Livestock and climate change

Going beyond preconceived ideas and recognizing the contribution of small-scale livestock farming facing climate change

- Agriculture is often seen as a large contributor to climate change, through the emission of greenhouse gases. At the same time, food production and income for rural communities are strongly affected by the same climate change through increased droughts, floods, storms, and adverse weather patterns.
- In changing environments, small-scale livestock farming and mobility through pastoralism, can offer solution to the threats caused by climate change by generating a low carbon footprint, improving resilience to climate variability and contributing to food security of the most vulnerable populations.
- VSF is strongly committed to support and promote small-scale livestock farming and pastoral systems with low GHG emissions and a greater climate adaptability.

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AGRICULTURE AND LIVESTOCK: AT THE HEART OF CLIMATE ISSUES

According to the Intergovernmental Panel on Climate Change (IPCC), climate change is primarily attributed to human activities in developed and emerging countries, and in particular to greenhouse gas (GHG) emissions. Studies show that the communities most exposed to climate change are those living in the southern region, especially in arid and dry Sub-Saharan African regions, as well as in the Caribbean and coastal areas. At a crossroads between food production and ecological implications, agriculture is looked at with greater attention, as a source of GHG emissions but also as a means of climate change mitigation and adaptation opportunities. Livestock farming is no exception, and it is indeed strongly related to climate issues.

According to a study from FAO (Steinfeld et al., 2006), livestock account for 18% of global GHG emissions, even ahead of transport emissions (13%). Such statements have resulted in increasing criticism of the livestock sector as a whole for its contribution to climate change, as seen in growing numbers of media and scientific articles on the subject.

VSF International believes that it is important to question this simplistic view and to analyse the context-specific realities of livestock keeping, especially in Least Developed Countries (LDCs). If we analyse in detail the figure of 18% provided by FAO, this refers indeed to the GHG emissions produced by livestock metabolic emissions and manure (including methane). However it also includes all the upstream and downstream emissions produced throughout the highly industrialized food chain (feed production, processing, transport, packaging, chemical treatments, waste management, etc.).

We need therefore to consider farming input and output system as a whole, and include all the vertical (the entire production chain) and horizontal (links between agriculture, livestock activities, deforestation, trade, other economic activities, human tradi-

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tions and culture…) linkages. In such a way it becomes evident how small scale farming systems, the majority of which are located in LDCs, have a lower carbon footprint than that represented in FAO data.
This is the reason why VSF considers that measures to mitigate GHG emissions from livestock should take into account the whole food chain on a case-by-case approach.

IN NORTH AND SOUTH, THE CARBON FOOTPRINT IS CORRELATED TO DEVELOPMENT PATTERNS AND THE TYPE OF LIVESTOCK FARMING

The strong expansion of intensive livestock farming (particularly in developed and emerging economies) is of particular concern as it is closely related to production conditions that have a high environmental impact:

- The high consumption of fossil fuels generates emissions all along the food chain: heating, cooling, ventilation and equipment of the costly production units; production of agrochemicals (fertilizer, pest control), and use of machinery to produce feed; processing, packaging and distribution of drugs for animal health; transport of inputs; processing, packaging, distribution, waste and pollution management;
- The need for external supply of feed increases emissions linked to deforestation (e.g. clearing of forests for the cultivation of feed crops, but also indirect land use changes);
- The water used to produce the same quantity of edible food is 5 time higher: it is estimated that 1 kg of edible beef requires 12,000 litres of water in grazing systems, and as many as up to 53,200 litres in intensive systems (Steinfeld et al., 2010);
- The use of drugs in prevention and treatment of illnesses common to intensive livestock farming generates drug resistance in animals and humans, public health problems, water and land pollution, and indirectly increases GHG emissions.

VSF International challenges the widespread belief by various experts, government agencies, and private businesses that priority should be given to intensive monogastric (poultry and pigs) livestock rearing, arguing that it would reduce carbon dioxide (CO_2) and methane (CH_4) emissions per kilogram of meat as compared to ruminant livestock. The same negative externalities apply indeed for all intensive and industrialised livestock systems. It has been proven that, when considering productivity per unit area, extensive and especially pastoral systems of livestock rearing are more productive, thus emitting less GHGs than any intensive rearing system (Sandford, 1983; Rivera-Ferre and Lòpez-i-Gelats, 2012).

Nonetheless, we should differentiate between different types of extensive livestock systems before concluding that this is the solution. As demonstrated in South America and southern Africa, for example, big ranches, or 'fazendas,' contribute heavily to land degradation and deforestation[1)] (besides denying smallholder farmers and indigenous populations access to land, as it is the case in the Brazilian Amazon).

Looking at farming input and output systems as a whole, small-scale livestock farming has a lower carbon footprint by:

- Extensive use of working animals instead of machinery (providing as well manure for fertilization and heating);
- Limited use of external inputs (fertilizers, pesticides, concentrated feed, chemical treatments for animal health);
- Direct consumption of products by the family and

1) The change in use of soil through deforestation and forest degradation is the main source of GHG emissions, by far greater than animal metabolic emissions of CO_2 and CH_4.

the local community (short food chains with reduced or no transport);

- Reduced environmental impact from reduced packaging and its waste disposal.

Furthermore, a sustainable use of natural pastures (which constitute 40% of the Earth's land surface) through an agroecological approach can:

- Store carbon in soils even more efficiently than agricultural systems (Neely et al., 2009), support the production of humus, limit soil tillage, and allow formation of permanent land cover;
- Contribute to long-term preservation of animal biodiversity, dissemination of seeds, and enrichment of woody plant biodiversity and pastures (25-year study conducted in pastoral areas of Senegal);
- Contribute to the balance of complex ecosystems, where both animals and livestock keepers have a clear role in the preservation of habitats and environmental dynamics, benefiting wildlife as well as domestic species.

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SMALL-SCALE FARMERS AND PASTORAL PEOPLE: VICTIMS AND A SOLUTION TO CLIMATE CHANGE

Given the increased number of extreme weather events and droughts, the damaging effects of climate change are likely to impact disproportionately the world's most impoverished and vulnerable populations.

In addition to climate variability, vulnerable rural and pastoral populations are confronted with other socio-economic and political drivers capable of exacerbating the effects of climate change (Rivera-Ferre et al., 2012). The marginalization of rural groups and pastoral communities (often accompanied by land expropriation), numerous obstacles to market access, non-competitiveness compared to large players, and poor access to training and communication all contribute to isolate small-scale producers from policy makers and the rest of society.

However, small-scale livestock farming can offer solutions to the threats caused by climate change, by generating a low carbon footprint, improving resilience to climate variability, and contributing to food security of the most vulnerable populations. This is the reason why VSF is strongly committed to supporting small-scale livestock farming.

PREPARING PASTORAL AND SMALL-SCALE LIVESTOCK FARMING FOR CLIMATE CHANGE

VSF International proposes a pro-active approach to promoting livestock farming with fewer emissions and better adaptation by vulnerable populations. In order to help pastoral livestock systems and small-scale livestock farming communities to facing climate change, two complementary approaches are required: 1. the mitigation of the impact of livestock and, 2. the reinforcement of livestock keepers' adaptive strategies to climate change.

VSF has extensive experience in this field and has developed its own best practices based on these experiences. These include improving water use and grazing resources; developing diets and animal breeding practices suitable for local production conditions; maintaining diversification in animal breed and species, developing partnerships between livestock keeper organizations, NGOs, research and development institutes expert in agroecology; recognizing and strengthening the role of livestock in policies for helping communities adapt to climate change at the local, national, and international levels.

CONCLUSION

Small-scale and pastoral livestock keeping in poor countries represents a marginal source of GHG emissions compared to the unbridled development of industrial livestock farming in developed and emerging countries. Small-scale producers are in fact the main victims of climate change, whose effects are exacerbated by socio-economic and political drivers that marginalize the most vulnerable populations.

In analysing the impact of livestock on climate change, VSF International considers it crucial to look at farming input and output systems as an integrated whole, taking into account vertical (the entire production chain) and horizontal (links between agriculture, livestock activities, trade, other economic activities, human traditions and cultures) aspects. By doing this, we see that small-scale farming systems, the majority of which are found in the least developed countries, have a relatively low carbon footprint. Moreover, small-scale farmers have developed interesting and useful adaptation strategies, to adapt since decades to climate instabilities.

Advocacy must focus on sensitizing citizens and policy makers at all levels to promote low-emission and locally sustainable livestock farming for both the overfed developed and emerging economies and the vulnerable developing countries. Across the globe, small farmers, who are the main contributors to food security, are vanishing in the face of big producers and struggle to access markets for their products.

The food, economic and climate crises we are experiencing should lead us to study more closely future integrated models of crop and livestock production and care, more friendly to mankind and its environment. To achieve this, small-scale livestock farming still has much to teach us.

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