

6. Conclusions: balancing society's objectives for livestock

The livestock sector supports almost one billion of the world's poorest people and is likely to do so for decades to come. Many people who rely on livestock for their sustenance and livelihoods are under extreme pressure from the global economic forces of growth, competition and global integration that are driving rapid structural change. The environmental and human-health hazards associated with livestock production are creating risks of systemic failure.

A growing awareness of the challenges faced by the livestock sector offers an opportunity for change. Governments and donors are increasingly recognizing the importance of agriculture in rural development and poverty reduction, and the central role of livestock in the livelihoods of poor men and women. At the same time, recent human-health scares related to potentially pandemic outbreaks of zoonotic diseases have captured headlines and frightened travellers around the world. Meanwhile, contingency programmes have been prepared in a large number of countries. Within governments, civil society and the scientific community, a strengthening consensus that climate change is a reality is leading the search for effective ways of mitigating the effects of climate change and adapting to it. Recognizing the urgency of a situation is the first step towards dealing with it (Kotter, 2005).

The livestock sector requires a delicate balance of policy interventions and institutional and technological innovations if it is to continue to meet the multiple, often competing, demands of society.

Balancing opportunities against risks

Rapid growth in the livestock sector offers clear opportunities for poverty reduction; agriculture is the key to pro-poor economic

development and the livestock sector is one of the fastest-growing agricultural activities. However, livestock pose environmental and health risks that must be mitigated. The sector is consuming a large share of the world's resources and is contributing a significant portion of global GHG emissions.

Steps are needed to improve the environmental performance of the livestock sector. It must use resources more efficiently, and capture the wastes it generates and turn them into resources. In economic terms, the positive and negative externalities long generated by the livestock sector should be internalized so that producers and consumers pay the real price of the impacts of livestock production on natural resources and the environment.

Animal-health systems should help reduce the growing risk of human pandemics of diseases that originate in animals and should deal better with the endemic diseases that constantly undermine the livelihoods of the poor. Rich and poor producers face different risks and incentives in the area of livestock health. Measures taken to control transboundary diseases may serve the public good by controlling potential pandemics, but, unless properly designed, they may also destroy the livelihoods, assets and safety nets of millions of smallholders. This aspect must be considered in the planning and implementation of such measures.

Balancing the needs of different smallholders

Growth in the livestock sector can promote broader economic growth, alleviate poverty and reduce food insecurity, but the traditional livestock "ladder" that smallholders once climbed to escape from poverty is now missing several rungs. Increasing competition, economies of scale and rising health and food-safety standards

mean that smallholders face enormous challenges in remaining competitive with larger, more-intensive production systems, and a widening gulf is emerging between those who can take advantage of growing demand for livestock products and those who cannot. Policy-makers need to recognize that not all smallholders will be able to benefit from the opportunities offered by growth, and that men and women may face different risks and opportunities. They should use scarce public resources, not in fighting insuperable forces of change, but rather in helping smallholders adapt to change in ways that produce better social outcomes. Specific gender-sensitive policy interventions can efficiently and effectively support the needs of different types of smallholders.

Some smallholders are competitive in the changing economic environment and can remain so if they receive the right kind of policy, financial and institutional support. They need institutional innovations to overcome the higher transaction costs associated with being small operators. These institutions should help them gain access to inputs on more favourable terms and provide a go-between with large-scale consolidators and retailers to overcome technical barriers that block smallholders' access to growing urban and international markets. Policy support should promote productivity growth and market access for smallholders. The development and dissemination of new technologies tailored for small-scale producers, and the establishment of market and communications infrastructure and animal-health and food-safety systems would help smallholders navigate the changing landscape in which they operate.

Most smallholder livestock producers will eventually leave the sector, as has been seen in OECD countries and many rapidly growing developing and transition economies. This is a natural part of the evolution of the agriculture sector and can be considered a sign of progress. When and where small-scale livestock producers face rising opportunity costs for their labour, they naturally move out of the sector and into more remunerative employment elsewhere. Broader rural development policies can promote a dynamic economy that offers attractive alternatives for livestock keepers who cannot compete in the sector.

Concerns arise when competitive forces push people out of the sector before the broader economy can create alternative employment opportunities. The very rapid pace of change in the livestock sector in many countries is driving an exodus that is faster in some areas than the overall economy can absorb.

The smallest livestock keepers, who rely on livestock primarily as a safety net, need particular attention that recognizes the multiple roles that livestock play in their livelihoods. At a minimum, the safety-net function played by livestock must not be destroyed without compensation or without the creation of alternative social safety nets.

Balancing food security and nutrition

Livestock products make an important contribution to household food security and they are especially important in meeting the micronutrient requirements of women and young children. Adding a small amount of animal-based foods to a plant-based diet can yield large improvements in maternal health and child development. Undernutrition, including inadequate levels of consumption of food of animal origin, remains a huge and persistent problem in the developing world. Inadequate diets hamper the mental and physical development of children and result in increased morbidity and mortality from infectious diseases. There are also significant economic costs in terms of reduced work performance and productivity in adults. Income growth can help to improve nutrition: as the incomes of the poor increase, they generally purchase more and better-quality food, including that of animal origin. However, waiting for economic growth to improve nutrition is not an acceptable solution. Action is needed that ensures immediate access to adequate diets; this can make an indispensable contribution to assisting the poor to escape the undernourishment/undernutrition–poverty trap.

On the other hand, many countries in the world, including developing countries, are experiencing an epidemic of obesity and diet-related non-communicable diseases that impose costly economic and health

burdens on society. Excessive consumption of high-fat and processed-meat products contributes to this problem, although, of course, other dietary and lifestyle choices are also implicated. Agricultural and trade policies can influence dietary choices by making certain products more or less readily available and affordable. Typically, agricultural policy is aimed at increasing the availability and accessibility of food, but there may be a need to promote a better balance in the choices people make.

Balancing the trade-offs among systems, species, goals and impacts

The trade-offs among the use of various livestock production systems and species, the goals set for the sector and livestock's social and environmental impacts must be recognized. Intensive production systems are extremely efficient converters of resources – feed, water, etc. – into high-quality, low-cost meat, milk and eggs. This is particularly the case for poultry and pigs. Intensive production systems also produce less GHG per unit of output than extensive systems. The demand for foods of animal origin in rapidly growing developing countries can be met most efficiently and with least contribution to climate change through intensive systems. But intensive production also comes at a cost.

Intensive systems are associated with the production of large amounts of waste products that often exceed the nutrient absorption capacity of local land. Stronger measures are required to ensure that these wastes are captured and returned to the land as fertilizers or used productively in other ways.

The amounts of resources used by intensive and extensive systems vary according to the livestock species and location, but, in all areas, improved management practices can reduce the environmental impact of livestock production.

The geographic concentration of intensive livestock production systems near urban centres creates a potent breeding ground for novel diseases, especially when small-scale, traditional producers remain nearby. It also increases exposure of urban populations to diseases carried by livestock, increasing the risk of transfer of zoonotic diseases

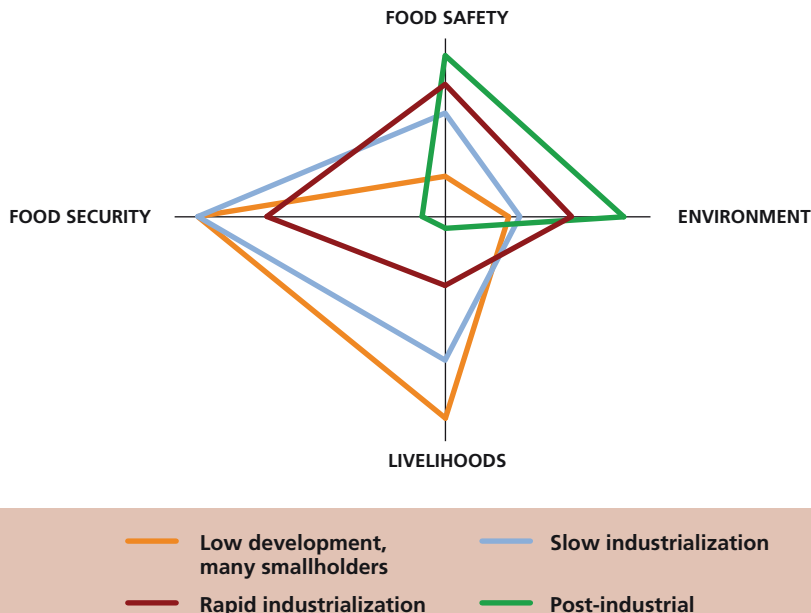
to the human population. Much stronger animal-health systems are required in order to mitigate and manage these health risks. A first step would be to encourage the relocation of intensive livestock production units away from urban areas and to reduce the risk of pathogens moving between systems.

Balancing objectives in different societies

This report has considered the role of livestock in meeting society's objectives in terms of delivery of private and public goods. Often, the multiple objectives of society are interrelated. Managing animal diseases, for example, may be crucial for securing the livelihoods of people living in poverty. Improving human nutrition through, *inter alia*, an appropriate contribution of livestock products to diets may also contribute to promoting social development. However, frequently there are trade-offs, especially in the short run, that require prioritization of objectives. Promoting livestock production and incomes may imply increased stress on natural resources. Tighter environmental restrictions may increase production costs for livestock products, reducing their accessibility to poorer population groups.

Different countries and societies may prioritize objectives differently, depending on factors such as income levels, relative role of smallholders in the sector, importance of and prospects for exports, and degree of pressure on and degradation of natural resources. In general, the objectives will tend to be prioritized differently according to the country's stage of economic development (Figure 16). Countries at low levels of economic development typically emphasize the role of livestock in economic and social development and poverty alleviation and design policies accordingly. Enhancing the contribution of livestock as a source of income, employment and insurance against risks for poor population groups with few other immediate livelihood options is likely to be a key objective for such countries. Other dimensions, such as managing livestock diseases, may also need consideration by low-income countries in order to support sustainable livelihoods.

FIGURE 16
Balancing policy objectives



Source: FAO.

At subsequent stages of development, the policy emphasis is likely to shift towards other objectives, such as: provision of food to growing, especially urban, populations; addressing human-health risks from animal diseases; and protecting the environment and natural resources. In advanced economies, in which livestock production represents a small share of the overall economy, society's concerns are likely to focus heavily on human health, food safety and the environment.

It is important at the international level to recognize the legitimacy of such differences in prioritization and to ensure that international policies and agreements do not focus exclusively on the priorities of a narrow group of affluent countries.

The way forward: towards an agenda for action for the livestock sector

The livestock sector is expected to provide safe, cheap and plentiful food and fibre for growing urban populations, to provide a livelihood for poor producers, to preserve

natural resources and use them efficiently, and to minimize health risks to human populations.

This edition of *The State of Food and Agriculture* has argued that the livestock sector is not contributing as well as it might to the provision of the private and public goods that are expected of it, largely because the necessary policy changes and investments have not been made. The rapid growth of the sector, in a setting of weak institutions and governance, has given rise to systemic risks that may have catastrophic implications for livelihoods, human and animal health and the environment. To meet the challenges and constraints it faces, the livestock sector requires renewed attention and investments from the agricultural research and development community and robust institutional and governance mechanisms that reflect the diversity within the sector and the multiple demands placed upon it.

Action is required at all levels, from the local level, through the regional and national levels to the international level. Multilateral institutions need to be involved, as well as civil society. However, no single entity is in a position to carry out its task in isolation.

Bringing together the multiple stakeholders, including the private sector, in a coordinated effort is indispensable.

There is a clear need to focus attention at the international level on the livestock sector and the challenges it faces. Developing an agenda for action for the livestock sector, supported by governments, international institutions, multilateral and bilateral donors and civil-society stakeholders is a crucial first step towards a livestock sector characterized by: better governance; a clearer focus on the problems and issues; a more inclusive development process; levels of investment commensurate with the importance of the sector and the challenges it faces; and improved international cooperation.

Indeed, considering the very substantial positive and negative impacts of the livestock sector on social, environmental and public health targets, and the importance of global governance for agriculture as a whole, such a framework may be an appropriate avenue for concerted international action to guide the development of the livestock sector.

Key messages of the report

- **The livestock sector is changing.** The livestock sector is one of the most dynamic parts of the agricultural economy. It has expanded rapidly in recent decades and demand for animal products is expected to continue growing strongly through the middle of this century, driven by population growth, rising affluence and urbanization. Urgent action is required if the sector is to meet this demand in ways that contribute to poverty reduction, food security, environmental sustainability and human health. The opportunities and challenges offered by the sector should be carefully balanced.
 - The potential for increasing demand for livestock products is substantial and implies challenges in terms of efficient use of natural resources, managing animal- and human-health risks, alleviating poverty and ensuring food security.
 - Growing demand for livestock products and the implementation of technological changes along the food chain have spurred major changes in livestock production systems. Small-scale mixed production systems are facing increased competition from large-scale specialized production units based on purchased inputs. These trends present major competitive challenges for smallholders and have implications for the ability of the sector to promote poverty reduction.
 - The shift from small-scale mixed production systems, based on locally available resources, to large-scale industrial systems has also changed the location of livestock production units. As the constraint of locally available natural resources is removed, the spatial distribution of livestock production facilities is becoming more clustered to exploit linkages along the supply chain. This has increased the efficiency of production but has implications for natural-resource use.
 - The increasing concentration of production and growth in trade are leading to new challenges in the management of animal diseases.
- **The livestock sector contributes to food security and poverty reduction.** However, it could do more with judicious policy and institutional reforms and significant public and private investments that consider three objectives: (i) to enhance the ability of smallholders to take advantage of the opportunities offered by growth in the sector; (ii) to protect the poorest households for whom livestock serve as a crucial safety net; and (iii) to enact broader rural development policies to ease the transition of many rural households out of the sector.
 - Livestock are important to the livelihoods of a large percentage of rural women, men and children living in poverty. They play a number of different roles, from income generation and the provision of inputs into mixed cropping systems to providing a buffer against environmental and economic shocks. Policy-makers need to consider the multiple roles of livestock in the livelihoods and food security of the poor.

- Smallholders need support in order to take advantage of the opportunities provided by an expanding livestock sector and to manage the risks associated with increasing competition and closer linkages with modern value chains. This requires significant and sustained innovation in national, regional and global food and agricultural systems, and a mix of policy and institutional change, capacity building, technological innovation and investment that is gender-sensitive and responsive.
- Policy-makers need to consider the different capacities of smallholders to respond to change. Some smallholders may be unable to compete in a rapidly modernizing sector and will give up their livestock, as opportunity costs for family labour rise. Broader rural development strategies aimed at creating off-farm employment for women, men and youths can ease their transition out of the livestock sector.
- Policy-makers need to recognize and protect the safety-net function performed by livestock for the very poor. Within the livestock sector, poor people are particularly vulnerable to risks related to zoonotic diseases and environmental hazards.
- **The livestock sector must improve its environmental performance.** Governance of the livestock sector should be strengthened to ensure that its development is environmentally sustainable. Livestock production is placing increasing pressures on land, air, water and biodiversity. Corrective action is needed to encourage the provision of public goods, such as valuable ecosystem services and environmental protection. This will involve addressing policy and market failures and developing and applying appropriate incentives and penalties. Livestock contribute to and are a victim of climate change. The sector can play a key role in mitigating climate change. For example, adoption of improved technologies, encouraged by appropriate economic incentives, can lead to reduced emissions of GHGs by livestock.
 - There is an urgent need for governments and institutions to develop and enact appropriate policies, at the national and international levels, that focus more on and account for livestock–environment interactions. Continued growth in livestock production will otherwise exert enormous pressures on ecosystems, biodiversity, land and forest resources and water quality, and will contribute to global warming.
 - A key policy focus should be on correcting market distortions and policy failures that encourage environmental degradation. For example, subsidies that directly or indirectly promote overgrazing, land degradation, deforestation, overuse of water or GHG emissions should be reduced or eliminated. Market-based policies, such as taxes and fees for natural-resource use, should cause producers to internalize the costs of environmental damages caused by livestock production.
 - Some negative environmental consequences from livestock production stem from problems associated with open-access common-property resources. Clarifying property rights and promoting mechanisms for cooperation are vital to sustainable management of common property.
 - The application of technologies that improve the efficiency of land use and feed use can mitigate the negative effects of livestock production on biodiversity, ecosystems and global warming. Technologies that increase livestock efficiency include improved breeds, improved grazing-land management, improved herd-health management and silvipastoralism.
 - Payments from public or private sources for environmental services can be an effective means to promote better environmental outcomes, including soil conservation, conservation of wildlife and landscapes and carbon sequestration.
 - The livestock sector has enormous potential to contribute to climate change mitigation. Realizing this potential will require new and

extensive initiatives at the national and international levels, including: the promotion of research on and development of new mitigation technologies; effective and enhanced means for financing livestock activities; deploying, diffusing and transferring technologies to mitigate GHG emissions; and enhanced capacities to monitor, report and verify emissions from livestock production.

- **Livestock diseases pose systemic risks that must be addressed.** Some animal-health services are public goods in that they protect human and animal public health and thus benefit society as a whole. Animal diseases reduce production and productivity, disrupt local and national economies, threaten human health and exacerbate poverty, but producers face a range of risks and differ in the incentives they are offered and their capacities to respond. Animal-health systems have been neglected in many parts of the world, leading to institutional weaknesses and information gaps as well as inadequate investments in animal-health-related public goods. Producers at every level, including poor livestock keepers, must be engaged in the development of animal-disease and food-safety programmes.
 - Animal diseases, the lack of adequate food hygiene and resulting food-borne illnesses are a problem for everyone because they can threaten human health, disrupt markets and trade, reduce productivity and deepen poverty. Improving the management of livestock with a view to preventing and controlling diseases can provide significant economic, social and human-health benefits for the poor and for society at large.
 - Pathogens evolve unpredictably, and it is impossible to prevent this. New pathogenic agents will continue to emerge, and the risk of spread has to be addressed specifically. An adequate global framework is necessary to address emerging zoonotic and transboundary animal diseases.
 - Public animal-health and food-safety systems need to recognize that the impacts of livestock disease and food-borne illnesses vary across countries and production systems depending on their economic status. The capacities of different groups to respond to these challenges, and the incentives needed to encourage them to do so, must be considered in the design of disease-control and risk-management strategies.
- Large, strategic and sustained investment is needed in national animal-health and food-safety infrastructure in developing countries to reduce the risks to human health and to allow growth in trade and markets, in ways that can contribute to lifting small livestock keepers out of poverty.
- The capacity of poorer countries to participate in the design of animal-health and food-safety standards should be enhanced so that they are better able to improve their animal-health and food-safety systems and gain greater access to markets for their livestock products.
- Producers of all levels and capacities must be engaged in the design and implementation of programmes to prevent and control animal disease and improve food safety. Poor livestock keepers need to be more engaged in disease-control efforts, to the benefit of themselves and others.
- Location matters. The concentration of intensive production systems in close proximity to urban population centres increases the risk of emergence of diseases and their transmission, both among animals and to humans. This is particularly the case when people and animals move between traditional and intensive systems. Incentives and regulations may be required to encourage the location of livestock production units in less densely populated areas.