GLOBAL AGENDA FOR
SUSTAINABLE LIVESTOCK

TOWARDS SUSTAINABLE LIVESTOCK

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LIVESTOCK IN DEVELOPMENT

Projected increases in animal protein demand and consumption are likely to maintain livestock's position as one of the fastest growing sub-sectors in agriculture for the foreseeable future, particularly in low-income and emerging economies. Much of this demand growth has so far been met by rapidly expanding modern forms of intensive livestock production, but more traditional and diversified systems continue to exist in parallel.

Far-reaching changes in the cost and availability of natural resources, combined with demands for product diversity, food safety and quality, and increasing social, environmental and animal welfare concerns, however, are creating new opportunities and challenges to livestock production. In addition, the growing reach of international value chains not only diversifies rural livelihood options, but also exposes production to rapidly changing patterns of competition, market preferences, and rules and standards.

Furthermore, the impact of chronic disease burdens, concerns on the prophylactic use of antimicrobial drugs, emerging infectious diseases, accelerating climate change, land degradation, and biodiversity loss, means that the livestock sector needs to tackle an ever-evolving set of production, pests and disease threats, often in rapidly declining environmental conditions.

The vast diversity in livestock systems worldwide, the different demands and expectations placed on the sector, and the ineffective participation in policy debates, have contributed to the difficulties by public policy in comprehensively addressing the sector. It has also contributed to a poor understanding of how the sector, in a context of an increasing world population, growing scarcity of natural resources, and accelerating climate change, can best contribute to the world's need for sustainable food and agriculture. Solutions need to be found for the sector to produce more, from less, in ways which benefit all.

These questions have fuelled debate and also contributed to a diversity of visions on what the future of the sector should look like. Integrating these different views has thus far been complex. It is becoming increasingly clear, however, that ensuring the livestock sector's contribution to sustainable food and agriculture, whilst reconciling the needs of different stakeholders and potential trade-offs, requires a comprehensive approach, concurrently addressing *Food security and health*, *Equity and growth*, and *Resources and climate*.

This document, prepared by the Agenda Support Team, is a first contribution towards the preparation of a much needed unifying, evidence-based 'all-in-one' narrative on the role of livestock in sustainable development.

FOOD SECURITY AND HEALTH

An estimated 805 million people in the world suffer chronic malnutrition. Livestock provide approximately 26 percent of human global protein consumption and 13 percent of total calories. Particularly in low - and middle -income countries demand for livestock products is increasing. With an expected growth of the world population from 7.2 billion to 9.6 billion by 2050, and growing incomes and urbanization, the demand for animal-source foods (ASF) is projected to increase. Compared to consumption levels in 2010, by 2050 demand for pork and eggs will increase by 65-70 percent; for beef, dairy products and mutton by 80-100 percent; and demand for poultry meat is projected to increase by 170 percent. There will be regional variation in these trends, with demand growth particularly strong for poultry products in South Asia (mainly driven by trends in India), for beef and dairy products in East Asia (mainly accounted for by trends in China) and strong growth for all product types across Africa (e.g. 380 percent for meat). The highest growth in total and per-capita consumption of ASF is projected to occur in low and lower middle income countries.

ASF can provide a critical supplement and diversity to staple plant-based diets, and are particularly appropriate for combating undernutrition and a range of nutritional deficiencies. They are energy-dense and good sources of protein, vitamins and of key micronutrients. ASF can measurably enhance quality in diets, especially for young children, the elderly, and pregnant and lactating women in food insecure households. ASF consumption is very low in undernourished populations; under these circumstances moderate increases in ASF consumption can provide critical nutritional benefits. The high nutrient density of ASF makes them attractive as a food-based intervention for populations that have difficulty consuming large volumes of food, including very young children and the sick.

Micronutrients (including iron, zinc, calcium and phosphorous, vitamin A and D) also tend to be more bioavailable in ASF, and some, such as vitamin B12, are found naturally only in ASF. In addition to the benefits of direct consumption of ASFs, the sale of animal products often also assists in complementing the food basket with other essential elements of healthy diets. Conversely, over-consumption of food, including ASF, is also frequently indicated as contributing to food-related health risks, including obesity. There has been growing concern about the health implications of high levels of meat consumption, in particular with reported increased risk of heart disease, diabetes and certain types of cancer. Obesity is now considered the world's number one health problem and kills three times more people than malnutrition; approximately one billion adults are overweight and a further 600 million are obese.

There are clearly areas of competition between direct food and feed uses for many crops, and livestock also compete for land and water resources locally, and through trade, globally. At the same time, efficiency improvements in many systems have greatly reduced the amount of feed required per kg animal product. In addition, on a dry matter basis, more than 80 percent of all feed is not edible by humans[1], and livestock transform large amounts of biomass/grass, crop residues and by-products into high-value ASF.

Reducing waste and losses, including production, harvest and processing losses, is another area that requires significant attention. Globally, 10–40% of agricultural production is wasted or lost[2]. Whereas 40% of food losses occur after harvest and during processing in developing countries, in industrialized countries over 40% is lost at the retail and consumer level[3].

1. GLEAM, 2014
2. United Nations Environment Programme, 2012
3. European Commission Directorate General for Health and Consumers, 2014

A total of 1.6 Giga tonnes of food is estimated to be wasted or lost annually. Meat and milk account for approximately 11 percent of this.

Animal production and products have strong cultural and religious elements in many settings. These express themselves not only through choices in species and the nature of specific production systems, but often also led to the creation of characteristic production landscapes.

The perishability of most ASFs also puts special demands on their marketing and preparation to prevent contamination and other food safety risks. For the poor people in developing countries, food-borne disease is frequent and generally under-reported. Food-borne pathogens are an important contributor to diarrheal diseases, which the WHO estimates to cause losses of between US $ 33-77 billion and 1.8 million human deaths annually.

The widespread use of antimicrobial drugs for preventive measures or as growth promoters is a growing concern. Inappropriate use may contribute to growing microbe resistance, which makes these drugs ineffective in treating infectious or parasitic infections in humans and animals. The use of such drugs has grown as livestock systems are intensifying around the world. In addition, residues harmful to consumers can be an issue in certain types of production systems.

Intensive production at large scale often involves the geographical clustering of large numbers of genetically similar animals. Strong biosecurity and health protection regimes may prevent infectious disease problems, but major outbreaks occur when a pathogen evolves to a higher virulent form, eludes the vaccine used, acquires resistance to antibiotics, or enters undetected into the food chain. Traditional livestock production systems - which involve animals roaming freely over large areas, but still in relatively high densities – can also facilitate disease spread, both among local animal populations and over large distances. Livestock connect wildlife and environmental health to human health, and are an important element in disease emergence and transmission. Seventy percent of all new human diseases have their origins in animals, and most of these come from wildlife.

Well-known diseases also continue to cause large losses to production and livelihoods. Outbreaks of notifiable diseases cause disruption to international trade and prevent access to more lucrative markets. In addition, such events often have concomitant disastrous knock-on effects on closely linked industries and activities. Livelihood strategies driven by poverty and desperation that contribute to pollution hotspots, and the incubation of microbes and increased distribution of insect vectors due to climatic changes, have an increasing effect on both human and animal disease outbreaks. The poor often bear a disproportionately high share of the burden of (zoonotic) disease because of their close contact with livestock in unsanitary conditions. Improvement of management practices and control of zoonoses and food-borne diseases should therefore be integral to strategies for effective use of livestock for poverty reduction.

Since the appearance of SARS and H5N1 highly pathogenic avian influenza, there has been an increasing realisation that new and emerging zoonotic diseases not only threaten the health of susceptible humans, but that they also have increasingly severe economic impacts on a wide range of enterprises and industries (with direct and indirect economic losses over the last decade estimated at around US $ 80 billion[4]).

4. FAO, 2013

Global food security and health needs to be addressed through livestock

- For many smallholders and pastoralists, livestock are essential for income and nutrition. The contribution of livestock to food security and health can be strengthened through investments and targeted policies that sustainably increase the productivity of smallholder and pastoral production systems and access to, or development of markets.
- Livestock convert large amounts of resources non edible by humans into high value ASF.
- Human and animal health and animal welfare need to be addressed throughout all production systems. Disease burdens and threats vary across systems. Confined systems have generally better biosecurity, but are also more exposed because of large numbers, close proximity, and animal uniformity.
- At low levels, increased intake of ASF is beneficial for human health and development, but overconsumption should be avoided.
- Livestock connect wildlife and environmental health to human health, and are an important element in disease emergence and transmission. Inclusive approaches to managing disease threats at the animal-human-environment interface, which involve producers at every level in the development and implementation of animal-disease and food-safety programmes, are required.

EQUITY AND GROWTH

Whilst the critical target of halving extreme poverty by the end of 2015 has been met, the world still counts more than one billion people that live in extreme poverty. In many countries the gap between the rich and poor has grown, with economic opportunities restricted further by global economic crises. Within this context, livestock often becomes a last resort livelihood strategy for the most marginalized. The sector provides employment to 1.3 billion people and livelihoods to 1 billion poor, 70 percent of whom are women. Ten times more women own livestock rather than land. A growing body of evidence suggests that increasing women's control over assets, including livestock, has positive effects on food security, child nutrition, and education, as well as women's wellbeing. Livestock also provide other important products and services such as asset savings, traction, manure for fuel and fertilizers, and leather and fibre.

Recent estimates suggest that about 75 percent of the world's poor live in middle-income countries, such as India, China, Nigeria, Pakistan and Indonesia, and only a quarter live in low-income countries, mostly in Africa[5]. Recent research finds that between 20 percent and 60 percent of households that escape poverty later return to poverty[6]. While education and creation of employment opportunities have positive impacts on poverty alleviation, natural disasters, illness and conflict can cause a return to poverty. Overall, there is increasing recognition that climate variability, climate-related disasters and longer-term climate change may increase the incidence of poverty and add to the difficulty and costs of eradicating poverty. The evidence that agricultural growth makes large contributions to poverty alleviation due to multiplier effects in the economy is increasingly well-known[7]. There is, however, relatively little empirical evidence on the relevance of these trends for livestock keepers.

5. http://www.ids.ac.uk/files/dmfile/IFBottomBillionMDGsweb.pdf
6. http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8835.pdf
7. http://www.econstor.eu/bitstream/10419/54152/1/63651336X.pdf; http://www.fao.org/docrep/015/i2744e/i2744e00.pdf, p 63

Livestock account for about 40 percent of global agricultural gross domestic product. Whilst the continuous growth of the sector undoubtedly offers many opportunities, its intensification and specialization may also lead to the marginalization of those that cannot take part in this growth. In these instances of uneven growth, livestock may become an expression of poverty. Marginalization may contribute to a further erosion of the rights of indigenous people and contribute to the use of child labour in certain livestock production systems. This differentiation not only has potential global health implications, but also requires policies and investments that, in a first instance, reduce vulnerability and increase resilience rather than productivity and market access. Value chain development, however, can also remove barriers for some smallholder producers to access more lucrative markets and contribute to more equitable growth. Market failures often result from distribution chains that alienate producers from consumers, thus undermining incentives to improve product quality. Investment incentives are further undermined by credit market failures that prevent even modest economies of scale. An important part of the livestock sector's contribution to growth requires incentives and institutions that increase market participation by smallholders.

The highest growth in total and per-capita demand and consumption of ASF is projected to occur in low and lower middle income countries. The 'middle class' in these countries will increasingly demand higher-value agricultural products, including meat, milk and eggs, potentially presenting a growing market for smallholders. This demand is often strongly conditioned by culture and tradition, and local livestock products may command substantial price premia, even among low-income consumers. In this way, preference for traditional varieties confers potential economic and environmental advantages to smallholder over large-scale intensive production. Moreover, smallholders are generally linked to urban consumers through supply chains of small enterprise traders, distributors, and retailers. This means that demand for traditional varieties or products has multiplier effects across networks of low-income market intermediaries. Labeling schemes and production methods (such as through improved animal welfare) can also set products apart and create and expand markets for small-scale producers. Although developed countries have the highest absolute levels, food expenditure is proportionately higher in developing countries, despite much lower per capita incomes. This also holds true for expenditure on meat and dairy products. Indeed, it is estimated that the 4 billion people (primarily in developing countries) who live on less than $3 a day, represent a food market of about $2.9 trillion per year[8].

Access to credit and finance is a major constraint to food security in many developing countries. Livestock may offer options for savings and accumulated capital, and may evade inflation. Additionally, livestock provide an instrument of liquidity and conversion into cash to support food security of households and communities, providing assets that can be sold in times of crisis. Livestock serve as an indicator of social importance within many communities, and higher social status may translate into access to or authority over a broader base of resources in the community.

Global poverty and inequality need to be addressed through livestock

- No other sector is more important to the lives and livelihoods of the poor than livestock. An estimated 1 billion poor people derive at least part of their livelihood from livestock.

8. PPLPI, 2012

- Livestock are the last resort for people that lack other assets and forms of income. These producers require investments and policies that reduce vulnerability, increase resilience, and respect the rights of indigenous people.
- Agricultural growth makes significant contributions to poverty reduction, but the understanding of the contribution of, for example, smallholder dairy and short-cycle species production systems to food security and economic growth needs to be enhanced.
- Women's ownership of livestock has additional positive effects on food security, child nutrition and education, and female wellbeing.
- Optimising the sector's contribution to equity and growth requires incentives, institutions, and services that develop value chains and remove barriers for smallholder producers to access more lucrative markets.

RESOURCES AND CLIMATE

Livestock are an important user of natural resources (land, water, nutrients, and biodiversity) and contributor to climate change. Livestock convert large amounts of by-products and waste material, for which there is no alternative use, into valuable products.

Twenty six percent of all land is used for grazing, and 33 percent of cropland is used for cultivation for livestock feed. Globally, livestock is currently estimated to use 3.73 billion hectares: 3.38 billion hectares for grazing and 0.35 billion hectares for feed production. In addition, 15 percent of global agricultural water use is linked to livestock production. Livestock production is also often implicated as a significant source of water pollution.

The sector contributes an estimated 14.5 percent of global greenhouse gas (GHG) emissions, but large potential to reduce the emission intensity of the sector through resource use efficiency gains exists, in addition to significant carbon sequestration potential as part of the many ecosystem services the sector may provide. This issue is well recognised, and since the first set of calculations was published[9] much has been done to measure and understand livestock system contributions in different countries and to explore mitigation options[10]. Wider adoption of existing best practices and technologies in feeding, health and husbandry, and manure management – as well as greater use of currently underutilized technologies such as biogas generators and energy-saving devices – could help the global livestock sector cut its outputs of global warming gases as much as 30 percent by becoming more efficient and reducing energy waste. GHG mitigation technologies may come at a cost to animal welfare and other environmental variables; and practices and technologies that have beneficial rather than detrimental co-effects should be favored. There is also increasing debate about the mitigation impacts that may be derived from changes in demand[11].

Crop and pasture expansion into natural ecosystems has contributed to livestock production growth and will continue in the future. Most expansion arises through the clearing of forests, resulting in losses of environmental goods and services, including stored carbon, biodiversity, water, and air quality. Global discussions on Reducing Emissions from Deforestation and Forest Degradation (REDD), conducted within the UNFCCC, have proposed an international ar-

9. Steinfeld, H, P Gerber, T Wassenaar, V Castel, M Rosales and C de Haan. 2006. Livestock's long shadow: Environmental issues and options. FAO. Rome, Italy. 390 pp. Accessible online at: http://www.fao.org/docrep/010/a0701e/a0701e00.HTM

10. Gerber, P.J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Falcucci, A. & Tempio, G. 2013. Tackling climate change through livestock. FAO, Rome.

11. IPCC, 2014

chitecture for related activities, pursuant to which there is increasing attention to developing workable approaches to addressing the drivers of deforestation, including livestock and crop production. Aside from extensive analysis in Brazil, in many areas of the world there is at present very limited evidence – even empiricalon practical approaches in the livestock sector, appropriate arrangements for cross-sector collaboration in land use planning and implementation of interventions, and the related costs of these interventions.

Payments for environmental services (PES) are frequently mentioned as a potential tool for increasing the value of livestock production systems. A review was recently completed of 50 PES schemes in grazing lands[12]. Of the specified environmental services demanded, the largest specified service was biodiversity: however, most schemes did not specify the services demanded, or specified multiple services. The review concluded that in many developing country contexts, where there are market imperfections, land tenure issues and broader development needs of land users, conditional payments for environmental services may be less relevant than more general investments in production systems and livelihoods. In addition, analysis of payments for carbon sequestration services projects in developing countries suggests that the critical driver of financial feasibility of such schemes is the profitability of the livestock production system itself, not the value of environmental services compensated.

Although livestock can be instrumental in landscape management and enhance biodiversity in numerous settings, it has also been indicated to pose a threat to biodiversity in 306 of the 825 ecoregions. Biodiversity of animals - and domestic animals in general - is indicated to be under threat in countries where breeding policies and subsidies may restrict the choice of breeds. Although genetic uniformity has been an important factor in advances made in resource use efficiency, the maintenance of genetic diversity will be key to livestock's role as a tool of adaptation in a context of ever-evolving production, disease, and climate threats. Management of ecosystems can have both beneficial and negative effects on the emergence of health threats. The importance of this will grow as climate change impacts on the frequency of extreme weather events, and as ambient temperature extend the occurrence of specific disease vectors beyond their traditional habitats.

Livestock manure is often an important input to maintaining soil fertility, and so contributes to greater crop production for food and income, lowering the need or purchase of synthetic fertilizers. In some areas, dung is also used as a fuel. Dung for fertilizer, fuel, and building material is often a marketable commodity. It is estimated that globally livestock manure supplies up to 12 percent of gross nitrogen input for cropping and up to 23 percent in mixed crop–livestock systems in developing countries[13]. In these systems, cattle, and other animals, also often provide traction power for transportation and crop production, for domestic use and for hire.

In intensive and confined livestock production systems, the management of livestock manure is increasingly important to reduce soil and water pollution and the emissions of noxious gases. Better manure management is also essential to control public health risks. Numerous technical options exist to manage manure and recover its nutrients and energy, but the economics of their use vary greatly among production systems, countries, and policy environments. Improved manure management can bring important economic and environmental benefits. Recycled nutrients can substitute for mineral fertilizer. Recovered energy reduces greenhouse gas emissions and substitutes for fossil fuel.

12. ADB 2014

13. Liu, J. et al., 2010. A high-resolution assessment on global nitrogen flows in cropland. Proc Natl Acad Sci U S A. 107(17): 8035–8040 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2867927/

Global environmental issues need to be addressed through livestock

- A large number of the world's producers rely on practices that are inefficient in their use of natural resources. The wider application of proven but not yet widely used technologies can generate large production and efficiency gains as well as animal welfare and environmental benefits.
- The current neglect of grasslands results in a high incidence of poverty in many marginal areas, but also in low productivity of land and livestock, and important degradation of land, water and biodiversity resources. Appropriately managed grazing land can provide large benefits in the form of carbon sequestration, protection of water services and biodiversity, but also enhance productivity and livelihoods.
- The management of livestock manure has become increasingly important to reduce the environmental impact of intensive and confined pig and dairy production systems. Recovering nutrients and energy contained in animal manure will not only stop pollution but also improve public health. Recycled nutrients help soil fertility and substitute for mineral fertilizer. Recovered energy reduces greenhouse gas emissions and substitutes fossil fuel.
- The maintenance of animal genetic diversity will be vital to livestock's role as a tool of adaptation in a context of ever-evolving production, disease, and climate threats.

SECTOR DYNAMICS AND PRACTICE CHANGE

Livestock are critical to building sustainability in food and agriculture. Sustainability is a process of continuous practice change that addresses social, economic and environmental objectives simultaneously (Box). From the above review it is possible to identify five broad principles that determine the sustainability of the sector: (i) increase efficiency; (ii) enhance livelihoods and human well-being; (iii) protect resources; (iv) increase resilience; and (v) improve governance.

Thus far, demand-led growth in the livestock sector has largely been met through rapidly expanding intensive poultry and pig production. This intensification, which has often occurred in the absence of appropriate regulation, has been characterised by spatial clustering and vertical integration of large-scale industrial production units located close to urban centres, driven by economies of scale. It has been assisted by the availability of relatively cheap cereal-based feeds and substantial advances in breeding, health and other technological inputs that have enhanced production efficiencies significantly, but without taking full account of other aspects of sustainable development, including animal welfare. What is required are investment programmes that accelerate the adoption of improved practices and ensure the livestock sector effectively plays its role towards sustainable food and agriculture. These programmes should be embedded in the existing policy and development frameworks and address a range of activities focused on the development of equitable value chains and safe and fair production processes.

SUSTAINABILITY

Sustainability considers the interplay between the natural and the human system. Sustainability means sustaining both the natural and the human system over the long term. Agriculture is perhaps the most pervasive human activity that connects the natural system with the human system. The natural system and its underlying biophysical processes provide environmental services that regulate key earth system processes such as climate, life including biodiversity, and water and nutrient cycling.

Likewise, the production and consumption of agricultural products and the way they are distributed (e.g. the food system) generate a set of social and economic services, including nutrition, food security, economic growth and poverty reduction, health and cultural values. They occur at various spatial scales (from local to global) and vary over time (current or future generations).

Agriculture takes many diverse shapes that reflect natural resource endowments, access to markets, and cultural and development contexts. Trade-offs between human and natural systems is perhaps where most of the attention on sustainability is focused. Interactions are not necessarily zero-sum trade-offs. Innovation is key to simultaneous improvements of both the natural and human system.

Industrial and urban development increasingly competes with agriculture for natural resources, in particular land, water, and energy, and adds to growing resource scarcity. Changes in climate, habitat and pathogens affect the environment, and increase risks and costs to agriculture. Growing populations and dietary change drive demand for agricultural products, not only increasing quantities, but also product diversification. Development in other sectors largely determines the social and economic services that are demanded from agriculture. Some countries, for example, rely heavily on agriculture for income, employment and growth, compared to countries with strong secondary and tertiary sectors.

The need to approach the future of livestock by meeting the complex challenges of sustainable livestock production, including protection of livelihoods and social contexts, stewardship of the environment, including biodiversity, and respect for animal welfare, mean the sector, perhaps, exemplifies the challenges towards sustainability like no other sub-sector in agriculture.

At the same time, facilitating livestock's contribution towards sustainable food and agriculture requires the building of capacity that enhances the flow of knowledge across countries and stakeholders, and also critically depends on the alignment of an enabling institutional environment that enables access to the necessary services, builds the required capacity, and that rewards efficiency gains and resource stewardship, and discourages wasteful practices.

Innovation, driven by entrepreneurs or other actors responding to market opportunities or

threats or, needs to be linked to concomitant changes in policies and institutions to ensure its wider application. Whilst research is required to identify further suites of mitigation and adaptation practices adapted to specific production systems and environments, its real value will only emerge when this knowledge is combined with ideas and practices that come from entrepreneurial and social activity.

Partnerships, links and networks will thus be key ingredients in the process as these provide the route for bringing together different ideas and information and using them creatively towards livestock sector sustainability Table 1 summarises some of the key areas where investment in the sector should be directed to support continuous practice change towards Sustainable Livestock.

Table 1: Targeting Investment towards Sustainable Livestock

PRINCIPLES OF SUSTAINABILITY	KEY AREAS OF ACTION AND INVESTMENT				
Increase efficiency	Efficiency of resource use: land, water, nutrients	Reduce emission intensity - CO_2 eq. per unit of product	Reduce waste through recycling and recovering nutrients and energy	Reduce food waste and losses	Reduce existing disease burdens and future health threats
Enhance livelihoods and human well-being	Protect assets, enhance multiple functions of livestock	Value chain development and participation - competitiveness	Reduce waste through recycling and recovering nutrients and energy	Cultural values (e.g. food, landscapes)	Access to quality medicines, vaccines and services
Protect resources	Reduce food-feed competition	Limit livestock's expansion into valuable eco-systems	Integrated land use management	Shield and enhance water resources	Identify and use valuable genetic resources and safeguard animal welfare
Increase resilience	Reduce disease risks, in particular pandemic threats	Improve coping capacity through technical and institutional interventions	Access to resources for marginalized producers	Use livestock as a tool of adaptation	Access to goods, services and markets
Improve governance	Of global commons (e.g. climate)	Of local commons (e.g. grazing, water)	Participation in resource management and value chains	Strengthen regulatory, incentive and investment frameworks	Veterinary systems, integrated with human and environmental health sectors

FRAMING LIVESTOCK IN GLOBAL POLICY TRENDS

Ensuring current and future livestock sector investments address the above issues, and reconcile the requirements of different stakeholders and potential trade-offs simultaneously, requires the exploration of new approaches that capitalize on the strength of different actors by building consensus and commitment among all concerned to action and on-the-ground improvements.

The Millennium Development Goals (MDGs) have been a key initiative in focusing international attention on ending extreme poverty, hunger, health and education, as well as the need for stewardship of the natural resource base. They provided a set of goals around which developed and developing country governments and heads of multilateral institutions agreed to harmonize and align aid delivery and the required partnerships. The MDGs have explicitly formed the basis for national development planning in many countries, with support in part from various UN agencies and other international actors. Discussions are ongoing on the identification of Sustainable Development Goals (SDGs) after 2015. Though no document has been finalized, a proposal has been prepared by the Open Working Group of the UN. It is likely that the SDGs will form a framework around which governments and the international community can focus and coordinate their development efforts between 2015 and 2030. Most SDGs are clearly relevant to the livestock sector's role in sustainable development. One main function of the SDGs is to orient investment by the international community, governments and other actors towards achieving specific objectives by 2030, and there is an urgent need to address the visibility of livestock in these policy debates, increasing awareness of policy-relevant investment needs and opportunities relating to the sector, and orienting policies and investment in appropriate ways.

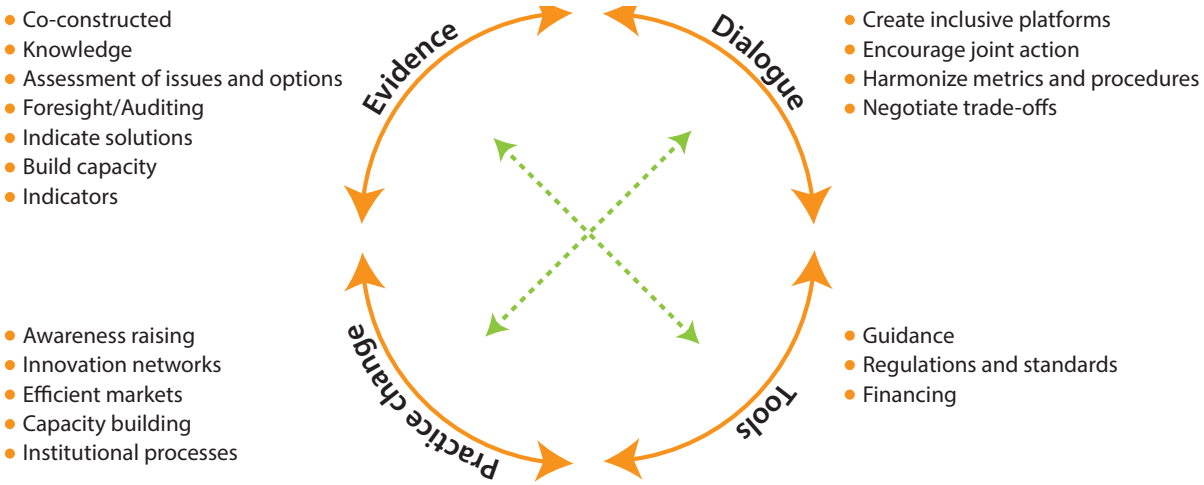
OPERATING LIVESTOCK SECTOR SUSTAINABILITY

Putting livestock sector sustainability into practice requires a range of actions to enhance sectoral as well as cross-sectoral productivity and sustainability. In order to identify issues and possible interventions, and build partnerships and ensure buy-in from critical stakeholders, the application of the five principles described above requires four types of action:

- building relevant, co-constructed and accessible evidence;
- engaging stakeholders in dialogue to build common understanding and joint action;
- developing innovative approaches and solutions; and
- formulating tools and levers to enable and incentivize changes in food and agricultural systems (Figure 1)

The process is not necessarily sequential: the exact succession of actions will differ according to location and scale (community, national or global level), and interaction can take place between any two action areas at any time during implementation. Coordination and communication among the different scales – from global to local levels – is essential.

Figure 1: Operating Sustainability: Four broad areas of action



Source: FAO

Given the multiple objectives of sustainability, an approach that enables dialogue between key stakeholders is required at international, country and local levels. Dialogues should be focussed on identifying major trade-offs or differences in priorities across stakeholders, taking both bio-physical and socio-economic factors into account. For stakeholder dialogue to be effective, meaningful and fair, it should be underpinned by science-based evidence, complemented as necessary by traditional knowledge. The dialogues should be geared towards negotiation and consensus building. The dialogue should generate a set of action points for enhancing the sustainability process at the national or other scales as relevant.

The stakeholder dialogue needs to be translated into innovative approaches for the development of enabling conditions and incentives that can foster the needed changes identified from the dialogue process. Specific options for addressing these changes need to be analysed and put forward – and addressed in the dialogue. At international level, the process may lead to binding law in the form of formal treaties, conventions and agreements, which will need to be translated into national law to become effective and non-binding instruments. The latter instruments, in the form of declarations, agendas, agreed principles and targets, act by influencing national policies without imposing obligations.

Better understanding of issues and options feeds into the stakeholder dialogue and enhances decision-making by stakeholders, individually or collectively. These decisions can improve the rules, both legal and voluntary, that govern human activities and provide signals and incentives. In turn, agreed rules induce practice change in technology, policies, and institutions. The decisions need to be tailored to the local realities of ecosystems and of the populations that will bear costs and enjoy benefits.

While innovation and practice change can take many forms and directions, multi-stakeholder decisions at global levels provide guidance for solutions at the regional, national and local levels, and vice-versa. At local level, collective stakeholder action will play a determining role in innovation and transition processes. As part of practice change, institutional frameworks and

consultative processes will help monitor and report on progress made, and adjust and adapt as required. Practice change, especially, needs to be supported by effective management systems designed to reflect national priorities and policies. It must be based on clear operational objectives and address the most relevant issues, after some risk and impact assessment. Such management systems require stakeholder participation and enhanced ownership of the agreed options and decisions. Guiding the transition towards sustainability requires flexibility, autonomy and creativity on the part of those who implement it.

Sustainable livestock needs integration

Ensuring livestock sector policies and investments concurrently address the vast diversity of livestock systems and the different demands and expectations placed by society on the sector requires integration of:

- knowledge, tools and information;
- sectoral and disciplinary perspectives, approaches and scales;
- stakeholder objectives and trade-offs;
- action towards continuous on-the-ground improvement.

TOWARDS A JOINT VISION

Recognizing that to be sustainable, the sector needs to respond to the growing demand for livestock products and enhance its contribution to food and nutritional security; provide secure livelihoods and economic opportunities for hundreds of millions of pastoralists and smallholder farmers; use natural resources efficiently, address climate change and mitigate other environmental impacts; and enhance human, animal, and environmental health and welfare; and

Conscious that ensuring livestock sector policies and investments address the vast diversity of livestock systems and the different demands and expectations placed by society on the sector requires the integration of knowledge, tools and information; sectoral and disciplinary perspectives, approaches and scales; stakeholder objectives and trade-offs; and action towards continuous on-the-ground improvement; and

Agreeing that the Agenda is open, consensual, based on knowledge and mutual respect, and built on voluntary stakeholder engagement; and

Approving to use a comprehensive approach, concurrently addressing:

Food security and health: the productivity of smallholders and pastoralists and the development of value chains; the human and animal health and welfare threats throughout all production systems; the role of ASF in healthy diets; the inclusive management of disease and food-safety threats at the animal-human-environment interface.

Equity and growth: the vulnerability, resilience, and rights of indigenous people and farmers; the contribution of, specific production systems to food security and economic growth; the ownership of livestock by women and the marginalized; the incentives, institutions, and services that develop value chains and removal of market barriers for smallholder producers.

Resources and climate: the wider application of proven but not yet widely used technologies; the appropriate management of grazing land; the recovery of nutrients and energy contained in animal manure; the maintenance and use of animal genetic diversity.

Through the facilitation of multi-stakeholder dialogue at international, national, and local level; the implementation of and support to joint analyses and assessments, including the development of harmonized metrics and methodologies; the identification and provision of tools and guidance; and the promotion of and support to innovation and local practice change **TOWARDS SUSTAINABLE LIVESTOCK.**

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