



Status of Urban Livestock Production in African Context: Overview

Isayas Asefa Kebede*

Department of Veterinary, Wolaita Sodo University, Wolaita Sodo, Ethiopia

ABSTRACT

This review is on urban livestock production. Urban livestock production refers to the rearing and processing of animals within municipalities (towns and cities). Animal production has been part of urban agriculture in many cities. An effective and profitable livestock production cannot be achieved if information is neither available nor accessible to the livestock keepers. Feeding strategies in urban areas vary according to such factors as social categories, animal species, household income and distance to the city center. Depending on the animal species and type of production involved, three major feeding systems can be distinguished. These are based on the use of household wastes and agro-industrial by-products, roughage and concentrates. Performance of the sector may be different from region to region, between countries and within different parts of a country. Most of the additional milk, eggs and poultry meat has been for domestic African markets, which have grown rapidly in many urban areas. The best market opportunity for future growth lies within Africa itself. Africa's meat demand is projected to almost triple between 1997 and 2025, from 5.5 million metric tons to 13.3 million metric tons. In the future, many developed countries will see a continuing trend in which livestock breeding focuses on other attributes in addition to production and productivity, such as product quality, increasing animal welfare, disease resistance and reducing environmental impact. Keeping livestock in urban areas is practiced by high and low-income urban dwellers and production ranges from large to small scale. In urban areas working equids are a major means of transport, both as ridden and pack animals and through pulling carts. They transport goods to and from markets, farm inputs to farmsteads, children to school, and the sick and women in labor to clinics and hospitals. Livestock may act as a form of financial capital in a number of different ways: as a form of savings, as an investment, a means for generating cash in an emergency, animal off take as an income, or by acting as collateral for credit or loans. Self-esteem owning, controlling and benefiting from livestock production increases women's self-esteem and strengthens their role as producers and income generators within the household and in the community. Animal products can also present health risks to consumers. If insufficiently processed then diseases such as tuberculosis, leptospirosis, anthrax, salmonellosis and brucellosis can be transmitted through the milk and meat of urban livestock. Zoonotic diseases are also associated with urban livestock.

Keywords: Gender; Livestock; Poverty; Production; Urban; Zoonosis

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Corresponding author: Isayas Asefa Kebede, Department of Veterinary, Wolaita Sodo University, Wolaita Sodo, Ethiopia; E-mail: byisayas@gmail.com

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INTRODUCTION

An urban livestock production system is a system that occurs in and around densely populated areas and with nearby and distant rural areas. Urban livestock production refers to the rearing and processing of animals within municipalities (towns and cities). The increasing demand for livestock products in developing countries is mainly driven by urbanization. Urban livestock production system encompasses all types of livestock keeping in and around densely populated areas [1-3].

The nature of human societies is changing. People are becoming increasingly congregated in urban centers and increasingly disconnected from food systems. "Local food systems have been increasingly replaced by a globalized food system", governed without much transparency by a few governments and institutional arrangements and strongly influenced by the small number of transnational corporations that dominate.

Urban livestock keeping in small scale, often dominated by poultry, pigs and dairy cows the space devoted to animals is relatively small. Animals are fed on food wastes from the household, restaurants and communal institutions. The demand for information on livestock production is also growing. Urban livestock production constitutes an important subsector of the agricultural production system in Ethiopia. Livestock keepers in the urban area are still receiving little attention in terms of policy, institutional and technical support targeted at their needs. In Addis Ababa city, about 33% of the livestock keeper households are headed by women [4-7].

An effective and profitable livestock production cannot be achieved if information is neither available nor accessible to the livestock keepers. Livestock keepers need information on livestock diseases, nutrition, treatment and control of diseases, breeding techniques and markets for their products. Urban livestock keepers still lack adequate information on livestock keeping practices.

Urban livestock production is a source of additional income. For the poorly remunerated employed civil servants and traders as well as retired urban dwellers. Other benefits include: Employment generation for the unemployed, opportunities for organic waste recycling and uplifting of social status. The increasing demand for livestock products in developing countries is mainly driven by urbanization, a notable growth in population and increasing incomes.

Animal production is and has been part of urban agriculture in many cities. It occurs in a multitude of forms (mixed farms or specialized livestock keepers; species, herd size, free roaming or confined, husbandry practices), scales and degree of market orientation (subsistence, mixed subsistence/commercial, small commercial, large commercial) and locations (back yards, roof tops, peri-urban areas, urban public vacant spaces) each with its own problems and opportunities.

The production system classification can thus be re-evaluated using different scenarios of change into the future made a tentative assessment of how these systems might be transformed by human population growth and climate change, giving some clues as to how the distribution of farming systems, and thus livelihood systems, may change over the next 20 to 40 years. Considerably more sophisticated analyses have been undertaken recently: These use various combinations of econometric models of the global agricultural sector and explicit models of land use change into the future, to assess how the nature and distribution of different agricultural production systems may shift in response to sets of socioeconomic and demographic stimuli [8-10].

Keeping livestock in urban areas can improve the food security and nutrition of the urban poor. Livestock production is undertaken in a multitude of ways across the planet, providing a large variety of goods and services and using different animal species and different sets of resources in a wide spectrum of agro-ecological and socio-economic conditions. Within this wide variety of livestock production there are certain patterns that have been categorized into various livestock production systems. Therefore, the objectives of this review paper are:

- To review the overall livestock production in urban area.
- To overview the benefits and the risk of urban livestock keeping.
- To highlight production and productivity of livestock in urban areas.
- To create awareness on urban livestock production.

LITERATURE REVIEW

Urban Livestock Keeping

Extent of livestock keeping in urban areas: Keeping livestock in urban areas is practiced by high and low income urban. Livestock keeping is the most important agricultural activity, partly due to the lack of suitable space for cultivation and partly due to the demand for cheap meat. Urban dwellers of all income groups are involved in livestock keeping, and different social groups engage in urban livestock keeping for different reasons.

Livestock keeping now seems to be recognized for the positive role that it can play in urban living conditions across the world. Indeed, livestock production has a variable and controversial, but often essential, role to play in and for cities. With both small and large animals, it is subject to change, e.g., local breeds are replaced by foreign breeds and, while it is increasing in some cities, it is decreasing elsewhere [11-13].

Livestock and Livelihoods

Livestock contributes to the livelihoods in the world, and just fewer than one in eight people are almost entirely dependent on livestock for their livelihood. The social functions of livestock are diverse. In the Niayes zone of Senegal it is

believed that “an animal will protect human beings from calamity”, therefore spiritual and mystical motivations are one of the reasons for keeping urban livestock. Livestock may act as a form of financial capital in a number of different ways, as a form of savings, as an investment, a means for generating cash in an emergency, animal off take as an income, or by acting as collateral for credit or loans.

Within a country livestock may be kept for various reasons among which are to achieve both national and household food security, to reduce poverty through generation of employment, income and savings, contribute to economic development through trade in livestock and livestock products and supplying raw materials to industry, while at the same time managing the environmental and public health implications of livestock production.

Livestock keepers can secure private benefits from common property resources through their livestock, this is applicable in off-plot urban livestock keeping systems where animals graze or scavenge for food in public spaces. Livestock can be a way of managing and diversifying risk and therefore increasing livelihood security, and they can make the difference between survival and abject poverty. Livestock also provide a source of transport, fuel, food and access to social networks. Livestock provide cash and in-kind income through the sale of animals and/or the sale and/or self-consumption of milk, meat, eggs and other animal products. Second, livestock are a form of savings and insurance.

Urban Livestock Production According to Ethiopian Context

With a population of over 70 million people, 44% of whom fall under the basic need's poverty line, and a GDP which is 1/5 of the Sub-Saharan African average, Ethiopia is one of the poorest countries in the world. In its sustainable development and poverty reduction program the Ethiopian government states that poverty reduction is its core objective, to be achieved principally, but not only, through economic growth. Broadly, the primary emphasis has been placed on rural welfare and on stimulating agriculture as a means of fueling growth in other sectors. In highly populated areas, smaller livestock (sheep, goats, etc.) are preferred over large animals that require large expanses of grazing land. In the highlands where crop production requires intensive tillage, draft animals such as oxen or mules are necessary.

This spatial variation in livestock population, coupled with other factors such as population density, grazing land availability, and access to markets has implications in grazing land management and livestock markets. Understanding spatial variations within the livestock economy is crucial in order to devise a feasible, more geographically targeted livestock policy. The urban livestock production system is complex. It involves diverse activities, such as production, processing and marketing, and several technologies at each level in the commodity chain that makes up the system. The major players in the production, processing and marketing of these products are women.

Role of Livestock in Reducing Poverty

Livestock often constitute a reserve of wealth, steadily built up and used to counter risks of income loss and food insecurity. Urban livestock rearing, even on a small scale, is a supplementary source of income for people employed in jobs other than farming (traders, artisans, civil servants). The majority of the world's estimated 1.3 billion poor people live in developing countries where they depend directly or indirectly on livestock for their livelihoods.

Increased economic activity in livestock fosters forward linkages through growth in livestock processing and marketing, and backward linkages through increased demand for inputs and livestock services. Ethiopia revealed the important political, economic and social contribution that equine ownership makes to households. But, unlike livestock, the economic value of working equids is more difficult to quantify, particularly regarding their use in subsistence farming systems. Livestock keeping in urban areas is also a multi-purpose activity and livestock may be important for a range of different reasons in any one situation, these roles include food security, income generation, saving, insurance and livestock and livestock products providing convertible assets.

Many working equids are used in the tourist trade, where they transport food and drinks to hotels and provide riding or carriage services for tourists and pilgrims. In urban areas working equids are a major means of transport, both as ridden and pack animals and through pulling carts. In the export of high value products such as coffee and chocolate, working animals, including equids, are often the first link in the transport chain, moving goods to district and regional hubs for onward motorized transport.

Performance of Livestock Sector

Production: The spectacular growth of livestock products especially milk, meat, eggs and poultry meat is attributed to the initiatives taken by the organized sector and the rising demand for these products in response to rising incomes in urban areas. The expenditure elasticity for livestock products is high with the tilt in favor of urban.

Performance of the sector may be different from region to region, between countries and within different parts of a country. At international level, there has been variation in terms of extent and nature of livestock sector growth and invariably the extent to which livestock can contribute towards economic development and the achievement of millennium development goals.

Trade: Most of the additional milk, eggs and poultry meat has been for domestic African markets, which have grown rapidly in many urban areas. Africa's traditional beef and hide exports have declined significantly since 1980-82 while exports of dairy products, eggs and sheep and goat meats have grown, also bovine meat, mutton and lambs, hide and skin, chicken meat, dairy and egg, livestock. Livestock trade beyond the region to the Arabian Peninsula has long been a significant

outlet for livestock owners in Ethiopia's Somali region. This trade has expanded greatly in recent years.

In 2010 Ethiopia formulated a five year development plan called the Growth and Transformation Plan (GTP). The GTP sets an ambitious target of increasing export earnings from live animal and meat export combined from the US\$125m achieved in 2009/10 to US\$1bn in 2014/15.

Future perspective: The best market opportunity for future growth lies within Africa itself. Africa's meat demand will be projected to almost triple between 1997 and 2025, from 5.5 to 13.3 million metric tons. Historically, domestication and the use of conventional livestock breeding techniques have been largely responsible for the increases in yield of livestock products that have been observed over recent decades. Cross-breeding, widespread in commercial production, exploits the complementarity of different breeds or strains and makes use of heterosis or hybrid vigor. In the future, many developed countries will see a continuing trend in which livestock breeding focuses on other attributes in addition to production and productivity, such as product quality, increasing animal welfare, disease resistance and reducing environmental impact. The tools of molecular genetics are likely to have considerable impact in the future. Institutional and policy frameworks that encourage the sustainable use of traditional breeds and in situ conservation need to be implemented, and more understanding is needed of the match between livestock populations, breeds and genes with the physical, biological and economic landscape.

Urban Livestock Feeding System

Feeding strategies in urban areas vary according to such factors as social categories, animal species, household income and distance to the city center. An important difference between animals is the distinction between ruminants such as cows, buffaloes, goats and sheep, which eat feeds rich in fiber (grass, hay, straw), and mono-gastric such as chickens, ducks and pigs. In urban conditions green feeds and fibrous crop residues tend to be relatively scarce. When (green) fodder is scarce, farmers can either turn to raising smaller animals (goats or sheep instead of cows or buffaloes) or buy concentrates (rice bran, oilseed cakes, commercial meals). By-products such as kitchen wastes, hotel leftovers or waste from the canning industry and beer brewers can also be useful, even in the keeping of such large ruminants as cows and buffaloes. Depending on the animal species and type of production involved, three major feeding systems can be distinguished. These are based on the use of household wastes and agro-industrial by-products, roughage and concentrates [14-17].

Important waste products for pigs and dairy animals are brewers' grain and rejected bananas or pineapples from canning factories. Small units of such species as rabbits can be fed diets that are based entirely on wastes and some roughage. In most intensive pig and poultry systems, the dominant feed mix comprises grains such as wheat, barley or maize, in combination with soy.

Household wastes and agro-industrial by products: Agro-industrial by-products refer to by-products derived in the industry due to processing of the main products. They are in comparison to crop residues, less fibrous, more concentrated and have a higher nutrient content. Good examples of AIBP are molasses, rice bran, pineapple waste, Palm Oil Mill Effluent (POME) produced from refining the palm oil and coconut cake, cassava peels, yam peels, maize husk, banana peels, cocoyam peels, rice bran, cowpea husk, rice husk and plantain peels.

Roughage based system: Feeding of large herbivorous species (sheep, goats, cattle, buffaloes) in urban areas is complex, because a large proportion of their ration has to be fiber in order to ensure a good functioning of the digestive system. Roughage such as straws and grasses contain a lot of fiber, but in urban conditions these feeds are generally expensive. They are rarely produced inside cities, and the costs of transport (from rural areas) and storage of bulky fodders are high. However, urban production systems using expensive roughage can be profitable in particular circumstances.

Concentrate based systems: These systems concern mainly intensive and specialized poultry, pig and dairy units in urban areas. The concentrates are often imported or made from local grain and oilseed milling by-products. Concentrate based rations to be addressed are the occurrence of mycotoxins (caused by molds) and chemical residues in the feed. Where legislation is ineffective there seems to be little point in establishing laboratories; collective action and education will have to be part and parcel of legislative measure.

Gender and Livestock Production

Women's typical role within a livestock production system is different from region to region, and the distribution of ownership of livestock between men and women is strongly related to social, cultural and economic factors. Women play an important role in livestock management, processing and marketing, acting as care providers, feed gatherers, and birth attendants.

The role of women in managing animals that are confined during most of the year is substantial and they are critically involved in removing and managing manure, which is often made into cakes and used or sold as fuel. In this regard, women have the major role in minimizing environmental pollution and public health problems related to urban livestock production.

Impact of Urban Livestock Production

Positive impact of urban livestock production: Waste is usually conceptualized as a useless or discarded material. However, if usable then 'waste', which includes livestock manure, can be considered a resource; soil amelioration for urban cultivation is one potential use of 'waste', others include livestock or aquaculture feed, fuel or construction.

Self-esteem owning, controlling and benefiting from livestock production increases women's self-esteem and strengthens

their role as producers and income generators within the household and in the community. Urban agriculture increases economic prosperity by creating jobs and developing new, local industries. The urban interface is characterized by strong urban influences; easy access to markets, services and other inputs; ready supplies of labor.

Public health impact of urban livestock production: Animal products can also present health risks to consumers. If insufficiently processed then diseases such as tuberculosis, leptospirosis, anthrax salmonellosis and brucellosis can be transmitted through the milk and meat of urban livestock. In addition to producing large quantities of meat, CAFOs also contribute vast amounts of waste to the environment, including manure, urine, carcasses, excess feed and feathers. As of 1997, animals in the US IAP system produced a grand total of approximately 1.4 billion tons of waste. This is equivalent to about 5 tons of animal waste for each person in the USA.

Scientists' estimates that more than 70% of all antibiotics produced in the USA are used in animal production. Many of these antibiotics are closely related to those used to treat infections in humans. Resistant strains of bacteria that develop in CAFO animals threaten the usefulness of these medicines in treating humans. A university of Iowa study found that people living near large scale pig facilities reported higher incidence of headaches, respiratory problems, eye irritation, nausea, weakness, and chest tightness.

Disease risks of urban livestock systems are likely to need much more attention in the near future. This should, however, be a reorientation towards a more holistic focus on social issues and system specificity, moving away from a single focus on disease as a clinical issue. Recent cases of SARS and avian influenza in densely populated areas of Asia have made zoonosis a major concern in public health.

DISCUSSION

Reduction of Zoonosis in Urban Livestock Production

The need for improved veterinary services in many low income and middle income countries is implied by the gap in broad awareness of zoonotic diseases and their ability for detection and prevention in animals, and the ability to quantify and report their occurrences. Because, disruptive effects to commerce and society can account for a large share of the economic costs of disease, integration of control

strategies in animals into zoonotic disease control efforts might prove more cost effective than would control in people alone. The increased risk of transferring diseases from animals to humans in urban areas needs to be reduced by working with producers on the adequate management of animal diseases and wastes, preventing scavenging, and maintaining adequate slaughtering procedures, among other issues.

A range of interventions for management of zoonotic diseases, including diagnostics, drugs, vaccines and management practices. For any disease, the relevance and importance of each intervention type depends very much on the biology and epidemiology of the disease itself. For instance, vector borne diseases pose particular opportunities for the use of management practices, while diseases characterized by livestock human transmission pose more opportunities for the use of vaccines than those characterized by wildlife human transmission.

The issues will be broken down into three sections, environment and pollution, health and disease and other problems. Perceptions of problems vary between countries and interest groups. Pollution from dung and urine causes a range of potential problems, for example, flies breeding on solid waste may transmit diseases such as diarrhea. Access to water and grazing problems of storing dung for sale are constraints on urban livestock keeping, and further problems such as complaints about noise and smell. Lack of public awareness on occupational and public health risks associated with UA. Inadequate multi sectoral coordinate efforts by different actors and little enforcement by laws [18-20].

Both men and women livestock keepers are challenged by the high cost of inputs (feed and drugs), availability, cost and quality of concentrated feed and grass hay, the absence of a market for fluid milk and the low prices of milk and milk products especially during the fasting period, poor reproductive performance of dairy cows, poor availability of artificial insemination technician and a shortage of semen. Problem such as lack of skill development or training, other management challenges to urban rearing of livestock include problem of suitable housing unit for the animals and high cost of medicare. Increasing climate variability will undoubtedly increase livestock production risks as well as reduce the ability of farmers to manage these risks (Table 1).

Table 1: Perceived problems in urban livestock systems and possible coping strategies at different levels of system hierarchy.

Perceived problems	Coping strategies
Farm level	
Animal health and welfare problems caused by high densities.	Redesign of housing, awareness building, improved management, ventilation and food.
Low output per animal, provides only a small part of the total food requirements.	Awareness raising at municipal administration level on multiple perceptions of urban livestock systems, e.g., animals as cash

generators for poor sections of the population or as efficient recyclers of waste.

Community level

Smell, dust and noise.

Use of drains, straw, bedding, sheds, tree hedges.

Conflict in neighborhood.

Make/modify legislation; involve local people, look for solutions rather than for rigid legislation.

Damage to ornamental plants.

Erect fences and/or tether animals; hang plants out of reach.

City level

Public health problems (diseases such as parasites).

Good health service, improved hygiene, improved packaging/treatment and awareness raising.

Pollution (from manure effluent and wastes from slaughterhouses, etc.).

Biogas; smaller scale enterprise; dung cakes; integration with vegetables.

Overgrazing of urban grounds.

Importing feed from rural areas and/or reduction or change of local herds.

Competition for space.

Efficient housing; reduction of numbers; introduction of smaller animals.

Stray animals/traffic problems.

Traffic rules, limited speed of cars, animals kept off main roads; reduced number of through roads.

Do not over promote large industrial urban livestock systems and/or restrict import of feed out of villages.

CONCLUSION

Livestock are a source of asset accumulation. Livestock provides employment to the people living in urban area and especially to women. This source can be mobilized to satisfy some unexpected expenditures such as children school fees, bride wealth, illness. The rapidly growing market demand will likely promote the intensification and modernization of the commercially valuable production branches (cattle, poultry). The IAP system has grown along with the increase in average meat consumption by people living in high income nations. The key problem facing humanity in the coming century is how to bring a better quality of life. In the future, many developed countries will see a continuing trend in which livestock breeding focuses on other attributes in addition to production and productivity, such as product quality, increasing animal welfare, disease resistance and reducing environmental impact. Policies and interventions have assumed that increased production will most effectively impact on the poor, rather than being built on an understanding of the multiple functions livestock perform and the need to address this in policy making. Urban pressure can accelerate the decline in livestock farming, with clear intensification processes, in contrast to the stable situation in the whole of the country. Developing countries for improving livestock production is through the provision of extension on production techniques. Urban livestock production is greatly challenged by a number of factors which could be categorized as feed and feeding, health, environmental, marketing and routine management related challenges. Therefore, based on above conclusion following recommendations are forwarded.

RECOMMENDATIONS

- Awareness should be created in the community that participates in livestock production about livestock management.
- Women should participate in livestock production without discrimination.
- Government should improve the capacity of livestock producer in financial and land for future expansion.

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