattle milk production account for the majority of emissions, respectively contributing 41 and 20 percent of the sector’s emissions. Pig meat, poultry meat and eggs contribute respectively less than 10 percent each to the sector’s emissions. Emission intensities vary greatly between species and regions but also within production systems under given agro-ecological conditions.

Climate change mitigation in the livestock sector

Case studies of the Tackling climate change publication show that the technical potential to reduce emissions within the livestock sector varies from 10 to 45 percent. These reductions can be achieved through wider use of existing efficient practices, technologies and changes in the production systems. These changes however require adequate policies but also education, awareness raising and incentives for technology transfer and adoption through existing networks where farmers and researchers can share their knowledge and experiences.

Reduction in GHG emissions is important in improving natural resource use efficiency of the sector as well as enhancing productivity which in turn can also contribute towards improving the livelihoods of the millions of poor who depend on livestock. Most climate change mitigation interventions in the livestock sector can provide both environmental and economic benefits.

In addition, it is estimated that the global soil carbon sequestration potential of grazing lands could go up to 0.4 to 0.5 Gt, if better management was achieved. Better land management often results also in an increased production of grass. Practices and technologies that reduce emissions can simultaneously increase productivity, thereby contributing to food security and economic development.

Feed quality can significantly contribute to reducing enteric fermentation (in particular improvements in feed ration digestibility). As participants of the learning event pointed out, cases from West Africa and South Asia have demonstrated that using improved crop residues to complement roughage diets result in better digestibility of the rations and reduce the GHG emissions. In addition, the use of feed additives, like lipid supplementation, is another option in mixed dairy or beef systems. Climate change mitigation has to be considered as a package approach to recover nutrients, for example by complementing lipid supplementation with biogas production.

Better management of manure not only reduces emissions, but also ensures recovery and recycling of nutrients and energy contained in manure, as well as energy savings and recycling along supply chains.

Findings from FAO's work show that GHG emissions could be reduced by 30 percent if producers in a given system, region and climatic zone adopted the technologies and practices currently used by farmers with lowest emission (expressed as emissions per unit of animal product). This potential can be reached with no change in production systems. It is important to note that efficiency-based mitigation strategies will not always result in a reduction of overall emissions, especially where production grows rapidly.

Some participants of the learning event also stressed the need for safeguards to avoid the potential negative side-effects of efficiency gains, such as animal diseases, poor welfare, and soil and water pollution. Many were of the opinion that climate change mitigation is achievable but should be considered alongside food security and climate change adaptation concerns. As a guiding principle for the climate-smart agriculture work, rural development as well as food security issues are a priority particularly in developing countries, and therefore the aim should be to combine these objectives with low-carbon resilient development goals.

Reducing deforestation

In a business as usual scenario, an increase in demand for livestock products implies an increase in demand for production resources such as land, water and other productive inputs. The livestock sector is also responsible for emissions from deforestation, for example, in Latin America where an estimated 10 percent of the 7.1 Gt of emissions are due to the expansion of pastures and feed-crop production into forest land. This deforestation has mostly been driven by beef production and expansion of soybean cultivation. Soybean is primarily used as a feed for chicken, pig and, to a limited extent, for dairy production.

Emissions arising from deforestation are a complex issue that should be further studied. In the *Tackling climate change report*, the deforestation emissions were considered from the period of 1990–2006. Within the last decade, productivity has greatly increased in many countries due to pasture and husbandry improvements. This combined with regulation and enforcement has slowed down the deforestation rate.

Methodologies for measuring greenhouse gases

No specific universal approach exists to measure emissions. Several methods can be used. The IPCC does provide a generally accepted method on how emissions can be quantified for most economic sectors, including agriculture. Countries reporting their GHG inventories to the UNFCCC convention are required to use the IPCC guidelines. The national GHG inventories usually track total emissions while supply chain approaches apply efficiency metrics such as GHG emissions per unit of product. There is a need for harmonization of methods to enable comparison of results. FAO through the LEAP partnership is supporting the harmonization in order to measure the environmental performance of the livestock sector consistently and reliably.

Agents of change: policies and funding

Implementation of mitigation strategies will require policies that support the transfer of knowledge and technologies as well as the adoption of technologies (through education, awareness raising and incentive schemes). Measures are also needed to facilitate access to credit to support practice change at the farm level. This can be funded from different sources, including carbon offsetting schemes or emission trading schemes, where emitters would pay for climate change mitigation. Payment for environmental services can also represent an additional source of income for farmers. Policies on labeling and certification are useful to inform both consumers and farmers about the emission profile of products.

Another existing mechanism on which developing countries may engage in is the Nationally Appropriate Mitigation Actions ([NAMAs](#)). A NAMA can be a set of policies and actions to reduce greenhouse gas emissions appropriate to the characteristics of the country. Agricultural NAMAs should be compatible with the larger national development objectives. For many countries an important goal of mitigation planning is to attract international financial support e.g. through Green Climate Fund, bilateral cooperation, or concessional loans. It is not always necessary to get external funding: it is possible to make climate change mitigation profitable, especially in developing countries where the demand for livestock products increases.

Livestock and nutritional balance

The [Tackling climate change through livestock](#) report recognizes the negative impact of over consumption of meat. It also suggests, along the lines of some of the participants, that changing diets could be part of the solution in developed countries where consumption of animal-source foods has taken face of obesity and non-communicable diseases. On the other hand, adding adequate amounts of meat or milk to people's diets can have a massive positive impact on their nutritional status. Not only has meat high amounts of protein, fat and many micronutrients, but they are also more bioavailable from animal-source foods than from plant-based foods.

Partnerships in action to reduce environmental footprint

Multi-stakeholder initiatives are one potential means to share expertise around the complex sustainability questions. In the past years, two important multi-stakeholder initiatives have evolved to address the livestock sector's environmental impact and increase its overall sustainability. LEAP Partnership and the Global Agenda for Sustainable Livestock are complementary, fully aligned and integrated initiatives that invite also more members to join them.

The Livestock Environment Assessment and Performance Partnership ([LEAP](#)) gathers stakeholders from the industry, governments and civil society from more than 20 nationalities to reach internationally recognized

harmonized methodologies for the assessment of the environmental performance of livestock supply chains. The [Global Agenda for Sustainable Livestock](#) guides and catalyzes the improvement of practices towards sustainability through a knowledge sharing platform together with 600 stakeholders from governments, academia, international organizations and the private sector. The Agenda looks for opportunities for improving the three dimensions of sustainability, with particular effort to involve also smallholders, pastoralists, indigenous and other civil society organizations. The Agenda provides information and conducts analysis that allows stakeholders to develop a common understanding and builds consensus on the path towards sustainability.

While multi-stakeholder partnerships have many advantages over the use of top-down mandatory or regulatory processes to address the sector's environmental issues, national regulations are also needed alongside international and voluntary partnerships.

Participants and platforms of the learning event

The learning event [Tackling Climate Change Through Livestock](#) consisted of two webinars and email discussions through [DGroup](#) and [LinkedIn](#) platforms of the Community of practice for Climate Change Mitigation in Agriculture. Over 250 participants from over 35 countries shared their experiences and took part in discussions. Participants are from research organizations to civil society organizations, national ministries and private sector. Experts from FAO's [Climate, Energy and Land Tenure Division](#); [Animal Health and Production Division](#); [Global Agenda for Sustainable Livestock](#) and the [Livestock Environmental Assessment and Performance \(LEAP\)](#), presented their activities and results. The event took place in October 2013. The community continues organizing learning events on topics related to climate change mitigation in agriculture. The recordings of the webinars and the presentations can be found on:

www.fao.org/climatechange/micca/85064

