Livestock and climate

Livestock rearing contributes to climate change, but at the same time it brings many benefits to small-scale farmers. Do these benefits outweigh the disadvantages in terms of greenhouse gas emissions? And how can these emissions be reduced?

Reducing greenhouse gas emissions from livestock

Akke van der Zijpp, Professor of Animal Production Systems, Wageningen University, the Netherlands.

Livestock was never really mentioned in the climate debate until 2007, when the Food and Agriculture Organisation (FAO) reported that livestock keeping produces 18 percent of all greenhouse gases. Since then, we have realised that livestock keeping is a cause of climate change, but is also affected by it. The chairman of the Intergovernmental Panel on Climate Change suggested that people should eat less meat. I do not think that that is feasible: for most people in developing countries, meat is a welcome part of the diet; and in rich countries only small groups of people voluntarily eat less meat. Thus, we have to look at strategies to reduce the impact of meat production on the climate. We do this by looking at the different sources of greenhouse gases in the livestock chain

A main source of the greenhouse gases related to livestock production is poor land use, like deforestation and overgrazing. This is responsible for more than one-third of the greenhouse gases produced by livestock. In Burkina Faso, land degradation as a result of free roaming cattle is common: land becomes unproductive with little organic matter. In pilot plots, it was clear that live fencing, controlled grazing, water harvesting and manure use could double the production of grains and cattle, with few inputs. Wide adoption of such practices is slow, unfortunately.

Managing manure

Another major source of all greenhouse gases from cattle is manure. This produces about a third of the 18 percent quoted by FAO. Reduction is possible if small-scale farmers could collect manure in time, process it properly, and incorporate it in the soil just before planting the crop. However, it is mostly women who manage manure, who are often heavily overworked. With more time, they could manage the manure much better. For example, fermenting manure into biogas reduces fuel wood collection time, deforestation and provides slurry for manure. But installations are expensive. Farmer groups may develop common biogas plants to reduce costs.

A quarter of the greenhouse gases comes from animals themselves, mainly from cows, sheep and goats, because of the bacteria in their stomach. A solution could be to change to mainly keeping pigs and chickens, which have different guts. That might be emotionally difficult for farmers: farmers who migrate, and have to leave their cattle behind, will start rearing the same species again. I come from a cattle keeping family, and I cannot imagine our family would change to pigs. Yet, chickens are a real alternative, particularly for poorer farmers: they are more efficient in turning grains into meat than cattle, and investments are affordable.

Seven percent of the greenhouse gases produced by livestock comes from fodder: this includes fertilizer used for production, and deforestation particularly for concentrate production. The remedy is again to use the land that you have more efficiently. There are experiments with no-till systems that produce less greenhouse gas – although fertilizer is needed there. Finally, one percent of greenhouse gases in the livestock sector comes from transport.

Another way of reducing greenhouse gas is changing cattle's diet. Relatively more concentrated than rough feed increases production of milk and meat, while greenhouse gas emissions remain about the same. For this reason, there is much to say for intensification of cattle keeping. Yet, getting concentrated feed is not always easy for small farmers, and in countries like India, managing free-roaming cattle is culturally sensitive. In such situations it is difficult to provide protein-rich feeds to cattle.

All in all, for small-scale farmers it is wisest to manage available land and cattle to use locally available means (such as trees, bushes, fields and available fertilizer) for intensification of cattle keeping, in combination with efficient species such as pigs and chickens and use of biogas. In that way they can both deal with climate change, and contribute to mitigation of the negative impact on the climate.

Akke van der Zijpp. E-mail: akke.vanderzijpp@wur.nl

Join the debate

change: Two views

Our last topic, "Subsidised fertilizer", provoked many reactions. In our digital newsletter, E-LEISA, this discussion is summarised for you. To subscribe to this newsletter, go to E-LEISA on the homepage of the *LEISA Magazine.*

Integrated local systems for mitigating climate change

Nitya Ghotge, Director, ANTHRA Pune, India.

Global demand for livestock products is expected to double during the first half of this century, as a result of the growing human population, and its growing affluence. Over the same period, we expect big changes in the global climate. Climate change is one of the most serious long-term challenges facing farmers and livestock owners around the globe today.

If livestock are effectively integrated into ecological agricultural systems, the benefits are many and various: returning valuable biomass to the soil improves water retention, and reduces risks posed by sudden periods of drought. Recycling carbon to the soil in this way closes the carbon cycle. By encouraging the use of local breeds of livestock, greenhouse gas emissions are reduced. Growing crops which require less water will reduce the need for fuel and energy-driven irrigation systems. Similarly, encouraging locally grown fodder crops, which are integrated into farming systems, will reduce transportation costs and aid carbon sequestration. By using local markets, transportation costs and carbon foot prints are reduced.

The major pollutants from industrial livestock rearing systems are accumulated animal wastes, antibiotics and hormones, chemicals from tanneries, and pesticides used to spray feed. Besides this, groundwater is exploited for growing fodder crops. These, in turn, are grown on extensive tracts of land, thereby diminishing agro-biodiversity. It may also increase phosphorus and nitrogen contamination which can have negative effects on marine ecosystems.

Energy

The social and environmental value of local, small-scale livestock production systems can far outweigh any negative consequences. This is mainly through the energy they produce. For example, in terms of traction and draft animal power, the use of livestock reduces the need for fossil fuels.

Methane, generated from animal waste, is a far more potent greenhouse gas than carbon dioxide. It can, however, provide cooking fuel (biogas) for rural households. This has multiple benefits. A gas which would have contributed to global warming and climate change, is then efficiently transformed into useful domestic energy. This in turn implies that rural households will make fewer demands on fossil fuel energy, as their energy needs get taken care of at the local level. If these energy solutions can be properly designed and promoted, the demand for fuel wood could be reduced. This may in turn allow for greater carbon sequestration in reforested areas.

Integrating livestock into a farm system can reduce the use of chemical fertilizers by recycling animal wastes into farm yard manure. Another way to reduce demand for chemical fertilizers is by recycling the slurry from biogas plants into local agriculture. This also enhances soils. Local systems also effectively utilise crop residues and plant by-products, thereby reducing the demands on land.

Ecological agriculture and endogenous systems, with livestock as an integrated component, have the potential to mitigate some of the adverse effects of climate change. Livestock are a key component in small-scale farming systems. Farmers need only to take small steps to adapt management practices to benefit fully, while also contributing to climate change mitigation.

Nitya Ghogte wrote this contribution together with **Sagari Ramdas**, also from ANTHRA. This is an organisation of women veterinary scientists working to address the constraints that face rural livestock rearers. E-mails: nitya.ghotge@gmail.com and sagari.ramdas@gmail.com ; http:// www.anthra.org

at http://ileia.leisa.info → Open Forum