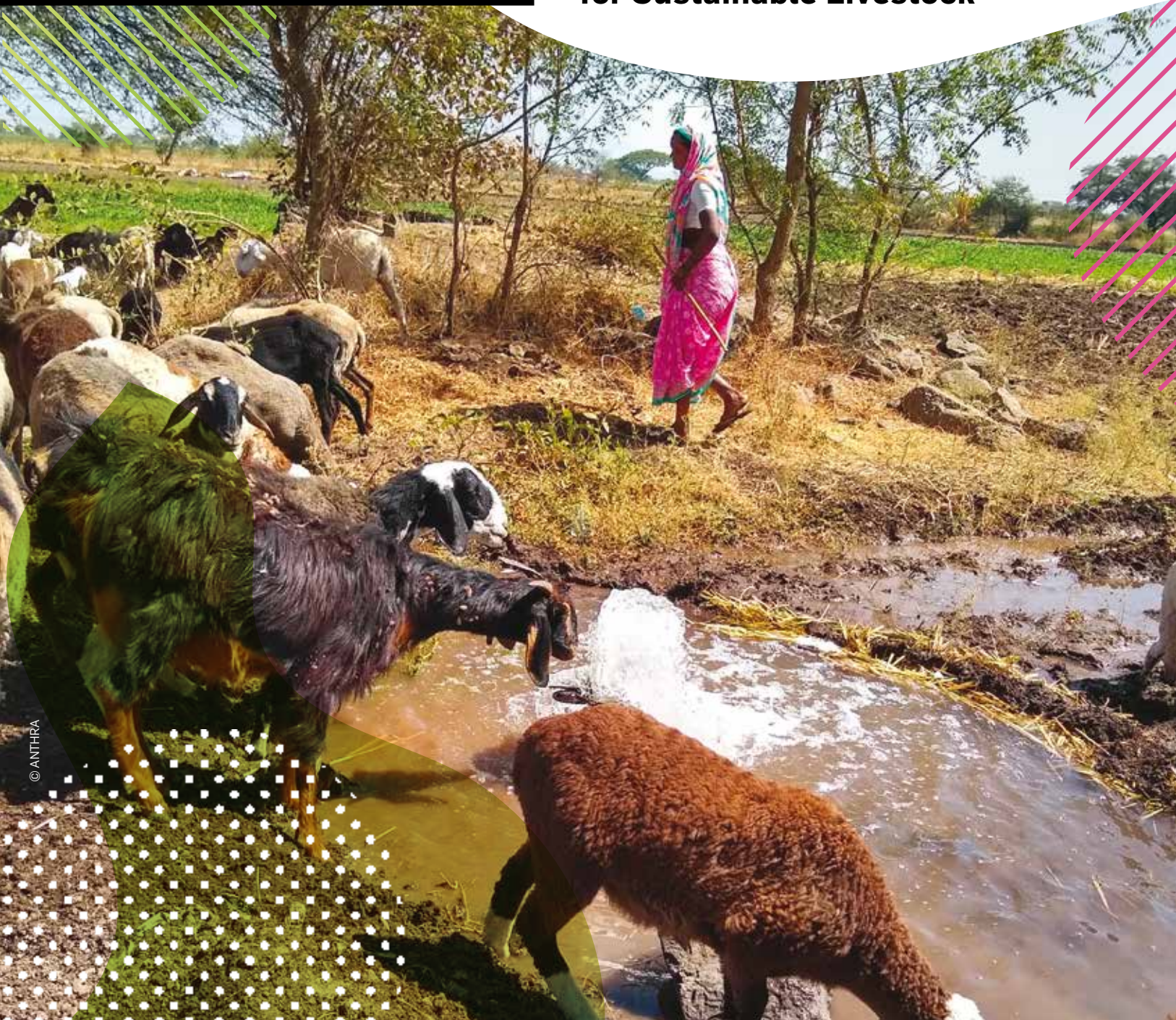


Smallholder Livestock Systems Innovations for Sustainability

**A Policy Brief from the NGO
Cluster of the Global Agenda
for Sustainable Livestock**



© ANTHRA

Global Agenda for Sustainable Livestock



Manhattan,
Kansas US,
September 2019

Global Agenda for Sustainable Livestock



Smallholder Livestock Systems Innovations for Sustainability

**A Policy Brief from the NGO
Cluster of the Global Agenda
for Sustainable Livestock**

Contents

ABBREVIATIONS	2
EXECUTIVE SUMMARY	3
1. SMALLHOLDER LIVESTOCK FARMING DELIVERS FOR SUSTAINABLE DEVELOPMENT	4
2. CURRENT CHALLENGES FACED BY SMALLHOLDER LIVESTOCK FARMERS	5
3. THE ROLE OF INNOVATION IN SMALLHOLDER LIVESTOCK SYSTEMS	6
3.1 Principles for innovation	7
4. INNOVATION IN ACTION	8
4.1 Food and Nutrition Security (FNS)	8
4.2 Animal Health and Welfare	9
4.3 Livelihood and Economic Growth.....	12
4.4 Environment and Climate Change	15
5. POLICY RECOMMENDATIONS	17
6. REFERENCES	18



Abbreviations

CEDEAO	Communauté Economique Des Etats de l'Afrique de l'Ouest/Economic Community of West African States
FAO	Food and Agriculture Organization of the United Nations
FNS	Food and Nutrition Security
GASL	Global Agenda for Sustainable Livestock
HI	Heifer International
IFAD	International Fund for Agricultural Development
LEGS	Livestock Emergency Guidelines and Standards
LMIC	Low and Middle Income Countries
OCDE	Office of Community and Economic Development
SDGs	Sustainable Development Goals
VSF	Vétérinaires Sans Frontières
WFP	World Food Programme

DEFINITIONS

Sustainability	the quality of being able to continue over a period of time
Innovation	developing new and sustainable responses to needs that are new or poorly met in the current conditions of knowledge, market and/or public policies, involving all the actors concerned
One Health	an approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes (WHO)

The Global Agenda for Sustainable Livestock (www.livestockdialogue.org) is a multistakeholder partnership committed to the sustainable development of the livestock sector. The partnership is made of several clusters drawn from different stakeholder groups. The NGO cluster brings together non-profit organisations with an expertise on specific areas relevant to smallholder livestock farming and pastoralism, environment, animal health and welfare, integrated service delivery for poverty reduction and resilient livestock-based livelihoods.

This policy brief was realised on behalf of the NGO cluster by Anthra, The Donkey Sanctuary, Heifer International, Kyeema Foundation, the LIFE network and VSF International.

Executive Summary

Sustainability is a concept that has captured the development lexicon for years. The Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 are an important landmark, aspiring to tackle thematic issues in global partnership. However, in a world of fluctuating and fickle economies, rapid globalisation, impending climate change and unexpected pandemics it appears that reaching the targets of sustainable development may pose some challenges.

Smallholder farming systems and pastoralism have supported human civilisation for centuries. In these systems, livestock are critical assets with multiple roles: they provide food, fuel, fibre, medicine, draft power and transport, manure, social status, economic security and increased income and political power. They also hold cultural importance, adding distinctive value and variety to different societies.

The Global Agenda for Sustainable Livestock (GASL) is founded on the conviction that the livestock sector has a key role to play in achieving the SDGs. Within that, the NGO cluster recognises the enormous contribution of smallholder livestock systems and pastoralism to meet such targets, especially in low and middle-income countries (LMICs). These systems can efficiently respond to challenges such as climate change, environmental degradation and market access in an increasingly globalised economy through continuous innovation and adaptation. They are a key feature of rural areas, competitively producing the bulk of livestock products in LMICs.

The role of sustainability and innovation in smallholder and pastoral systems encompasses a number of wide-reaching subjects, therefore for the purpose of this paper the main focal domains are food and nutrition security (FNS), animal health and welfare, livelihood and economic growth, and environment and climate change.

This paper examines smallholder and pastoral systems, highlighting the role of sustainability and innovation. It also looks at how modern technologies such as mobile phones and scientific research such as on new immunisation methods can support sustainable development and why these systems should be valorised through more favourable policies.

1 Smallholder livestock farming delivers for sustainable development

Globally, livestock contributes 40% to the total value of reported agricultural output and supports the livelihoods and food security of almost 1.3 billion people, of whom 800 million are resource-poor farmers¹.

Livestock production systems worldwide are diverse, ranging from small to large scale and with varying levels of input use: from intensive to extensive, with many intermediate systems existing between the two extremes. The impact of these systems on the environment (biodiversity conservation, natural resource use, GHG emissions), on public health (outbreak of pandemics, zoonotic diseases, emergence of AMR, animal-source food nutrient quality, food safety, etc.) as well as the implications for the livelihood and economics of livestock keeping communities are also varied.

Smallholder livestock farming is key to livelihoods, food and nutrition security and employment for rural communities in LMICs, and provides important environmental benefits. Examples of smallholder, low-input livestock systems include pastoral and agro-silvo-pastoral systems, family poultry, backyard farming, and mixed crop-livestock production systems (rain-fed or irrigated) (Tarawali 2015). These livestock systems are the most widespread in LMIC and offer great potential for achieving the SDGs (Wong et al, 2017).

In these systems, livestock has multiple functions. It provides food for household consumption, products for income generation and quick cash when emergencies and external shocks occur (i.e. climatic disasters, diseases, price volatility, etc.). They are important assets, critical to the multiple needs of smallholders (e.g. manure, draught and hauling power, etc.), while also having a cultural and spiritual value and being unique descriptors of the identity of specific pastoralist groups. (FAO, 2007, 2015) This is the case, for instance, of the Sami herders from northern Scandinavia and Russia who keep reindeer, of the pastoralists of Uganda who keep Ankole cattle, or of Raika pastoralists in India who keep camels. Likewise, smallholder poultry is often an important part of traditional ceremonies throughout Africa and Asia (Clarke 2004).

By providing opportunities for income generation, livestock helps reduce poverty and support economic growth. It also enables women to become economically active, increasing personal resilience and helping to reduce inequality.

Livestock production provides varied nutrition to households, which leads to the reduction of hunger and malnutrition. Ensuring this provision, and additional income to afford access to other resources, livestock can in turn lead to positive health and wellbeing amongst communities. Reduced waste, nutrient cycling and shorter value chains also enable responsible production and consumption (De Bruyn 2015).

Finally, smallholder farming systems support climate change adaptation and mitigation, where responsible natural resources management techniques, the use and provision of important ecosystem services and contributions to maintaining biodiversity offer significant environmental benefits. **Box 12**



© Wouter Elsen, VSF Belgium

¹ <https://www.worldbank.org/en/topic/agriculture/brief/moving-towards-sustainability-the-livestock-sector-and-the-world-bank>



2 Current challenges faced by smallholder livestock farmers

Global trends in livestock development alongside higher demand and consumption of meat, milk and eggs have led to increased pressure being placed on livestock systems. Growing demand for animal-sourced food is leading to structural changes in the livestock sector and greater competitive divergence between large-scale systems and marginalised smallholder producers. Large-scale producers can outcompete using intensive production systems and better access to technology and infrastructure. As a result, the economic involvement of smallholder systems is increasingly difficult, with inhibited access to the growing consumer market.

This unequal growth of the livestock sector and increasing marginalization of smallholders poses concerns in terms of socio-economic development, sustainability, food security, livelihoods, human and animal health, animal welfare and the environment, putting at stake the achievement of the SDGs.

Negative perception and misleading associations are also considerable challenges for smallholder and pastoral systems, with questions raised over production quality and capability compared to larger or more intensive systems. For example, in the absence of secure land tenure or access rights, pastoralism and open grazing have been blamed for desertification while backyard poultry has also been incorrectly blamed for spreading avian flu (Alders et al 2013).

The experience of NGO Cluster members who represent national and international NGO's spread across different continents presents a contrasting view, where smallholder and pastoral systems can be demonstrably effective, efficient and innovative, if adequate support and policies are provided. Locality plays an important part in this process, holding value across productivity, culture, social dynamics and environment.

3 The role of innovation in smallholder livestock systems

Innovation consists of **developing new and sustainable responses to needs that are new or poorly met in the current conditions of knowledge, market and/or public policies, involving all the actors concerned**, including - in the first place - the main beneficiaries of the innovation. In smallholder livestock systems, an innovation can be made across several stages of the livestock keeping system:

- > the production system, such as innovations in how animals themselves are reared or shifts in breeds or species by livestock keepers;
- > the services offered by the producers, such as shift in the products or by products normally produced by the livestock keepers or the services they need for example health services, breeding services, veterinary services;
- > the way of organizing production, using natural resources including shifts in ways of feeding or grazing animals, organising value chains, which could be lengthening or shortening or different ways of value addition the improvements in nutrition, which may be the introduction of new or hitherto unused fodder resources;
- > the reduction of exclusion, by having landless and marginalised communities keeping animals of poverty and vulnerability; or
- > the improvement of living conditions through increased income and livelihood opportunities.

Innovation involves several stages that are not always perfectly linear: emergence, experimentation, evaluation and scaling up. All concerned stakeholders, including livestock keepers' families and their organisations, should be involved as much as possible in all these stages, through approaches that stimulate creativity, a culture of innovation, and which develop complementary skills.

An innovative approach in the context of a project requires experimentation and a certain degree of risk taking. In order to be defined as innovation, the proposed response should be clearly different from the solutions available in the local area, while being appropriate to the context. It is often conceived with the aim of changing scale, of being duplicated. In the case where the innovation is taken from existing experiences from other places, it should seek to adapt to the specific needs of its territory (it should be a transposition, not a duplication), and that's why the engagement of local actors become so important.

Smallholders and pastoralists have been coping and adapting to challenges posed by climate change, rapid urbanization, population growth, marketing barriers and health risks for centuries. In a rapidly changing environment, innovation is necessary in order to support livestock keeper communities to cope with and adapt to new challenges.

Under the SDG framework, policymakers at national and international levels are paying increasing attention to measures aimed at adaptation to risk. Sustainability programmes and policies, often designed through externally driven and large-scale measures, should also build on the knowledge, interest and innovativeness of local actors within livestock systems to support their capacity to adapt. Without this, top-down interventions can put smallholders at risk, undermining their resilience strategies, and exacerbating the recurrent food crisis and poverty cycles.



Conversely, co-operative innovation that encourages local resource users to control and drive the process can accelerate the achievement of development targets within these systems. Examples such as the Participatory Innovation Development (PID) approach demonstrate the value of farmers, pastoralists and local resource users taking the lead, while external actors, such as researchers or NGOs, acting just as facilitators (Gebre Michael et al, 2011).

3.1 Principles for innovation

When supporting innovation for smallholder systems, a number of principles can aid the process and facilitate their contribution to achieving the SDGs:

- > Adopting **participatory approaches** at all stages of project cycle (design, implementation and evaluation), fostering local ownership as a strong focus for the innovation, in order to assure its sustainability Catley 2011.
- > Maintaining and valuing local and traditional knowledge while providing access to new technologies and scientific approaches, considering the fundamental relationships that small-scale livestock keepers and pastoralists have with their environments (Manzano, 2017). **Box 11**
- > Implementing inclusive programmes that involve a wide range of actors, with particular attention to women, youth, indigenous and vulnerable groups' needs. **Box 10**
- > Adopting a systemic, transdisciplinary, multi-sectoral approach and partnership to understand the complexity of problems from different perspectives and forms of knowledge, anticipate any potential impacts on different parts of the local system (people, animals, environment) and minimize the possible negative effects. **Box 9**



4 Innovation in action

4.1 Food and Nutrition Security (FNS)

Human undernutrition remains a major public health challenge globally, affecting 821 million people in 2017 and contributing to over 3 million preventable maternal and child deaths each year. Africa remains the continent with the highest prevalence of undernourishment, affecting almost 21% of the population, more than 256 million people (FAO, IFAD, WFP, 2018).

Livestock is an indispensable asset of smallholder farmers and has a huge impact on human capital through nutrition and health. Animal-source foods (ASFs), including meat, milk, eggs and offal can provide high-quality protein and micronutrients, improving the healthful adequacy of diets that have previously relied on nutritionally poor but readily available staple crops (Randolph et al., 2014).

BOX 1

FROM THE STABLE TO THE TABLE: IMPROVING THE LOCAL MILK VALUE CHAIN

In Mali, the PAFLAPUM project, conceived and implemented in collaboration between international and local NGOs, producers associations and state services, has been providing an integrated support to the local milk value chain. The project connects breeders and markets through a network of milk collecting points, mini-dairies and 88 selling points in Bamako. 2000 jobs have been created, including livestock keepers but also milk collectors, dairies staff and milk sellers. Thanks to improved animal feed, establishment of fodder banks managed by farmers cooperatives, improved access to animal health services and improved husbandry practices and genetic improvements, milk production per cow increased by +59% from 2016 to 2018 in Bamako (from 3 to 4,5 l/cow/day) and +77% in Kayes (2,5 to 4,5 l/cow/day) (VSF International, 2019). Local high-quality milk is now affordable to the consumers in Bamako and Kayes, who have welcomed this new offer with enthusiasm. The demand for local milk has thus significantly increased, shifting consumption from imported milk powder to locally produced milk. The project fosters also the inclusion of fragile and marginalized social groups, such as women and widows. The sellers' revenues and their overall life situations have greatly improved, and their roles within society have been boosted.

MORE INFO

<http://www.vsf-suisse.org/vsf/web/en/index.asp?QString=291,0,82,0,0,0&View=Detail>

Supporting innovations for FNS within smallholder systems should consider the different dimensions of availability, quantity and stability of safe food supplies, access to nutritionally rich and diverse foods and the ability to effectively absorb nutrients from dietary intake. **Box 10**

In many LMICs, pastoralism, agro-pastoralism and smallholder mixed farming systems are the main providers of meat, milk and eggs sold in the markets (CEDEAO and OCDE, 2008; Herrero et al. 2012) and are therefore crucial for household nutrition and socio-economic development. Support to the resilience capacity of these livestock systems and to well-functioning local markets prove to be key element to secure access to food for millions of vulnerable people. On the other side, availability of animal proteins is strictly correlated with animal productivity.

Any innovative approach to improve

animal nutrition, health and well-being has important benefits for balanced and nutritionally-rich diets. Finally, in terms of quality of animal-sourced food, the food safety challenges are numerous. Even small techniques that improve the hygiene, such as the introduction of washable stainless-steel milk tanks, can have tremendous benefits for health.

The possibilities to respond with innovations to the FNS needs are huge, and the identification of the best locally-adapted solutions should be made in close collaboration with farmers and local actors, with a special attention to women's involvement. Sustainable improvements within household nutrition often place focus on women and the smaller livestock species that they traditionally manage (Galiè et al., 2018). Enhancing the role women play in livestock keeping, securing their access to resources, to decision making and participation in income-generating activities can help to reduce childhood undernutrition.

4.2 Animal Health and Welfare

In many rural areas and drylands in Africa, Asia and Latin America the presence of veterinary services is poor and scattered. This, combined with weak governance and poor infrastructure, contribute to the fragility of health system both for animals and humans. Often the number of qualified veterinarians does not suffice to provide quality animal health services at local level (VSF International, 2018), resulting in poor animal health. Keeping livestock healthy, is critical for the livelihoods and survival of millions of livestock keepers and pastoralists, and has important implications for human and environmental health as well.

Zoonotic diseases, food-borne diseases and antimicrobial resistance are all risks related to the human-animal interface which are directly affecting human health. It is clear why at international level much attention is being paid to them. However, major attention should be kept also on non-zoonotic livestock diseases, including a number of neglected tropical diseases, as their impact on livestock productivity, mortality and reproduction/fertility has big consequences on the food security and overall resilience of livestock-dependent communities.



© Russell Powell

The One Health approach offers a way to manage in an interconnected way human, animal and environmental health, as the three exist in close proximity. For small-scale farmers and pastoralists, whose livelihood is directly dependent on the natural resources and landscape available, this proximity is even more marked. Pastoralists do not necessarily see a great difference between their health and the health of their animals as they share such a close relationship with the animals they own.

A One Health approach is particularly adapted to pastoral settings and small-scale mixed farms to address both human and animal health concerns in a locally-adapted effective way. Since One Health is based on participatory, transdisciplinary and multisector approach, it opens up the door for interesting innovations issued in participatory fora and engaging different forms of knowledge, sectors and disciplines, for sustainable solutions. At the livestock-wildlife interface, interspecies approaches for disease surveillance, control and general health are needed, especially in areas of high biodiversity and zoonotic disease transfer risk.

Participatory epidemiology is also offering opportunities for sustainable innovation (Catley et al., 2011; Bagnol et al., 2016). The experience and perception of animal owners strongly

influence the efficacy of animal health programming, with communication and participation identified as being integral to success. Innovative approaches to participatory epidemiology include for example the use of information and communication technologies (ICTs) such as mobile phones for community-based health reporting or local outbreak assessments and monitoring with mobile applications. **Box 9**

Another important innovation that proved key to assure animal health delivery in remote areas is the establishment and training of community-based animal health workers (CAHWs). CAHW systems were one of the new animal health delivery systems developed from the 80's onwards to fill the gaps and respond to health needs in many countries in the Global South (Leyland et al., 2014). Although the approaches (as well as the name) vary from country to country and depends on the organisations that facilitate their instalment, some common feature exist: CAHWs are members of the community and often livestock keepers themselves; they generally receive training in basic animal health care and provide a limited range of veterinary tasks to the members of their community, often in association with or supervised by a graduated veterinarian. They build upon the knowledge, participation, and needs of live-

BOX 2 COMMUNITY ANIMAL HEALTH WORKERS

Several NGOs across the globe² have been training Community Animal Health Workers (CAHWs) through different programs. These animal health agents are known by different names, including for instance "village vaccinators" or "community agro-vet entrepreneurs" (CAVEs), who also have the business development skills on agro-vet. They are trained on the basics of livestock care, management, nutrition, breeding and preventive health, and often on agribusiness and enterprise development. Several focus on women as trainees. The CAHWs provide several services to the livestock keepers community including preventive care like timely vaccinations and deworming, first aid treatment, input supply to smallholder farmers on new advances in animal production and health technology. As a result of the trainings, mortality of livestock has decreased, with a subsequent rise in production. They have also led to women taking on new roles and responsibilities, thereby breaking traditional social barriers and seeing a rise in measured levels of empowerment. Some programs have also helped attract youth to agribusiness, thereby reducing migration to cities.

MORE INFO

VSF International (2018)

² VSF-International, ANTHRA, Kyeema Foundation, Heifer International, among others.

BOX 3 LOCAL AND INDIGENOUS KNOWLEDGE WORKS

Poor farmers are the most affected by general challenges in livestock healthcare as they do not have the means to access expensive or sophisticated veterinary care. Yet, there is a vast repertoire of indigenous knowledge based on ethnoveterinary and management practices, which has the potential to address some of the health-care problems on a local and low-cost basis.

In India, for over 20 years efforts have been made to document, validate and disseminate these practices among amongst several groups across the country and abroad. With the growing concern of excessive use of contaminants and antimicrobials and the resulting residues in food products including those of animal origin such as milk, meat, and eggs, the use of safe plant derivatives for treating animals is gaining prominence. Since 1996, different rural communities in Andhra Pradesh and Maharashtra in India have been participating on an action research project to document, research and socially validate local animal health care, feeding and management practices (Ghotge and Ramdas, 2002, 2008).

MORE INFO

<http://www.anthra.org/focus-area/one-health/>



stock-owning communities to deliver localised animal health services. The implementation of the CAHW system entails robust community participation that enhances its acceptance, usability and replicability. The practice registered a major breakthrough when it was deployed in the successful Rinderpest eradication program.

Other complementary actions to promote animal health, well-being and welfare for sustainable smallholder livestock development include improving feed, fodder and forage production, appropriate housing and management, access to water sources combined with animal health service delivery. The maintenance of health through these preventive practices focused on animal welfare assure the achievement of the “Five Animal Freedoms”: freedom from hunger or thirst by readily available access to fresh water and a diet to maintain full health and vigour; freedom from discomfort by providing an appropriate environment including shelter and a comfortable resting area; freedom from pain, injury or disease by prevention or rapid diagnosis and treatment; freedom to express normal behaviour by providing sufficient space, proper facilities and company of the animal's own kind; freedom from fear and distress by ensuring conditions and treatment which avoid mental suffering (Brambell, 1965).



© Philip Davis

BOX 4

SCIENTIFIC INNOVATION TRANSLATES INTO A SUCCESSFUL VACCINATION PROGRAMME

Successful vaccination programs against Newcastle disease (ND) implemented in rural Sub Saharan Africa and South Asia improved considerably chicken health and production. The thermotolerant vaccine (doesn't need a reliable cold chain) was developed through rigorous and careful research in the laboratory and the field and can be administered with ease by trained farmers or CAHWs (Alders, 2014). This vaccine has been specially designed for small holdings and family (backyard) poultry. Government and the private sector are also supported to produce a quality assured product in program countries. Development and facilitation of locally suited distribution models of the vaccine to reach community level is also promoted. This whole value chain approach has been shown to give 1:60 cost benefit to communities (Fisher, 2014).

MORE INFO

www.kyeemafoundation.org and www.heifer.org

4.3 Livelihood and Economic Growth

As outlined earlier in the paper, livestock is a key asset for over 1.3 billion people, including 800 million resource-poor farmers and over 200 million pastoralists. Livestock play multiple roles in supporting livelihoods. Especially in LMICs, sales of milk, meat, eggs and live animals are an essential source of household income. Livestock are often one of the main assets that rural households possess, and which allow them to manage risks. Other benefits are numerous, including provision of manure and traction for ploughing to support crop farming and improve overall farm productivity, or transporting goods to markets.

Livestock is also an important asset for women, who represent about two-thirds of smallholder livestock keepers (Herrero, 2012), and who are often also responsible for processing animal products, especially milk. Livestock assets are generally more equitably distributed between men and women than are other assets like land, although the species or breeds owned by women and their control over income generation varies by region and culture (Kristjanson et al., 2010). Despite the central role women play in livestock production, women generally have lower access to technologies, inputs, information and training than men. Innovative approaches to foster women empowerment through livestock should carefully consider overcoming those gaps.

More in general, in order to promote sustainable economic growth of smallholder farmers, it is important to integrate pro-poor wealth creating value chains with poor and vulnerable groups into market activities in an equitable and fair manner. These value chains create lasting wealth that is rooted and stays in communities through local ownership, mutually beneficial linkages and inclusive business relationships. **Box 1**

In pastoral areas, innovative multi-actor approaches to secure grazing rights, access to natural resources and herds mobility are key to support the livelihood of pastoral communities, while reducing the risk of conflicts with sedentary crop farmers.

BOX 5 SUPPORT WHERE IT MATTERS

Recognition of the multiple roles of livestock in the economies of LMICs is crucial for understanding why their loss due to disasters or shocks is so damaging to the livelihood systems of livestock keeping communities. When disaster strikes, whether natural (such as drought, flooding, etc) or man-made (war), livestock are as seriously affected as the people depending on them. Effective emergency responses should aim to protect and re-build livestock assets to strengthen the livelihoods and recovery capacity of affected populations that depend on them.

The Livestock Emergency Guidelines and Standards (LEGS) offer guidance and a set of operational principles on the main types of interventions targeting livestock in emergency contexts. LEGS is based on a livelihood approach which places the resilience of affected communities at the centre, and establishes strong links between short-term humanitarian interventions and long-term development goals. LEGS include interventions on 6 domains: provision of feed; provision of water; provision of veterinary services; destocking; restocking; and livestock shelter and settlement.

MORE INFO

<https://www.livestock-emergency.net/>

BOX 6 CLOSING THE INCOME GAP

Some large-scale value chain projects in East Africa (dairy), Nepal (goat) and Haiti (goat) showed great impact in improving rural economic development. The initiative designs and commercializes products and services, creates jobs and generates new waves of economic development in rural communities. NGOs help entrepreneurs, especially women and youth, with the skills and resources they need to earn living incomes. Living Income is the total net income needed to live a dignified life: a life with adequate nutritious food, access to resources, education, healthcare, and money saved for emergencies. The value chain projects aim to close the gap between current income levels and living income.

Likewise, the "Improving Income and Nutrition through Community Empowerment" (INCOME) Project in Cambodia contributed to improve the livelihoods and food security of 30,000 farming families by focusing on swine and poultry value chains. There is an increase in daily income among project participants from USD 0.89 per day per capita (2012) to USD 3.16 per day per capita.

MORE INFO

www.heifer.org



BOX 7 TRADITIONS THAT COUNT

Poultry farming has great potential to help smallholder farmers reach a living income. However, there is a high mortality rate in chicks, especially during the early stages of life, making it crucial for smallholder farmers to adopt appropriate tools that help them increase their production and lower mortality rates.

In Tanzania³, two projects focusing on helping smallholder farmers through backyard poultry are serving a total of 2,550 families organized in 152 self-help groups. Each family received an original placement of one cockerel rooster and five pullet hens as a part of the project. The local technology known as “*kinengunengu*”⁴ has been deployed as a strategy to improve chicken productivity. The primary benefit of this technology is reduced chick mortality by keeping chicks enclosed for warmth during chilling temperatures and reduced risk from predation. So far, chick mortality has been reduced from 90% reported during baseline surveys to 20% during 2018. The two projects have distributed 35 *kinengunengus*, each one costing TZS 200,000 (Approx. USD \$90.00). To ensure that the technology is sustained, 50 local artisans were trained on how to fabricate *kinengunengus*.

Training smallholder farmers on the use of this technology is part of the good poultry husbandry practices promoted in the project areas, which also includes training on nutrition and use of ethnoveterinary medicines. The expected impact of the intervention is estimated to reach more than 12,750 households in both regions.

MORE INFO

<https://www.heifer.org/>

Similar programs are being conducted with significant livelihood impacts in Mozambique, Malawi, Ethiopia and the Asia-Pacific.

MORE INFO

<https://kyeemafoundation.org/explore-our-work/>

³ Igunga Eco-village project (<http://www.igungaecovillage.com/>) and Maisha Bora project (<http://www.maishabora-tz.org/>)

⁴ Video: How to Construct a Local (kinengunengu) Chicken Brooder <https://www.youtube.com/watch?v=cplav4doDKo>



BOX 8 **NEW PRODUCTS, NEW MARKETS**

In India, camel milk is not normally found on supermarket shelves, but thanks to the efforts of NGOs, pastoralist communities and the private sector, it is finding its way slowly to these shelves as a niche product. The need to strengthen the camel milk value chain responded to multiple goals of increasing herder's income, offering to urban consumers a high-quality product, and to provide new livelihood opportunities to camel pastoralists, as camels' traditional use as transport animal is disappearing. Traditional camel herders, mainly pastoral communities such as the Rebari and the Raika who were in danger of losing a livelihood have now begun rearing camels again and selling the milk at a good price.

[MORE INFO](http://www.lpps.org/)

<http://www.lpps.org/>

In India, parallel efforts are being made by several NGOs⁵ to support sheep herders (mainly pastoralists) to access the market for premium price of organic, antibiotic-free meat sold in urban Indian markets (Ghotge, Athani and Ganguly, 2017).

⁵ Future greens, Timbaktu collective and Anthra

4.4 Environment and Climate Change

The livestock sector is under constant scrutiny for its contribution to climate change. However, the environmental benefits of pastoralism and small-scale mixed farming systems are numerous. These benefits include nutrient cycling and soil improvement; improved ecosystem function (e.g. seed dispersal, moderate ecosystem disturbance), ecosystem service provision, and biodiversity conservation. For livestock species, research has shown that local breeds are best suited to local environments, adapting better to disease and climate change than introduced species (FAO, 2015).

Agroecology in particular is practiced by many mixed farming systems and can be considered an “effective approach to tackle climate change and the interconnected challenges facing food security and nutrition”⁶. Pastoralist systems also generally have advantages regarding sustainability and efficiency, including the use of marginal lands that do not compete with agriculture.

However, these systems are severely hit by the consequences of climate change due to their direct dependence on the surrounding local environment and resources. Harsh climatic events, decreased pasture or water availability, higher disease incidence and resource-based conflicts can all affect the livelihoods of pastoralists and smallholder livestock farmers. Innovation can influence both their adaptation strategies, their mitigating contribution and their resilience.

For instance, innovative approaches based on integration of climate smart livestock and crop production practices can be very useful to increase farmers resilience from climate shocks, to help them responding to agricultural emergencies rapidly and efficiently (early warning systems) and to strengthen their capacities to deal with future extreme climate incidents.

Utilising existing resources more efficiently is one way in which livestock systems can adapt to a changing climate and minimise their own impact. Renewable energy systems such as communal or private biodigesters allow the production of biogas (mainly methane) from cattle dung, which can then be used for cooking. As a substitute for wood, this can replace between 13 and 18 Tons/year of wood, reducing deforestation (AVSF, 2019).

Educational initiatives present the opportunity to develop small-scale livestock farming while maintaining a traditional balance with the surrounding environment. Promotion of dietary diversity, including the promotion of underutilised plant and animal sources can also help offset greenhouse gas production as well as strengthening lower carbon footprint farming activities, where locally grown supplementary foods are selected over imported commercial products (Alders, 2012).

BOX 9 MOBILE AND CONNECTED

Ferlo region in Northern Senegal is an arid and isolated pastoral zone, where the livelihood of agro-pastoral communities is challenged by regular droughts, bush fires, soil degradation, lack of water points and more in general lack of technical services and infrastructure. NGOs and producers' organizations are joining efforts to restore natural resources and to support adaptation strategies to climate hazards. Activities include: revitalizing existing Pastoral Units (multi-stakeholder management agreement for the shared use of pastoral resources) and creating new ones; conflict management and prevention; development of income-generating activities for women and young people within the livestock and crop value chains; access to rural energy; and setting up a Pastoral Information and Early Warning System to guide pastoralists in their herd mobility choices. Satellite images and mobile data collection systems provide information on the state of pastures, weather, state of the water points, presence of disease outbreaks, etc. This real-time information available on the internet and mobile phones guides pastoralists in their herd mobility choices and help decision-makers to take emergency or preservation measures.

MORE INFO
<http://spaif.org/spaif.php>

A similar initiative is implemented in the cross-border areas between Niger, Burkina Faso and Mali. There, a Transhumant Information System (TIS) serving over 100,000 pastoralists, aims to provide updated information through the use of new technologies. The TIS is fed by several actors including technical services' state agents, community-based animal health workers, and pastoralists leaders, who all collect data from the ground every 10 or 14 days and send them on a server. Collected information include availability and quality of pasture, evolution of pluviometry, state of water points, market price of livestock and cereals, state of transhumant corridors, conflicts, livestock thefts and disease outbreaks. Once validated, synthesized and analysed, these data are broadcasted via community radios in local languages. The information is also available through an interactive voice mail, which can be accessed by herders via their mobile phone. In case of urgent communication, such as highly contagious animal diseases or a conflict, the information is sent through SMS to all community leaders. The information is also published in a monthly bulletin for decision-makers and development actors.

MORE INFO
<https://veterinaire.sansfrontieres.be/mediatheque/systeme-dinformation-des-transhumants/>

Similar initiatives in India use mobile phones and communication platforms like Whatsapp to keep mobile pastoralists informed about, disease outbreaks, vaccination routines etc.

MORE INFO
<http://www.anthra.org/projects/mapping-rangelands-pastoral-landscapes/>

⁶ <http://www.fao.org/publications/highlights-detail/en/c/1113542/>

BOX 10 SAVING THE BUSH

Improving backyard livestock and crop production has proved to be an impactful alternative to bush-meat consumption and overutilization of wildlife in areas with fragile ecosystems. In Zambia and Madagascar, local and international NGOs⁷ have been working with vulnerable communities combining education and technology delivery to improve family poultry and crop integration as an alternative to bushmeat consumption in order to protect the local wildlife biodiversity in surrounding forest and national park landscapes (Alders and Kock, 2017).

MORE INFO

https://youtu.be/ZY7bQilJ2_Y

⁷ Kyeema Foundation, Community Markets for Conservation, Wildlife Conservation Society

BOX 11 BCP'S PROTECT LIVESTOCK BREEDS AND TRADITIONAL KNOWLEDGE

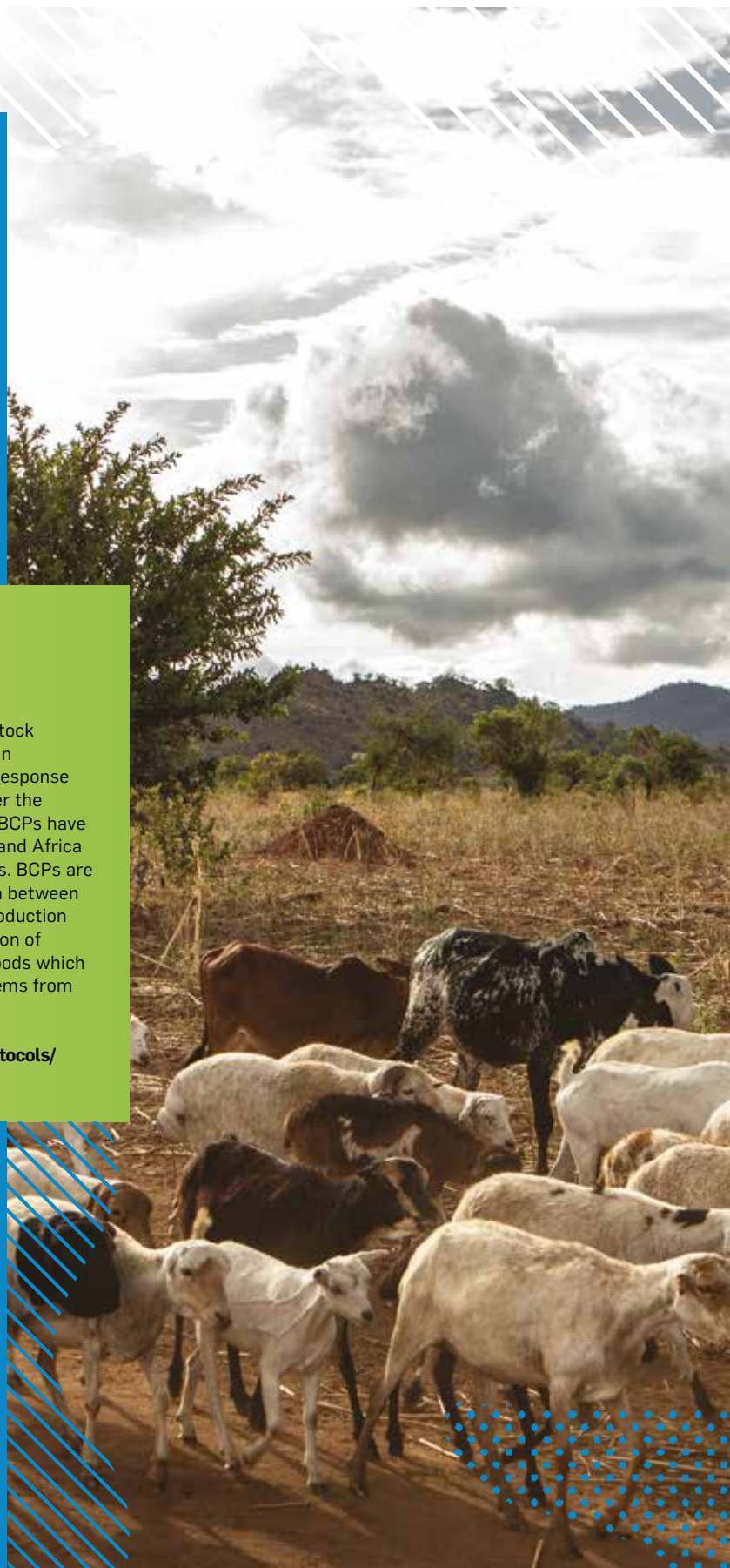
Biocultural Community Protocols (BCPs) are an approach for livestock keeping communities to put on record their traditional knowledge in stewarding biological diversity. They are a legal tool conceived in response to the need for fair and equitable benefit-sharing agreements under the Convention on Biological Diversity (LPP and LIFE Network, 2010). BCPs have been developed with several pastoralist communities across Asia and Africa to help conserve livestock biodiversity and value indigenous breeds. BCPs are a first step towards making visible and establishing the connection between livestock breeds, specific communities and agroecological food production systems – and can serve not only as a starting point for conservation of animal genetic resources but also safeguarding associated livelihoods which may also be under threat. BCPs provide insight into livestock systems from the perspectives of the breeding communities

MORE INFO

<http://www.pastoralpeoples.org/themes/biocultural-community-protocols/>

BOX 12 STOCKING CARBON TO COMBAT CLIMATE CHANGE

Fodder and forage production provide opportunities to valorise marginal areas for improved livestock feeding, while increasing biodiversity and stocking carbon. In Nepal and India, smallholder farmers are equipped and trained to grow fodder and forage in unproductive and unused lands, public lands accessed through leases, borders of irrigation canals, sides of roads and trails, terraces and bunds of the farmlands. Community nurseries managed by smallholder farmers are the main source of seedlings and saplings, in addition to leveraging similar resources from local government agriculture and forestry departments. Smallholder goat farmers in Nepal have planted more than 8,000 hectares of land between 2013 and 2016 (Heifer International Nepal, Annual Report 2016). Likewise, in India more than 500,000 fodder/forage plants were planted in 2016 alone (Heifer International India, Annual Report 2016).





5 Policy recommendations

Smallholder farming and pastoral systems exemplify a sustainable form of livestock production, able to maximise SDG outcomes. However, they often face several challenges including limited access to resources, services, infrastructure, education and political marginalization.

In a rapidly changing environment, where climatic events are getting more unpredictable and harsher, urbanization and consumption patterns are pushing up demand for animal products, zoonotic diseases and pandemics pose severe risks for health, the sustainability of these systems and their contributions to livelihoods require greater levels of support, including through innovation. As showed in this paper, smallholder farming offers great potential in this respect, especially when innovations are following participatory and inclusive approaches, are valuing local knowledge and local environments, and are based on transdisciplinary, multi-sectoral partnerships.

Within the NGO Cluster of the GASL, members have experienced success through community interaction, educational initiatives, technological engagement and cooperative programming. In order to achieve sustainability within smallholder and pastoral systems, we call for endorsement of the suggested principles for innovation and present the following recommendations:

- > Recognise the contribution of smallholder livestock systems to the economic, environmental, health and social aspects of the Sustainable Development Goals, and support them with adequate policies and means;
- > Review the perception and development frameworks of smallholder systems within the wider livestock sector to identify areas where tailored investment would support sustainable and competitive development;
- > Encourage and facilitate interdisciplinary and cross-sectoral approaches to analyse and anticipate the complexity of problems, taking into account knowledge from a wide range of sources (local or traditional practises, research, service provision, NGOs and governments, etc.);
- > Support the dissemination of this cross-sectoral and multi-actor knowledge, using locally appropriate education, capacity building and technological means;
- > Support inclusive policy and programming that facilitates a participatory approach at all stages of livestock development and across a wide range of relevant stakeholder levels;
- > Encourage collaborative engagement between organisations to aid knowledge transfer, decision-making and resource allocation, while implementing projects on the ground;
- > Scientific research projects to be sensitised to the special and specific needs of small holder and pastoral communities.

6 References

- Alders R. and Kock R.** (2017)
What's food and nutrition security got to do with wildlife conservation? *Australian Zoologist*.
- Alders, R.** (2014)
Making Newcastle disease vaccines available at village level. *Veterinary Record*: 174: 502-503.
- Alders R., Adongo Awuni J., Bagnol B., Farrell P., and de Haan N.** (2013).
Impact of Avian Influenza on Village Poultry Production Globally. *Ecohealth Journal*.
- Alders R.** (2012)
Challenges and opportunities for small-scale family poultry production in developing countries. XXIV World's Poultry Congress, Salvador, Brazil, 5-9 August, *World's Poultry Science Journal* 68 (Supplement 1: 153).
- Alders R. and Pym R.** (2009)
Village poultry and human development. *World's Poultry Science Journal*, Vol. 65.
- AVSF** (2019)
Promotion de l'accès aux Energies Durables dans les projets d'AVSF au Mali. *Capitalisation des expériences et pratiques*.
- Bagnol B., Naysmith S., de Bruyn J., Wong J., Alders R.** (2016)
Effective animal health programming requires consideration of and communication with those at the human-animal interface. *CAB Reviews*: 11 (030).
- Brambell** (1965)
Report of the Technical Committee to enquire into the welfare of animals kept under intensive livestock husbandry systems. London, UK.
- Cately A., Alders R., Wood J.** (2011)
Participatory epidemiology: approaches, methods, experiences. *The Veterinary Journal*.
- CEDEAO and OCDE** (2008)
Livestock and regional market in the Sahel and West Africa. Potentials and challenges
- Clarke B.** (2004)
Poultry for profit and pleasure. Diversification booklet 3. Agricultural Support Systems Division, FAO, Rome.
- De Bruyn J., Wong J., Bagnol B., Pengelly B., Alders R.** (2015)
Family poultry production and food and nutrition security. *CAB Reviews* 10(13):1-9.
- FAO, IFAD, WFP** (2018)
The state of food insecurity in the world 2018. Building climate resilience for food security and nutrition.
- FAO** (2015).
The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture, edited by B.D. Scherf & D. Pilling. FAO Commission on Genetic Resources for Food and Agriculture Assessments. Rome.
- Fisher H.** (2014)
Newcastle disease control in Africa. ACIAR Impact Assessment Series Report No. 87.
- Galiè A., Teufel N., Korir L., Baltenweck I., Webb G. A., Dominguez-Salas P., Yount K.** (2018)
The Women's Empowerment in Livestock Index. Social Indicators Research.
- GebreMichael, Y. et al** (2011)
Participatory climate-change adaptation building on local innovation. AfricaAdapt Climate Change Symposium, March 2011.



Ghotge N., Athani B.R. and Ganguly C.K. (2017)

Bringing Organic Lamb to the Table: Opportunities and Challenges faced by Indian Shepherds". Final Report 19th Organic World Congress 09-11th November 2017 International Expo Centre and Mart Greater Noida http://apeda.gov.in/apedawebsite/trade_promotion/ReportsTradeEvents/ReportonOWC2017APEDA.pdf

Ghotge N., Ramdas S. (2008)

Plants Used in Animal care. The Anthra collective. Anthra, India.

Ghotge N.S., Ramdas S.R et al. (2002)

A Social Approach to the Validation of Traditional Veterinary Remedies –The Anthra Project, 2002, Tropical Animal Health and Production 34 p. 121-143

Herrero M., Grace D., Njuki J., Johnson N., Enahoro D., Silvestri S., Rufino M. (2012)

The roles of livestock in developing countries. *Animal: an international journal of animal bio-science*. 7. 1-16. 10.1017/S1751731112001954.

Kristjanson P., Waters-Bayer A., Johnson N., Tipilda A., Njuki J., Baltenweck I., Grace D., and MacMillan S. (2010)

Livestock and Women's Livelihoods: A Review of the Recent Evidence. Discussion Paper No. 20. Nairobi, Kenya, ILRI.

Leyland T., Lotira R., Abebe D., Bekele G. and Catley A. (2014)

Community-based Animal Health Work-ers in the Horn of Africa: An Evaluation for the US Office for Foreign Disaster Assistance. Feinstein In-ternational Center, Tufts University Africa Regional Office, Addis Ababa and Vetwork UK, Great Holland.

LPP and LIFE Network (2010)

Biocultural Community Protocols for Livestock Keepers. Lokhit Pashu-Palak Sansthan (LPPS). Sadri, Rajasthan, India.

Manzano P. (2017)

Development Interventions in Pastoralist Areas: A New Decision Matrix to Identify Win-Win Situations and No-Go Zones. *The Solutions Journal*, Volume 8, Issue 3, May 2017.

Randolph T., Schelling E., Grace D., Nicholson C. Leroy J., Cole D. Demment M. Omore A., Zinsstag J., Ruel M. (2007)

Invited Review: Role of Livestock in Human Nutrition and Health for Poverty Reduction in Developing Countries. *Journal of Animal Science*. 85.

Tarawali S. (2015)

The role of livestock in achieving the SDGs. 16th Annual General Meeting of the Inter-Agency Donor Group on Pro-poor-livestock research and development GIZ Berlin, 18 to 20 November 2015. ILRI presentation.

VSF International (2018)

Community-based Animal Health Workers (CAHWs). Guardians for quality, localized animal health services in the Global South. Policy Brief.

VSF: un International (2019)

Le lait local instrument de développement socio-économiqueExpériences du réseau VSF International en Afrique de l'Ouest. Poster available at: <http://vsf-international.org/fr/project/poster-lait-local-developpement-socio-economique/>

Wong J., de Bruyn J., Bagnol B., Greive H., Li M., Pym R., Alders R. (2017)

Small-scale poultry and food security in resource-poor settings: A review. *Global Food Security* 15: 43-52.

CONTRIBUTIONS FROM

Dilip Bhandari
HEIFER INTERNATIONAL

Amy Cripps
THE DONKEY SANCTUARY

Nitya Ghotge
ANTHRA

Margherita Gomasca
VSF INTERNATIONAL

Valentina Riva
THE DONKEY SANCTUARY

Ilse Kohler Rollefson
THE LIFE NETWORK

Eliza Smith
KYEEMA FOUNDATION

COPY EDITING

GASL EDITORIAL COMMITTEE

DESIGN

CLAUDIA ILLUZZI

RECOMMENDED CITATION

GASL 2019

LIVESTOCK-DIALOGUE@FAO.ORG

This publication was supported by the donors of the Global Agenda for Sustainable Livestock to the Core Budget in 2019.



© Richard Nyoni

© Hervé Bossy, VSF Belgium

© ANTHRA



Global Agenda for Sustainable Livestock





© Oliver Kessel



© Philip Davis