African Livestock Futures

Realizing the potential of livestock for food security, poverty reduction and the environment in Sub-Saharan Africa

Policy Brief

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Key Points

1. **Demand for livestock products in sub-Saharan Africa (SSA) will increase several folds by 2050. The trend of increased demand is currently not matched by a similar growth of production within Africa.**

2. **The growing markets for livestock produce, and increasing production of livestock products, could be important contributors to the economic growth of nations, as well as to the resilience and productivity of producers' livelihoods, and to the food security of all.**

3. **However, unmanaged increases in livestock production have adverse consequences for the environment, for the climate, and for disease risks. These result from increased pressure on natural resources (particularly water and land), increased levels of greenhouse gas emissions and the potential for more people to contract zoonotic diseases.**

4. **Under all scenarios, smallholders, with their mixed crop and livestock farming systems, will continue to be the main producers of ruminant (cattle, goat and sheep) products until 2050. For monogastrics (such as poultry and pigs), most of the expansion will be through industrial production systems.**

5. **Policies that encourage healthy food consumption patterns, the sustainable intensification of all livestock production systems and selective promotion of monogastric livestock production, could result in increased environmental efficiency of livestock systems in sub-Saharan Africa. This can be done in ways that protect production in pastoral communities, and by smallholder farmers.**

6. **Sustainable intensification of livestock production will yield significant benefits for food security, incomes, trade, smallholder competitiveness and ecosystems services. These benefits need to be widely appreciated: at the present time farmers face major challenges when attempting to increase their investments in livestock production especially when the sector's contribution to sustainable development and economic growth is not appreciated.**

7. **The required investments include increased provision of veterinary services, inputs, institutional support, processing and markets. These are all essential if current livestock production systems are to evolve into viable commercial operations.**

This report is produced by the office of the Special Representative of the UN Secretary General for Food Security and Nutrition and UN System Influenza Coordinator (UNSIC).

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Copies of this policy brief, the report of the African Livestock Futures and its executive summary are available on the following websites:

www.un-influenza.org

and www.towardsasaferworld.org

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Introduction

Animal products are critical to the nutrition, food security, livelihoods and resilience of hundreds of millions of people throughout the world.

Poor people depend on animal-source food (especially dairy products) to ensure that their diets deliver the nutrients necessary for cognitive and physical development. However, many developing countries face a 'double burden of malnutrition' that is, the persistence of under-nutrition along with a rapid rise of illnesses associated with over-nutrition. Hence the importance of sustainable consumption: avoiding massive changes in the amount of meat in the diet as disposable income increases.

The rising demand for livestock products has generated jobs all along the livestock value chain, from input sales through animal production, trading and processing to retail sales. It is now estimated that up to 1.3 billion people globally are employed in different livestock product value chains globally.

More than half of the world's people depend on the food produced by smallholders, where livestock are an integral part of smallholder farming systems.

As people's incomes increase, their demand for (and access to) livestock products tends to increase as well.

The degree to which people have predictable access to safe livestock products depends on the extent to which local markets responds to increasing demand and to which gaps in production can be met through imports from elsewhere. A growing market for livestock produce, and the increasing production of livestock products, can be an important contributor to the resilience and productivity of rural people's livelihoods.

The potential for farmers and food processors to respond to increasing demand with greater production is important.

The situation now in Sub-Saharan Africa

Demand for livestock products in sub-Saharan Africa (SSA) is increasing rapidly. The trend of increased demand is currently not matched by a similar growth in local production.

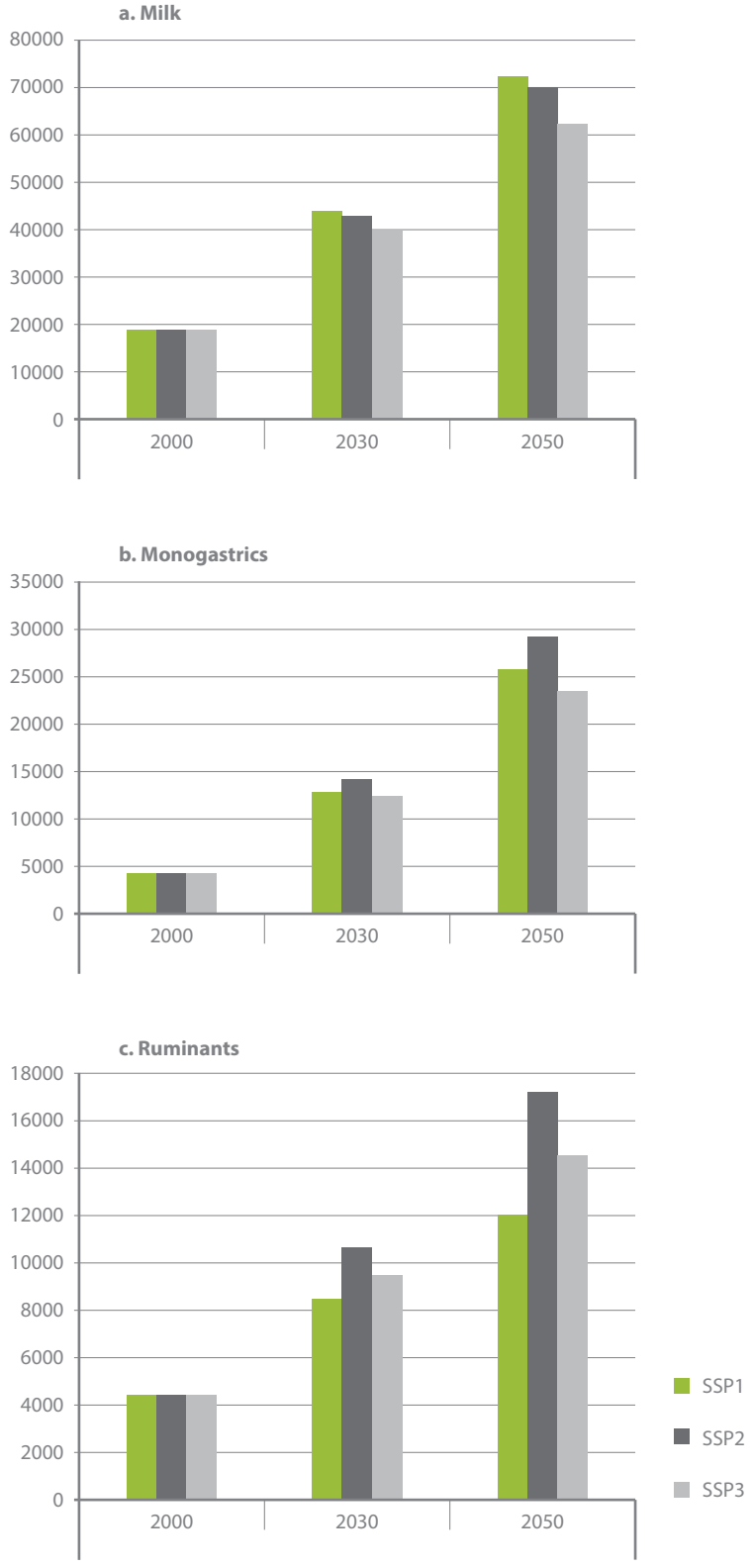
Several African governments, as well as regional organizations, are now working out how they can best ensure that their farmers can contribute to the better availability of high quality livestock products, thus reducing the need for dependence on increased imports. At the same time, governments are increasingly aware that if increases in the production of livestock products are not carefully managed, there will be adverse consequences, including greatly increased pressures on natural resources (particularly water and land), greenhouse gas emissions, and increased threats of zoonotic diseases.

The risks associated with unmanaged increases in livestock production prompt national decision-makers to ask a number of questions. What kind of livestock policies will contribute to the expansion of livestock production in Africa in ways that bring equitable benefits to societies? How best to ensure that they also contribute to people enjoying good health? What are the options for ensuring that livestock production practices are sustainable from social, environmental, economic and climatic perspectives?

Such questions prompted an investigation of plausible trajectories for African livestock up to 2050 aiming to provide policy recommendations for realising the potential of livestock as an engine of economic growth, food security and environmental well-being in sub-Saharan Africa.

The study completed by June 2014. This policy brief is informed by its findings and policy recommendations.

Figure 1 - The total consumption (000s tonnes) of livestock products (a. milk, b. monogastric meat, c. ruminant meat) in sub-Saharan Africa to 2050 by SSP scenario.



The African Livestock Futures study uses a global partial equilibrium model (GLOBIOM), builds on the IPCC's Shared Socio-Economic Pathways (SSP) scenarios and examines three variants: a sustainable intensification scenario with high economic growth, high GDP growth, changing diets and high technological change (SSP1), a continuation of current trends (SSP2) and a degradation scenario with low technological change, low economic growth and high population growth (SSP3).

Trends in Livestock consumption, production, trade and prices under all scenarios

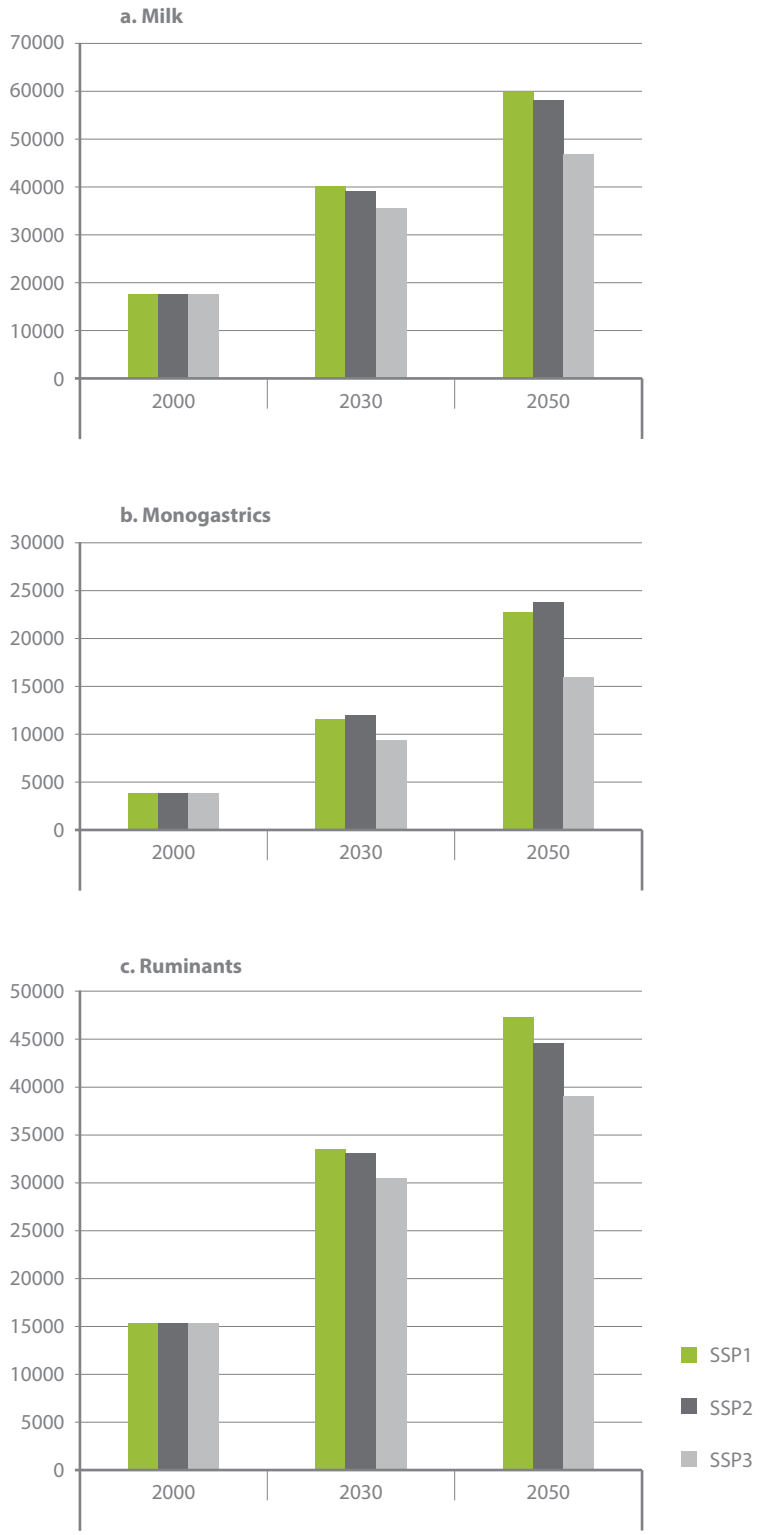
Consumption of animal products

- Under the sustainable intensification scenario (SSP1), more sustainable diets and better household waste management would lead to a 43% increase in livestock product consumption in Africa due to high economic growth and fast technological progress.
- Milk consumption is likely to triple under most scenarios in all SSA regions by 2050, with Eastern Africa, traditionally the largest consumer of milk, dominating the growth in consumption.
- The consumption of meat and eggs from poultry and pork have the highest projected rates of growth across SSA. West Africa is projected to have a six to seven-fold increase in the consumption of monogastric products (mostly poultry) to 2050, followed by Southern and Eastern Africa (four-fold increases).
- Ruminant meat consumption is also projected to grow in all scenarios, but at lower rates than milk and monogastric meats.

Livestock Production

- Significant production growth can be observed across scenarios for all livestock products in Africa amounting to an increase by 250% to 2050.
- The conditions for achieving production growth (high technological change potential in livestock and crop yields, lower costs, and adequate product prices) are highest for milk in East and West Africa, for monogastrics in West Africa and for ruminant meat in East Africa.
- Given the right socio-economic conditions and technology to reduce costs and increase productivity, with modest expansion to guarantee feed sources, pastoral systems in arid regions could triple cattle milk production and increase small ruminant milk and meat production by a factor of 5 or 6 relative to the production levels of 2000.

Figure 2 - Total production (000s tonnes) of livestock products (a. milk, b. monogastric meat, c. ruminant meat) to 2030 and 2050 by scenario in sub-Saharan Africa



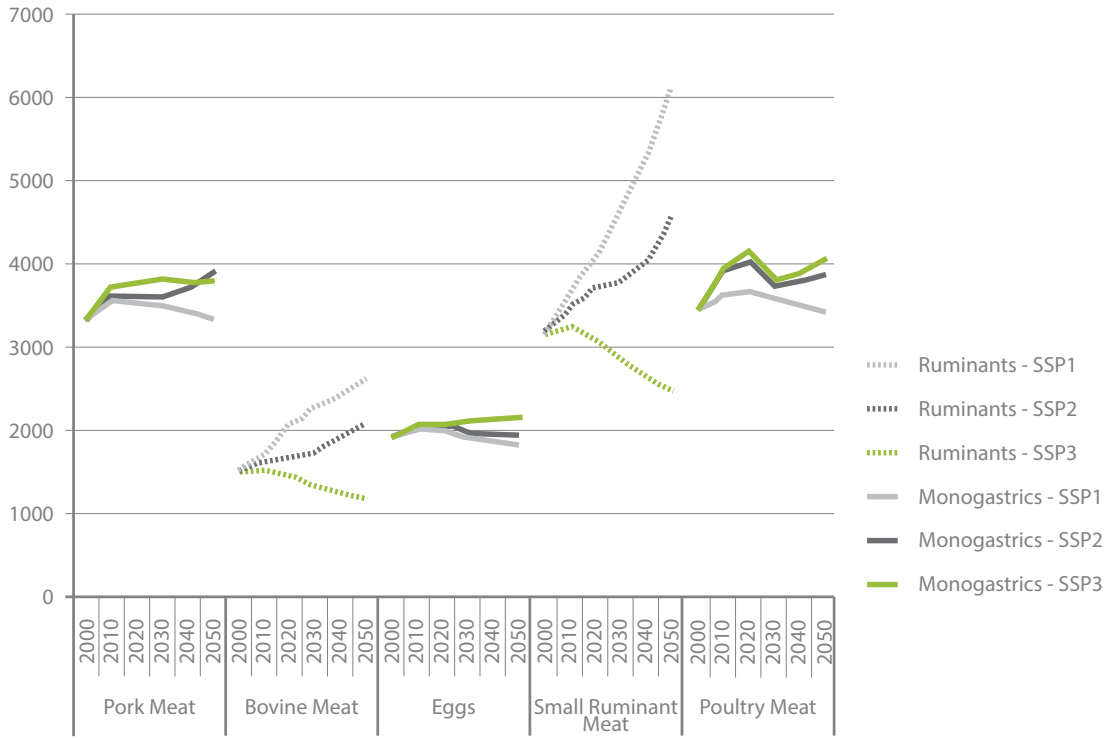
Livestock Production by systems

- Smallholder mixed crop-livestock systems are, and will remain, the main producers of ruminant products to 2050, under all scenarios. However, under SSP1 and SSP2, mixed crop-livestock and pastoral systems in more humid areas are likely to increase the production of meat and milk by 4 to 8 fold relative to 2000 production.
- This is because in these areas, the favourable yield increases in livestock and crops projected in these systems are high (SSP1) and also, significant grassland and cropland expansion is likely to happen to support the additional production (larger impact in SSP2, business as usual).
- This demonstrates that it is in these systems, which have a low baseline production, where significant improvements in productivity, resource use efficiency and GHG intensities can be made at low cost through improved technology.
- In the case of monogastrics, most expansion of production in all scenarios will be through industrial production systems.
- The majority (67%) of the monogastric production in Africa and the Middle East still came from smallholder systems. It is estimated that industrialisation's share is projected to increase from the 33% to about 80% by 2050, independently on the scenario chosen.

Prices of Livestock product

- The livestock product price index is projected to increase substantially, exceeding 50% in Africa by 2030 (and on to 2050).
- Baseline prices of pork and poultry meat in sub-saharan Africa relative to global prices are at least twice as high, thus rendering these sectors locally uncompetitive, especially under the baseline productivity and production levels.
- The sustainability scenario (SSP1), in general terms shows a decreasing trend in prices that partly explains the increases in the production of these commodities.
- For the other two scenarios, large variability exists in the projected prices of ruminant meats, and this is partly a reflection of the changing supply and demand terms in the scenarios, with current trend scenario (SSP2) and negative scenario (SSP3) showing increases in prices, especially of the ruminant meats, where larger variation in productivity parameters exists.

Figure 3 - Sub-Saharan African prices for selected livestock products to 2050 by SSP scenario.



Trade and competitiveness of Livestock sector

- Livestock production systems in the developing world contribute significantly to the global production of the different livestock products. These shares are likely to increase as more future growth in livestock production is projected to occur in the developing world.
- Global trade has grown in recent years as a result of trade liberalization and shifts in regional comparative advantages associated with technical change. Movements of animal products, inputs and services being very dynamic due to increased internal connectivity, transport networks, improved value chains and the increasing need to supply the growing urban populations.
- Only under the sustainable intensification of livestock production scenario (SSP1), can the low trade deficit conditions prevailing until 2000 for all animal products (around 10% of national production) can be maintained to 2050. This suggests that investing in the sustainable intensification of livestock systems in Africa is an urgent matter.
- Population increases and lower economic growth in the other two scenarios SSP2 and SSP3, would force Sub-Saharan Africa towards a greater trade dependency to fill the product demand gaps.
- Maintaining business as usual trends (SSP2) would lead to a doubling of imports of milk and monogastric products (poultry mostly) relative to production by 2050 and potentially, to an increase in imports for ruminant meats from about 2% in 2000 to about 16% in 2050 of the share of production.
- Any negative deviation from the current trend in terms of productive efficiency, prices and GDP growth; such as the potential impacts of climate change on agricultural productivity, would make the SSA livestock sector largely uncompetitive, with substantially lower resource use efficiencies and high production costs (SSP3). This would have negative implications for both consumers and producers, and is likely to affect the continent's food security.

Land use

- The increased livestock production will come to some extent from intensification of production on the current agricultural land but will also require expansion of agricultural activities in other land cover types.
- About 55% of global cropland and 43% of grassland expansion and about 44% of the total deforestation is projected to occur in Africa and the Middle East.
- The business as usual scenario (SPP2) has the highest level of land use change. This diminishes under the sustainability scenario (SSP1) due to high technical change, shifts in diets to more resource use efficient livestock products and lower population growth. Land use change also diminishes in the degradation scenario (SSP3) due mostly to demand contractions resulted from low GDP growth and inefficient production that limits production growth.
- The increased crop yields would require additional inputs. The study estimates that globally the use of nitrogen fertilizer would need to increase several folds under SSP2 by 2050 and also around 40% more irrigation water would be required in Africa and the Middle East.

Implications of Livestock trends

- All scenarios show major changes in the African livestock production systems - ownership and management, production, consumption, trade, prices, environmental and health effects.

Implications on the environment

- Livestock production will have different impacts on greenhouse gas emissions and other environmental variables depending on the production systems and their related productivity and feed use.
- The largest methane emissions from ruminant livestock come from the regions with the largest numbers of animals, in this case the pastoral and smallholder mixed systems in the arid regions.
- SSP1 and SSP2, the two scenarios with the highest production have the highest emissions, with the difference that SSP1 has higher efficiency of production and therefore requires slightly less animals to meet the projected level of production in comparison with SSP2.
- The largest emissions from livestock come from CO_2 from land use change for cropland expansion or conversion to grassland.

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- The results clearly show that we could double, and in some parts triple, the GHG efficiencies of livestock production in Africa if sustainability criteria and technological change were driven by economic growth (SSP1). The largest impacts are observed in regions with the lowest initial efficiencies (Congo Basin and West Africa). Gains would also be obtained in other scenarios, but not while maintaining the level of protein intake from animal source foods.

Potential health effects

- There could be increasing threats of disease affecting animals and people under all scenarios.
- The risks of disease-causing pathogens moving from wildlife (or even people) into domestic animal populations is significant because of the reservoirs of pathogens in African wildlife.
- Infectious diseases associated with monogastric expansion could increase, especially if veterinary surveillance and appropriate regulation of industrial systems does not follow the accelerated growth trajectory in this kind of system. This will have significant impact on the future of poultry and pork in Sub-Saharan Africa.
- Increased trade in livestock products could increases food borne diseases, if markets operate under loose standards, lack of cold chains and others.

Livestock policies

A combination of demand management, intensification of land based systems and structural change promoting more industrial monogastric systems, could lead to increases in the environmental efficiency of livestock systems (for example, improved GHG emissions intensities) in sub-Saharan without sacrificing smallholder and pastoral production.

- A well-articulated set of good policies is needed: policies that are fairly enforced and that do not disadvantage poorer farmers or processors. Effective systems of governance for the livestock production sector, as well as for the processing and marketing of animal-derived products are also essential.

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Investing in livestock systems in Africa

- Expanding the benefits of livestock production, while reducing the environment and health costs, depends on increasing the competitiveness of African livestock in international, regional, and domestic markets.
- Sustainable investments of agriculture and livestock systems could yield significant benefits for food security, incomes, trade, smallholder competitiveness and ecosystems services. This has to be made clear as financing investment in livestock sector remains a challenge everywhere, especially when its contribution to sustainable development and growth is unclear.
- Such investments include the increased provision of services, inputs, appropriate institutional support and markets; all of which are essential to transform traditional livestock industries into commercial operations.
- Investment frameworks increasingly focus on the whole value chain, linking patterns of demand to production systems, seeking to minimize risks associated with increases in production.
- This calls for investments in the infrastructure required for intensification of livestock production (such as roads, ports, refrigeration and cold chains) that facilitate market access and reduce the costs of getting products safely from producers to consumers while optimizing transportation and storage and minimizing spoilage and waste.
- To ensure an optimal context for investment in the livestock sector, governments seek to establish systems of laws, regulation and governance: increasingly these are designed to establish fair and competitive markets and systems for trade in animals and their products, in ways that reduce the risks faced by producers, processors and consumers, minimize the financial uncertainties for investors and contribute to all – especially the most disadvantaged – realizing their human rights.

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Policies to establish financing mechanisms that can provide sustainable and long-term in livestock sector.

- Functioning and principled partnerships between government (with its policy and regulatory responsibilities), producers (especially organizations of small-scale livestock producers), agri-business enterprises and consumers, will increase the likelihood that risks are minimized, technical innovations are available to all who can use them, and the growth in demand is satisfied in a predictable way while maintaining high standards of animal health and welfare, and public health.
- Private investments - both domestic and foreign - are increasingly becoming important drivers of productivity in agriculture. This is certainly true of the livestock sector.
- It is important that businesses are enabled to feel welcome by like-minded players in governments, academia and development agencies: this means creating principles for the engagement of business that highlight (and make explicit) the commitment of businesses to work for the better lives of individuals and communities.
- Examples of this effort include developing new forms of livestock and disasters insurance products, and establishing links between those products to participatory disease surveillance and to market information.
- Examples also include creating more resilient infrastructure that expand existing and opens up new markets, particularly in emerging economies.

Policies to encourage effective governance of the livestock sector

- Policies for livestock development should help to establish appropriate incentives for good practice and transparent investment frameworks that take all of these potential benefits and risks fully into account. If such policies are not developed and then applied in an equitable manner, the livestock sector will grow without adequate governance.
- Policies should include ensuring that all people have security of tenure over their assets, have access to land and water, have a say in alternative uses, and are able to obtain necessary goods and services (including livestock extension and comprehensive veterinary care).
- One important point of reference is the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security that is endorsed by the Committee on World Food Security (CFS) on 11 May 2012. These are particularly relevant to pastoralists, indigenous farmers and small-scale livestock keepers.

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Policies to managing livestock production externalities

Managing environmental costs

- Governments should enforce regulations that limit the externalities associated with intensified production particularly for urban and peri-urban livestock enterprises.
- This calls also for regulating the providers of veterinary services so that they do not contribute to externalities such as antibiotic resistance and at the same time promote adherence to food safety standards.
- It also calls for more attention to the capabilities of professionals - and the functioning of their institutions, and that there are transparent and explicit roles for the government on the one hand and private producers or processors on the other.
- Enforcing regulations should be combined with the application of incentives in ways that take account of income inequalities. One possible incentive system is the payment for environmental services (PES). Most PES projects have focused on climate regulation, water management, landscape preservation, and conservation and management of biodiversity or a "bundle" of the previous services. PES should be targeted to livestock systems in developing countries, including increasing the opportunities for pastoral/grazing systems and for mixed crop-livestock systems to access to PES schemes.

Protecting animal and human health

- The risks of humans being affected by zonnozes - as a result of increased livestock production - must be addressed. Options include creating buffer zones with high biosecurity in densely settled areas where there is intensive livestock production.
- Those who produce livestock need to be able to access new forms of insurance - such as risk-based or commercial index-based insurance products. These products should be linked to participatory disease surveillance systems and to better market information.

A last word

The increasing demand for livestock products in Africa will encourage a growth in production. This should be undertaken within a policy context that prioritizes people's well-being and safeguards the environment. Joint working by multiple stakeholders is critically important to improve investments in livestock and to reduce the likelihood that the health of the world's people and of their planet will be undermined as a result of uncontrolled expansion of livestock production in Africa.

Stakeholders rely on Governments to offer a compass to guide their investments. National livestock investment policies should be designed in ways that contribute to improvements in communities' livelihoods, serve the interests of all people for whom investments are being made, and contribute to the overall well-being of our planet. The expected benefits of investment policies should serve as the basis for judging the long-term impact of investments in the livestock sector. If such policies are not adopted, and evaluated at regular intervals, Africa's farmers, food processors and consumers will miss out on important opportunities for enhancing economic development in an equitable and sustainable manner.

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