

# Livestock and climate change

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

**Position paper by VSF Europa**

**Based on AVSF (Agronomes et Vétérinaires Sans Frontières) position paper "Élevage et changement climatique: dépasser les idées reçues et reconnaître la place spécifique de l'élevage paysan" 2010**

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## **ABSTRACT**

According to Intergovernmental Panel on Climate Change (IPCC) experts, climate change is primarily ascribable to human activities (developed and emerging countries) and in particular to greenhouse gases (GHG) emissions. There is scientific consensus on global climate change within the scientific community. Livestock allegedly accounts for 18% of global greenhouse gas emissions, immediately ahead of transports (13%). FAO publication, "Livestock's Long Shadow"<sup>1</sup> (Steinfeld et al., 2006)

VetVet Europa look at farming input and output system as a whole, thus considering livestock as vertically (the entire production chain) and horizontally (connection between agriculture, livestock activities, human tradition and culture) integrated. As a result, small-scale farming systems, the majority of which are found in the least developed countries (LDCs), have a lower carbon footprint compared to the data provided by Fao.

Studies show that the communities most exposed to climate change are those living in the Southern regions, especially in arid and dry Sub-Saharan African regions, as well as in the Caribbean islands and the coastal areas. At a crossroads between food and ecological stakes, agriculture is looked at with greater attention, as a solution to climate change mitigation and adaptation problems.

Farming is no exception and in fact is central to this discourse. VetVet Europa it asks the following questions: what new economic patterns for development should be chosen, both in the South and in the North, that lead to less emission and prove to be more respectful towards the environment? How can we support the most impoverished and most vulnerable populations to adapt to such a change, improving and protecting their livelihoods and revenue? What kind of food habits should be adopted? Some data are interesting, for example, considering productivity per area unit, extensive and especially pastoral systems are found to be more productive, thus emitting less GHG (Sandford, 1983, see also Rivera-Ferre and Lòpez-i-Gelats, 2012).

VetVet Europa consider crucial to look at farming input and output system as a whole, thus considering livestock as vertically (the entire production chain) and horizontally (connection between agriculture, livestock activities, human tradition and culture) integrated. As a result, small-scale farming systems, the majority of which are found in the least developed countries, have a lower carbon footprint.

Also intensive monogastric breeding is not dissimilar from intensive ruminant breeding in that they both generate negative externalities. Small-scale livestock farming contributes to food security for the most vulnerable communities.

Rather than a defensive strategy, VetVet Europa proposes an offensive one, to promote livestock farming with less emissions and a better adaptation for vulnerable populations. In addition to climate variability, there are other socio-economic drivers capable of exacerbating the damaging effects due to climate change (Rivera-Ferre and al., 2012): indeed they have very little control over the market and remain vulnerable to competition from larger players

key words: small scale farming, agroecology, animal health, animal welfare, social, economic, traditions, food security, resilience, children, woman, land grabbing, biofuel

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<sup>1</sup> Downloaded from: <http://www.fao.org/docrep/012/a0701f/a0701f00.htm>

## 1. AGRICULTURE AT THE HEART OF CLIMATE ISSUES

There is scientific consensus on global climate change within the scientific community. According to IPCC<sup>2</sup> experts, climate change is primarily ascribable to human activities, and in particular to greenhouse gases (GHG) emissions<sup>3</sup>. Historically developed countries were the only ones to be blamed, but now they share their responsibility with an increasing number of developing countries (e.g. China, India, Brazil, etc. ).

Although developed and emerging countries are both responsible for GHG<sup>4</sup> emissions, increasingly studies show that the communities most exposed to climate change are those living in the Southern regions, especially in arid and dry Sub-Saharan African regions, as well as in the Caribbean islands and the coastal areas. Increases in temperatures, changes in precipitations, the unpredictability of rain periods, more frequent extreme weather events are featuring the expected scenarios. Today, unequal development is compounded by climate change that affects more heavily those communities who are the least responsible.

This new situation raises a number of critical issues that need to be dealt with: i.e. what

kind of agricultural production system should we promote? What new economic patterns for development should be chosen, both in the South and in the North, that lead to less emission and prove to be more respectful towards the environment? How can we support the most impoverished and most vulnerable populations to adapt to such a change<sup>5</sup>, improving and protecting their livelihoods and revenue? What kind of food habits should be promoted?

Agriculture is at the core of these arguments<sup>6</sup>, both as primary source of greenhouse gases<sup>7</sup>, and as main source of food and income for the people most strongly affected by climate change: with the main victims being (smallholder) farmers.

At a crossroads between food and ecological stakes, agriculture is looked at with greater attention, as a solution to climate change mitigation<sup>8</sup> and adaptation problems. Farming is no exception and in fact is central to this discourse.

## 2. LIVESTOCK "IN THE DOCK"

In the FAO publication, "Livestock's Long Shadow"<sup>9</sup> (Steinfeld et al., 2006), great emphasis is placed upon the impact of livestock on the environment, and more

<sup>2</sup> Synthesis from the 4th evaluation report about the 2007 climate of the IPCC (Intergovernmental Panel on Climate Change) Experts on the climate change. Synthesis edited by the Ministry of Foreign Affairs. 2008.

<sup>3</sup> The main greenhouse gases are steam, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (formula N<sub>2</sub>O) and ozone (O<sub>3</sub>). Industrial greenhouse gas emissions include heavy halocarbons (chlorofluorocarbons including CFCs, HCFC-22 molecules such as freon and perfluoromethane) and sulphur hexafluoride (SF<sub>6</sub>).

<sup>4</sup> Even if developing countries are now big GHG producers, China overtook the US since February 2009 in annual emissions-they are far behind Northern countries in terms of combined emissions since 1990.

<sup>5</sup> In the climate change context, adaptation amounts to adjustment to natural and human systems to produce recognized and planned effects in climate change.

<sup>6</sup> Cf AVSF reference text: « Rural Agricultures, essential victims and actors of the fight against climate change ».

<sup>7</sup> Agriculture is responsible for 10 to 14% of GHG global emissions (deforestation aside) of which 75% in developing countries.

<sup>8</sup> Reduction of agricultural GHG emissions but also and specifically carbon storage in soils' organic matter (forests and agriculture are the only sectors capable of capturing and storing carbon through photosynthesis: "carbon sink"). The potential reduction in agriculture through soil storage is estimated to 5.5-6 Gt CO<sub>2</sub> eq per year (89% of the global agricultural potential) 70% in developing countries.

<sup>9</sup> Downloaded from:  
<http://www.fao.org/docrep/012/a0701f/a0701f00.htm>

specifically on climate change. This report states that livestock allegedly accounts for 18% of global greenhouse gas emissions, immediately ahead of transports (13%).

FAO estimates that the conversion of tropical forest into grassland leads to the production of some 1.7 billion tons of CO<sub>2</sub> on an annual basis in addition to 0.7 billion tons resulting from the conversion of tropical forest into croplands for feed (animal food) production. However, the increased demand for products of animal origin, associated with global population growth, urbanization and rising standards of living (especially in emerging countries), is projected to double the world demand for animal proteins by 2050<sup>10</sup>. Faced with limited resources and an increasing demand for food, livestock farming, as a source of food, is often seen as less effective than crop farming. Moreover, livestock farming accounts for 70% of all arable land (one third of which is earmarked to feed crop production) and 30% of the world's land surface (Steinfeld et al., 2006).

In recent years, journalists, experts and environmentalists have increasingly cluttered the media with these arguments, to denounce the high environmental toll of livestock farming and to send a wakeup call on the climate threat posed by livestock rearing<sup>11</sup>. VSF Europa believes it is important to qualify this message, to get rid of preconceived ideas and to question it within the specific context of LDCs (List Developed Countries). Because a far too global outlook, no matter how accurate and reliable, is quite likely to have a significantly detrimental effect on vulnerable smallholder farmers.

### 3. ... BUT A MUCH MORE NUANCED REALITY

#### 3.1 EMISSIONS FROM LIVESTOCK: WHAT ABOUT THEM?

The figure of 18% first published by FAO has been referred to subsequently in most articles and publications, often with a lack of discernment. This figure refers to the greenhouse gas emissions produced by livestock<sup>12</sup> and manure (including methane - CH<sub>4</sub>), but it also includes all the upstream and downstream emissions produced throughout the food value-chain (especially feed production, processing, transport, packaging, chemical treatments, waste management). Thus, when looking at agricultural production only, the IPCC estimates that agriculture is supposed to be responsible for "only" 10 to 12% of emissions (Intergovernmental Panel on Climate Change (IPCC), 2007), of which about a quarter is attributable to livestock. This reduces the share of livestock to only 3% of total emissions.

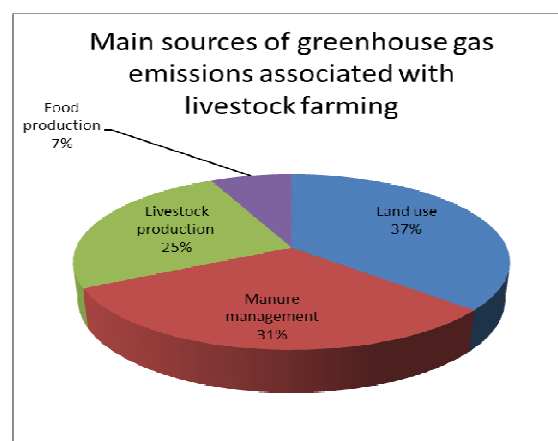


Figure 1. (Steinfeld et al, 2006).

A follow up to the first FAO report is the report published in 2009 on "State of Food and Agriculture" devoted to livestock, where

<sup>10</sup> The World Situation of Food and Agriculture 2009 (FAO)

<sup>11</sup> Among other things, to take only a few titles of articles in "Le Monde": October 3, 2008: "How the appetite of meat weights on the climate," October 14, 2009: "What if the meat was murdering?" November 18, 2009: "When will there be an end to the ravages of the meat industry?" December 23, 2009: "Eat less meat to save the planet?", February 19, 2010, "the growth of livestock, a threat to the planet" ...

<sup>12</sup> Mainly by belching (roasts) related to rumination

the FAO reconsidered its own statements (FAO, 2009. The State of Food and Agriculture 2009: Livestock in the Balance).

At present, measures to mitigate livestock GHG emissions are mostly linked to productivity, which consequently leads to the conclusion that, unlike extensive farming, intensive livestock farming systems are emitting less GHGs per weight unit of end-product. However, this approach is questionable: measures should take into account the whole life cycle of the product. Indeed, if the measure considers productivity per area unit, extensive and especially pastoral systems are found to be more productive, thus emitting less GHG (Sandford, 1983, see also Rivera-Ferre and López-i-Gelats, 2012).

The lines of argumentation to support these theses are explained in the next chapter.

### 3.2 IN THE NORTH AND IN THE SOUTH, THE CARBON FOOTPRINT IS CORRELATED TO DEVELOPMENT PATTERNS AND TYPES OF LIVESTOCK FARMING:

Despite what has been mentioned above, greenhouse gas emissions from livestock remain a major cause for concern that calls for a wide range of measures according to a case-by-case approach.

The strong expansion of intensive livestock farming (particularly in developed and emerging countries) is of particular concern as it is closely inter-related with production conditions and surrounding emissions:

- Costly production units which require high consumption of fossil fuels (especially heating, ventilation, equipment ...);
- The need for external supply of feed, which increases emissions linked to deforestation (e.g.: feed crops following deforestation);

- Long streams with heavy use and dependence on fossil fuels (transport of inputs, processing, packaging, distribution, waste management);
- 5 time higher use of water to produce the same quantity of edible food: it is currently 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)
- Animal health care and welfare: intensive livestock farming generates a high use of chemical drugs for animal health and consequently a dependence on fossil fuels (transport of raw materials, processing, packaging, distribution, waste and pollution management). Moreover the use of chemical drugs in prevention and treatment of pathologies caused by the breeding technique (technopathy), generates drug resistance in animals, food and humans, public health problems, water and land pollution and consequently increased emission of GHG to face these problems.

Extensive livestock is not necessarily an alternative. The "ranching"<sup>13</sup> case developed in southern Africa or in Brazil's large "fazendas" can teach some good lessons:

- In Brazil, small-farm breeding heavily contributes to degradation and deforestation, especially in Amazonia pioneering lands denying smallholder farmers access to land. However, the change in the use of soil through deforestation and forest degradation is the main source of greenhouse gas emissions, by far greater than animal metabolic emissions of carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>).

<sup>13</sup> Ranching: commercial farming practiced extensively, with a low density of animals on very important areas, especially in South America and southern Africa



Therefore, it is crucial to look at farming input and output system as a whole, thus considering livestock as vertically (the entire production chain) and horizontally (connection between agriculture, livestock activities, human tradition and culture) integrated. As a result, small-scale farming systems, the majority of which are found in the least developed countries, have a lower carbon footprint:

- GHG emissions by ruminants and manure are likely to be quite substantial given the high number of animals in the world. Yet, they have to be measured more accurately by taking into account breed, diet specific small scale farming systems, animal care and welfare.
- Environment degradation is often caused by populations suffering from extreme marginalization, both in geographical and political terms: e.g. Brazilian peasant farmers at the edge of the Amazon rainforest; Cambodian farmers who were victims of land grabbing; Malagasy farmers caught between a rice front and the insecurity of traditional pastures; Mongolian farmers faced with the loss of ancient land use rights that prevented overgrazing... The same is true along the edges of natural reserves or in pastoral areas (overgrazing is common in pasture lands). Even in semi-arid areas traditional livestock keepers are often pushed out of their rangelands and forced to accept deforestation or overgrazing practices, by the hands of companies making high investments in agriculture projects with irrigation systems, mostly managed by public or private foreign investors.
- Small-scale livestock farming also contributes to saving fossil energies, by:
  - Making extensive use of working animals instead of machinery. This practice is independent of the use of fossil fuels and provides manure for fertilisation and heating;
  - Making limited use of external inputs (fertilizers, pesticides, concentrated feed, chemical treatments for animal health)
  - Home consumption of products by the family and the local community - marketing of the surplus, thus preventing products from being transported and fossil fuels from being used again
  - Reducing environmental impact thanks to packaging reduction and its waste disposal
- A sustainable use of natural pastures (40% of emerged land), can:
  - Store carbon<sup>14</sup> in soils even more efficiently than agricultural systems (Neely, C. et al., 2009), support the production of humus, limit soil tillage and allow a permanent land cover (agro forestry systems, agroecology, production)
  - Aim at a long-term preservation of animal biodiversity, dissemination of seeds and enrichment of woody planting biodiversity and pastures (study conducted in Senegal for 25 years in pastoral areas - Diouf et al, 2005).
  - 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 domesticated species.

<sup>14</sup> Organic matter from the agricultural and pasture plots (crop residues, natural degradation ...) contributes in certain conditions to a substantial enrichment of carbon in organic matter soils.

- Contribute to the preservation of traditions, culture and territorial identity of people.

VSF Europa challenges the recurrent proposition promoted by various experts, and embraced by state agencies and private businesses, whereby priority is given to intensive monogastric livestock rearing (poultry and pigs) with the argument that it would reduce CO<sub>2</sub> and CH<sub>4</sub> emissions per kilogram of meat as compared to ruminant livestock for the following reasons:

- This assertion remains to be confirmed for small-scale livestock farming methods of ruminants (very different from ranching systems that are typically the subject of studies in extensive farming);
- Apart from climate issues, intensive monogastric breeding is not dissimilar from intensive ruminant breeding in that they both generate negative externalities, such as water and soil pollution, manure management, loss of biodiversity, dependence on fossil fuel, epidemics, animal welfare issues, competition with food crops for land, water and other land resources, among others;
- Last but not least, it leads to minimise the economic, social and environmental functions of small-scale livestock farming, which involves not only providing food but also integrating the cultural identity and the social status of the local communities (as better explained below).

### 3.3 IN THE LEAST DEVELOPED COUNTRIES, LIVESTOCK IS A PRECIOUS RESOURCE TO IMPROVE ADAPTATION SKILLS IN POPULATIONS.

Given the increasing number of extreme weather events and droughts reported, it appears that climate change will take a heavy toll on the most vulnerable populations, particularly those in Africa:

- The higher frequency of extreme weather conditions - high temperatures, floods, droughts - may significantly affect livestock production, by reducing water, pasture and crop supply for herds.
- Several animal diseases are likely to spread out geographically as a result of climate change, especially when diseases or disease vectors - mainly insects and ticks - thrive on warm annual temperatures and humidity.
- Changes in seasonal rainfall patterns and more erratic rainfalls reduce predictability in livestock keepers' planning of movements.

However, small-scale livestock farming can offer solutions to these problems:

1. Small-scale livestock farming contributes to food security for the most vulnerable communities

Six hundred million people from the poorest regions of the world depend on livestock for survival (I. A. Wright, 2009). Livestock accounts for savings (often rightly called "the farmer bank") that allow rural families to capitalize on the prosperous crops and cope with periods of crisis. As such it acts as a buffer that improves populations' resilience.

In the most deprived and isolated areas, small livestock (e.g. poultry, pigs, small ruminants) in particular is the wallet of



farmers, especially among the poorest. This type of farming is accessible to all, and allows farmers to generate (short cycle of) revenues, particularly to the benefit of women and children.

Livestock provides high quality food which is essential for good physical and cognitive developmental growth, especially in children. Moreover, small-scale livestock farming is the system that compete the least with human food, given that it depends mainly on pastures, crops and household waste recycling (Rivera-Ferre and al., 2012).

Livestock, integrated into mixed farming, contributes to farmers' diversified production and improves the adaptability of families to environmental changes, contributing to income, food and diversifying opportunities. In most cases, mixed farming relies on agricultural and food leftovers, thus contributing to a better exploitation of resources, and improving soil fertility without competing with humans for food.

2. Mobile breeding of ruminants<sup>15</sup> help pastoral populations :

- to cope with extreme weather conditions (deserts, high plateaus, plains ...) by providing transport, access to water (animal-powered drainage), food and income. This includes adapting seasonal mobility plans to yearly weather patterns, changing the size and composition of the herds according to water availability and pastures (de-stocking, replacing sheep with goats, selecting more adaptable breeds etc.);
- to maintain traditional knowledge and practices (water management, food preservation, social organisation, reciprocity and collaboration, traditional veterinarian services, traditional medicine) and biodiversity (animal breeds, grazing, and foragers trees and shrubs) adapted to

extreme weather and environmental conditions;

- to develop, maintain and protect the ecosystem balance in vulnerable and highly unproductive environments that could hardly be exploited otherwise.

In addition, it should be noted that mobile livestock breeding can be of central importance across some continents as it plays a fundamental role in food security and sovereignty. This is true, for example, in Sahelian countries vis-à-vis the coastal countries in West Africa. This also applies to other desert and mountainous areas (e.g. Gobi desert, Andes...).

3. In agricultural areas, ruminant breeding enhances the resilience of the local communities to deal with extreme weather conditions (droughts, floods ...) due to:

- preservation of different breeds and species, which allows for greater adaptation capacity. Local breeds have a better resilience to climate variability (rusticity, capabilities of weight loss and resistance to starvation, disease resistance, etc.)
- adaptation of livestock practices to the different seasons, climatic conditions and food availability (especially production of milk in the rainy season, destocking for consumption or processing during the dry season)
- diversification of activities to make up for crop harvest losses or to better split up production year round, limiting hunger gap.
- fodder crop installations to split up animal feed year round, as a continuous soil cover (with several advantages, such as damp maintaining and fertility increase).

<sup>15</sup> mobile breeding of bovines, small ruminants, dromedaries

## **4. PREPARING PASTORAL BREEDING AND FARMING FOR CLIMATE CHANGE**

the mitigation of the impact of livestock and another on the reinforcement of livestock keepers' adaptive strategies to climate change.

VSF E highlights that climate change will never be addressed properly, without tackling the global demand for fossil fuels, and the amount of energy required by the whole set of human activities. The amount of fossil fuels burned yearly (the undisputedly most important cause for the rocketing rates of atmospheric CO<sub>2</sub>) equals the carbon capture achieved by the entire planet's vegetation throughout 400 years of primary production. As a result, claiming that such a marginal GHG producer as low-input rural livestock keeping systems are to blame is not only useless and misleading as an approach but also highly detrimental to those worst affected by climate change.

Therefore VSF Europa refuses to adopt a fatalistic approach (as proposed by FAO in the "State of Food and Agriculture 2009") by encouraging the conversion of livestock keepers and the establishment of "safety nets"<sup>16</sup> the reason being twofold: on the one hand, the local livestock farming could acquire greater potential than expected once the environment is set up, especially by developing local services, supporting Pastoral Organizations and reducing unfair competition from imported products; on the other hand, animal ownership is in itself a traditional strategy for survival. Its worldwide adoption in itself states the evidence of its effectiveness, every day and everywhere. Rather than a defensive strategy, VSF Europa proposes an offensive one, to promote livestock farming with less emissions and a better adaptation for vulnerable populations.

Two complementary approaches are required to help pastoral and small-scale livestock farming to adjust to climate: one resting on

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<sup>16</sup> Social safety nets, insurance ...

#### 4.1 MITIGATING THE IMPACT OF LIVESTOCK BY ADOPTING BEST PRACTICES FOR EMISSIONS

- Improving farm production and manure management<sup>17</sup> by strengthening the complementarity of agriculture / livestock<sup>18</sup> and biogas production in livestock areas.

##### **BOX 1**

###### ***VSFs' field experiences***

*In 2012 AVSF started a "biogas" project with Action Carbone (Good Planet Foundation), Initiatives Conseils Développement (ICD) and an Indian NGO, SKG Sangha, with the aim to equip dairy farmers (AVSF partners in Mali), with bio digesters. The objective is to reduce methane emissions produced by animals and manure while developing alternative energy sources to fossil fuels and wood used for lighting and cooking, and the slurry of the methanisation for fertilizing pastures and crops). This project is part of a program on carbon mitigation carried out by the "Network Carbone Mali", in partnership with the Malian government. Another project of biogas development is implemented in Senegal, in the pastoral region of Ferlo.*

*In Cambodia, AVSF puts a lot of efforts into setting up a National Biogas Program with the participation of the government.*

*Currently, VSFB is planning interventions in Rwanda to make bio digesters more easily accessible for livestock keepers and central to the country's national policy. These interventions go hand in hand with the planting of anti-erosive plants such as *Trypsacum* spp., which can also be used as fodder. The idea is also to sensitize and encourage the local community to use new generation mini stoves, that would use less fire wood than the traditional 3 stone stoves often found in rural areas in Rwanda. The aim of this project is to facilitate the access to a sustainable energy resource and to mitigate deforestation.*

- Improving water use and grazing resources by encouraging the rehabilitation of degraded lands and the regeneration of pastures.

##### **BOX 2**

###### ***VSFs' field experiences***

*AVSF and its local partners have worked together since 1984 in Mali near Timbuktu where methods applicable to the Sahelian areas were successfully tested and validated in the framework of community-based water management (especially wells, boreholes) and pasture regeneration.*

*In Mongolia, the association is trying to promote a more sustainable management of pastures, by revamping traditional techniques (especially defend setting, over-sowing), but also supporting nomadic livestock keepers in the formation of "users group" and the formalisation of collective plans for the use of pastures being validated by administrative authorities.*

<sup>17</sup> The manure deposited on fields and pastures produce little amounts of methane, while factory farms and feedlots that manage manure in liquid form release 18 million tons of methane annually (Steinfeld and al., 2006)

<sup>18</sup> Every ton of additional humus in the soil strips the atmosphere of 1,8 tons of CO<sub>2</sub> (Hoffmann, 2011)

*In South Sudan, VSFG witnesses the use of violence being sought after to settle disputes over access to limited resources, such as water and pasture, consequently VSFG is seeking to implement peace building measures and civil conflict resolution methods for this purpose. In addition, VSFG promotes the involvement of the Council of Traditional Authority Leaders (COTAL) in settling disputes and jurisdiction issues. In order to enable pasture regeneration, meetings are held with all groups involved to gain a widely accepted water and land management plan. In Northern Kenya VSFG implemented similar procedures to achieve water and land sustainable use. In an area where climate conditions can cause conflicts, non violent access to limited resources by different groups is one way of preventing insecurity and destabilisation.*

*In Uganda, VSFB and its partners are at work "on the fringes" to rehabilitate degraded land under the Livestock for Livelihood Project as livestock, agriculture and wildlife facilitators across the Kidepo Valley Park. This includes gabion filling, fruit tree planting and contour bounding. These measures are intended to reduce overpressure from being exercised on the trees that are indiscriminately cut down for charcoal burning. This work is also supported through alternative livelihood actions and investments. Natural resources utilization plans lie at the heart of the inter-community agreements which enable communities to improve the management of available natural resources. To reduce over-grazing pressure on the same rangelands surrounding limited number of water points, VSF B also encourages and facilitates inter-community cooperation, joint ownership, rehabilitation of new water points and opening of new grazing areas to ensure a more balanced and efficient use of resources which could lead to sustainable exploitation and regeneration of degraded lands.*

*SIVtro Vsf Italia/CENESTA: The spreading of mixed fodder, food and cash crops allows Iranian pastoralist communities to perform a very efficient and sustainable use of water and soil resources, whilst at the same time keeping Carbon Dioxide emissions at the lowest levels*

- to develop diets and animal breeding practices suitable for local production conditions, cutting down on greenhouse gas emissions.
- to supply information to farmers and set up systems to prevent overgrazing and deforestation (dry forests, tropical forests and protected areas ).

### **BOX 3**

#### **VSFs' field experiences**

*AVSF organized a workshop on "Farming, sustainability and CC in the Ferlo desert," from June 24 to June 26 2009 in Saint-Louis (Senegal), designed primarily to better align livestock keepers with UNPD reflections, Senegalese Governmental and regional policies over a carbon neutral development area in the silvopastoral zone of the Ferlo desert. This workshop brought together 90 participants from government, livestock keepers' organizations, communities and research centres.*

*In the Gobi desert (Mongolia), AVSF lead a feasibility study which aimed at producing cashmere profitably while respecting natural resources (pasture conservation/regeneration, rational management of water resources).*

*In Northern Kenya and South Sudan, VSFG supports the implementation and operation of pastoral and farmer field schools to change the existing copying systems, to prevent overgrazing, to withstand drought seasons and to promote the traditional knowledge of pastoralist communities.*

*VSF B also operates pastoralists field schools (PFS) through which community members come together to improve their knowledge, build on existing skills and change their mind sets towards more efficient and effective use of their resources and assets. Fodder production and environmental management (monitoring of rangeland to reduce overgrazing alternative livelihood and discourage deforestation) are key priorities as they generate significantly positive changes through new attitudes and replication of lessons learnt.*

*The support provided to pastoral communities in negotiations and agreements on reciprocal grazing is also an opportunity to reinforce compliance of protected areas by-laws (i.e. forests, dry season grazing areas, enclosures), thus generating cross-border grazing (especially mobility, utilisation of common grazing areas).*

*In Mali, VSFB and its partners coordinate a number of projects on improved development of poultry in villages with the involvement of some 750 women residing in the Kati area. Thanks to this project, deforestation has been cut down and women make enough money to satisfy basic household's needs. In addition by raising poultry, women now have access to manure that is being used to fertilize the soils, thus reducing their dependence on chemical fertilizers.*

*SIVtro VSF Italia/CENESTA: Resilience is key to all traditional animal farming systems, based on mobility, soil restoration and vegetation productivity after each season. Ancient practices for preventing overgrazing, such as adopting "qoroq" by Abolhassani in Iran should be encouraged and the obstacles preventing these practices from staying alive, should be removed. Likewise, major criticalities preventing communities from keeping livestock for maintaining their lifestyles should be addressed, especially when they result in obstacles to sustainable land use practices, leading to land degradation, biodiversity loss, impoverishment, sedentariness of mobile peoples.*

- Finally, to develop partnerships between livestock keepers' organizations, NGOs on development and research institutes to:

- to define the real impact of small-scale livestock farming and pastoral conditions in the South in terms of sequestration and greenhouse gas emissions (carbon footprints);
- to capitalize on indigenous and traditional knowledge, to test and disseminate technical solutions adapted to livestock keepers in the logic of mitigation and adaptation, in particular, testing and validating food rations for ruminants to reduce the release of methane;
- to design and implement education programs on livestock breeding and interactions with climate change;
- to train and empower livestock keepers' organizations and to support the building capacity of livestock services and extension services so as to promote the expansion of low carbon farm models (e.g. by playing on complementary agro ecology / livestock / agro forestry, with enhancement of crop residues, saving fossil fuels and wood, limiting the degradation of pastures, restoration of degraded soils)
- to train local experts capable of assessing the carbon balance in rural farming systems and certifying projects
- to support active participation of smallholder livestock keepers' representatives in the global food governance arena, including the FAO Committee on World Food Security (CFS) and the NGO/CSO platforms lobbying for the right to food, and the recognition of the importance of local producers vis-a-vis the most relevant International Organizations and Global Conventions



**BOX 4*****VSFs' field experiences***

*SIVtro-VSF Italy is member of the Italian Committee for Food Sovereignty (over 400 members, including NGOs, producers associations, civil society movements, etc.) that participates in the CSM4CFS Forum (International Food Security and nutrition Civil Society Mechanism) in charge of coordinating the Civil Society participation in the CFS (Committee on World Food Security - FAO).*

*AVSF is member of Coordination Sud, the French platform grouping more than 130 NGOs working on solidarity. AVSF is involved in the Agriculture and Food commission and the climate commission, responsible for implementing advocacy activities to lobby for agriculture, market and climate change, as well as for the defense of vulnerable populations and sustainability..*

*VSFB is currently the focal point for the informal Coalition for European Lobbies on African Pastoralism, regrouping European members and African partners responsible for advocating the rights of pastoralists in Africa.*

## 4.2 RECOGNIZING AND STRENGTHENING THE ROLE OF LIVESTOCK IN HELPING COMMUNITIES TO ADAPT TO CLIMATE CHANGE

- Development of national diversification programs on agricultural production including development of small-scale livestock farmers in vulnerable areas.

**BOX 5*****VSFs' field experiences***

*Since 1988 AVSF is involved in tutoring the Togolese development of poultry farming in 1500 villages across the country by introducing traditional hen houses, by training stockbreeders and by developing local services: zootechnical monitoring of livestock, veterinary care and vaccination against Newcastle disease<sup>19</sup>.*

*In Vietnam, AVSF is using small livestock development (pigs, poultry) as an exit strategy for absolute poverty on behalf of ethnical minorities residing in the north of the country.*

*In South Sudan VSFG introduces ox ploughs to increase productivity in agriculture. Thanks to increased harvests, the hunger gap between the rainy seasons is reduced. In agricultural trainings the implementation of new plants like the drought resilient Cassava (manioc) is favoured along with the introduction of different vegetables and fruit trees to guarantee better nutrition standards for the most vulnerable people such as women and children.*

*In Iran, SIVtro-VSF Italia supports the initiative of CENESTA for expanding income-generating activities operated by the tribal groups of mobile herders, including commercialization of cash crops (pistachio) handcraft products, eco-tourism*

*In Uganda, under the Livestock for Livelihood Project, fruit trees are being targeted and grown to ensure the rehabilitation of degraded lands and to generate opportunities for potential income capable of releasing communities' pressure on wildlife and deforestation. In addition, in the area bordering on the wildlife Park, VSFB supports the development of "Community Camping grounds"*

<sup>19</sup> Main constraint to the development of the poultry-farm



*as part of an Ecotourism programme. Others income-generating activities include training and assistance for beekeepers and Village Community Banking assistants (VICOBA).*

*In Mali, ownership of small livestock can prove to be essential in critical times, it helps to make essential purchases and to have access to animal proteins. Herds and small cattle in particular are interesting because when people need to flee from their village due to external factors such as a context of conflict, they can take the herd with them. VSFB has supported livestock keeping households, displaced in Mali due to the long-standing crisis, in preserving their herds.*

- To develop multi-actor governance systems based on local communities and to spread the grazing pressure, to facilitate access to water, to master the pastoral tenure, to improve infrastructure and to prevent conflicts.

#### **BOX 6**

##### **VSFs' field experiences**

*In the regions of Mopti and Timbuktu in Mali, access to water and land in nomadic pastoral farming areas is regularly the subject of conflict between farmers, herders and fishermen. Since 2007 AVSF has tutored communities to develop a coordinated management action plan for water resources and grazing areas between stakeholders. Participatory mapping of uses and resources (water points, pastures, agricultural areas, seasonal migration routes) has introduced new agreements (dates of cultivation, dates of seasonal migration, transit corridors compliance) and clear definitions of infrastructural needs (especially rehabilitation of wells, marking corridors for animals, regeneration of pastures).*

*Since 2012, VSFB intervened in the Niore Sahel region to assist and support small and middle scale livestock keepers in the broader framework of pastoral planning to resolve conflicts between livestock keepers and crop farmers and to optimize the use of natural resources in the broader context of demographic pressure. Mobility of pastoralists is key to this project. Different activities to rehabilitate some pasturelands are also planned, due to their severe degradation resulting from successive droughts.*

- Development of community-based animal health services that will help local farmers to deal with animal diseases, in particular vector-borne diseases related to the geographical redistribution of vectors (modification of habitats), the increased movement of people and livestock and the greater vulnerability of livestock (conflicts over access to resources)
- preservation, study and application of non conventional medicine including ethnoveterinary techniques.

#### **BOX 7**

##### **VSFs' field experiences**

*In northern Vietnam, in the province of Thai Nguyen, AVSF has trained livestock keepers in basic veterinary care and vaccination of poultry (paravets). At the onset of bird flu in 2004, these networks were immediately mobilized to participate in operational and monitoring disease outbreaks and implementation of emergency measures.*

*In Madagascar, where there was almost no vet service in the countryside, AVSF has trained and backed 120 Community Animal Health Auxiliaries in different parts of the island, since 2004.*

*In South Sudan VSFG supports the construction of new agro-vet-stores in remote areas to help more than 10,000 households to access drugs and treatments. To prevent the spreading of diseases among animals and human beings, new slaughter slabs and houses are being built and training programmes are carried out in meat hygiene especially during slaughter procedure and throughout the chain of meat distribution.*

*In the Saharawi Camps, backyard livestock breeding -camels and goats- is very common, accounting for the only source of fresh animal-source food. SIVtro-VSFItalia is partner in a long-term project for building and accompanying public veterinary services, including education, training, exchange of experts, building of the infrastructure, sensitizing authorities and the local population on the importance of livestock management, as well as of dietary and hygienic principles. Sivtro Vsf I implemented a study on local etnoveterinary and application of local phytoterapy besides courses on homeopathic methodology.*

*In Niger, Mali, the RDC, Rwanda and other countries, VSFB sets up SVPPs (Services Vétérinaires Privés de Proximité). Their common objective is to provide access to local veterinary services in remote rural areas, through the installation of Community Animal Health Workers - networks, managed by veterinarians that are being supported by VSFB through trainings, provision of equipment, supply of veterinary products, means of transport, etc. In Rwanda for example there are currently 28 CAHWs in the Nyanza district and 65 in the Huye district, supported by the PROXIVET project.*

- Diversification of breeds and maintenance of biodiversity in marginal lands: small livestock farming can help to preserve 40 species and almost 8000 breeds throughout the world, which also amounts to as many genetic qualities to adapt to changes.

#### **BOX 8**

##### **VSFs' field experiences**

*In northern Vietnam, in mountainous areas, in the framework of small-scale and familiar pig-breeding development, AVSF is backing the maintenance of a local breed of quality Mon Cai, in order to preserve maternal qualities (especially proliferation, gentleness) and to put it to work by crossing with another breed which has better meat productivity.*

- Greater involvement of farmers and farmers organizations in areas of national consultation to:
  - recognize pastoralism, secure land tenure legislation and regulate the issue of land grabbing, national and international encroaching upon rangelands (especially agro fuel plantations, irrigation perimeters, ranching) without forgetting the degradation and deforestation caused by farmers themselves;
  - protect local animal genetic resources to maintain a genetic capacity to adapt to future extreme weather events;
  - identify the knowledge and practices of farmers in adapting to climate variability;
  - develop early warning systems capable of recovering from episodes of food or health crisis in enclave areas (especially pastoral livestock);
  - animal welfare

**BOX 9**
VSFs' field experiences

*Since 2012 AVSF has been implementing a project in the Ferlo area, in Senegal, in which one of the objectives is to set up an information early warning system that will allow local partners, including livestock farmers and decision makers to get access to specific information about Ferlo pastoral resources, meteorological data, risks and vulnerable area and regulatory texts.*

*Since 2010 AVSF implemented a project of equine welfare in collaboration with The Broke in Casamance Senegal.*

- support organizations of farmers and veterinarians (public and private) in the development of local services to improve the health of animals and the collective capabilities of surveillance, prevention and control against animal diseases.

**BOX 10**
VSFs' field experiences

*In Iran, SIVtro-VSFI and Cenesta are supporting several Confederacies of Mobile Indigenous Peoples, claiming for the legal recognition of their traditional social structures, enabling them to access credit and to lobby for their protection. They are also working on their behalf to guarantee access to and management authority over the rangelands and natural resources, that are presently under the jurisdiction of State Authorities*

*In the Horn of Africa VSFB works with pastoral communities at community level to empower local leaders in the enforcement of laws, the peaceful and sustainable administration of resources, whereas at national level, with key pastoral advocacy associations and networks (Riam Riam, Coalition of pastoralist Civil Society Organizations COPACSO) and finally at regional level for the introduction of reciprocal grazing agreements along cross borders -*

### 4.3 DRIVERS OF CLIMATE CHANGE

#### IMPACT: HOW TO FACILITATE THE ACCESS OF SMALL-SCALE LIVESTOCK KEEPERS AND THEIR ORGANIZATIONS TO FINANCIAL MECHANISMS

In addition to climate variability, there are other socio-economic drivers capable of exacerbating the damaging effects due to climate change (Rivera-Ferre and al., 2012):

- Demographic growth: this trend has highly damaging effects, such as a over-exploitation of grazing lands and water resources available. The influx of

migrants tends to introduce new practices and know how that may prove mal adapted to the particular local environment they are moving in.

- Marginalization of rural groups by policies which neglect their traditional knowledge and lifestyle: several territorial policies are at the root of expropriations and land access restrictions that drive pastoral communities to settle in areas where they cannot develop their practices as usual, or to abandon their lands and move to urban areas. Otherwise, the fast development in leasing and purchasing land in developing countries, especially in Africa, by multinational corporations and foreign governments, stems from the little importance attached by

governments and large investors to the role of small-scale livestock keepers in feeding local population. Another example is the lack of or limited budget allocated to state veterinary and rural extension systems.

- The integration of small-scale livestock keepers into the market economy: worldwide, the prices of food in general, including livestock source foods, were about 40% lower in the mid-1990s and early-2000s than they are today. In addition to the price increase, a great volatility has been characterizing the food prices in the last 10 years, as a result of the increased commodification and the expansion of the stock trade over the food sector. Therefore, farmers can no longer count on an affordable feed, neither on the predictability of their prices. Small-scale livestock keepers are at the end of long market chains; indeed they have very little control over the market and remain vulnerable to competition from larger players. Small-scale farmers living in remote areas face high transaction costs to access consumers, as well as obstacles to penetrate markets formally due to requirements to meet food quality standards.
- The double mistake to support bio fuels for carbon reduction: as large land areas storing carbon are used to cultivate sugar cane or maize for the production of bio ethanol the change of the soil contributes to the emission of CO<sub>2</sub> and during the same procedure farmers are using artificial fertilizers to increase harvest amounts. The process to gain fertilizers also contributes to climate change because during the production of fertilizers the dangerous gas called nitrous oxide is released into the atmosphere. The global warming potential of nitrous oxide is under the time horizon of 20 years 280 times higher than that of carbon dioxide (Climate Change 1995).
- Poor access to training courses and communication: small scale farmers have difficult access to training and to communicate to the public about their products, organoleptic characteristics and local sustainable development. This results in a lack of information for

consumers at the same time, in the north and south of the world, particularly in urban areas.

In terms of mitigation, devices adapted to livestock farming are gradually being put in place (voluntary certification systems) but are still inaccessible to farmers. However, the possible inclusion of agriculture in the international carbon market is highly controversial; VSF Europa shall carefully consider any possible negative effects, such as an additional incentive to land grabbing and speculation on agricultural product. It is also essential to give better insight of livestock farming in the context of national adaptation plans (PANA), the future work plan on agriculture in the framework of the international negotiations and European cooperation policies, including financial mechanisms to support incentives for livestock farmers in the evolution of their practices.

VSF E will continue, in every part of the world, to implement information and training processes (especially conferences, symposia, training, strategic alliances, media, web, Development Education Projects) concerning the knowledge of the rural world and its characteristics of social and environmental sustainability .

## **5. CONCLUSION: MOVING WITH DETERMINATION TOWARDS A CLEAN LIVESTOCK FARMING, A VECTOR OF ADJUSTMENT**

While small-scale and pastoral livestock keepers in poor countries contribute to a certain extent to GHG emissions, they represent a marginal threat compared to the unbridled development of industrial livestock farming in developed and emerging countries.

In contrast, small-scale livestock keepers play a fundamental role in enhancing rural populations' resilience to climate change, while providing many positive externalities at economic, social and environmental levels. Over the last centuries, small-scale livestock keepers acquired a deep knowledge of countless and highly diversified environments worldwide. Their production systems, inspired by the need for resilience, led to selecting thousands of locally adapted breeds, and to developing countless adaptation strategies and practices that often provide an appropriate response to climate change.

An undifferentiated stigmatisation of livestock farming and meat consumption may thus discredit such a valuable and accessible tool for addressing the effects of climate change already visible in the South.

How much food of animal origin is necessary for the world growing population in the next decades, and how will it be produced? A redistribution of animal products should be recommended, towards downsizing consumption rates in wealthy countries and, possibly, increasing them in the disadvantaged ones. Moreover, having regard to the public health situation deteriorated by the presence of pesticides and pharmaceuticals in surface and deep waters, small-scale farming reduces or eliminates the use of chemical principles, bringing the animals to a lifestyle closer to their ethological characteristics as required by the animal welfare.

Active advocacy must be conducted in this direction to sensitize the citizens and the authorities at all levels, and to rehabilitate a low-emission and locally sustainable livestock

farming for both the overfed North and the vulnerable South. Everywhere in the world small farmers are in trouble and they are disappearing because of the prevalence of the big market.

This requires consultation and appropriate policies at local, national and international levels:

1) to address the urgent needs caused by the on-going climate change (e.g. consultation on access to resources, protection of biodiversity, diversification of operations, the fight against animal diseases, among others)

2) to increase investments on pilot actions (e.g. energy-saving technologies, adaptation of food rations, development of certification schemes, alternative livestock methods, animal care and welfare, distribution of products in short chain) based on highly innovative processes with a closer involvement of new players such as research centres and the private sector. However, VSF Europa is aware that an excessive focus on GHG mitigation leads to "simplistic" solutions, which do not have a real impact and distract from the real challenge: getting out of fossil fuel dependence, changing diet behaviour and restore resilience and soil fertility (Rivera-Ferre and al., 2012).

The food, economic and climate crisis we are experiencing should lead us to more firmly question the means to develop future models of crop and livestock production and care, more friendly to the mankind and his environment. To achieve this, small-scale livestock farming still has much to teach us.

(Based on an AVSF position paper)

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