

ABSTRACT

Is Africa different? Economics of the livestock sector

This abstract is based on a full-length paper written by Martin Upton in 2012. The paper is one of a series of economic papers commissioned by GALVmed and produced by a team from the Royal Veterinary College, University of London, led by Jonathan Rushton. The series aimed to address the overarching question: Africa, economics, and poverty – what do livestock add and how can this contribution be improved?

Introduction

This paper provides a comprehensive review of economics of the African livestock sector focused at the sub-continental and national rather than the household level. In turn, it addresses the role of livestock in development; considers whether Africa is different in terms of economics, imports of livestock products, and land and labour resources; and reviews opportunities and constraints in livestock production, trade, non-market functions, value chains, animal feed, and animal and public health. Finally, based on this review, it concludes that devoting more attention to the livestock sub-sector is justified by growing demand for animal sourced products and the opportunity this provides to increase incomes, nutrition and welfare of the rural poor.

Livestock in economic development

Rapid increases in demand for meat, milk and eggs – the animal sourced foods – in developing countries over recent decades has been labelled the ‘Livestock Revolution’. It is driven by population growth, rising per capita incomes and urbanisation. This demand represents an opportunity for rural development and poverty reduction but equally the demand can be met by large-scale commercial producers and international suppliers.

The majority of the world’s rural poor keep livestock that can provide many benefits to smallholder and pastoralist families including income, nutritious diets, savings and insurance, draft power and enhanced social status. The benefits from livestock can extend beyond livestock keepers, through the creation of employment in processing and marketing of livestock and their products, and in supply of livestock inputs, such as feed. But livestock production is constrained by cost and availability of labour, animal genetic resources, feed, animal health and public services.

A major review of livestock sector aid projects conducted during the 1990s concluded that few had achieved any significant improvement in livelihoods of the poor. The review’s authors went on to identify institutions, meaning behavioural rules that form the basis for production exchange and distribution, as being important in the successful delivery of pro-poor measures.

Major causes of market failure in the livestock sector are externalities, such as negative impacts of livestock on the environment and the provision of public goods.

Globally, the livestock sector accounts for nearly half of agricultural output. Growing demand for livestock products and the potential for poverty reduction make it appropriate to review the livestock sector in sub-Saharan Africa – which has the highest proportion of the population living in extreme poverty.

Is Africa different?

According to 2005 data, over half of Africa's population survive on less than USD 1.25 a day: in South Asia, the proportion living in extreme poverty was smaller but the number is greater.

Sub-Saharan Africa has a higher population growth rate, on average, than South Asia and most other parts of the world. Overall, a third of all Africans live in town and cities but there are large variations between sampled countries, from 13% in Uganda to 60% in South Africa. Urban populations throughout Africa are growing faster than the overall population.¹

In the latter half of the twentieth century, African economies generally stagnated, although average per capita incomes vary widely between countries, from low-income countries, such as Ethiopia, to upper middle-income countries, such as Botswana. However, in 2010 per capita output for the continent rose rapidly, bucking the global trend and outperforming South Asia. This growth is attributed to better economic policies and high commodity prices for metals, minerals and oil. Africa is now one of the fastest growing regions in the developing world.

Population growth, urbanisation and increased incomes are driving increased demand for meat, which represents both an opportunity and a challenge for the continent's livestock producers.

Average land holdings in sub-Saharan Africa are larger than in South Asia, but while more than a third of arable land in South Asia is irrigated, the proportion in sub-Saharan Africa is negligible. Cereal yields in Africa are less than half those achieved in South Asia: the former sub-continent being a net cereal importer while the latter is a net cereal exporter.

The livestock sub-sector

Cattle, sheep, goats and camels, which depend largely on natural grazing and browse, account for more than 90% of the livestock unit population in sub-Saharan Africa. The numbers of all livestock species are increasing, although the growth rates for pig and chicken populations are higher than for ruminants or that of the human population.

Given the relative extensive areas of land, and particularly rangeland, per person engaged in agriculture, the high density of livestock units per person is achieved at a low livestock density per hectare.

In sub-Saharan Africa between 2000 and 2010, total production of nearly all livestock commodities increased by more than 3% per year. Increased production was influenced more by increasing animal numbers than productivity gains. Productivity is low by international standards and there is considerable potential for improvement.

Nearly 80% of poor livestock keepers in sub-Saharan Africa are engaged in rain fed mixed crop-livestock farming and a further 14% in grassland based systems. By comparison, a third of the poor livestock keepers in South Asia are engaged in irrigated mixed farming systems.

¹ The data reported is from a sample of 6 countries

Production of animal sourced foods in sub-Saharan Africa is generally failing to keep pace with growing demand, with the shortfall being made up of imports. Sub-Saharan Africa is a net importer of animal sourced foods: 2.5% of the supply of eggs, 9.9% of meat and 11.6% of milk was imported in 2007. In West Africa, twice as much milk is imported as produced domestically. Except for Zambia, the sampled countries are net importers of cereals, which has implications for intensive production of pigs, poultry and dairy that are dependent on compound feeds. Compared to South Asia, per capita supply of meat in sub-Saharan Africa is much higher, but milk and eggs lower: total animal protein intake, at 12 g per day, is similar in both regions, though low by international standards. There is weak development of African's trade in livestock and animal sourced food. The opportunity to increase production depends on Africa's relative competitiveness compared to other livestock producing countries.

Sub-Saharan Africa is a net exporter of live animals, due mostly to exports of cattle, sheep and goats from East Africa to the Middle East. In West Africa, trade in live cattle within the region is important. Sub-Saharan Africa is also a net exporter of hides, skins and wool, with Ethiopia and South Africa benefiting most.

Draft power, provided by cattle, donkeys, horses or camels depending on the agro ecological zone, still plays a role in sub-Saharan Africa although it is difficult to place an estimate on its value. Changing practices, such as the spread of minimal tillage conservation agriculture, are expected to impact on the use of draft power.

Livestock manure has the potential to improve soil fertility, although its use is lower in sub-Saharan Africa than other regions. Competing uses for manure, such as a fuel or for use in biogas digesters, limit amounts available for application to land. In peri-urban areas, manure can be a potential hazard contributing to pollution of air and water sources.

Income and food supply from systems that combine livestock and crop production tends to be more stable than from either component alone. The mobility of livestock in the event of shocks is also an important factor. Livestock represent a form of savings and investment that is especially important to the poor who lack access to formal financial or insurance services.

Livestock also serve a range of social and cultural functions. Livestock ownership is an indicator of social status and wealth, and is associated with benefits such as enhanced ability to obtain credit.

Livestock product value chains

Africa, with its large and growing urban populations and increasing per capita incomes is likely to experience higher per capita consumption of livestock products. Most meat, milk and eggs are consumed in urban areas and value chains have to be developed to supply these urban consumers. Livestock product value chains usually involve intermediaries between the producer and consumer, such as traders, processors and retailers.

African livestock producers face various barriers to accessing markets including physical barriers, such as poor roads and infrastructure, structural challenges, such as imbalance of power between producers and other value chain actors, and low levels of skills, information and organisation.

Typically, in Africa, farmers and pastoralists sell their ruminant livestock to traders in small village markets that have few facilities. Larger secondary markets, located in regional capitals, are dominated by middlemen, traders

and butchers and serve terminal markets. Terminal markets are located in urban centres and are dominated by medium to large-scale traders. High fees levied by market authorities serve to encourage buying and selling of livestock outside formal markets. Increasingly, livestock are trucked rather than trekked between point of production and terminal markets. Seasonality of supply of animals presents problems for abattoirs and prevents them working at or near full capacity year round.

Poultry meat production in sub-Saharan Africa grew at more than 5% a year between 2000 and 2010. Whilst this rate is slower than that in Asian and Latin American Countries, it is faster than the output growth of other African livestock. Although most rural households in Africa keep a few scavenging birds for their own consumption or local sale, the growth in poultry output is due to expansion of large-scale commercial production, much of which is vertically integrated combining breeding, feed production, processing and fast-food outlets.

Milk marketing arrangements vary across Africa. In Kenya, the main producer in East Africa, the market is dominated by small-scale producers, traders and processors and the main product is raw milk, which is favoured by consumers because it is cheaper than pasteurised milk and they prefer the taste. In Southern Africa, milk from large-scale dairy farms is processed by commercial dairies and distributed to retailers via functional cold chains. West Africa is heavily dependent on imports of long-life milk and skimmed milk powder.

Over recent decades in East and Southern Africa, market liberalisation has seen the disbanding of government run meat and milk marketing boards as livestock product value chains have been placed in the hands of the private sector. Government responsibilities in animal sourced food value chains include provision of physical infrastructure, such as roads, improving flow of market information and the development of frameworks to ensure quality and safety of products.

Animal feed balance

Plant growth in Africa is largely determined by rainfall. In the humid zone, rainfall is high and occurs year round, but elsewhere there tends to be wet and dry seasons. Seasonal variation in livestock feed is a severe challenge in all but the humid zone.

Pastoralists have traditionally coped by moving their herds to dry season grazing reserves; some still do although this is becoming increasingly difficult. Most smallholders in mixed crop-livestock systems do not grow forages or make hay or silage and rely on crop by-products and residues. Increased frequency of droughts due to climate change causes substantial mortality of livestock, increases in food prices and in some cases human deaths.

Ruminants and equines depend primarily on natural grassland and browse for their nutrition, except for specialist forages grown to feed some dairy cattle. Rapid intensification of grassland management is likely to be needed to meet growing demand for meat and milk.

In mixed crop-livestock systems, a wide range of potential feed resources may be available including crop residues and by-products, natural pasture and, for dairying in East Africa, sown forages. Small-scale pigs and poultry tend to survive by scavenging and on households waste and by-products.

Intensification of livestock production is occurring in most African countries, requiring use of purchased concentrate feeds fed to pigs, poultry and dairy cattle. In most cases, cereals and other feed ingredients are imported. Profitability of these intensive enterprises depends on the relative price of feeds and livestock products, whilst climate change and human and animal diseases pose further risks and challenges.

Animal disease risks faced by African producers

African livestock producers face a particularly high risk of animal diseases due to the tropical climate, widespread movement of animals, poor housing and weak animal health services. Resource poor livestock keepers have limited capacity to cope with disease and are vulnerable to their impacts.

Tick-borne diseases, especially East Coast fever (ECF), are a major threat to livestock producers in East and Southern Africa. The threat of ECF limits adoption of high yielding exotic dairy cattle and the economic cost of the disease includes significant losses due to mortality as well as the cost of treatment and prevention. Preventive measures used to be based on state funded dipping in acaricide in communal dip tanks, but this has declined markedly since the 1980s: some now question the sustainability of control based on intensive use of acaricides. Vaccination using the infection and treatment method is relatively expensive and requires a functional cold chain and expert veterinary supervision. Chemotherapy against ECF requires early diagnosis and treatment and is also expensive. Integrated control of tick-borne diseases, combining vaccination, maintenance of natural immunity and strategic use of acaricides, can be effective but requires careful and expert planning and management.

Tsetse transmitted trypanosomiasis causes losses across Africa estimated to total up to USD1.5 billion annually. Control of the disease in cattle, sheep and goats depends on use of curative and preventative drugs, although drug resistance is a problem; use of West African breeds that are naturally tolerant, although they tend to be of limited productivity; and various tsetse control measures, all of which are problematic.

Gastro-intestinal parasites also cause considerable losses to African livestock producers. Control depends on the use of drugs although widespread drug resistance threatens the efficacy of this approach.

Endemic diseases, such as the above examples, are always present and eradication is not feasible. In the absence of support from NGOs or the state, producers have to meet the cost of control themselves. Collaboration amongst producers and careful management are needed to realise the benefits of community-wide approaches, which can ensure effective control and limit the development of drug resistance.

Public sector investment is justified in national preventive systems against epidemic transboundary animal diseases, such as foot-and-mouth disease and African swine fever. Such investments can contribute to enhanced food security, support sustainable livelihoods of resource poor livestock producers and prevent environmental damage. Preventive approaches include precautionary measures, such as disease surveillance, and outbreak control. Of particular note is the successful eradication in 2011 of the formerly devastating transboundary disease rinderpest.

Some epidemic diseases, such as Rift Valley fever and brucellosis, are of special concern because they can also affect people. Some zoonoses can be food-borne, which emphasises the need for effective meat inspection and milk quality control.

Provision of animal health services

Whilst some animal health functions, such as clinical diagnosis and treatment, and production and distribution of vaccines and drugs are generally considered to be most appropriately delivered through the private sector, others are considered public goods, best delivered through the public sector. The latter includes quarantine and animal movement control, veterinary inspections, and drug and vaccine quality control. In addition, although the private sector may provide certain services more efficiently, public sector involvement might be needed to ensure service provision to resource-poor producers.

Some functions, such as disease surveillance, prevention, control and eradication of highly contagious disease with serious socio-economic, trade and public health consequences can be delivered by both the public and private sectors, although the finance generally comes from the public budget.

A study of national animal disease prevention systems in Africa showed that the level of expenditure depended on the relative wealth of the country, not the need. Another study in West Africa showed that the benefits of disease surveillance systems generally exceeded the costs. Prevention of the introduction of transboundary animal diseases and the ability to demonstrate freedom from these diseases to trading partners serve as strong incentives for regional harmonisation of disease control policies and compliance with animal health standards.

Efforts over recent decades to shift the provision of clinical veterinary services from the public to the private sector have had limited success. Vets wishing to establish private practices find it difficult to do so outside dairying areas as livestock owners tend to be highly dispersed. They also face unfair competition from state employed vets who also provide private clinical services as a sideline. Restrictions on certain drugs and vaccines, which only state vets can handle, are an additional constraint.

Less intensively trained para-vets have long assisted fully trained state employed vets, especially in more remote areas. More recently, some of these para-vets have started to offer animal services on a fee-paying basis while some NGOs have recruited and trained community-based animal health workers. Services provided by para-vets and community-based animal health workers tend to be less costly than those provided by fully trained vets and their presence tend to increase access to drugs, treatment and advice by the poor. However, institutional and legal frameworks governing these activities are generally lacking. Such frameworks are needed to ensure effective supervision, enable referral of difficult cases and disease reporting, and provide periodic refresher training.

African governments have a role to play in monitoring and enforcing animal health regulations. A careful balance needs to be achieved, however, to ensure measures are not too restrictive in limiting effective delivery. Governments also have roles in promoting research and providing extension services. All these functions are costly: although international aid might be available in the short term, more sustainable arrangements are required for the longer term. Options include service provision via producer co-ops or national veterinary associations, decentralisation of services and a 'one-health' approach, which combines human and animal health service delivery. None of these, however, are panaceas.

Conclusions

The recent surge in Africa's economic growth should generate rising markets for livestock products and opportunities for reducing rural poverty. Development of the livestock sector can contribute to satisfying both goals.

Sub-Saharan African agriculture has substantial supplies of natural and human resources and a large and growing, mainly ruminant, livestock population. Off-take rates and yields are low, but appear to be growing.

More data are required on the performance of different production systems to identify key areas of improvement. Other non-market products, such as draught power, manure and insurance, should not be forgotten.

Areas which need to be addressed include market chains, which are largely informal and unsophisticated; feed supplies, which are variable and uncertain; animal diseases, which cause high costs and risks; and under-resourced and limited animal health services.