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The role of livestock for ACP countries: Challenges and opportunities ahead

Resources on The role of livestock
sector in ACP countries¹

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Revised by Ronalee Biasca in September 2012



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The role of livestock for ACP countries: Challenges and opportunities ahead

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This Reader is not intended to
exhaustively cover the theme of
livestock farming and trading and its
role in ACP countries but to provide
some background information and
selected information resources. Most
text of this Reader has been directly
taken from the original documents
or websites. For additional inputs,
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resources are available at [http://
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1. Introduction

Livestock is the principal user of global land and a significant source of livelihood for about 1 billion people, of whom 800 million are poor. It affects, positively or negatively, the natural resource base, public health, social equity, and economic growth.

Driven by population growth, urbanization, and increased income, the demand for animal-source food products in developing countries is rapidly increasing. Livestock, which already constitutes 30% of the agricultural gross domestic product (GDP) in the developing world, and about 40% of the global agricultural GDP, is one of the fastest-growing subsectors in agriculture. Growing demand presents real opportunities for economic growth and poverty reduction in rural areas. It could directly benefit the 1 billion poor people who depend on livestock as a source of income and subsistence.

Livestock also provides traction for about 50% of the world's farmers and is a source of organic fertilizer for most of the world's croplands, converting waste products into inputs in the production of high-value food. For these reasons, the sector has a critical role to play in making agriculture sustainable, in reducing poverty, and in contributing to economic growth. As experience has shown in both industrialized and developing parts of the world, if the sector is left to the market, major negative effects occur. Public policy is therefore necessary enhance the sector's contribution to equitable economic development and mitigate its negative impacts on public health, social equity, and the environment².

While the global supply of livestock products has more than kept up with the human population expansion, the situation has not been the same in all regions. Production levels

have expanded rapidly in East and Southeast Asia, and in Latin America and the Caribbean, but growth in sub-Saharan Africa has been very slow. Fast growth in human populations in some developing countries combined with low productivity per animal have made it hard for livestock production in those areas to keep up. There is also considerable variation within the developing world, with sub-Saharan Africa and South Asia producing at much lower levels per person than Latin America and the Caribbean.

The International Livestock Research Institute (ILRI) estimates that about 35 percent of poor livestock keepers live in South Asia, about 30 percent in Sub-Saharan Africa, about 15 percent in East and South East Asia and the remainder are distributed across Latin America, West Asia and North Africa, Europe and Central Asia.

2. The Livestock sector: an overview

Agriculture can make a major contribution to poverty reduction as about 50-75% of the world's poor depend on it as part of their livelihood. Apart from having a direct impact on farm incomes and rural employment, agricultural growth also stimulates other forms of growth through demand for non tradable and consumption linkages.

Since in most developing countries agricultural populations continue to grow while agricultural land cannot expand at the same rate, agricultural production cannot easily be expanded horizontally. Rather, productivity gains, measured in terms of value of output per area of land, are essential to increase agricultural production and thereby raise rural incomes and feed growing urban and rural populations.

Livestock products provide an example of high-value agricultural produce, with roughly three out of four agricultural households already keeping livestock³.

Key data and trends

The livestock sector in developing countries accounts for more than a third of the agricultural gross domestic product and is growing faster than most other agricultural subsectors, constituting 30 percent of the agricultural GDP in the developing world, and about 40 percent of the global agricultural GDP. This growth is driven by the rapidly increasing demand for livestock products. Population growth, urbanization, and increasing income are driving demand for animal-source foods in developing countries, a phenomenon described

by Delgado et al. as the “Livestock Revolution”. Between 1975 and 2001, for example, annual per-capita consumption of poultry, pork, beef, and milk grew by 5.9%, 4.0%, 3.2%, and 1.7% respectively. The share of world consumption of meat by developing countries increased from 36% in 1983 to 57% in 2003 and of milk from 24% to 45%. However, despite this rapidly increasing share of global consumption in developing countries, per-capita consumption is still comparatively low. In developed parts of the world, commercialization took place a long time ago, and the transition from extensive to intensive production often entailed major negative environmental consequences.

Livestock production and merchandizing in industrialized countries are big businesses, accounting for 53% of the agricultural GDP. However, production and consumption of livestock products in the developed world are now growing only slowly or stagnating. Health concerns, low or zero population growth, and saturated markets have resulted in a scant 0.5% annual increase in per-capita meat and milk consumption. Between 1980 and 2002, total meat production increased by just 22%. Poultry and pig production increased by only 1% annually, while ruminant meat production actually declined by 7% over the 22-year period. The combination of strong growth in demand in the developing world and limited to negative growth in demand in industrialized countries represents a major opportunity for livestock keepers in developing countries, where most demand is met by local production, and will continue to be well into the foreseeable

future⁵. Growing demand presents real opportunities for economic growth and poverty reduction in rural areas. It could directly benefit the 1 billion poor people who depend on livestock as a source of income and subsistence. Livestock also provides traction for about 50 percent of the world's farmers and is a source of organic fertilizer for most of the world's croplands converting waste products into inputs in the production of high-value food. For these reasons, the sector has a critical role to play in making agriculture sustainable, in reducing poverty, and in contributing to economic growth.

Economic importance of livestock systems in developing country regions: the case of sub-Saharan Africa

Asia represents almost 60% of the total value of animal production in the developing world. Then follows the Latin America and Caribbean region with just over 25%, West Asia and North Africa with 8%, and sub-Saharan Africa with around 7%.

For developing countries as a whole, the annual economic value of production of milk, pork, poultry and eggs, and beef and veal is approximately the same, at around US\$40 billion each. Mutton has a value only 12% of this amount. However, as with poultry, small ruminants have a special worth for resource-poor livestock keepers in view of their low capital value per head and short generation intervals⁶.

Livestock production is switching from extensive (grazing) to intensive

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(stall-fed poultry, pigs, and dairy cows), increasing the demand for feed grains, including oilseeds.

In developing countries, 28% of grain consumption was already used for feed in 2005. But the use of cereals for feed is growing more slowly than the increase in meat production because other feedstuffs, such as oilseed meals and cassava, are substituted for cereal grains, and the share of poultry in total meat production is growing⁷.

In the tropics and subtropics of sub-Saharan Africa, the system in the arid and semi-arid grasslands is the most economically important. Next are the mixed rainfed systems—first in the humid and sub humid lands and then in the arid and semi-arid lands. The two grassland systems, in the temperate and tropical highlands and in the humid and sub humid tropics and subtropics, each are about 25% the value of the foremost grassland system. Beef, veal and milk represent the most valuable animal products in sub-Saharan Africa, ahead of sheep and goat meat and poultry and eggs, which are all of almost equal value⁸.

Livestock Revolution Underway

Estimates of realized and projected consumption trends by the International Food Policy Research Institute (IFPRI), the Food and Agriculture Organization of the United Nations (FAO)

and the International Livestock Research Institute (ILRI) shows that production of certain food commodities will have to increase more rapidly than others in different parts of the world to meet expected demands. Whereas only marginal increases in consumption of meat and milk are expected in the developed world, increases of 114% and 133% respectively are projected until the year 2020 for meat and milk consumption in the developing world. The projected production increases to meet these demands in developing countries amount to 108% for meat and 145% for milk. The greatest (85%) increase in world meat consumption will be developing countries, with highest increases occurring in Asia, specifically East Asia. Also, more than 90% of the world's predicted 60% increase in milk consumption will occur in Asia, mainly South Asia. However, for the next 10 to 25 years, minimal growth will take place in the overall global consumption of these two livestock products.

The demands for increased animal products are higher than for cereals because of changing consumption patterns following urbanization, population growth and projected income growth. Diets with more high-value protein and micronutrients will improve human health and the livelihood of many poor people. The implications of increased food production and changed diets of billions of people may be dramatic in the next few

decades and could improve the well-being of many rural poor as both consumers and producers.

In contrast to the familiar Green Revolution that started in plant production 30 years ago, a livestock revolution is just underway to meet the increase in demand for food of animal origin. Such a revolution assumes a wise use of natural resources, including animal and plant genetic resources, in order to be realized.

The challenge is how to take advantage of prevailing trends for the benefit of the rural and sub-urban poor livestock keepers in developing countries rather than the more industrialized production in other parts of the world. Already predictions are that unless major improvement in productivity occurs, East Asia and Africa will increasingly remain net importers of meat and milk products.

For cereals, milk and dairy products, South Asia, Africa and East Asia will increasingly become net exporters of cereals. More than 70% of the predicted increase in the world's meat consumption will be in form of pork and poultry, most of which will be produced under intensive industrial production, partly explaining the predicted trends in inter-regional cereal trade⁹. The higher pace of industrialisation will continue, especially for pig and poultry production.



3. Livestock role in agricultural development

Livestock sector's contribution to agricultural GDP, and annual livestock sector growth, by region, 1990 and 2007

Region/ country	1990			2007			Annual growth rate	
	Agricultural (billion international dollars)	Livestock production (billion international dollars)	Livestock: agricultural GDP (%)	Agricultural production (billion international dollars)	Livestock production (billion international dollars)	Livestock: agricultural GDP (%)	Agriculture (%)	Livestock (%)
EAP	244	58	23.7	478	145	30.3	4.0	5.6
China	173	45	25.8	355	120	33.9	4.3	6.0
EECA	142	95	67.0	120	53	44.5	-1.0	-3.3
LAC	111	49	43.8	190	81	42.7	3.2	3.0
NENA	36	12	33.7	60	22	36.7	3.1	3.6
South Asia	149	43	29.1	241	82	33.9	2.9	3.8
India	106	29	27.2	170	54	31.9	2.8	3.8
SSA	61	17	28.1	97	26	26.6	2.8	2.4
All regions	742	274	36.9	1,185	408	34.5	2.8	2.4

* Livestock sector GDP is frequently underestimated owing to accounting methods that do not (fully) include products such as manure and services such as draught power, the benefits of which are allocated to other sectors (for an example see Behnke, 2010).

Source:FAOSTAT, 2010.

Livestock production systems: a classification

Animal agriculture systems correspond to agro-ecological opportunities and demand for livestock commodities.

In many of these systems, the livestock element is interwoven with crop production. Animal manure is often essential in maintaining soil fertility, and the role of animals in nutrient cycling is often an important motivation for keeping animals.

In other cases, mobile forms of livestock production have been developed to harness resources from semi-arid or mountainous, seasonally shifting or temporarily available pastures. Although many of these systems result from a long historical evolution, they are currently under pressure to adjust rapidly evolving socio-economic conditions.

Over recent decades, large intensive livestock production units, in particular for pig and poultry production have emerged in many developing regions in response to rapidly growing demand for livestock products.

For clarity it helps to classify that vast variety of individual situations into a limited number of distinct production systems.

FAO has proposed a classification of 11 categories of livestock production systems (LPSs) based on different types of farming systems, relationship to land and agro-ecological zones. Two main groups of LPSs have been identified:

- **Solely Livestock Systems (L):** those solely based on animal production, where more than 90% of dry matter fed to animals come from rangelands, pastures; annual

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forages and purchased feeds, and less than 10% of the total value of production comes from non-livestock farming activities; and

- Mixed Farming Systems (M): those where cropping and livestock rearing are associated in mixed farming systems, where more than 10% of the dry matter fed to animals comes from crop by-products or stubble, or more than 10% of the total value of production comes from non-livestock farming activities.

Below the distinction between livestock-only and mixed farming, four broad groupings have been distinguished.

Solely Livestock Systems (L) have been classified in:

Landless Livestock Production Systems (LL): A subset of the solely livestock systems in which less than 10% of the dry matter fed to animals is farm produced and in which annual average stocking rates are above ten livestock units (LU) per hectare of agricultural land.

The following additional differentiation is made:

- Landless monogastric systems (LLM): A subset of LL in which the value of production of the pig/poultry enterprise is higher than that of the ruminant enterprises.
- Landless ruminant systems (LLR): A subset of LL in which the value of production of the ruminant enterprises is higher than that of the pig/poultry enterprise.

Grassland Based Systems (LG): A subset of solely livestock systems in which more than 10% of the dry matter fed to animals is farm produced and in which annual average stocking rates is less than ten LU per hectare of agricultural land:

- Temperate and tropical highland (LGT)
- Humid/sub-humid tropics and sub-tropics (LGH)
- Arid/semi-arid tropics and sub-tropics (LGA)

Mixed Farming Systems (M): Livestock systems in which more than 10% of the dry matter fed to animals comes from crop by-products, stubble or more than 10% of the total value of

production comes from non-livestock farming activities.

Rainfed Mixed Farming Systems (MR): A subset of the mixed systems in which more than 90% of the value of non-livestock farm production comes from rainfed land use, including the following classes:

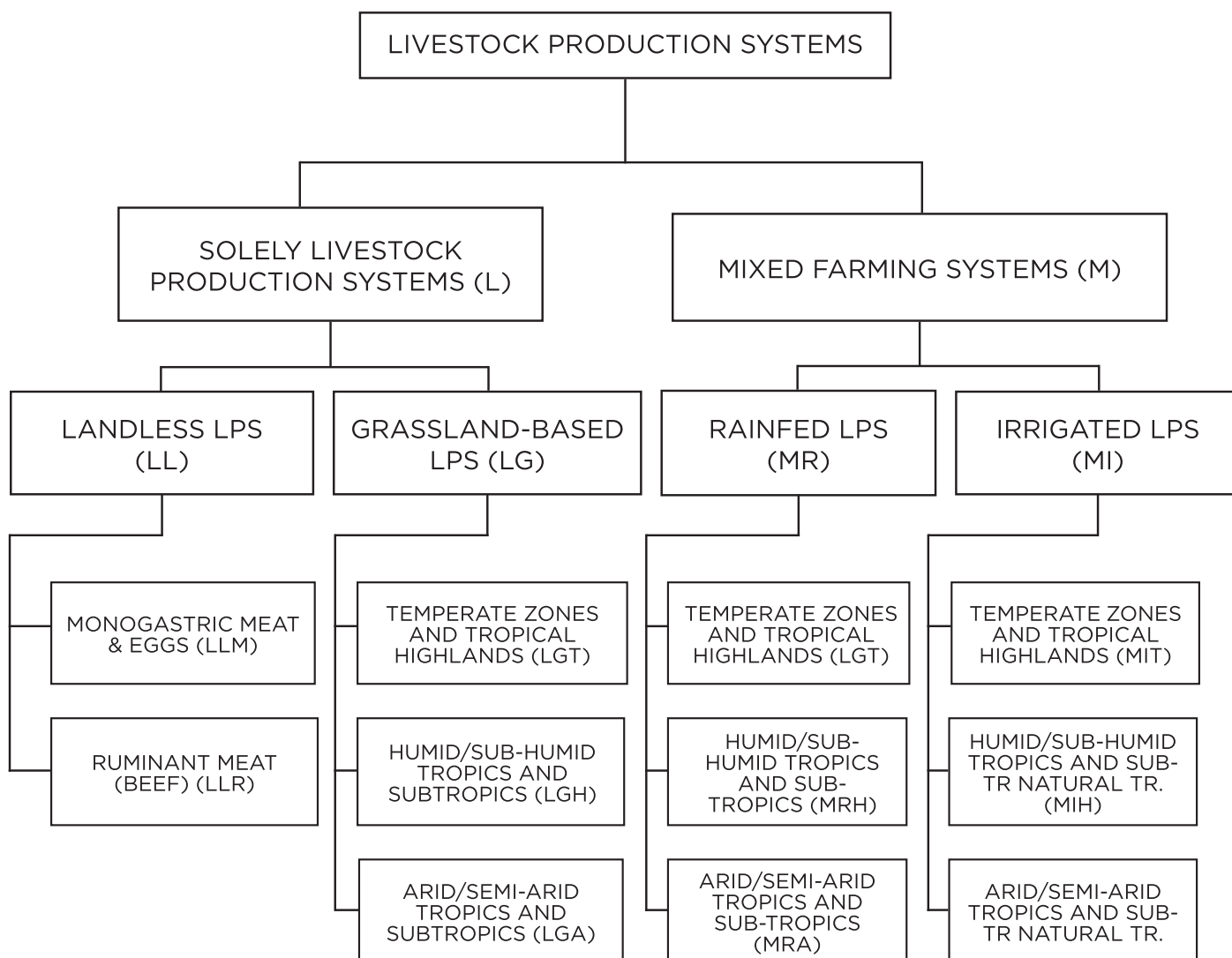
- Temperate and tropical highland (MRT)
- Humid/sub-humid tropics and sub-tropics (MRH)
- Arid/semi-arid tropics and sub-tropics (MRA)

Irrigated Mixed Farming Systems (MI): A subset of the mixed systems in which more than 10% of the value of non-livestock farm production comes from irrigated land use, including:

- Temperate and tropical highland (MIT)
- Humid/sub-humid tropics and sub-tropics (MIH)
- Arid/semi-arid tropics and sub-tropics (MIA);¹⁰

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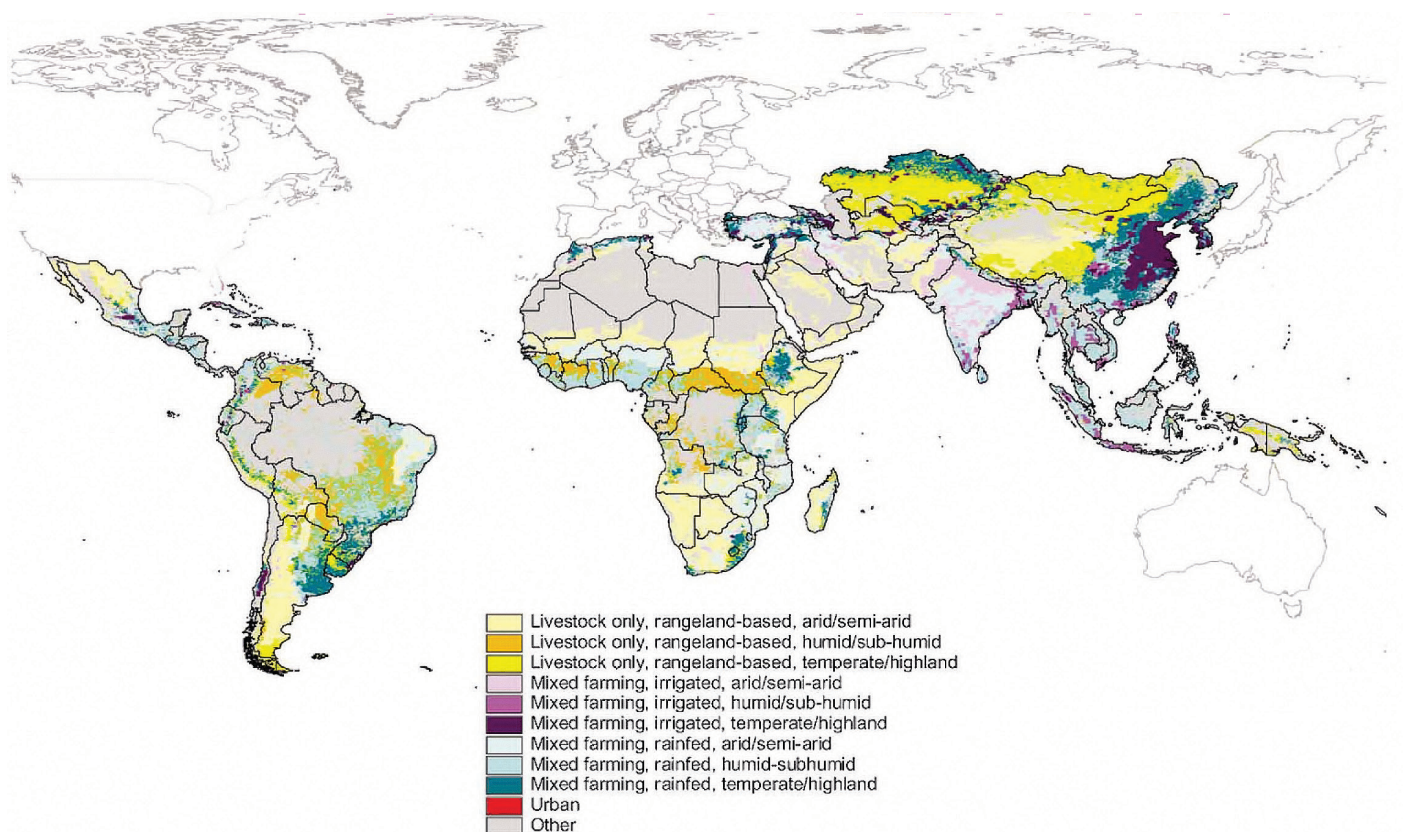
Classification of world livestock production systems¹¹



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On this basis, ILRI has shown the production systems on a global map:

Global livestock production systems¹²



The case of pastoral production systems

By combining data from various sources, it is estimated that there are about 120 million pastoralists/agro-pastoralists worldwide, of which 50 million reside in sub-Saharan Africa (SSA). Within sub-Saharan Africa, Sudan and Somalia have the largest pastoral/agro-pastoral populations of seven million each, followed by Ethiopia with four million. Pastoralism contributes 10 to 44 percent of the GDP of African countries. The

pastoralist population in Africa is estimated at 268 million (over a quarter of the total population), living in an area representing approximately 43 percent of the continent's total land mass.

The number of livestock in the pastoral/agro-pastoral production systems in sub-Saharan Africa was estimated by overlaying the livestock production systems maps with livestock density maps. The largest number of pastoral/agro-pastoral livestock is found in East Africa. Within East Africa, Sudan has the largest numbers of pastoral/agro-

pastoral livestock comprising an estimated 18 million cattle, 18 million goats and 22 million sheep. In West Africa, the number and proportion of animals in pastoral/agro-pastoral production systems is lower than in East Africa. In West Africa the largest numbers of livestock kept in pastoral/agro-pastoral production systems are found in Niger (1 million cattle, 6 million goats, 4 million sheep) and in Mauritania (1 million cattle, 4 million sheep and 6 million goats). Estimating meat production from pastoral/agro-pastoral livestock and relating it to total national meat production reported in FAOSTAT

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shows that in Djibouti, Somalia, Eritrea, Sudan, Western Sahara, Niger, Mauritania, Benin, Chad, Guinea-Bissau, Guinea and Mali pastoralists/agro pastoralists not only own a major proportion of the national herd but also contribute a significant share to national meat production. Worldwide, pastoralists constitute one of the poorest population sub-groups and among African pastoralists/agro-pastoralists the incidence of extreme poverty ranges from 25 to 55%¹³.

Western Africa

In Western Africa, there is a wide variation in the size of national economies. The contribution of the livestock sector to agricultural GDP ranges from 5 percent in Cote d'Ivoire to 44 percent in Mali. The livestock sector also provides employment for about 50 percent of the economically active population. Livestock is an important factor of intergration in the region as cattle, sheep and goats are major itmes exported from land-locked Sahelian countries to humid and sub-humid coastal countries. However, the regional supply of meat and dairy products is far lower than demand, resulting in a large net importation of livestock products – a trend that is expected to increase in the future.

Central Africa

In Central Africa, particularly in Chad, Cameroon and the Central Africa Republic (CAR), pastoralism plays a major role in livestock production. The contribution of livestock to GDP in is estimated at 27 percent in Chad, 13 percent in Cameroon and 9 percent in CAR. The level of poverty in pastoral communities remains higher than the average level of

44 percent. Intra-regional trade in livestock and livestock products is a feature of this region.

East Africa

The multipurpose socioeconomic and cultural features of pastoralism are better exploited in East Africa compared to other regions. The region includes Sudan and Somalia, which are both major livestock exporters to the Gulf states. Livestock export facilities along the northern Somali coast and Djibouti continue to grow, often with private sector investment. Eastern Africa is also characterized by exploitation of pastoral areas for wildlife conservation and tourism, especially in Kenya and Tanzania, although the extent to which revenues benefit pastoralists is unclear. In Ethiopia the livestock-dependent leather industry is the second largest source of foreign currency after coffee. In Uganda, pastoralist and small livestock producers contribute the fourth largest share of foreign currency earnings. Kenya and Tanzania have vast arid lands occupied by pastoralists who supply the substantial domestic meat markets.

Southern Africa

In South Africa pastoralism accounts for about 60 percent of the national cattle herd, where the livestock sector, including pastoralism, is an important meat export market for neighboring Namibia. In Namibia the pastoral-dominated livestock sector contributes 3 percent of GDP and 28 percent of the agricultural GDP. Namibian pastoralists hold 80 percent of the national cattle herd, which contributes about one-third of income in traditional households.

Diversified use of livestock

Domestic animals have, for more than 10 thousand years, contributed to human needs for food and agricultural products such as meat, dairy products, eggs, fiber and leather, draft power and transport, manure to fertilise crops and for fuel. Livestock also play an important economic role as capital and for social security.

The value of livestock has also been clearly demonstrated for soil nutrient management, especially in soils in rapidly intensifying crop-livestock systems and in those already intensified. Integration of livestock into crop systems enhances smallholder farm productivity and profitability. The multiple uses of livestock also include their cultural roles in many societies. Hence, the use of animal resources varies considerably between various parts of the world as the social, environmental and other conditions for animal production differ enormously. Currently, an estimated 30 – 40% of the world's total agricultural output is produced by its variety of livestock. In some parts of the world, including some parts of Africa, where intensive mixed livestock-crop systems are practiced, as much as 70–80% of the farm income is from livestock. In such systems, much of the crops produced are fed to livestock and converted to high quality food for human consumption¹⁴.

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Livestock production developments and indicators

The different livestock population numbers have been converted into tropical livestock units (TLU) considering the metabolic size of animals of different species. Europe shows slightly decreased animal numbers for all the livestock species,

yet there is a surplus of livestock production in Europe today. Africa, Asia and South America show steady increases in TLU numbers. When contrasting the TLU numbers with the output of food products it emerges that high livestock numbers and TLU do not necessarily equate to high productivity. Neither do they reflect the overall utility functions that the various livestock play in each region. For example,

whereas cattle TLU in Africa is the same as a cattle TLU in Europe, on average the European cattle are almost 2–3 times bigger, and thus the two are not comparable from a productivity point of view. Secondly, the African/Asian animals are used for many more tasks than food production (e.g. draft, energy, social security etc.) compared to animals in temperate climates in the developed world¹⁵.



4. Linkages between the livestock sector and poverty

4.1 The density and distribution of poor livestock keepers: some data

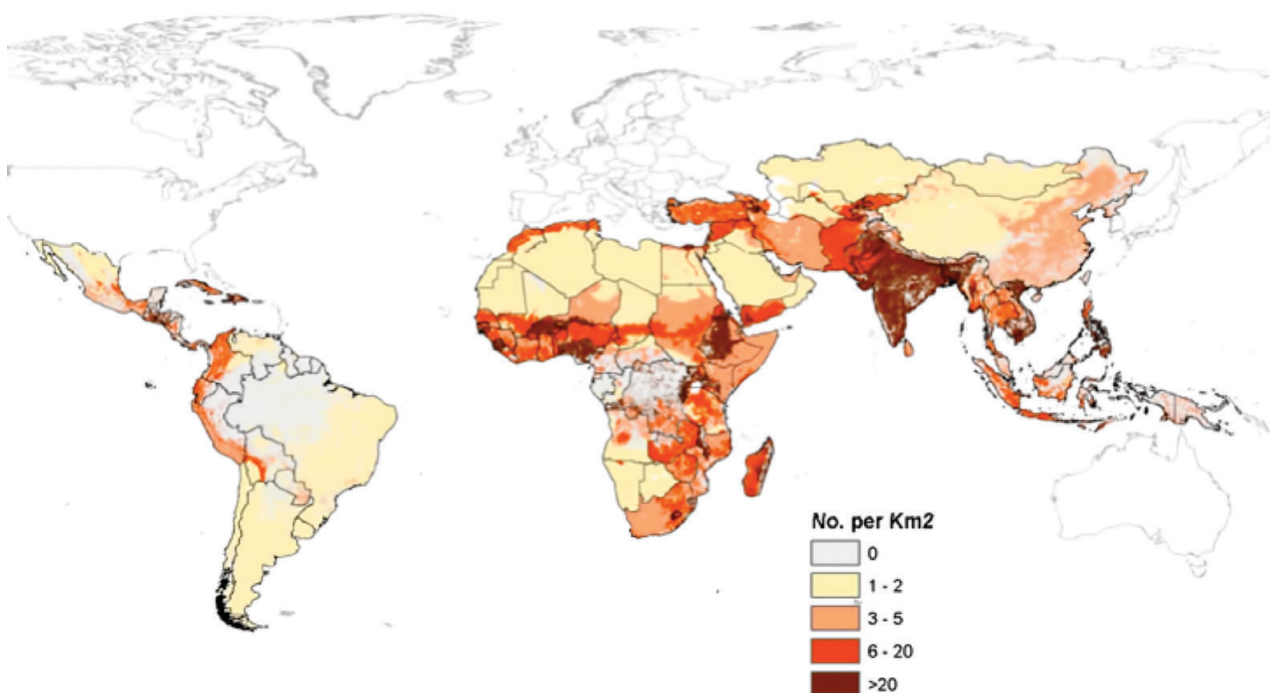
At the global level, information on the importance of livestock to rural livelihoods is difficult to find. Equally, in 2002 ILRI estimated the distribution of poverty among livestock keepers. Poverty rates clearly differ within and between production systems. The proportional importance of livestock to household income streams differs from one culture to another and within

production systems. For example, mixed crop-livestock farmers have multiple opportunities for obtaining income from a variety of sources; thus, income from livestock probably contributes a smaller proportion to their household food basket. By contrast, most pastoralists depend on livestock for a large proportion of their income, although this is changing.

Thus, any map of poverty among livestock keepers needs to account for the importance of livestock to income at the household level. In an attempt to estimate the distribution of poverty among livestock keepers, ILRI in 2002 used proportions

of poor livestock keepers as a percentage of the total poor by livestock production system and derived that the density of poor livestock keepers defined in this way is particularly high throughout South Asia (India, Pakistan and Bangladesh) and in parts of Sub-Saharan Africa (SSA), including Nigeria, Ethiopia, Uganda, Burundi, Rwanda, Malawi, and some systems in Kenya, South Africa and Niger, for example. These high densities appear to occur mostly in the mixed systems, these are the mixed irrigated systems in parts of SA, and the mixed rain-fed systems in parts of India and in most of SSA¹⁶.

Density of poor livestock keepers¹⁷



Kruska and Thornton, 2009.

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The map illustrates the differential poverty rates associated with particular production systems defined in some way and shows (ostensibly) numbers of 'poor livestock keepers' by system by country¹⁸.

It indicates that the density of poor livestock keepers defined in this way is particularly high

throughout South Asia (SA) - India, Pakistan and Bangladesh - and in parts of Sub-Saharan Africa (SSA), including Nigeria, Ethiopia, Uganda, Burundi, Rwanda, Malawi, and some systems in Kenya, South Africa and Niger, for example).

These high densities appear to occur mostly in the mixed systems these are the mixed irrigated systems in parts of SA, and the mixed rainfed systems in parts of India and in most of SSA.

In terms of the numbers of poor and, so far as the analysis is capable

of distinguishing, the numbers of poor livestock keepers, the critical regions are South Asia and Sub Saharan Africa. ILRI analysis indicates that while the rangeland systems contain relatively few poor (some 60 million), most of these households are dependent on livestock for their livelihoods. Almost half of the poor in rangeland systems are located in SSA. The mixed systems contain large numbers of poor (over 1 billion), and the numbers of poor who depend to some extent on livestock are considerable; the mixed irrigated systems contain approximately 103 million poor livestock keepers, and the mixed rainfed systems some 366 million poor livestock keepers.

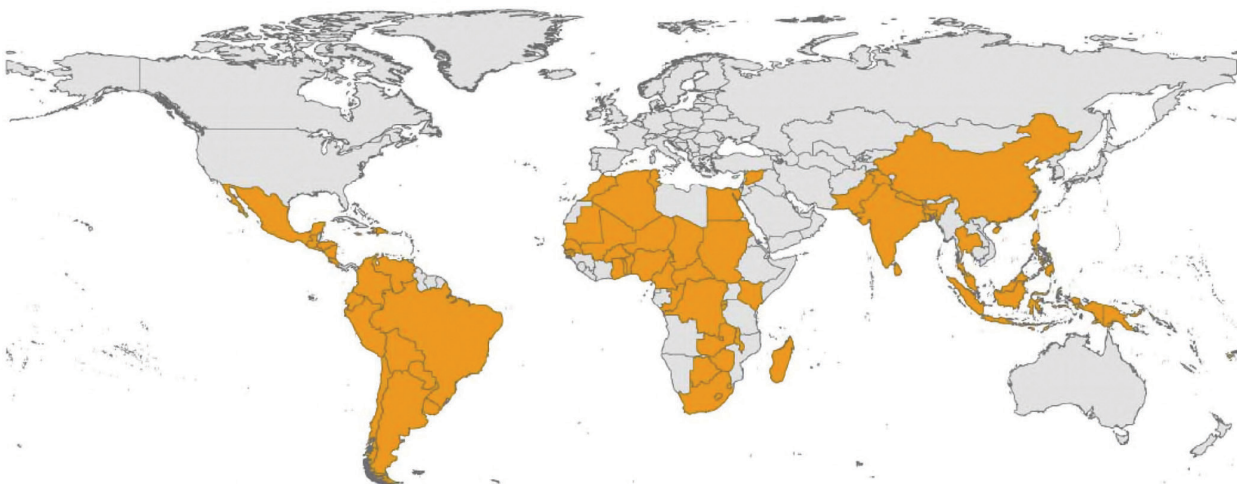
In terms of the magnitude of poverty and the importance of livestock to poor households in the developing world, this analysis suggests that there are at least 550 million poor livestock keepers globally¹⁹.

4.2 The role livestock plays in poverty reduction

A causal relationship between economic growth and livestock productivity in a sample of developing countries has been shown by research.

A wide array of economic literature has documented that increased agricultural productivity triggers economic growth and poverty alleviation in developing countries: given the share of livestock value-added in agriculture increases as economic development progresses, up to over 50% in most industrialized countries, it suggests that increases in livestock productivity act as a stimulus of economic growth on their own right.

Countries for which data for a causality test between growth in per capita GDP and productivity in the livestock sector was available²⁰



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Overall, the results indicate that the orthodox paradigm of increased agricultural productivity being a driver of economic growth in developing countries also applies to the livestock sector on its own right, possibly because of the increased contribution to the sector in agricultural value added along the process of economic development²¹.

Which implications?

With steadily increasing consumer demand for meat, milk and other livestock products, the majority of the rural poor have a significant stake in this sub-sector of agriculture that can contribute to poverty reduction both through enhanced crop yields and increased production of high value livestock products and by-products. This is particularly so in arid and semi-arid areas where crop production is not a viable alternative.

On the one hand, many livestock holders can benefit directly from the increasing market demand for livestock products. Demand growth rates of 3% for cereals are less than half the demand growth for high value livestock commodities, demand for which is increasing by 6-8% annually²². The benefits derived from economies of scale, leading to better resilience against disasters and calamities such as the ongoing bird flu outbreaks and favorable domestic trade support and policy environments may further favor industrialized livestock production systems in the future²³.

On the other hand, the poor can also benefit from the fact that livestock development creates demand for labor – both within and outside the sector – supports backward and

forward linkages such as the feed and processing industries, sustains trade balances, encourages food security through stronger supply and can lead to lower prices for livestock products.

The potential contribution of livestock development to the livelihood of the poor thus appears significant: home-consumption of livestock products, manure, draught and hauling power, as well as the sale of meat, milk, eggs, blood, fiber, hides and skins can significantly sustain the livelihood of poor livestock keepers and generate labor demand in rural areas²⁴.

At the same time, this process is predicted to drive the small producers out of the ever-increasing competitive global market, for both economic and biological reasons.

Although mixed crop-livestock production systems will persist in the foreseeable future, higher levels of intensification will be required, with increased use of livestock genotypes that are likely to respond better to the changes in production systems. Consequently, small-scale mixed crop-livestock production systems will eventually be confined to more remote areas, with poverty persisting and livestock playing a more central survival role and a key first step out of poverty. Under such conditions livestock on their own are unlikely to create overwhelming riches to their keepers²⁵.

Livestock plays and poverty reduction

Within the agricultural sector, investing in livestock sector development has increasingly been recognized as an effective way to

contribute to broad-based poverty reduction for macro- as well as micro-economic reasons.

At the macro-economic level it is anticipated that, as economic development proceeds, the livestock sector becomes the single largest contributor to agricultural GDP: in industrialized countries the livestock sector accounts for an average of 50% of agricultural value-added, compared to about 30% in today's developing countries. The reason underlying this trend is that once basic nutritional requirements are met, gains in real per caput income are primarily associated with food consumption shifts from low(er)-value, carbohydrate-rich food items to high(er)-value, protein-rich food items, such as meat, eggs, and dairy products.

It is thus not surprising that the livestock sector has been growing rapidly in most developing countries. Due to overall economic growth and increasing disposable incomes, the annual growth rates in consumption and production of meat and milk in developing countries averaged between 3.5 and 4.0% in the decade 1995 to 2005. This is at least double the growth rates for the major staple foods over the same period, which range between 1.4 and 2.0%.

At the micro-economic level, a large share of the rural poor at least partly depends on livestock for their livelihoods. These poor include pastoralists and agro-pastoralists, but also many mixed crop-livestock farmers as well as the landless, for which livestock provide an avenue to participate in food production. Preliminary estimates of the

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International Livestock Research Institute (ILRI) suggest that about 65% of the rural poor keep livestock. An FAO analysis of 15 nationally-representative household surveys shows that between 46% and

82% of rural households in Asia, Africa and Latin America keep livestock. Furthermore, the ownership of livestock – such as cattle, buffalo, sheep, goats, pigs and poultry – appears more evenly distributed among the different income groups, including the poor, than agricultural land. For instance, about 65% of the poorest households are estimated to own farm animals in Ghana, 74% in Madagascar, 55% in Bangladesh, 85% in Viet Nam, 87% in Ecuador and 59% in Nicaragua.

Livestock significantly contribute to the livelihoods of the poor. The sale of live animals and livestock products often constitutes a substantial portion of the cash income of the poor, which is essential for meeting obligations such as school or medical fees. Livestock function as a source of fertilizer, manure paddies for fuel, ploughing, draft power and hauling services, and thereby raise agricultural productivity and alleviate agricultural labor constraints. In the “household economy”, livestock constitute a buffer to risk, a form of savings, and confer a certain social status, while, in the broader economic context, livestock generate additional employment and income opportunities.

Livestock provide a valuable source of nutrient-rich food for home-consumption: animal source food (ASF) is particularly appropriate for nutritionally vulnerable groups,

such as young children, the elderly, and pregnant women. Nutrients in ASF (e.g. iron and zinc) are of greater bioavailability than those from plant sources. Moreover, meat is an effective dietary enhancer of iron absorption. The high nutrient density of ASF makes them valuable as food-based interventions for populations that have difficulty absorbing large volumes of food, particularly for very young children (who have limited gastric capacity relative to their high nutritional requirements during this stage of rapid growth).

The expansion of livestock markets: which impact on the poor?

Given the co-location of demand- and supply-growth of ASF, the current expansion of markets for livestock products has the potential to benefit a significant share of the poor who depend on livestock for their livelihoods. However, this potential contribution to poverty reduction associated with livestock sector development, both through direct and indirect effects, currently remains largely untapped by national policy makers and development agencies.

Smallholder livestock keepers are disadvantaged by:

- Market and institutional imperfections resulting in inadequate access to animal health services or credit are pervasive in rural and peri-urban areas of developing countries and

constrain the livestock-dependent poor in making better use of their livestock assets.

- The prevailing policy paradigm, in which livestock are considered an “appendage” to rather than an essential component of agriculture, and which rarely addresses livestock related market imperfections, usually favors large-scale over small-scale operators, while the trend towards industrialization and concentration along the livestock supply chains at national, regional and international level creates additional pressure on small-scale operators and may exacerbate rural poverty and out-migration.
- Unregulated growth of the livestock sector can have negative consequences, for example through public health hazards associated with zoonotic diseases, through environmental degradation by unduly high grazing pressures on rangeland, or through pollution by livestock waste. Such externalities disproportionately affect the poor, who heavily depend on the natural resource base for their basic needs and whose capacity to cope with shocks is limited²⁶.

The trend of intensification and industrialization underway in the livestock sector can potentially have both positive and negative effects for the poor. For the rural poor the issue is mainly the sustainability and profitability of their farming enterprise, but for both rural and urban poor, the cost of basic staples is also affected.

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Some authors have argued that the livestock revolution might be good for the poor. This projection is based on the assumption that it will be easier for the poor to improve their income when the overall pie is growing in a sector where they already have a major stake, and intensification might provide economically viable alternatives for their labor other than just crops. However, the

increased intensification of livestock production, especially the increased concentration and vertical integration of input supply, production, and processing that accompanies it, could provide a serious threat to smallholder production, since they may not be able to compete with the more efficient industrial units.

Considerable economies of scale exist, especially in poultry and

pig production, housing, input procurement, and disease control. However, the costs of antibiotic resistance and its spillover into public health, the cost of unsustainable feeding practices, and occasional large epidemics such as the outbreaks of classical swine fever and foot-and-mouth disease also demonstrate the drawbacks of large, intensive production units²⁷.

5. Livestock sector developments: which challenges?

Livestock-sector development generates substantial risks and negative externalities as well as opportunities, all of which must be addressed by public policy. These externalities spill over from individual producers into society and become manifest in environmental impacts, in public health risks, and in the frequent inability of smallholder producers to meet more exacting consumer and industry standards.

5.1 Livestock and the environment

Livestock impacts land and water in many ways. On the negative side, overgrazing by ruminant livestock leads to nutrient depletion, soil compaction, and ultimately to soil denudation and erosion. In addition, livestock's feed-grain and oilseed requirements lead to the expansion of the arable agricultural frontier, in particular in sub humid and humid tropical forest areas, resulting in soil erosion and biodiversity loss. On the positive side, livestock can enhance soil fertility, and, through animal traction, improve the soil's physical qualities²⁸.

It is estimated that the livestock sector produces 18% of anthropogenic carbon dioxide (CO₂), and that, depending on the estimate about 20 to 70% of the world's grasslands are degraded by overgrazing. For example, in the United States, the sector is responsible for about one third of the nitrogen and phosphate loading of freshwater resources. The sector is also a major force behind the loss of biodiversity from some of the world's most diverse ecosystems.

In arid zones, the prevailing pastoral systems are already producing at maximum capacity, but their growing population is affected by a reduction in grazing areas, leading to a downward cycle of land degradation and poverty. There are too many people for the available animals. On the other hand, the annual vegetation of these ecosystems has proven to be remarkably resilient.

Livestock contributes to soil degradation in the arid areas through overgrazing and soil compacting. However, there is still a strong debate on the degree and reversibility of such livestock-induced land degradation. Current scientific evidence points to the strong resilience of the annual vegetation of these areas and the high level of efficiency with which the tropical arid rangelands are used.

Moreover, livestock is only one of the many causes of land degradation. Cropping in marginal areas and firewood cutting are also important causes. Livestock-induced land degradation occurs mostly around settlement areas, water points, and along livestock trek routes.

In addition, livestock-related land degradation is mostly induced in times of drought, when the perennial vegetation of trees and shrubs is cut for fodder²⁹.

As far as humid zones are concerned, livestock ranching has for a long time been associated with the deforestation of tropical rainforests³⁰. However, this connection has gained increased significance in recent years, as the rate of deforestation

increased and the role of livestock in the process became more pronounced. In the Amazon area, deforestation has accelerated from about 18,000 km² per year over the 1990–2000 decade, to about 25,000 km² per year in recent years, and grew at 0.6% during 2000–2005.

It is estimated that in 2010, livestock in South America will be grazing on 24 million hectares, which were still forests in 2000; 60 to 70% of the conversion in the Amazon area is for cattle ranching or feed-grain production; the rest is mostly for small-scale subsistence farming. The Central American picture is more varied. Costa Rica has an expanding forest area and Panama and Colombia have a very slow deforestation rate of 0.1% per year, but countries such as El Salvador and Guatemala have rates of more than 1% per year. Dairy and crop farming seem to be the driving forces. In Asia and Central Africa, legal and illegal timber extraction is the main driving force and livestock development plays only a minor role in the deforestation of the tropical rainforest.

As far as carbon emissions are concerned, the conversion of tropical forest into cropland causes the release of large quantities of CO₂. Amazonian evergreen forests account for about 10% of the world's terrestrial primary productivity and 10% of the carbon stored. It is estimated that the conversion of tropical rainforest to grassland for livestock ranching annually produced about 1.7 billion tons of CO₂ equivalent and 0.7 billion tons for the conversion of tropical forest

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into cropland for livestock feed (corn and soybean)³¹.

An estimation of livelihoods transition in Africa due to climate change

The impacts of climate change on agricultural systems are likely to be highly heterogeneous, both spatially and temporally. Some places in the highlands of sub-Saharan Africa (SSA) may see improvements in conditions for crop growth as a result of increasing temperatures and rainfall amounts, and there may be opportunities for smallholders to intensify and/or diversify production in these areas. There are other places where the changing climate means that the livelihood strategies of rural people will have to change, to preserve food security and provide income generating options. These are likely to include areas of Africa that are already marginal for crop production. As these become increasingly marginal, then livestock may provide an alternative to cropping. In many of the semiarid systems in sub-Saharan Africa, livestock production enables farmers to diversify incomes, helping to reduce income variability—indeed, livestock are a crucial coping mechanism for poor and vulnerable people in variable environments.

Some authors suggest that areas that are already marginal for cropping are likely to become increasingly marginal, and that the people who depend for their livelihoods in these marginal areas are already much poorer than average. They suggest that populations in more remote marginal areas will be disproportionately affected by climate change—as these impacts

take hold, the poorest will be the worst affected, all other things being equal. In such situations, in which climate change impacts will tend to negatively affect the production potential of areas where particularly poor populations are located³².

The effects of climate change will be manifested in the increasing need to find renewable forms of energy and the growing human population displacing grazing livestock systems. Recurring droughts in the Horn of Africa have forced poor pastoralists and agro-pastoralists to sell animals that they might not normally choose to sell, to diversify their herds and to rely on a wider income range than livestock ownership.^{32a}

5.2 Livestock and human health: exploring the linkages

The linkages between livestock and health are significant, particularly for the poor, whether as livestock raisers or as consumers of meat and milk, or even as users of the environment. The processes of livestock production and consumption bring both benefits and problems for human health.

Benefits of livestock for human health and nutrition

Animal source foods (ASFs) such as meat, milk, and eggs are guaranteed sources of high-quality protein and essential structural fats. They are also a major source of highly bioavailable (that is, easily absorbed and used by the body) essential micronutrients, such as iron, zinc, vitamin A, and

calcium, that are either lacking or not as bioavailable in many developing-country diets that are predominantly composed of cereals. These nutrients are essential to maintain adequate growth and development.

Livestock production can also have positive health effects by improving the livelihoods of the poor. Mixed crop and livestock production systems provide a critical source of income to 84% of the world's rural poor. In India more than 70 million farm families rely directly on micro level dairying for employment and income, and in Viet Nam 60–70% of all rural households raise chickens and pigs. Many of these mixed-farm households have little access to other assets or resources, and therefore the animals they keep provide them with a pathway out of poverty. Dairy products, eggs, wool, leather goods, and even manure can be traded for cereals. The prevailing trend of industrial livestock production in recent years may therefore threaten the positive impact of livestock on the livelihoods of many of the world's poor³³.

Risks of livestock for human health

Livestock production and consumption can lead to four main types of human health risks: (1) diseases transmitted from livestock to humans; (2) environmental pollution; (3) food borne diseases and risks; and (4) diet-related chronic diseases.

Diseases transmitted from livestock to humans. Zoonoses are diseases that can be transmitted from animals to humans via bacteria, parasites, viruses, and unconventional agents. The more common and serious

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zoonoses caused by infectious agents include salmonellosis, swineherds' disease caused by *Leptospira* species, brucellosis, the hepatitis E virus (HEV), bovine spongiform encephalopathy (BSE) and the variant Creutzfeldt-Jakob disease (vCJD), Rift Valley fever (RVF), adult meningitis caused by *Streptococcus suis*, and the influenza virus.

In the past, attempts at eradicating zoonoses associated with livestock included quarantine, vaccination, depopulation, cleaning and disinfection of farms, and mass culling of animals. Today, unconventional measures are being suggested, such as Hazard Analysis and Critical Control Point Program (HACCP) controls by food processors, bans on imports of live animals, and early warning systems. Bird flu is a real concern because there is no tried and tested vaccine, and while the experimental licensed drug oseltamivir phosphate appears to work, the world does not have enough for widespread use. The death of livestock from disease epidemics severely impoverishes poor households, as does the ill health or death of the breadwinner from disease. Thus, for small livestock-keeping households in developing countries to ascend from poverty, the provision of human and animal health care is crucial³⁴.

Food borne diseases and risks. Several deadly bacteria are associated with the consumption of ill-prepared livestock products, notably *Campylobacter*, *Salmonella*, *E. coli* O157:H7, and *Enterococcus*. Antibiotics are used widely in developed countries in intensive

livestock operations and are used increasingly in developing countries as growth promoters and to prevent the spread of infection. Though they have the potential benefit of increasing the availability of ASFs to poor families in developing countries, a recent study estimated that the benefit was negligible. Antibiotics are also a food borne public health risk: there are concerns that the use of antibiotics in animals could lead to the emergence of strains of resistant pathogens that also cause diseases in humans, thus reducing the ability to treat human disease. The United States and European Union banned the use of certain antibiotics as growth promoters in the late 1990s; by 2006 all antibiotic growth promoters had been banned in the United Kingdom.

Concern about livestock-related food borne diseases has led industrialized countries to develop strict food safety standards, but compliance with high-technology, process-based food safety standards, like HACCP, are prohibitively costly for many small, developing- country producers. Unless addressed, this situation could lead to negative feedback effects on income and poverty reduction³⁵.

Answering these challenges will involve selective priority-setting by responsible public institutions. Mitigating the negative impacts of the livestock sector in such a way that the positive contributions of the sector are allowed to materialize will entail substantive public policy and investment. While capitalizing on positive externalities relies principally on private investment, the effectiveness of that investment in

producing positive impacts depends in large measure on the creation of a broader enabling environment. This enabling environment is very much the province of public policy, and would address such matters as tenure security, the provision of public infrastructure, and other factors that influence the investment climate³⁶.

5.3. Livestock and animal health: a threat to livelihoods and trade

About 46 million cattle are at risk of contracting tsetse-transmitted trypanosomiasis in Africa. About 3 million cattle die of Animal African Trypanosomiasis (AAT) annually. In the tsetse- infested areas, trypanosomiasis reduces meat and milk production by at least 50%. It also limits opportunities for farmers in terms of crop and livestock production: there is less efficient nutrient cycling, less access to animal traction, lower income from milk and meat sales and less access to liquid capital. The economic losses in cattle production alone are between US\$1,000 and 1,200 million annually, while total losses, in terms of agricultural GDP in Africa, amount to about US\$4,750,000 million per year³⁷.

Animal diseases constitute a major constraint to livestock production and trade and the safe utilization of animal products worldwide. For the poor, the impact of livestock disease on lives and livelihoods is particularly severe. Indeed, an

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outbreak of disease can mean the difference between sufficient food stocks and food insecurity, between having a secure income to the loss of key household assets. The presence of livestock disease also makes it difficult for the poor to participate in local, national and regional livestock trade. Equally importantly, animal health and human health are intricately related. Zoonotic disease can have a major influence on the health and wellbeing of the households involved. Hence, livestock disease has a major influence on poverty outcomes.

To address the impact of livestock disease on the poor, issues relating to the delivery of animal healthcare services must also be dealt with. Furthermore, actions for development take place in a wider policy environment. Hence, national

and regional policies regarding the livestock health sector in general also need to be considered.

One of the many challenges facing pastoralists and smallholder farmers across Africa is lack of information on animal health and access to medicines and vaccines. With poor information-sharing systems, pastoralists and smallholder farmers are often cut off from development initiatives that are transforming livestock production in other parts of the world. Farmers need up-to-date and accurate information on how best to care for their animals, new animal health practices, the best ways to treat diseases and news of the latest drugs to reach the market.

Animal health services across sub-Saharan Africa need to be fast, effective and affordable, but

they are severely compromised by privatization of the veterinary sector. Another problem is a lack of trained animal health professionals. Controlling livestock disease now relies on farmers, animal health assistants and extension workers, who are often ill equipped for the task. At the same time, the livestock sector is expanding due to increasing demands for livestock food products and urbanization. Improving the delivery of veterinary information is essential for supporting rural people to maintain their livestock. This issue is hugely important globally. Formalizing community-based animal health workers (CAHWs) who are trained to assist with animal health care in rural areas in Africa where few veterinarians are willing to work is key.³⁸

6. Policy challenges

Natural resource management

Grasslands cover more than one-fourth of the world's terrestrial surface, and the livestock sector is the largest user of agricultural land. The effects of livestock grazing on land are manifold, and depend mainly on the prevailing ecosystem. In the arid rangelands, the extent of land degradation is subject to considerable debate. Estimates vary, identifying between 20 and 70% of arid rangelands as being degraded.

What is clear is that arid ecosystems are being used at full capacity and that they are highly resilient. Most arid rangelands are common property, and public policy and development programs can play a major role in their management. Developing alternative employment to stimulate outmigration is a priority. Programs that facilitate herd mobility would effectively increase the resilience of pastoral systems. Insurance services and destocking and restocking facilities would help producers manage risk. Index-based livestock insurance (IBLI) insures pastoralists in arid and semi-arid regions of northern Kenya and southern Ethiopia against the livestock mortality that often follows severe or catastrophic drought, such as that which gripped the Horn of Africa in 2011. During drought, widespread livestock mortality is caused primarily by forage scarcity, so IBLI tracks local forage conditions using real-time, publicly available satellite data ("greenness maps") to determine the severity of drought, predict area-average livestock losses, and calculate policyholders' indemnity payments.

When the contractual threshold of forage loss or predicted livestock mortality is reached, the IBLI contract is triggered, and policyholders receive a payout proportionate to the number and type of animals insured and the severity of vegetative loss and expected her loss in the policyholder's geographic area. IBLI aims to serve as a productive safety net for households affected by livestock loss and help them effectively manage the resulting shock. It may also incentivize investment in livestock and promote financial deepening in pastoral areas.^{38b}

Payment for environmental services (PES) would create alternative income sources and reorient pastoral production systems from their narrow emphasis on animal products to land management.

In the humid tropics, livestock-induced deforestation is driven by technological advances and the fast-growing demand for feed grains. The earlier driving force of subsidization of cattle ranching has greatly diminished. The recommended policies and investments require a combination of regulation (zoning), incentives (PES), and research for alternative feeding systems. While the share of water withdrawal (7%) and depletion (15%) by the livestock sector is still relatively small, the current and projected worldwide water shortages also warrant more attention to reducing the sector's water requirements. Policy and investment should prioritize increasing the efficiency of irrigation and reducing pollution from livestock waste.

About three-quarters of the meat and milk produced in the developing world come from mixed farming systems, and a large part of the remainder comes from fast-growing high-input-high-output industrial systems. Recycling of nutrient and livestock waste is the chief environmental issue related to these production systems. In principle, they use the livestock sector's best system of recycling, with livestock by-products (manure, traction) essential for crop farmers and crop residues critical for livestock farmers as livestock feed. However, regional imbalances are common, with excessive concentration in some areas. The availability of infrastructure defines the geographic location of production. In earlier stages of development, processing tends to concentrate around urban centers. As infrastructure improves, processing shifts to feed-producing areas. A number of policy options are available to promote a more even geographic distribution of livestock. These policies generally pursue a strategy of intensification without concentration, encouraging more intensive forms of production, but preventing the intensive production units from concentrating in one area. The negative environmental impact of the sector would be mitigated by improvements in infrastructure, and a level playing field for waste recycling such as organic fertilizer and biogas-generated power—including the use of carbon trading schemes³⁹

Global climate change

In light of the current debate on global climate change, greenhouse

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gas emissions from the livestock sector are a critical priority. And the figures are staggering. Considering emissions along the entire commodity chain, the livestock sector currently contributes 18% of total human-induced greenhouse gas emission equivalents, including about 9% of total carbon dioxide (CO₂), 37% of methane (CH₄), and 65% of nitrous oxide (N₂O) emissions. This exceeds the emissions of the global-transport sector. As a global public good, urgent action by the global community is required. This should start with creating awareness at the highest political levels because livestock emissions have not yet been addressed by global decision-making institutions.

Raising high-level awareness should lead to an active participation of livestock sector stakeholders in the post-Kyoto negotiations. Technical options include: (a) carbon sequestration on grazing land; (b) reduction of methane emissions from low-input ruminant production, in particular, dairy, through improved feeding; and (c) reduction of methane and nitrous oxide emissions from animal waste, through energy recovery and improved waste management⁴⁰.

Public health

While livestock products are critical in the diet of vulnerable groups in the developing world, the livestock sector also poses major health risks. Over the past 15 years,

75% of the human diseases that have emerged have been of animal origin. Livestock-induced foodborne

diseases affect millions. Meat has also become an important factor in the obesity crisis, which has begun to affect the developing world. In addition, the so-called diseases of trade, such as foot-and-mouth disease and classical swine fever, cause billions of dollars in economic losses. The recent emergence of highly pathogenic avian influenza has focused the world's attention on the need for efficient early warning response and control systems. The integration of human and animal health systems in an ecosystems context, as pursued with the One World, One Health strategy, would be an important overarching organizing framework, but one that needs to be made operational. At the global level, improved coordination and risk-management tools (compensation, communication) need to be developed and implemented. Increased international support to technology development for the control of the "diseases of the poor" is also needed. At the national level, emphasis needs to be placed on strengthening the public-good services of surveillance and early warning and early response to disease outbreaks⁴¹.

Human health

The key to managing the linkages between livestock and health is to promote the benefits and mitigate the problems as they affect poor and vulnerable groups.

One problem that must be mitigated is the spread of zoonoses. Effective surveillance, prevention, and control of zoonoses are indispensable and require improved coordination

among farmers, public health agencies, and animal disease control officials, as well as organizations involved in food and water safety. International organizations and affluent countries must strengthen the capacities of resource-poor countries and other partners to detect, control, and prevent zoonoses. There must also be systematic integration between public health infrastructure and policy, as well as between human and animal health surveillance and control. To enhance global surveillance and response to zoonotic diseases, the Food and Agriculture Organization of the United Nations, the World Organisation for Animal Health, and the World Health Organization have jointly initiated a Global Early Warning System (GLEWS) for transboundary animal diseases. Sharing the information generated from this initiative is crucial.

In developing countries, smallholders have only rudimentary methods of protecting themselves from diseases and preventing their spread to neighboring farms and communities. There may be a need to rethink the trends toward wholesale privatization of animal health services and public disinvestment in these services and to look more deeply into public and private partnerships. Although the developed countries have put in place extensive regulatory and market-based measures to mitigate environmental damage from intensive livestock production in urban and peri-urban centers, in developing countries both monitoring and compliance costs are prohibitive. It may be necessary to rethink concentrated livestock

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feeding operations to better handle waste disposal problems linked to the ill health of livestock keepers and the community at large. Less intensive livestock operations could also potentially reduce animals' susceptibility to infection and disease and reduce the indiscriminate use of antibiotics.

Overall, there should be no need for conflict among the goals of health, environmental safety, and wealth creation; rather they should be viewed as ideal complements⁴².

Poverty

There is a significant risk that livestock sector development will exclude smallholders. Access to the fast-growing and more sophisticated market for meat and milk products is dependent on higher quality and stricter safety standards, greater uniformity of the product, stricter reliability of supply, and verifiability

of origin. Owing to the economies of scale enjoyed by large producers, practically all these standards carry higher costs per unit product for smallholders. Small producers and processors risk being crowded out of more remunerative markets. Quality and safety standards also provide opportunities and can add value and generate employment along the supply chain. Capitalizing on these opportunities will require support for collective action through cooperatives, associations, or contract farming and vertical integration.

For contract farming to function well in this capacity, a sound legal framework is required to ensure the proper enforcement of contracts. For cooperatives to develop properly, government interference should be avoided. Public-safety standards should be set with careful attention to the government's capacity to enforce them, to the relevance of the public health risk they seek

to address, and to the overall competitiveness of the market.

Producers generally have little leverage in the setting of private sector standards. Finally, smallholders should be assured of equal treatment in the incentives frameworks—for instance, in subsidies⁴³.

Policy makers in developing countries should aim to direct livestock sector development on a pathway which is sustainable and contributes to poverty reduction, i.e. which under current circumstances benefits smallholder producers, who will continue to constitute a significant proportion of livestock keepers for several decades to come, as well as other small-scale actors along the livestock value chain, which are intimately affected by livestock sector development, without compromising food safety⁴⁴.



7. The role of livestock in the development agenda

As noted above, unregulated, livestock generates significant negative externalities. It contributes to land degradation and water pollution and to the erosion of biodiversity, and it is a major source of greenhouse gas emissions. It poses serious risks to public health, including diseases such as highly pathogenic avian influenza (HPAI) and bovine spongiform encephalopathy (BSE).

As a recent World Bank report suggests, growth in the livestock sector is driven almost entirely by private investment. In terms of public sector investment and policy it has been the object of “benign neglect,” the results of which are often anything but benign.

The neglect of livestock in public policy has also led to the exclusion of smallholders from the benefits of growth in this sector. These adverse impacts and missed opportunities are likely to continue unless public policy and investment in the sector changes.

Left entirely to the market, incentives often lead producers to make decisions contrary to larger social interests such as public health. Market failures can force competing small producers out of the market and make market entry difficult, if not impossible, for many prospective producers. These market failures need to be rectified if the potential benefits of livestock-sector development are to be realized among smallholders and the communities to which they belong. Appropriate policies and effectively enforced regulations are needed

to mitigate the risks and negative impacts of the sector on public health and on the environment. Active public sector engagement is generally required to bring about some level of convergence between the incentives of individual producers and the interests of society⁴⁵.

Towards a new approach?

A variety of factors led to public sector disengagement from the livestock sector and account for the low levels of public funding for livestock development, both by national governments and international development agencies. Recognition of the fact that growth in the sector is led by private investment, and the departure of global donor funding for parastatal entities during the early 1990s, contributed to a general neglect of the public goods quality of livestock production and consumption—including some that are global public goods. Livestock is also notable for being an unpopular sector throughout much of the community of nongovernmental and civil society organizations, which gained considerable voice during the latter 1990s when a number of international development agencies pursued broader engagement with them. Anti-livestock advocacy by these groups and others was also effective in reaching policy makers, who became more reluctant to devote public resources to oversight of the sector.

The results of this disengagement by governments and the international community have been perverse. Owing to the lack of effective policies and regulatory frameworks, livestock remains both a major contributor to pollution and greenhouse gas emissions and a major source of risk to public health.

A concerted effort combining major investments in awareness-raising at the international, national, and local levels, with policy changes and investment, are clearly required.

Awareness-raising needs to cover both the positive and negative effects of the livestock sector. If it overemphasizes the sector’s negative effects, it will likely discourage the public investments that are necessary. If it overemphasizes the sector’s positive effects, it is likely to be ineffective and perceived as advocacy by parties with interests within the sector. Both dangers are clear based on past experience.

Responsible awareness-raising must also point to the reality of increasing demand in the developing world without expressing contempt toward the often laudable and rational pleas of those advocating reduced consumption.

A number of directions warrant high priority:

- Increase, through the international and national press, general awareness for the need for action.
- Integrate, through active lobbying, environmental and

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public health issues (and in particular the global public goods of emerging infectious zoonotic diseases and GHG emission) into the international dialogue on environment and health issues and upcoming negotiations.

- Seek to integrate the livestock sector, and in particular the fate of poor livestock keepers, into developing country policy documents, such as the Poverty Reduction Strategy Papers (PRSPs). Creating tools to enable the sector stakeholders to make the case more effectively to policymakers, such as prepared by the World Organization for Animal Health (OIE) for Performance of Veterinary Services (PVS), can be a major help⁴⁶.

The EU Experts' Group on Livestock Matters in Developing Countries (ELIDEV) experience

The EU Experts' Group on Livestock Matters in Developing Countries (ELIDEV) was succeeding the Group created by the Commission with the Member States in the mid- eighties to firstly deal with Rinderpest in Africa and the PARC programme (Pan-African Rinderpest Campaign). Over years, the Group has been involved in the preparation and the implementation of main livestock development programmes (such as the Pan-African Programme for the control of Epizootics - PACE). Then it became very active in sectoral (e.g. Agricultural Sector Investment Programmes, the Livestock - Environment and Development initiative -LEAD) as well as in strategy and policy issues.

At that point of its history, the Group felt that it had to define and to agree upon detailed Terms of reference and to review its composition. As the result of active consultations amongst the Members of the Group, TOR's were defined in 2002-2003. It was also decided that the Group will be composed of both policy and technical competencies from each Member State and the EC⁴⁷.

The overall objective of the group is support the contribution of livestock farming and trading to the achievement of the Millennium Development Goals fitting with the Declaration of Paris on aid efficiency.

In a context of crisis due to diseases outbreaks, food insecurity and Overseas Development Assistance contraction, and poor attention paid to the Livestock sector in Development policies and strategies, the Group decided its goal could be met by increasing the awareness on the positive aspects and contribution of livestock production and animal products to development, food sovereignty, food security, and the provision of quality protein food to the populations in coherent, complementary and co-ordinated European Commission and Member States policies and programmes.

For these reasons the ELIDEV Group launched an initiative in 2008 aiming at focusing on advocacy for the animal production sector in order to raise awareness on Livestock issues among decision makers and balance the negative perception of the sector. Recognizing that diverse food sources are needed to feed a diverse and growing

world population as it faces climate change, that consumption of meat levels in the North are neither sustainable nor healthy, it is essential when shaping policies, to balance the demands of developed countries with the needs of developing countries. Therefore, key advocacy objectives are to (i) engage policymakers in a debate on how to limit the environmental impact and footprint of industrial livestock farming without reducing poor people's capacity to feed themselves (ii) place livestock systems at the heart of the international climate change agenda (iii) secure funding from food security programmes to harness livestock's role as a key source of nutrition and pathway out of poverty (iv) invest in research and development for sustainable ways of optimising livestock production in emerging economies to respond to the demands of a growing population (v) shift the focus of livestock production from quantity to quality for healthy and balanced diets (vi) support pastoralist animal keepers in unique ecosystems to manage natural resources and preserve biodiversity (vii) encourage cooperation between different professional sectors to integrate environmental management with medicine, veterinary and social sciences, urban planning and public health.

The demand for livestock products will continue to grow and it will become increasingly challenging to meet the demand. It is estimated that as soon as 2050, there will be 9.15 billion people to feed, 1.3 times as many as in 2010, of which the most will be urban. Based on estimates

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published in 2006, the expanded population is expected to consume almost twice as much animal protein as today. The largest growth is expected in developing countries, which are anticipated to overtake developed countries in their total consumption of livestock products.⁴⁸

Part of any increase will need to be driven by efforts to convert more of the existing natural resources into food on the place – efficiency will need to improve and waste of natural resources have to be reduced. Waste occurs throughout livestock

food systems and can be due to production inefficiency resulting from disease or poor feeding.⁴⁹

Today's livestock sector must be prepared to respond with a shift in focus and investment towards building greater resilience into food systems, meaning an increased ability to deal with change and recover from shocks. Climate change is creating new shocks and trends, both of which are certain yet difficult to predict and have the potential to make the production environment extremely uncertain.⁵⁰

For the future, the private and public sectors, research and technology development will have a significant role. Funding must be increased, in order to improve efficiency, improve basic infrastructure, conduct research that adapt a long-term view or that benefits the poor, support animal health services in remote areas.

Policy needs to provide regulation and standards for animal health as well guide and support the use of marginal lands and recycling livestock waste.⁵¹

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Resources available online (English and French)

En italique les documents disponibles en français

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CAADP

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Research and Development Institute

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

CGIAR - Consultative Group on
International Agricultural Research

www.cgiar.org

CIPAV - Centre for the Study
of Sustainable Agricultural and
Livestock Production Systems

www.cipav.org.co

CIRAD - Economie et politiques
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<http://epe.cirad.fr/>

*CIRDES - Centre International de
Recherche-Développement sur
l'Élevage en zone Subhumide*

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

CRSP - Global Livestock
Collaborative Research Support
Program

<http://glcrsp.ucdavis.edu/>

LINKS - Livestock Information
Network and Knowledge System

<http://links.tamu.edu/Pages/Public/Home.aspx>

CTA - Technical Centre for
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<http://www.cta.int/>

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IDS - Livestock and pastoralism

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IFAD - Livestock and rangelands

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Rural poverty knowledge base
- Livestock and rangeland
development

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IFPRI - International Food Policy
Research Institute
www.ifpri.org

IGAD - Intergovernmental Authority
on Development
<http://www.igad.org/>

Livestock Policy Initiative
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Acronyms

AAT	Animal African Trypanosomiasis
ADB	African Development Bank
ALive	African Livestock partnership
ASF	Animal source food
AU	African Union
AU-IBAR	AU Inter-African Bureau for Animal Resources
BSE	bovine spongiform encephalopathy
BTB	Bovine tuberculosis
CAADP	Comprehensive African Agricultural Development Plan (AU)
CAHWs	Community-based animal health workers
COMESA	The Common Market for Eastern and Southern Africa
EA	East Asia
EC	European Commission
ELIDEV EU	Experts' Group on Livestock Matters in Developing Countries
FEWS	Famine Early Warning System (USAID)
FMD	Foot-and-mouth disease
GDP	Gross Domestic Product
GIS	Geographical Information System
GLC	Global land cover
GLEWS	Global Early Warning System
GLiPHA	Global Livestock Production and Health Atlas
GLIS	Global Livestock Information System
GLW	Gridded livestock of the world
GRID	Global Resource Information Database (UNEP)
HACCP	Hazard Analysis and Critical Control Point Program HEV hepatitis E virus

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HPAI	highly pathogenic avian influenza
IGAD	Intergovernmental Authority on Development
IIASA	International Institute for Applied Systems Analysis
ILRI	International Livestock Research Institute
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated pest management
IUCN	International Union for the Conservation of Nature
LAC	Latin America and the Caribbean
LDPS-2	Livestock Development Planning System, Version 2
LEGS	Livestock Emergency Guidelines and Standards
LG	Livestock only, rangeland-based
LGA	Livestock only - arid/semi-arid tropics and subtropics
LGH	Livestock only - humid/subhumid tropics and subtropics
LGT	Livestock only - temperate and tropical highlands
LID	Livestock In Development (UK)
LINKS	Livestock Information Network and Knowledge System
LLM	Landless mono-gastric system
LLR	Landless ruminant system
LMS	Landless metropolitan system
LS	Landless system in high population density areas
MI	Mixed irrigated
MIA	Mixed irrigated - arid/semi-arid tropics and subtropics
MIH	Mixed irrigated - humid/subhumid tropics and subtropics
MIT	Mixed irrigated - temperate and tropical highlands

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MODIS	Moderate resolution imaging spectroradiometer
MR	Mixed rainfed
MRA	Mixed rainfed - arid/semi-arid tropics and subtropics
MRH	Mixed rainfed - humid/subhumid tropics and subtropics
MRT	Mixed rainfed - temperate and tropical highlands
NEPAD	New Partnership for Africa's Development
OECD	Organization for Economic Co-operation and Development
OIE	World Organisation for Animal Health
PAAT	Programme Against African Trypanosomiasis
PACE	Pan-African Programme for the control of Epizootics
PARC	Pan-African Rinderpest Campaign
PES	Payment for environmental services
PPLPI	Pro-Poor Livestock Policy Initiative
PVS	Performance of Veterinary Services
REI	Regional Economic Integration
PRSP	Poverty Reduction Strategy Paper
RELPA	Regional Enhanced Livelihoods in Pastoral Areas
RVF	Rift Valley fever
SA	South Asia
SADC	Southern African Development Community
SAE	Small-area estimation
SEA	South-East Asia
SPS	Sanitary and Phytosanitary measures
SSA	Sub-Saharan Africa

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TBT	Technical barriers to trade
TIPI-CAL	Technology Impact and Policy Impact Calculation
TLU	Tropical livestock unit
vCJD	variant Creutzfeldt-Jakob disease
WHO	World Health Organization

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Endnotes

- 1 This Reader is not intended to exhaustively cover the theme of livestock farming and trading and its role in ACP countries but to provide some background information and selected information resources. Most text of this Reader has been directly taken from the original documents or websites. For additional inputs, kindly contact Isolina Boto (boto@cta.int) or Ronalee Biasca (biasca@cta.int). The Reader and most of the resources are available at <http://brusselsbriefings.net/>.
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